Lab Unlimited
CARL STUART GROUP







Laboratory Catalogue 2014/2015
Edition 18

partner of the LLG Lab Logistics Group

Strategic Alliance to Serve you Better

In October 2012 Lab Unlimited joined forces with Jaytee for the provision of technical support services for laboratory instruments. The two companies have been working together for many years and it became clear that each company has skills that are complimentary to the other but also overlap in areas.

The combined skills of both companies are extensive and offer customers the opportunity of availing of support from this enlarged skill set from a single source in a seamlessly coordinated operation.

Jaytee is particularly strong in the area of HPLC, GC and MS and Lab Unlimited has a long history in dissolution, temperature calibration, liquid handling, weighing, viscosity & rheology, HPLC & GC as well as other laboratory disciplines.

Merging technical and operational resources, the two companies believe that the synergies delivered through this partnership will provide our current and future customers with the widest range of laboratory services from a single source.

Working together Lab Unlimited and Jaytee have sufficient scale to maintain and keep up to date with a wider range of analytical techniques than independent suppliers in their marketplace. Being quality driven, we are continually training all our engineers in both established techniques and evolving new technologies.

Centralised scheduling and coordination is further enhanced through the Lab Unlimited Technical Support portal www.service.labunlimited.com. This portal allows customers to log support calls on a 24 x 7 x 365 basis, to verify preventive maintenance schedules, to view service and calibration histories of each individual instrument and also to request copies of calibration certificates.

Our Philosophy is simple 'right first time' or 'first time fix' from our engineering workforce. We use only the best available parts (sourced from OEMs) and alternative parts that are exposed to rigorous appraisal and testing regimes.

Servicing & calibration capabilities

Which manufacturer's instrumentation can we support?

If we were to list them all, there would not be enough room on this page so below we have listed the major ones. If you have an instrument from a manufacturer who is not listed then give us a call, we can confirm our capability quickly for you.



HPLC, GC GCMS, LCMS
Agilent/HP, AB Sciex, Dionex, Gilson, Jasco, Shimadzu, Merck-Hitachi, MicroMass, Varian, Waters and more.

Gas Flow meters
Agilent/HP, Supelco, Humonics, J&W Scientific, Alicat, Varian, Perkin Elmer

Gravimetric
Mettler, Sartorius, Kern

Diluting & Dispensing
Hamilton, Car-may

Tablet Testing
Distek, Sotax, Electrolab

Weighing
Mettler, Sartorius, Ohaus, Kern, A+D

Temperature
Binder, IKA, Julabo

Mixing & Stirring
IKA, Heldolph, Homogenising

Viscosity
Brookfield, Haake

pH & Conductivity
WTW, Mettler

Milling, Grinding & Sieving
Retsch

USP Water
Thermo TKA Barnstead

Our services allow you, our customer, to achieve full compliance by working with you to tailor calibration procedures and documentation to meet your specific requirements. Both company's pride in quality of service and a shared belief that our customer always comes first ensures that you benefit from our flexibility - we do not lock you into restrictive 'service plans'.

In addition, you receive preferential response times, a discounted engineer Call Day rate (forget the ambiguous hourly rates) and full telephone & email technical support at all times during business hours.

Lab Unlimited Associated Services

Installation Qualification (IQ):
The IQ execution, verifies that the equipment, and its ancillary systems or sub-systems have been installed in accordance with installation drawings and or specifications under cGMP guidelines.

Operational Qualification (OQ):
OQ is the process of demonstrating that an instrument will function according to its operational specification in the selected environment.

Performance Qualification (PQ):
PQ is defined as the process of demonstrating that an instrument consistently performs according to a specification appropriate for its routine use.

Preventive Maintenance (PM):
PM provides regular maintenance according to manufacturer specification & ensures the instrument is maintained in peak condition for optimal performance.

Full Contract Services:
Our contract services are customised (Maintenance schedules, Validation Specifications, Documentation reports) to suit your needs and cover maintenance and validation on all analytical disciplines.

Expertise:
All our engineers are cross trained which provides for quick response time to maintenance call outs.

Quality:
All validations carried out are traceable to National Standards and follow pre-approved protocols and documentation.

Instrument sales and rental

We are able to offer a comprehensive selection of used instruments that are fully reconditioned prior to sale. This includes HPLC, GC, LC-MS, GC-MS, SPECTROMETERS, TABLET TESTING and WEIGHING to mention only the larger items.

We service, stock and support products from Agilent, Waters, ABSciex, Dionex, Gibson, Jasco, Shimadzu, Merck-Hitachi, MicroMass, Varian, Sotax, Distek, Hamilton, Julabo, WTW, IKA, Binder, Mettler, Sartorious, Kern, Car-may, Electrolab and others.

With more than 25 years experience we pride ourselves in maintaining the highest quality used equipment that has been expertly reconditioned and where appropriate offered with relevant warranties.

If you have short term requirements or are uncertain as to future needs, then talk to us about available equipment rental options.



Management & Reporting



Service Management
Our Service Management and Customer Relations Management database enables us to manage our customers and their inventory. Our processes are driven to allow us to pre-empt and manage your servicing requirements.

Reporting
Our bespoke Service Management software is flexible enough to meet individual customer requirements.

Specify what performance analytics you want to monitor first response, downtime, reliability etc. We can tailor reports by period, instrument, system and/or location.

Telephone Helpline
We have dedicated staff available to answer all your technical queries. This resource is available for everyone, not just customers with maintenance agreements.

An Open Invitation…
We are so confident in our expertise and ability to give our customers an outstanding service, that we welcome any inspections or audits of our laboratory and facilities that our customers or prospective partners care to make.

How does this benefit our customers?

Together we offer a one stop service shop for all your laboratory analytical instrumentation needs. We offer such a wide range of analytical disciplines that the requirement for multiple vendors is minimised.

Through our Technical Support portal each customer can see full details of all instrumentation in their laboratory along with the PM/PV and calibration status for each individual item, including future scheduled dates for work to be carried out.

Calibration standards feature heavily in our portfolio. It is imperative to users that they know that their instrumentation is performing according to specification in order to be confident that they are achieving the highest accuracy and repeatability of results in accordance with the increasing regulatory demands of today's modern marketplace.

We have the only European service centre capable of both calibrating and repairing ADM gas flow meters for GC and other uses.

In addition to our servicing and calibration capability, we carry extensive stocks of spares, consumables and general laboratory items. We aim to have the right product for our customer to be able to perform all of their daily analytical tasks. Visit www.labunlimited.com to browse 50,000+ products that can be ordered today.

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Imprint

Published by:
Lab Logistics Group GmbH
Meckenheim, Germany

Editor:
Hélène Desaphy
André Meise

Printing:
KonradinHeckel
Heckel GmbH, Nürnberg, Germany

Software:
Wiessoft GmbH, Schifferstadt, Germany

Design:
Die Gestalter GmbH, Schwerte, Germany

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Copies: 133,000

Published: 2013

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All product listings have been researched and presented in co-operation with the respective supplier.
Every effort has been made to ensure that data, descriptions and prices given within this catalogue were correct at the time of going to press but we accept no liability for any error. E & OE.
We kindly ask you for your understanding.

Your LLG-Partner's Terms and Conditions of Business will apply.

Abbreviation key:

PK = packaging unit

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QUALITY HAS A NAME – DURAN®

As one of the leading manufacturers of borosilicate glass 3.3, the DURAN GROUP works constantly to optimise its existing products and develop new products. The combination of long years of experience with the flexibility of a medium-sized company makes the DURAN GROUP an ideal partner.

Our umbrella brand

DURAN GROUP
magic of precision

WHAT MAKES DURAN® SPECIAL

Optimum physical and chemical characteristics make DURAN® glass the material of choice for laboratory applications.

- High raw material purity guarantees uniform glass characteristics
- Decades of experience in the manufacture of laboratory glassware guarantee constant high quality
- Uniform wall thickness distribution throughout the product
  – therefore better mechanical stability and greater thermal shock resistance
  – prevents material stresses, which may cause the glass to crack when subject to heating or cooling
- Advantages: improved safety for employees, longer laboratory glass service life, protection of valuable substances



THE BATCH CERTIFICATE

All DURAN® laboratory glass bottles, beakers, Erlenmeyer flasks and reagent bottles are provided with a "retrace code".

- Eight-figure number on the articles
- Permits, together with the DURAN Group article number, the calling up of a batch and quality certificate via the DURAN GROUP home page – quickly and conveniently
- Traceability right back to the time of manufacture and the corresponding batch
- Gap-free documentation within your own quality management system



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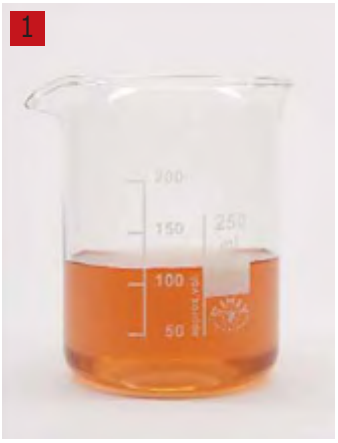
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DURAN GROUP
magic of precision

1 Beakers, Borosilicate 3.3, low form

DIN 12 331. ISO 3819. With approximate graduations and spout.

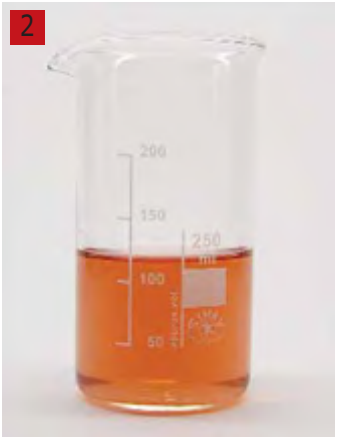
Capacity ml	Ext. diam. mm	Height mm	PK	Cat. No.
5	22	30	10	**9.013 905**
10	26	35	10	**9.013 906**
25	34	50	10	**9.013 900**
50	42	60	10	**9.013 901**
100	50	70	10	**9.013 902**
150	60	80	10	**9.013 903**
250	70	95	10	**9.013 904**
400	80	110	10	**9.013 910**
600	90	125	10	**9.013 911**
800	100	135	10	**9.013 912**
1000	105	145	10	**9.013 913**
2000	130	185	4	**9.013 914**
3000	150	210	4	**9.013 915**
5000	170	270	2	**9.013 916**



2 Beakers, Borosilicate 3.3 glass, tall form

DIN 12 331. ISO 3819. With approximate graduations and spout.

Capacity ml	Ext. diam. mm	Height mm	PK	Cat. No.
25	30	55	10	**9.013 924**
50	38	70	10	**9.013 925**
100	48	80	10	**9.013 920**
150	54	95	10	**9.013 921**
250	60	120	10	**9.013 922**
400	70	130	10	**9.013 923**
600	80	150	10	**9.013 930**
800	90	175	10	**9.013 931**
1000	95	180	10	**9.013 932**
2000	120	240	6	**9.013 933**
3000	135	280	6	**9.013 934**



3 Beakers, DURAN®, low form

DIN 12331. ISO 3819. With easy-to-read scale and large labelling field for easy marking, in fired-on, highly durable white ceramic. Due to the wall thickness, it is suitable for use as a heating vessel. Glass Type I/neutral glass as per USP, EP and JP. With retrace code (Batch Identification) except 5ml, 10ml and 25ml. Certificate available via the Internet. Autoclavable. *DURAN Group*

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
5*	22	30	1	**9.013 007**
10*	26	35	1	**9.013 008**
25	34	50	1	**9.013 014**
50	42	60	1	**9.013 017**
100	50	70	1	**9.013 024**
150	60	80	1	**9.013 029**
250	70	95	1	**9.013 036**
400	80	110	1	**9.013 041**
600	90	125	1	**9.013 048**
800	100	135	1	**9.013 053**
1000	105	145	1	**9.013 054**
2000	132	185	1	**9.013 063**
3000	152	210	1	**9.013 068**
5000	170	270	1	**9.013 073**
10000*/**	217	350	1	**9.013 086**

* Without graduations.
** Not to DIN and ISO.



4 Beakers Super Duty, DURAN®, low form

With approximate graduations and spout. Reinforced, sturdy rim and increased mechanical strength for heavy duty. Glass Type I/neutral glass as per USP, EP and JP. With retrace code (Batch Identification). Certificate available via the Internet. Autoclavable. *DURAN Group*

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
150	60	80	1	**9.051 150**
250	70	95	1	**9.051 151**
400	80	110	1	**9.051 152**
600	90	125	1	**9.051 153**
1000	105	145	1	**9.051 154**
2000	132	185	1	**9.051 155**
5000	170	270	1	**9.051 156**





1 Beakers, DURAN®, tall form

DIN 12331. ISO 3819. With approximate graduations and spout. With easy-to-read scale and large labelling field for easy marking, in fired-on, highly durable white ceramic. Due to the wall thickness, it is suitable for use as a heating vessel. Glass Type I/neutral glass as per USP, EP and JP. With retrace code (Batch Identification). Certificate available via the Internet. Autoclavable.

DURAN Group

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
50	38	70	1	**9.013 117**
100	48	80	1	**9.013 124**
150	54	95	1	**9.013 129**
250	60	120	1	**9.013 136**
400	70	130	1	**9.013 141**
600	80	150	1	**9.013 148**
800	90	175	1	**9.013 153**
1000	95	180	1	**9.013 154**
2000	120	240	1	**9.013 163**
3000	135	280	1	**9.013 168**



2 Filter beaker, DURAN®

Heavy wall. With spout. Glass type I/neutral glass as per USP, EP and JP. Autoclavable.

DURAN Group

Capacity ml	Diam. mm	Height mm	Description	PK	Cat. No.
250	70	94	with graduations	1	**9.051 036**
500	89	124	with graduations	1	**9.051 044**
1000	105	160	with graduations	1	**9.051 054**
2000	135	195	with graduations	1	**9.051 063**
3000	157	205	with graduations	1	**9.051 068**
5000	182	256	with graduations	1	**9.051 073**
10000	225	340	without graduations	1	**9.051 086**
15000	260	390	without graduations	1	**9.051 088**
20000	285	430	without graduations	1	**9.051 091**



3 Beakers, low form, Pyrex®

NEW!

- Complies with ISO 3819 and DIN 12331
- Manufactured from Pyrex® borosilicate glass
- Excellent thermal performance
- High resistance to chemical attack
- White graduations and marking spot

Scilabware

Capacity ml	Ext. diam. mm	Height mm	PK	Cat. No.
25	34	50	10	**9.014 003**
50	42	60	10	**9.014 001**
100	50	70	10	**6.238 860**
150	60	80	10	**9.014 002**
250	70	95	10	**6.254 004**
400	80	110	10	**9.014 004**
600	90	125	10	**6.258 182**
1000	105	145	10	**9.014 005**



6.230 405

Beakers, low form, heavy duty, Pyrex®

NEW!

- Mechanically stronger than standard beakers
- Designed for longer life and increased user safety
- Reinforced rims and spout, less prone to breakage during washing etc.
- Thicker walls and heavier bases
- Manufactured from Pyrex® borosilicate glass
- White graduations and marking spot

Scilabware

Capacity ml	Ext. diam. mm	Height mm	PK	Cat. No.
250	68	90	12	**6.230 404**
400	77	110	12	**6.230 405** 4
600	90	124	6	**6.235 736**
1000	108	156	6	**6.252 670**

Glassware cleaners - please see page 1122.

E & OE.

1 Beakers, tall form, Pyrex®

NEW!

Scilabware

- Complies with ISO 3819 and DIN 12331
- Manufactured from Pyrex® borosilicate glass
- Tall form with spout
- White graduations and marking spot

Capacity ml	Ext. diam. mm	Height mm	PK	Cat. No.
100	48	80	10	**6.254 003**
150	54	95	10	**6.254 389**
250	60	120	10	**9.014 006**
400	70	130	10	**6.251 689**
600	80	150	10	**6.205 753**

1



2 Beakers, 18/10 steel

With rim and spout. Flat bottom for good contact with hotplates and magnetic stirrers.

Bochem

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
100	50	60	1	**9.013 610**
250	65	85	1	**9.013 611**
500	80	110	1	**9.013 612**
1000	100	130	1	**9.013 613**
2000	120	180	1	**9.013 614**
3000	150	180	1	**9.013 615**
5000	180	210	1	**9.013 616**

2



3 Measuring jugs with handle, 18/10 steel

Graduated 200 ml.
Heavy duty. With spout and handle.

Bochem

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
1000	100	140	1	**9.275 850**
2000	130	170	1	**9.275 852**

3





1



1 LLG-Griffin beakers, PP

According to ISO 7056. Printed blue graduations.

Capacity	Grad.	Diam.	Height	PK	Cat. No.
ml	ml	mm	mm		
25	5	32	47	2	**9.013 670**
50	10	39	60	2	**9.013 671**
100	10	50	70	2	**9.013 672**
250	25	67	93	2	**9.013 673**
500	50	88	119	2	**9.013 674**
1000	50	109	147	2	**9.013 675**
2000	100	133	184	1	**9.013 676**

2



2 Griffin beakers, PP

Highly transparent. With easily readable, printed blue scale. *VITLAB*
To preserve markings, cleaning at no higher than 60°C is recommended.
Food-safe product according to EC Directive No. 10/2011.

Material	Capacity	Grad.	Diam.	Height	PK	Cat. No.
	ml	ml	mm	mm		
PP	10	2	25	35	1	**9.013 208**
PP	25	5	31	47	1	**9.013 220**
PP	50	10	40	60	1	**9.013 228**
PP	100	20	49	70	1	**9.013 238**
PP	150	20	56	80	1	**9.013 244**
PP	250	50	68	94	1	**9.013 248**
PP	400	50	77	109	1	**9.013 209**
PP	500	100	88	122	1	**9.013 254**
PP	600	100	91	125	1	**9.013 256**
PP	800	100	98	136	1	**9.013 258**
PP	1000	100	102	149	1	**9.013 262**
PP	2000	200	133	183	1	**9.013 264**
PP	3000	200	174	214	1	**9.013 266**
PP	5000	500	185	248	1	**9.013 270**

3



3 Griffin beakers, ETFE, for trace analysis

Transparent. With easily readable, printed black scale. *VITLAB*
Very good chemical resistance and very high thermal stability from -100°C to +150°C.
To preserve markings, cleaning at greater than 60°C is not recommended.

Capacity	Grad.	Diam.	Height	PK	Cat. No.
ml	ml	mm	mm		
25	5	32	50	1	**9.013 702**
50	10	39	59	1	**9.013 703**
100	20	50	72	1	**9.013 704**
250	50	67	96	1	**9.013 706**
400	50	77	109	1	**9.013 707**
500	100	88	122	1	**9.013 192**
600	100	91	125	1	**9.013 708**
1000	100	105	143	1	**9.013 710**

4



4 Griffin beakers, PFA, for trace analysis

Transparent. With a raised scale. Excellent chemical resistance and very high thermal stability from -200°C to +260°C *VITLAB*
Autoclavable at 120°C (2 bar) according to DIN EN 285.
The advantages of PFA
- Specially suitable for use in trace analysis
- Ideal for sensitive and valuable samples
- Long-term maintenance of low-concentration reference materials in PFA containers
- No memory effects
- Practically no carryover, no contamination due to the extremely hydrophobic, anti-adhesive and smooth surfaces
- High thermal stability, from -200°C to +260°C
- Chemical inertness against nearly all chemicals
- Good transparency and dimensional stability
- Easy to clean
- Use of high purity raw materials

Material	Capacity	Grad.	Diam.	Height	PK	Cat. No.
	ml	ml	mm	mm		
PFA	25	5	32	50	1	**9.013 210**
PFA	50	10	39	59	1	**9.013 211**
PFA	100	20	50	72	1	**9.013 212**
PFA	250	50	67	96	1	**9.013 213**
PFA	500	100	88	122	1	**9.013 214**
PFA	1000	100	109	141	1	**9.013 215**

E & OE.

1 Griffin beakers PMP

Crystal clear. With easily readable, printed red scale. *VITLAB*
To preserve markings, cleaning at no higher than 60°C is recommended.



Material	Capacity ml	Grad. ml	Diam. mm	Height mm	PK	Cat. No.
PMP	10	2	25	35	1	**9.013 315**
PMP	25	5	31	47	1	**9.013 320**
PMP	50	10	40	60	1	**9.013 328**
PMP	100	20	49	70	1	**9.013 338**
PMP	150	20	56	80	1	**9.013 344**
PMP	250	50	68	94	1	**9.013 348**
PMP	400	50	77	109	1	**9.013 350**
PMP	500	100	88	122	1	**9.013 354**
PMP	600	100	91	125	1	**9.013 356**
PMP	800	100	98	136	1	**9.013 358**
PMP	1000	100	102	149	1	**9.013 362**
PMP	2000	200	133	183	1	**9.013 364**
PMP	3000	200	174	214	1	**9.013 366**
PMP	5000	500	185	248	1	**9.013 370**

2 Beakers, PTFE, Low form

With reinforced rim and spout. Ungraduated. *BRAND*
Excellent chemical and temperature resistance.



Capacity ml	Diam. mm	Height mm	PK	Cat. No.
5	20	28	1	**9.013 722**
10	25	33	1	**9.013 723**
25	33	45	1	**9.013 724**
50	45	60	1	**9.013 725**
100	55	65	1	**9.013 726**
150	60	70	1	**9.013 727**
250	70	95	1	**9.013 728**
400	80	105	1	**9.013 729**
500	100	125	1	**9.013 731**
1000	105	155	1	**9.013 734**
2000	120	210	1	**9.013 735**

3 LLG-measuring jugs, PP

According to ISO 7056. Printed blue graduations. Stackable.



Capacity ml	Grad. ml	Diam. mm	Height mm	PK	Cat. No.
250	5	75	115	2	**9.013 680**
500	10	100	137	2	**9.013 681**
1000	10	125	167	2	**9.013 682**
2000	20	148	217	1	**9.013 683**
3000	25	170	244	1	**9.013 684**

4 Graduated jugs, PP, moulded graduations

NEW!

Highly transparent. *VITLAB*
With a raised scale and stable, easy-grip handle.
Autoclavable at 121°C (2 bar) according to DIN EN 285.
Food-safe (suitable for contact with foodstuff in accordance with Regulation (EC) No. 10/2011).



Capacity ml	Grad. ml	Diam. mm	Height mm	PK	Cat. No.
50	2	40	70	1	**7.008 977**
100	2	50	80	1	**7.008 978**
250	5	70	120	1	**7.008 967**
500	10	91	133	1	**7.008 969**
1000	10	116	170	1	**7.008 971**
2000	20	150	215	1	**7.008 973**
3000	50	170	242	1	**7.008 975**
5000	100	210	270	1	**7.008 976**



1 Graduated jugs, PP, moulded blue graduations

Highly transparent. With easily readable, raised, embossed blue scale, and stable, easy-grip handle. *VITLAB*
To preserve markings, do not clean at temperatures exceeding 60ºC. Conditionally autoclavable at 121°C (2 bar) according to DIN EN 285. For autoclaving, we recommend the design with raised graduations. Food-safe (suitable for contact with foodstuff in accordance with Regulation EC No. 10/2011).

Capacity	Grad.	Diam.	Height	PK	Cat. No.
ml	ml	mm	mm		
50	2	40	70	1	**9.275 772**
100	2	50	80	1	**9.275 773**
250	5	70	120	1	**9.275 748**
500	10	91	133	1	**9.275 775**
1000	10	116	170	1	**9.275 776**
2000	20	150	215	1	**9.275 777**
3000	50	170	242	1	**9.275 778**
5000	100	210	270	1	**9.275 779**



2 Graduated jugs, PP, blue graduations

NEW!

Stackable. Highly transparent. *VITLAB*
With easily readable, printed blue scale and stable handle.
To preserve markings, do not clean at temperatures exceeding 60ºC. For autoclaving we recommend the design with raised graduations (cat. nos. 7.008 967 and 7.008 978).
Food-safe (suitable for contact with foodstuff in accordance with Regulation EC No. 10/2011).

Capacity	Grad.	Diam.	Height	PK	Cat. No.
ml	ml	mm	mm		
250	5	75	115	1	**9.275 738**
500	10	100	140	1	**9.275 740**
1000	10	125	167	1	**9.275 742**
2000	20	148	212	1	**9.275 744**
3000	50	170	242	1	**9.275 746**



3 Graduated jugs, SAN, moulded graduations

NEW!

Crystal clear. *VITLAB*
With a raised scale and stable, easy-grip handle.
Food-safe (suitable for contact with foodstuff in accordance with Regulation (EC) No. 10/2011).

Capacity	Grad.	Diam.	Height	PK	Cat. No.
ml	ml	mm	mm		
250	5	70	120	1	**7.008 966**
500	10	91	133	1	**7.008 968**
1000	10	116	170	1	**7.008 970**
2000	20	150	215	1	**7.008 972**
3000	50	170	242	1	**7.008 974**



4 Conical measures, PP, graduated

Graduated. Can withstand temperatures up to 120°C. With wide base for stability. *Kartell*

Capacity	Grad.	Height	PK	Cat. No.
ml	ml	mm		
100	2	118	1	**9.013 773**
250	5	164	1	**9.013 774**
500	10	183	1	**9.013 775**
1000	20	263	1	**9.013 776**



9.014 008

Beakers, conical form, Pyrex®

NEW!

- Conical shape (Phillips pattern) with spout *Scilabware*
- Manufactured from Pyrex® borosilicate glass
- Excellent thermal performance and chemical resistance

Capacity	Neck diam.	External flask diam.	Height	PK	Cat. No.
ml	mm	mm	mm		
250	52	68	105	10	**9.014 007**
500	59	86	142	10	**9.014 008** 5

E & OE.

The highest quality, for a performance you can measure.





VITLAB® volumetric flasks Class A have an individually adjusted ring-mark for highest precision.



VITLAB® dispensers are suitable for a wide variety of applications in the dispensing of exact volumes.



VITLAB® burettes are characterized by a comfortable handling and accurate results.

VITLAB is one of the leading manufacturers of Liquid Handling instruments and high quality plastic laboratory products and has decades of experience in the development and production of volume measuring devices. Based on DIN 12681 VITLAB was the first manufacturer of Class A, conformity-certified measuring cylinders available in PMP plastic. With the conformity certificate VITLAB guarantees that the products are calibrated in accordance with German Calibration Regulations and ensures that the tightest tolerances for the adherence to measurement standards are maintained.

VITLAB®
Competence in Labware

VITLAB GmbH • Linus-Pauling-Str. 1 • 63762 Grossostheim • Germany • tel: +49 (0) 6026 9 77 99-0 • fax: 9 77 99-30 • e-mail: info@vitlab.com • www.vitlab.com

Plastic as Science





At the end of Fifties, the plastics technological developments led naturally to the birth of the **Labware Division**, the Kartell section specifically dedicated to study and supply products for the laboratory market. The Division uses raw materials, such as Polypropylene, Polystyrene and Polyethylene to produce a wide range of lightweight, highly resistant and economic products, the natural alternative to the glass. *That's the reason why Kartell is today internationally known as a leader in high quality technical laboratory products.*

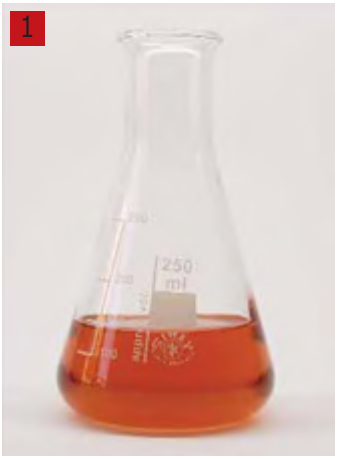
Kartell LABWARE

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Tel. +39 02 900121
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www.kartell.it
labware@kartell.it

1 Erlenmeyer flasks, Borosilicate glass 3.3, narrow neck

DIN ISO 1773. With graduations and beaded rim.

Capacity ml	Neck diam. mm	External flask diam. mm	Height mm	PK	Cat. No.
25	22	42	70	10	**9.141 079**
50	22	51	85	10	**9.141 080**
100	22	64	105	10	**9.141 081**
200	34	79	131	10	**9.141 085**
250	34	85	140	10	**9.141 082**
300	34	87	156	10	**9.141 086**
500	34	105	175	10	**9.141 083**
1000	42	131	220	10	**9.141 084**
2000	50	166	280	6	**9.141 087**
3000	50	187	310	6	**9.141 088**
5000	50	220	365	2	**9.141 089**



2 Erlenmeyer flasks, narrow neck, DURAN®

DURAN®. DIN ISO 1773. Narrow neck. With approximate graduations and beaded rim. *DURAN Group*
Uniform wall thickness distribution makes these beakers ideal for heating applications.
Erlenmeyer flasks are well suited for mixing, because of their conical shape. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable. With Retrace Code (Batch Identification), certificate available via the Internet.

Capacity ml	Bottom diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
25	42	22	75	1	**9.141 014**
50	51	22	90	1	**9.141 017**
100	64	22	105	1	**9.141 024**
125	67	28	112	1	**9.141 028**
150*	74	28	118	1	**6.234 510**
200*	79	34	131	1	**9.141 032**
250	85	34	145	1	**9.141 036**
300*	87	34	156	1	**9.141 039**
500	105	34	180	1	**9.141 044**
800	120	42	200	1	**9.141 053**
1000	131	42	220	1	**9.141 054**
2000	166	50	280	1	**9.141 063**
3000	187	52	310	1	**9.141 068**
5000	220	52	365	1	**9.141 073**

* Not to DIN.



3 Erlenmeyer flasks DURAN® Super Duty, narrow neck

With approximate graduations. Reinforced sturdy rim, and increased mechanical strength for heavy duty. Glass type I/neutral glass as per USP, EP and JP. With Retrace Code (Batch Identification) certificate available via the Internet. Autoclavable. *DURAN Group*

Capacity ml	Bottom diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
25	42	22	75	1	**9.141 270**
50	51	22	90	1	**9.141 271**
100	64	22	105	1	**9.141 272**
250	85	34	145	1	**9.141 273**
500	105	34	180	1	**9.141 274**
1000	131	42	220	1	**9.141 275**
2000	166	50	280	1	**9.141 276**
5000	220	52	365	1	**9.141 277**

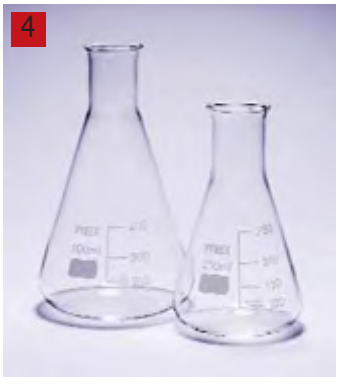


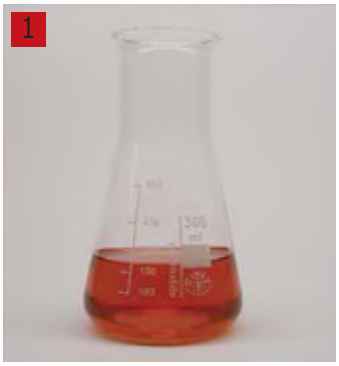
4 Narrow neck-Flasks, conical, Pyrex®

NEW!

- Complies with ISO 1773 and DIN 12353 *Scilabware*
- Erlenmeyer pattern
- Manufactured from Pyrex® borosilicate glass for highest resistance to thermal shock and chemical corrosion

Capacity ml	Neck diam. mm	External flask diam. mm	Height mm	PK	Cat. No.
50	18	51	85	10	**9.014 030**
100	18	64	105	10	**6.253 785**
250	34	85	145	10	**6.253 751**
500	34	105	180	10	**9.014 031**
1000	42	131	220	10	**7.656 279**
2000	50	166	280	10	**9.014 032**





1 Erlenmeyer flasks, Borosilicate glass 3.3, wide neck

DIN ISO 24450. With graduations and beaded rim.

Capacity ml	Neck diam. mm	External flask diam. mm	Height mm	PK	Cat. No.
25	32	42	70	10	**9.141 186**
50	34	51	85	10	**9.141 180**
100	34	64	105	10	**9.141 181**
200	50	79	131	10	**9.141 187**
250	50	85	135	10	**9.141 182**
300	50	87	156	10	**9.141 183**
500	50	105	170	10	**9.141 184**
1000	50	131	215	10	**9.141 185**
2000	72	153	280	6	**9.141 188**



2 Erlenmeyer flasks, DURAN®, wide neck

DIN EN ISO 24450. Wide neck. With approximate graduations and beaded rim. With Retrace Code (Batch Identification), certificate available via the Internet.
Glass type I/neutral glass as per USP, EP and JP. Autoclavable.

DURAN Group

Capacity ml	Bottom diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
25*	43	31	70	1	**9.141 114**
50	51	34	85	1	**9.141 117**
100	64	34	105	1	**9.141 124**
200	79	50	131	1	**9.141 132**
250	85	50	140	1	**9.141 136**
300	87	50	156	1	**9.141 139**
500	105	50	175	1	**9.141 144**
1000	131	50	220	1	**9.141 154**
2000*	153	72	276	1	**9.141 163**

* Not to DIN.

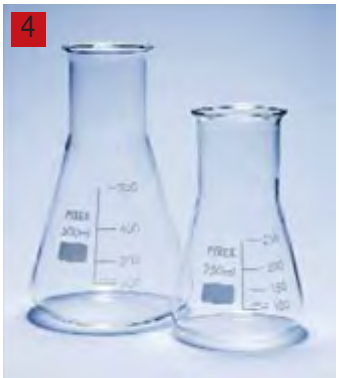


3 Erlenmeyer flasks DURAN® Super Duty, wide neck

With approximate graduations. Reinforced, sturdy rim and increased mechanical strength for heavy duty. Glass Type I/neutral glass as per USP, EP and JP. With retrace code (Batch Identification). Certificate available via the Internet. Autoclavable.

DURAN Group

Capacity ml	Bottom diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
100	64	34	105	1	**9.141 280**
250	85	50	140	1	**9.141 281**
500	105	50	175	1	**9.141 282**
1000	131	50	220	1	**9.141 283**



4 Flasks, conical, wide neck, Pyrex®

NEW!

Scilabware

- Complies with ISO 24450
- Erlenmeyer pattern
- Manufactured from Pyrex® borosilicate glass
- Excellent thermal performance
- High resistance to chemical attack
- White enamel graduations and marking spot

Capacity ml	Neck diam. mm	External flask diam. mm	Height mm	PK	Cat. No.
100	30	64	110	10	**9.014 033**
250	46	85	140	10	**6.252 200**
500	46	105	175	10	**9.014 034**

E & OE.

Flasks, conical, wide neck, heavy duty, graduated, Pyrex®

NEW!

- Mechanically stronger than conventional Erlenmeyers
- Reinforced rims for extra strength and resistance to impact fracture
- Manufactured from high quality Pyrex® borosilicate glass
- White graduations and marking spot

Scilabware

Capacity ml	Height mm	Ext. diam. mm	Neck diam. mm	NS	PK	Cat. No.
125	109	66	27	27	12	**6.254 447**
250	134	81	33	33	12	**6.253 743**
500	170	97	43	43	6	**6.902 292** 1

1



6.902 292

2 Erlenmeyer flasks, borosilicate glass 3.3, with screw neck

Borosilicate glass 3.3. Resistant to heat and almost all chemicals. Ideal for contamination free storage of culture specimen and media. Inscriptions are in white enamel which is specially designed for glass use. Autoclavable flasks and PP screw caps are resistant up to 121°C.

Isolab

Capacity ml	Height mm	Neck thread GL	PK	Cat. No.
100	110	32	1	**9.141 100**
250	145	32	1	**9.141 101**
500	180	32	1	**6.242 393**
1000	225	32	1	**9.141 102**

2



3 Erlenmeyer flasks, DURAN®, with screw neck

DURAN®. With DIN screw neck, PBT-screwthread cap (autoclavable up to 180°C), and approximate graduations. The flask is suitable for storage and cultivation. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable; undo cap before autoclaving. With retrace code (Batch Identification). Certificate via internet.

DURAN Group

Capacity ml	Diam. mm	Height mm	Neck thread GL	PK	Cat. No.
100	64	109	25	1	**9.141 224**
250	85	149	32	1	**9.141 236**
500	105	180	32	1	**9.141 244**
1000	131	225	32	1	**9.141 254**

3



4 Erlenmeyer flasks, PP

Highly transparent, wide-mouth, can also be used with NS stoppers (not included). Suitable for storage and cultivation of cell cultures.
Safer than glass flasks for use in incubator shakers due to the break resistance of plastic. Suitable for microwaves.
To preserve markings, do not clean at temperatures exceeding 60ºC
Food-safe product according to EC Directive No. 10/2011.

VITLAB

Capacity ml	Grad. ml	Neck thread GL	Stopper NS	PK	Cat. No.
50	10	40	34/35	1	**9.141 381**
100	20	40	34/35	1	**9.141 382**
250	50	52	45/40	1	**9.141 383**
500	100	52	45/40	1	**9.141 384**
1000	200	52	45/40	1	**9.141 385**

4





1 Baffled flasks DURAN®

With GL 45 thread *DURAN Group*

- Oxygen introduction is often a limiting factor for cell growth.
- Baffled flasks cause a turbulent flow, increase the gas exchange surface and produce a higher oxygen transfer.
- Automated one-step production enables a reproducible and comparable result.
- Complete with membrane screw cap (gas exchange).

Capacity ml	Bottom diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
250	85	30	145	1	**9.141 260**
500	105	30	149	1	**9.141 261**



2 Culture flasks, borosilicate glass 3.3

Erlenmeyer. With 3 side baffles. Beaded rim.

Capacity ml	Diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
250	85	34	140	1	**9.010 125**
300	87	34	156	1	**9.010 126**
500	105	34	175	1	**9.010 127**
1000	131	42	220	1	**9.010 128**



3 Culture flasks, borosilicate glass 3.3

Erlenmeyer. With 3 side baffles. Straight neck. Suitable for metal caps.

Capacity ml	Diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
100	64	38	112	1	**9.010 120**
250	85	38	145	1	**9.010 121**
500	105	38	183	1	**9.010 122**
1000	131	38	232	1	**9.010 123**



4 Erlenmeyer flasks with baffles, PC

Transparent. With baffles indented into the base which increases mixing when trypsinizing and aerating in processes such as cell culture and fermentation. Autoclavable. *Thermo Scientific*

Capacity ml	PK	Cat. No.
250	1	**9.140 968**
500	1	**9.140 969**
1000	1	**7.048 662**
2000	1	**7.048 663**

Disposable Erlenmeyer flaks - please see page 1349.

E & OE.

1 Round bottom flasks, DURAN®, narrow neck

To DIN ISO 1773. Narrow neck. With beaded rim. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable. *DURAN Group*

Capacity ml	Diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
50	51	26	95	1	**9.141 417**
100	64	26	110	1	**9.141 424**
250	85	34	144	1	**9.141 436**
500	105	34	168	1	**9.141 444**
1000	131	42	200	1	**9.141 454**
2000	166	42	260	1	**9.141 464**
3000	185	50	260	1	**9.141 468**
4000	207	52	290	1	**9.141 471**



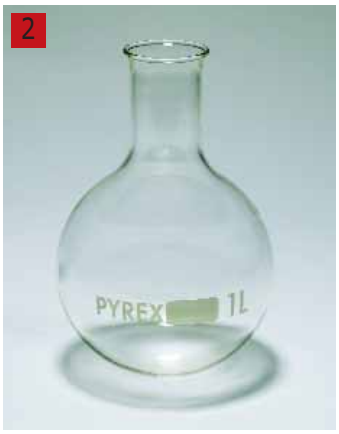
Flasks, boiling, round bottom, narrow neck, Pyrex®

NEW!

- Complies with ISO 1773
- Manufactured from Pyrex® borosilicate glass which offers excellent resistance to chemical corrosion and thermal shock

Scilabware

Capacity ml	Neck diam. mm	External flask diam. mm	Height mm	PK	Cat. No.
100	18	65	115	10	**9.014 026**
250	30	85	144	10	**9.014 027**
500	30	105	175	10	**9.014 028**
1000	36	131	200	10	**9.014 029** 2



9.014 029

3 Flasks, boiling, flat bottom, narrow neck, Pyrex®

NEW!

- Complies with ISO 1773
- Flat base for standing on benches and hotplates etc.
- Manufactured from Pyrex® glass for high resistance to thermal shock
- Excellent chemical durability for contamination-free performance
- With white enamel marking spot

Scilabware

Capacity ml	Neck diam. mm	External flask diam. mm	Height mm	PK	Cat. No.
100	18	64	110	10	**9.014 020**
250	30	85	140	10	**9.014 021**
1000	36	131	200	10	**9.014 022**



4 Flat bottom flasks, DURAN®, wide neck

DIN ISO 24450 (wide mouth), DIN ISO 1773 (narrow mouth). With beaded rim. Glass Type I/neutral glass as per USP, EP and JP. Uniform wall thickness distribution makes these beakers ideal for heating applications. Flat base means flasks can be set down without a supporting ring. Autoclavable. *DURAN Group*

Capacity ml	Diam. mm	Neck diam. mm	Height mm	Description	PK	Cat. No.
50	51	34	90	wide mouth	1	**9.141 717**
100	64	34	105	wide mouth	1	**9.141 724**
250	85	50	138	wide mouth	1	**9.141 736**
500	105	50	163	wide mouth	1	**9.141 744**
1000	131	50	190	wide mouth	1	**9.141 754**
2000*	166	76	230	wide mouth	1	**9.141 763**
2000	166	50	230	wide mouth	1	**9.141 764**
250	85	34	138	narrow mouth	1	**9.141 636**
500	105	34	136	narrow mouth	1	**9.141 644**
1000	131	42	190	narrow mouth	1	**9.141 654**
2000**	166	42	250	narrow mouth	1	**9.141 664**
4000	207	50	275	narrow mouth	1	**9.141 671**
5000	223	50	290	narrow mouth	1	**9.141 673**
6000	237	65	315	narrow mouth	1	**9.141 676**
10000	280	65	360	narrow mouth	1	**9.141 686**



* Non to DIN, with reinforced rim.
**Not to ISO.

1



9.014 023

Flasks, boiling, flat bottom, wide neck, Pyrex®

NEW!

Scilabware

- Complies with ISO 24450
- With wide neck to facilitate easy addition of solid samples etc.
- Flat base for standing on benches and hotplates etc.
- Flat base for standing on benches and hotplates etc.
- Manufactured from Pyrex® glass for high resistance to thermal shock
- Excellent chemical durability for contamination-free performance

Capacity ml	Neck diam. mm	External flask diam. mm	Height mm	PK	Cat. No.
250	47	84	140	10	**9.014 023**
500	47	103	170	10	**9.014 024**
1000	47	131	200	10	**9.014 025**

2



2 Kjeldahl flasks, DURAN®

To DIN 12360. With beaded rim.

DURAN Group

Capacity ml	Diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
100	60	22	200	1	**9.141 824**
250	81	34	270	1	**9.141 836**
500	101	34	300	1	**9.141 844**
750	115	34	340	1	**9.141 851**
1000	126	34	350	1	**9.141 854**

Note: special sizes available on request.

3



3 Flask rings, pressed cork

Height 30mm.

For flasks ml	Ext. diam. mm	Int. diam. mm	PK	Cat. No.
10 / 100	80	30	1	**9.143 003**
250 / 500	110	60	1	**9.143 006**
1000 / 2000	140	90	1	**9.143 009**
3000	170	120	1	**9.143 012**
4000	210	150	1	**9.143 015**

4



4 Flask ring, PP.

Provides a secure base for round bottom flasks from 10ml to 10000ml capacity.

Kartell

Diam. mm	Height mm	PK	Cat. No.
170	50	1	**9.143 040**

E & OE.

1 Flask support rings, "BiBase".



Double sided. Sits firmly on the bench to support round-bottomed flasks.
- Very soft and easy to clean
- Resistant to chemicals
- Good thermal and electric insulation
- Excellent adhesion with glass
- Non-slip

Available in two qualities:
Black rubber, good adhesion to glass.
Blue silicone elastomer, resistant to oxidation and temperatures from -60 to +200°C.

For flasks:	Narrow dia./Wide dia. /Height:
50 to 500ml:	46mm/80mm/30mm
500 to 2000ml:	80mm/120mm/40mm
2000 to 6000ml:	120mm/162mm/45mm

Material	For flasks ml	Max. kg	PK	Cat. No.
Rubber	50 to 500	13	1	**9.143 031**
Rubber	500 to 2000	18	1	**9.143 032**
Rubber	2000 to 6000	30	1	**9.143 033**
Silicone elastomer	50 to 500	13	1	**9.143 035**
Silicone elastomer	500 to 2000	18	1	**9.143 036**
Silicone elastomer	2000 to 6000	30	1	**9.143 037**

2 LAB rings



Rings to stabilise glassware and plasticware on shakers or to immerse in water baths. Vinyl-coated lead rings will not mark or scratch benchtops and labware.

Type	For flasks ml	Int. diam. mm	PK	Cat. No.
O-Shape	5 to 10	18	1	**7.072 085**
O-Shape	125 to 500	48	1	**6.243 010**
O-Shape	250 to 1000	51	1	**6.242 742**
O-Shape	500 to 2000	57	1	**6.243 011**
O-Shape	1000 to 4000	70	1	**7.054 161**
C-Shape	125 to 500	42	1	**9.149 902**
C-Shape	250 to 1000	51	1	**9.149 905**
C-Shape	500 to 2000	54	1	**9.149 906**
C-Shape	1000 to 4000	66	1	**9.149 907**
Lead Ring Stand, holds up to 8 rings			1	**6.243 012**

Water baths please see page 798.

3 Lab sleeves



Lead. Cylindrical, with opening. Provides a stable bench support for a variety of vessels, or used to sink flasks in waterbaths. Sealed in strong PVC. Flexible. Can be opened, closed or adapted to the diameter of the laboratory flask.

For dia. mm	Int. diam. mm	Weight g	PK	Cat. No.
48 to 59	53	240	1	**9.149 916**
59 to 73	66	460	1	**9.149 917**
73 to 90	80	600	1	**9.149 918**
90 to 110	100	750	1	**9.149 919**

4 LLG-Test tubes Fiolax® glass



Round bottom test tubes made of high quality Fiolax® glass with beaded rim.

Ext. diam. mm	Height mm	Wall thickness mm	PK	Cat. No.
8	70	0.5	100	**7.190 001**
10	100	0.5	100	**6.234 026**
12	75	0.5	100	**7.613 795**
12	100	0.5	100	**7.190 011**
14	130	0.5	100	**7.606 374**
16	130	0.6	100	**7.606 375**
16	160	0.6	100	**7.190 021**
18	180	0.6	100	**7.190 023**
20	180	0.6	100	**7.190 028**



1 Test tubes, Fiolax® glass, with rim

Fiolax®. Round bottom with rim. Light-walled and resistant to rapid temperature changes and localised heating. *DURAN Group*

Diam. mm	Height mm	Wall thickness mm	PK	Cat. No.
8	70	0,4-0,5	100	**9.190 001**
10	75	0,4-0,5	100	**9.190 003**
10	100	0,4-0,5	100	**9.190 006**
12*	75	0,4-0,5	100	**9.190 008**
12	100	0,4-0,5	100	**9.190 011**
14	130	0,4-0,5	100	**9.190 013**
16*	130	0,5-0,6	100	**9.190 016**
16	160	0,5-0,6	100	**9.190 021**
18	180	0,5-0,6	100	**9.190 023**
20	150	0,5-0,6	100	**9.190 026**
20	180	0,5-0,6	100	**9.190 028**
25	150	0,6-0,7	50	**9.190 033**
25	200	0,6-0,7	50	**9.190 036**
30	200	0,7-0,8	50	**9.190 038**

* Non DIN size.



2 LLG-Test tubes, AR® soda-lime glass

Test tubes with round bottom made out of AR®-Glass. Hydrolytic resistance: Class HGB 3 acc. to ISO 719, Type III acc. to C - USP.

Diam. mm	Height mm	Wall thickness mm	Description	PK	Cat. No.
8	70	0.5	with beaded rim	100	**6.201 034**
10	100	0.5	with beaded rim	100	**6.801 073**
12	100	0.5	with beaded rim	100	**7.607 198**
14	130	0.5	with beaded rim	100	**6.800 620**
16	130	0.6	with beaded rim	100	**6.800 382**
16	160	0.6	with beaded rim	100	**7.600 405**
20	180	0.6	with beaded rim	100	**7.607 778**
25	150	0.9	with beaded rim	50	**6.800 621**
30	200	0.9	with beaded rim	50	**7.600 324**
15	100	1.0	without rim	100	**7.651 872**
16	120	1.0	without rim	100	**7.651 871**
18	130	1.0	without rim	100	**7.652 552**
30	100	1.0	without rim	81	**6.235 823**



3 Test tubes, AR® soda-lime glass, rimless

Rimless, with round bottom (0.7 to 1.0 mm wall thickness).

Diam. mm	Height mm	Wall thickness mm	PK	Cat. No.
8	40	0.7 ± 0.03	100	**9.190 200**
10	70	0.9 ± 0.04	100	**9.190 202**
10	100	0.9 ± 0.03	100	**9.190 205**
12	75	0.7 ± 0.04	250	**6.258 821**
12	100	0.7 ± 0.04	250	**6.258 822**
14	100	0.9 ± 0.04	250	**6.258 823**
14	130	0.9 ± 0.04	250	**6.258 824**
16*	100	0.8 ± 0.04	250	**6.258 825**
16*	160	0.8 ± 0.04	250	**6.258 826**
18*	180	1.0 ± 0.05	250	**6.258 827**

* Suitable for Kapsenberg caps.



4 Test tubes with spout, AR® soda glass

With spout and round bottom. 0.1ml graduations.

Capacity ml	Diam. mm	Height mm	Wall thickness mm	PK	Cat. No.
5	12	110	0.70	1	**9.190 305**
10	13	160	1.00	1	**9.190 310**
20	15	200	0.90	1	**9.190 320**

Caps and stoppers - please see page 31.

1 Test tubes, DURAN®, with or without rim

Available rimmed or rimless. DURAN® test tubes have a heavier wall and considerable mechanical strength and excellent resistance to temperature changes. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable.

DURAN Group

Diam. mm	Height mm	Wall thickness mm	With rim	PK	Cat. No.
8	70	0,8 - 1,0	with	100	**9.190 101**
10	75	0,8 - 1,0	with	100	**9.190 103**
10	100	0,8 - 1,0	with	100	**9.190 106**
12	75	0,8 - 1,0	with	100	**9.190 108**
12	100	0,8 - 1,0	with	100	**9.190 111**
13	100	0,8 - 1,0	with	100	**9.190 112**
14	130	0,8 - 1,0	with	100	**9.190 113**
16	130	1,0 - 1,2	with	100	**9.190 116**
16	160	1,0 - 1,2	with	100	**9.190 121**
18	180	1,0 - 1,2	with	100	**9.190 123**
20	150	1,0 - 1,2	with	100	**9.190 126**
20	180	1,0 - 1,2	with	100	**9.190 128**
25	150	1,0 - 1,2	with	50	**9.190 133**
25	200	1,0 - 1,2	with	50	**9.190 136**
30	200	1,0 - 1,4	with	50	**9.190 138**
8	70	0,8 - 1,0	without	100	**9.190 151**
10	75	0,8 - 1,0	without	100	**9.190 153**
10	100	0,8 - 1,0	without	100	**9.190 156**
12	75	0,8 . 1,0	without	100	**9.190 158**
12	100	0,8 - 1,0	without	100	**9.190 161**
13	100	0,8 - 1,0	without	100	**9.190 162**
14	130	0,8 - 1,0	without	100	**9.190 163**
16	130	1,0 - 1,2	without	100	**9.190 166**
16	160	1,0 - 1,2	without	100	**9.190 171**
18	180	1,0 - 1,2	without	100	**9.190 173**
20	150	1,0 - 1,2	without	100	**9.190 176**
20	180	1,0 - 1,2	without	100	**9.190 178**
25	150	1,0 - 1,2	without	50	**9.190 183**
25	200	1,0 - 1,2	without	50	**9.190 186**
30	200	1,0 - 1,4	without	50	**9.190 188**

1



Test tubes with stopper, DURAN® tubing, NS cone

Round bottom test tubes with NS cone and polystoppers. Made of DURAN® tubing.

Lenz

Length mm	Ext. diam. mm	NS	PK	Cat. No.
100	16	14/23	1	**9.190 410** 2
160	16	14/23	1	**9.190 416**
180	18	14/23	1	**9.190 418**

2



9.190 410

3 Test tubes, borosilicate glass 3.3, graduated, NS, with stopper

Wall thickness approx. 1.2mm. With NS ground socket and PP stopper. Graduations of approx. volume and markings are in high contrast white enamel. Supplied singly.

BRAND

Capacity ml	Grad. ml	NS	Diam. mm	Height mm	PK	Cat. No.
10	0.10	12/21	15	165	1	**9.190 508**
20	0.20	14/23	17	200	1	**9.190 516**
25	0.20	14/23	17	220	1	**9.190 521**
30	0.50	14/23	19	220	1	**9.190 524**

3



Test tube stands please see page 38.



1 Test tubes and centrifuge tubes, PS

Round or conical bottom.

Capacity ml	Length mm	Diam. mm	Description	PK	Cat. No.
2.0	40	10.5	round bottom	3000	**9.400 505**
3.5	63	11.0	round bottom	3000	**9.400 520**
4.0	70	11.0	round bottom	2880	**9.400 530**
4.0	55	12.0	round bottom	3600	**6.510 405**
5.0	75	12.0	round bottom	2000	**9.400 532**
10.0	100	14.0	round bottom	1400	**9.400 562**
12.0	100	16.0	round bottom	1600	**9.400 564**
14.0	100	17.0	round bottom	1500	**9.400 565**
20.0	152	16.0	round bottom	1500	**9.400 590**
4.5	75	12.0	conical bottom	3600	**9.400 901**
13.0	103	16.5	conical bottom	1500	**9.400 908**



2 Culture tubes, Borosilicate glass, screw cap

For culture growth, transport and storage. Heavy walled, thickness 1.1mm. Wide neck for easy inoculation and cleaning. Complete with aluminium or plastic screw cap and rubber sealing gasket. The 15ml size is specifically designed for use in centrifuges. Autoclavable. *schuett-biotec*

Capacity ml	Diam. mm	Height mm	Screw cap	PK	Cat. No.
15	16	98	Aluminium	100	**9.010 612**
20	16	150	Aluminium	100	**9.190 600**
15	16	98	Plastic	100	**9.010 613**
20	16	150	Plastic	100	**9.190 605**
50	25	150	Plastic	100	**9.010 620**



3 Tubes, glass, culture, screw cap, Soda-lime glass

Autoclavable. For culture growth, transport and storage. Complete with aluminium or plastic screw cap and rubber sealing gasket. The 5ml size has a frosted marking area. *schuett-biotec*

Capacity ml	Diam. mm	Height mm	Screw cap	PK	Cat. No.
3	12	35	Aluminium	100	**9.010 608**
5	14	50	Aluminium	100	**9.010 602**
5	14	50	Plastic	100	**9.010 603**
15	27	45	Plastic*	100	**9.010 610**
20	27	50	Plastic*	100	**9.010 611**
30	27	75	Plastic*	100	**9.010 601**

*also available with aluminium screw cap



4 Storage cases for culture tubes

For the protective storage and transportation of culture tubes.

Material	For	PK	Cat. No.
Polystyrene	50 jars, 35x12mm	1	**9.010 609**
Polypropylene, autoclavable	50 jars, 35x12mm	1	**9.010 614**
Wood	100 jars, 50x14mm	1	**9.010 605**

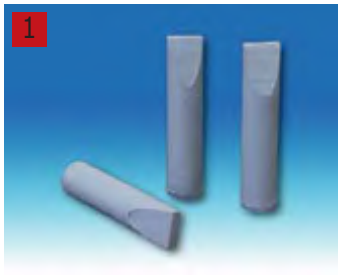


9.010 605

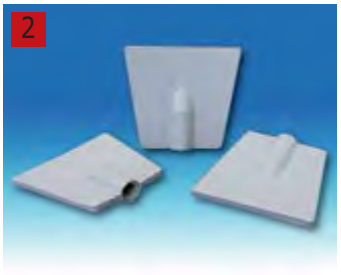
Test tube cleaners

Rubber. For removing heavy soiling from test tubes by scraping. With 5mm boring for rod. In various styles as indicated below.

Type	Form	Width mm	PK	Cat. No.
Rubber wiper	Rod-shaped	8	1	**9.190 901** 1
Rubber wiper	Spade-shaped	35	1	**9.190 902** 2
Test tube cleaner	4 blades	30	1	**9.190 903** 3



9.190 901



9.190 902



9.190 903

Glas bars please see page 116.

4 LLG-Stoppers for test tubes, PE



For tubes dia. mm	Colour	PK	Cat. No.
12 to 13	neutral	100	**9.231 270**
12 to 13	blue	100	**9.231 271**
12 to 13	yellow	100	**9.231 272**
12 to 13	red	100	**9.231 273**
12 to 13	green	100	**9.231 274**
15 to 16	neutral	100	**9.231 275**
15 to 16	blue	100	**9.231 276**
15 to 16	yellow	100	**9.231 277**
15 to 16	red	100	**9.231 278**
15 to 16	green	100	**9.231 279**

5 Sealing caps for test tubes, versilic silicone



Transparent. Made of versilic silicone. Type number corresponds to outside diameter of the vessel to be sealed (glass, plastic or metal). Sealing caps have a slight taper and offer a very secure hold and are comfortable to use.

Ext. diam. mm	PK	Cat. No.
10	1	**9.231 510**
12	1	**9.231 512**
14	1	**9.231 514**
16	1	**9.231 516**
18	1	**9.231 518**
20	1	**9.231 520**
22	1	**9.231 522**
25	1	**9.231 541**
30	1	**9.231 530**
35	1	**9.231 532**
42	1	**9.231 534**
45	1	**9.231 535**
50	1	**9.231 536**



1 Rubber stoppers

DIN 12871. Solid. *Deutsch & Neumann*

Bottom diam. mm	Top diam. mm	Height mm	PK	Cat. No.
3.5	6.5	15	1	**9.230 203**
5.0	9.0	20	1	**9.230 205**
8.0	12.0	20	1	**9.230 208**
10.5	14.5	20	1	**9.230 210**
12.5	16.5	20	1	**9.230 212**
14.0	18.0	20	1	**9.230 214**
17.0	22.0	25	1	**9.230 217**
18.0	24.0	30	1	**9.230 218**
21.0	27.0	30	1	**9.230 221**
23.0	29.0	30	1	**9.230 223**
26.0	32.0	30	1	**9.230 226**
29.0	35.0	30	1	**9.230 229**
31.0	38.0	35	1	**9.230 231**
36.0	44.0	40	1	**9.230 236**
41.0	49.0	40	1	**9.230 241**
47.0	55.0	40	1	**9.230 247**
50.5	59.5	45	1	**9.230 250**
56.0	65.0	45	1	**9.230 256**
60.0	70.0	50	1	**9.230 260**
64.5	75.5	55	1	**9.230 264**
71.0	83.0	60	1	**9.230 271**
79.0	92.0	65	1	**9.230 279**
87.0	100.0	65	1	**9.230 287**
94.0	107.0	65	1	**9.230 294**



2 Silicone rubber stoppers

Transparent. To DIN 12871. Solid. Operating temperature up to 225°C. Supplied singly. *Deutsch & Neumann*

Bottom diam. mm	Top diam. mm	Height mm	PK	Cat. No.
3.5	6.5	15	1	**9.230 503**
5.0	9.0	20	1	**9.230 505**
8.0	12.0	20	1	**9.230 508**
10.5	14.5	20	1	**9.230 510**
12.5	16.5	20	1	**9.230 512**
14.0	18.0	20	1	**9.230 514**
17.0	22.0	25	1	**9.230 517**
18.0	24.0	30	1	**9.230 518**
21.0	27.0	30	1	**9.230 521**
23.0	29.0	30	1	**9.230 523**
26.0	32.0	30	1	**9.230 526**
29.0	35.0	30	1	**9.230 529**
31.0	38.0	35	1	**9.230 531**
36.0	44.0	40	1	**9.230 536**
41.0	49.0	40	1	**9.230 541**
47.0	55.0	40	1	**9.230 547**
50.5	59.5	45	1	**9.230 550**
56.0	65.0	45	1	**9.230 556**
60.0	70.0	50	1	**9.230 560**
64.5	75.5	55	1	**9.230 564**
71.0	83.0	60	1	**9.230 571**
79.0	92.0	65	1	**9.230 579**



3 Stoppers with turn-over flange

Silicone or natural rubber. These stoppers guarantee perfect sealing even with poorly finished rims on glass or plastic bottles. The top of the stopper has a septum which can be punctured by a hypodermic needle. Very secure fit prevents accidental opening.

Material	Diam. mm	PK	Cat. No.
Silicone	7.1	1	**9.230 481**
Silicone	10.2	1	**9.230 482**
Silicone	12.7	1	**9.230 483**
Silicone	14.9	1	**9.230 484**
Silicone	15.9	1	**9.230 485**
Silicone	19.4	1	**9.230 486**
Silicone	23.7	1	**9.230 487**
Silicone	30.7	1	**9.230 488**
Rubber	7.1	1	**9.230 650**
Rubber	10.2	1	**9.230 651**
Rubber	12.7	1	**9.230 652**
Rubber	14.9	1	**9.230 653**
Rubber	15.9	1	**9.230 654**
Rubber	19.4	1	**9.230 655**
Rubber	23.7	1	**9.230 656**
Rubber	30.7	1	**9.230 657**

E & OE.

1 Cork stoppers

A1 superb quality. Non-porous.



Top diam. mm	Bottom diam. mm	Height mm	PK	Cat. No.
6	3	16	1	**9.230 703**
9	6	17	1	**9.230 706**
10	7	18	1	**9.230 707**
11	8	20	1	**9.230 708**
12	9	20	1	**9.230 709**
13	10	22	1	**9.230 710**
15	12	22	1	**9.230 712**
17	14	22	1	**9.230 714**
18	15	22	1	**9.230 715**
19	16	23	1	**9.230 716**
22	18	26	1	**9.230 718**
24	20	27	1	**9.230 720**
26	22	27	1	**9.230 722**
28	24	27	1	**9.230 724**
30	26	27	1	**9.230 726**
32	28	27	1	**9.230 728**
34	30	27	1	**9.230 730**
36	32	27	1	**9.230 732**
38	34	27	1	**9.230 734**
40	36	27	1	**9.230 736**
42	38	27	1	**9.230 738**
45	41	27	1	**9.230 741**
50	45	30	1	**9.230 745**
55	50	30	1	**9.230 750**
60	55	30	1	**9.230 755**
65	60	30	1	**9.230 760**
70	65	30	1	**9.230 765**

2 Cork borers

Brass, with handles. *Juchheim Laborgeräte*



Diam.	PK	Cat. No.
5 - 11	1	**9.143 471**
5 - 15	1	**9.143 473**
5 - 19	1	**9.143 475**
5 - 26	1	**9.143 477**

3 LLG-Cellulose stoppers

Cellulose, 100% chlorine-free bleached.
Ideal for closing test tubes, culture flasks, Erlenmeyer flasks etc.



For inter. diam. mm	PK	Cat. No.
7.5 to 8.5	4000	**9.231 660**
8.5 to 9.5	1000	**9.231 661**
9.5	2000	**9.231 662**
10.5 to 11.5	2000	**9.231 663**
9.5 to 11.5	1000	**9.231 664**
11.5 to 13.5	1000	**9.231 665**
11.5 to 13.0	1000	**9.231 666**
12.5 to 14.5	1000	**9.231 667**
13.0 to 14.5	1000	**9.231 668**
12.0 to 14.0	1000	**9.231 669**
13.5 to 15.5	500	**9.231 670**
17.5 to 18.5	500	**9.231 671**
20.5 to 22.0	400	**9.231 672**
19.0 to 22.5	500	**9.231 673**
27.0 to 32.5	1000	**9.231 674**
29.5 to 31.0	250	**9.231 675**
32.5 to 35.0	100	**9.231 676**
32.0 to 33.0	150	**9.231 677**
30.0 to 32.5	750	**9.231 678**
33.5 to 36.0	150	**9.231 679**
35.5 to 39.5	600	**9.231 680**
37.5 to 41.5	100	**9.231 681**
40.0 to 43.5	100	**9.231 682**
42.0 to 46.5	100	**9.231 683**
47.0 to 48.0	75	**9.231 684**



1 Stoppers, cellulose, Steristoppers®

Cellulose, 100% biodegradable and fully compostable autoclavable. Steristoppers® have been proved as an excellent sealing for microbiological samples and tissue cultures in test tubes and Erlenmeyer flasks. They are in constant use in many European microbiological laboratories.

- Sterilisable up to 200°C
- Air permeable
- Disposable
- Money saving
- Labour saving
- Economical
- Tight fitting

Type	For inter. diam. mm	Bottom diam. mm	Top diam. mm	Length mm	PK	Cat. No.
No. 5 S	5.5 to 7.5	5.0	7.0	31	1000	**9.231 205**
No. 7	8.5 to 9.5	8.0	9.5	32	1000	**9.231 207**
No. 9	10.5 to 11.5	10.0	12.0	30	2000	**9.231 209**
No. 10	9.5 to 11.5	9.0	14.0	30	1000	**9.231 210**
No. 12	11.5 to 13.5	11.0	16.0	32	1000	**9.231 211**
No. 13	12.5 to 14.5	11.0	16.0	35	1000	**9.231 212**
No. 13.5 P	13.5 to 14.5	13.0	19.0	33	1000	**9.231 213**
No. 14	13.0 to 14.5	12.0	16.0	40	1000	**9.231 214**
No. 15	13.5 to 15.5	13.0	18.0	39	500	**9.231 215**
No. 18	17.5 to 18.5	17.0	22.0	38	500	**9.231 218**
No. 20	20.5 to 22.0	20.0	23.0	42	400	**9.231 220**
No. 23.5 P	22.5 to 27.0	24.0	30.0	40	500	**9.231 225**
No. 26	26.0 to 27.0	24.0	28.0	42	500	**9.231 226**
No. 29	29.5 to 31.0	28.0	33.0	62	250	**9.231 229**
No. 32	32.5 to 35.0	31.0	36.0	65	100	**9.231 232**
No. 32 P	32.0 to 33.0	31.0	46.0	54	150	**9.231 233**
No. 32 W	32.5 to 35.0	31.0	36.0	65	800	**9.231 231**
No. 34	33.5 to 36.5	33.0	37.0	62	150	**9.231 234**
No. 37	37.5 to 41.5	37.0	45.0	59	100	**9.231 237**
No. 38	40.0 to 43.5	37.0	47.0	60	100	**9.231 238**
No. 40 P	42.0 to 46.5	43.0	50.0	53	100	**9.231 240**
No. 45 P	47.0 to 48.0	44.0	57.0	66	75	**9.231 245**

P = correct fit
W = soft
S = pointed



2 Reaction tube stand, PP

Grey. Numbered positions for 20 x 1.5ml microcentrifuge tubes. Autoclavable (121°C). *BRAND*
Accessories: Adapter (PP) for 0.5ml microtubes.

Array	Internal dimensions (W x L x H) mm	PK	Cat. No.
2 x 10	70 x 210 x 37	1	**9.409 380**
Adapter (20 Units)		20	**7.020 330**



3 Reaction tube stands, PP

Stackable racks with alphanumerical positions. Operating temperature -20°C to +90°C. *BRAND*
Autoclavable at 121°C (2 bar), acc. DIN EN 285. Density 1.2 g/cm³. Will not float in water bath. Racks are supplied in two-pieces (Ø 11 mm, for micro tubes) or three-pieces (Ø 13 mm for cryogenic tubes) for convenient and permanent assembly. L x W x H in mm: 265 x 126 x 38.

Array	Colour	For tubes diam. mm	Length mm	Width mm	Height mm	PK	Cat. No.
8 x 16	White	11	265	126	38	1	**9.409 308**
8 x 16	Blue	11	265	126	38	1	**9.409 309**
8 x 16	Red	11	265	126	38	1	**9.409 312**
8 x 16	Yellow	11	265	126	38	1	**9.409 313**
6 x 14	White	13	265	126	38	1	**9.409 314**
6 x 14	Blue	13	265	126	38	1	**9.409 316**
6 x 14	Red	13	265	126	38	1	**9.409 321**
6 x 14	Yellow	13	265	126	38	1	**9.409 323**

1 Test tube rack Origami, PP

NEW!

Tenak

The Origami Tube Rack is designed to be height adjustable which makes it very flexible and usable for almost any test tube on the market. Depending on the hole diameter the racks can be used for microcentrifuge tubes, cryovials, vacutainers, and 15ml and 50ml falcon tubes. The Origami Tube Rack has a printed alphanumeric grid for easy location of the samples. It is made of polypropylene and can be used in temperatures from -45°C to 60°C. Dimensions (WxDxH): 240 x 120 x 140mm.



No. of tubes	For tubes diam. mm	PK	Cat. No.
45	12.5	5	**9.194 015**
28	18	5	**9.194 016**
15	30	5	**9.194 017**

2 Microtube Racks, 20-Well, PP

Interlocking racks with 2 x 10 array hold 0.5/1.0/1.5/2.0ml tubes.

Polypropylene racks lock together on each side, permitting the user to attach several together to increase capacity. Features an innovative "hold-it" finger slot on the front, and internal ribbing for stability. Autoclavable. Dimensions: 210mm x 90mm x 46mm.



Colour	PK	Cat. No.
blue	1	**9.409 088**
red	1	**9.409 089**
white	1	**9.409 090**

3 3-Way Rack, PP

Heathrow Scientific

Polypropylene racks connect to one another on each end. Snap together for more tube storage. Convenient finger slots are moulded into the rack making them easy to pick up and move. Lowest level has 24 wells to hold individual 0.2ml tubes or strips of 8 or 12 tubes. Middle tier has 14 wells to hold 0.5ml tubes. Top tier has 12 wells to hold 1.5/2.0ml tubes. Autoclavable. Dimensions: 164mm x 123mm x 62mm
Package: 6 racks, colour assorted



Colour	PK	Cat. No.
natural, blue, green, purple, yellow, orange	6	**9.193 990**

4 Tube Racks Rota-Rack® Duo

Heathrow Scientific

Works with PCR® tubes right next to centrifuge tubes. The 0.2ml tube wells oriented in standard 96-well format. Use with PCR® transfer trays. Rotate the rack to work either with 0.2ml tubes and 0.5ml tubes, with 0.2ml tubes and 1.5ml tubes or with 0.5ml tubes and 1.5ml tubes. Or turn a module and work with a total of 96 x 1.5ml tubes. Quickly identify tubes with imprinted alphanumeric system. Autoclavable. Dimensions (L x W x H): 296 x 118 x 34mm



Type	PK	Cat. No.
Tube Rack Rota-Rack® Duo	1	**9.194 000**

5 Tube rack microcentrifuge (1.5ml), PP

NEW!

Kartell

Two-tier, available in four different colours. These versatile racks are autoclavable and can be used dry, in water baths or in freezers. Each rack has an alpha-numeric reference for easy sample identification. Can accomodate 100x1.5ml tubes with closed caps or without caps, and 50x1.5ml tubes with open caps.
Racks are stackable even when loaded and have (purpose) designed label spaces on each side (for bar coding, etc.).



Array	Length mm	Width mm	Height mm	Colour	PK	Cat. No.
100	263	112	85	blue	1	**6.225 714**
100	263	112	85	yellow	1	**6.238 141**
100	263	112	85	grey	1	**6.226 179**
100	263	112	85	red	1	**6.401 579**



1 LLG-Microtube rack, stainless steel 18/10

This sloping, combination rack holds 48 x 0.2ml PCR tubes (suitable also for 8 and 12 strips), 30 x 0.5ml tubes and 12 x 1.5ml or 12 x 2.0ml tubes. Resistant against UV sterilisation, ideal for PCR workstations. Autoclavable and heat resistant (200°C).
Dimensions (L x W): 220 x 95mm. Height: front 20mm, back 45mm.

Type	PK	Cat. No.
LLG-Microtube Rack	1	**9.409 000**



2 Tube racks 4-Way, PP

Build as large a rack as you need by linking together multiple rack units. Racks feature a unique system of tabs and slots, which facilitate easy assembly and sturdy fit. Heavy-duty polypropylene racks can hold 4 x 50ml or 12 x 15ml conical tubes, 32 x 1.5ml or 32 x 0.5ml microtubes. Autoclavable. Dimensions (L x W x H): 175 x 95 x 51mm.

Colour	PK	Cat. No.
Natural	1	**9.409 131**
Blue	1	**9.409 132**
Green	1	**9.409 133**
Pink	1	**9.409 134**
Yellow	1	**9.409 135**
Orange	1	**9.409 136**
Blue, green, pink, yellow, orange	5	**9.409 137**



3 Pop-Up™ Rack, PP

Robust polypropylene construction. Simple, easy to open and close. Flatten for compact storage. Pops up for instant use. Expand and collapse when racks are needed. Printed grid aids rapid retrieval. Stack racks in open or closed position. Saves space when racks are not in use. Not recommended for steam sterilisation. Dimensions (L x W x H): 255mm x 137mm x 72mm when expanded, 21mm high when collapsed. *Heathrow Scientific*

Colour	For	PK	Cat. No.
Pink	21 x 15ml and 12 x 50ml tubes	2	**9.193 997**
Blue	21 x 15ml and 12 x 50ml tubes	2	**9.193 998**



4 Tube Racks Rota-Rack®, PP

Interlocked racks. Rotate each of the four modules independently. Use several sizes of test tubes, culture tubes, centrifuge tubes or microcentrifuge tubes at the same time. Autoclavable. *Heathrow Scientific*
Each module of the Rota-Rack® for large tubes holds 2 x 50ml tubes, 8 x 15ml tubes, 6 x 20mm tubes or 10 x 10/13mm tubes. Each module of the Rota-Rack® for microtubes holds 6 x 15ml tubes, 9 x 1.5/2.0ml tubes, 12 x 0.5ml tubes or 32 x 0.2ml PCR tubes or 4 x 8-tube strips.

Description	Length mm	Width mm	Height mm	PK	Cat. No.
Rota-Rack® for large tubes	224	110	110	1	**9.193 988**
Rota-Rack® for micro tubes	210	100	100	1	**9.193 989**

E & OE.

Wire Racks, epoxy-coated steel

NEW!

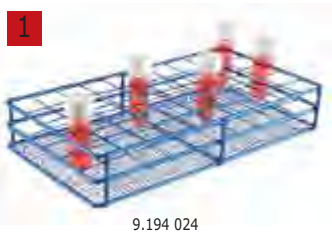
Chemically resistant racks for transport or sample handling. *Heathrow Scientific*

Typ A: Rack suitable for low profile tubes up to a diameter of 25mm or a diameter of 33mm. Mesh bottom support.

Typ B: Support capped tubes 15ml up to 20mm diameter 3x5 format or 50ml tubes up to 30mm diameter 2x4 format. Slotted bottom.

Typ C: Holds bottles 250ml up to 60mm diameter. Slotted bottom

1



9.194 024

2



9.194 025

Type	Array	For tubes diam. mm	Length mm	Width mm	Height mm	PK	Cat. No.
A	2 x 6	25	164	64	32	1	**9.194 021**
A	5 x 10	25	271	145	32	1	**9.194 022**
A	2 x 6	33	212	80	60	1	**9.194 023**
A	5 x 10	33	355	189	60	1	**9.194 024** 1
B	3 x 5	20	127	76	76	1	**6.243 203**
B	2 x 4	30	147	80	89	1	**6.239 754**
C	2 x 3	60	205	135	104	1	**9.194 025** 2

3 Tube rack PP

NEW!

Manufactured from high density polypropylene. Moulded-in alpha numeric grid reference on the top tier of the rack allows easy sample identification. Due to their weights, they do not float in the water baths.
Rack dimensions 140mm x 275mm x 72mm *Isolab*

3



Array	For tubes diam. mm	PK	Cat. No.
50	12 - 13	1	**9.193 141**
50	15 - 16	1	**9.193 142**
50	17 - 18	1	**9.193 143**
45	18 - 20	1	**9.193 144**
26	28 - 30	1	**9.193 145**

4 Tube rack PP

NEW!

Manufactured from high density polypropylene. Due to their weights, they do not float in the water baths, not even in agitated water. These racks are supplied dismantled and can be easily assembled . A moulded-in alpha-numeric grid reference on the top tier of the rack allows easy sample identification. Rack dimensions : 250mm x 110mm x 70mm *Isolab*

4



Array	For tubes diam. mm	PK	Cat. No.
6 x 15	13	1	**9.193 146**
5 x 12	16	1	**6.238 007**
4 x 10	20	1	**7.970 029**
3 x 8	25	1	**9.193 147**
3 x 7	30	1	**6.237 160**

1 2 Test tube racks, PP

BRAND

PP. For all common test tube diameters. Very sturdy design. All openings are widely spaced apart to accommodate screw cap tubes. All racks have the same footprint and can be stacked easily when empty. Modified PP with greater density than water makes them ideal for use in water baths. Large marking area (60 x 12mm) for barcode labels and alphanumeric references for clear sample identification. Racks are supplied in three parts for quick and permanent assembly. Continuous use temperature -20 to +90°C. Autoclavable (121°C). Choice of colours as outlined below.

Array	For tubes diam. mm	Length mm	Width mm	Height mm	Colour	PK	Cat. No.
6 x 14	13	265	126	75	White	1	**9.193 240**
6 x 14	13	265	126	75	Blue	1	**9.193 241**
6 x 14	13	265	126	75	Red	1	**9.193 242**
6 x 14	13	265	126	75	Yellow	1	**9.193 243**
5 x 11	16	265	126	75	White	1	**9.193 230**
5 x 11	16	265	126	75	Blue	1	**9.193 231**
5 x 11	16	265	126	75	Red	1	**9.193 232**
5 x 11	16	265	126	75	Yellow	1	**9.193 233**
5 x 11	18	265	126	75	White	1	**9.193 245**
5 x 11	18	265	126	75	Blue	1	**9.193 246**
5 x 11	18	265	126	75	Red	1	**9.193 247**
5 x 11	18	265	126	75	Yellow	1	**9.193 248**
4 x 10	20	265	126	75	White	1	**9.193 250**
4 x 10	20	265	126	75	Blue	1	**9.193 251**
4 x 10	20	265	126	75	Red	1	**9.193 252**
4 x 10	20	265	126	75	Yellow	1	**9.193 253**
4 x 8	25	265	126	88	White	1	**9.193 255**
4 x 8	25	265	126	88	Blue	1	**9.193 256**
4 x 8	25	265	126	88	Red	1	**9.193 257**
4 x 8	25	265	126	88	Yellow	1	**9.193 258**
3 x 7	30	265	126	88	White	1	**9.193 260**
3 x 7	30	265	126	88	Blue	1	**9.193 261**
3 x 7	30	265	126	88	Red	1	**9.193 262**
3 x 7	30	265	126	88	Yellow	1	**9.193 263**

1



2



3



3 Tube standing and drying racks, PP

NEW!

Heathrow Scientific

Autoclavable, fiberglass-reinforced polypropylene racks are ideal for bench work or storage of test tubes. Allows easy viewing of tube contents. Does not float in water baths. User can also turn tubes as well as electrophoresis and chromatography plates upside-down and use as a drying rack. The flexible peg design is suitable for tubes with a diameter of 10mm to 13mm and 14mm to 17mm. Includes embossed indexing and drainage holes.

Colour	For tubes	No. of pegs	Length mm	Width mm	Height mm	PK	Cat. No.
White	14 to 17mm	50	188	104	69	1	**6.243 212**
Blue	14 to 17mm	50	188	104	69	1	**6.243 213**
White	10 to 13mm	96	182	126	69	1	**6.243 210**
Blue	10 to 13mm	96	182	126	69	1	**6.243 211**

1 Tube racks, PP

Will not float. Alphanumeric grid referenced on top tier for easy identification of samples. Stackable when empty. Can be used in freezers or water baths. Autoclavable at 121°C for 20 min.

Kartell



Array	For tubes diam. mm	Length mm	Width mm	Height mm	Colour	PK	Cat. No.
90	13	246	105	64	white	1	**6.205 483**
90	13	246	105	64	blue	1	**6.224 460**
90	13	246	105	64	yellow	1	**6.206 439**
90	13	246	105	64	red	1	**9.193 200**
60	16	246	105	72	white	1	**6.205 109**
60	16	246	105	72	blue	1	**6.206 347**
60	16	246	105	72	yellow	1	**6.206 305**
60	16	246	105	72	red	1	**6.204 936**
40	20	246	105	72	white	1	**6.205 110**
40	20	246	105	72	blue	1	**6.206 206**
40	20	246	105	72	yellow	1	**6.224 461**
40	20	246	105	72	red	1	**9.193 201**
40	25	295	125	85	white	1	**6.236 328**
40	25	295	125	85	blue	1	**6.236 329**
40	25	295	125	85	yellow	1	**6.236 330**
40	25	295	125	85	red	1	**9.193 202**
24	30	300	112	85	white	1	**6.207 191**
24	30	300	112	85	blue	1	**7.632 543**
24	30	300	112	85	red	1	**6.401 582**
24	30	300	112	85	yellow	1	**6.204 134**

2 Test tube racks, Type 5970, polyketone

3-tier grid design. Will not float. Single moulding, with no sharp edges or corners. Alphanumeric grid referenced on top tier for easy identification of samples. End plates can be labelled or written on. Autoclavable.

Thermo Scientific



Note: Do not autoclave when loaded with filled test tubes. Do not expose to strong concentrated acids.

Type	Array	For tubes diam. mm	Colour	Length mm	Width mm	Height mm	PK	Cat. No.
5970	6 x 12	13	White	200	102	57	1	**9.194 513**
5970	6 x 12	13	Orange	200	102	57	1	**9.194 523**
5970	6 x 12	13	Yellow	200	102	57	1	**9.194 533**
5970	6 x 12	13	Blue	200	102	57	1	**9.194 543**
5970	6 x 12	13	Green	200	102	57	1	**9.194 553**
5970	6 x 12	13	Red	200	102	57	1	**9.194 563**
5970	6 x 12	16	White	248	127	70	1	**9.194 514**
5970	6 x 12	16	Orange	248	127	70	1	**9.194 524**
5970	6 x 12	16	Yellow	248	127	70	1	**9.194 534**
5970	6 x 12	16	Blue	248	127	70	1	**9.194 544**
5970	6 x 12	16	Green	248	127	70	1	**9.194 554**
5970	6 x 12	16	Red	248	127	70	1	**9.194 564**
5970	4 x 10	20	White	250	102	83	1	**9.194 515**
5970	4 x 10	20	Orange	250	102	83	1	**9.194 525**
5970	4 x 10	20	Yellow	250	102	83	1	**9.194 535**
5970	4 x 10	20	Blue	250	102	83	1	**9.194 545**
5970	4 x 10	20	Green	250	102	83	1	**9.194 555**
5970	4 x 10	20	Red	250	102	83	1	**9.194 565**
5970	4 x 10	25	White	300	121	92	1	**9.194 516**
5970	4 x 10	25	Orange	300	121	92	1	**9.194 526**
5970	4 x 10	25	Yellow	300	121	92	1	**9.194 536**
5970	4 x 10	25	Blue	300	121	92	1	**9.194 546**
5970	4 x 10	25	Green	300	121	92	1	**9.194 556**
5970	4 x 10	25	Red	300	121	92	1	**9.194 566**
5970	3 x 8	30	White	283	121	83	1	**9.194 517**
5970	3 x 8	30	Orange	283	121	83	1	**9.194 527**
5970	3 x 8	30	Yellow	283	108	83	1	**9.194 537**
5970	3 x 8	30	Blue	283	108	83	1	**9.194 547**
5970	3 x 8	30	Green	283	108	83	1	**9.194 557**
5970	3 x 8	30	Red	283	108	83	1	**9.194 567**

Also available in half sizes (Type 5972).

3 Reaction tubes stand, PE-coated wire

PE-coated wire. For 4 x 12 reaction vessels 1.5ml, distance between compartments is 5mm. With two handles.



Array	Length mm	Width mm	Height mm	PK	Cat. No.
4 x 12	250	90	40	1	**9.409 390**



1 Test tube racks, wire/nylon

White nylon coated or stainless steel wire, electrochemically polished. 3-tier design, second tier approximately 30mm high. For 50ml test tubes.

Hole size: approx. 30 x 30mm

Distance between each compartment: approx. 5mm

Type	Array	Length mm	Width mm	Height mm	PK	Cat. No.
Nylon coated wire	4 x 2	150	80	80	1	**9.193 970**
Nylon coated wire	5 x 2	190	80	80	1	**9.193 972**
Nylon coated wire	6 x 2	230	80	80	1	**9.193 974**
Stainless steel wire	4 x 2	150	80	80	1	**9.193 971**
Stainless steel wire	5 x 2	190	80	80	1	**9.193 973**
Stainless steel wire	6 x 2	230	80	80	1	**9.193 975**



2 Test tube racks, wire/nylon

Wire with white nylon coating. 3-tier design , second tier approximately 30mm high. Opening size 18 x 18mm. Temperature resistant up to 80°C max.

Array	Height mm	PK	Cat. No.
2 x 6	70	1	**9.193 762**
2 x 10	70	1	**9.193 764**
2 x 12	70	1	**9.193 766**
3 x 12	70	1	**9.193 768**
4 x 6	70	1	**9.193 772**
4 x 12	70	1	**9.193 774**
10 x 10	70	1	**9.193 776**
2 x 12	100	1	**9.193 784**
4 x 12	100	1	**9.193 788**



9.409 014

LLG-Test tube racks, self-aligning, stainless steel

NEW!

Robust stainless steel (brushed) test tube racks. Due to the special construction the racks align the test tubes automatically so that the tubes are more comfortable to use. Contamination from vessel to vessel is also reduced as the tops of the tubes do not touch. Dishwasher safe, steam autoclavable, suitable for dry heat (200°C) and water bath. Each rack holds up to 50 test tubes.

For neck dia. mm	Int. bore diam. mm	Dimensions (L x W x H) mm	PK	Cat. No.
12	13.5	184 x 102 x 75	1	**9.409 012**
14	15.5	202 x 110 x 75	1	**9.409 013**
16	17.5	224 x 120 x 75	1	**9.409 014**



4 Test tube stands, wood

Two tier with rods. For tubes up to 18mm diameter.

Array	For tubes diam. mm	PK	Cat. No.
2 x 6	18	1	**9.193 012**
2 x 9	18	1	**9.193 018**
2 x 12	18	1	**9.193 024**

1 Test tube racks, PP

Blue. For tubes up to 18mm in diameter. Autoclavable and unbreakable. Can be dismantled. Can be recycled.

Array	For tubes diam. mm	PK	Cat. No.
12	18	1	**9.193 112**
24	18	1	**9.193 124**



2 Test tube racks, stainless steel

Corrosion resistant, stainless steel wire. Electrochemically polished.
Opening size 18 x 18mm. Mesh grid levels are positioned at the top and 30mm above the base.

Array	Height mm	PK	Cat. No.
2 x 12	70	1	**9.193 824**
3 x 12	70	1	**9.193 836**
4 x 12	70	1	**9.193 848**
4 x 12	100	1	**9.193 948**



3 Test tube holders, wood

Wood with metal spring.

For neck dia. mm	PK	Cat. No.
Up to 20	1	**9.193 992**
Up to 30	1	**9.193 993**



4 Containers, PP with lids

BRAND

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
ca. 50	56	25	1	**9.402 415**
ca. 115	75	30	1	**9.402 420**



5 LLG-Sample containers with tamper-evident cap, PS and PP

White with tamper-evident cap. Multi-purpose containers e.g. for storage or transport of samples.

Capacity ml	Diam. mm	Height mm	Material container	Material Lid	PK	Cat. No.
40	36	52	PS	PE-LD	10	**9.402 350**
100	58	58	PP	PP	10	**9.402 353**
250	64	95	PS	PE-LD	10	**9.402 356**
1000	116	116	PP	PP	5	**9.402 359**



6 Jars with snap cap, PE

Slightly tapered with snap cap attached which snaps tightly closed when pressed. *Kartell*

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
1	8	32	100	**9.401 805**
3	14	32	1	**9.401 820**
5	15	49	1	**9.401 822**
7	23	33	1	**9.401 830**
8	17	58	1	**9.401 825**
20	25	75	1	**9.401 835**
25	31	53	1	**9.401 838**
35	31	75	1	**9.401 840**





1 Jars with screw cap, PE-HD

Heavy walled jar and screw cap with cone liner. *Kartell*

Capacity ml	Ext. diam. mm	Height mm	PK	Cat. No.
5	21	36	1	**9.401 850**
10	21	58	1	**9.401 851**
30	35	53	1	**9.401 852**
60	35	94	1	**9.401 853**
90	55	63	1	**9.401 854**
180	55	110	1	**9.401 855**



2 Sample containers, PP with snap on caps, PE-LD

Transparent. *VITLAB*
With PE-LD snap-on lid. Conical shape.
Food-safe product according to EC Directive No. 10/2011.

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
5	20	25	1	**9.402 770**
12	22	37	1	**9.402 774**
18	22	57	1	**9.402 776**
50	30	97	1	**9.402 782**
160	50	110	1	**9.402 784**

3



3 Rolled rim bottles, AR glass with PE snap-on lid

With PE snap-on lid. Tight closing.

Capacity ml	Height mm	Diam. mm	PK	Cat. No.
3	30	19	200	**9.400 211**
5	40	19	200	**9.400 215**
10	50	21	200	**9.400 220**
10	45	22	200	**9.400 225**
15	52	24	200	**9.400 235**
20	55	27	200	**9.400 240**
20	70	25	200	**9.400 250**
25	50	30	250	**9.400 230**
30	75	28	200	**9.400 260**
40	80	30	200	**9.400 270**
50	100	30	200	**9.400 280**
100	145	34	100	**9.400 290**

4 5



9.070 321



9.070 322

Sample containers, PS, with metal cap, sterile

NEW!

Ideal for sample collection and storage. Made of virgin polystyrene. All materials are non-cytotoxic. For In Vitro use only. CE Marked in accordance with the European Directive 98/79/CE. The metal cap with inert PVC-Liner ensures leak proof seal.

Capacity ml	PK	Cat. No.
60	300	**9.070 321** 4
100	200	**9.070 322** 5
250	50	**9.070 323**



6 Multi-purpose jars, PS

Multi-purpose, Polystyrene jar without cap. *Thermo Scientific*
Please order cap separately.

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
12,5	27	29	1000	**4.008 637**
20,0	27	41	2400	**4.008 944**
30,0	27	60	1200	**4.009 104**
50,0	41	49	800	**4.008 750**
100,0	53	54	300	**4.008 570**
100,0*	53	54	100	**6.230 948**

*sterile with lid

E & OE.

1 Lids, PE for multi-purpose jars, PS

Thermo Scientific

For jars ml	PK	Cat. No.
12,5 / 20 / 30	4000	**4.008 824**
50	2400	**4.008 825**



2 LLG-Round sample containers, PP

White with screwed on lid.

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
30	58	17	10	**9.402 310**
75	58	45	10	**9.402 313**
310	81	79	10	**9.402 318**
600	119	65	10	**9.402 321**
1250	119	128	5	**9.402 324**



3 Jars, PP with PP screw cap

White, complete with red PP screw cap, in safe pack with certificate of analysis.

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
25	31	40	25	**7.077 661**
90	52	52	25	**7.077 852**
125	52	67	25	**7.085 372**
250	68	79	20	**7.053 933**
500	75	97	9	**7.052 896**
625	90	113	6	**7.051 092**
1000	102	127	3	**7.052 895**
1250	102	155	3	**7.053 930**



4 Jars with screw cap, PP

Transparent. Excellent chemical resistance. Autoclavable - undo cap before autoclaving. *Thermo Scientific*

Capacity ml	Screw cap diam. mm	PK	Cat. No.
15	38	12	**9.033 230**
30	43	12	**9.033 231**
60	53	12	**9.033 232**
125	70	12	**9.033 233**
250	70	6	**9.033 234**
500	120	6	**9.033 235**
1000	120	6	**9.033 236**



5 Jars, PE-HD with cap, PE-LD

PE-HD with PE-LD cap. Resistant to acids and chemicals. Suitable for cold storage rooms, refrigerators and freezers. Stackable. Food safe. Color: natural.

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
200	98	42	1	**9.033 201**
400	114	55	1	**9.033 202**
700	114	88	1	**9.033 211**
1000	136	110	1	**9.033 212**
2000	169	143	1	**9.033 213**



6 Jars with screw cap, PC

Cylindrical. Very durable. Stackable. Non-toxic. Suitable for cold storage rooms and refrigerators. Autoclavable - remove cap before autoclaving. *Thermo Scientific*

Capacity ml	Screw cap diam. mm	Colour	PK	Cat. No.
15	38	transparent	4	**9.033 237**
30	43	transparent	4	**9.033 238**
60	53	transparent	4	**9.033 239**
125	70	transparent	4	**9.033 240**
250	70	transparent	4	**9.033 241**
500	120	transparent	4	**9.033 242**





1 Cylindrical jars with ribbed cap, PE-HD

The cylindrical jars are supplied with insert and cap. Thanks to the large neck they are suitable for powders, solid specimen, creamy or semisolid substances, crystals and hygroscopic substances.
Suitable for foodstuff.

Kartell

Capacity	Diam.	Height	Neck i. d.	PK	Cat. No.
ml	mm	mm	mm		
70	50	60	36	1	**6.205 920**
120	56	71	36	1	**6.206 304**
250	69	94	50	1	**6.205 857**
500	86	107	70	1	**6.205 921**
1000	111	128	85	1	**6.205 922**
1500	111	182	87	1	**6.226 130**
2000	111	235	87	1	**6.223 901**



2 Storage jars, series 376, PE-HD

Natural round jars without lid. The wide mouth allows for easy filling and cleaning. Black caps available with PE foam leakproof wad - please order separately.

Kautex

Capacity	Thread external dia.	Height	PK	Cat. No.
ml	mm	mm		
100	40	77	1	**9.073 388**
250	50	98	1	**9.073 389**
500	65	122	1	**9.073 390**
750	65	130	1	**9.073 391**
1000	80	153	1	**9.073 392**
1500	80	173	1	**9.073 393**
2000	80	192	1	**9.073 394**

Height in mm without lid.



3 Caps for storage jars, series 376, PP

Black, screw cap with PE-foam insert.

Kautex

For jars	Thread external dia.	PK	Cat. No.
ml	mm		
100	40	1	**9.073 071**
250	50	1	**9.073 072**
500 and 750	65	1	**9.073 073**
1000, 1500 and 2000	80	1	**9.073 074**



4 Wide mouth containers, PET

Transparent with white polypropylene cap.
Round, except 2000ml which is square.

Behr

Capacity	Cap diam.	Ext. diam.	Height	PK	Cat. No.
ml	mm	mm	mm		
100	70	74	37	10	**9.103 136**
250	70	85	75	10	**9.103 137**
500	82	88	107	10	**9.103 138**
2000	100	133	180	10	**9.103 140**
2500	100	135	210	10	**9.103 148**
3000	100	145	210	10	**9.103 149**



E & OE.

1 Sample jars with screw cap, PFA

VITLAB

With screw cap made of PFA. Cylindrical, tall shape.
Ideal for sample collection, transport and storage of samples.
The advantages of PFA
- Specially suitable for use in trace analysis
- Ideal for sensitive and valuable samples
- Long-term maintenance of low-concentration reference materials in PFA containers
- No memory effects
- Practically no carryover, no cross-contamination due to the extremely hydrophobic, anti-adhesive, smooth surfaces
- High thermal stability from -200°C to +260°C, autoclavable at 121°C (2 bar) according to DIN EN 285
- Chemical inertness against nearly all chemicals
- Good transparency and dimensional stability
- Easy to clean
- Use of high purity raw material



Capacity ml	Neck thread GL	Diam. mm	Height mm	PK	Cat. No.
30	40	38	54	1	**9.401 810**
60	40	38	90	1	**9.401 812**
90	56	54	62	1	**9.401 814**
180	56	54	112	1	**9.401 816**

2 Jars, DURAN®, low form

DURAN Group

With removable, drop-on cover. Without handle.



Ext. diam. mm	Height mm	PK	Cat. No.
60	40	1	**9.033 018**
80	50	1	**9.033 026**
100	60	1	**9.033 029**
150	80	1	**9.033 034**

3 LLG-Wide-neck jars, glass

NEW!

Twist-off jar, wide-neck. Perfect for sample storage. Glass, clear.
Without cap, please order cap separately.

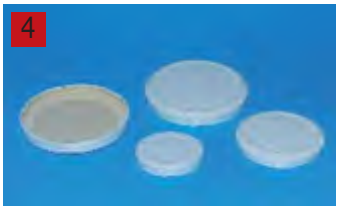


Capacity ml	Diam. mm	Height mm	PK	Cat. No.
106	48	78.0	12	**9.070 301**
212	63	80.5	12	**9.070 302**
375	63	120.5	12	**9.070 303**
720	82	148.0	12	**9.070 304**
1062	82	176.0	12	**9.070 305**

4 Cap for LLG wide-neck jars

NEW!

Twist-off screw cap for wide-neck jars



Diam. mm	For	PK	Cat. No.
48	106 ml LLG Twist-Off-jar	12	**9.070 306**
63	212 ml and 375 ml LLG Twist-Off-jar	12	**9.070 307**
82	720 ml and 1062 ml LLG Twist-Off-jar	12	**9.070 308**

5 Bottle carriers, wire/PE

Made of PE coated wire.
For carrying laboratory bottles of various sizes.
With base and fixed carrying handle.



For bottles ml	Int. diam. mm	Height mm	PK	Cat. No.
4 x 2000	130	110	1	**9.102 204**
6 x 2000	130	110	1	**9.102 206**
8 x 2000	130	110	1	**9.102 208**
10 x 2000	130	110	1	**9.102 210**
4 x 1000	100	100	1	**9.102 214**
6 x 1000	100	100	1	**9.102 216**
8 x 1000	100	100	1	**9.102 218**
10 x 1000	100	100	1	**9.102 220**
4 x 250	80	80	1	**9.102 224**
6 x 250	80	80	1	**9.102 226**
8 x 250	80	80	1	**9.102 228**
10 x 250	80	80	1	**9.102 230**
12 x 250	80	80	1	**9.102 232**



1 Bottle carriers, wire/plastic coated

Plastic-coated. Strong wire frame.

For bottles ml	PK	Cat. No.
4 x 1000	1	**9.102 321**
2 x 2500	1	**9.102 322**





2 3 Safety box DURAPorter™, PC

NEW!

Heathrow Scientific

Ideal for transporting biological and clinical samples, as well as instruments and products that you want to keep clean and dry under testing environmental conditions.
The clarity of the DuraPorter™ enables the user to visibly check sample integrity, so that it can be opened using the right precautions.

- Polycarbonate construction and available in three colors for use/owner identification
- Silicone water-tight seal and three lid clasps provide secure closure
- Carry handle folds neatly into body space allowing the units to be stacked
- Lid opens a full 180°, allowing total access to contents and making it easier to clean
- Will accommodate 13 and 16 mm tubes in a 72-place OneRack™, or similar sized/brand of rack
- Use the separators provided to create your own compartment sizes, or use empty to transport larger products and equipment
- Autoclavable
- Dimensions (WxDxH): 380 x 160 x 196 mm

Colour	PK	Cat. No.
Clear with blue handles	1	**9.194 005**
Yellow with yellow handles	1	**9.194 006**
Red with red handles	1	**9.194 007**



4 Cleaning baskets, stainless steel wire

With cover, made of non-rusting, electrochemically polished, stainless steel wire. For washing hardware. Frame, base and cover made of 8 x 8 x 1.2mm spot welded wire mesh.

L x W x H approx. 250 x 150 x 150mm.

Type	PK	Cat. No.
Cleaning basket	1	**9.908 130**



E & OE.

1 Transport baskets, stainless steel wire

Non-rusting stainless steel, electrochemically polished. With fold down handle that locks into position. Handle with plastic moulding. Made of 8 x 8 x 1.2mm diameter spot welded wire mesh. Base reinforced with two rods.

Width mm	Length mm	Height mm	PK	Cat. No.
300	400	200	1	**9.143 090**



2 Wire baskets, wire/nylon

White. Nylon coated, strong wire.

Width mm	Length mm	Height mm	PK	Cat. No.
100	100	100	1	**9.033 341**
120	120	120	1	**9.033 342**
140	140	140	1	**9.033 344**
160	160	160	1	**9.033 346**
200	200	200	1	**9.033 350**



3 Wire baskets, stainless steel

Polished stainless steel wire.

Width mm	Length mm	Height mm	PK	Cat. No.
100	100	100	1	**9.033 410**
120	120	120	1	**9.033 412**
140	140	140	1	**9.033 414**
160	160	160	1	**9.033 416**
180	180	180	1	**9.033 418**
200	200	200	1	**9.033 420**
200	300	200	1	**9.033 430**
200	400	200	1	**9.033 440**



4 Aquaria, soda-lime glass

Thick- walled with coarse ground rim.

Width mm	Depth mm	Height mm	PK	Cat. No.
100	100	100	1	**9.003 906**
100	150	150	1	**9.003 920**
130	180	180	1	**9.003 932**
150	200	200	1	**9.003 941**
180	250	220	1	**9.003 951**
220	300	240	1	**9.003 954**
230	360	260	1	**9.003 964**



5 Display boxes, PS

Polystyrol. Heavy duty, industrial quality. Stackable (lengthways and crosswise). With RAL certificate. Shock-resistant, high impact PS. Food safe colors. Smooth underbody, therefore suitable for transport.

Colour	Width mm	Length mm	Height mm	PK	Cat. No.
red	100	165/140	75	1	**9.033 121**
blue	100	165/140	75	1	**9.033 123**
green	100	165/140	75	1	**9.033 124**
red	145	232/200	125	1	**9.033 131**
blue	145	232/200	125	1	**9.033 133**
green	145	232/200	125	1	**9.033 134**
red	200	336/300	150	1	**9.033 141**
blue	200	336/300	150	1	**9.033 143**
green	200	336/300	150	1	**9.033 144**



1



1 Stacking boxes, PP

PP. May be stacked and linked with reinforcing and stacking ribs. Smoothly rounded, without corners. Easy to clean. Two sintered metal straps are located on the lid as lid clamps.

9L capacity — Dim. (W x L x H): 212 x 350 x 165mm
29L capacity — Dim. (W x L x H): 360 x 440 x 240mm

Colour	Capacity litres	PK	Cat. No.
red	9	1	**9.301 460**
red	29	1	**9.301 470**
blue	9	1	**9.301 463**
blue	29	1	**9.301 473**

2



2 Storage, Stacking and transport containers, PP/PE-HD

White. Thermoplastic resin.
The raw material used is physiologically compatible and corresponds with the directives of the Federal Board of Health.

Capacity Litres	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Material	PK	Cat. No.
9	510 x 310 x 60	560 x 360 x 64	PP	1	**9.301 643**
10	410 x 310 x 85	445 x 345 x 90	PP	1	**9.301 641**
23	395 x 295 x 200	460 x 330 x 210	HDPE	1	**9.301 663**
28	600 x 400 x 120	660 x 450 x 130	HDPE	1	**9.301 647**
31	480 x 410 x 160	550 x 450 x 170	HDPE	1	**9.301 645**
35	530 x 315 x 210	600 x 350 x 220	HDPE	1	**9.301 661**
50	600 x 400 x 210	660 x 450 x 220	HDPE	1	**9.301 649**
96	600 x 400 x 400	660 x 450 x 410	PP	1	**9.301 651**

3



3 Lids for storage, stacking and transport containers.

Depth mm	Width mm	For	PK	Cat. No.
660	450	9.301 647 / 649 / 651	1	**9.301 655**
460	330	9.301 663	1	**9.301 664**

4



4 Collapsible boxes, PP

PP. Dim. (WxDxH): 470 x 340 x 240mm.

Capacity Litres	Colour	PK	Cat. No.
30	Black	1	**9.301 469**

5



5 Transport and storage containers, PE-HD

Stackable. *Kartell*

Width mm	Length mm	Height mm	PK	Cat. No.
415	315	200	1	**9.301 538**
595	365	255	1	**9.301 556**
695	440	306	1	**9.301 566**

Trolleys please see page 260

E & OE.

1 Euro-boxes, aluminium alloy



- High strength, corrosion resistant aluminium alloy
- Stainless steel hinges
- Cover for protection against dust and water
- Strengthened rim
- Cover clamp straps
- Can be secured with lead seal, padlock or fitted lock
- Stackable
- Impact resistant, blue plastic stacking brackets

Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Capacity litres	Weight g	PK	Cat. No.
350 x 250 x 310	400 x 300 x 340	27	3000	1	**9.301 356**
550 x 350 x 220	600 x 400 x 250	42	4700	1	**9.301 357**
550 x 350 x 310	600 x 400 x 340	60	4900	1	**9.301 358**
550 x 350 x 380	600 x 400 x 410	73	5200	1	**9.301 359**
750 x 350 x 310	800 x 400 x 340	81	6100	1	**9.301 360**
750 x 550 x 380	800 x 600 x 410	157	7500	1	**9.301 361**
750 x 550 x 580	800 x 600 x 610	239	8900	1	**9.301 362**

Usable dimensions approx. 30mm less than internal dimensions.

2 Storage boxes, PE-HD with tightly closing PE-LD lid



PE-HD. With tightly closing PE-LD lid. Suitable for cold storage rooms and refrigerators. Temperature range/withstands temperatures (without mechanical stress) from -40 to +95°C. Stackable. Acid and chemical resistant. Food safe. Colour: natural.

Capacity Litres	Width mm	Length mm	Height mm	PK	Cat. No.
0.50	103	103	64	1	**9.033 270**
1.00	103	103	127	1	**9.033 275**
1.00	103	208	64	1	**9.033 280**
1.50	103	208	94	1	**9.033 285**
2.00	103	255	94	1	**9.033 286**
2.00	208	208	64	1	**9.033 287**
3.20	208	208	94	1	**9.033 288**

3 LLG-Buckets white with lid, PP

NEW!



For transport, packaging and storage of foodstuffs, building materials and non-corrosive chemicals

Capacity Litres	PK	Cat. No.
1	1	**9.040 030**
2	1	**9.040 031**
3	1	**9.040 032**
5	1	**9.040 033**
10	1	**9.040 034**

4 LLG- Buckets, PP



Round version 10L with metal handle, graduated, white.

Capacity Litres	Colour	PK	Cat. No.
10	white	1	**9.040 216**



1 Buckets, PE-HD

White. Without spout. With division into 1L segments. *VITLAB*
Stable handle with reinforcement in the middle for comfortable carrying.
Tightly closing, transparent PE-LD lid - please order separately.

Capacity Litres	Diam. mm	Height mm	PK	Cat. No.
5	250	240	1	**9.040 006**
10	290	300	1	**9.040 012**

Lids PE-LD for buckets PE-HD

VITLAB

For bucket l	PK	Cat. No.
5	1	**9.040 206**
10	1	**9.040 212**



2 Buckets with spout, PP

Transparent. With division into 1L segments. *VITLAB*
With stable handle and spout for easy emptying.
Highly resistant to chemicals. Without lid.
Food-safe product according to EC Directive No. 10/2011.

Capacity Litres	Diam. mm	Height mm	PK	Cat. No.
12	310	330	1	**9.040 022**
15	310	370	1	**9.040 025**



3 Buckets, series 610/615, PE-LD

Graduated. *Kautex*
- thick-walled
- very stable
- durable
- litre scale
- laboratory and industrial bucket (white) with plastic coated steel carrying handle
- builder's bucket (grey) with rust-free handle

Type 1: with spout
Type 2: without spout

Type	Capacity Litres	Colour	Bottom diam. mm	Top diam. mm	Height mm	PK	Cat. No.
1	10	white	193	280	300	1	**9.040 110**
1	15	white	235	316	335	1	**9.040 115**
2	10	white	212	253	279	1	**9.040 010**
2	10	grey	212	253	279	1	**9.040 011**



4 Buckets, 18/10 steel

Graduated. With handle. *Bochem*
Lids - Order separately.

Capacity Litres	Diam. mm	Height mm	PK	Cat. No.
6	260	190	1	**9.040 325**
10	280	235	1	**9.040 330**
12	300	270	1	**9.040 332**
15	310	305	1	**9.040 335**

E & OE.

1 Lids for buckets 18/10 stainless steel

RSG

For buckets	Diam. mm	PK	Cat. No.
6L	260	1	**7.623 893**
10L	280	1	**6.901 567**
12L	300	1	**7.636 628**
15L	310	1	**7.612 465**



2 Transport containers with lid and handle, 18/10 steel

Bochem

Height mm	Diam. mm	Capacity Litres	PK	Cat. No.
155	100	1	1	**9.039 921**
170	135	2	1	**9.039 922**
185	160	3	1	**9.039 923**
240	180	5	1	**9.039 925**
280	180	6	1	**9.039 926**
280	225	10	1	**9.039 928**



3 Aspirator Bottles, wide mouth, PE-HD

Suitable for food. With carrying handle. Ideal for containing liquids, powders and granules. Very strong and durable quality for extended use over time. With gasket in the screw cap and additional inner cap for a very tight seal. Screw cap can be attached to the bottle using the integrated loops.



Capacity Litres	Neck Int. diam. mm	Neck Ext. dia. mm	Body diam. mm	Height mm	Handle	PK	Cat. No.
5	84	94	170	350	1	1	**9.139 938**
10	99	109	210	420	1	1	**9.139 939**

4 Aspirator Bottles, narrow neck, PE-HD

With carrying handle. Suitable for food. Very strong and durable quality for extended use over time. With gasket in the screw cap for a very tight seal. Screw cap can be attached to the bottle using the integrated loops. With thread of 12 mm depth for use with a ¾" stopcock. Please order the stopcock separately (Cat. No. 9.109 937). The bottles can be used in ambient temperatures below 0°C.

Capacity Litres	Neck Int. diam. mm	Neck Ext. dia. mm	Body diam. mm	Height mm	Handle	PK	Cat. No.
5	52	62	160	350	1	1	**9.139 929**
10	52	62	210	430	1	1	**9.139 930**
25	84	97	270	570	2	1	**9.139 931**
50	84	97	350	690	2	1	**9.139 932**



1



1 Aspirator Bottles, narrow neck, PE-HD, with stopcock

With carrying handle and ¾" stopcock. Thread and opening for stopcock provided. Suitable for food. Very strong and durable quality for extended use over time. With gasket in the screw cap for a very tight seal. Screw cap can be attached to the bottle using the integrated loops. The bottles can be used in ambient temperatures below 0°C.

Capacity	Neck Int. diam.	Neck Ext. dia.	Body diam.	Height	Handle	PK	Cat. No.
litres	mm	mm	mm	mm			
5	52	62	160	350	1	1	**9.139 933**
10	52	62	210	430	1	1	**9.139 934**
25	84	97	270	570	2	1	**9.139 935**
50	84	97	350	690	2	1	**9.139 936**

2



2 Stopcock, ¾", for Aspirator bottles

For 9.139 933 to 9.139 936 and 9.139 929 to 9.139 932.

Type	PK	Cat. No.
Tap for aspirator bottles	1	**9.139 937**



1 Storage bottles, PE-HD

Natural, narrow-neck storage bottles with or without scale.
Storage vessel with drain made of food-safe polyethylene
- With UV protection for long life
- Resistant to acids and chemicals
- Special colour and printing possible
- With metal carrying belt
- With threaded plug and wide thread 22mm
- with white screw cap Ø 65mm
- with 2 O-rings/seals

Other sizes available on request.

Please order stopcocks and adapter for stopcocks with R 1/2" separately.

Description	Capacity Litres	Ext. diam. mm	Height mm	PK	Cat. No.
Aspirator bottles, without scale	5	167	348	1	**9.002 601**
Aspirator bottles, without scale	10	210	427	1	**9.002 602**
Aspirator bottles, without scale	25	275	580	1	**9.002 603**
Aspirator bottles, with scale	5	167	348	1	**9.002 606**
Aspirator bottles, with scale	10	210	427	1	**9.002 607**
Aspirator bottles, with scale	25	275	580	1	**9.002 608**
Stopcock with sleeve connection 19mm (3/4")				1	**6.253 481** 2
Adapter for stopcocks with R 1/2"				1	**6.227 536**
Angled stopcock, straight, with sleeve connection 12mm (1/2")				1	**9.002 670** 3
Angled stopcock, curved, with sleeve connection 12mm (1/2")				1	**9.002 671**

1



2



6.253 481

3



9.002 670

4 Aspirator bottles, series 350, PE-HD

Natural with printed blue graduations (in L) and screw closure. With or without threaded connection at base. Inside neck diameter 50mm. *Kautex*
Please order stopcock separately.

Capacity Litres	Stopcock connection	Handle	Ext. diam. mm	Height mm	PK	Cat. No.
5	without	1	167	330	1	**9.011 009**
10	without	1	206	427	1	**9.011 010**
25	without	2	278	580	1	**9.011 025**
60	without	2	346	823	1	**9.011 060**
5	with	1	167	330	1	**9.011 069**
10	with	1	206	427	1	**9.011 071**
25	with	2	278	580	1	**9.011 072**
60	with	2	346	823	1	**9.011 076**

Height in mm without cap.

4



5 Accessories for series 350 aspirator bottles

Type	Figure	PK	Cat. No.
Stopcock, blue PE-HD	a	1	**9.011 181**
Blanking plug, natural PE-HD	b	1	**9.011 170**
Stopcock, blue PP	c	1	**9.139 997**
Reducer, blue for 9.193 997	d	1	**9.011 078**

5







1 2 Bottles Type 2250 with handle, PP

Thermo Scientific

With 83mm diameter. With screw cap and shoulder handles. Graduated. For nutritive media, distilled water or other solutions. Leakproof. Not for use with aggressive substances. Neck also accepts stoppers, 36mm in height and a top/bottom diameter of 75/62mm. Autoclavable - for best results, autoclave using a properly vented closure.

Type	Capacity Litres	Description	PK	Cat. No.
2250	10	with stopcock	1	**9.002 721**
2250	20	with stopcock	1	**9.002 722**
2250	50	with stopcock	1	**9.002 723**
2250	10	without stopcock	1	**9.011 102**
2250	20	without stopcock	1	**9.011 103**
2250	50	without stopcock	1	**9.011 104**

3



3 Aspirator carboys with tab, Type 2322, PC

Thermo Scientific

Transparent. With PP stopcock. Graduated. Leakproof. Robust. Suitable for use in cold rooms. Autoclavable, before autoclaving, unscrew cap and set on bottle neck.

Type	Capacity Litres	Width mm	Depth mm	Height mm	PK	Cat. No.
2322	9	216	146	362	1	**9.139 916**
2322	20	318	219	381	1	**9.139 917**

4



4 Aspirator carboys Type 2320, PE-HD

Thermo Scientific

With PP stopcock. Graduated. Leakproof. Stable. Rigid. Suitable for use in cold rooms.

Type	Capacity Litres	Width mm	Depth mm	Height mm	PK	Cat. No.
2320	9	216	146	356	1	**9.139 918**
2320	20	318	219	381	1	**9.139 919**

5



5 Aspirator carboys Type 2321, PP

Thermo Scientific

Aspirator carboy with screw cap and stopcock made of PP. With stainless steel handle. Graduated. Inside diameter of 86mm neck opening. Robust. Autoclavable only when empty, before autoclaving, unscrew cap.

Type	Capacity Litres	Width mm	Depth mm	Height mm	PK	Cat. No.
2321	9	216	146	356	1	**9.139 921**
2321	20	318	219	381	1	**9.139 922**

6



6 Carboys Type 2211, PE-HD

Thermo Scientific

With PP screw cap. Robust. Space-saving. With graduations and stainless steel handles. Inside diameter 86mm neck opening. The 20L carboy has recessed handles.

Type	Capacity Litres	Width mm	Depth mm	Height mm	PK	Cat. No.
2211	9	216	146	343	1	**9.139 906**
2211	20	318	219	381	1	**9.139 907**

E & OE.

1 Stopcocks, quick action Type 6422, 6432 , PP or ETFE

Thermo Scientific

Type 6422 PP. Autoclavable. Standard stopcock with quick acting closure. Accepts tubing with an inside diameter of up to 16mm. For tubing with an inside diameter of 6.4mm to 7.9mm. PE-HD adapter is provided.

Type 6432. Autoclavable. Housing and plugs made of Tefzel® ETFE. For tubing with an inside diameter of 6.4mm to 7.9mm. Without adapter.

Type	Material	PK	Cat. No.
6422	PP	1	**9.139 925**
6432	ETFE	1	**9.139 926**

Tefzel® is registered trademark of DuPont.

1



2 3 Space saving jerrycan Flachmann LaboPlast®, PP

The compact jerrycan Flachman is ideal as a space-saving canister with a width of only 6.5cm. Different liquids can be stored and decanted in a small space. Flachmann can also be stored lying on its side eg. in a refrigerator. It is very stable due to ribbed structure and thick sides. Using the support stand for two or three canisters, any number of canisters can safely be placed in the open. The compact jerrycan can also be used as a settling canister.

- With or without threaded connector 3/4"
- PP, transparent
- Canister without valve autoclavable
- Volume: 5L
- Dimensions (WxDxH): 65 x 335 x 335mm
- Graduations: 250ml
- With moulded, indestructible litre graduation

Space-saving Compact set: Flachmann LaboPlast® canister and Compact stopcock
The Flachmann canister is ideal to store and decant liquids in a small space. The Compact stop cock for canisters and barrels features an impressive compact design, which not overlaps the footprint of the canister and there fore can be stored an places e.g. within a refigerator or rack without screwing off the stop-cock.

Type	PK	Cat. No.
with screw neck, with tamper-evident cap, PP, blue	1	**9.140 002**
without screw neck, with tamper-evident cap, PP, blue	1	**9.140 001**
Compact jerrycan & Compact stop cock set (9.140 003)	1	**9.140 004**
Compact jerrycan & stop cock set (9.139 997)	1	**9.140 011**

2



3





1



9.139 997

2



9.140 003

3



9.140 000

Stop cocksLaboPlast®

StopCock Siphon *Bürkle*

- With rotatable spout, preventing drips
- With tapered spout for bottles with narrow openings from diameter 6mm to 8mm
- Fits screw threads with R ¾"
- Pressure proof to 2 bar at 20°C without discharge angle
- Seals made of PTFE und PE, parts in contact with media made of PP, PE and PTFE

StopCock Compact

- Compact design, the short discharge does not protrude
out over the lower edge of the container
- The specially optimised design of the discharge forms an even stream of liquid with no splashing or spattering
- The Compact stop cock fits all containers with R ¾" connecting threads
- PP, PE and PTFE are materials that offer outstanding chemical resistance to acids and bases

StopCock PA

- Made of polyamide electroconductive, can be grounded separately
- Ideally suited for solvents
- Inexpensive alternative to stainless steel stopcocks
- PTFE seal
- Including adapter for ¾" inner thread made of PA electroconductive
- Fits all containers with ¾" outer thread and with included adapter, to all ¾" inner threads
- Pressure proof to 2 bar at 20°C without discharge angle

Type	PK	Cat. No.	
StopCock Siphon	1	**9.139 997**	1
StopCock Compact	1	**9.140 003**	2
StopCock PA	1	**9.140 000**	3

4



4 Wide-mouth jerrycans, PE-HD

PE-HD. 88mm neck opening. Offers UV protection. With thread and stopper on the narrow side. Wide thread 22mm. Food safe. Angle valves for 9.002 670 and 9.002 671, 10L variant with additional small spout.

Capacity Litres	Width mm	Depth mm	Height mm	PK	Cat. No.
10	154	302	397	1	**9.139 975**
22	180	370	475	1	**9.139 970**

5



5 Angled stopcocks, PE-HD

PE-HD. With spout attachment 12mm (1/2") diameter and 22mm threaded connector. For bottles and wide-mouth carboys. Acid and chemical resistant, pressure resistant up to 1.5 bar. For 9.139 975 and 9.139 970. Food safe.

Description	PK	Cat. No.
Angled stopcock, straight	1	**9.002 670**
Angled stopcock, curved	1	**9.002 671**

1 Jerrycan with integrated spout, PE-HD

NEW!

Hünersdorff

Jerrycan in stable design for varied applications in profession and leisure made of food-safe polyethylene (PE-HD)
- UV protection for long life
- Especially suitable for drinking water and food
- space-saving and stackable
- integrated spout with wide thread
- With transparent PE-protective film
- Blue screw cap Ø 65mm
- With threaded plug and wide thread 22mm



Capacity Litres	Width mm	Length mm	Height mm	PK	Cat. No.
10	350	165	310	1	**9.002 611**
20	350	165	495	1	**9.002 612**

2 Carboys behroplast®, PE

Polyethylene, with welded stopcock. Leakproof, even after prolonged use.

Behr



Capacity Litres	Width mm	Length mm	Height mm	PK	Cat. No.
5	160	190	240	1	**9.140 100**
10	190	190	360	1	**9.140 101**
15	170	380	370	1	**9.140 097**
20	250	280	370	1	**9.140 098**
25	240	300	450	1	**9.140 099**
30	260	300	450	1	**9.140 102**
60	330	390	670	1	**9.140 103**

3 Carboys, PE-HD

White, transparent with wide screw cap and handle.

Behr



Capacity Litres	Length mm	Width mm	Height mm	Neck	PK	Cat. No.
5	130	160	280	Ø 85 mm	1	**6.302 202**
15	380	170	370	Ø 80 mm	1	**6.201 006**

4 Industrial jerrycans, PE-HD

Jerrycans with capacity of 2 to 30L.
Please order closures separately.

Kautex



Capacity L	Width mm	Depth mm	Height mm	Weight g	Thread external dia. mm	Colour	PK	Cat. No.
2.00	145	109	196	110	45	natural	1	**9.140 021**
2.50	153	115	208	125	45*	natural	1	**9.140 022**
3.00	153	115	240	140	45*	natural	1	**9.140 023**
5.00	190	145	251	250	50*	natural	1	**9.140 025**
6.00	192	145	294	265	45	natural	1	**9.140 026**
8.00	230	190	270	320	45	natural	1	**9.140 027**
10.00	230	190	310	450	50*	natural	1	**9.140 030**
20.00	290	246	385	950	60*	blue	1	**9.140 032**
25.00	290	246	450	1100	60*	blue	1	**9.140 031**
30.00	320	284	435	1250	60*	blue	1	**9.140 033**
20.00	290	246	385	950	60*	natural	1	**9.140 037**
30.00	320	284	435	1250	60*	natural	1	**9.140 038**

* With UN approval.

Safety funnels please see page 253



1 Screw caps and accessories for industrial carboys, PE-HD

Kautex

Description	For	PK	Cat. No.
Black, with tear-off ring and vent	2 / 2.5 / 3 / 6 / 8 litre jerrycans	1	**9.140 048**
Black, with tear-off ring and vent	5 / 10 litre jerrycans	1	**9.140 068**
Black, with tear-off ring and vent	20 / 25 / 30 litre jerrycans	1	**9.140 050**
Black, with tear-off ring	2 / 2.5 / 3 / 6 / 8 litre jerrycans	1	**9.140 051**
Black, with tear-off ring	5 / 10 litre jerrycans	1	**9.140 046**
Black, with tear-off ring	20 / 25 / 30 litre jerrycans	1	**9.140 047**
Red, with tear-off ring	2 / 2.5 / 3 / 6 / 8 litre jerrycans	1	**9.140 040**
Red, with tear-off ring	5 / 10 litre jerrycans	1	**9.140 042**
Red, with tear-off ring	20 / 25 / 30 litre jerrycans	1	**9.140 043**
With stopcock	2 / 2.5 / 3 / 6 / 8 litre jerrycans	1	**9.140 062**
With stopcock	5 / 10 litre jerrycans	1	**9.140 061**
With stopcock	20 / 25 / 30 litre jerrycans	1	**9.140 063**
With pump dispenser	2 / 2.5 / 3 / 6 / 8 litre jerrycans	1	**9.140 054**
With pump dispenser	10 litre jerrycans	1	**9.140 065**
With pump dispenser	20 litre jerrycans	1	**9.140 070**
With pump dispenser	25 litre jerrycans	1	**9.140 071**
With pump dispenser	30 litre jerrycans	1	**9.140 072**
Wrench, PE-HD to apply / remove	2 / 2.5 / 3 / 6 / 8 litre jerrycans	1	**9.140 073**
Wrench, PE-HD to apply / remove	5 / 10 / 20 / 25 / 30 litre jerrycans	1	**9.140 108**



9.072 182

DURAN® laboratory glass bottle GL 25

NEW!

DURAN Group

Areas of application
- Storing expensive/sensitive media, reference samples etc.
- Packaging bottle for reference samples, stability tests, proficiency tests and deuteration solutions
- Shipping bottle for small sample volumes
- Storing proteins, vitamins, DNA

Description	Capacity ml	PK	Cat. No.
clear, without cap	10	1	**9.072 181**
clear, with cap	10	1	**9.072 182** 2
amber, without cap	10	1	**9.072 183**
amber, with cap	10	1	**9.072 184**
protect laboratory glass bottle, without cap	10	1	**9.072 185**



9.072 334

Laboratory bottles Borosilicate glass 3.3, GL 45, with retrace code

Borosilicate glass 3.3. DIN 168 - 1. EN ISO 4796-1.
With graduations and retrace code, pouring ring, PP screw cap and ISO thread.

Capacity ml	Ext. diam. mm	Height mm	PK	Cat. No.
100	56	100	10	**9.072 331**
250	70	138	10	**9.072 332**
500	86	176	10	**9.072 334** 3
1000	101	225	10	**9.072 335**
2000	136	260	10	**9.072 336**
5000	186	330	1	**9.072 337**
10000	234	410	1	**9.072 338**
20000	299	505	1	**6.802 824**

E & OE.

1 LLG Safety Nets

NEW!

LLG safety nets from polyethylene for covering glass containers. Cut to size w/ scissors. Package contains 5m.

Description	Colour	For dia. mm	PK	Cat. No.
LLG Safety Nets, roll	red	6 - 15	5	**6.258 996**
LLG Safety Nets, roll	blue	12 - 25	5	**6.510 849**
LLG Safety Nets, roll	yellow	20 - 40	5	**6.050 131**
LLG Safety Nets, roll	green	30 - 60	5	**6.050 132**
LLG Safety Nets, roll	red	50 - 100	5	**6.050 133**
LLG Safety Nets, roll	yellow	90 - 200	5	**6.079 513**

1



2 Laboratory bottles, DURAN®, with retrace code

DURAN®. Graduated and DIN thread ISO 4796-1. Neutral glass/Type I glass in compliance with USP/EP. A ring-shaped moulding on the shoulder of the 100 to 2000ml bottles enables the filling height of the nominal capacity to be visible. With Retrace code (Batch identification). Certificate available via the Internet. Autoclavable. *DURAN Group*

Please order cap and pouring ring separately.

Capacity ml	Diam. mm	Height mm	Neck thread GL	PK	Cat. No.
25	36	70	25	1	**9.072 013**
50	46	87	32	1	**9.072 020**
100	56	100	45	1	**9.072 011**
150	62	105	45	1	**9.071 683**
250	70	138	45	1	**9.072 012**
750	95	203	45	1	**9.071 684**
500	86	176	45	1	**9.072 015**
1000	101	225	45	1	**9.072 016**
2000	136	260	45	1	**9.072 017**
3500	160	295	45	1	**9.071 685**
5000	182	330	45	1	**9.072 018**
10000	227	410	45	1	**9.072 019**
20000	288	505	45	1	**9.072 014**

2



3 Laboratory bottles, DURAN®, with screw cap and retrace code

To ISO 4796-1. Thread acc. to DIN 168-1 and approximate graduations. A ring-shaped moulding on the shoulder of the 100ml to 2000ml bottles makes the filling height of the nominal capacity visible. The 25ml bottle has a specially shaped glass rim for pouring (eliminating the need for an additional pouring ring). Neutral glass/Type I glass in compliance with USP/EP and JP. With easy to read scale and large labelling field for easy marking, in fired-on, highly durable white ceramic. With Retrace code (Batch identification). Certificate available via the Internet. Autoclavable. **With blue PP screw cap and pouring ring.** *DURAN Group*

Temperature (max): 140°C

Capacity ml	Ext. diam. mm	Height*	Neck thread GL	PK	Cat. No.
25**	36	74	25	1	**9.072 003**
50	46	91	32	1	**9.072 000**
100	56	105	45	1	**9.072 001**
150	62	105	45	1	**9.071 680**
250	70	143	45	1	**9.072 002**
500	86	181	45	1	**9.072 005**
750	95	203	45	1	**9.071 681**
1000	101	230	45	1	**9.072 010**
2000	136	265	45	1	**9.072 007**
3500	160	295	45	1	**9.071 682**
5000	182	335	45	1	**9.072 008**
10000	227	415	45	1	**9.072 004**
15000	268	450	45	1	**7.076 312**
20000	288	510	45	1	**9.072 009**

*Height mm incl. cap

**With specially shaped glass edge for improved pouring out (so that an additional plastic pouring ring is not required).

3





1 Laboratory bottles, DURAN® amber, with retrace code

DURAN Group

DURAN®. ISO 4796-1, Amber with DIN thread. Neutral glass/Type I glass acc. to USP/EP and JP. Autoclavable. With approximate graduations. A ring-shaped moulding on the shoulder of the 100 to 2000ml bottles makes the filling height of the nominal capacity visible. The 25ml bottle has a specially formed rim for pouring (eliminating the need for an additional pouring ring).
UV protection up to 500nm. Unaffected DURAN® properties within the bottle, as colour is applied only to the outer surface. Very uniform, durable and chemically resistant, amber colour due to innovative technology.
With Retrace code (Batch identification). Certificate available via the Internet.
Please order screw cap and pouring ring separately.

Capacity ml	Diam. mm	Height mm	Neck thread GL	PK	Cat. No.
25	36	70	25	1	**9.071 979**
50	46	87	32	1	**9.071 980**
100	56	100	45	1	**9.071 981**
150	62	105	45	1	**9.071 686**
250	70	138	45	1	**9.071 982**
500	86	176	45	1	**9.071 983**
750	95	203	45	1	**9.071 687**
1000	101	225	45	1	**9.071 984**
2000	136	260	45	1	**9.071 985**
3500	160	295	45	1	**9.071 688**
5000	182	330	45	1	**9.071 987**
10000	227	410	45	1	**9.071 988**
15000	268	445	45	1	**7.021 486**
20000	288	505	45	1	**9.071 989**



2 Safety-coated bottles, DURAN®, with retrace code

DURAN Group

Glass laboratory bottles with DIN thread to ISO 4796-1. Safety-coated in plastic (DURAN® Protect). Neutral glass/Type I acc. to USP/EP. With Retrace code (Batch identification). Certificate available via the Internet. Autoclavable.

DURAN® Protect is a resistant and transparent plastic coating based on a cross-linked co-polymer (polyurethane) applied onto DURAN® 3.3 borosilicate glass. The coating made from PU adheres to the glass surface and fulfils the following functions:
- protects the glass surfaces against mechanical damage **(scratch protection)**
- keeps fragments together in the event of glass breakage **(shatter protection)**
- minimises loss of fluid in the event of glass breakage
(leak and spray protection)
- absorbs UV rays up to a light wavelength of 380 nm **(light protection)**

Temperature resistance
Do not subject to an open flame or direct heat (e.g. on a laboratory hotplate). The max. temperature sustained is 135°C - continuous use at this temperature (>30 mins.) should be avoided.
DURAN® Protect is suitable for freezing (down to -30°C) and for use in microwaves.
Please order cap and pouring ring separately.

Capacity ml	Ext. diam. mm	Height mm	Neck thread GL	PK	Cat. No.
100	56	100	45	1	**9.071 991**
150	62	105	45	1	**9.071 689**
250	70	138	45	1	**9.071 992**
500	86	176	45	1	**9.071 995**
750	95	203	45	1	**9.071 690**
1000	101	225	45	1	**9.071 996**
2000	136	260	45	1	**9.071 997**
3500	160	295	45	1	**9.071 691**
5000	182	330	45	1	**9.071 998**

Bottle carriers - please see page 45.

E & OE.

1 Reagent bottles DURAN®, clear/amber, pressure resistant



DURAN® reagent bottles, DIN thread, ISO 4796. Pressure resistance, as a result of amended shape, in the range of -1 up to +1.5 bar (tested by the TÜV in accordance with DIN EN 1595, with GS mark). Neutral/Type 1 glass in accordance with USP/EP. With Retrace code (Batch identification). Certificate available via the Internet. Autoclavable.
Please order cap and pouring ring separately.

DURAN Group

Capacity ml	Ext. diam. mm	Height mm	Neck thread GL	Colour	PK	Cat. No.
250	70	138	45	clear	1	**9.071 706**
500	86	176	45	clear	1	**9.071 707**
1000	101	225	45	clear	1	**9.971 704**
250	70	138	45	amber	1	**9.071 701**
500	86	176	45	amber	1	**9.071 702**
1000	101	225	45	amber	1	**9.971 703**

2 Laboratory bottles Premium, DURAN®, with retrace code



DURAN®. ISO 4796-1, DIN ISO 718. Premium laboratory bottle with DIN thread. Highly leak-tight using Premium screw cap. Working temperature from -196°C up to 260°C.
With PTFE coated silicone seal and pouring ring. With additional reverse scale, accuracy ±5%. Thermal shock resistance of 160K (tested by the German TÜV and with GS mark). Bottle and screw cap in accordance to USP/EP guidelines (Glass Type I/Neutral glass, screw cap raw material USP Class VI, seal FDA). Screw cap material is similar to PFA and highly resistant against chemicals. The material is free from colourants and therefore no leaching takes place. DMF available upon request. Premium bottle and screw cap fulfil highest requirements of the pharmaceutical, chemical and food industry. With Retrace code (Batch identification). Certificate available via the Internet (available for cap and bottle). Autoclavable.

DURAN Group

Capacity ml	Ext. diam. mm	Height*	Neck thread GL	PK	Cat. No.
100	56	105	45	1	**9.072 155**
250	70	143	45	1	**9.072 156**
500	86	181	45	1	**9.072 157**
1000	101	230	45	1	**9.072 158**

*Height mm incl. cap

3 Square shape laboratory bottles, DURAN®, with retrace code



Ergonomic handling due to angular shape, highly stable, good stackability - proven DURAN® properties give a space saving of 44% in comparison with standard laboratory bottles (example applies to 100ml bottles)
With pouring ring and PP screw cap. Temperature (max.): +140°C
Advantages:
- proven DURAN® properties
- excellent chemical resistance
- low coefficient of expansion
- can be sterilised to 140°C. Before autoclaving, unscrew closure and set lightly on the container. Do not screw the closure down.
- freezer limit: -40°C. Only freeze the bottle by laying at an angle and if max. ¾ full.
- ergonomic handling
- very stable
- with Retrace code (Batch identification). Certificate available via the Internet.
- neutral glass/Type I glass acc. to USP/EP and JP.

DURAN Group

Capacity ml	Neck thread GL	Width mm	Height*	PK	Cat. No.
100	32	50	109	1	**9.072 076**
250	45	64	143	1	**9.072 077**
500	45	78	181	1	**9.072 078**
1000	45	94	222	1	**9.072 079**

*Height mm incl. cap



1 Screw caps, PP

PP. DIN thread. With lip seal. Temperature resistant to 140°C. Only suitable for DURAN® laboratory bottles.

DURAN Group

Neck thread GL	Colour	PK	Cat. No.
25	blue	1	**9.209 065**
32	blue	1	**9.209 067**
45	blue	1	**9.209 069**
45	yellow	1	**9.072 400**
45	green	1	**9.072 401**
45	grey	1	**9.072 402**
80	blue	1	**9.140 110**



2 Pouring rings, PP

PP. Autoclavable to 140°C (steam).

DURAN Group

Neck thread GL	Colour	PK	Cat. No.
32	blue	1	**9.209 081**
45	blue	1	**9.209 083**
45	green	1	**9.209 075**
45	grey	1	**9.209 076**
45	yellow	1	**9.209 077**



3 Premium screw cap, TpCh260

TpCh260 (similar to PFA), with PTFE coated silicone seal. Colourless (to aviod risk of leaching) and temperature resistant from -196°C to +260°C. Ideal for dry sterilization. USP/FDA standard conformity. DFM available on request. Autoclavable.
With Retrace code (Batch Identification). Certificate available via the internet.

DURAN Group

Neck thread GL	Diam. mm	Height mm	PK	Cat. No.
25	32	32	1	**9.072 159**
45	51	26	1	**6.205 218**



4 Premium pouring ring for Premium screw cap, TpCh260

Colourless pouring ring TpCh260, height 4mm. Temperature resistant from -196°C to +260°C.

DURAN Group

Neck thread GL	PK	Cat. No.
45	1	**6.803 677**



5 Membrane Cap, PP/ PTFE

Cap from PP, membrane from PTFE. Ideal for autoclaving processes because the membrane permits pressure equalisation and tight sealing, reducing the risk of contamination.
Temperature resistant up to 140°C.
Typical applications: storage or transport of gas generating media, autoclaving of media.

DURAN Group

Neck thread GL	PK	Cat. No.
25	1	**9.284 567**
32	1	**9.284 568**
45	1	**9.209 068**
80	1	**9.284 531**



E & OE.

1 Screw cap, GL45, with 2 hose connections, PP



DURAN Group

This new hose connection system has been specially developed for the connection of soft elastic tubing which, for example, is used in biotechnology for transferring media with the aid of peristaltic pumps.
The curved hose connections prevent kinking of the tubing. The grey PP core moves freely and allows the vessel to be changed without twisting the securely attached tubing. Autoclavable.
Properties/application:
- safe, sterile transfer of liquid media within a closed system
- highly versatile because the screw cap is based on the standard GL45 thread
- ideal for use with elastic, soft tubing of 6 - 9mm i.d. (Viton®, Tygon®, silicone)
- 2 x polypropylene, curved, hose connections on top and straight connections below
- optional filter top part for sterile pressure equalisation available
- temperature resistant up to +140°C
- autoclavable/dishwasher-proof

Description	PK	Cat. No.
Screw cap, with 2 hose connections	1	**6.240 019**
Filter top part	1	**9.071 692**

Further Safety caps - please see page 1448.

2 Wide mouth bottles with GLS 80® neck, DURAN®, clear, with screw cap



DURAN Group

Laboratory bottle with GLS80® wide neck (80mm diameter). Neutral/Type 1 glass acc. to USP/EP. With PP screw cap and pouring ring (autoclavable and temperature resistant up to 140°C). With improved quick release cap which allows the bottle to be easily opened and closed with a minimum of turns. The wide neck is ideal for any application with powders or granulates, giving easier filling and emptying. Special thread means opening takes less than a turn. With Retrace code (Batch identification). Certificate available via the Internet.

Capacity ml	Diam. mm	Height without closure mm	PK	Cat. No.
250	95	105.0	1	**9.071 896**
500	101	152.0	1	**9.284 510**
1000	101	222.0	1	**9.284 511**
2000	136	252.0	1	**9.284 512**
3500	160	271.0	1	**9.071 966**
5000	182	314.0	1	**9.284 513**
10000	227	389.0	1	**9.284 514**
20000	288	484.0	1	**9.284 515**

3 Wide mouth bottles GLS 80®, DURAN® amber glass



Temperature-resistant, bottle can be used up to 500°C (for short periods), screw cap and pouring ring up to +140°C. Protects light-sensitive media from light wavelengths between 300nm to 500nm. Unaffected DURAN® properties within the bottle, as colour is only applied on the outer surface. Very uniform, durable and chemically resistant amber colour due to innovative technology. With 80mm wide mouth screw thread. Ideal for applications with powders and granules, easy filling and emptying. Neutral glass/Type I glass acc. to USP/EP and JP. With Retrace Code (Batch Identification). Certificate available via the Internet. Autoclavable.

Capacity ml	Diam. mm	Height without closure mm	PK	Cat. No.
250	95	105.5	1	**9.071 899**
500	101	148.0	1	**9.284 516**
1000	101	218.0	1	**9.284 517**
2000	136	248.0	1	**9.284 518**
3500	160	271.0	1	**9.071 968**
5000	182	310.0	1	**9.284 519**
10000	227	385.0	1	**9.284 520**
20000	288	480.0	1	**9.284 521**



1 Wide mouth bottles GLS 80® protect, DURAN®

DURAN Group

Laboratory bottle with batch identification (Retrace Code), certificate available via the internet, with GLS80® wide neck (o.d. 80mm). Glass Type I/neutral glass as per USP, EP and JP. Autoclavable. Ideal for any application with powder or granulate, easier filling and emptying.
The coating of DURAN® protect is a resistant and transparent plastic coating based on a cross-linked copolymer. Complete with blue quick release closure (PP, integral lip seal) and pouring ring (PP) for drip-free pouring and clean, safe working.
The coating adheres to the surface of the glass and fulfils the following functions:
- protection of the glass surface against mechanical damage (e.g. scratches)
- keeps broken glass in place after breakage and avoids or reduces leakage
- minimises loss of media in case of breakage
- absorption of light up to a wavelength of 380nm

Temperature resistance:
- autoclavable (< 135°C)
- can be used in microwaves
- high temperature applications for extended periods (>30min) and direct heating with a flame not recommended
- freezing down to -30°C possible

Temperature (max.): 135°C

Capacity ml	Diam. mm	Height without closure mm	PK	Cat. No.
250	95	105.5	1	**9.071 897**
500	101	148.0	1	**9.284 522**
1000	101	218.0	1	**9.284 523**
2000	136	248.0	1	**9.284 524**
3500	160	271.0	1	**9.071 969**
5000	182	310.0	1	**9.284 525**



2 Accessories for Wide mouth bottles GLS 80®, PP

Temperature resistant up to 140°C. Autoclavable. *DURAN Group*

Description	Diam. mm	Height mm	PK	Cat. No.
Screw cap	87	40.0	1	**9.140 110**
Pouring ring, blue	77	6.8	1	**9.284 530**
Membrane cap	86	40.0	2	**9.284 531**



3 Quick release closure, PSU compound, for GLS 80® laboratory bottles

NEW!

DURAN Group

GLS 80® quick release thread allows opening and closing of bottle with three-quarters of a turn
- Double-sided PTFE-coated silicone seal, medium in contact with PTFE only
- Excellent mechanical stability, high chemical resistance
- Autoclavable/suitable for hot-air sterilisation, Tmax = 180°C

Suitable GLS 80® pouring ring, PTFE
- Excellent chemical resistance
- Autoclavable/suitable for hot-air sterilisation, Tmax = 250°C

Quick release closure and pouring ring without colourants, preventing contamination of equipment

Description	Diam. mm	Height mm	PK	Cat. No.
Screw cap	88.5	40.00	1	**7.651 746**
Pouring ring		6.85	1	**6.237 901**



4 Connection system for wide-mouth bottles GLS 80®

DURAN Group

Materials used PP, PBT and PTFE. Flexible modular system. Five different hose diameters (3.2mm, 6.0mm, 8.0mm, 10.0mm and 12.0mm) can be connected.
Sterile pressure equalisation is possible through use of membrane filter. Unused ports can be provided with a blind cap.
Typical applications: safe transfer of liquid media within a closed and sterile system (evaporation is reduced).
Autoclavable - maximum temperature 140°C.

Description	Neck thread GL	PK	Cat. No.
4-port cap GL 18, diam. 86mm, height approx. 60mm	80	1	**9.284 532**
Insert for screw cap, inner diam. 3.2mm	18	1	**9.284 533**
Insert for screw cap, inner diam. 6.0mm	18	1	**9.284 534**
Insert for screw cap, inner diam. 8.0mm	18	1	**9.284 535**
Insert for screw cap, inner diam. 10.0mm	18	1	**9.284 536**
Insert for screw cap, inner diam. 12.0mm	18	1	**9.284 537**
Screw cap for tube connection, blue	18	1	**9.284 538**
Pressure equilization for 4-port	18	1	**9.284 539**
Screw cap, red	18	1	**9.284 540**

E & OE.

1 GLS 80® Stirred Reactor

DURAN Group

The GLS 80® stirred reactor is suitable for a wide range of laboratory mixing processes. The screwthread connections (2 x GL14, 2 x GL18) provided allow addition or removal of media from the bottle during the mixing process. The whole assembly can be autoclaved and is therefore suitable for use in fermentation and culture. By using components from the GLS 80 connection system, an additional media bottle (Tubing o.d.: 1.6 to 12.0mm) can be connected or a sterile pressure equalizer attached. Drive for the stirrer is provided by a standard, commercial, magnetic stirrer. The variable length stirrer shaft can be used in DURAN® GLS 80® laboratory glass bottles (1000 and 2000ml) and provides notably improved mixing in comparison with standard magnetic stirrer bars. The paddle is exchangeable and can be used up to 500 rpm. Typical applications: mixing of liquids, dissolving of solids, simple fermentation.
Supplied with: GLS 80® stirred reactor with anchor strirrer, magnetic, incl. 1000 or 2000 ml DURAN® GLS 80 bottle , GL14 screw cap (PP, blue), 2 x GL14 a. 2 x GL18 screw cap (PBT red).



Description	PK	Cat. No.
incl. shaft, connection and screw cap	1	**9.197 379**
incl. bottle 1L	1	**9.197 380**
incl. bottle 2L	1	**9.197 381**

Accessories for agitation reactor GLS 80®

DURAN Group

Type	Description	PK	Cat. No.
Stirrer	impeller type	1	**9.197 382** 2
Stirrer	anchor type	1	**9.197 383**
Spare screw cap	PP blue/grey	1	**9.197 385**
Spare shaft	stainless steel, incl. PEEK connection	1	**9.197 386**



9.197 382

3 GL45 Stirred Reactor

DURAN Group

The perfect support for your mixing processes

Properties:
- driven using standard magnetic stirrers
- variable stirrer shaft, can be used for 500ml and 1000ml DURAN® GL 45 laboratory bottles
- can be used up to 500rpm
- entirely autoclavable
- temperature resistant up to 140°C
- compatible with proven DURAN® connection systems; can fit tubing from 1.6mm to 6.0mm i.d.
- significantly improved, thorough mixing compared to standard magnetic stirring bar
- materials used PP/PTFE/PEEK/stainless steel
- parts in contact with media fully conform to FDA requirements
- bottle supplied (500ml or 1000ml)

Application:
The above mentioned properties make the DURAN® stirred reactor ideal for the widest possible range of mixing processes in laboratories, e.g. mixing liquids or dissolving solids. The connections available allow introduction of media into the bottle or or removal during mixing.
The whole assembly is autoclavable, so that it can be used in biological applications, for example simple fermentation processes. With the aid of components from the DURAN® connection system extra media bottles can be attached, or a sterile pressure release fitted.

Items supplied:
GL45 stirred reactor, incl. 500ml or 1000ml DURAN® GL45 bottle, folding magnetic stirrer and GL45 PP cap with 2 x GL14 ports, 2 x GL14 PBT caps red



Description	PK	Cat. No.
GL45 stirred reactor, incl. 500ml DURAN® GL45 bottle	1	**9.197 395**
GL45 stirred reactor, incl. 1000ml DURAN® GL45 bottle	1	**9.197 396**
Folding magnetic stirrer for GL45 stirred reactor, incl. shaft	1	**9.197 391**
Spare screw cap 2-ports for GL45 stirred reactor (excl. stirrer)	1	**9.197 393**

1



2



1 2 Wide-mouth reagent bottles with stopper, soda-lime glass

Soda-lime glass. To ISO 4796-2. Standard ground joint neck. With glass stopper. Hydrolytic class 3.

DURAN Group

Capacity ml	Diam. mm	Height mm	Neck NS	Colour	PK	Cat. No.
50	44	79	24/20	clear	1	**9.071 405**
100	52	97	29/22	clear	1	**9.071 408**
250	71	129	34/24	clear	1	**9.071 414**
500	86	164	45/27	clear	1	**9.071 419**
1000	107	200	60/46	clear	1	**9.071 424**
50	44	78	24/20	amber	1	**9.071 505**
100	52	97	29/22	amber	1	**9.071 508**
250	71	129	34/24	amber	1	**9.071 514**
500	86	164	45/27	amber	1	**9.071 519**
1000	107	200	60/46	amber	1	**9.071 524**

3



3 Wide mouth reagent bottles with stopper, DURAN®

DURAN®. ISO 4796-2. With standard ground joint as outlined below. With glass stoppers. Glass Type I/neutral glass as per USP, EP and JP. With Retrace Code (Batch Identification). Certificate available via the Internet. Autoclavable.

DURAN Group

Capacity ml	Diam. mm	Height mm	Neck NS	Colour	PK	Cat. No.
50	44	79	24/20	clear	1	**9.071 817**
100	52	97	29/22	clear	1	**9.071 824**
250	70	133	34/35	clear	1	**9.071 836**
500	86	163	45/40	clear	1	**9.071 844**
1000	107	201	60/46	clear	1	**9.071 854**
2000	133	247	60/46	clear	1	**9.071 863**

4



4 Wide-mouth bottles, soda-lime glass

Clear or amber glass. Round thread neck in accordance with DIN 168.
Please order screw caps separately.

Capacity ml	Neck thread GL	Diam. mm	Height mm	Colour	PK	Cat. No.
30	32	36.0	68.0	clear	126	**7.960 500**
50	32	44.0	75.0	clear	85	**7.960 501**
100	40	50.0	93.0	clear	63	**7.960 502**
125	40	54.0	98.0	clear	80	**7.960 503**
150	45	57.0	104.0	clear	42	**9.072 210**
250	55	70.0	113.0	clear	48	**7.960 504**
500	55	84.0	154.0	clear	20	**7.960 505**
1000	68	103.5	180.5	clear	18	**7.960 506**
30	32	36.0	68.0	amber	126	**7.960 507**
50	32	44.0	75.0	amber	85	**7.960 508**
100	40	50.0	93.0	amber	63	**7.960 509**
125	40	54.0	98.0	amber	84	**7.960 510**
250	55	70.0	113.0	amber	42	**7.960 511**
500	55	84.0	154.0	amber	20	**7.960 512**
1000	68	103.5	180.5	amber	12	**7.960 513**

1 Screw caps for wide-mouth bottles, PP/LDPE

Cap PP, seal LDPE
For bottles 9.072 203 to 9.072 324 series and 7.060 572.



Neck thread GL	Material	PK	Cat. No.
32	PP	1	**9.072 164**
40	PP	1	**9.072 165**
45	PP	1	**7.075 021**
55	PP	1	**9.072 166**
68	PP	1	**9.072 167**

Wide-mouth bottles, clear and amber glass, PTFE-lined screw caps

Behr

Clear and amber glass. For storage and transport. The PTFE-lined screw caps make them ideal for taking samples.
Type RB = amber glass
Type RK = clear glass

Type	Capacity ml	Thread diam. mm	PK	Cat. No.
RB 250 GT	250	55	1	**9.072 325** 2
RB 500 GT	500	55	1	**9.072 326**
RB 1000 GT	1000	68	1	**9.072 327**
RK 250 GT	250	55	1	**9.103 200** 3
RK 500 GT	500	55	1	**9.103 201**
RK 1000 GT	1000	68	1	**9.103 202**



9.072 325



9.103 200

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

behr Labor-Technik



1 LLG-Wide neck bottles, with screw cap, PE-LD, economy pack

Transparent, with cap. The wide neck opening means that the bottles are easy to fill and clean, leak-proof. Ideal for liquids, pastes and granulates.

Capacity ml	Diam. mm	Height mm	Thread external dia. mm	PK	Cat. No.
50	39.0	76.0	32	50	**9.073 510**
100	48.0	93.5	32	20	**9.073 511**
250	64.0	120.0	40	10	**9.073 512**
500	77.0	154.0	50	10	**9.073 513**
1000	95.0	205.0	65	4	**9.073 514**
1500	108.0	226.0	65	4	**9.073 515**
2000	120.0	247.0	65	1	**9.073 516**



2 Wide mouth bottles, series 303, PE-LD

Natural, translucent. Thick-walled. Ideal for taking, storing and transporting samples of liquids, pastes and granulated products. *Kautex*
Please order closure separately.

Capacity ml	Diam. mm	Height mm	Thread external dia. mm	PK	Cat. No.
50	39.0	76.0	32	1	**9.072 981**
100	48.0	93.5	32	1	**9.072 982**
200	59.0	114.0	40	1	**9.072 983**
250	64.0	120.0	40	1	**9.072 984**
300	67.5	128.0	40	1	**9.072 985**
500	77.0	154.0	50	1	**9.072 986**
750	88.0	173.0	50	1	**9.072 987**
1000	95.0	205.0	65	1	**9.072 988**
1500	108.0	226.0	65	1	**9.072 989**
2000	120.0	247.0	65	1	**9.072 990**

Height in mm without cap.



3 Caps for wide mouth bottles, series 303, PE-LD

For 9.072 981 to 9.072 990 series bottles. *Kautex*

For Thread o.d. mm	For bottles ml	PK	Cat. No.
32	50, 100	1	**9.072 778**
40	200, 250, 300	1	**9.072 779**
50	500, 750	1	**9.072 781**
65	1000, 1500, 2000	1	**9.072 782**



4 Wide mouth bottles, series 303, PP

Round, Natural without closure. With approximate graduations. Ideal for liquids, pastes and granulates. For taking samples, sending specimens and as transport containers. Can be filled with hot substances. Autoclavable to max. 121°C. **Please order closure separately.** *Kautex*

Note: Before autoclaving, unscrew closure and set lightly upside down on the container. Do not screw the closure down.

Capacity ml	Diam. mm	Thread external dia. mm	Height without closure mm	PK	Cat. No.
100	48.5	32	94.0	1	**9.072 965**
250	64.5	40	121.0	1	**9.072 966**
500	77.5	50	155.0	1	**9.072 967**
1000	96.0	65	205.0	1	**9.072 968**



5 Screw caps for wide mouth bottles, series 303, PP

Natural. *Kautex*

For Thread o.d. mm	For bottles ml	PK	Cat. No.
32	100	1	**9.072 970**
40	250	1	**9.072 971**
50	500	1	**9.072 972**
65	1000	1	**9.072 973**

1 Wide neck bottles, series 303, PE-LD

Brown, offers protection against UV rays for light sensitive liquids. These wide neck bottles are easy to fill and clean. Leakproof.
Please order closure separately.

Kautex



Capacity ml	Thread external dia. mm	Height mm	PK	Cat. No.
50	32	76.0	1	**9.073 681**
100	32	93.5	1	**9.073 682**
250	40	120.0	1	**9.073 684**
500	50	154.0	1	**9.073 686**
1000	65	205.0	1	**9.073 688**

Height in mm without closure.

2 Caps, series 303, PE-LD

Brown, screw caps.

Kautex



For Thread o.d. mm	For bottles ml	PK	Cat. No.
32	50, 100	1	**9.073 778**
40	250	1	**9.073 779**
50	500	1	**9.073 781**
65	1000	1	**9.073 782**

3 Medium neck bottles, series 307, PE-HD with screw cap, PP

With graduations. Leakproof screw cap. Multi-purpose bottles for universal use in the laboratory and in industry. Offers a good level of chemical resistance. Generous neck diameters offer easy filling and cleaning. Ideal for pastes, granulates and withstands heat filling.

Kautex



Capacity ml	Thread external dia. mm	Height mm	PK	Cat. No.
100	25	99.5	1	**9.073 344**
250	28	129.5	1	**9.073 345**
500	40	161.0	1	**9.073 346**
1000	50	203.0	1	**9.073 347**

Height in mm without closure.

4 Spare screw caps for series 307 medium neck bottles, PP

Natural, spare screw caps.

Kautex



For Thread o.d. mm	For bottles ml	PK	Cat. No.
25	100	1	**9.073 348**
28	250	1	**9.073 349**
40	500	1	**9.072 971**
50	1000	1	**9.072 972**

5 Wide mouth bottles, series 310, PE-HD

Square, Natural, without closure. Wide mouth, therefore easy to fill and empty, leakproof. Easy to clean. Square shape makes the best use of space. Ribbed sides for a secure hold. With space for a label.
Please order closure separately.

Kautex



Capacity ml	Thread external dia. mm	Width mm	Depth mm	Height mm	PK	Cat. No.
250	40	59.0	59.0	110.5	1	**9.073 385**
500	40	69.0	69.0	145.5	1	**9.073 386**
1000	50	86.5	86.5	178.5	1	**9.073 387**

Height in mm without closure.



1 Caps for series 310 PETG and PVC

Black screw caps, suitable for wide mouth containers made of PVC (clear or amber) and PETG.

Kautex

For Thread o.d. mm	For bottle ml	PK	Cat. No.
32	50	1	**9.073 070**
40	100	1	**9.073 071**
50	200 and 300	1	**9.073 072**
65	500	1	**9.073 073**
80	750 and 1000	1	**9.073 074**
80	2000	1	**9.073 075**



2 Tamper-evident caps vor series 310, PP/PE

Suitable for series 310 PVC wide mouth containers (transparent and amber).
Tamper-evident black PP cap with PE foam liner and tamper-evident ring which immediately indicates unauthorised opening. Perfect for determining whether the cap has been removed.

Kautex

For Thread o.d. mm	For jars ml	PK	Cat. No.
40	100	1	**9.074 071**
50	200 and 300	1	**9.074 072**
65	500	1	**9.074 073**



3 Tamper-evident caps for series 310, PP/PTFE

White with PTFE foam liner.

Kautex

Neck thread GL	For bottle ml	PK	Cat. No.
32	100 to 250	1	**9.073 480**
45	500 to 1000	1	**9.073 481**



4 Caps for series 310, PE-LD

Natural, screw cap for 9.073 385 to 9.073 387.

Kautex

For Thread o.d. mm	For bottles ml	PK	Cat. No.
40	250, 500	1	**9.072 779**
50	1000	1	**9.072 781**



5 Wide mouth bottles, with closure, 357 series, PE-HD

Multi-sided (octagonal), natural PE-HD, with screw closure. With an extra-large neck opening, this container is ideal for disposal, storage, collection, transport, waste and sampling of dry substances.

Kautex

Capacity Litres	Diam. mm	Height mm	Neck diam. mm	Thread external dia. mm	PK	Cat. No.
5	190 x 180	230	108	120	1	**9.073 036**
10	230 x 222	303	108	120	1	**9.073 042**



6 Wide mouth bottles, 311 series, PE-HD

Natural. Square with recessed handle. Large, wide mouth containers designed to be space-saving. Safe and easy to use.
Ideal for storing, collecting and transporting dry substances.

Kautex

Type 1: Tamper-evident cap 9.072 893 please order separately.
Type 2: Supplied with closure.

Type	Capacity ml	Height mm	Thread external dia. mm	PK	Cat. No.
1	2300	188	80	1	**9.072 932**
2	4400	263	120	1	**9.072 934**

E & OE.

1 Tamper-evident cap for 311 series, PP

Blue, with conical seal and tamper-evident ring for 2.3L wide mouth containers. Immediately indicates unauthorised opening. Perfect for determining whether the cap has been removed.

Kautex

For	PK	Cat. No.
Type 2300, art. nr. 9.072 932	1	**9.072 893**



2 3 Square reagent bottles, PE-HD

Natural or white. Wide neck. UN approved for solid materials.
Please order closure separately.

Kautex

Capacity ml	Colour	Width mm	Depth mm	Height without closure mm	Thread external dia. mm	PK	Cat. No.
50	natural	36	36	88.5	28*	1	**9.072 869**
100	natural	45	45	101.0	32	1	**9.072 870**
250	natural	59	59	128.0	45	1	**9.072 871**
350	natural	60	60	164.0	45*	1	**9.072 877**
500	natural	75	75	161.0	54	1	**9.072 872**
750	natural	83	83	185.0	54	1	**9.072 878**
1000	natural	85	85	212.0	54	1	**9.072 873**
1500	natural	108	108	209.0	80	1	**9.072 874**
2500	natural	122	122	258.0	80	1	**9.072 875**
4000	natural	142	142	294.0	80	1	**9.072 876**
50	white	36	36	88.5	28*	1	**9.072 879**
100	white	45	45	101.0	32	1	**9.072 880**
250	white	59	59	128.0	45	1	**9.072 881**
500	white	75	75	161.0	54	1	**9.072 882**
750	white	83	83	185.0	54	1	**9.072 883**
1000	white	85	85	212.0	54	1	**9.072 884**
1500	white	108	108	209.0	80	1	**9.072 885**
2500	white	122	122	258.0	80	1	**9.072 886**
4000	white	142	142	294.0	80	1	**9.072 887**

*not UN approved









1 Caps for wide neck reagent bottles, PP (melamine*)

Guarantees the functionality and the tightness of the bottle to protect the contents. *Kautex*

Type a) Screw cap, black with 1.5mm PE foam lining. Ensures that the bottle is tightly and safely sealed.
Type b) Tamper-evident cap, blue, with conical seal and tamper-evident ring. Immediately indicates unauthorised opening. Perfect for determining whether the cap has been removed.
Type c) Tamper-evident cap, red, with PE foam lining and tamper-evident ring. Immediately indicates unauthorised opening. Perfect for determining whether the cap has been removed.

Type	Colour	For bottles ml	Thread external dia. mm	PK	Cat. No.
Type a*	black	50	28	1	**9.072 894**
Type a	black	100	32	1	**9.072 895**
Type a	black	250, 350	45	1	**9.072 896**
Type a	black	500, 750, 1000	54	1	**9.072 897**
Type a	black	1500 - 4000	80	1	**9.072 898**
Type b	blue	50	28	1	**9.072 904**
Type b	blue	100	32	1	**9.072 092**
Type b	blue	250, 350	45	1	**9.072 093**
Type b	blue	500, 750, 1000	54	1	**9.072 094**
Type b	blue	1500 - 4000	80	1	**9.072 893**
Type c	red	50	28	1	**9.072 899**
Type c	red	100	32	1	**9.072 900**
Type c	red	250, 350	45	1	**9.072 901**
Type c	red	500, 750, 1000	54	1	**9.072 902**
Type c	red	1500 - 4000	80	1	**9.072 903**

* melamine.



2 Wide mouth containers, series 310, PETG

Square, without closure. Crystal clear, ideal for presenting products in their true colours. The wide mouth enables easy filling and cleaning. *Kautex*
Please order closures separately.

Capacity ml	Thread external dia. mm	Height mm	PK	Cat. No.
50	32	60.5	1	**9.073 395**
100	40	71.0	1	**9.073 396**
200	50	88.0	1	**9.073 397**
500	65	108.0	1	**9.073 398**
1000	80	143.0	1	**9.073 399**
2000	80	187.0	1	**9.073 400**

Height in mm without closure.



3 Wide mouth containers, series 310, PVC

Square, Transparent. Clear, for good product presentation. Amber, for light sensitive contents. The wide mouth allows for easy filling and cleaning. Black PP, tamper-evident leakproof closure. *Kautex*
Please order closures separately.

Capacity ml	Colour	Thread external dia. mm	Height mm	PK	Cat. No.
100	Transparent	40	83.5	1	**9.074 051**
200	Transparent	50	98.5	1	**9.074 052**
300	Transparent	50	105.5	1	**9.074 053**
500	Transparent	65	118.5	1	**9.074 054**
100	Amber	40	83.5	1	**9.074 061**
200	Amber	50	98.5	1	**9.074 062**
300	Amber	50	105.5	1	**9.074 063**
500	Amber	65	118.5	1	**9.074 064**

Height in mm without closure.

1 Square, wide mouth containers, series 310, PVC

Rigid, Amber or Clear PVC containers. Universal container for storage, sample dispatch and transport. The clear version is ideal for colour-fast product presentation. The amber version is suitable for light sensitive products.
Please order screw caps separately.

Kautex



Capacity ml	Width mm	Depth mm	Height without closure mm	Thread external dia. mm	Colour	PK	Cat. No.
50	38.0	38.0	57.0	32	clear	1	**9.073 050**
100	46.0	46.0	71.0	40	clear	1	**9.073 051**
200	59.5	59.5	87.0	50	clear	1	**9.073 052**
300	67.5	67.5	94.0	50	clear	1	**9.073 053**
500	80.5	80.5	108.0	65	clear	1	**9.073 054**
750	91.5	91.5	120.0	80	clear	1	**9.073 055**
1000	97.5	97.5	143.0	80	clear	1	**9.073 056**
2000	122.0	122.0	187.0	80	clear	1	**9.073 057**
50	38.0	38.0	54.0	32	amber	1	**9.073 060**
100	46.0	46.0	71.0	40	amber	1	**9.073 061**
200	59.5	59.5	87.0	50	amber	1	**9.073 062**
300	67.5	67.5	94.0	50	amber	1	**9.073 063**
500	80.5	80.5	108.0	65	amber	1	**9.073 064**
750	91.5	91.5	120.0	80	amber	1	**9.073 065**
1000	97.5	97.5	143.0	80	amber	1	**9.073 066**
2000	122.0	122.0	187.0	80	amber	1	**9.073 067**

Suitable closures please see page 70

2 Wide-Mouth Bottles Type 2104, PE-HD with screw cap, PP

Durable, general-purpose bottles with countless applications in the lab or field. Translucent, more rigid than PE-LD. Wide mouth is easy to fill with dry materials or liquids. Excellent chemical resistance to most acids, bases and alcohols. Can be used in freezer - use to -100°C. Suitable for shipping liquids. Leakproof with PP screw cap.

Thermo Scientific



Type	Capacity ml	Cover type mm	PK	Cat. No.
2104	30	28	12	**9.103 221**
2104	60	28	12	**9.103 222**
2104	125	38	12	**9.103 223**
2104	250	43	12	**9.103 224**
2104	500	53	12	**9.103 225**
2104	1000	63	6	**9.103 226**
2104	1500	63	6	**9.103 227**

3 Graduated wide mouth bottles, PE/PP

Polyethylene (body) and Polypropylene (cap). Will withstand considerable pressure before rupturing. Secured by tagging points on bottle and cap. Confidential notes can be placed in the space between insert sealing plug and cap.



Capacity ml	Grad. ml	Ext. diam. mm	Int. diam. mm	Height mm	PK	Cat. No.
50	10	40	24.00	77	1	**9.072 950**
100	20	48	24.00	89	1	**9.072 951**
250	25	61	34.50	126	1	**9.072 952**
500	50	75	34.50	158	1	**9.072 953**
1000	100	93	45.00	200	1	**9.072 954**
2000	100	115	45.00	247	1	**9.072 955**



1 Graduated square bottles, wide neck, PE (Body), PP (Cap)

Space saving bottles, ideal for long term storage of samples. Approximate graduations allow reproducible filling without the use of cylinders/beakers. Easy grip caps can be wired down for security. Suitable for foodstuff.

Capacity	Grad.	Width	Length	Height	Tubing i.d.	PK	Cat. No.
ml	ml	mm	mm	mm	mm		
25	5	32	34	52	18.0	1	**9.072 943**
50	10	38	38	70	24.0	1	**9.072 944**
100	20	42	48	90	34.5	1	**9.072 945**
250	50	57	60	110	34.5	1	**9.072 946**
500	100	70	80	138	45.0	1	**9.072 947**
1000	100	80	103	176	58.0	1	**9.072 948**
2000	100	100	134	210	58.0	1	**9.072 949**



2 Bottles, wide mouth, PE, graduated

NEW!

PE. General purpose bottle meeting Food and Drug regulations with pictograms. Wide neck for easy filling and emptying of liquid or powder samples. Conform to DIN 13316 and 168. With PE closure. Deep seal ensures leakproof closure.

Capacity	Grad.	Ext. diam.	Height	Tubing i.d.	DIN	PK	Cat. No.
ml	ml	mm	mm	mm			
50	10	38	88	24.0	32	1	**9.072 974**
100	20	48	105	24.0	32	1	**9.072 975**
250	25	60	140	38.0	45	1	**9.072 976**
500	100	75	170	38.0	45	1	**9.072 977**
1000	100	95	206	55.0	63	1	**9.072 978**
2000	100	120	252	55.0	63	1	**9.072 979**



3 Graduated wide mouth bottles

PP, meeting Food and Drug regulations with pictograms. Very sturdy, rupture-proof bottles. Wide mouth for easy filling and emptying of liquid or powder samples. Conforms to DIN 13316 and 168. With PP closure. Deep seals ensure leakproof closure. Autoclavable.

Capacity	Grad.	Ext. diam.	Height	Tubing i.d.	DIN	PK	Cat. No.
ml	ml	mm	mm	mm			
50	10	38	88	24.0	32	1	**9.073 030**
100	20	48	105	24.0	32	1	**9.073 031**
250	25	60	140	38.0	45	1	**9.073 032**
500	100	75	170	38.0	45	1	**9.073 033**
1000	100	95	206	55.0	63	1	**9.073 034**
2000	100	120	252	55.0	63	1	**9.073 035**



4 Wide mouth bottle with screw cap Economy Type 2189, PE-HD/PP

With PP screw cap. Economical, break-resistant bottle. Guaranteed leakproof for safe sampling, shipping and storage. Translucent bottle allows viewing of liquid level.
EPA-specified sample bottle material for a wide variety of inorganic compound and elemental analyses.

Thermo Scientific

Type	Capacity ml	Cover type mm	PK	Cat. No.
2189	30	28	72	**9.103 228**
2189	60	28	72	**9.103 229**
2189	125	38	72	**9.103 230**
2189	250	43	72	**9.103 231**
2189	500	53	48	**9.103 232**
2189	1000	63	24	**9.103 233**

E & OE.

1 Wide mouth bottle with screw cap Economy Type DS2185, PE-HD/PP, brown



With amber PP screw cap. Protects light sensitive samples from UV/VIS light transmission during sampling, shipping or storage. Wide mouth allows easy retrieval of grab samples and reduces turbulence when filling. Single-use sample bottle. Leakproof.

Thermo Scientific

Type	Capacity ml	Cover type	PK	Cat. No.
DS2185	30	28	72	**9.103 234**
DS2185	60	28	72	**9.103 235**
DS2185	125	38	72	**9.103 236**
DS2185	250	43	72	**9.103 237**
DS2185	500	53	48	**9.103 238**
DS2185	1000	63	24	**9.103 239**

2 Fluorinated Wide-Mouth Bottles Type 2197, PE-HD



With fluorinated PP screw cap. Safe, durable, cost-efficient line of fluorinated wide-mouth bottles. Fluorinated surface provides improved barrier properties and reduces solvent absorption and permeation. Fluorination enhances long-term container performance, prevents material loss due to permeation and yields lower extractables. Widemouth design allows for easy filling and dispensing of solid and liquid materials. Split- and puncture-resistant. Recyclable. Leakproof.

Thermo Scientific

Type	Capacity ml	Cover type mm	PK	Cat. No.
2197	125	38	12	**9.103 240**
2197	250	43	12	**9.103 241**
2197	500	53	12	**9.103 242**
2197	1000	63	6	**9.103 243**

3 Wide-neck Bottle PassPort IP2 Type 2199, PE-HD



With PP screw closure. Safe, durable, cost-efficient line of wide-mouth bottles for packaging and transporting hazardous materials. Recommended for customers who are designing, assembling and certifying their own combination packaging. Split and puncture resistant. Wide mouth allows for easy filling of dry materials or liquids. Heavy duty walls. Molded into bottom: IP2 marking, material, volume, registration notch and the Nalgene® brand name. Evaluated at 15psi (103kPa) per 49 CFR 173.27 (c) (2), ICAO Technical Instructions Part 3-1;1.1.6.1, and IATA Dangerous Goods Regulations Section 5.0.2.9. Leakproof.

Thermo Scientific

Capacity ml	PK	Cat. No.
125	12	**9.103 244**
250	12	**9.103 245**
500	12	**9.103 246**
1000	6	**9.103 247**

4 Wide-Mouth Bottles Type 2105 with screw cap, PP



Transparent. Rigid wall. For general laboratory use. Withstands temperatures up to +121°C. Autoclavable - cap should be unscrewed before autoclaving.

Thermo Scientific

Type	Capacity ml	Cover type mm	PK	Cat. No.
2105	30	28	12	**9.103 248**
2105	60	28	12	**9.103 249**
2105	125	38	12	**9.103 250**
2105	250	43	12	**9.103 251**
2105	500	53	12	**9.103 252**
2105	1000	63	6	**9.103 253**



1 Heavy-Duty Vacuum Bottles Type 2126, PP with screw cap PP/TPE

With white PP screw cap and TPE gaskets. Most durable Nalgene-bottle. Large, thick-walled bottle with wide mouth for extra-rugged service. Withstand application of full vacuum for 24 hours at 20°C. Leakproof. Autoclavable.

Thermo Scientific

Type	Capacity ml	Cover type mm	PK	Cat. No.
2126	1000	53B	1	**7.048 062**
2126	2000	53B	1	**7.048 063**
2126	4000	83B	1	**7.048 064**
2126	5000	83B	1	**7.048 065**

Suction pumps - please see page 1353.



2 Wide-mouth bottle Economy Type 2187, PPCO

General-purpose, single-use sample bottle, with PP screw cap. Leakproof. Autoclavable.

Thermo Scientific

Type	Capacity ml	Cover type mm	PK	Cat. No.
2187	30	28	72	**9.103 254**
2187	60	28	72	**9.103 255**
2187	125	38	72	**9.103 256**
2187	250	43	72	**9.103 257**
2187	500	53	48	**9.103 258**
2187	1000	63	24	**9.103 259**



3 Kegs, wide mouth, PE-HD, UN approved

PE-HD. White, with red lid. UN-approved for Packaging groups I, II and III. Suitable for use with foodstuffs. Max. filling temperature of 80°C. Product must have cooled down to 30°C before the barrel is closed and stacked. All barrels can be sealed airtight, watertight and water-vapour tight.

Capacity L	Diam. mm	Height mm	PK	Cat. No.
3.60	198	175	1	**9.050 020**
6.40	198	266	1	**9.050 021**
10.40	274	239	1	**9.050 019**
15.40	274	328	1	**9.050 022**
20.00	274	418	1	**9.050 018**
26.40	316	424	1	**9.050 023**



4 Kegs, wide mouth, PE, with handles, with UN-approval

PE-HD. White, with red lid. UN-approved for Packaging groups I, II and III. Suitable for use with foodstuffs. Max. filling temperature of 80°C. Product must have cooled down to 30°C before the barrel is closed and stacked. All barrels can be sealed airtight, watertight and water-vapour tight.

Behr

Capacity L	Diam. mm	Height mm	Neck	PK	Cat. No.
10.4	274	239	Ø 204 mm	1	**6.800 205**
15.4	274	328	Ø 204 mm	1	**6.200 593**
26.0	316	426	Ø 204 mm	1	**6.078 171**
54.0	410	518	Ø 282 mm	1	**6.900 353**
68.5	410	632	Ø 282 mm	1	**6.401 093**



5 Narrow-mouth packing bottles, soda-lime glass

Amber, with PP (Pilferproof) 28 neck finish.
Please order caps separately.

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
30	35.0	71.0	143	**9.070 200**
50	40.5	81.0	99	**9.070 201**
100	50.5	96.0	56	**9.070 202**
250	65.0	133.0	39	**9.070 203**
500	82.0	160.0	20	**9.070 205**
1000	100.5	207.0	14	**9.070 204**

1 Screw caps for narrow-neck bottles, PP 28

PP Cap (Pilferproof) 28 neck finish, with approx. 19.4mm inner mouth.
For bottles 9.070 200 to 9.070 205 series.

Description	PK	Cat. No.
Closure, black, with foam insert	500	**6.303 525**
Closure, white, with cone sealing	500	**9.070 210**
Closure, white, with pouring ring	500	**9.070 211**
Closure, child proof lock, white, with pouring ring	500	**9.070 212**
Originality closure, white, with foam insert	500	**9.070 213**



2 Screw caps for narrow-neck bottles, PP/PE-LD

PP cap with PE-LD seal.
For bottles 9.072 103 to 9.072 154 series.

Neck thread GL	PK	Cat. No.
18	1	**9.072 160**
22	1	**9.072 161**
25	1	**9.072 162**
28	1	**9.072 163**



3 4 Narrow-neck reagent bottles with stopper, soda-lime glass

Amber or Clear. Soda-lime glass. ISO 4796-2. With glass stopper. Hydrolytic class 3. *DURAN Group*
Standard ground joint neck.

Capacity ml	Diam. mm	Height mm	Neck NS	Colour	PK	Cat. No.
100	52	96	14/15	clear	1	**9.070 408**
250	72	130	19/26	clear	1	**9.070 414**
500	89	165	24/29	clear	1	**9.070 419**
1000	110	200	29/32	clear	1	**9.070 424**
50	42	80	14/15	amber	1	**9.070 505**
100	52	96	14/15	amber	1	**9.070 508**
250	72	130	19/26	amber	1	**9.070 514**
500	89	165	24/29	amber	1	**9.070 519**
1000	110	200	29/32	amber	1	**9.070 524**







1



2



1 2 Narrow-neck reagent bottles with stopper, DURAN®

Amber or Clear. DURAN®. ISO 4796-2. With conical ground joint and glass stopper. Glass Type I/neutral glass as per USP, EP and JP. With Retrace code (Batch identification). Certificate available via the Internet. Autoclavable.

Capacity	Diam.	Height	Neck	Colour	PK	Cat. No.
ml	mm	mm	NS			
10	28	52	10/19	clear	1	**9.070 808**
25	36	64	12/21	clear	1	**9.070 814**
50	42	80	14/15	clear	1	**9.070 817**
100	52	96	14/15	clear	1	**9.070 824**
250	70	130	19/26	clear	1	**9.070 836**
500	86	164	24/29	clear	1	**9.070 844**
1000	107	200	29/32	clear	1	**9.070 854**
2000	134	248	29/32	clear	1	**9.070 863**
5000	182	323	45/40	clear	1	**9.070 873**
10000	227	398	60/46	clear	1	**9.070 886**
50	42	80	14/15	amber	1	**9.070 917**
100	52	96	14/15	amber	1	**9.070 924**
250	70	130	19/26	amber	1	**9.070 936**
500	86	164	24/29	amber	1	**9.070 944**
1000	107	200	29/32	amber	1	**9.070 954**
2000	134	248	29/32	amber	1	**9.070 963**

3



3 Reagent bottles, narrow neck, glass stopper, Pyrex®

NEW!

ISO 4796-2 conformed. Made of Borosilicate glass. With ground neck. Supplied with solid glass stopper.

Scilabware

Capacity	Ext. diam.	stopper size	Height	PK	Cat. No.
ml	mm		mm		
100	54	14/15	106	10	**9.072 371**
250	73	19/26	143	10	**9.072 372**
500	89	24/29	175	10	**9.072 373**
1000	111	29/32	214	10	**9.072 374**
2000	138	29/32	262	10	**9.072 375**
5000	181	45/40	333	1	**9.072 376**
10000	227	60/46	414	1	**9.072 377**
20000	288	60/46	508	1	**9.072 378**

We can **supply** this **manufacturer's whole product range !**

partner of the LLG Lab Logistics Group

DURAN GROUP magic of precision

E & OE.

1 2 Narrow- neck square bottles, soda-lime glass, with screw cap

Soda-lime glass, with high threaded neck. Without closure. Hydrolytical class 3. *DURAN Group*
Clear: without pouring ring and dust cap
Amber: with pouring ring and dust cap

Capacity ml	Diam. mm	Height mm	Neck thread GL	Colour	PK	Cat. No.
100	49	119	32	clear	1	**9.072 051**
250	64	155	32	clear	1	**9.072 052**
500	77	186	32	clear	1	**9.072 055**
1000	97	223	45	clear	1	**9.072 060**
100	49	119	32	amber	1	**9.072 061**
250	64	155	32	amber	1	**9.072 062**
500	77	186	32	amber	1	**9.072 065**
1000	97	223	45	amber	1	**9.072 070**

1



2



3 Tamper-evident caps for DURAN® square screw cap bottles, PP

Blue PP. For square screw cap bottles (soda-lime glass). *DURAN Group*
Type H: Narrow-neck, with high form thread.
Type K: Wide-necked, with short form thread.
Temperature (max.): 140°C

Type	Thread	Diam. mm	Height mm	PK	Cat. No.
32 H	32	45	32	1	**9.072 041**
45 H	45	60	35	1	**9.072 042**
32 K	32	44	23	1	**9.072 092**
45 K	45	58	27	1	**9.072 093**
54 K	54	69	29	1	**9.072 094**
60 K	60	78	29	1	**9.072 095**

3



4 Reagent bottles, narrow neck, Pyrex®

NEW!

- Complies with ISO 4796 *Scilabware*
- Borosilicate glass with unground neck
- For use with rubber stoppers (not supplied)

Capacity ml	Ext. diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
100	54	13	95	10	**9.072 379**
250	73	18	131	1	**9.072 380**
500	89	23	163	10	**9.072 381**
1000	111	28	200	10	**9.072 382**
2000	138	28	248	10	**9.072 383**
5000	187	44	315	1	**9.072 384**
10000	227	59	398	1	**9.072 385**
15000	258	59	460	1	**9.072 386**
20000	288	59	492	1	**9.072 387**

4





1 Dispensers/bottle-top flasks, Dispensette® III, amber soda-lime glass

Amber soda-lime glass.With PP screw cap and PE-LD pouring ring.Reservoir bottles. Space-saving, square design, except 2500ml reservoir which is cylindrical.

BRAND

Capacity ml	Neck thread GL	Width mm	Height mm	PK	Cat. No.
100	32	50	125	1	**9.284 541**
250	32	65	160	1	**9.284 542**
500	32	80	195	1	**9.284 543**
1000	45	95	230	1	**9.284 544**
2500*	45	140	300	1	**9.284 545**

* cylindrical design



2 LLG-Narrow-neck bottles with cap, PE-LD, economy pack

Transparent with cap.

Capacity ml	Diam. mm	Height mm	Thread external dia. mm	PK	Cat. No.
50	37.0	78.0	18	50	**9.073 500**
100	47.0	105.0	18	20	**9.073 501**
250	63.0	119.0	25	10	**9.073 502**
500	78.0	152.0	25	10	**9.073 503**
1000	96.0	206.0	28	4	**9.073 504**
2000	120.0	264.0	28	1	**9.073 505**



3 Narrow-neck bottles, series 301, PE-LD

Natural. Round bottle without closure. Tall, narrow form, leakproof. Easy to handle. Also available with dropper cap or spray cap.
Please order cap separately.

Kautex

Capacity ml	Diam. mm	Height mm	Thread external dia. mm	PK	Cat. No.
10	26.0	46.5	14	1	**9.072 741**
20	31.5	56.5	14	1	**9.072 742**
30	33.5	68.5	14	1	**9.072 743**
50	37.5	86.0	18	1	**9.072 745**
100	47.5	105.0	18	1	**9.072 748**
200	57.5	133.0	18	1	**9.072 751**
250	61.3	140.0	25	1	**9.072 750**
500	75.0	177.0	25	1	**9.072 752**
1000	97.5	223.5	28	1	**9.072 755**
2000	120.0	264.0	28*	1	**9.072 757**
3000	138.0	300.0	32*	1	**9.072 759**
5000	162.0	355.0	40*	1	**9.072 762**

Height in mm without seal.
*includes seal.



4 Round square-shouldered bottles, series 302, PE-LD

Natural. Round. Tall, narrow form, leakproof. Easy to handle. Also available with dropper cap or spray cap.
Please order cap separately.

Kautex

Capacity ml	Diam. mm	Thread external dia. mm	Height mm	PK	Cat. No.
50	36.5	18	80.0	1	**9.073 365**
100	44.5	18	98.5	1	**9.073 366**
250	60.0	25	127.5	1	**9.073 368**
500	75.5	25	160.0	1	**9.073 369**
1000	95.0	28	196.0	1	**9.073 370**

Height in mm without cap.

1 Caps for narrow-neck bottles, series 301/302, PE-LD

Natural. *Kautex*



Description	For Type	For bottles ml	For Thread o.d. mm	PK	Cat. No.
Screw-type cap	301	10, 20, 30	14	1	**9.072 771**
Screw-type cap	301, 302	50, 100, 200	18	1	**9.072 773**
Screw-type cap	301, 302	250, 500	25	1	**9.072 775**
Screw-type cap	301, 302	1000, 2000	28	1	**9.072 777**
Screw-type cap	301	3000	32	1	**9.072 778**
Dropping cap *	301	10, 20, 30	14	1	**9.073 314**
Dropping cap *	301, 302	50, 100, 200	18	1	**9.073 315**
Dropping cap *	301, 302	250, 500	25	1	**9.073 318**
Dropping cap *	301, 302	1000, 2000	28	1	**9.073 319**
Small nozzle cap with retaining band, Red PVC	301, 302	all		1	**9.073 320**
Spray cap	301, 302	100	18	1	**9.223 110**
Spray cap	301	200	18	1	**9.223 111**
Spray cap	301, 302	250	25	1	**9.223 112**
Spray cap	301, 302	500	25	1	**9.223 113**
Spray cap	301, 302	1000	28	1	**9.223 114**
Spray cap	301	2000	28	1	**9.223 120**

* with PVC-Nozzle, red.

2 Round Bottles, series 308, PE-HD

Neck design allows sngle handed use. *Kautex*
Used for:
- Packaging
- Storage
- Transport

Please order closure separately.



Capacity ml	Diam. mm	Neck diam. mm	Thread external dia. mm	Height mm	PK	Cat. No.
50	32	17.0	22	86.0	1	**9.072 783**
100	41	17.0	22	108.5	1	**9.072 784**
250	56	17.0	22	135.5	1	**9.072 785**
500	70	19.4	25	173.0	1	**9.072 786**
1000	89	19.4	25	211.5	1	**9.072 787**

Height without cap.

3 Caps for Round Bottles, series 308, PP

White caps. *Kautex*



Description	For bottles ml	Thread Internal Ø mm	PK	Cat. No.
Neck opening caps	50 / 100 / 250	22	1	**9.072 788**
Neck opening caps	500 / 1000	25	1	**9.072 789**
Cap with lip seal	50 / 100 / 250	22	1	**9.072 790**
Cap with lip seal	500 / 1000	25	1	**9.072 791**



1 Narrow-neck reagent bottles, series 308/310, PE-HD, UN-approved

Kautex

UN-approved (only with the fitting UN-approved closures: 9.073 379 - 381).
Square except 500ml size which is round and has an outside diameter of 77mm.
Available in natural or black. Suitable for transporting hazardous liquids.
Leakproof.
Please order closure separately.

Capacity ml	Colour	Neck thread GL	Weight g	Height mm	Serie	PK	Cat. No.
500	natural	45	50	176.5	308	1	**9.073 373**
1000	natural	45	88	211.8	310	1	**9.073 374**
2500	natural	45	163	282.0	310	1	**9.073 375**
500	black	45	52	176.5	308	1	**9.073 376**
1000	black	45	92	211.8	310	1	**9.073 377**
2500	black	45	167	282.0	310	1	**9.073 378**

Height in mm without closure.



2 Narrow-neck bottles, series 310 "Clear Grip", PP

Kautex

- glass-like transparency and finish (ideal for product presentation)
- purity
- low weight (low density)
- good chemical resistance
- excellent thermal stability
- good stiffness and impact resistance
- autoclavable (max. 121°C)
- easily recyclable

Please order closures separately.

Capacity ml	Neck thread GL	Weight g	Height mm	PK	Cat. No.
100	32	15	108.0	1	**9.073 456**
250	32	21	136.0	1	**9.073 457**
500	45	40	169.0	1	**9.073 458**
1000	45	61	204.0	1	**9.073 459**



3 Square reagent bottles, PE-HD

Kautex

Natural or white. Narrow neck.
Please order closures separately.

Capacity ml	Width mm	Depth mm	Height without closure mm	Thread external dia. mm	Colour	PK	Cat. No.
100	45	45	108.0	32	natural	1	**9.072 850**
250	60	60	136.0	32	natural	1	**9.072 851**
500	74	74	170.0	32	natural	1	**9.072 852**
1000	85	85	221.0	32	natural	1	**9.072 853**
2500	122	122	272.0	45	natural	1	**9.072 854**
100	45	45	108.0	32	white	1	**9.072 855**
250	60	60	136.0	32	white	1	**9.072 856**
500	74	74	170.0	32	white	1	**9.072 857**
1000	85	85	221.0	32	white	1	**9.072 858**
2500	122	122	272.0	45	white	1	**9.072 859**

1 Caps for narrow neck reagent bottles, PP

Kautex

a) Tamper-evident cap, blue, with conical seal and tamper-evident ring. Immediately indicates unauthorised opening. Perfect for determining whether the cap has been removed.
b) Tamper-evident cap, red, with PE foam lining and tamper-evident ring. Immediately indicates unauthorised opening. Perfect for determining whether the cap has been removed.
c) Tamper-evident cap, white/blue, with child-proof lock, conical seal and tamper-evident ring. Immediately indicates unauthorised opening. Perfect for determining whether the cap has been removed.
d) Tamper-evident cap, white/red, with child proof lock, tamper-evident ring, conical seal and degassing membrane. Immediately indicates unauthorised opening. Perfect for determining whether the cap has been removed.

e)Tamper-evident cap (not oulined below), red, degassing cap, with conical gasket and degassing membrane.



For bottles ml	For Thread o.d. mm	Figure	PK	Cat. No.
100 to 1000	32	a	1	**9.072 041**
2500	45	a	1	**9.072 862**
100 to 1000	32	b	1	**9.072 863**
2500	45	b	1	**9.072 868**
100 to 1000	32	c	1	**9.072 866**
100 to 1000	32	d	1	**9.072 867**
100 to 1000	32	without Fig.	1	**9.072 905**

2 Narrow-neck bottles Type 1600, FEP with screw cap ETFE

Thermo Scientific

Transparent. Teflon® FEP bottle with leakproof Teflon® ETFE screw cap. Highly resistant to chemicals, corrosion and temperature. Autoclavable - cap should be unscrewed before autoclaving.



Type	Capacity ml	Screw cap diam. mm	PK	Cat. No.
1600	30	20	1	**9.103 011**
1600	60	20	1	**9.103 012**
1600	125	24	1	**9.103 013**
1600	250	24	1	**9.103 014**
1600	500	28	1	**9.103 015**
1600	1000	38	1	**9.103 016**
1600	2000	38-430*	1	**9.103 017**

* with high form thread.
Teflon® and Tefzel® are a registered trademark of DuPont.

3 Narrow-neck bottles with screw cap Type 2006, PP

Thermo Scientific

PP bottle and screw cap. High level of chemical resistance. Leakproof. Autoclavable - cap must be unscrewed before autoclaving.



Type	Capacity ml	Screw cap diam. mm	PK	Cat. No.
2006	4	13	12	**9.103 260**
2006	8	20	12	**9.103 261**
2006	15	20	12	**9.103 262**
2006	30	20	12	**9.103 263**
2006	60	20	12	**9.103 264**
2006	125	24	12	**9.103 265**
2006	250	24	12	**9.103 266**
2006	500	24	12	**9.103 267**
2006	1000	38-430*	6	**9.103 268**

* with high form thread.

4 Narrow-neck bottles Type 2002, PE-HD, with screw cap, PP

Thermo Scientific

PE-HD bottle with PP leakproof screw cap. High level of chemical resistance.



Type	Capacity ml	Screw cap diam. mm	PK	Cat. No.
2002	4	13	12	**9.103 269**
2002	8	20	12	**9.103 270**
2002	15	20	12	**9.103 271**
2002	30	20	12	**9.103 272**
2002	60	24	12	**9.103 273**
2002	125	24	12	**9.103 274**
2002	250	24	12	**9.103 275**
2002	500	28	12	**9.103 276**
2002	500	38-430*	12	**9.103 277**
2002	1000	38-430*	6	**9.103 278**

* with high form thread.



1 Narrow-neck bottles Economy Typ 2087, PPCO, with screw cap, PP

With PP screw cap. General-purpose, single-use sample bottle. Leakproof. Autoclavable. *Thermo Scientific*

Type	Capacity ml	Cover type mm	PK	Cat. No.
2087	30	20	1	**9.103 035**
2087	60	20	1	**9.103 036**
2087	125	24	1	**9.103 037**
2087	250	24	1	**9.103 038**
2087	500	28	1	**9.103 039**
2087	1000	38-430	1	**9.103 040**



2 Aluminium bottles

For storage, transport or shipment of samples/ reference materials that must not be contaminated in any way. *Bürkle*

- Complies with PCB regulations
- With UN approval (60 - 1200ml)
- Pure aluminium (AL99.5 material)
- PP screw cap with internal aluminium seal

Capacity ml	Diam. mm	Height mm	Thread external dia. mm	PK	Cat. No.
38	35	70	38	1	**9.072 168**
60	40	88	38	1	**9.072 169**
120	57	97	38	1	**9.072 170**
300	57	160	38	1	**9.072 171**
600	74	192	38	1	**9.072 172**
1200	88	248	38	1	**9.072 173**



3 DURAN® Stainless Steel Bottle and cap, GL 45, without UN approval

NEW!

- corrosion resistant stainless steel *DURAN Group*
- fully compatible with all the GL 45 caps
- unbreakable
- Hazardous materials laboratory container for storage of liquids, intermediates, or solid product
- Storage of precious materials, such as high purity fine chemicals, pharmaceutical or cosmetic products
- Storage of light sensitive materials

Description	Capacity ml	PK	Cat. No.
DURAN® Group GL 45 Stainless Steel Laboratory Bottle	1500	1	**9.072 175**
DG Stainless steel (316L) cap with PTFE sealing disk, GL 45		1	**9.072 177**



E & OE.

1 2 Square bottles, PE-HD and PVC, with PE-LD screw cap

Square, PE-HD, Natural, translucent bottle with PE-LD screw cap with leakproof seal. *Kautex*
Square, PVC, transparent, rigid bottle with PP screw cap.
Please order screw caps separately.

Capacity ml	Width mm	Depth mm	Height mm	Thread external dia. mm	Material	PK	Cat. No.
100	40.5	32.0	110.5	18	PE-HD	1	**9.072 808**
250	53.5	42.0	146.5	25	PE-HD	1	**9.072 814**
500	63.5	54.5	180.0	25	PE-HD	1	**9.072 819**
1000	84.0	66.0	222.5	25	PE-HD	1	**9.072 824**
250	59.0	38.0	151.5	25	PVC	1	**9.072 914**
500	70.0	50.0	189.0	25	PVC	1	**9.072 919**
1000	87.5	61.0	233.0	25	PVC	1	**9.072 924**

Height in mm without cap.

1


2


3 Caps for PE-HD and PVC square bottles

Kautex

3


Description	For bottles	PK	Cat. No.
Screw cap, natural LDPE	100 ml, HDPE	1	**9.072 773**
Screw cap, natural LDPE	250 to 500 ml, HDPE	1	**9.072 775**
Dropper cap, natural LDPE, with teat*	100 ml, HDPE	1	**9.073 315**
Dropper cap, natural LDPE, with teat*	250, 500 and 1000 ml, HDPE	1	**9.073 318**
Moulded plastic cap, black melamine	100 ml, HDPE	1	**9.073 321**
Moulded plastic cap, black melamine	250, 500 and 1000 ml, HDPE	1	**9.073 322**
Moulded plastic cap, melamine, white	250, 500 and 1000 ml, PVC	1	**9.072 929**
Screw cap, white PP, with washbottle jet	250, 500 and 1000 ml, PVC	1	**9.072 915**

* incl. small captive cap

4 Square bottles Type 2007, PE-HD, with PP screw cap

PE-HD bottle with PP screw cap. Leakproof. *Thermo Scientific*

Type	Capacity ml	Screw cap diam. mm	Width mm	Depth mm	Height mm	PK	Cat. No.
2007	125	28	64	58	102	12	**9.103 279**
2007	250	38	76	48	114	12	**9.103 280**
2007	500	48	94	58	140	12	**9.103 281**
2007	1000	53	125	71	180	6	**9.103 282**
2007	2000	63	152	81	239	4	**9.103 283**

4


1



1 Square bottles Type 2015, PC, with screw cap, PP

PC bottle with leakproof PP screw cap. With moulded graduations and pouring rim. Ideal for storing aqueous solutions and for the short-term storage of cell culture media. Autoclavable.

Thermo Scientific

Type	Capacity ml	Screw cap diam. mm	PK	Cat. No.
2015	30	20	12	**9.103 284**
2015	60	24	12	**9.103 285**
2015	125	38-430*	6	**9.103 286**
2015	250	38-430*	6	**9.103 287**
2015	500	38-430*	4	**9.103 288**
2015	1000	38-430*	4	**9.103 289**
2015	2000	53B	1	**9.103 077**

* with high form thread.

2 LLG- Safety vented wash bottle, PE-LD

NEW!

Manufactured from PE-LD with safety imprint on wash bottle body in accordance with regulation (EC) No. 1272/2008 (GHS). Dispensing tube is used to optimize the backflow of the medium. The lack of a spray insert and the even molding of the inner diameter allow turbulence free operations. Permanent imprints on the body indicates the statutory information in accordance with GHS and also all important information. The name of the chemical solution inside the bottle is printed in German, English, French and Spanish. Other informations such as chemical formula, CAS number, hazard pictogram, signal word, hazard statements, other phrases and NFPA code is also printed.

Label	Capacity ml	PK	Cat. No.
acetone	500	1	**9.223 504**
distilled water	500	1	**9.223 505**
ethanol	500	1	**9.223 506**
isopropanol	500	1	**9.223 507**
methanol	500	1	**9.223 508**

2 3 LLG- Safety vented wash bottle, PE-LD

NEW!

- Multi-lingual wide neck wash bottles featuring the patented DripLok® vapour venting valve that prevents solvent drips
- Indelibly printed in 4 languages (English, French, German and Spanish)
- Choose from 4 solvent labels all including the new Globally Harmonised Symbols, NFPA diamond, risk phrases and safety information
- Fitted with colour coded one-piece PP closures that maintain their shape in use
- Closures feature precision jet-tip aperture for fine control

Label	Capacity ml	PK	Cat. No.
Acetone	500	1	**9.223 491**
Methanol	500	1	**9.223 492**
Isopropanol	500	1	**9.223 493**
Ethanol	500	1	**9.223 494**

2



3



E & OE.

1 LLG-Wash bottles, narrow neck, PE

Easy to squeeze, semirigid, translucent and excellent clarity. The stream of the liquid can be easily controlled by hand pressure. Dispensing tip provides extra fine stream - tip can be cut back in order to increase the flow rate, if required.



Capacity ml	PK	Cat. No.
100	1	**9.223 500**
250	1	**9.223 501**
500	1	**9.223 502**
1000	1	**9.223 503**

2 Narrow-neck bottles, series 301, PE-LD

Natural. Round bottle without closure. Tall, narrow form, leakproof. Easy to handle. Also available with dropper cap or spray cap. *Kautex*
Please order cap separately.



Capacity ml	Diam. mm	Height mm	Thread external dia. mm	PK	Cat. No.
10	26.0	46.5	14	1	**9.072 741**
20	31.5	56.5	14	1	**9.072 742**
30	33.5	68.5	14	1	**9.072 743**
50	37.5	86.0	18	1	**9.072 745**
100	47.5	105.0	18	1	**9.072 748**
200	57.5	133.0	18	1	**9.072 751**
250	61.3	140.0	25	1	**9.072 750**
500	75.0	177.0	25	1	**9.072 752**
1000	97.5	223.5	28	1	**9.072 755**
2000	120.0	264.0	28*	1	**9.072 757**
3000	138.0	300.0	32*	1	**9.072 759**
5000	162.0	355.0	40*	1	**9.072 762**

Height in mm without seal.
*includes seal.

3 Round, square-shouldered bottles, series 302, PE-LD

Natural. Round. Tall, narrow form, leakproof. Easy to handle. Also available with dropper cap or spray cap. *Kautex*
Please order cap separately.



Capacity ml	Diam. mm	Thread external dia. mm	Height mm	PK	Cat. No.
50	36.5	18	80.0	1	**9.073 365**
100	44.5	18	98.5	1	**9.073 366**
250	60.0	25	127.5	1	**9.073 368**
500	75.5	25	160.0	1	**9.073 369**
1000	95.0	28	196.0	1	**9.073 370**

Height in mm without cap.

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

KAUTEX A Textron Company



1 Caps for narrow-neck bottles, series 301/302, PE-LD

Natural. *Kautex*

Description	For Type	For bottles ml	For Thread o.d. mm	PK	Cat. No.
Screw-type cap	301	10, 20, 30	14	1	**9.072 771**
Screw-type cap	301, 302	50, 100, 200	18	1	**9.072 773**
Screw-type cap	301, 302	250, 500	25	1	**9.072 775**
Screw-type cap	301, 302	1000, 2000	28	1	**9.072 777**
Screw-type cap	301	3000	32	1	**9.072 778**
Dropping cap *	301	10, 20, 30	14	1	**9.073 314**
Dropping cap *	301, 302	50, 100, 200	18	1	**9.073 315**
Dropping cap *	301, 302	250, 500	25	1	**9.073 318**
Dropping cap *	301, 302	1000, 2000	28	1	**9.073 319**
Small nozzle cap with retaining band, Red PVC	301, 302	all		1	**9.073 320**
Spray cap	301, 302	100	18	1	**9.223 110**
Spray cap	301	200	18	1	**9.223 111**
Spray cap	301, 302	250	25	1	**9.223 112**
Spray cap	301, 302	500	25	1	**9.223 113**
Spray cap	301, 302	1000	28	1	**9.223 114**
Spray cap	301	2000	28	1	**9.223 120**

* with PVC-Nozzle, red.



2 Wash bottles Type 2401, PE-LD

PE-LD bottle and suction tube. PP screw cap and suction tube support moulded as one piece . *Thermo Scientific*

Type	Capacity ml	Screw cap diam. mm	PK	Cat. No.
2401	125	24	1	**9.223 223**
2401	250	24	1	**9.223 224**
2401	500	28	1	**9.223 225**
2401	1000	38-430*	1	**9.223 226**

*with high form thread



3 Wash bottles Type 2403, FEP, with screw cap, ETFE

Screw cap, jet and feed tube are one-piece moulded from ETFE. Ideal for contamination-free work and suitable for trace element analysis. *Thermo Scientific*

Type	Capacity ml	Screw cap diam. mm	PK	Cat. No.
2403	125	24	1	**9.223 231**
2403	250	24	1	**9.223 232**
2403	500	28	1	**9.223 233**
2403	1000	38	1	**9.223 234**

1 Wide-neck wash bottles, Unitary™, Type 2402, PE-LD, with screw cap, PP

PE-LD Bottle with leakproof PP screw cap. Wide mouth neck. Bottle and dispensing jet are moulded in one piece. *Thermo Scientific*



Type	Capacity ml	Screw cap diam. mm	PK	Cat. No.
2402	125	24	1	**9.223 236**
2402	250	38	1	**9.223 237**
2402	500	38	1	**9.223 238**
2402	750	38	1	**9.223 239**
2402	1000	43	1	**9.223 240**

2 Wide-mouth wash bottles Unitary™ Type DS2408, PE-LD

Red. PE-LD bottle with leakproof PP screw cap. Bottle and dispensing jet are moulded in one piece. *Thermo Scientific*



Type	Capacity ml	Screw cap diam. mm	PK	Cat. No.
DS2408	250	38	1	**9.223 252**
DS2408	500	38	1	**9.223 255**

3 VITsafe™ Safety wash bottles, narrow neck, PP/PE-LD

Bottles made from PE-LD, spray tube from PP. *VITLAB*
Safer due to the durable safety imprint in accordance to Directive (EC) No. 1272/2008 (GHS), as well as with all important information:
- Material name in German, English, French and Spanish
- Chemical formula, CAS No., hazard pictogram, signal word
- Risk phrases (H phrases), safety phrases (P phrases), as well as NFPA Code

Precise spray jet and optimised medium backflow through the continuous and finely drawn tip of the spray tube. Practically no leakage or dripping with the bright red VENT-CAP screw cap, the design of which prevents almost all static overpressure.



Label	Capacity ml	Neck thread GL	Material	PK	Cat. No.
Acetone	250	25	PP	1	**9.223 345**
Acetone	500	25	PP	1	**9.223 351**
Acetone	1000	32	PP	1	**9.223 360**
Acetonitrile	500	25	PE-LD	1	**7.058 640**
Distilled water	250	25	PE-LD	1	**9.223 340**
Distilled water	500	25	PE-LD	1	**9.223 346**
Distilled water	1000	32	PE-LD	1	**9.223 355**
Ethanol	250	25	PE-LD	1	**9.223 344**
Ethanol	500	25	PE-LD	1	**9.223 350**
Ethanol	1000	32	PE-LD	1	**9.223 359**
Ethyl acetate	250	25	PE-LD	1	**9.223 343**
Ethyl acetate	500	25	PE-LD	1	**9.223 349**
Ethyl acetate	1000	32	PE-LD	1	**9.223 358**
Acetic acid	500	25	PE-LD	1	**7.079 737**
Isopropanol	250	25	PE-LD	1	**9.223 342**
Isopropanol	500	25	PE-LD	1	**9.223 348**
Isopropanol	1000	32	PE-LD	1	**9.223 357**
Methanol	250	25	PE-LD	1	**9.223 341**
Methanol	500	25	PE-LD	1	**9.223 347**
Methanol	1000	32	PE-LD	1	**9.223 356**
Methylene chloride	500	25	PE-LD	1	**7.078 722**
Methylethylketone (MEK)	500	25	PP	1	**9.223 354**
N, N-Dimethylformamide	500	25	PE-LD	1	**6.401 458**
Xylene	500	25	PE-LD	1	**7.087 939**
Hexane	500	25	PE-LD	1	**7.009 310**
Heptane	500	25	PE-LD	1	**6.073 505**
Tetrahydrofurane (THF)	500	25	PE-LD	1	**7.087 940**
Toluene	500	25	PE-LD	1	**7.087 938**
Pentan	500	25	PE-LD	1	**6.242 784**



1 VITsafe™ safety wash bottles, wide-mouth, PP/PE-LD

VITLAB

PE-LD or PP Bottles, PP spray tube.
Safer due to the durable safety imprint in accordance to Directive (EC) No. 1272/2008 (GHS), as well as with all important information:
- Material name in German, English, French and Spanish
- Chemical formula, CAS No., hazard pictogram, signal word
- Risk phrases (H phrases), safety phrases (P phrases), as well as NFPA Code

Precise spray jet and optimised medium backflow through the continuous and finely drawn tip of the spray tube.
Practically no leakage or dripping with the bright red VENT-CAP screw cap, the design of which prevents almost all static overpressure.

Label	Capacity ml	Neck thread GL	Material	PK	Cat. No.
Acetone	250	45	PP	1	**9.223 375**
Acetone	500	45	PP	1	**9.223 381**
Acetone	1000	63	PP	1	**9.223 390**
Acetonitril	500	45	PE-LD	1	**6.235 042**
Distilled water	250	45	PE-LD	1	**9.223 370**
Distilled Water	500	45	PE-LD	1	**9.223 376**
Distilled water	1000	63	PE-LD	1	**9.223 385**
Ethanol	250	45	PE-LD	1	**9.223 374**
Acetic acid	500	45	PE-LD	1	**6.234 466**
Ethanol	500	45	PE-LD	1	**9.223 380**
Ethanol	1000	63	PE-LD	1	**9.223 389**
Ethyl acetate	250	45	PE-LD	1	**9.223 373**
Ethyl acetate	500	45	PE-LD	1	**9.223 379**
Ethyl acetate	1000	63	PE-LD	1	**9.223 388**
Isopropanol	250	45	PE-LD	1	**9.223 372**
Isopropanol	500	45	PE-LD	1	**9.223 378**
Hexane	500	45	PE-LD	1	**9.223 391**
Heptane	500	45	PE-LD	1	**9.223 392**
Isopropanol	1000	63	PE-LD	1	**9.223 387**
Methanol	250	45	PE-LD	1	**9.223 371**
Methanol	500	45	PE-LD	1	**9.223 377**
Methanol	1000	63	PE-LD	1	**9.223 386**
Methylethylchloride	500	45	PE-LD	1	**6.225 506**
Methylethylketone (MEK)	500	45	PP	1	**9.223 384**
N,N-Dimethylformamide	500	45	PE-LD	1	**6.225 507**
Pentane	500	45	PE-LD	1	**9.223 397**
Tetrahydrofurane (THF)	500	45	PE-LD	1	**9.223 393**
Toluene	500	45	PE-LD	1	**9.223 394**
Xylol	500	45	PE-LD	1	**9.223 395**



2 Wash bottle caps, Vent-Cap, PP

VITLAB

Screw cap and PP spray tube.
Practically no leakage or dripping with the bright red VENT-CAP screw cap, the design of which prevents almost all static overpressure. Precise spray jet and optimised medium backflow through the continuous and finely drawn tip of the spray tube.

Neck thread GL	PK	Cat. No.
25	1	**9.223 400**
32	1	**9.223 401**
45	1	**9.223 402**
63	1	**9.223 403**

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

VITLAB Competence in Labware

E & OE.

1 Safety wash bottles, wide mouth, series 303, PE-LD

Laboratory safety wash bottle printed with symbols for hazardous substances. *Kautex*
Leakproof. Description of contents is given in German, English and French.
Scratch-resistant ink. Bottles can be fully emptied thanks to a movable outlet jet, also can be used upside down. Safety note: If the base of the jet is positioned above the liquid level, no liquid will be ejected in the event of a change in temperature. The jet tip is sealed for safety during transport and must be cut before use. With fitted PE-LD washbottle cap.



Type	Cover type	Capacity ml	Thread external dia. mm	Height mm	PK	Cat. No.
Acetone	Red	250	40	120	1	**9.073 355**
Acetone	Red	500	50	154	1	**9.073 356**
Ethanol	Green	250	40	120	1	**9.073 357**
Ethanol	Green	500	50	154	1	**9.073 358**
Isopropanol	Yellow	250	40	120	1	**9.073 359**
Isopropanol	Yellow	500	50	154	1	**9.073 360**
Methanol	Orange	250	40	120	1	**9.073 361**
Methanol	Orange	500	50	154	1	**9.073 362**
Distilled water	Blue	250	40	120	1	**9.073 363**
Distilled water	Blue	500	50	154	1	**9.073 364**

Height in mm without closure.

Wash Bottle Carrier, PP

NEW!

Bel-Art Products

- convenient storage and transport of up to 6 wash bottles
- molded of rugged and lightweight polypropylene
- autoclavable at 121°C
- chemical and corrosion resistant
- secure handle
- holds 250ml or 500 ml bottles
- hole diameter 7.4cm
- 286mm x 194mm x 225mm (w x d x h)

Description	PK	Cat. No.
Wash Bottle Carrier, PP	1	**6.801 015** 2



6.801 015

3 Dropper bottles, PE-HD

Natural. Without PE-HD combination closure with screw-on dropping tip which must be ordered separately. Highly suitable for adhesives and other liquids that can be finely dispensed.

Capacity ml	Diam. mm	PK	Cat. No.
10	24.0	1	**9.073 310**
25	31.3	1	**9.073 311**
50	40.0	1	**9.073 312**



4 Cap for dropping bottles, PE-HD

For bottles 9.073 310 to 9.037 312 series. *Kautex*

Type	PK	Cat. No.
Cap for dropping bottles	1	**9.073 313**





1 Dropper bottle Type 2414, FEP/ETFE

Teflon® FEP bottle. Tefzel® ETFE dropper and cap. Excellent chemical resistance. Autoclavable.

Thermo Scientific

Type	Capacity ml	PK	Cat. No.
2414	30	1	**9.073 300**

Teflon® and Tefzel® are a registered trademark of DuPont.



2 Pressure atomizer LaboPlast®, PE-HD

PE/PP/glass-fibre reinforced PA, V2A, FKM/bottle material: PE-HD. With short spray nozzle. Left-handed and right-handed pistol control. The pressurised spray has a working pressure of 4 bar.

Bürkle

Capacity ml	Ext. diam. mm	Height mm	Neck diam. mm	Weight g	PK	Cat. No.
1500	142	315	45	520	1	**9.223 162**

Bürkle

Type	PK	Cat. No.
Spray lance, 300mm long	1	**9.223 165**
Foam jet	1	**9.223 166**



3 Spray bottles LaboPlast®, PE/PP

Chemical resistant to a large extend. Trigger-action spray pump with steplessly adjustable spray nozzle.

Bürkle

Capacity ml	Ext. diam. mm	Height mm	Neck diam. mm	Weight g	PK	Cat. No.
250	60	220	18.0	80	1	**9.223 152**
500	75	240	18.0	95	1	**9.223 155**
1000	98	295	17.5	130	1	**9.223 160**



4 5 Spray bottle Turnn'Spray with overhead valve, PE/PP

NEW!

Spraying over your head is not possible with standard spray bottles. As soon as the suction tube is no longer immersed in liquid, you can't spray any more. Not so with our overhead spray bottle Turn'n'Spray. It features a special technology that allows you to spray from any position. That means you can spray practically and conveniently from any direction and reach hard-to-access places easily and without straining. The high-quality, refillable quality spray bottle can be used again and again.

Bürkle

- Uninterrupted spraying, even over your head
- Parts in contact with media made of PP, PE, silicon and stainless steel
- Nozzle diameter 0.6mm, nozzle is continuously adjustable
- Amount sprayed per stroke: 1.2ml ±0.1



Capacity ml	Height with closure mm	Neck diam. mm	PK	Cat. No.
250	220	19	1	**6.252 153**
500	240	19	1	**6.252 154**
1000	295	19	1	**6.252 166**

1 LLG-Funnel, borosilicate glass 3.3

With short stem. Cone angle of 60°. Standard borosilicate funnels with a high heat stability. All funnels have a cone angle of 60° and therefore offer an optimum fit for all filter sizes. DIN ISO 4798

Funnel diam. mm	Height mm	For filter paper dia. mm	PK	Cat. No.
40	70	55 - 70	1	**9.251 200**
60	100	70 - 90	1	**9.251 201**
80	140	125 - 150	1	**9.251 202**
100	180	150 - 185	1	**9.251 203**
120	210	185 - 240	1	**9.251 204**
150	250	240 - 270	1	**9.251 205**



2 Funnels, soda-lime glass

DIN ISO 4798. With short stem. *DURAN Group*

Diam. mm	Height mm	For filter paper dia. mm	PK	Cat. No.
35	60	45 to 55	1	**9.251 003**
45	80	55 to 70*	1	**9.251 005**
55	95	70 to 90	1	**9.251 007**
70	125	110 to 125	1	**9.251 011**
80	140	125 to 150	1	**9.251 016**
100	180	150 to 185	1	**9.251 019**

* Not to DIN ISO 4798.



3 Funnels, DURAN®

DIN ISO 4798. With short stem. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable. *DURAN Group*

Diam. mm	Height mm	For filter paper dia. mm	PK	Cat. No.
35	60	45 to 55	1	**9.251 123**
45	80	55 to 70	1	**9.251 128**
55	95	70 to 90	1	**9.251 133**
70	125	110 to 125	1	**9.251 138**
80	140	125 to 150	1	**9.251 141**
100	180	150 to 185	1	**9.251 146**
120	210	185 to 240	1	**9.251 023**
150	265	240 to 270	1	**9.251 157**
200	325	320 to 385	1	**9.251 161**
300	409	500	1	**9.251 169**



4 Analytical funnels, DURAN®

For rapid filtration. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable. *DURAN Group*

Diam. mm	Height mm	For filter paper dia. mm	PK	Cat. No.
65	200	70 to 90	1	**9.251 237**
80	210	110 to 125	1	**9.251 241**
110	265	150 to 185	1	**9.251 248**



LLG-Filter paper - please see page 682.

1



1 LLG-Fast filtration funnels with internal rib, PP

- clear, virgin polypropylene.
- polypropylene funnels are autoclavable at 121°C and 1.1 bar for 30 minutes.
- external ribs prevent airlock and back pressure.
- with internal helicoidal rib which prevents filter papers from sticking and increases filtration speed.

Funnel diam. mm	Shaft diam. mm	Stem length mm	For filter paper dia. mm	PK	Cat. No.
40	6.0	40	55 - 70	10	**9.251 191**
60	8.0	60	70 - 90	10	**9.251 192**
80	8.0	80	125 - 150	10	**9.251 193**
80	9.0	150	125 - 150	10	**9.251 197**
100	10.0	100	150 - 185	10	**9.251 194**
120	16.0	120	185 - 240	10	**9.251 195**
150	16.0	150	240 - 270	10	**9.251 196**

2



2 Urbanti TPX rapid funnels, Bel-Art

TPX clear. For rapid filtration. Ribbed inside. Heat resistant up to 177°C. Autoclavable.

Top diam. mm	Stem int. diam. mm	Stem ext. diam. mm	For filter paper dia. mm	PK	Cat. No.
51	3	7.5	75 to 90	1	**9.251 391**
70	3	7.5	110 to 125	1	**9.251 392**
70	7	10.0	110 to 125	1	**9.251 393**
100	7	10.0	150 to 185	1	**9.251 394**
140	10	16.0	240 to 270	1	**9.251 395**
196	20	26.0	320 to 385	1	**9.251 396**

3



3 LLG-Funnels, PP

- clear, virgin polypropylene.
- polypropylene funnels are autoclavable at 121°C and 1.1 bar for 30 minutes.
- external ribs prevent airlock and back pressure.

Funnel diam. mm	Shaft diam. mm	Stem length mm	For filter paper dia. mm	PK	Cat. No.
40	6.0	40	55 - 70	10	**9.251 185**
60	8.0	60	70 - 90	10	**9.251 186**
80	8.0	80	125 - 150	10	**9.251 187**
100	10.0	100	150 - 185	10	**9.251 188**
120	16.0	120	185 - 240	10	**9.251 189**
150	16.0	150	240 - 270	10	**9.251 190**

4



4 Funnels, PP

Transparent. Rapid flow due to a steep 60° angle. *VITLAB*
Practical handle with loop for hanging.
Food-safe product according to EC Directive No. 10/2011.

Funnel diam. mm	Shaft diam. mm	Length*	Height mm	PK	Cat. No.
30	1.5	25	45	1	**9.251 602**
30	4.0	25	47	1	**9.251 605**
40	4.0	35	65	1	**9.251 610**
50	7.0	43	85	1	**9.251 615**
75	6.0	55	110	1	**9.251 620**
100	8.0	77	155	1	**9.251 625**
120	11.0	90	180	1	**9.251 630**
150	15.0	95	220	1	**9.251 635**

* Stem length (mm)

1 Barrel funnels, PP/PE-HD

Transparent. Rapid flow due to a steep 60° angle. Practical handle for hanging.
Suitable for filling large amounts of liquids.
Cat. No. 9.251 640, 9.251 645 and 9.251 650 are food-safe products according to EC Directive No. 10/2011.



Funnel diam. mm	Stem diam. mm	Length*	Height mm	Material	PK	Cat. No.
200	22	90	200	PP	1	**9.251 640**
250	30	100	260	PP	1	**9.251 645**
350	35	170	440	PP	1	**9.251 650**
400	42	150	365	PE-HD	1	**9.251 655**
430	37	420	420	PE-HD	1	**9.251 660**

* Stem length (mm)

2 Funnels, stainless steel Remanit® 4301

With filling vent and handle. *RSG*

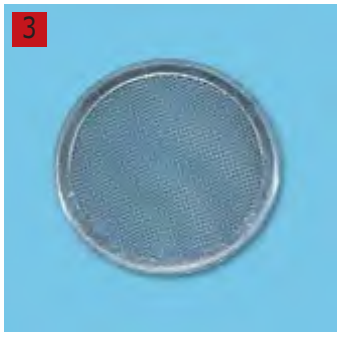


Funnel diam. mm	Tube diam. mm	Height mm	PK	Cat. No.
50*	8.0	90	1	**6.231 805**
80*	12.0	115	1	**9.251 208**
100	12.0	125	1	**9.251 210**
120	13.0	145	1	**9.251 212**
150	17.0	190	1	**9.251 215**
200	18.0	220	1	**9.251 220**
250	18.0	260	1	**9.251 225**

* without handle.

3 Sieve filter for barrel funnels

For 9.251 640 and 9.251 645.



Type	Diam. mm	PK	Cat. No.
Sieve filter	50	1	**9.251 665**

4 Powder funnels, PP

Transparent.
With short, wide stem. For transfer of powdered and granular substances. Rapid flow due to a steep 60° angle.
Food-safe products according to EC Directive No. 10/2011.



Funnel diam. mm	Height mm	Stem diam. mm	PK	Cat. No.
65	68	15	1	**9.251 720**
80	76	21	1	**9.251 725**
100	94	22	1	**9.251 730**
120	110	26	1	**9.251 735**
150	138	28	1	**9.251 740**
180	160	43	1	**9.251 741**

5 Powder funnels, soda-lime glass

Hydrolytical class 3. With short wide stem.



Funnel diam. mm	Height mm	Stem diam. mm	PK	Cat. No.
55	60	20	1	**9.251 307**
70	72	22	1	**9.251 311**
80	79	24	1	**9.251 316**
100	94	26	1	**9.251 319**



1 Powder funnels, DURAN®

With short, wide stem.

Funnel diam. mm	Height mm	Stem diam. mm	PK	Cat. No.
120	105	34	1	**9.251 323**
160	140	35	1	**9.251 332**
200	170	40	1	**9.251 338**



2 Powder funnels, borosilicate glass 3.3, with NS-cone

With short stem and NS cone.

Funnel diam. mm	NS	Stem diam. mm	PK	Cat. No.
60	14/23	13	1	**4.008 433**
80	19/26	17	1	**4.008 434**
100	24/29	22	1	**4.008 435**
120	29/32	26	1	**4.008 436**



9.251 343

Solid addition funnels with NS cone, Duran® tubing

Duran® tubing. 60°C angle. With stopper and NS cone.

Funnel diam. mm	NS	PK	Cat. No.
45	14 / 23	1	**9.251 340**
55	19 / 26	1	**9.251 341**
70	24 / 29	1	**9.251 342**
80	29 / 32	1	**9.251 343**



4 Standard joint funnels, PP

Transparent.
For multi-neck flasks, laterally flattened, suitable for standard joint necks of various sizes.
Suitable for the filling of liquid or powdered reagents into a reaction flask, specially for loading of multi-neck flasks during a reaction.
Food-safe product according to EC Directive No. 10/2011.

Funnel diam. mm	Height mm	NS	PK	Cat. No.
40	75	14 / 23	1	**9.251 814**
50	95	19 / 26	1	**9.251 819**
75	135	29 / 32	1	**9.251 829**



5 LLG-Funnel holder, PP

Manufactured from best quality polypropylene. Suitable to hold all types of laboratory funnels with diameters up to 150mm. Two tapered wedges are provided to ensure firm grip on funnels having diameters of 10-13mm.

Description	PK	Cat. No.
LLG-Funnel holder	1	**9.251 558**

1 LLG-Funnel holders, stainless steel, with or without boss head



These funnel holders are suitable to hold all types of funnels with a diameter up to 150mm. They can also accommodate separating funnels (up to 1000ml). With or without boss head.

Diam. mm	Description	PK	Cat. No.
40	without boss head	1	**9.251 550**
60	without boss head	1	**9.251 551**
80	without boss head	1	**9.251 552**
100	without boss head	1	**9.251 553**
40	with boss head	1	**9.251 554**
60	with boss head	1	**9.251 555**
80	with boss head	1	**9.251 556**
100	with boss head	1	**9.251 557**

2 Funnel stands LaboPlast®, PP



White PP, reinforced glass-fibre. For 2 or 4 funnels. Corrosion resistant. Robust, heavy base provides good stability. Funnel holders are fully height-adjustable. With aperture reduction insert for small funnels. Suitable for funnels of 40mm Ø to 160mm Ø.

To hold funnels piece	Width mm	Length mm	Height mm	PK	Cat. No.
2	140	300	480	1	**9.069 922**
4	150	550	500	1	**9.069 924**

3 Funnel holders, PP



Polypropylene. Single or double holder for funnels from 25mm (with adapter supplied) up to 170mm diameter. Without adapter they can be used for powder funnels with stem diameters not exceeding 35mm. Two clamp adapters are provided for use with rods from 8mm to 14mm. *Kartell*

To hold funnels piece	PK	Cat. No.
1	1	**9.251 561**
2	1	**9.251 560**

4 Funnel holders, stainless steel



Adjustable height 140 to 220 mm. Inner diameter upper ring: 47 mm. *Isolab*

Description	PK	Cat. No.
Funnel holders	1	**4.008 510**



1 Gas jars, DURAN®

DURAN®. With base. Rim flanged and surface-ground. Autoclavable. *DURAN Group*

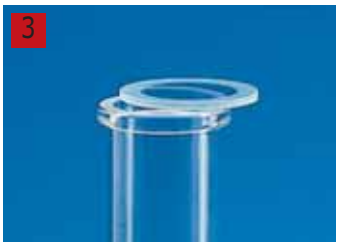
Capacity ml	Diam. mm	Height mm	PK	Cat. No.
130	40	100	1	**9.318 107**
250	40	200	1	**9.318 134**
500	40	400	1	**9.318 168**
570	60	200	1	**9.318 136**
700	60	250	1	**9.318 146**



2 Gas jars, DURAN®

DURAN®. With base. Rim roughly ground. Autoclavable. *DURAN Group*

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
250	40	200	1	**9.318 034**
300	50	150	1	**9.318 021**
380	40	300	1	**9.318 052**
500	40	400	1	**9.318 068**
570	60	200	1	**9.318 036**
600	50	300	1	**9.318 053**
700	60	250	1	**9.318 046**
1000	50	500	1	**9.318 080**
1500	65	450	1	**9.318 077**
2000	80	400	1	**9.318 074**



3 Gas jar covers, glass

For gas jars. Clear glass.

For dia. mm	PK	Cat. No.
50	1	**9.318 407**
60	1	**9.318 408**
70	1	**9.318 409**
90	1	**9.318 411**



4 Pneumatic trough, glass

Cylindrical. Heavy glass.

Diam. mm	Height mm	PK	Cat. No.
250	125	1	**9.172 305**



5 Glass cylinders with knob lid, DURAN®

DURAN®. With knob lid and polished rim. *DURAN Group*

Diam. mm	Height mm	PK	Cat. No.
80	80	1	**9.318 201**
100	100	1	**9.318 203**
120	120	1	**9.318 205**
150	150	1	**9.318 210**
210	210	1	**9.318 221**
260	260	1	**9.318 232**

E & OE.

1 Watch glasses, Soda-lime glass

To DIN 12341. Ground edges. Hydrolytical class 3.



Diam. mm	PK	Cat. No.
40	1	**9.263 004**
50	1	**9.263 005**
60	1	**9.263 006**
70	1	**9.263 007**
80	1	**9.263 008**
90	1	**9.263 009**
100	1	**9.263 010**
110	1	**9.263 011**
120	1	**9.263 013**
125	1	**9.263 012**
150	1	**9.263 015**
200	1	**9.263 020**
250	1	**9.263 025**

2 Watch glasses, Borosilicate glass 3.3

DIN 12341. Flame-polished edges. Autoclavable.



Diam. mm	PK	Cat. No.
50	10	**9.263 470**
60	10	**9.263 471**
70	10	**9.263 472**
80	10	**9.263 473**
100	10	**9.263 474**
125	10	**9.263 475**
150	10	**9.263 476**
200	10	**9.263 477**

3 Watch glasses, DURAN®

DURAN®. DIN 12341. Flame-polished edges. Autoclavable. *DURAN Group*



Diam. mm	PK	Cat. No.
40	1	**9.263 424**
50	1	**9.263 432**
60	1	**9.263 434**
80	1	**9.263 441**
100	1	**9.263 446**
125	1	**9.263 452**
150	1	**9.263 457**
200	1	**9.263 461**
250	1	**9.263 466**

4 Watch glasses, PP

With base. Resistant to steam sterilisation (121°C). *Kartell*



Diam. mm	PK	Cat. No.
60	1	**9.263 526**
80	1	**9.263 528**
100	1	**9.263 530**
125	1	**9.263 532**

5 Evaporating dishes, DURAN®

DURAN®. DIN 12336. Flat-bottom with spout. Autoclavable. *DURAN Group*



Capacity ml	Rim diam. mm	Height mm	PK	Cat. No.
15	50	25	1	**9.000 032**
45	60	30	1	**9.000 034**
60	70	35	1	**9.000 038**
90	80	45	1	**9.000 041**
170	95	55	1	**9.000 044**
320	115	65	1	**9.000 049**
600	140	80	1	**9.000 054**
1500	190	100	1	**9.000 059**
2500	230	130	1	**9.000 063**



1 Evaporating basins, Quartz glass

Transparent silica (Quartz glass). In accordance with DIN 12336. Flat-bottom with spout.

proQuarz GmbH

Capacity ml	Rim diam. mm	Height mm	PK	Cat. No.
10	40	18	1	**9.000 110**
15	50	25	1	**9.000 111**
45	60	30	1	**9.000 112**
60	70	35	1	**9.000 113**
90	80	45	1	**9.000 114**
170	95	55	1	**9.000 115**
320	115	65	1	**9.000 116**





2 3 LLG-Crystallising dishes, borosilicate glass

NEW!

Crystallising dishes with or without drain. DIN 12337/12338. Autoclavable.

Capacity ml	Diam. mm	Height mm	DIN	Description	PK	Cat. No.
20	40	25	12337	without drain	1	**7.616 800**
40	50	30	12337	without drain	1	**6.228 031**
60	60	35	12337	without drain	1	**6.236 596**
100	70	40	12337	without drain	1	**6.233 757**
150	80	45	12337	without drain	1	**6.227 688**
300	95	55	12337	without drain	1	**6.205 104**
500	115	65	12337	without drain	1	**6.205 105**
900	140	75	12337	without drain	1	**6.236 597**
2000	190	90	12337	without drain	1	**6.236 598**
3500	230	100	12337	without drain	1	**6.236 599**
20	40	25	12338	with drain	1	**6.226 043**
40	50	30	12338	with drain	1	**7.616 171**
60	60	35	12338	with drain	1	**6.227 922**
100	70	40	12338	with drain	1	**6.228 387**
150	80	45	12338	with drain	1	**6.225 256**
300	95	55	12338	with drain	1	**6.803 567**
500	115	65	12338	with drain	1	**6.223 298**
900	140	75	12338	with drain	1	**6.206 856**
2000	190	90	12338	with drain	1	**6.803 371**
3500	230	100	12338	with drain	1	**6.231 072**



4 Crystallising dishes, DURAN®

DURAN®. To DIN 12337 and DIN 12338. With spout. Dishes with capacity of 100ml and above have labelling patch. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable.

DURAN Group

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
20	40	25	1	**9.144 024**
40	50	30	1	**9.144 032**
60	60	35	1	**9.144 034**
100	70	40	1	**9.144 038**
150	80	45	1	**9.144 041**
300	95	55	1	**9.144 044**
500	115	65	1	**9.144 049**
900	140	75	1	**9.144 054**
2000	190	90	1	**9.144 059**
3500	230	100	1	**9.144 063**



9.000 074

Crystallising dishes, flat bottom, Pyrex®

NEW!

- Complies to DIN 12337
- Manufactured from Pyrex® borosilicate glass
- Suitable for use up to 400°C
- Chemically and thermally resistant

Scilabware

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
100	70	40	10	**9.000 074** 5
500	115	65	10	**9.000 075**
900	140	75	10	**9.000 076**
2000	190	90	10	**9.000 077**

E & OE.

1 LLG-Porcelain evaporating dishes with spout, flat bottom, shallow form



Glazed.

Capacity ml	Ext. diam. mm	Height mm	DIN	PK	Cat. No.
10	50	10	12903	1	**9.115 301**
20	60	14	12903	1	**9.115 302**
28	75	15		1	**9.115 305**
55	80	20	12903	1	**9.115 303**
110	100	25	12903	1	**6.231 540**
250	130	30	12903	1	**9.115 304**
450	160	40		1	**9.115 306**
1100	200	55		1	**9.115 307**
1750	250	55		1	**9.115 308**

2 Evaporating basins, porcelain, shallow form



Glazed inside and outside except for rim. *Haldenwanger*

Capacity ml	Rim diam. mm	Height mm	PK	Cat. No.
8*	40	9	1	**9.000 204**
10*	50	11	1	**9.000 205**
20*	63	13	1	**9.000 206**
40*	80	20	1	**9.000 208**
80*	100	22	1	**9.000 210**
270*	125	25	1	**9.000 212**
450	160	35	1	**9.000 216**
1100	190	55	1	**9.000 220**
1750	240	65	1	**9.000 225**
2500	300	60	1	**9.000 230**

*According to DIN standard

3 LLG-Porcelain evaporating dishes with spout, round bottom, medium form



Glazed.

Capacity ml	Ext. diam. mm	Height mm	DIN	PK	Cat. No.
10	40	16	12903	1	**9.115 310**
20	50	20	12903	1	**9.115 311**
30	63	25	12903	1	**6.239 177**
60	80	32	12903	1	**9.115 312**
150	100	40	12903	1	**9.115 313**
285	125	50	12903	1	**9.115 314**
700	170	74	12903	1	**9.115 315**
1000	200	80	12903	1	**9.115 316**
41	72	26		1	**9.000 150**
62	83	27		1	**9.000 151**
110	96	30		1	**9.000 152**
240	127	42		1	**9.000 153**
420	154	50		1	**6.232 525**
558	170	55		1	**9.000 154**

4 LLG-Porcelain evaporating dishes with spout, flat bottom, medium form

NEW!



Glazed.

Capacity ml	Ext. diam. mm	Height mm	PK	Cat. No.
93	86	33	1	**6.251 474**
1000	195	74	1	**6.241 820**





1 Evaporating basins, porcelain, medium form

Round bottom with spout. DIN 12903. 10 to 310ml sizes are completely glazed inside and out. 640 to 3400ml sizes are glazed with the exception of the outer base.

Haldenwanger

Capacity ml	Rim diam. mm	Height mm	PK	Cat. No.
10	40	16	1	**9.000 304**
25	50	20	1	**9.000 305**
35	63	25	1	**9.000 306**
75	80	32	1	**9.000 308**
115	100	40	1	**9.000 310**
250	115	50	1	**9.000 312**
580	160	64	1	**9.000 316**
1000	200	80	1	**9.000 320**
2200	250	86	1	**9.000 325**
3400	310	110	1	**9.000 330**



2 Evaporating basins, 18/10 steel

18/10 steel. Cylindrical.

Bochem

Description	Capacity ml	Diam. mm	Height mm	PK	Cat. No.
Tall	125	75	35	1	**9.000 460**
Tall	250	85	50	1	**9.000 461**
Tall	500	110	55	1	**9.000 462**
Shallow	50	60	20	1	**9.000 470**
Shallow	75	70	20	1	**9.000 471**
Shallow	100	80	20	1	**9.000 472**



3 LLG Crucible with porcelaine handle

NEW!

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
22	45	26	1	**7.656 131**



4 Porcelain Crucible

To DIN 12907. Glazed inside and outside except for rim.

Haldenwanger

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
80	63	35	1	**9.140 113**
140	80	45	1	**9.140 114**
290	100	65	1	**9.140 115**
500	125	70	1	**9.140 116**
1300	160	97	1	**9.140 118**
2600	215	112	1	**9.140 119**

Capacity brimful. Dimensions may vary by up to 4%.



5 Bowls, PP

Round , white with broad, stable edge and circumferential standing ring on the bottom.
Food-safe product according to EC Directive No. 10/2011.

VITLAB

Capacity Litres	Ext. diam. mm	Height mm	PK	Cat. No.
1	160	70	1	**9.301 216**
2	200	80	1	**9.301 220**
3	240	100	1	**9.301 224**
4	280	120	1	**9.301 228**
7	320	130	1	**9.301 232**
9	360	150	1	**9.301 236**
13	400	180	1	**9.301 240**

E & OE.

1 Laboratory-bowls, 18/10 steel

With flanged rim. Polished finish. *Bochem*

Capacity ml	Ext. diam. mm	Height mm	PK	Cat. No.
1000	165	75	1	**9.200 518**
2000	220	75	1	**9.200 524**
3000	240	95	1	**9.200 526**
4500	260	120	1	**9.200 529**
6000	305	120	1	**9.200 533**
8000	320	145	1	**9.200 536**

1



2 Instrument trays, melamine resin

White, melamine resin. Autoclavable (121°C)

Width mm	Length mm	Height mm	PK	Cat. No.
190	150	20	1	**7.608 352**
240	180	20	1	**9.200 324**
270	210	20	1	**9.200 327**
300	150	20	1	**9.200 328**
300	190	20	1	**7.055 383**
360	240	20	1	**9.200 335**
430	290	20	1	**9.200 345**

7.603 295 with handle bar

2



3 Instrument boxes, melamine resin

Melamine resin. Base section is autoclavable (121°C).
Please order lid separately.

Width mm	Length mm	Height mm	PK	Cat. No.
110	210	30	1	**9.200 177**
150	190	40	1	**9.200 170**
160	290	30	1	**9.200 165**
160	290	60	1	**9.200 160**
240	350	40	1	**9.200 155**
250	350	100	1	**9.200 150**

3



4 Lids, PS for instrument boxes

For	PK	Cat. No.
9.200 177	1	**9.200 181**
9.200 170	1	**9.200 182**
9.200 165 und 9.200 160	1	**9.200 183**
9.200 155 und 9.200 150	1	**9.200 184**

4



5 Trays, stainless stell

RSG

Width mm	Length mm	Height mm	PK	Cat. No.
110	170	20	1	**9.150 722**
120	200	20	1	**9.150 723**
140	220	28	1	**9.150 724**
180	240	30	1	**9.150 726**
180	260	30	1	**9.150 727**
180	280	30	1	**9.150 728**
210	310	40	1	**9.150 729**
250	350	40	1	**9.150 730**
280	420	50	1	**9.150 732**
340	520	50	1	**9.150 733**

5







1 Instrument boxes, glass

Glass. With vertical walls and polished rims.
With or without stainless steel lid. Dimensions stated are nominal.

Lid	Width mm	Length mm	Height mm	PK	Cat. No.
without	60	120	40	1	**9.200 014**
without	90	170	45	1	**9.200 017**
without	100	200	50	1	**9.200 020**
without	100	200	100	1	**9.200 037**
without	150	220	55	1	**9.200 022**
without	150	275	60	1	**9.200 028**
without	220	350	70	1	**9.200 035**
with	60	120	40	1	**9.200 114**
with	90	170	45	1	**9.200 117**
with	100	200	50	1	**9.200 120**
with	100	200	100	1	**9.200 137**
with	150	220	55	1	**9.200 122**
with	150	280	60	1	**9.200 128**
with	220	350	70	1	**9.200 135**



2 Instrument boxes, stainless steel 18/10

Stainless steel 18/10. Satin finish. With knob lid.

Width mm	Length mm	Height mm	PK	Cat. No.
80	120	40	1	**9.200 412**
100	160	30	1	**9.200 416**
100	200	50	1	**9.200 420**
150	260	50	1	**9.200 426**
200	300	50	1	**9.200 430**
180	280	60	1	**9.200 428**
200	400	80	1	**9.200 440**
300	500	100	1	**9.200 450**



3 Trays and Screen Baskets from Stainless Steel

NEW!

Dürr Metalltechnik

For Transport, Cleaning, Sterilization and Storage of laboratory equipment and instruments.

- Improves cleaning results by up to 30%, secure, efficient, practical, economic
- Protected honeycomb structure guarantees high levels of stability
- Can be deployed individually
- No "dead angles" when rinsing your instruments, ensuring a much more through cleaning
- Multifunctional holders for instruments

Description	Dimensions (W x D x H) mm	PK	Cat. No.
Screen basket, 1/2 STE	240 x 240 x 30	1	**9.033 450**
Screen basket, 1/2 STE	240 x 240 x 50	1	**9.033 451**
Screen basket, 1/2 STE	240 x 240 x 70	1	**9.033 452**
Screen basket, 3/4 STE	400 x 240 x 30	1	**9.033 453**
Screen basket, 3/4 STE	400 x 240 x 50	1	**9.033 454**
Screen basket, 3/4 STE	400 x 240 x 70	1	**9.033 455**
Screen basket, normal	480 x 240 x 30	1	**9.033 456**
Screen basket, normal	480 x 240 x 50	1	**9.033 457**
Screen basket, normal	480 x 240 x 70	1	**9.033 458**
Lid for wash tray	243 x 243	1	**9.033 470**
Lid for wash tray	403 x 243	1	**9.033 471**
Lid for wash tray	483 x 243	1	**9.033 472**



4 Laboratory trays LaboPlast®, PP

Bürkle

White multi-purpose trays. Injection-moulded. Durable and resist flexing, with strong, rounded rim. Stackable and hygienic. Polished surface is easy to clean. Resistant to many acids and alkaline solutions. Food Safe.

Internal dimensions mm	Width mm	Length mm	Height mm	PK	Cat. No.
130 x 180	230	180	42	1	**9.200 203**
180 x 240	310	250	65	1	**9.200 204**
240 x 300	370	310	75	1	**9.200 205**
300 x 400	520	420	120	1	**9.200 206**
400 x 500	634	534	140	1	**9.200 207**
500 x 700	846	648	160	1	**9.200 208**

E & OE.

1 Photographic trays LaboPlast®, PVC, with or without grooves

White, with or without grooves in the base. Temperature resistant up to +70°C.
Trays in red or black available on request.



Base	Type	Width mm	Length mm	Height mm	PK	Cat. No.
140 x 190	with grooves	230	180	40	1	**9.200 220**
190 x 260	with grooves	320	240	50	1	**9.200 225**
260 x 320	with grooves	370	320	50	1	**9.200 232**
310 x 410	with grooves	530	430	105	1	**9.200 243**
420 x 510	with grooves	610	520	110	1	**9.200 252**
510 x 610	with grooves	730	630	110	1	**9.200 267**
110 x 160	without grooves	200	150	30	1	**9.200 269**
140 x 190	without grooves	230	180	40	1	**9.200 270**
190 x 260	without grooves	320	240	50	1	**9.200 275**
260 x 320	without grooves	370	320	50	1	**9.200 282**
310 x 410	without grooves	530	430	105	1	**9.200 283**
420 x 510	without grooves	610	520	110	1	**9.200 292**
510 x 610	without grooves	730	630	110	1	**9.200 297**

2 Photographic trays, PVC

PVC. With ribbed base. *Kartell*



Width mm	Length mm	Height mm	PK	Cat. No.
150	200	45	1	**9.200 372**
200	250	60	1	**9.200 373**
260	320	70	1	**9.200 374**
300	350	80	1	**9.200 375**
330	430	90	1	**9.200 376**
420	520	90	1	**9.200 377**
530	675	100	1	**9.200 378**
420	540	180	1	**9.200 379**

3 Photographic trays, 18/10 steel

18/10 steel. With rounded edges. *Mühlacker*



Width mm	Length mm	Height mm	PK	Cat. No.
140	190	50	1	**9.200 700**
180	250	60	1	**9.200 701**
190	260	50	1	**9.200 702**
260	320	60	1	**9.200 703**
240	350	70	1	**9.200 704**
270	400	80	1	**9.200 705**
330	500	100	1	**9.200 706**

4 Tidy trays, PVC

PVC. With compartments. For use as drawer trays or bench tidy trays. *Kartell*



Compart-ments no.	Width mm	Length mm	Height mm	PK	Cat. No.
5	304	404	64	1	**9.200 370**
12	303	403	63	1	**9.200 380**

5 Pipette tray, PVC

PVC. For pipettes of all sizes. Can accommodate 7 pipettes with overall stem diameter not exceeding 20mm longitudinally or 16 pipettes with stem diameter not exceeding 10mm laterally. *Kartell*



Width mm	Length mm	Height mm	PK	Cat. No.
220	280	39	1	**9.200 392**

6 Pipette tray, PVC

PVC. Tidy tray. With 4 long compartments for approx. 30 graduated pipettes (1ml to 20ml). *Kartell*



Width mm	Length mm	Height mm	PK	Cat. No.
300	420	30	1	**9.200 394**

1



1 LLG-Porcelain crucibles, low, DIN 12904

To DIN 12904. Glazed.

Capacity ml	Ext. diam. mm	Height mm	Form	PK	Cat. No.
5	30	19	Low form	1	**9.250 900**
10	35	22	Low form	1	**9.250 901**
17	40	25	Low form	1	**9.250 902**
21	45	28	Low form	1	**9.250 903**
34	50	32	Low form	1	**9.250 904**
63	60	38	Low form	1	**9.250 905**
91	70	44	Low form	1	**9.250 906**

2



2 LLG-Porcelain crucibles, medium, DIN 12904

To DIN 12904. Glazed.

Capacity ml	Ext. diam. mm	Height mm	Form	PK	Cat. No.
10*	30	25	Medium form	1	**9.250 907**
12	35	28	Medium form	1	**9.250 910**
20	40	32	Medium form	1	**9.250 911**
30	45	36	Medium form	1	**9.250 912**
45	50	40	Medium form	1	**9.250 913**
80	60	48	Medium form	1	**9.250 914**
120	70	56	Medium form	1	**9.250 915**
200*	80	62	Medium form	1	**9.250 916**

* Non to DIN

3



3 LLG-Porcelain crucibles, tall, DIN 12904

To DIN 12904. Glazed.

Capacity ml	Ext. diam. mm	Height mm	Form	PK	Cat. No.
15	30	38	Tall form	1	**9.250 920**
26	35	44	Tall form	1	**9.250 921**
35	40	50	Tall form	1	**9.250 922**
50	45	56	Tall form	1	**9.250 923**
72	50	62	Tall form	1	**9.250 924**
130	60	75	Tall form	1	**9.250 925**

4



4 LLG-Porcelain filter crucibles, with porous bottom

NEW!

To Din 12909. Glazed.

Capacity ml	Ext. diam. mm	Height mm	Pore size µm	PK	Cat. No.
8	25	28	6	1	**9.052 080**
8	25	28	7	1	**9.052 081**
8	25	28	8	1	**9.052 082**
15	30	35	6	1	**9.052 083**
15	30	35	7	1	**9.052 084**
15	30	35	8	1	**9.052 085**
25	35	40	6	1	**6.233 176**
25	35	40	7	1	**6.233 748**
25	35	40	8	1	**9.052 086**
35	40	43	6	1	**9.052 087**
35	40	43	7	1	**9.052 088**
35	40	43	8	1	**9.052 089**
50	45	50	6	1	**9.052 090**
50	45	50	7	1	**9.052 091**
50	45	50	8	1	**9.052 092**

5



5 LLG-Porcelain lids for crucible, DIN 12904

Glazed. For Cat. No. 9.052 080 to 9.052 092.

Lid diam. mm	Crucible diam. mm	DIN	PK	Cat. No.
34	30	12904	1	**9.250 930**
39	35	12904	1	**9.250 931**
44	40	12904	1	**9.250 932**
49	45	12904	1	**9.250 933**
54	50	12904	1	**9.250 934**
64	60	12904	1	**9.250 935**
74	70	12904	1	**9.250 936**
84	80		1	**9.250 937**

E & OE.

1 Crucibles, porcelain, low form

To DIN 12904. Glazed. Without lid. *Haldenwanger*

Capacity ml	Ext. diam. mm	Height mm	PK	Cat. No.
8	30	19	1	**9.250 030**
11	35	22	1	**9.250 035**
20	40	25	1	**9.250 040**
25	45	28	1	**9.250 045**
40*	50	32	1	**9.250 050**
65	60	38	1	**9.250 060**
95	70	47	1	**9.250 070**

* Conradson crucible in accordance with ASTM D 189-65



2 Crucibles, porcelain, medium form

To DIN 12904. Glazed. Without lid. *Haldenwanger*

Capacity ml	Ext. diam. mm	Height mm	PK	Cat. No.
10*	30	25	1	**9.250 130**
13	35	28	1	**9.250 135**
20	40	32	1	**9.250 140**
38	45	36	1	**9.250 145**
49	50	40	1	**9.250 150**
90	60	50	1	**9.250 160**
150	70	60	1	**9.250 170**
230*	82	65	1	**9.250 180**

* Not to DIN.



3 Crucibles, porcelain, tall form

To DIN 12904. Glazed. Without lid. *Haldenwanger*

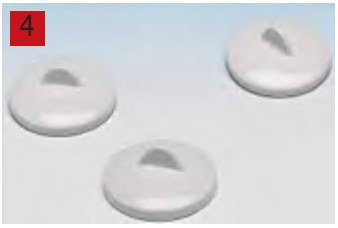
Capacity ml	Top diam. mm	Height mm	PK	Cat. No.
11	26	33	1	**9.250 225**
15	30	38	1	**9.250 230**
24	35	44	1	**9.250 235**
40	40	50	1	**9.250 240**
50	46	58	1	**9.250 245**
85	50	65	1	**9.250 250**
140	60	79	1	**9.250 260**



4 Lids for porcelain crucibles, DIN 12904

Haldenwanger

Lid diam. mm	Crucible diam. mm	PK	Cat. No.
28	20	1	**6.005 993**
32	26	1	**9.250 306**
35	30	1	**9.250 308**
43	40	1	**9.250 310**
46	46	1	**9.250 313**
52	52	1	**9.250 314**
60	63	1	**9.250 316**
75	70	1	**9.250 319**
87	82	1	**9.250 327**



5 Crucibles, Alsint, wide form

Conical. For use up to approx. 1700°C. *Haldenwanger*
Al_2O_3 content 99.7%.

Capacity ml	Top diam. mm	Bottom diam. mm	Height mm	PK	Cat. No.
10	30	14	24	1	**9.250 389**
25	41	18	37	1	**9.250 390**
40	48	20	41	1	**9.250 391**
60	54	24	50	1	**9.250 392**
80	60	26	50	1	**9.250 393**
100	66	30	56	1	**9.250 394**





1 Crucibles, Alsint, tall form

Conical. Max. 1700°C.
Al_2O_3 99.7%.

Haldenwanger

Capacity ml	Top diam. mm	Bottom diam. mm	Height mm	PK	Cat. No.
10	25	15	30	1	**9.250 399**
15	30	18	38	1	**9.250 400**
20	33	18	40	1	**9.250 401**
30	38	21	47	1	**9.250 402**
45	42	25	54	1	**9.250 403**
80	50	27	65	1	**9.250 404**
150	62	32	75	1	**9.250 405**
250	73	35	90	1	**9.250 406**
350	85	35	100	1	**9.250 407**



2 Lids for alsint crucibles

Haldenwanger

Lid diam. mm	Crucible diam. mm	PK	Cat. No.
25	28	1	**6.241 895**
30	32	1	**6.801 239**
35	35	1	**7.602 538**
40	43	1	**6.304 147**
45	46	1	**6.900 118**
50	52	1	**6.236 618**
63	60	1	**7.620 719**
70	68	1	**6.231 115**



3 Crucibles, quartz glass, medium form

Transparent silica (Quartz glass). Medium form.

proQuarz GmbH

Capacity ml	Ext. diam. mm	Height mm	PK	Cat. No.
20	40	32	1	**9.250 340**
49	50	40	1	**9.250 350**
90	60	48	1	**9.250 351**



4 LLG-Porcelain incinerating dishes

NEW!

Description	Capacity ml	Ext. diam. mm	Height mm	PK	Cat. No.
deep form, without drain	21	40	20	1	**6.237 126**
deep form, with drain	64	60	30	1	**6.241 972**
deep form, without drain	64	60	30	1	**6.242 424**
low form, without drain	70	81	20	1	**7.654 046**
deep form, without drain	103	70	35	1	**7.654 045**



5 Incinerating dishes, porcelain, flat form

Without spout. Glazed except for base exterior.

Haldenwanger

Capacity ml	Ext. diam. mm	Height mm	PK	Cat. No.
8	37	10	1	**9.115 036**
10	42	11	1	**9.115 041**
15	47	12	1	**9.115 045**



6 Incenerating dishes, porcelain, cylindrical form

Deep. Without spout. Glazed, except for base exterior.

Haldenwanger

Capacity ml	Ext. diam. mm	Height mm	PK	Cat. No.
15	40	20	1	**9.115 140**
30	50	25	1	**9.115 150**
60	60	30	1	**9.115 160**

1 Incenerating dishes, porcelain, rectangular

With vertical side walls. Glazed, except for base exterior. *Haldenwanger*

Capacity ml	Length mm	Depth mm	Height mm	PK	Cat. No.
10	48	25	10	1	**9.115 245**
20	70	45	12	1	**9.115 265**
55	95	55	15	1	**9.115 295**



2 LLG-Porcelain incenerating boats, with eyelet

NEW!

Unglazed.

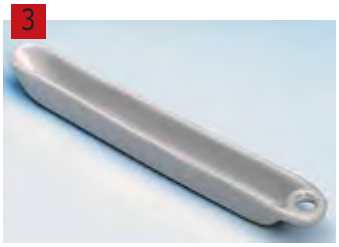
Length mm	Width mm	Height mm	PK	Cat. No.
105	14	9	1	**9.250 941**
85	13	8	1	**9.250 942**
75	13	8	1	**9.250 940**
90	13	8	1	**6.243 229**
40	12	10	1	**9.250 943**



3 Incenerating boats, porcelain, with loop handle

Glazed porcelain. *Haldenwanger*

Length mm	Width mm	Height mm	PK	Cat. No.
85	13	8	1	**9.201 590**
102	13	10	1	**9.201 596**



4 Magnesia trays

Width mm	Length mm	PK	Cat. No.
9	100	100	**9.152 109**



5 Magnesia rods

For flame tests.

Type	PK	Cat. No.
Magnesia rods	100	**9.152 125**



6 Flame test glasses

Cobalt blue glass.

Width mm	Length mm	PK	Cat. No.
50	50	1	**9.140 205**
100	100	1	**9.140 210**



7 Combustion tube, hard porcelain

Unglazed, hard porcelain. *Haldenwanger*
For Carbon and Sulphur determinations.

Ext. diam. mm	Int. diam. mm	Length mm	PK	Cat. No.
22	17	600	1	**9.173 176**



1



1 Crucibles, nickel

99.6% nickel.
Wall thickness 1mm.
Please order lid separately.

Bochem

Capacity ml	Ext. diam. mm	Height mm	PK	Cat. No.
15	30	30	1	**9.250 630**
25	35	35	1	**9.250 635**
30	40	40	1	**9.250 640**
70	50	50	1	**9.250 650**

2



2 Lids for Crucibles, nickel

Bochem

For Crucibles	Ext. diam. mm	PK	Cat. No.
15 ml	30	1	**9.250 660**
25 ml	35	1	**9.250 665**
30 ml	40	1	**9.250 670**
70 ml	50	1	**9.250 680**

Note: Platinum Crucibles available on request.

3



3 Laboratory spoon, stainless steel 18/10

Stainless steel 18/10

Bochem

Length mm	Spoon L x W mm	PK	Cat. No.
135	45 x 31	1	**9.150 213**
180	55 x 38	1	**9.150 218**
195	60 x 45	1	**9.150 221**
280	85 x 70	1	**9.150 226**

4



4 Spoon, stainlees steel

Remanit® 4301. Polished. With one open spoon and one tapered flat end. Length 200mm.

RSG

Length mm	PK	Cat. No.
200	1	**9.150 050**

5



5 Pharmacist's spoon, stainless steel

Remanit® 4301. Polished. Slim form. Length 150mm.

RSG

Length mm	PK	Cat. No.
150	1	**9.150 060**

6



6 Reagent spoons, 18/10 steel

Dimensions spoon (W x L): 15mm x 25mm

Overall length mm	PK	Cat. No.
200	1	**4.008 513**

7



7 Reagent spoons, double-ended, 18/10 steel

18/10 steel. Double ended.

Bochem

Length mm	Spoon L x W mm	PK	Cat. No.
120	30x22 - 23x17	1	**9.150 012**
150	30x22 - 23x17	1	**9.150 015**
180	40x29 - 30x22	1	**9.150 018**
210	40x29 - 30x22	1	**9.150 021**
250	48x29 - 40x29	1	**9.150 025**
300	48x35 - 40x29	1	**9.150 030**

E & OE.

1 LLG Multi-purpose spoon, 18/10 steel

Length mm	For	Spoon L x W mm	Spatulas L x W mm	PK	Cat. No.
150	Right handed user	15 x 35	25 x 13	1	**9.150 800**
180	Right handed user	15 x 35	25 x 13	1	**9.150 801**
210	Right handed user	15 x 35	25 x 13	1	**9.150 802**
250	Right handed user	15 x 35	25 x 13	1	**9.150 073**
300	Right handed user	15 x 35	25 x 13	1	**9.150 074**
150	Left handed user	15 x 35	25 x 13	1	**9.150 080**
180	Left handed user	15 x 35	25 x 13	1	**9.150 081**
210	Left handed user	15 x 35	25 x 13	1	**9.150 082**



2 Spatulas, round grooved, 18/10 steel

Polished, round grooved. *Isolab*

Length mm	PK	Cat. No.
150	1	**4.008 448**
180	1	**4.008 449**
210	1	**4.008 450**



3 Powder spoon, 18/10-Stahl

18/10 steel. Narrow form. *Bochem*

Length mm	Spoon L x W mm	PK	Cat. No.
170	40 x 10	1	**9.150 620**



4 Ladles, 18/10-Stahl

18/10 steel. Bowl diameters as outlined below.

Bochem

Capacity ml	Length mm	Diam. mm	PK	Cat. No.
90	185	70	1	**9.150 665**
200	315	90	1	**9.150 685**
220	315	100	1	**9.150 700**
620	345	140	1	**9.150 703**



5 LLG- Spoon spatulas, 18/10 steel, deep form

18/10 steel. Deep form.

Length mm	Spoon L x W mm	Spatulas L x W mm	PK	Cat. No.
120	31 x 23	30 x 20	1	**4.008 445**
150	38 x 27	32 x 22	1	**9.150 810**
180	40 x 30	35 x 25	1	**9.150 811**
210	40 x 30	35 x 25	1	**9.150 812**
250	50 x 38	45 x 32	1	**4.008 446**
300	55 x 45	50 x 40	1	**4.008 447**



6 Micro spoon spatulas, 18/10 steel

Excellent grade polished stainless steel with one end having a flat spatula and the other end having a micro spoon.

Length mm	Spoon L x W mm	PK	Cat. No.
150	9 x 5	1	**9.150 820**
180	9 x 5	1	**4.008 451**



1



1 Micro powder spatula, stainless steel

Remanit® 4301. Polished. Very flexible. *RSG*

Width mm	Length mm	PK	Cat. No.
3	150	1	**6.239 195**
3	210	1	**9.220 205**
4	130	1	**9.220 206**
4	150	1	**9.220 207**
4	185	1	**9.220 208**
5	150	1	**6.231 957**
6	130	1	**9.220 201**
6	150	1	**9.220 202**
6	185	1	**9.220 203**
6	210	1	**9.220 204**
7	150	1	**6.226 081**

2



3



2 3 Micro Spatulas, double-ended, 18/10 steel

Spoon-shaped ends. *Bochem*

Type	Width mm	Length mm	PK	Cat. No.
A- Single-ended	5	130	1	**9.220 313**
A- Single-ended	5	185	1	**9.220 318**
A- Single-ended	5	210	1	**9.220 321**
B- Double-ended	5	130	1	**9.220 363**
B- Double-ended	5	185	1	**9.220 368**
B- Double-ended	5	210	1	**9.220 371**

4



4 Micro double-ended spatulas, 18/10 steel

Stainless steel with one end having a flat spatula and the other end having a flat spatula with rounded edges. *Bochem*

Length mm	Spatula width mm	PK	Cat. No.
100	3	1	**9.220 210**
130	3	1	**9.220 213**
150	5	1	**9.220 215**
185	5	1	**9.220 218**
210	5	1	**9.220 221**

5



6



5 6 Double ended spatulas, 18/10 steel

18/10 steel. Narrow form.

Length mm	Type	PK	Cat. No.
130	straight	1	**4.008 454**
150	straight	1	**4.008 455**
185	straight	1	**4.008 456**
210	straight	1	**4.008 457**
250	straight	1	**4.008 458**
300	straight	1	**4.008 459**
185	curved	1	**4.008 460**
250	curved	1	**4.008 461**

1 2 Double-ended spatulas, 18/10 steel

18/10 steel. With one end having a flat spatula and the other end having a flat spatula with rounded edges. *Bochem*

Length mm	Spatula width mm	Type	PK	Cat. No.
130	9	Straight	1	**9.220 013**
150	9	Straight	1	**9.220 015**
185	9	Straight	1	**9.220 018**
210	11	Straight	1	**9.220 021**
250	11	Straight	1	**9.220 025**
300	16	Straight	1	**9.220 030**
150	9	Bent	1	**9.220 115**
185	9	Bent	1	**9.220 118**
210	11	Bent	1	**9.220 121**
250	11	Bent	1	**9.220 125**

1


2


3 Double ended spatulas chattaway, 18/10 steel

Polished stainless steel with one end flat and the other with a bent flat end.

Length mm	Spatula width mm	PK	Cat. No.
100	9	1	**4.008 452**
130	9	1	**4.008 453**
150	9	1	**9.150 815**
180	9	1	**9.150 816**
210	9	1	**9.150 817**

3


4 Spatula with knob, 18/10 steel

Drop-forged 18/10 steel. With one flat end and one knob end. *Bochem*

Width mm	Length mm	Length Spattle area	PK	Cat. No.
9	150	60	1	**9.220 415**
11	210	70	1	**9.220 421**

4


5 Spatulas, nickel chromium steel/PTFE

Nickel chromium steel. Single or double-ended, as outlined below. With PTFE-coated ends.

Type	Length mm	PK	Cat. No.
Double-ended spatula	200	1	**9.220 940**
Spoon spatula	225	1	**9.220 945**

5


6 Sample spoon, PP

White PP. Length 180mm. Autoclavable at 121°C. *Bel-Art Products*

Length mm	Capacity ml	Width mm	PK	Cat. No.
180	1.23	20	1	**9.150 643**
180	2.46	25	1	**9.150 644**
180	4.93	30	1	**9.150 645**
180	14.79	39	1	**9.150 646**

6


7 Sampling spoon SteriPlast, PS

Sampling spoon ideal for powder, granules, pastes, liquids. Sterilised, single packed. *Bürkle*

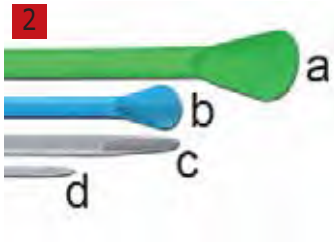
Length mm	Capacity ml	PK	Cat. No.
125	2	100	**7.651 884**
150	8	100	**6.306 595**

7


1



2



1 2 Powder spatula smartSPATULAS®, PP

NEW!

Heathrow Scientific

Single use polypropylene lab tools made to increase productivity and reduce costly contamination errors. They offer an Always there and always clean' alternative to metal spatulas.

- Size related designs to fit perfectly with standard 0.5, 1.5/2.0, 15 and 50 mL tubes
- Ideal for dispensing or sample collection of powders or soft solids
- Shatter resistant in liquid nitrogen and resistant to dilute acids and bases and can be used with hot liquids
- Anti-static, sterile and Eco-friendly versions available
- Autoclavable and complies with FDA standards for food contact

Description	Colour	For tubes ml	Length mm	Diam. mm	Figure	PK	Cat. No.
Micro Antistatic	Natural	0.2	14	3.5	d	300	**6.256 896**
Eco	Natural	15/1.5/2.0	14	7.0	-	300	**6.256 894**
Standard	Blue	15/1.5/2.0	21	7.0	b	300	**6.256 893**
Standard	Natural	15/1.5/2.0	21	7.0	c	300	**6.256 895**
Standard sterile	Natural	15/1.5/2.0	21	7.0	-	100	**6.256 898**
Macro	Green	50	31	1.0	a	150	**6.256 897**

3



3 Spatulas, PS

BRAND

Impact resistant polystyrol. Available as double-ended flat spatula or one end flat and the other with spoon.

Type	Length mm	PK	Cat. No.
Double-ended	150	1	**9.220 850**
Double-ended	180	1	**9.220 851**
With spoon	180	1	**9.220 852**
With spoon	210	1	**9.220 853**

4



4 Spoon spatulas, porcelain

Haldenwanger

Glazed.

Length mm	Spoon L x W mm	Spatulas L x W mm	PK	Cat. No.
121	36 x 11	33 x 10	1	**9.220 812**
170	45 x 20	42 x 21	1	**9.220 816**
210	54 x 30	48 x 25	1	**9.220 820**
305	131 x 42	56 x 39	1	**9.220 830**

5



5 Spatula set, stainless steel, 7 pieces

RSG

Remanit® 4301.
7 pieces:
1 x pair of forceps, blunt, straight, 145mm
1 x micro spoon-spatula 150/5mm
1 x micro spoon-spatula 150/7mm
1 x double spatula 150/9mm
1 x powder spatula 150/9mm
1 x micro powder spatula 150/4mm
1 x micro double spatula 150/4mm

In synthetic leather bag with hook-and-loop fastener. Made in Germany.

Type	PK	Cat. No.
Spatula set	1	**7.630 153**

6



6 Chemist's small instrument set, 5 pieces

Hammacher

1 x micro-powder-spatula, flexible, 150mm long
1 x spatula, double-ended, flexible, 150mm long
1 pair of scissors, sharp/sharp, straight, 145mm
1 x spoon spatula, 150mm, 32 x 22 mm (blade L x W)
1 pair of thumb forceps, simple type, 130mm long

Type	PK	Cat. No.
HSO 125-00	1	**9.160 004**

1 Chemist's large instrument set, 9-piece

Large, 9-piece set, containing: *Hammacher*

Micro-spatula, double ended, flexible, 130mm long
Micro-spoon spatula, spoon 5 x 7 mm, 150mm long
Micro-powder spatula, double ended, flexible, 185mm long
Weighing scoop, 10 x 40mm W x L, 170mm long
Scissors, straight, serrated, 170mm long
Poly-spoon, 180mm long
Spatula, double ended, non-flexible, 185mm long
Spatula, wide type, both ends round, 150mm long
Forceps, sharp, simple type, 160 mm

Type	PK	Cat. No.
HSO 126-00	1	**9.160 010**



2 Spatula/section lifter, 18/10 steel

18/10 steel. With wooden handle. Short, flexible blade. *Bochem*

Length mm	Blade width mm	Blade length mm	PK	Cat. No.
150	10	50	1	**9.220 510**
150	15	50	1	**9.220 515**



3 Spatulas with wooden handle, stainless steel

Flexible, long blade as outlined below. *Bochem*

Length mm	Blade length mm	Blade width mm	PK	Cat. No.
165	75	14	1	**9.220 607**
190	100	18	1	**9.220 610**
230	130	20	1	**9.220 613**
250	150	22	1	**9.220 615**
275	165	27	1	**9.220 616**
310	200	32	1	**9.220 620**
365	250	38	1	**9.220 625**
415	300	42	1	**9.220 630**



4 Pharmacists spatula

Stainless steel 4310. With durofol handle. Flexible blade. *Gerd Schneider*

Length mm	Blade width mm	Blade length mm	PK	Cat. No.
165	14	75	1	**9.220 490**
190	18	100	1	**9.220 491**
230	20	130	1	**9.220 492**
250	22	150	1	**9.220 493**
310	32	200	1	**9.220 495**



5 Laboratory spatula, PC

Polycarbonate, crystal clear.

Width mm	Length mm	Weight g	PK	Cat. No.
20	145	18	1	**9.220 841**



6 Tongue depressors, wooden

Wooden.

Length mm	PK	Cat. No.
150	100	**9.165 101**



1



1 Cleaning scraper, PP/wood

Wooden handle, length: 25 cm, dimensions PP-area (L x W): approx. 9 x 5 cm.

Type	PK	Cat. No.
Cleaning scraper, PP/wood	1	**9.190 946**

2



2 Stirring rods, AR- clear soda glass

AR- clear soda glass. With flame-polished ends.

Length mm	Ext. diam. mm	PK	Cat. No.
200	3	10	**9.197 403**
150	4	10	**9.197 404**
200	4	10	**9.197 405**
150	5	10	**9.197 406**
200	5	10	**9.197 407**
150	6	10	**9.197 408**
200	6	10	**9.197 424**
250	6	10	**9.197 426**
300	7	10	**9.197 431**
300	8	10	**9.197 433**
300	9	10	**9.197 435**

3



3 Disposable stirrer, PS

PS. Stem diameter 3mm. *BRAND*
With one round end and one spatula-shaped end.

Length mm	PK	Cat. No.
120	500	**9.409 501**

4



4 Deflagrating spoon

Steel. Cup 18mm diameter, shaft 450mm. *Juchheim Laborgeräte*

Stem diam. mm	PK	Cat. No.
3	1	**9.150 530**

5



5 Scissors dissecting, stainless steel

Excellent grade polished stainless steel with fine sharps points and close shanks.
Available as 2 types:
- straight body form
- curved body form

Type	Length mm	PK	Cat. No.
straight body form	130	1	**6.236 264**
curved body form	130	1	**9.204 222**

6



6 LLG-Scissors general purpose, stainless steel

Excellent grade polished stainless steel with straight form and close shanks.
Available as 3 types:
- sharp/sharp points
- blunt/blunt points
- sharp/blunt points

Type	Length mm	PK	Cat. No.
sharp - sharp	130	1	**6.237 703**
sharp - sharp	160	1	**9.204 231**
blunt - sharp	130	1	**9.204 232**
blunt - sharp	160	1	**9.204 233**
blunt - blunt	130	1	**9.204 234**
blunt - blunt	160	1	**9.204 235**

1 Surgical scissors, stainless steel

Straight, closed shanks. Point/blunt.

Length mm	PK	Cat. No.
130	1	**9.204 220**



2 Surgical scissors, sharp points, stainless steel

Fine-polished finish.
Closed shanks with fine sharp points, curved or straight, as outlined below.

Type	Length mm	PK	Cat. No.
Straight	105	1	**9.204 206**
Curved	105	1	**9.204 207**



Universal scissors, stainless steel, polished

NEW!

All purpose scissors for use in the office and at home. Produced from stainless steel. Sharp blades for accurate cutting. Ergonomic designed handles made from ABS material feature soft-grip insert. Supplied on try-me card.
Colour: black/red
- stainless steel, polished
- special grinding for precise cuts
- ergonomic handles

Description	Length mm	PK	Cat. No.
Universal scissor	140	1	**9.160 651** 3
Universal scissor, acuate	160	1	**9.160 652** 4
Universal scissor	210	1	**9.160 653** 5
Universal scissor	255	1	**9.160 654** 6

3



9.160 651

4



9.160 652

5



9.160 653

6



9.160 654

7 Heavy Duty Scissor, stainless steel, black

NEW!

Stainless steel blades and large comfortable black ABS handles. Suitable for cutting tougher materials.
Features integral groove center for opening corks from bottles, nutcracker, bottle opener, etc. Supplied on try-me card.

Description	Length mm	PK	Cat. No.
Universal scissor	215	1	**9.160 655**

7



Scissors, stainless steel

Description	Length mm	PK	Cat. No.	
Utility scissors	130	1	**4.008 515**	1
Utility scissors	160	1	**4.008 516**	2
Utility scissors	200	1	**4.008 517**	3

1



4.008 515

2



4.008 516

3



4.008 517

4



4 Paper-cutting scissors, stainless steel

Bochem

Length mm	Length*	PK	Cat. No.
250	135	1	**9.204 325**

*blade length (mm)

5



9.160 656

6



9.160 658

7



9.160 657

8



9.160 659

Allround Cutter

NEW!

Werner Dorsch

An easy and comfortable handling is ensured by the ergonomically shaped and rubberized grip zone. The break-off device is integrated into the grip section of the ABS plastic casing. Comes with a metal blade guide and auto-lock system. Both cutters will be delivered on blister cards including 2 spare cutting blades.

Type	PK	Cat. No.	
Allround Cutter 18 mm	1	**9.160 656**	5
Allround Cutter 9 mm	1	**9.160 657**	7
Replacment blade for Allround Cutter 18mm	1	**9.160 658**	6
Replacment blade for Allround Cutter 9mm	1	**9.160 659**	8

9



9.156 027

10



9.156 030

Cutter M 9

Small, handy pocket sized model with plastic handle and clip. With retractable blade and slotted cover for breaking off the blades safely. 13 break-off blades per knife. Barrel colour black. Replacement blades available.

Type	PK	Cat. No.	
Cutter	1	**9.156 027**	9
Spare blade for M 9	10	**9.156 030**	10

11



9.156 018

12



9.156 020

Cutter ML 18

For heavy use, with patented safety lock for blade-lock with one hand. With retractable blade and slotted cover for breaking off the blades safely. 8 break-off blades per knife. Barrel colour white. Replacement blades available.

Type	PK	Cat. No.	
Cutter	1	**9.156 018**	11
Spare blade for ML 18	10	**9.156 020**	12

1 Apollo blades



High-quality Swedish alloy steel. Standard quality.

Type	PK	Cat. No.
Apollo	5	**9.156 110**

2 Multi-purpose knife



With 3 blades.

Type	PK	Cat. No.
Multi-purpose knife	1	**9.160 001**

3 LLG-Multi-purpose tool



Blue anodised housing with stainless steel screws. Specifications: Needlenose Pliers, Wire Cutters, Wire Stripper, Knife, Saw Knife, Saw, Screwdriver, Crosshead Screwdriver, Bottle/Can Opener, File. Supplied completely with Nylon Belt Pouch. Dimensions: 100 x 45 x 20mm

Type	Weight g	PK	Cat. No.
LLG-Multi-purpose tool	230	1	**9.160 000**

4 Leatherman® Wingman Multi-Tool, Stainless Steel



Tools: Spring-action Needlenose Pliers, Spring-action Regular Pliers, Spring-action Wire, Cutters, 420HC Combo Knife, Package Opener, Wood/Metal File, thomann Scissors, Small Screwdriver, Medium Screwdriver, Phillips Screwdriver, Ruler (1.5 in), Bottle Opener, Can Opener, Wire Stripper, Features: Removeable Pocket Clip.
Measurements: 6.6cm (Blade Length), 9.7cm (Closed)

Type	Weight g	PK	Cat. No.
Leatherman® Wingman Multi-Tool	198	1	**9.159 996**

5 Universal slicer



Stainless steel. Sturdy with plastic coated handle. Persistard metal handle (inside). *Bochem*

Length mm	Blade length mm	PK	Cat. No.
190	40	1	**9.204 332**

6 Ceramic knife



Stainless. Non-magnetic. Heavy duty ceramic, metal-free blade. Specially for preparing samples in trace element analysis. Dishwasher safe. Blade length 120mm.

Type	PK	Cat. No.
Knife	1	**9.160 680**

1



1 Glass markers, diamond-tipped

Writing diamond for writing on glass. Available as a pen with retractable tip or mounted on a wooden handle.

Type	PK	Cat. No.
With wooden grip	1	**9.032 920**
Pen type	1	**9.032 930**

2



2 Glass marker pen

Pen design with tungsten carbide nib. For writing on glass, porcelain and plastic. *Bel-Art Products*

Type	PK	Cat. No.
Glass marker pen	1	**9.032 932**

3



3 Electro-diamond pen

For writing on specimen slides and for marking, labelling or engraving metal or plastic. The motor automatically switches on once the hand is in the writing position and switches off once the pen is horizontal again. The writing nib rotates rapidly allowing effortless engraving. The nib can be exchanged easily without the need for tools. The engraving is deep so that it will last indefinitely. Weight approx. 100g, finger grip approx. 15mm. Includes nib type A for glass, 1.5mm diameter. Other nib types are available as accessories.

Type	PK	Cat. No.
Electro-diamond pen	1	**9.032 940**

4



4 Nibs, for electro-diamond pen.

For electro-diamond pen. Supplied singly.

Type	For	PK	Cat. No.
A	Glass, 1.5 mm dia.	5	**9.032 945**
B	Hardened metal, 2.5 mm dia.	5	**9.032 946**

5



5 Hammer

DIN 1041, steel-forged hammer head, double bracketed with ash handle.

Weight g	PK	Cat. No.
300	1	**9.306 127**

6



6 Double open-ended spanner set

Chrome vanadium steel. Complies with DIN 3110.
Drop-forged, chromium-plated. Comprises of 8 spanners, 6mm to 22mm.

Type	PK	Cat. No.
Double open-ended spanner set	1	**9.306 021**

7



7 Combination spanner set

Chrome vanadium steel. Complies with DIN 3113. Comprises of 8 spanners, 8mm, 9mm, 10mm, 11mm, 13mm, 14mm, 17mm and 19mm.

Type	PK	Cat. No.
Combination spanner set	1	**9.306 105**

1 Precision engineer's set

With 1/4" square drive, 36-piece set. Includes 4mm - 13mm sockets, screwdriver bits with square drive for slotted, Phillips, TORX (with frontal hole) and Allen sockets as well as 1.25mm - 1.5mm - 2.0mm - 2.5mm and 3mm angled Allen keys.

Type	PK	Cat. No.
PROXXON 23080	1	**9.306 121**

1



2 Automotive and universal tool set

12 piece ring/open end spanner set: 1 piece each in sizes 6mm to 15mm, 17mm and 19mm. Knipex 180mm combination pliers. Knipex 240mm water pump pliers. FLEX-DOT screwdriver set: 1 slotted screwdriver each in sizes 8.0 x 1.2mm - 5.5 x 1.0mm and 3.0 x 0.5mm. 1 Phillips screwdriver, size 2. Including two stubby screwdrivers: 1 size 2 Phillips screwdriver and 1 slotted screwdriver 5.5 x 1.0mm. Automotive light tester with cable and crocodile clip (for automotive electrical systems only).

Sockets, sizes 8mm - 10mm - 12mm - 13mm - 14mm - 15mm - 17mm - 19mm - 22mm and 24mm. Reversible ratchet. Universal joint. 1 each 125mm and 250mm extensions. Long T-handle with slide (for loosening wheel nuts). Special 16mm and 21mm spark plug sockets with ball head on longer side. Pocket Allen key set (8 piece set) from 1.5 - 8.0mm. PROXXON ball-peen hammer (300g), ground on all sides and partially polished. With inseparable graphite handle (fibre-glass reinforced, non-slip soft coating in grip area) for unparalleled vibration damping.

Type	PK	Cat. No.
PROXXON 23650	1	**9.306 125**

2



3 Screwdriver set

Hardened, chrome vanadium molybdenum steel. With impact-resistant, cadmium-free, plastic handles. Insulated in accordance with VDE 0680/2, 1000V, 7 screwdrivers.

4 VDE screwdriver:	2.5 x 80/3.5 x 100/4 x 100/5.5 x 125mm
2 VDE Phillips screwdriver:	PH1 x 80/PH2 x 100mm
1 Voltage detector	

Type	PK	Cat. No.
Wera 160i/7	1	**9.306 107**

3



4 Allen key set

8 piece, 2-10mm.
In shock-resistant plastic case with clear, sliding lid.

Type	PK	Cat. No.
Wiha 351	1	**6.206 421**

4



1



1 Electronics screwdriver set with rack

NEW!

6-piece screwdriver set consisting of:
4 flat screwdrivers: 2.5mm/3.0mm/3.5mm/4.0mm
2 PH screwdrivers: Size 0 and 1

Hülden

Type	PK	Cat. No.
Electronics screwdriver set with rack	1	**9.210 143**

2



2 Side cutting pliers

Type 7001. DIN 5238 B. ISO 5749. For hard and soft wire. Inductively hardened precision cutting edges. Cutting hardness approx. 62 HRC. Plastic coated handles.

Length mm	PK	Cat. No.
180	1	**9.306 111**

3



3 Water pump pliers

Chrome vanadium steel. Form D. With locking groove and glide adjustment. Inductively hardened toothed grips.
6 position jaw opening.

Length mm	PK	Cat. No.
250	1	**9.306 115**

4



4 Combination pliers

Tool steel. Light design. DIN ISO 6746. For cutting hard and soft wire. Long cutting edges for thicker cable. Inductively hardened cutting edges. Cutting hardness 60 HRC. Plastic coated handle grips.

Length mm	PK	Cat. No.
180	1	**9.306 117**

5



5 Vernier calliper gauge, digital

Stainless steel, with 5 digit LCD display. Accuracy ±0.03mm, resolution 0.01mm.
Switchable between metric/imperial.

Bochem

Type	Length mm	PK	Cat. No.
Digital	150	1	**9.204 610**

6



6 LLG-Torch

Sturdy torch with 12 energy saving LED lights for ultra-bright light. Made from metal with practical hand strap incl. 3 x 1.5V AAA batteries.

Dimensions (Dia. x L): 30 x 120mm

Type	PK	Cat. No.
LLG-Torch	1	**9.961 000**

1 TRIZETTE®

NEW!

Werner Dorsch

The extra bright LED light can be switched on when needed. The plastic lens has a size of approx. 3.2 cm and features a 4-fold magnification. Delivery with 3 button cell batteries (LR44). Size: approx. 14 x 4 x 2 cm, weight: 27 g

Description	PK	Cat. No.
TRIZETTE®	1	**9.160 660**

1



2 LLG-Forceps, 18/10 steel

Sprung flutes.

Length mm	Type	PK	Cat. No.
105	blunt-straight	1	**4.008 471**
115	blunt-straight	1	**4.008 472**
130	blunt-straight	1	**4.008 473**
145	blunt-straight	1	**6.255 826**
160	blunt-straight	1	**4.008 474**
200	blunt-straight	1	**4.008 475**
250	blunt-straight	1	**4.008 476**
300	blunt-straight	1	**4.008 477**
115	blunt-straight, with tooth	1	**4.008 478**
130	blunt-straight, with tooth	1	**4.008 479**
145	blunt-straight, with tooth	1	**4.008 480**
160	blunt-straight, with tooth	1	**4.008 481**

2



3 LLG-Dissecting forceps, stainless steel 420

Manufactured from premium grade polished stainless steel with fine sharp points and sprung flutes.
Available as 2 types:
- straight body form
- curved body form

Length mm	Type	PK	Cat. No.
105	sharp - straight	1	**4.008 482**
115	sharp - straight	1	**9.171 121**
130	sharp - straight	1	**9.171 122**
150	sharp - straight	1	**9.171 123**
160	sharp - straight	1	**4.008 483**
200	sharp - straight	1	**4.008 484**
105	sharp - curved	1	**4.008 485**
115	sharp - curved	1	**9.171 124**
130	sharp - curved	1	**6.236 683**

3



4 Tissue forceps, 18/10 steel

With tooth grips 1:2.

Length mm	PK	Cat. No.
115	1	**9.171 311**
130	1	**9.171 313**
145	1	**9.171 314**
160	1	**9.171 316**

4



1



1 Forceps, curved end, stainless steel

Remanit® 4301, with sharp ends, angled.

Length mm	PK	Cat. No.
105	1	**7.637 274**
115	1	**9.171 211**
130	1	**9.171 213**
145	1	**9.171 214**
160	1	**9.171 215**
200	1	**9.171 217**

2



9.160 130

3



9.160 135

Forceps, fine, 18/10 steel

Non-magnetic. Extra fine ends, without grooves.

Length mm	Type	PK	Cat. No.
105	Straight	1	**9.160 130** 2
105	Curved	1	**9.160 135** 3

4



4 Forceps, curved end, 18/10 steel

Stainless 18/10 steel. Curved ends with sharp tips.

Length mm	PK	Cat. No.
115	1	**9.171 221**
130	1	**9.171 223**
145	1	**9.171 224**
160	1	**9.171 225**

5



9.160 125

6



9.160 127

7



9.160 128

High Precision Forceps

NEW!

Swiss made. Stainless steel. Electro-polished surface. Precision made. Very fine tips as outlined below.

Ideal-tek S.A.

Type	Length mm	Width Tip mm	Thickness mm	PK	Cat. No.
Angled 45°	110	0.10	0.06	1	**9.160 125** 5
Angled 90°	110	0.10	0.06	1	**9.160 126**
Straight	110	0.10	0.06	1	**9.160 127** 6
Curved	115	0.17	0.10	1	**9.160 128** 7
Straight	135	0.10	0.06	1	**9.160 129**

8



9.160 187

9



9.160 188

Gerald micro forceps, stainless steel

Dressing foreceps, 175mm long

Length mm	Form	PK	Cat. No.
175	straight points	1	**9.160 187** 8
175	curved points	1	**9.160 188** 9

10



10 LLG-Cover glass forceps, self-locking, stainless steel

Stainless steel 4301

Length mm	Form	PK	Cat. No.
105	Straight	1	**9.160 380**
105	Curved	1	**9.160 381**

E & OE.

1 LLG-Cover glass forceps, type Kühne, stainless steel

Stainless steel 4301

Length mm	Form	PK	Cat. No.
115	Curved	1	**9.160 386**
130	Curved	1	**9.160 387**
145	Curved	1	**9.160 388**
115	Straight	1	**9.160 391**
130	Straight	1	**9.160 392**
145	Straight	1	**9.160 393**



Cover glass forceps, stainless 18/10 steel

With flattened ends, straight or curved as outlined below. Points 6mm wide.

Length mm	Form	PK	Cat. No.
105	straight	1	**9.160 205** 2
105	curved	1	**9.160 210** 3



9.160 205



9.160 210

Further forceps please see page 1071.

4 Forceps, PMP

White. Polymethylpentene (PMP). Elastic. With pointed ends. Comfortable to use. Self-sprung. Autoclavable (121°C).

Length mm	PK	Cat. No.
115	1	**9.171 411**
145	1	**9.171 414**



5 Forceps, POM

Polyoxymethylene(POM). Yellow. Glass-fibre reinforced POM. With blunt, rounded tips. Flexible. Non-conductive.

Length mm	PK	Cat. No.
115	1	**7.009 045**
145	1	**7.009 046**
180	1	**9.171 418**
250	1	**9.171 425**



6 LLG-Measuring scoops, PE-HD

NEW!

For heavy industrial use. Suitable for foodstuff.

Length mm	Capacity ml	PK	Cat. No.
25	250	1	**9.201 091**
30	500	1	**9.201 092**
35	1000	1	**6.240 471**
40	1500	1	**9.201 093**





1 Measuring scoops, PE-HD

Natural colouring. Conical in shape with tapered filling edge.
Food-safe product according to EC Directive No. 10/2011.

VITLAB

Capacity ml	Length mm	PK	Cat. No.
15	115	1	**7.008 959**
25	135	1	**7.008 960**
65	185	1	**7.008 961**
110	215	1	**7.008 962**
150	250	1	**9.201 025**
350	310	1	**9.201 030**
750	350	1	**9.201 035**
1250	400	1	**9.201 040**



2 Measuring scoops, PP

White measuring scoops which are also suitable as weighing scoops. With precision formed filling edge and comfortable, stable handle.
Easily readable volume quantities on the upper side of the handle.
Food-safe products according to EC Directive No. 10/2011.

VITLAB

Capacity ml	Length mm	PK	Cat. No.
2	60	1	**9.201 052**
5	82	1	**9.201 053**
10	100	1	**9.201 055**
25	135	1	**9.201 057**
50	160	1	**9.201 058**
100	200	1	**9.201 059**
250	260	1	**9.201 061**
500	315	1	**9.201 062**
1000	385	1	**9.201 065**



3 Scoops, Aluminium

Schröder

Length mm	PK	Cat. No.
135	1	**9.201 113**
185	1	**9.201 118**
210	1	**9.201 121**
250	1	**9.201 125**
265	1	**9.201 126**
310	1	**9.201 131**
350	1	**9.201 135**
400	1	**9.201 140**
430	1	**9.201 143**



4 Scoops, stainless steel

Remanit® 4301

RSG

Length mm	Diam. mm	Length*	PK	Cat. No.
190	50	100	1	**9.201 219**
250	75	150	1	**9.201 222**
310	105	200	1	**9.201 232**
350	120	240	1	**9.201 235**
365	150	250	1	**6.080 286**

* Length Scoop (mm)

Sampling products please see page 514

Sterile spoons please see page 518

E & OE.

1 Bunsen burner, portable Labogaz® 206

For operation with gas cartridge C 206 (Cat.-No.: 9.018 520). DVGW-authorised.
Weight: 380g without cartridge
Height: 200mm with cartridge
Consumption: 55g/h

Type	PK	Cat. No.
Labogaz® 206	1	**9.018 510**

1



2 Bunsen burner, portable, Labogaz® 470

For operation with gas cartridges CV 300 Plus (Cat.-No.: 6.243 905) or CV 470 Plus (Cat.-No.: 9.018 512).
Weight: 380g without cartridge
Height: 190mm with cartridge

Type	PK	Cat. No.
Labogaz® 470	1	**9.018 511**

2



3 Blowlamp Soudogaz® X 2000/X 2000 PZ

High performance multi-purpose blowlamp with a high quality brass burner. Metallic cartridge cover with plastic screw-on base for easy cartridge insertion. To use with cartridge C 206.

Weight: 380g without cartridge
Consumption: 120g/h
Flame temperature: approx. 1750°C

Type	PK	Cat. No.
Soudogaz® X 2000 without piezo ignition	1	**9.018 540**
Soudogaz® X 2000 PZ with piezo ignition	1	**9.018 539**

3



4 Blowlamp PT 2000

Sturdy brass body and burner with fine flame adjustment for soft and hard soldering. Polypropylene shock-resistant, ergonomic handle. To use with cartridge C 206.
Weight: 380g without cartridge
Consumption: 120g/h
Flame temperature: 1750°C

Type	PK	Cat. No.
Blowtorch PT 2000	1	**9.018 547**

4





Gas cartridges

C 206 pierceable cartridge
Without safety valve. For bunsen burners Labogaz® 206 and Soudogaz blow torches.
CV470 Plus and CV 300 Plus valve cartridge
With safety valve. For bunsen burner Labogaz® 470.
CV 360 valve cartridge
With safety valve. For gas-safety burner schuett phoenix (Cat.-No. 9.018 770).

Safety valve allows removal of partially used valve gas cartidges.

Type	Capacity g	Height mm	Description	PK	Cat. No.
C 206	190	90	Gas ratio 80/20 Butane/Propane	1	**9.018 520** 1
CV 300 Plus	240	105	Gas ratio 80/20 Butane/Propane	1	**6.243 905** 2
CV 470 Plus	450	140	Gas ratio 80/20 Butane/Propane	1	**9.018 512** 3
CV 360	52	140	Butane	1	**9.018 519** 4

1


9.018 520

2


6.243 905

3


9.018 512

4

9.018 519

Gas cartridge

220g/400ml. With safety valve. Provides approx. 3 hours use.

Type	PK	Cat. No.
Gas cartridge	1	**9.018 364**

5


5 Spirit burner

18/10 steel. With wick height adjuster and sealing cap. Capacity approx. 60ml.

Type	PK	Cat. No.
Spirit burner	1	**9.018 560**

6

9.018 549

Spirit lamp

Soda-lime glass. Flat conical form. With ground on cover. Without filling inlet, without wick or nozzle (please order separately). Capacity 100ml.

Type	PK	Cat. No.
Without filler inlet	1	**9.018 549** 6
Wick	1	**9.018 553**
Nozzle	1	**9.018 554**

7


7 Teclu burner

Nickel-plated brass and steel. DIN 30665. max. 1300°C, with needle valve, air regulator and pilot light. *Bochem*

Height mm	Rating kW	Type	PK	Cat. No.
180	1.53	Natural	1	**9.018 377**
180	2.36	Propane	1	**9.018 378**

E & OE.

1 Safety burner

Maximum temperature 1300°C, with needle valve, **thermo safety element** (bimetallic flame sensor with magnetic lock), air regulator and pilot light. Nickel-plated brass and steel. *Bochem*

Height mm	Rating kW	Type	PK	Cat. No.
180	1.53	Natural gas	1	**9.018 388**
180	2.36	Propane	1	**9.018 389**

1



2 Bunsen burner

With needle valve DIN 30665.
Air regulation, pilot flame, max. 1300°C. *Bochem*

Height mm	Rating kW	Type	PK	Cat. No.
160	1.53	Natural gas	1	**6.076 257**
160	2.36	Propane	1	**6.088 530**

2



3 Teclu burners

Teclu burner with stopcock and pilot flame DIN (NG-2411 BO0033) *Juchheim Laborgeräte*

Height mm	Weight g	Description	PK	Cat. No.
165	360	for natural gas	1	**9.018 311**
165	360	for propane gas	1	**9.018 312**

3



4 Teclu burners

Teclu safety burner with needle stopping valve and thermofeeler with safety valve on heavy plate shaped base. *Juchheim Laborgeräte*

Height mm	Weight g	Description	PK	Cat. No.
200	685	for natural gas	1	**6.056 812**
200	685	for propane gas	1	**6.072 042**

4



5 Rubber sucker base for Juchheim laboratory burner

Juchheim Laborgeräte

Description	PK	Cat. No.
Rubber sucker base for Juchheim laboratory burner	1	**9.018 315**

5



6 Bunsen burners

Bunsen burner with needle valve and pilot flame DIN (NG-2411 BO0031). *Juchheim Laborgeräte*

Height mm	Weight g	Description	PK	Cat. No.
150	300	for natural gas	1	**9.018 313**
150	300	for propane gas	1	**9.018 314**

6



Gas safety tubing please see page 137

1



1 Teclu burners

Teclu burner with needle valve DVGW-Nr. NG-2411BO0033. *Juchheim Laborgeräte*

Height mm	Weight g	Description	PK	Cat. No.
150	325	for propane gas	1	**6.236 456**
150	325	for natural gas	1	**9.018 310**

2



2 Bunsen burners

Bunsen burner with stopcock and pilot flame DIN (NG-2411 BO0032) *Juchheim Laborgeräte*

Height mm	Weight g	Description	PK	Cat. No.
155	315	for natural gas	1	**9.018 318**
155	315	for propane gas	1	**9.018 319**

3



3 Bunsen burners

Bunsen burner with needle valve DIN (NG-2411 BO0031). *Juchheim Laborgeräte*

Height mm	Weight g	Description	PK	Cat. No.
150	320	for natural gas	1	**9.018 316**
150	320	for propane gas	1	**9.018 317**

4



4 Bunsen burners with air regulator and needle valve

With air regulator and needle gas valve.

Height mm	Type	PK	Cat. No.
160	Universal burner	1	**9.018 294**
	Rubber sucker base	1	**9.018 360**

5



5 Multi gas burner Teclu

With stopcock.
Air regulation, max. 1300°C

Height mm	Rating kW	Type	PK	Cat. No.
160	0.5 - 3	Multi gas	1	**9.018 292**

6



6 Burner for cartridges

With needle gas valve and air regulator. Without cartridge.
Only for the gas cartridge 9.018 364.

Height mm	Type	PK	Cat. No.
136	Burner for cartridges, Teclu	1	**9.018 363**
136	Burner for cartridges, Bunsen	1	**9.018 370**

E & OE.

Safety Laboratory Gas Burners Fuego SCS series

NEW!

WLD-TEC

Suitable for all flame related applications in the laboratory. The low profile body facilitates ergonomic operation; the streamlined design reduces air flow disturbances in a clean room workbench. The Fuego SCS series can be operated with foot pedal, button function or touch free IR-Sensor. Made of stainless steel, with fireproof controls.

- SCS Safety Control System with gas safety cut off: Ignition and flame control, temperature monitor, automatic unit switch off, residual heat display, burner head assembly monitor.
- BHC Burner Head Control.
- Removable burner head.
- Tilt mechanism right/left.
- Turbo flame.
- Holding device for 3 inoculation loop holders.
- Nozzles for natural gas, propane/butane gas.
- Approved by DIN-DVGW, approval no. NG2211AS0167.
- Warranty: 2 years.

Fuego SCS basic/ Fuego SCS basic RF: With stainless steel foot pedal, button function, 3 standard programs (without IR-Sensor and graphic display). The foot pedal regulates the burning time either by continuous foot pressure or by start-stop function.

Fuego SCS basic RF: Features as Fuego SCS basic but enables wireless operation due to modern radio foot pedal.

Fuego SCS/Fuego SCS pro: with Double-Click IR-sensor, button function and foot pedal operation. (foot pedal optional). Double-Click IR-sensor: This adjustable safety function ensures that the burner can only be ignited by activating the IR-Sensor twice. Adjustable IR-sensor reaction distance: 5mm to 50mm.
Illuminated graphic display: The animated, self-explanatory and language-less symbol display facilitates a rapid selection of all functions. 6 standard-programs with count down display: 1sec to 2hrs selectable.
The first safety laboratory gas burner with comfort package: Cooling time reminder for inoculation loops, temperature regulation for heating media, gas consumption display for gas cartridges, flexible and individual by selecting user account, acoustic signals as operating aids.
Additional safety assistance: Zero-pressure shut off for a pressureless gas hose. Graphical installation instructions facilitate the initial start-up.

Fuego SCS pro: Features as Fuego SCS, plus battery operation (9hrs), 2 rechargeable batteries (Mignon AA), fast charge function (3hrs) and safety tilt sensor.

Additional accessories are available on request.

Specifications

Dimensions (WxDxH):	103 x 130 x 49mm
Power supply:	100-240V 50/60Hz
Weight:	700g

Type	PK	Cat. No.
Fuego SCS basic	1	**6.232 207** 1
Fuego SCS basic RF	1	**6.255 678**
Fuego SCS	1	**6.231 770** 2
Fuego SCS pro	1	**9.018 584**
Stainless steel foot pedal	1	**9.018 585**

1



6.232 207

2



6.231 770



1 schuett phoenix II Safety Bunsen Burner

schuett-biotec

For sterilising, heating, flame sterilising. Modern Bunsen burner with state-of-the-art safety features plus outstanding quality characteristics: Operating status, safety notes and warnings in written language for most international languages. Brilliant colour display. Unique Joy-Stick navigation. Operating modes: by hand or with foot pedal or motion sensor. Designed for use in microbiological safety cabinets and in the chemical laboratory.
Housing made of stainless steel and safety glass. UV- and solvent resistant. For case of cleaning and flame-sterilising. Suitable for use with natural gas (central gas) or butane/propane gas (gas cartridges).
"Push-and-Twist" bayonet fixture for burner head, no tools needed for cleaning. Integrated stand for tilting right or left. Flame timer adjustable from 1 seconds to 120mins. Safety standard acc. to DIN 30665 part 1, DIN-DVGW Reg.NG-2211AR0750.

3 models available:
schuett phoenix II eco
(with foot-switch) Start flame by foot-switch or button (On/Off). Best suited for use in microbiological safety cabinets. Best price to performance ratio.
schuett phoenix II standard
(brilliant colour display, selection of native language, sensor and foot- switch) Start/Stop flame by activating sensor 1x or 2x, use foot switch or press button by hand. Continuous display of timer.
schuett phoenix II accu
(brilliant colour display, selection of native language, sensor and built-in extra heavy duty power cells) Start/stop flame by activating sensor 1x or 2x, use foot-switch or press button by hand. Continuous display of timer and battery power. Operates for up to 30 hours, intermittent use.
Complete with battery charger for 3 hour recharging. Ideal for mobile usage.
Flame sterilization carousels semi- and fully automated
For precise and time-controlled flaming of different kinds of inoculating loops. Minimization of gas consumption, the life of the inoculating loops is significantly increased. The inoculating loop is placed into the carousel after use and is sterilized immediately after turning the holder in flaming position. Sterilization time infinitely adjustable. Designed for continuous work-flow with sample series in the Laminar Flow.
Semi-automated: schuett easyloop (for 6 Inoculating loop holders)
Comfortable manual rotation,fully automated flaming process. For use with Safety Bunsen Burners schuett phoenix II standard and accu.
Sterilization time: 3 to 5 s (adjustable from 1 s to 120 min)
Fully automated: schuett flammy R (for 5 Inoculating loop holders)
Fully automated rotation and inoculating. In combination with a standard gas-safety-burner (e.g. schuett phoenix II).
Sterilization time: 2 to 10 s

Type	Width mm	Depth mm	Height mm	Weight g	PK	Cat. No.
schuett phoenix II eco (Fig. b)	128	160	85	1000	1	**9.018 760**
schuett phoenix II standard (Fig. a)	128	160	85	1000	1	**9.018 761**
schuett phoenix II accu (Fig. a)	128	160	85	1000	1	**9.018 762**
schuett easyloop (Fig. g)	150	190	310	900	1	**9.018 798**
schuett flammy R	100	160	345	2000	1	**9.018 779**

Accessories for gas-safety burner schuett phoenix II

schuett-biotec

Type	PK	Cat. No.
Adapter for gas cartridges CV 360 incl. pressure reducer (Fig. f)	1	**7.930 139**
Adapter for gas cartridges C 206* (Fig. e)	1	**6.244 006**
Adapter for gas cartridges CV 270/300/470*	1	**6.240 475**
Adapter for gas cartridges CP 250*	1	**9.018 750**
Adapter for gas cartridges CG 1750*	1	**9.018 751**
Windshield, stainless steel (Fig. d)	1	**9.018 752**
Glass spatter guard (Fig. c)	1	**9.018 753**
Gas safety hose with threaded screw connections for propane/butane 0.5m	1	**9.018 754**
Gas safety hose with threaded screw connections for propane/butane 2.0m	1	**9.018 755**
Hot-Tray, stainless steel, height-optimized	1	**9.018 756**
Instrument tray	1	**9.018 758**
Foot-switch, stainless steel	1	**9.018 759**

* Incl. pressure regulator and 0.5m safety gas tubing.

E & OE.

1 Flame sterilizer schuett easyflame



Mobile and handy device for scarfing and flame-sterilising. *schuett-biotec*
With piezoelectric-ignition and gas supply control for producing a "soft" or a "sharp" flame. Infinite adjustment of the flame. Highest operational safety. In short-term use, the flame is activated as long as the push button is pressed. For continuous operation with lock key.

schuett easyflame to use with propane/butane gas, mobile, suitable with gas cartridges with 7/16" connection thread, e.g. CG 1750, Express 444, AT 2000.
Adapter for CV 360 gas cartridges optionally.

schuett easyflame^{plus} to use with natural gas, central gas supply in the lab available on request.

Specifications:

Dimensions (WxDxH):	260 x 90 x 60mm
Weight:	approx. 350g

Description	PK	Cat. No.
schuett easyflame	1	**9.018 794**
Holder for mobile sterilizer or cartridges	1	**6.240 421**

2 Infrared burner PowerCube IRB2



Laboratory heating device for the safe, rapid heating of large samples. Can be used anywhere, even where standard burners with an exposed flame cannot be used. *Bühler*

Advantages:
- Heats up quickly, constant heating
- No open flames, no soot, odourless
- Integral continuous electronic power adjustment between 0% and 100%.
- Casing safe to touch even when hot.
- Built-in casing handles for safe transport.
- Inert ceramic, long-life heating element.
- Built-in overheat monitor.
- Protection of electrical components against spilled liquids
- Additional side safety shield on burner element.
- Includes four-arm support for flat bottom containers. By using an accessory bracket the burner can be mounted on a tripod.

Accessories: bracketfor mounting the PowerCube into a tripod stand. With stainless steel rod approx. 13cm long.

Specifications:

Connector:	800W/230V
Dimensions (WxDxH):	150 x 150 x 170mm
Weight:	approx. 2.5kg
Max. temperature:	900°C
Heated area:	100 x 100mm

Type	PK	Cat. No.
PowerCube IRB 2. 800 W / 230 V	1	**9.018 699**

3 Accessories for Infrared burner PowerCube IRB2



Accessories: Tripod bracket for mounting the PowerCube into a tripod stand. With stainless steel rod approx. 13cm long. *Bühler*

Description	PK	Cat. No.
Tripod bracket	1	**9.018 698**

4 Hook clamp, for fixation of Support Material on PowerCube IRB2



Incl. screw connection. Material no. 4301.

Jaw opening mm	Angle	Thread	Description	PK	Cat. No.
13	90	M8	Nickel plated steel	1	**9.224 284**
13	90	M8	18/10 steel	1	**9.224 289**

1



1 Beaker tongs, with silicone-sleeved jaws

Withstand up to to +240°C. TÜV test mark. Arm length: 160mm.

Length mm	Jaw opening mm	PK	Cat. No.
300	50 to 100	1	**9.310 010**

2



2 Beaker tongs

Electro polished 18/10 steel wire frame with bowed strip-metal jaws and ceramic fibre jaw linings.

Length mm	Jaw opening mm	PK	Cat. No.
300	60 to 100	1	**9.310 016**

3



3 Beaker tongs, stainless steel

Beaker tong of 300mm length is made out of stainless steel. Insulated jaws are used to hold all types of beakers.

Isolab

Length mm	For	Temp. range °C	PK	Cat. No.
300	beakers volume up to 1000ml	120	1	**6.237 287**

4



4 Flask tongs, stainless steel

Stainless steel flask tong - 300mm length with insulated jaws, used to hold all types of flasks.

Isolab

Length mm	For	Temp. range °C	PK	Cat. No.
300	flasks volume up to 2000ml	120	1	**4.008 397**

5



5 Flask tongs

18/10 steel. Electro polished. Polyamide coated jaw clamps.

Length mm	Jaw opening mm	PK	Cat. No.
230	15 to 60	1	**9.310 025**

6



6 Crucible tongs, 18/10 steel

With bow and flutes.

Length mm	PK	Cat. No.
300	1	**4.008 441**

7



7 Crucible tongs

18/10 steel. With bow and gripping tips.

Length mm	PK	Cat. No.
160	1	**9.310 116**
200	1	**9.310 120**
220	1	**9.310 122**
250	1	**9.310 125**
300	1	**9.310 130**
400	1	**9.310 140**
500	1	**9.310 150**
600	1	**9.310 160**

8



8 Crucible tongs, PTFE-coated

18/10 steel. With bow, and 75mm long PTFE-coated tips.

Length mm	PK	Cat. No.
200	1	**9.310 285**
250	1	**9.310 290**

E & OE.

1 Bassin tongs, 18/10 steel



Length mm	PK	Cat. No.
300	1	**4.008 440**

2 Tripod stand

Zinc-plated steel. With circular top and flared legs.



Diam. mm	Height mm	PK	Cat. No.
100	180	1	**9.034 110**
120	210	1	**9.034 112**
120	250	1	**6.200 910**
140	220	1	**9.034 114**
160	230	1	**6.059 957**

3 Tripod stand

Chrome plated steel. Tripods are meant to be used in conjunction with wire gauze, triangles or a sand bath. *Isolab*



Diam. mm	Description	PK	Cat. No.
125	total height 200mm	1	**6.242 704**
125	adjustable height min 200mm/ max 250mm	1	**4.008 512**

Square Quadrupod

Nickel chromium steel. For glass ceramic laboratory plates. Dimensions as outlined below. *DURAN Group*

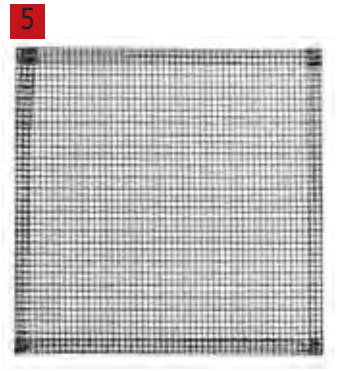


9.034 557

Width mm	Length mm	Height mm	PK	Cat. No.
135	135	220	1	**9.034 553**
155	155	220	1	**9.034 557** 4
175	175	220	1	**9.034 558**

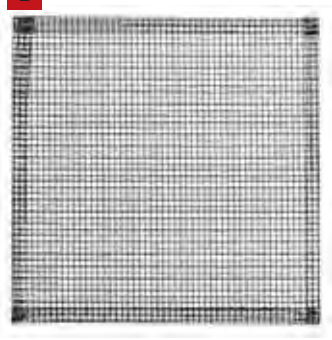
5 Wire gauzes

Plain, stainless steel wire with flanged edges. Mesh: 0.6mm x 2.0mm. Sizes as outlined below. *RSG*



Width mm	Length mm	PK	Cat. No.
115	115	1	**9.150 717**
135	135	1	**9.150 718**
155	155	1	**9.150 719**
175	175	1	**9.150 720**
195	195	1	**9.150 721**

1



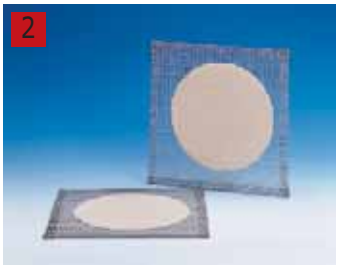
1 Wire gauzes

NEW!

Plain, stainless steel wire with heat resistant center, mesh: 0.6mm x 2.0mm *RSG*

Width mm	Length mm	PK	Cat. No.
135	135	1	**9.033 653**
155	155	1	**9.033 655**
175	175	1	**9.033 657**
195	195	1	**9.033 659**

2

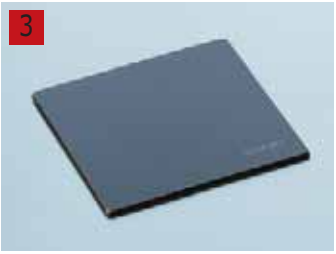


2 Wire gauzes

Steel wire with round ceramic centre. Sizes as outlined below.

Width mm	Length mm	PK	Cat. No.
120	120	1	**9.033 632**
160	160	1	**9.033 636**
200	200	1	**9.033 640**

3



3 Glass ceramic laboratory protection plate

Glass ceramic material with a smooth, pore-free surface. Chemically resistant and operates between -200°C and +700°C. Ideal for use as a bench protector or heating surface in place of a wire gauze or pipeclay triangle. *DURAN Group*

Width mm	Length mm	PK	Cat. No.
135	135	1	**9.034 253**
155	155	1	**9.034 257**
175	175	1	**9.034 258**

4



4 Triangle

Zinc-plated steel wire with pipeclay tubes. *Juchheim Laborgeräte*

Pipeclay tube Length mm	Weight g	PK	Cat. No.
40	16	1	**9.033 740**
50	33	1	**9.033 741**
60	38	1	**6.250 142**
100	58	1	**6.085 914**

5



5 Gas lighter

For all types of gas. Bow-shaped. With flint.

Type	PK	Cat. No.
Gas lighter	1	**9.018 801**
Flints	1	**9.018 805**

6



6 Piezoelectric gas lighter, Clipper

Piezoelectric.

Type	PK	Cat. No.
Piezoelectric gas lighter, Clipper	1	**9.018 820**

E & OE.

1 Gas safety tubing



Flexible connecting line of a rubber tubing with a contracted metal spiral and double-sided end sockets according to DVGW 5501(P). Kink resistant. For connecting between safety gas connection fitting according to DIN 3383-4 and gas burners for laboratories according to DIN 30665 section 1.
For all gases according to DVGW worksheet G 260, at pressures up to 100 mbar and temperatures up to 70°C. Installations according to DVGW-TRGI 2008 and DVGW worksheet G 621. DVGW Reg.-No. DG-4607AU2366. Sold only in specified lenght

Deutsch & Neumann

Length mm	PK	Cat. No.
500	1	**9.018 935**
600	1	**9.018 936**
750	1	**9.018 937**
1000	1	**9.018 940**
1250	1	**9.018 942**
1500	1	**9.018 945**
2000	1	**9.018 950**
3000	1	**9.018 960**

2 Tubing for gas burners

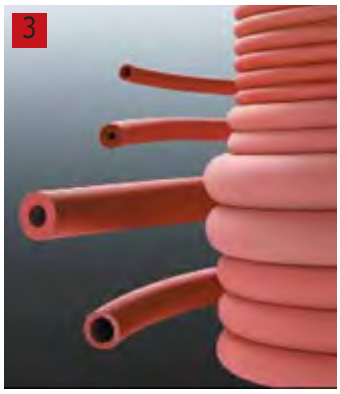


According to DIN 30664 section 1. Without reinforcement and jacket. Connecting line for connecting between safety gas connection fitting according to DIN 3383-4 and gas burners for laboratories according to DIN 30665 section 1.
For all gases according to DVGW worksheet G 260, at pressures up to 100 mbar and temperatures up to 70°C. Installations according to DVGW-TRGI 2008 and DVGW worksheet G 621. DVGW Reg.-No. NG-4607AU2366. Supplied per metre.

Deutsch & Neumann

Int. diam. mm	Wall thickness mm	PK	Cat. No.
10	2.00	1	**9.018 970**

3 Tubing

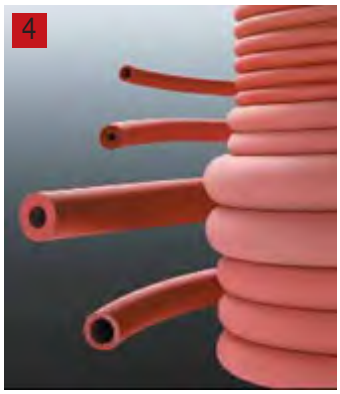


Red. Rubber (NR). Durometer 45 Shore A. Supplied per metre or in standard coils of 25m.

Deutsch & Neumann

Int. diam. mm	Wall thickness mm	PK	Cat. No.
2	1.00	1	**9.205 157**
3	1.00	1	**9.205 158**
3	1.50	1	**9.205 159**
4	1.00	1	**9.205 160**
4	1.50	1	**9.205 166**
5	1.50	1	**9.205 170**
5	2.00	1	**9.205 171**
6	1.50	1	**9.205 173**
6	2.00	1	**9.205 174**
7	1.50	1	**9.205 179**
7	2.00	1	**9.205 180**
8	2.00	1	**9.205 184**
9	2.00	1	**9.205 187**
10	2.00	1	**9.205 192**
12	2.50	1	**9.205 195**
18	3.00	1	**9.205 200**

4 Vacuum tubing, rubber



Red. Rubber (NR). Durometer 45 Shore A. Supplied per metre or standard coils of 25m.

Deutsch & Neumann

Int. diam. mm	Wall thickness mm	PK	Cat. No.
4	4.00	1	**9.205 804**
5	5.00	1	**9.205 805**
6	5.00	1	**9.205 806**
7	5.00	1	**9.205 807**
8	5.00	1	**9.205 808**
10	5.00	1	**9.205 809**



1 Viton Tubing

Supplied per metre. *Deutsch & Neumann*

- Fluoroelastomer Rubber (FPM), black
- Temperature range -10°C to over +200°C
- Good resistance to ozone and weathering, as well as benzine and mineral oil
- Durometer 75 Shore A

Int. diam. mm	Wall thickness mm	PK	Cat. No.
2	1.0	1	**9.205 745**
3	1.0	1	**9.205 758**
4	1.0	1	**9.205 765**
5	1.0	1	**9.205 769**
6	1.0	1	**9.205 772**
6	2.0	1	**9.205 774**
8	1.5	1	**9.205 782**
8	2.0	1	**9.205 784**
9	2.0	1	**9.205 787**
10	2.0	1	**9.205 792**



2 Tubing, silicone, Rausil FG

Suitable for food use, according to BfR (BgVV) and FDA§177.2600.
Supplied per metre or in standard coils of 50M. Durometer 60 Shore A.

Int. diam. mm	Wall thickness mm	PK	Cat. No.
1.00	1.0	1	**9.205 222**
1.50	1.0	1	**9.205 233**
2.00	1.0	1	**9.205 245**
2.00	2.0	1	**9.205 246**
3.00	1.0	1	**9.205 258**
3.00	1.5	1	**9.205 259**
3.00	2.0	1	**9.205 260**
4.00	1.0	1	**9.205 265**
4.00	1.5	1	**9.205 266**
5.00	1.0	1	**9.205 269**
5.00	1.5	1	**9.205 270**
6.00	1.5	1	**9.205 273**
6.00	2.0	1	**9.205 274**
7.00	1.5	1	**9.205 279**
7.00	2.0	1	**9.205 280**
8.00	1.5	1	**9.205 282**
8.00	2.0	1	**9.205 284**
9.00	2.0	1	**9.205 287**
10.00	2.0	1	**9.205 292**
12.00	2.0	1	**9.205 294**



3 Versilic silicone tubing

Pure silicone with high-grade properties. To Ph.Eur, DAB 10 and USP XXIII Class VI (biological tests). Suitable for food use to FDA, BGA and EU guidelines. Temperature range from -60 to +200°C (up to +220°C for short periods). Transparent to translucent. Shore strength 62 ±5. Density 1.16. Biologically neutral. Suitable in particular for use in biotechnology, fermentation or pharmaceutical production. Good physical properties such as suppleness, elasticity, flexibility, resistant to bending and tearing. Good recovery characteristics, with high fatigue resistance when twisted. Elongation at tear >300%.
Supplied per metre or in standard coils of 25m.

Int. diam. mm	Ext. diam. mm	Wall thickness mm	PK	Cat. No.
0.50	2.5	1.0	1	**9.205 300**
1.00	3.0	1.0	1	**9.205 301**
2.00	4.0	1.0	1	**9.205 302**
3.00	5.0	1.0	1	**9.205 303**
4.00	6.0	1.0	1	**9.205 304**
5.00	7.0	1.0	1	**9.205 305**
6.00	10.0	2.0	1	**9.205 275**
7.00	11.0	2.0	1	**9.205 306**
8.00	12.0	2.0	1	**9.205 285**
9.00	13.0	2.0	1	**9.205 307**
10.00	14.0	2.0	1	**9.205 308**
12.00	17.0	2.5	1	**9.205 309**

E & OE.

1 Fabric-reinforced PVC tubing

Transparent. Supplied per metre or in standard coils of 50M. PVC with terylene mesh reinforcement. Certificated by German TÜV with due regard to regulatory of DIN EN ISO 5774:2008. Proofed by BGVO directive 2002/72/EC bis 2008/39/EC for food contact. Durometer 77 Shore A.



Int. diam. mm	Thickness mm	PK	Cat. No.
6.00	3	1	**9.205 816**
8.00	3	1	**9.205 818**
10.00	3	1	**9.205 820**
12.50	3	1	**9.205 823**

2 PVC-Tubing

Approved by BGVO directive 2002/72/EC and 2008/39/EC for food contact. Approved by KTW-C directive - Germany Federal Environment Agency for use in cold water. *Kunststoffe Guttasyn*
Durometer 77 Shore A.
Price per metre.



Int. diam. mm	Thickness mm	PK	Cat. No.
2.00	1.00	1	**9.205 345**
3.00	1.00	1	**9.205 358**
3.00	1.50	1	**9.205 359**
4.00	1.00	1	**9.205 365**
4.00	1.50	1	**9.205 366**
5.00	1.00	1	**9.205 369**
5.00	1.50	1	**9.205 370**
6.00	1.00	1	**9.205 372**
6.00	1.50	1	**9.205 373**
6.00	2.00	1	**9.205 374**
7.00	1.50	1	**9.205 379**
7.00	2.00	1	**9.205 380**
8.00	1.50	1	**9.205 382**
8.00	2.00	1	**9.205 384**
9.00	1.50	1	**9.205 386**
9.00	2.00	1	**9.205 387**
10.00	2.00	1	**9.205 392**
12.00	2.00	1	**9.205 394**
15.00	2.00	1	**9.205 397**
18.00	2.00	1	**9.205 398**

3 Laboratory tubing Isoflex

Autoclavable PVC tubing, transparent and non-toxic, non ageing and non oxidising. Packed in PE bags. The tubing is marked every metre. Good resistance against strong acids and akalis, fair resistance against organic solvents.
Durometer 77 Shore A.
Supplied in 20M coil.



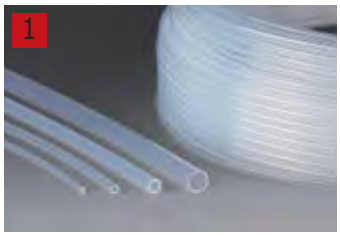
Int. diam. mm	Ext. diam. mm	Wall thickness mm	PK	Cat. No.
1	2.4	0.8	20	**9.205 142**
2	4.0	1.0	20	**9.205 143**
4	6.0	1.0	20	**9.205 144**
5	8.0	1.5	20	**9.205 145**
6	9.0	1.5	20	**9.205 146**
7	11.0	2.0	20	**9.205 147**
8	12.0	2.0	20	**9.205 148**
10	14.0	2.0	20	**9.205 149**
12	17.0	2.5	20	**9.205 150**

4 PE-Tubing

Durometer 45 Shore D. Price per meter.



Int. diam. mm	Wall thickness mm	PK	Cat. No.
2.00	0.40	1	**6.079 602**
2.00	1.00	1	**6.070 172**
8.00	1.00	1	**9.205 482**
8.00	1.50	1	**6.900 070**
9.00	2.00	1	**6.070 228**
10.00	2.00	1	**9.205 492**



1 Tubing, PFA

PFA fluorocarbon resin. Highly chemical resistant and temperature resistant up to +260°C. Supplied per metre. *BOLA*

Int. diam. mm	Ext. diam. mm	PK	Cat. No.
0.80	1.60	1	**9.205 824**
1.58	3.18	1	**9.205 825**
2.00	4.00	1	**9.205 827**
3.60	6.00	1	**9.205 826**
3.96	6.35	1	**9.205 829**
4.00	6.00	1	**9.205 830**
4.35	6.35	1	**9.205 831**
6.00	8.00	1	**9.205 833**
6.35	9.52	1	**9.205 834**
6.80	10.00	1	**9.205 835**
8.00	10.00	1	**9.205 836**
10.00	12.00	1	**9.205 839**



2 Flex tubing, PFA

Corrugated tubing with circular corrugations around the longitudinal axis and cylindrical tubing ends with a length of 40mm which can for example be connected directly to fittings, stopcocks or hose connectors. Together with BOLA Laboratory Screw Joints, the connection is tight and suitable for vacuum. *BOLA*

- highly flexible
- tight bending radius only causes little cross-section reduction
- non-porous
- translucent
- ideal for connections under vibrations
- usable with a small bending radius
- for compensation of thermal expansions
- for easy handling of liquids

Size NW	Int. diam. mm	Ext. diam. mm	Length m	PK	Cat. No.
8.0	6.00	8.0	0.50	1	**9.205 711**
10.0	8.00	10.0	0.50	1	**9.205 712**
13.0	10.00	12.0	0.50	1	**9.205 713**
14.0	12.00	14.0	0.50	1	**9.205 714**
8.0	6.00	8.0	1.00	1	**9.205 731**
10.0	8.00	10.0	1.00	1	**9.205 732**
13.0	10.00	12.0	1.00	1	**9.205 733**
14.0	12.00	14.0	1.00	1	**9.205 734**
16.0	14.00	16.0	1.00	1	**9.205 735**
10.0	8.00	10.0	2.50	1	**6.237 188**
13.0	10.00	12.0	2.50	1	**9.205 740**
10.0	8.00	10.0	0.25	1	**9.205 741**

Special lengths available on request



3 PTFE-Tubing

Highly chemical resistant and withstands temperatures from -200°C to +260°C. Supplied per metre. *BOLA*

Int. diam. mm	Ext. diam. mm	PK	Cat. No.
0.50	1.0	1	**9.205 608**
0.50	1.6	1	**9.205 609**
0.80	1.6	1	**9.205 616**
1.00	1.6	1	**9.205 619**
1.00	2.0	1	**9.205 621**
1.00	3.0	1	**6.070 190**
1.50	2.1	1	**9.205 630**
1.50	3.5	1	**9.205 633**
1.60	3.2	1	**9.205 634**
2.00	3.0	1	**9.205 644**
2.00	4.0	1	**9.205 645**
3.00	4.0	1	**9.205 657**
3.00	5.0	1	**9.205 658**
4.00	5.0	1	**9.205 663**
4.00	6.0	1	**9.205 665**
5.00	6.0	1	**9.205 668**
6.00	8.0	1	**9.205 672**
7.00	9.0	1	**9.205 678**
8.00	10.0	1	**9.205 680**
8.00	10.0	1	**7.210 036**
10.00	12.0	1	**9.205 691**

E & OE.

1 Iso-Versinic Tubing



Synthetic fluoroelastomer.
Chemically resistant to hydrocarbons (aromatic and aliphatic), oils, strong acids, oxidizing agents and chlorous solvents. Excellent resistance to abrasion and flexing. Good ozone and radiation protection. Impermeable to gas and steam. Shore A, hardness see table below. Density 1.9. Temperature range -20°C to +200°C (up to +300°C for short periods). Elongation at tear >250%. Suitable for transporting corrosive liquids.
Supplied per metre.

Int. diam. mm	Ext. diam. mm	Wall thickness mm	Shore	PK	Cat. No.
1	3	1.0	67	1	**9.205 700**
2	4	1.0	67	1	**9.205 701**
3	5	1.0	67	1	**9.205 702**
4	6	1.0	67	1	**9.205 703**
5	8	1.5	72	1	**9.205 704**
6	9	1.5	72	1	**9.205 705**
7	10	1.5	72	1	**9.205 706**
8	12	2.0	72	1	**9.205 707**
10	14	2.0	72	1	**9.205 708**
12	17	2.5	72	1	**9.205 709**

2 Norprene® tubing A 60 G



Black, Thermoplastic elastomer, Shore A 61. Temperature range -60 to +135°C. Suitable for use as tubing for peristaltic pumps. Very high endurance. Resistant to many aggressive chemicals. Heat and ozone resistant (does not turn brittle). Fills the performance gap between single elastomers (such as EPDM, chloroprene) and expensive polymers (viton, silicone).
Supplied per metre or in standard coils of 15m.

Int. diam. mm	Ext. diam. mm	Wall thickness mm	PK	Cat. No.
1.60	4.8	1.6	1	**9.206 941**
3.20	6.4	1.6	1	**9.206 944**
4.80	8.0	1.6	1	**9.206 951**
6.40	9.6	1.6	1	**9.206 956**
6.40	11.2	2.4	1	**9.206 957**
8.00	11.2	1.6	1	**9.206 961**
8.00	12.8	2.4	1	**9.206 962**
9.50	12.7	1.6	1	**9.206 967**
9.60	14.4	2.4	1	**9.206 968**
11.10	14.3	1.6	1	**9.206 973**
12.70	15.9	1.6	1	**9.206 976**
12.70	17.5	2.4	1	**9.206 977**

3 Tygon® tubing 3350



Silicone-platinum sanitary tubing, Shore A 50.
Temperature range -81 to +200°C. Very high-grade silicone tube with smooth inner surface. Ozone and UV resistant. High flexibility with good recovery characteristics. To FDA and USP Class VI, in accordance with ISO 10993.
Supplied in 15m coil.

Int. diam. mm	Ext. diam. mm	Wall thickness mm	PK	Cat. No.
3.20	6.4	1.6	15	**9.208 380**
4.80	8.0	1.6	15	**9.208 381**
6.40	9.6	1.6	15	**9.208 382**
6.40	11.1	2.4	15	**9.208 383**
8.00	12.7	2.4	15	**9.208 384**
9.50	12.7	1.6	15	**9.208 385**
12.70	15.9	1.6	15	**9.208 386**
12.70	17.5	2.4	15	**9.208 387**

4 Tygon® tubing ELFL



Transparent, flexible, Shore A 56.
Temperature range -54 to +74°C. Tygon tubing with the longest "Flex-Life" (lifespan) when used in peristatic pumps. To FDA/USP Class VI. Suitable for food, drinks or pharmaceutical applications. Resists ageing and non-toxic. Resistant to many chemicals.
Supplied in 7.5m coil.

Int. diam. mm	Ext. diam. mm	Wall thickness mm	PK	Cat. No.
1.60	4.8	6.0	7	**9.208 439**
3.20	6.4	6.0	7	**9.208 440**
4.80	8.0	6.0	7	**9.208 441**
6.40	9.6	6.0	7	**9.208 442**
8.00	11.2	6.0	7	**9.208 443**
9.50	15.9	3.2	7	**9.208 444**
12.70	19.1	3.2	7	**9.208 445**

1



1 Peristaltic pump tubing, Tygon R 3607

With 2 colour-coded bridges (international standards). ID 0.13 to 0.64 wall thickness: 0.9mm, ID 0.76 to 3.18 wall thickness: 0.85mm.
Shore: 55. Fits most common peristaltic pump models, e.g. Verder, Ismatec, Watson-Marlow, IKA and Heidolph. Standard tubing, transparent. Length 380mm. Long working lifespan. Good resistance to acids and alkalis. Suitable for general use and with food.

Int. diam. mm	Colour	PK	Cat. No.
0.13	orange-black	12	**9.208 201**
0.19	orange-red	12	**9.208 202**
0.25	orange-blue	12	**9.208 203**
0.38	oragne-green	12	**9.208 204**
0.51	orange-yellow	12	**9.208 205**
0.64	orange-white	12	**9.208 206**
0.76	black-black	12	**9.208 207**
0.89	orange-orange	12	**9.208 208**
1.02	white-white	12	**9.208 209**
1.14	red-red	12	**9.208 210**
1.30	grey-grey	12	**9.208 211**
1.42	yellow-yellow	12	**9.208 212**
1.52	yellow-blue	12	**9.208 219**
1.65	blue-blue	12	**9.208 213**
1.85	green-green	12	**9.208 214**
2.06	purple-purple	12	**9.208 215**
2.29	purple-black	12	**9.208 216**
2.54	purple-orange	12	**9.208 217**
2.79	purple-white	12	**9.208 218**
3.18	black-white	12	**9.208 222**

2



2 Flow indicators LaboPlast®

Bürkle

Gives a visual indication of liquid or gas flow in tubing. Operates in both directions and at any angle. Can accomodate flow rates down to approx. 150ml/min. Length incl. nozzle 88mm. For tubing from 6mm to 11mm diameter. Maximum pressure: 2 bar. Food Safe.
Choice of models:
- LiquiMobil made of SAN up to 30°C working temperature.
- CheMobil made of PMP up to 60°C working temperature, autoclavable good, chemically resistance.

Type	Colour	PK	Cat. No.
LiquiMobil/SAN	blue	1	**9.003 910**
LiquiMobil/SAN	red	1	**9.003 911**
LiquiMobil/SAN	black	1	**9.003 912**
CheMobil/ PMP	blue	1	**9.003 913**
CheMobil/ PMP	red	1	**9.003 901**
CheMobil/PMP	black	1	**9.003 914**

3



3 Tubing cutter

Bel-Art Products

Suitable for cutting tubing with external Ø from 1.6mm to 19mm. Length 76mm.

Type	PK	Cat. No.
Tubing cutter	1	**9.205 898**
Replacement blade	1	**9.205 899**

4



4 Rod and tubing cutter

Buddeberg

Suitable for all rubber tubing, even PTFE and fabric-reinforced tubing. Interchangeable blade.

Type	PK	Cat. No.
Cutter	1	**9.306 000**
Replacement blades	10	**9.306 001**

1 Glass tubing cutters

For glass tubing up to 30mm Ø. With interchangeable hard metal wheel.

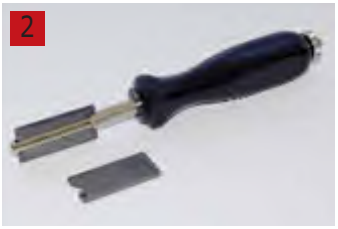
Type	PK	Cat. No.
Glass tubing cutter	1	**9.110 510**
Replacement roller	1	**9.110 511**



2 Glass cutting knife

With interchangeable blades made of metal.

Type	PK	Cat. No.
Glass cutting knife	1	**9.110 500**
Replacement blade	1	**9.110 501**



3 Laboratory threaded joints - GL 14/18/25

BOLA

Enables GL threads to clamp easily to fluoroplastic or thick-walled tubing made out of other plastics, glass or metal. (Ideally suited for connection with Bola GL fittings, Bola pressure valves, Bola GL taps and Bola GL ball valves).
The laboratory threaded joints consist of a red screw cap made of glass-fibre reinforced ETFE, a sealing disc and a tapered sealing ring made of PTFE, as well as a V-ring made of glass-fibre reinforced ETFE. This patented system withstands pressures up to approx. 10 bar, is suitable for a vacuum (at room temperature in the case of sizes 14 to GL25) and is easy to assemble without tools. The substance that passes through only comes in contact with PTFE.

Bola laboratory threaded joints can, for example, be used to hold probes (including stainless steel probes), sensors, laboratory taps, submerged tubes, thermometers or as a cable feed.



For external tube diam. mm	Neck thread GL	PK	Cat. No.
1.0	14	1	**9.209 802**
1.6	14	1	**9.209 803**
3.0	14	1	**9.209 806**
3.2	14	1	**9.209 807**
4.0	14	1	**9.209 808**
6.0	14	1	**9.209 809**
6.35	14	1	**9.209 810**
3.0	18	1	**9.209 816**
3.2	18	1	**9.209 817**
4.0	18	1	**9.209 818**
6.0	18	1	**9.209 819**
8.0	18	1	**9.209 820**
10.0	18	1	**9.209 821**
6.0	25	1	**9.209 839**
8.0	25	1	**9.209 840**
10.0	25	1	**9.209 841**
12.0	25	1	**9.209 842**

4 Screwthread connection caps HT (High Temp.)

BOLA

PPS (polyphenylene sulphide), reinforced with glassfibre, providing very high mechanical strength, even at temperatures up to +250°C. The contoured grip ensures secure closing and easy opening.

For thread size GL	Bore diam. mm	PK	Cat. No.
14	9	1	**9.209 115**
18	11	1	**9.209 119**
25	15	1	**9.209 126**
32	20	1	**9.209 133**
45	34	1	**9.209 136**





1 Keck adapters KA 14

Glass fibre reinforced thermoplastic polyester (PBT).
Melting point 225°C. Temperature and chemically resistant. For quick, secure, tight connection of tubing with glass screwthreads and ferrules.

For	Colour	PK	Cat. No.
Glass ferrule GL 14 complete	yellow	1	**9.208 931**
Glass ferrule RD 14 complete	red	1	**9.208 941**
Glass screwthread GL 14	yellow	1	**9.208 930**
Glass screwthread RD 14	red	1	**9.208 940**



2 Accessories for Keck adapter KA 14

Type	For	Colour	PK	Cat. No.
Tubing section with flat seal	9mm	blue	1	**9.208 935**
Screwthread cap	Glass screwthread GL 14	yellow	1	**9.208 932**
Screwthread cap	Glass screwthread RD 14	red	1	**9.208 942**
Clamping ring with 0-ring	Glass ferrules	yellow	1	**9.208 933**
Clamping ring with 0-ring	Glass ferrules	red	1	**9.208 943**
Coupling (PBT)	For connecting 2 tubing sections	-	1	**9.208 957**



3 GL fittings

BOLA

PTFE couplings with GL connector screwthread. Connect PTFE, PFA, FEP, glass and metal tubing. Fittings are chemical and temperature resistant to approx. 250°C. Can be used at working pressures of up to 10 bar when used in combination with Bola laboratory screwthread connections (at room temperature). A further advantage is that they can be used as expansion/reduction adapters to connect tubing of different diameters. For easy tubing connection we recommend accessory Bola laboratory screwthread connectors - please order separately.

Neck thread GL	Bore mm	PK	Cat. No.
14	6.5	1	**9.207 133**
18	10.5	1	**9.207 134**
25	14.5	1	**9.207 135**



9.209 851



9.209 852

Bottle distributors, PTFE

BOLA

With GL-threaded necks and screw caps. Suitable for GL45 threaded bottles. The distributors are ideal for decanting liquids, whereby the necks are connected either to a liquid source or to an excess pressure or vacuum system (up to 6mm max. tubing diameter). For hassle-free connection, we recommend the Bola threaded connector (please order separately) in accordance with the outer diameter of the tubing.

Type	Neck	PK	Cat. No.
PFA	2 x GL 14	1	**9.209 851** 4
PTFE	3 x GL 14	1	**9.209 852** 5
PTFE	3 x GL 18	1	**9.209 844**

E & OE.

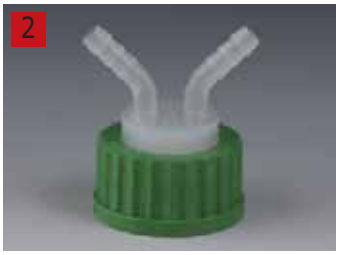
Flexible Distributors, PP

For connecting elastic tubing by simply slipping it onto hose connectors. Suitable for GL45 threaded bottles. With screw cap made of glass-fibre reinforced PP, ideal for transferring liquids or gases. The angled tubing connectors can be attached to a liquid source, a pressure source or a vacuum system. Avoid crimping of the tubing. The distributor can be loosened by simply turning the screw cap. The complete distribution system can then be fixed onto another bottle. *BOLA*

number of nozzles	For tubing bore mm	PK	Cat. No.
2	6 - 9	1	**7.634 892** 1
3	6 - 9	1	**9.209 858** 2
2	7 - 11	1	**9.209 859**



7.634 892



9.209 858

3 GL stopcocks, PTFE

Stopcocks with cylindrical taps and GL screwthread made of pure PTFE, giving almost total chemical resistance. Can be used at working pressures of up to 6 bar when used in combination with Bola laboratory screwthread connections (at room temperature).
A further advantage is that they can be used as expansion/reduction adapters to connect tubing of different diameters.
For easy tubing connection we recommend accessory Bola laboratory screwthread connectors - please order separately. *BOLA*

2-way construction.



Neck thread GL	Bore diam. mm	PK	Cat. No.
14	4	1	**9.207 153**
18	6	1	**9.207 154**
25	8	1	**9.207 155**

4 Stopcocks, PTFE

With 3-way GL screwthread connections. With L-shape key bore. *BOLA*

Neck thread GL	Bore diam. mm	PK	Cat. No.
14	4	1	**9.207 156**
18	6	1	**9.207 157**
25	6	1	**9.207 158**



5 Two-way valves Laboplast®

Resistant to compression max. 1 bar. *Bürkle*
- PVDF: excellent chemical resistance, transparent, suitable for food
- PP/PE: for industrial use, red/white
- Operating temperature: PVDF +0 up to +40°C, PP/PE +5 up to +40°C

For tubing bore mm	Valve bore mm	Material	PK	Cat. No.
5 to 7	4	PVDF	1	**9.116 771**
7 to 9	6	PVDF	1	**9.116 772**
9 to 11	8	PVDF	1	**9.116 773**
11 to 13	8	PVDF	1	**9.116 775**
5 to 7	4	PE / PP	1	**9.116 781**
7 to 9	6	PE / PP	1	**9.116 782**
9 to 11	8	PE / PP	1	**9.116 783**
11 to 13	8	PE / PP	1	**9.116 784**





1 Three-way valves Laboplast®

Bürkle

- Transparent, PVDF. Very high chemical resistance. Suitable for food use. Maximum pressure 1 bar.
- Red/white, PE/PP. Economical. For industrial use. Suitable for food use. Maximum pressure 1 bar.
- Operating temperature: PVDF +0°C up to +40°C, PP/PE +5°C up to +40°C.

For tubing bore mm	Valve bore mm	Material	PK	Cat. No.
5 to 7	4	PVDF	1	**9.116 776**
7 to 9	6	PVDF	1	**9.116 777**
9 to 11	8	PVDF	1	**9.116 778**
11 to 13	8	PVDF	1	**9.116 780**
5 to 7	4	PE / PP	1	**9.116 786**
7 to 9	6	PE / PP	1	**9.116 787**
9 to 11	8	PE / PP	1	**9.116 788**
11 to 13	8	PE / PP	1	**9.116 789**



2 Tubing connectors, PP

Transparent, PP. Straight,

BRAND

For tubing bore mm	Length mm	PK	Cat. No.
3 to 5	47	1	**9.207 163**
6 to 10	55	1	**9.207 165**
9 to 13	57	1	**9.207 168**



3 Tubing connectors, PP

Transparent, PP. Straight. Used to link tubing of different diameters.

BRAND

For tubing bore mm	Length mm	PK	Cat. No.
5 to 17	110	1	**9.207 270**



4 Tubing connectors, PP

Grey. PP. Straight.

Kartell

For tubing bore mm	Length mm	PK	Cat. No.
4 to 5	39	1	**9.207 221**
5 to 7	52	1	**9.207 222**
7 to 9	59	1	**9.207 223**
9 to 11	59	1	**9.207 224**
11 to 13	66	1	**9.207 225**
13 to 15	66	1	**9.207 226**



5 Tubing connectors, PP

PP. T- shape.

Kartell

For tubing bore mm	Length mm	PK	Cat. No.
3 - 4	20	1	**9.207 182**
4 - 5	30	1	**9.207 183**
6 - 7	40	1	**9.207 184**
8 - 9	55	1	**9.207 185**
10 - 11	69	1	**9.207 189**
12 - 13	79	1	**9.207 190**

1 Tubing connectors, PE-HD

PE-HD. Straight. *BRAND*

For tubing bore mm	Length mm	PK	Cat. No.
10 to 11	45	1	**9.207 167**
12 to 14	74	1	**9.207 169**
19 to 21	74	1	**9.207 174**
24 to 26	84	1	**9.207 179**



2 Plug tubing connectors, PE

PE. Comprising of two pull-apart sections, similar to conical ground joint. Not suitable for high pressure applications. *Kartell*

For tubing bore mm	Length mm	PK	Cat. No.
3 to 5	57	1	**9.207 261**
5 to 7	65	1	**9.207 262**
7 to 9	70	1	**9.207 263**
9 to 12	75	1	**9.207 264**
11 to 14	80	1	**9.207 265**



3 Reduction adapters/Reducing adapters, PP

Transparent , PP. *BRAND*

For tubing bore mm	Length mm	PK	Cat. No.
3 to 5 / 6 to 10	55	1	**9.207 336**
3 to 5 / 9 to 13	55	1	**9.207 338**
6 to 10 / 9 to 13	59	1	**9.207 340**



4 Non-return valves, PP

NEW!

Prevents water back-flow when pressure falls. Useful for any tubing system and vacuum line. Maximum safe working pressure:2 bar, minimum: 0.07 bar at room temperature (20°C). *Kartell*

Int. diam. mm	PK	Cat. No.
8-10	1	**9.303 028**
10-15	1	**9.303 029**



5 Reduction adapters/Reducing adapters, PE-HD

Transparent, PE-HD.

BRAND

For tubing bore mm	Length mm	PK	Cat. No.
8 to 10/11 to 14	66	1	**9.207 356**
12 to 14/18 to 20.5	73	1	**9.207 357**



6 GL fittings, PTFE

PTFE couplings with GL connector screwthread. Connect PTFE, PFA, FEP, glass and metal tubing. Fittings are chemical and temperature resistant to approx. 250°C. Can be used at working pressures of up to 10 bar when used in combination with Bola laboratory screwthread connections (at room temperature). A further advantage is that they can be used as expansion/reduction adapters to connect tubing of different diameters. For easy tubing connection we recommend accessory Bola Laboratory screwthread connectors which can be ordered separately. *BOLA*

Neck thread GL	Bore mm	PK	Cat. No.
14	6.5	1	**9.207 113**
18	10.5	1	**9.207 114**
25	14.5	1	**9.207 115**





1 Y - tubing connectors, PP

Transparent, PP. Y- shape.

Kartell

For tubing bore mm	Length mm	PK	Cat. No.
3 to 4	24	1	**9.207 200**
4 to 5	35	1	**9.207 203**
6 to 7	54	1	**9.207 205**
8 to 9	64	1	**9.207 207**
10 to 11	74	1	**9.207 208**
12 to 13	87	1	**9.207 210**



2 120° Y connectors, PP

Kartell

Diam. mm min./max.	Tubing i.d. mm	PK	Cat. No.
4/5/6	1.5	1	**9.207 231**
6/7/8	2.7	1	**9.207 232**
8/9/10	4.7	1	**9.207 233**
10/11/12	5.5	1	**9.207 234**
12/13/14	7.6	1	**9.207 235**
14/15/16	9.6	1	**9.207 236**



3 4 way connectors, PP

Kartell

Diam. mm	Tubing i.d. mm	PK	Cat. No.
3.5	1.5	1	**9.207 241**
6.0	2.7	1	**9.207 242**
8.0	4.6	1	**9.207 243**
10.0	7.0	1	**9.207 244**
12.0	8.0	1	**9.207 245**
13.5	9.5	1	**9.207 246**
15.0	11.6	1	**9.207 247**



4 L - tubing connectors, PP

Transparent, PP. L-shape.

Kartell

For tubing bore mm	Length mm	PK	Cat. No.
3 to 4	15	1	**9.207 251**
5	21	1	**9.207 252**
6 to 7	25	1	**9.207 253**
8 to 9	30	1	**9.207 254**
10 to 11	36	1	**9.207 255**
12 to 13	42	1	**9.207 256**
14 to 15	48	1	**9.207 257**



5 Tubing connectors, TPX

Type	For tubing bore mm	PK	Cat. No.
C-1, straight	3-5	1	**9.207 601**
C-2, straight	5-8	1	**9.207 602**
C-3, straight	8-10	1	**9.207 603**
Y-1, Y-shape	3-5	1	**9.207 611**
Y-2, Y-shape	5-8	1	**9.207 612**
Y-3, Y-shape	8-10	1	**9.207 613**
T-1, T-shape	3-5	1	**9.207 621**
T-2, T-shape	5-8	1	**9.207 622**
T-3, T-shape	8-10	1	**9.207 623**
E-1, reduction adapter	3-5 / 5-8	1	**9.207 631**
E-2, reduction adapter	5-8 / 8-13	1	**9.207 632**

1 Mini tubing connectors, PP



Type	For tubing bore mm	PK	Cat. No.
Straight, AA	1.6	1	**9.207 291**
Straight, DD	2.5	1	**9.207 292**
Straight, CC	3.2	1	**9.207 293**
Straight, 4040	4.0	1	**9.207 801**
T-shape, T10	1.6	1	**9.207 294**
T-shape, T20	2.5	1	**9.207 295**
T-shape, T30	3.2	1	**9.207 296**
T-shape, T40	4.0	1	**9.207 811**
T-shape, T50	5.0	1	**9.207 812**
T-shape, T60	6.5	1	**9.207 813**
L-shape, L10	1.6	1	**9.207 821**
L-shape, L20	2.5	1	**9.207 822**
L-shape, L30	3.2	1	**9.207 823**
Y-shape, Y210	1.6	1	**9.207 831**
Y-shape, Y220	2.5	1	**9.207 832**
Y-shape, Y230	3.2	1	**9.207 833**
Reduction adapter, AD	1.6 - 2.5	1	**9.207 297**
Reduction adapter, AC	1.6 - 3.2	1	**9.207 298**
Reduction adapter, 1040	1.6 - 4.0	1	**9.207 834**
Reduction adapter, 1050	1.6 - 5.0	1	**9.207 835**
Reduction adapter, DC	2.5 - 3.2	1	**9.207 299**
Reduction adapter, 2040	2.5 - 4.0	1	**9.207 841**
Reduction adapter, 2050	2.5 - 5.0	1	**9.207 842**
Reduction adapter, 3040	3.2 - 4.0	1	**9.207 843**
Reduction adapter, 3050	3.2 - 5.0	1	**9.207 844**
Reduction adapter, 3060	3.2 - 6.5	1	**9.207 845**
Reduction adapter, 4050	4.0 - 5.0	1	**9.207 846**
T-reduction adapter, T230/210	1 x 1.6, 2 x 3.2	1	**9.207 865**
T-reduction adapter, T230/220	1 x 2.5, 2 x 3.2	1	**9.207 866**
T-reduction adapter, T210/220	1 x 2.5, 2 x 1.6	1	**9.207 867**
T-reduction adapter, T220/230	1 x 3.2, 2 x 2.5	1	**9.207 869**
Straight, threaded, M6210	1.6	1	**9.207 871**
Straight, threaded, M6220	2.5	1	**9.207 872**
Straight, threaded, M6230	3.2	1	**9.207 873**
Straight, threaded, M6240	4.0	1	**9.207 874**
Straight, threaded, M6250	5.0	1	**9.207 875**

Other materials on request!

2 Non-return valves, PE-HD



PE-HD. FKM (Viton®) valve disc. Not suitable for pressure applications. *BRAND*

Int. diam. mm	Length mm	PK	Cat. No.
6 to 9	80	1	**9.303 039**

3 Dialysis tubing clips



Orange, PP. Suitable for RC standard membranes. Autoclavable.

Flat width mm	PK	Cat. No.
12	1	**9.206 734**
23	1	**9.206 735**
35	1	**9.206 736**
55	1	**9.206 737**
75	1	**9.206 738**

Further colours and clips for Biotech membranes available on request.

4 Mediclips



Robust PPF. For flat widths of dialysis tubing up to 40mm.

Type	PK	Cat. No.
Mediclips	1	**9.206 300**

1



1 Keck tubing clamps KT

Thermoplastic polyester (PBT). Continuous control of flow rate in tubing with just one finger.

For external tube diam. mm	Colour	PK	Cat. No.
4.5	red	1	**9.205 904**
6.0	yellow	1	**9.205 906**
10.0	blue	1	**9.205 910**
14.0	red	1	**9.205 914**

2



2 Tubing clamps, Acetal

Resistant to deformation and corrosion. *Bel-Art Products*

Mini-Clamp:
Single position on/off clamp. Use for thin-walled tubingwith outer diameter up to 4.7mm

Mid-Range Clamp:
Adjustable in 15 positions.
Suitable for tubing with outer diameter from 3.2mm to 11mm.

Maxi Clamp:
Adjustable in 12 positions.
Suitable for tubing with outer diameter up to 19mm

Description	PK	Cat. No.
Tubing clamp, mini	100	**6.301 574**
Tubing clamp, mid-range	12	**9.205 918**
Tubing clamp, maxi	6	**6.254 275**

3



3 Tubing clamp, Acetal

Clamp is molded of strong, durable plastic with serrated jaws 27mm long. Attach at any point on tubing without disconnecting tubing. Designed to be operated with one hand, the clamp locks closed and opens when the locking tab is released. *Bel-Art Products*

- Autoclavable
- One hand open and close operation
- For use on tubing with a wall thickness of 0.82mm or thinner
- When not in use, the circular opening (approximately 6 mm diameter) at hinge end allows clamp to remain attached to tubing having 6-10mm OD with little to no restriction in flow
- Overall length is 59mm

Type	PK	Cat. No.
Tubing clamp	12	**6.200 838**

4



5



4 5 Curved tubing clamps stop-it, PVDF

Stepless flow regulation. The micro setting screw allows very fine stepless flow control, the flow can also be shut off completely. The fully adjustable pressure plate squeezes the hose against the stable steel hook. The hose is compressed over a wide area in order to prevent it from being damaged. Easy-Click closure - Stopper can be opened and closed in any position - without tiresome screwing on and off. Stopper is with up to 160°C heat-resistant and chemical resistant plastic PVDF, the clamp is galvanised steel. Available in 3 sizes for hose diameters up to 20mm. *Bürkle*

Colour	To fit tubing mm	PK	Cat. No.
red	0.5 to 10	1	**9.303 775**
red	0.5 to 15	1	**9.303 776**
red	1.0 to 20	1	**9.303 777**
yellow	0.5 to 10	1	**9.303 778**
yellow	0.5 to 15	1	**9.303 779**
yellow	1.0 to 20	1	**9.303 780**
blue	0.5 to 10	1	**9.303 781**
blue	0.5 to 15	1	**9.303 782**
blue	1.0 to 20	1	**9.303 783**
green	0.5 to 10	1	**9.303 784**
green	0.5 to 15	1	**9.303 785**
green	1.0 to 20	1	**9.303 786**

Sample bags please see page 181.

1 2 Tubing clamps stop-it, Metall

Tubing clamps can regulate or stop the flow through of tubings that carry fluids or gases. Stepless flow regulation: The knurled screw allows very fine stepless flow control. The flow can also be shut off completely. The fully adjustable pressure plate squeezes the hose against the stable steel hook. The hose is compressed over a wide area, in order to prevent it from being damaged, stop-it can be mounted on hoses after they have been connected. stop-it metal is extremely heat resistant and robust due to the steel and aluminum. The hose clamp is available in four different sizes up to a maximum hose diameter of 30mm.

Bürkle


1


2

To fit tubing mm	PK	Cat. No.
0.5 to 10	1	**9.303 787**
0.8 to 15	1	**9.303 788**
1.1 to 20	1	**9.303 789**
2.5 to 30	1	**9.303 790**

3 Tubing clips, Mohr pattern

Nickel plated. Spring pinchclip.


3

Length mm	PK	Cat. No.
40	1	**9.180 040**
50	1	**9.180 050**
60	1	**9.180 060**
70	1	**9.180 070**
80	1	**9.180 080**

4 Tubing clips, Hofmann pattern

Brass nickel plated. Bottom hinged.


4

Clamping range mm	PK	Cat. No.
12	1	**9.180 112**
17	1	**9.180 117**
20	1	**9.180 120**
25	1	**9.180 125**
30	1	**9.180 130**
40	1	**9.180 140**
50	1	**9.180 142**

5 Tubing clips, Hofmann pattern

Brass/nickel. Extra strong. With wing nut closure. Bottom hinged.

Bochem


5

Clamping range mm	PK	Cat. No.
50	1	**9.180 150**

6 Tubing clamps

Pean pattern. Polished stainless steel. For clamping tubing.

Bochem


6

Length mm	PK	Cat. No.
140	1	**9.180 199**
160	1	**9.180 200**
180	1	**9.180 201**



1 Curved tubing clamps

Wilo. SK range. Steel. Large, plastic knurled nut with embedded brass screwthread insert which closes a metal bracket onto the curved tubing stirrup. Clamping range 10mm to 30mm. Temperature resistant up to 150°C.

Clamping range mm	Material	PK	Cat. No.
10	Knurled nut Aluminium	1	**9.180 210**
15	Knurled nut Moulded plastic	1	**9.180 215**
20	Knurled nut Moulded plastic	1	**9.180 220**
30	Knurled nut Moulded plastic	1	**9.180 230**



2 Nickel chromium steel clips

Hose clips, with hexagonal head.

Jaw opening mm	PK	Cat. No.
10 to 5.5	1	**9.207 510**
12 to 8.5	1	**9.207 512**
14 to 9.5	1	**9.207 514**
17 to 12.0	1	**9.207 517**
21 to 16.0	1	**9.207 521**
25 to 20.0	1	**9.207 525**
29 to 24.0	1	**9.207 529**



3 Worm drive tubing clamps

To DIN 3017. Chrome steel 1.4016. With galvanized, worm drive screw.

Jaw opening mm	Band-width nm	PK	Cat. No.
7 to 11	5.0	1	**9.207 435**
11 to 19	5.0	1	**9.207 436**
8 to 12	7.5	1	**9.207 437**
10 to 16	7.5	1	**9.207 439**
12 to 22	9.0	1	**9.207 440**
16 to 25	9.0	1	**9.207 445**
20 to 32	9.0	1	**9.207 452**
25 to 40	9.0	1	**9.207 460**
32 to 50	9.0	1	**9.207 465**
40 to 60	9.0	1	**6.241 130**



4 Herbie tubing clamps

Beetle nylon 6.6. Simple to assemble by pressing together without the need for tools. Quick to detach with side dislocation. Good chemical resistance. Temperature resistant from -40°C to +170°C. Longterm temperature 125°C, shortterm temperature 170°C.

Type	Jaw opening mm	PK	Cat. No.
AA	6.5 to 7.9	1	**9.207 707**
B	7.9 to 9.2	1	**9.207 708**
BB	9.2 to 10.3	1	**9.207 709**
C	10.2 to 11.8	1	**9.207 710**
D	12.0 to 13.8	1	**9.207 712**
E	13.1 to 15.1	1	**9.207 713**
F	15.0 to 17.1	1	**9.207 715**
G	16.9 to 19.1	1	**9.207 717**
H	18.1 to 20.6	1	**9.207 718**
I	20.3 to 23.0	1	**9.207 720**
K	22.2 to 24.9	1	**9.207 722**
L	24.5 to 27.6	1	**9.207 725**



5 Tubing clamps POM

Hose clips made of Polyacetal (POM). *Bürkle*

Jaw opening mm	PK	Cat. No.
6.0 to 6.5	10	**6.052 587**
9.0 to 10	10	**6.052 588**
10.0 to 11	10	**6.052 589**
11.0 to 12	10	**6.052 590**
12.0 to 14	10	**6.052 591**
13.0 to 15	10	**6.052 592**
15.0 to 17	10	**6.052 593**
17.0 to 19	10	**6.052 594**
18.0 to 20	10	**6.052 595**
20.0 to 22	10	**6.052 596**
23.0 to 25	10	**6.052 598**

E & OE.

1 Autoclavable adhesive Tape

Indicator adhesive tape with steam indicator, for steam sterilisation. The white stripes change colour to brown whilst being autoclaved (121°C and 134°C). Supplied in a roll of 50M, 19mm wide.

Type	PK	Cat. No.
Indicator adhesive tape	1	**9.140 784**



2 Dry-Heat Indicator Tape, Comply™

Lead free version available now. *3M Deutschland*
Semi-crepe paper. Self adhesive. Very good adhesion on various soft packagings. This chemical indicator tape is designed for use as packaging tape and for the immediate identification of items exposed to dry heat processing. Supplied in a roll of 55M.

Type	Width mm	PK	Cat. No.
Comply™	19	1	**9.140 783**



For more sterilization tapes see 1162.

3 Adhesive parcel tape tesapack® 4024

Strong, brown tape.

Width mm	Length m	PK	Cat. No.
50	66	1	**9.140 813**



4 Adhesive tape dispenser tesa® 6285

For sealing cardboard boxes, using accessory tesapack®, tesafilm® or tesakrepp® sealing materials.

Width mm	PK	Cat. No.
50	1	**9.140 817**





1



1 Adhesive label tape Write-on™, writable

Bel-Art Products

Specially coated plastic tape with adhesive backing. Makes labels of any length. Can be used with any pens. Excellent adhesion to glass, metal, PE etc. Resistant to humidity, as well as acids and alkali solutions in weak concentrations. Leaves no residue when removed.

Temperature resistance
up to +257°C: 30 min
up to +80°C: 24 h
Resistant to -80°C.

Colour	Width mm	Length m	PK	Cat. No.
White	12.7	36.6	1	**9.040 379**
White	19.0	36.6	1	**9.040 380**
White	25.4	36.6	1	**9.040 381**
White	12.7	54.9	1	**9.040 351**
White	19.0	54.9	1	**9.040 352**
White	25.4	54.9	1	**9.040 353**
Red	12.7	36.6	1	**9.040 336**
Red	19.0	36.6	1	**9.040 341**
Red	25.4	36.6	1	**9.040 346**
Yellow	12.7	36.6	1	**9.040 337**
Yellow	19.0	36.6	1	**9.040 342**
Yellow	25.4	36.6	1	**9.040 347**
Green	12.7	36.6	1	**9.040 338**
Green	19.0	36.6	1	**9.040 343**
Green	25.4	36.6	1	**9.040 348**
Blue	12.7	36.6	1	**9.040 339**
Blue	19.0	36.6	1	**9.040 344**
Blue	25.4	36.6	1	**9.040 349**
Orange	12.7	36.6	1	**9.040 340**
Orange	19.0	36.6	1	**9.040 345**
Orange	25.4	36.6	1	**9.040 350**

2



2 Adhesive tape dispenser Write-On™

Bel-Art Products

- For one roll Write-On™ adhesive tape
- With epoxy-coated steel writing platform
- Weighted base with non-skid pads prevents sliding or lifting
- 76mm core fits standard tape rolls up to 25mm wide and accepts tape rolls having a maximum diameter of 133mm
- accepts 36.6m as well as 54.9m rolls
- Dimensions of base is 213 x 87 x 95mm (w x d x h)
- Dimensions of writing platform 102 x 152mm

Type	PK	Cat. No.
Write-On™	1	**9.040 388**

3



3 Adhesive tape dispenser Write-On™ Economy

NEW!

Bel-Art Products

Provides a smooth writing surface, making labeling easy and fast. When marked tape is advanced and cut off on the serrated edge, a fresh length of label tape is positioned on the writing platform. Plastic cutting edge is moulded into the housing. Various widths and colours of tape rolls can be mixed together on the spindles, which accommodates 5 or more 12 to 19mm narrow rolls or 4 x 25mm wide rolls. Spindles are easily removed from the unit for loading and unloading and can be adjusted to hold either 25 or 75mm core diameter rolls.

- Includes three plastic separating discs to assure smooth, snag free dispensing for up to four rolls of tape (additional discs on request).
- Moulded-in pen holder wells on the dispenser help to keep writing instruments handy
- Ideal for use with the full line of Write-On™ Tapes, which are available in 6 colors and 3 widths.
- Includes mounting holes for secure attachment to a benchtop (screws not included). Can also be attached to vertical surfaces using Wall Mount Adapter

Dimensions (WxDxH): 302mm x 143mm x 121mm

Items supplied:
Write-On™ Economy: Adhesive tape dispenser incl. 1 roll of 12mm white Write-On™ Labeling Tape

Type	PK	Cat. No.
Write-On™ Economy	1	**9.040 389**

E & OE.

1 Adhesive tape for label protection

Clear, polyester tape. With special synthetic adhesive. Resistant to moisture and most solvents. Resistant to temperatures of -196 to +200°C (dry heat) and up to +121°C (steam sterilization). Excellent adhesion to glass, metal, PE etc. Supplied in rolls as outlined below. *Bel-Art Products*



Width mm	Length m	PK	Cat. No.
25	32.9	1	**9.040 425**
38	32.9	1	**9.040 438**
51	32.9	1	**9.040 450**

2 Label dispenser

For easy and quick dispencing of tape for safety labels and Bel-Art labels.



Type	PK	Cat. No.
Label dispenser	1	**9.040 550**

3 Adhesive labels

White, blank, self-adhesive labels. 75g/m² woodfree paper, with strong rubber adhesive coating. Smear-resistant, sheet size approx. 168 x 120mm. Packed in sturdy cardboard boxes. Label sizes and pack quantities as outlined below.



Width mm	Length mm	PK	Cat. No.
30	12	10000	**9.040 612**
40	13	5000	**9.040 614**
22	16	10000	**9.040 616**
40	19	5000	**9.040 618**
50	20	5000	**9.040 620**
40	25	5000	**9.040 625**
53	34	2500	**9.040 635**
67	34	1000	**9.040 636**
82	52	1000	**9.040 652**

4 Deep freeze labels SuperPrint, white

Self-adhesive deep-freeze labels on A4 sheets. Remains firmly attached even at very low temperatures. Perfect for all PC printers (laser/inkjet/dot-matrix), copiers and multi-functional machines. Not suitable for colour laser printers and colour copiers. The label paper in High-Resolution-Quality guarantees perfect toner fixing and optimum laser printing results, also at high resolution. Trouble-free processing due to all-around protective edge and optimum flatness.



Length mm	Width mm	PK	Cat. No.
38.1	21.2	25	**6.201 004**
66.0	33.8	25	**6.201 005**

5 Cryogenic labels, Type 5040

Durable, non-shrinking, plain cloth labels. Ideal for labelling cryoboxes. Supplied in packs of 10 sheets of labels with each sheet containing 20 labels. *Thermo Scientific*



Type	Width mm	Height mm	PK	Cat. No.
5040	50	25	200	**9.400 976**



1 Deep freeze labels TOUGH-SPOTS®

NEW!

Heathrow Scientific

Pre-cut Peel-off round lables for 0.5 and 1.5/2.0ml microcentrifuge tube tops.
Temperature resistant from -196°C to 80°C.
Easy to write on: PVC labels accept writing from most lab markers.
Convenient: Dispensing box assists in labeling individual tubes used in small experiments.

Dimensions:	**For vessels:**
9.5mm diam.	0.5ml tubes
13mm diam.	1.5/2.0ml tubes

Diam. mm	Colour	PK	Cat. No.
9.5	White	1000	**9.040 711**
9.5	Blue	1000	**9.040 712**
9.5	Green	1000	**9.040 713**
9.5	Red	1000	**9.040 714**
9.5	Yellow	1000	**9.040 715**
13.0	White	1000	**9.040 716**
13.0	Blue	1000	**9.040 717**
13.0	Green	1000	**9.040 718**
13.0	Red	1000	**9.040 719**
13.0	Yellow	1000	**9.040 720**



2 Deep freeze labels Cryo-Babies/Cryo-Tags

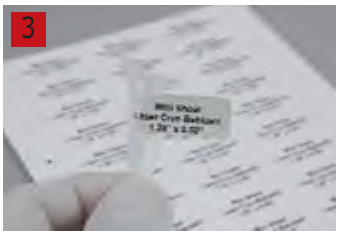
NEW!

Heathrow Scientific

Temperature resistant from -196°C to +150°C. All labels withstand freezer temperatures down to -196°C (liquid and vapor phase nitrogen), boiling water baths (100°C), autoclaving and moderate oven temperatures (150°C). Chemically inert labels resist most organic solvents and caustic agents. They adhere to most plastics, glass and metals without cracking, peeling and degrading. Made with a flexible, polyfin label material and acrylic adhesive. This unique combination expands and contracts together with temperature fluctuations resulting in a strong adhesive bond. Convenient dispensing box assists in labeling individual tubes used in small experiments. Easy to write on. PVC labels accept writing from most lab markers including solvent resistant pens.

Dimensions (L x W):	**For vessels:**
24 x 13mm	0.5ml tubes
33 x 13mm	1.5/2.0ml tubes
38 x 13mm	General application

Type	Dimensions (W x D) mm	Colour	PK	Cat. No.
Cryo-Babies	24 x 13	White	1000	**9.100 030**
Cryo-Babies	33 x 13	White	1000	**9.100 031**
Cryo-Tags	38 x 13	White	1000	**9.100 032**



3 Laser deep freeze labels Cryo-Babies

NEW!

Heathrow Scientific

Temperature resistant from -196°C to +150°C. All sheets withstand freezer temperatures down to -196°C (liquid and vapor phase nitrogen), boiling water baths (100°C), autoclaving and moderate oven temperatures (150°C). Chemically inert labels resist most organic solvents and caustic agents. They adhere to most plastics, glass and metals without cracking, peeling and degrading. Made with a flexible, polyfin label material and acrylic adhesive. This unique combination expands and contracts together with temperature fluctuations resulting in a strong adhesive bond. Label sheets are specially top-coated to readily accept laser printing. Heat-resistant, stay-flat sheets will not jam in laser printers. Easy to write on. PVC labels accept writing from most lab markers including solvent resistant pens.

Dimensions (W x D) mm	PK	Cat. No.
33 x 13	1700	**9.100 033**

Cryogenic items - please see our chapter 7

E & OE.

1 Labels Tough-Tags

NEW!



Heathrow Scientific

Temperature resistant from -40°C to +121°C. Tough-Tags resist boiling water baths, autoclaving and moderate freezer temperatures. Chemically inert labels resist most organic solvents and caustic agents. They adhere to most plastics, glass and metals without cracking, peeling and degrading. Tubes are pre-cut, peel-off labels which accept many marking instruments. They are perfectly sized to fit microcentrifuge tubes and other containers in the laboratory. Tubes labeled with Tough-Tags easily slide in and out of centrifuge rotors without binding.

Dimensions (L x W):	**For vessels:**
24 x 13mm	0.5ml tubes
33 x 13mm	1.5/2.0ml tubes
38 x 6mm	Microplates
21 x 7mm	PCR tubes
38 x 19mm	General application

Dimensions (W x D) mm	Colour	PK	Cat. No.
24 x 13	White	1000	**9.100 045**
24 x 13	Blue	1000	**9.100 046**
24 x 13	Green	1000	**9.100 047**
24 x 13	Red	1000	**9.100 048**
24 x 13	Yellow	1000	**9.100 049**
33 x 13	White	1000	**9.100 040**
33 x 13	Blue	1000	**9.100 041**
33 x 13	Green	1000	**9.100 042**
33 x 13	Red	1000	**9.100 043**
33 x 13	Yellow	1000	**9.100 044**
38 x 6	White	1000	**9.100 050**
21 x 7	White	1500	**9.100 051**
38 x 19	White	1000	**9.100 052**

2 Label station, acrylic for Tough-Tags®/Cryo-Babies®/Tough-Spots®

NEW!



Heathrow Scientific

Portable label station holds up to six standard size boxes of Tough-Tags®, Cryo-Babies®, and Tough-Spots®. Just drop the box in the label station and feed the paper through the slot.
- Acrylic station includes a writing surface, a cutting edge for easy dispensing and non-skid rubber feet
- Counter-sunk holes provided for wall mounting

Dimensions (W x D x H) mm	PK	Cat. No.
280 x 89 x 120	1	**9.100 060**

3 Label solvent, Solvent 50



SOLVENT 50 is a highly effective label solvent for the effortless removal of self adhesive labels on the basis of natural orange terpenes. It works on the adhesive and quickly and gently dissolves adhesive labels on glass, porcelain, metal, wood, foil and cardboard. SOLVENT 50 also removes sticky residue of any kind, such as tar spots or glue residue from stickers. Check compatability when using on plastics. Not suitable for polystyrene.

Density:	Spray: 0.74g/cm³ (20°C) Jerrycan: 0.83g/cm³ (20°C)
Ignition point:	Spray: < 0°C Jerrycan: 46°C
Evaporation rate:	Spray and jerrycan: 94 (DIN 53170 Ether = 1).

Type	Capacity L	PK	Cat. No.
Spray can	0.20	1	**9.412 810**
Jerrycan	5.00	1	**9.412 811**

1



1 BMP™21 Hand-held label printer

The portable label printer BMP™21 creates long lasting labels which adhere securely. Even under extremely demanding industrial applications the thermal transfer printer BMP™21 labels are pin sharp and clearly legible.

Key Features:
- Hard wearing design
- 203 dpi thermal transfer print
- Large LCD Display (3 lines of text, 1 line of icons)
- Left or right handed cutter activation
- Automatic data serialisation and built-in graphics and barcodes

Type	PK	Cat. No.
BMP™21	1	**9.040 551**

Brady labels Material overview

Type B-499: Permanent adhesive, write-on capabilities

Type B-461: Permanent adhesive - suitable for liquid nitrogen application if label material is wrapped around itself, as in self-lamination, write-on capabilities

Type B-481: Clear polyester will remain resistant when exposed to xylene and other chemicals that are commonly used in the slide staining process.

Type B-488: Permanent acrylic adhesive - ideal for flat surfaces, write-on capabilities, excellent solvent resistance and xylene resistance

Type B-427: Permanent acrylic adhesive; self-laminating, write-on capabilities, suitable for liquid nitrogen application and can be used to ID a frozen vial if label material is wrapped around itself, as in self-lamination

Type B-492: Label material that will adhere to frozen surfaces

Type B-595: Mark aisles, passageways, storage locations, point out safety equipment, exits. Indoor/outdoor marking film, high gloss, durable, flexible. Temperature range: -40°C to 82°C, durability outdoors up to 10 years.

2



2 Accessories for BMP™21 Hand-held label printer

Brady

Description	PK	Cat. No.
Hard Case	1	**9.040 555**
Magnet	1	**9.040 556**
Tool	1	**9.040 557**
AC Adapter - Europe 220V	1	**9.040 553**
AC Adapter - UK 220V	1	**9.040 554**
AC Adapter - USA 110V	1	**9.040 552**

Application Key for Brady labels

Brady

F = Freezer (-70°C)
N = Liquid Nitrogen (-196°C)
A = Autoclave
H = Hot Water Bath (100°C)
S1 = Self-laminating label
L = Low-Profile (extremely thin)
V = Vial Identification
S2 = Slide Identification
P = Plate Identification
G = General Identification

E & OE.

1 2 3 4 Labels for BMP™21 Hand-held label printer

Brady

Black on white. Brady´s laboratory labels are designed to withstand extreme laboratory environments. The labels are rersistent against high/low temperatures, solvents and chemicals (Alcohol and DMSO).

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Type	Material	Width mm	For	PK	Cat. No.
B-461	Polyester	9.50	F N A H S1 L V S2	6.4	**9.040 562**
B-461	Polyester	12.70	F N A H S1 L V S2	6.4	**9.040 574**
B-461	Polyester	19.05	F N A H S1 L V S2	6.4	**9.040 575**
B-499	Nylon cloth	9.53	F N A V P G	4.2	**9.040 576**
B-499	Nylon cloth	12.70	F N A V P G	4.2	**9.040 577**
B-499	Nylon cloth	19.05	F N A V P G	4.2	**9.040 578**
B-488	Polyester	9.53	F A S2 P G	6.4	**9.040 579**
B-488	Polyester	12.70	F A S2 P G	6.4	**9.040 580**
B-488	Polyester	19.05	F A S2 P G	6.4	**9.040 581**
B-427	Vinyl	19.05	F N S1 V S2 P G	4.2	**9.040 582**
B-427	Vinyl	25.40	F N S1 V S2 P G	4.2	**9.040 583**
B-427	Vinyl	30.48	F N S1 V S2 P G	4.2	**9.040 584**
B-427	Vinyl	38.10	F N S1 V S2 P G	4.2	**9.040 585**

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5 Label printer BBP™ 33

NEW!

Brady

The BBP™ 33 Label Printer is a completely hassle free, easy to use PC-based printer that can print signs and labels up to 101.6 mm wide. Smart chip supplies automatically set up the label in your Brady software, eliminating manual calibration and label waste. Drop-in ribbon and label cartridges ensure fast and effortless material changes. The BBP™ 33 Label Printer can print on a full range of laboratory labels and provides you clear and durable labelling to eliminate errors in sample identification and ensure traceability. It is really that simple and hassle free - exactly the way label making should be. Solves all your labelling challenges

- Thermo transfer printer
- Printer resolution: 300dpi
- Printer speed: 101mm/sec (Max.)
- Dimensions (W x H x D): 230.6 x 241.6 x 304.8mm
- Use LabelMark™and CodeSoft™ label software or with Windows® based driver for 3rd party software use
- Fast and effortless material changeovers

5



Type	PK	Cat. No.
BBP™ 33 EU Printer	1	**9.050 797**
BBP™ 33 UK Printer	1	**9.050 796**
BBP™ 33 EU Printer + MarkWare	1	**9.050 799**
BBP™ 33 UK Printer + MarkWare	1	**9.050 798**

6 Labels for Label printer BBP™33

NEW!

Brady

Type	Material	Dimensions mm	Description	For ink ribbon	PK	Cat. No.
B-461	Polyester	9.53	Labels for vial top identification	B30-R4300	1000	**9.050 811**
B-461	Polyester	12.70	Labels for vial top identification	B30-R4300	1000	**9.050 812**
B-461	Polyester	12.70 x 55.88*	Labels for ampoules and tubes	B30-R4300	1500	**9.050 815**
B-461	Polyester	25.40 x 133.35**	Labels for ampoules and tubes	B30-R4300	650	**9.050 816**
B-481	Polyester	22.86 x 22.86	Labels for slides	B30-R6400	2500	**9.050 817**
B-488	Polyester	22.86 x 19.05	Labels for microplates	B30-R4300	3000	**9.050 813**
B-488	Polyester	48.26 x 6.35	Labels for microplates	B30-R4300	2000	**9.050 814**
B-488	Polyester	22.86 x 19.05	Labels for bottles, flasks, dishes and general identification	B30-R4300	3000	**9.050 818**

Dimensions printable height: *19.05mm, **38.10mm

6



1



2



1 2 Label printer BMP™71

Brady

- Large, highly visible colour display with on screen indicators
- WYSIWYG interface
- Easy to load materials; Drop & Go
- Use 1 printer for all your applications
- Computer style keypad, with a selection of 4 layouts
- Standalone operation
- PC connectivity and operational through Brady's software packages LabelMark™ and MarkWare™
- Fast printing
- True field usable printer with long lasting battery and easy to carry printer design
- Auto font sizing
- Multi language user interface
- All European character sets embedded in the printer
- Built in barcode - time/date stamp - 500+ graphics
- Specific label applications
- Wizard based applications for Electrical, Tele/Datacom & Safety labels

Key Material features
- Smart cell technology for all materials and ribbons providing auto formatting
- Largest variety of materials available in the market, both standard and custom made labels
- Can print both on diecut labels and continuous materials, including PermaSleeves™,
- Self-laminating Labels, EPREP (Engraved Plate REPlacement) labels, Reflective, Phosphorescent and Tamper Resistant tapes
- 30+ different materials
- Labels up to 50.80mm wide
- Labels up to 1016mm long
- Prints on all TLS2200® and HandiMark™ parts, including bulk packs

Supplied with: BMP71 comes in a hard carry case with battery pack, AC adapter/battery charger, USB connection cable, TLS/HandiMark label roll adapter, Cleaning card and swab, Product CD (contains user manual, printer driver and tutorial), Quick Start Guide, M71-R6000 black ribbon, M71-31-423 diecut labels and M71C-2000-595-WT tape

Type	PK	Cat. No.
BMP™71-QWERTZ-EU	1	**9.412 915**
BMP™71-QWERTZ-EU + Software Labelmark 5.0	1	**9.412 916**

3



3 Labels for label printers BMP™71

Please order printer ribbons separately. *Brady*

Type	Length m	Width Tip mm	For ink ribbon	PK	Cat. No.
B-595	15.24	13.00	M71-6000	1	**9.412 900**
B-595	15.24	25.40	M71-6000	1	**9.412 901**
B-595	15.24	50.80	M71-6000	1	**9.412 902**
B-461	45.70	12.70	M71-4300	500	**9.412 903**
B-461	45.70	9.53	M71-4300	500	**6.228 911**
B-461	41.28	15.24	M71-4300	250	**6.224 171**
B-498	12.70	25.40	M71-6200	500	**9.412 904**
B-498	38.10	25.40	M71-6200	250	**9.412 905**
B-499	25.40	9.50	M71-4300	500	**9.412 906**
B-499	12.70	22.90	M71-4300	500	**9.412 907**
B-499	9.50	25.40*	M71-4300	500	**9.412 908**
B-488	22.90	19.10	M71-4300; M71-6200	250	**9.412 909**
B-488	22.90	22.90	M71-4300; M71-6200	250	**9.412 910**

* with 9.525 diameter vial top label.

4



4 Permanent markers, edding 404, 0.75mm

Stroke width approx. 0.75mm. Low-odour, smudge-proof water-resistant and quick drying. Refillable. Replaceable tips. For labelling, painting and writing on virtually all materials, including glass, metal and plastics. Alcohol-based ink without toluene/xylene. Colours as outlined below.

Colour	PK	Cat. No.
Black	1	**9.050 451**
Red	1	**9.050 452**
Blue	1	**9.050 453**
Green	1	**9.050 454**

1 Permanent markers, edding 400, 1mm



Stroke width approx. 1mm. Low odour, smudge-proof water-resistant and quick-drying. Refillable. With replaceable tips. For labelling, painting and marking on virtually all materials including glass, metal and plastics. Alcohol-based ink without toluene/xylene.

Colour	PK	Cat. No.
Black	1	**9.050 421**
Red	1	**9.050 422**
Blue	1	**9.050 423**
Green	1	**9.050 424**

2 Permanent markers, edding 3000, 1.5mm to 3mm



The classic with round tip. Stroke width approximately 1.5mm to 3mm. Low-odour, smudge-proof and water-resistant and quick drying. Refillable. Replaceable tips. For labelling, painting and writing on virtually all materials, including glass, metal and plastics. Alcohol-based ink without toluene/xylene. Colours as outlined below.

Colour	PK	Cat. No.
Black	1	**9.050 411**
Red	1	**9.050 412**
Blue	1	**9.050 413**
Green	1	**9.050 414**

Lab markers, 1.0mm point



9.050 602

Writes on dry or wet surfaces including glass, plastic, china and metal. Fine line markers. Colour does not run in water or alcohol when used normally, but can be washed off.

Description	Colour	PK	Cat. No.
extra fine fibre point, approx. 0.6 mm	green	1	**9.050 584**
fine fibre point, approx. 1.0 mm	black	1	**9.050 601**
fine fibre point, approx. 1.0 mm	red	1	**9.050 602** 3
fine fibre point, approx. 1.0 mm	blue	1	**9.050 603**
fine fibre point, approx. 1.0 mm	green	1	**9.050 604**

4 LAB-Marker II, 0.6mm, highly permanent



With hard wearing, fine fibre point. For labelling most materials (plastic, metal, china, glass etc.) Line thickness: 0.6mm. Particularly suitable for tissue and cell culture applications. The non-toxic ink is dye, bleach and wash-resistant and also resists solvents including alcohol and xylene.

Colour	PK	Cat. No.
black	1	**9.050 611**
red	1	**9.050 612**

5 CD/DVD/BD markers, edding 8400, 0.5mm to 1mm



Stroke width approx. 0.5mm to 1mm. Special marker for the careful and permanent labelling of CDs, DVDs and Blu-ray discs. Soft tip and special water-based ink (solvent-free) will not damage the sensitive surface of the data layer unlike alcohol-based ink. Ink is smudge-proof and water-resistant on drying.

Colour	PK	Cat. No.
Black	1	**9.050 696**

6 LLG-Lab Notebook



For recording research data, experimental procedures, and design ideas. Use these notebooks to keep your information safe and well organised. Numbered, acid-free, grid pages include spaces for title, project number, book number, date, and witness signature. Lined notebooks feature college ruled pages for easy report writing. Covers are waterproof and chemical-resistant. All notebooks contain periodic and conversion tables in the back. Admissible as court evidence when used as prescribed by law. Measures: 216 x 279mm.

Description	Type	Colour	PK	Cat. No.
Lab Notebook, 100 pages	grid	black	1	**9.050 750**
Lab Notebook, 200 pages	grid	blue	1	**9.050 751**
Lab Notebook, 200 pages	lined	red	1	**9.050 752**

1



1 Molecular model system Molymod®

NEW!

The Molymod® system is an original, unique system of high quality molecular models. *Spiring Enterprises*
The set consists of a variety of atom parts and links designed to make a large number of possible structures relevant to a specific chemistry subject or use, e.g. Biochemistry, Organic or Inorganic. All sets are fully compatible.
Atom parts are made of solid clouded plastic spheres. They are available with holes from 1 to 6 in the usual angular orientations.

Type	Description	PK	Cat. No.
Introductory Set	48 atom parts, 62 links	1	**9.883 101**
Organic Set, large	111 atom parts, 140 links	1	**9.883 103**
Biochemistry Set, large	257 atom parts, 160 links	1	**9.883 107**
Organic Set, small	50 atom parts, 64 links	1	**9.883 108**
Inorganic/Organic Set, small	51 atom parts, 38 links	1	**9.883 109**
Inorganic/Organic Set, large	106 atom parts, 86 links	1	**9.883 104**
Biochemistry Set, small	72 atom parts, 40 links	1	**9.883 110**

2



2 LLG-Laboratory jack, stainless steel

NEW!

Length mm	Width mm	Min. height mm	Max. height mm	Max. load kg	PK	Cat. No.
200	200	90	320	25	1	**9.117 220**

3



3 Swiss Boy laboratory jacks, anodised aluminium.

Anodised aluminium. Corrosion proof, stable and easily adjustable. Equipped with a motor, upper and lower end positions are adjustable. At reaching the setting, the laboratory support stops automatically. In various colours as outlined below.

Width mm	Length mm	Adjustable from / to mm	Max. load kg	Colour	PK	Cat. No.
40	50	31 - 93	20	Green	1	**9.117 100**
75	80	49 - 147	30	Blue	1	**9.117 105**
140	120	60 - 243	50	Pink	1	**9.117 110**
150	122	80 - 278	80	Gold	1	**9.117 115**
216	180	95 - 398	90	Light blue	1	**9.117 116**
320	240	120 - 500	90	Grey	1	**9.117 118**

4



4 Swiss Boy laboratory jack accessories

Swiss Boy laboratory stand accessories. Baseplates and ancilliary plates made of grey/black anodised aluminium. Support used to attach Swiss Boys in any position to apparatus scaffolding existing in many laboratories. Maximum support rod diameter 20mm. Black.

Description	Width mm	Length mm	PK	Cat. No.
Ancillary plate	200	200	1	**9.117 130**
Ancillary plate	300	300	1	**9.117 131**
Ancillary plate	260	180	1	**9.117 132**
Ancillary plate	500	400	1	**9.117 134**
Ancillary plate	220	320	1	**9.117 135**
Baseplate	200	200	1	**9.117 133**
Support rod	12	650	1	**9.117 177**
Support			1	**9.117 199**

1 2 Laboratory jacks, 18/10-stainless steel

Bochem

For those who wish to reach the top
New design and improved construction:
- Improved scissor technology with reduced tolerances
- Ergonomic knob, rounded and user friendly
- Scissor-construction made of 18/10-stainless steel

Properties:
- All models are manufactured according to DIN 12897.
- With the operating load we differ between the maximal dynamic operating load (Kg max. dyn.) and the maximal static operating load (Kg max. stat.) of the lab jack. These norms are also according to DIN 12897.
- Smaller models up to 240mm x 240mm (Typ 1) have a simple adjusting wheel, which can be operated by hand.
- With the bigger models from 300mm x 300mm on (Typ 2) is the ratchet includet.

1



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Type	Width mm	Length mm	Min. height mm	Max. height mm	Max. dyn. kg	Max. stat. kg	PK	Cat. No.
A	100	100	55	120	5	10	1	**9.118 923**
A	130	160	60	275	7	30	1	**9.118 924**
A	200	200	60	275	7	30	1	**9.118 925**
A	240	240	60	275	7	30	1	**9.118 926**
B	300	300	130	470	12	60	1	**9.118 928**
B	400	400	130	470	15	60	1	**9.118 929**
Ratchet		190					1	**9.118 921**

3 4 Laboratory jacks, aluminium

Bochem

For those who wish to reach the top
New design and improved construction:
- Improved scissor technology with reduced tolerances
- Ergonomic knob, rounded and user friendly
- Scissor-construction made of 18/10-stainless steel

Properties:
- All models are manufactured according to DIN 12897.
- With the operating load we differ between the maximal dynamic operating load (Kg max. dyn.) and the maximal static operating load (Kg max. stat.) of the lab jack. These norms are also according to DIN 12897.
- Smaller models up to 240mm x 240mm (Typ 1) have a simple adjusting wheel, which can be operated by hand.
- With the bigger models from 300mm x 300mm on (Typ 2) is the ratchet included.

3



4



Type	Width mm	Length mm	Min. height mm	Max. height mm	Max. dyn. kg	Max. stat. kg	PK	Cat. No.
A	100	100	55	120	5	10	1	**9.118 960**
A	160	130	60	275	7	30	1	**9.118 961**
A	200	200	60	275	7	30	1	**9.118 962**
A	240	240	60	275	7	30	1	**9.118 963**
B	300	300	130	470	12	60	1	**9.118 964**
B	400	400	130	470	15	60	1	**9.118 965**
Ratchet		190					1	**9.118 921**

5 6 Laboratory jacks, aluminium anodized

Bochem

For those who wish to reach the top
New design and improved construction:
- Improved scissor technology with reduced tolerances
- Ergonomic knob, rounded and user friendly
- Scissor-construction made of 18/10-stainless steel

Properties:
- All models are manufactured according to DIN 12897.
- With the operating load we differ between the maximal dynamic operating load (Kg max. dyn.) and the maximal static operating load (Kg max. stat.) of the lab jack. These norms are also according to DIN 12897.
- Smaller models up to 240mm x 240mm (Typ 1) have a simple adjusting wheel, which can be operated by hand.
- With the bigger models from 300mm x 300mm on (Typ 2) is the ratchet included.

5



6



Type	Width mm	Length mm	Min. height mm	Max. height mm	Max. dyn. kg	Max. stat. kg	PK	Cat. No.
A	100	100	55	120	5	10	1	**9.118 975**
A	160	130	60	275	7	30	1	**9.118 976**
A	200	200	60	275	7	30	1	**9.118 977**
A	240	240	60	275	7	30	1	**9.118 978**
B	300	300	130	470	12	60	1	**9.118 979**
B	400	400	130	470	15	60	1	**9.118 970**
Ratchet		190					1	**9.118 921**

1



1 Laboratory jacks MAXI, 18/10-stainless steel

Bochem

For those who wish to reach the top:
New design and improved construction:
- Improved scissor technology with reduced tolerances
- Ergonomic knob, rounded and user friendly
- Scissor-construction made of 18/10-stainless steel

Properties:
- The MAXI lab jacks offer 30% more height because of an amplified construction
- Scissor-construction made of 18/10-stainless steel
- Adjustment of height with the help of an adjusting wheel.
- Ergonomic knob, rounded and user friendly
- With the operating load we differ between the maximal dynamic operating load (Kg max. dyn.) and the maximal static operating load (Kg max. stat.) of the lab jack. These norms are also according to DIN 12897.

Width mm	Length mm	Min. height mm	Max. height mm	PK	Cat. No.
130	160	75	400	1	**6.225 931**
200	200	75	400	1	**9.118 945**

2



2 Laboratory jacks MAXI, aluminium

Bochem

For those who wish to reach the top:
New design and improved construction:
- Improved scissor technology with reduced tolerances
- Ergonomic knob, rounded and user friendly
- Scissor-construction made of 18/10-stainless steel

Properties:
- The MAXI lab jacks offer 30% more height because of an amplified construction
- Scissor-construction made of 18/10-stainless steel
- Adjustment of height with the help of an adjusting wheel.
- Ergonomic knob, rounded and user friendly
- With the operating load we differ between the maximal dynamic operating load (Kg max. dyn.) and the maximal static operating load (Kg max. stat.) of the lab jack. These norms are also according to DIN 12897.

Width mm	Length mm	Min. height mm	Max. height mm	PK	Cat. No.
130	160	75	400	1	**9.118 946**
200	200	75	400	1	**9.118 947**

3



3 Laboratory jacks with hydraulic drive, stainless steel

Juchheim Laborgeräte

Advantages:
- easy, safe lifting
- stable, parallel movement
- alternative stainless steel versions available on request

Max. kg	Width mm	Length mm	Min. height mm	Max. height mm	PK	Cat. No.
25	200	230	91	285	1	**9.118 980**
25*	200	230	91	285	1	**9.118 971**
25**	200	230	91	285	1	**9.118 981**
15	200	230	108	393	1	**9.118 982**
25	300	300	91	285	1	**9.118 983**
25*	300	300	91	285	1	**9.118 984**

* With safety lowering device
**High-grade steel, except the pump unit

1 Laboratory jacks with hydraulic drive, high capacity

Juchheim Laborgeräte

Advantages:
- Easy and safe lifting
- Stable, parallel movement
- Alternative stainless steel versions (1.4571) on request



Width mm	Depth mm	Min. height mm	Max. height mm	Max. kg	PK	Cat. No.
400	450	175	625	85	1	**9.118 985**
500	500	230	850	85	1	**9.118 986**
600	600	230	1060	85	1	**9.118 987**

2 Laboratory jack LABLIFT m

NEW!

IKA

IKA® lab lifts are suitable for raising and supporting small laboratory devices or vessels. The maximum weight that can be raised is up to 7 kg (max. dynamic load) and the maximum supporting weight is up to 25 kg (max. static load). The working height can extend from 70 mm to 300 mm. The auxiliary springs ensures that users can raise large loads easily, especially from the lowest position.

- The hand wheel ensures that the operation is smooth and comfortable
- The self-lubricating bearing significantly reduces friction



Width mm	Depth mm	Min. height mm	Max. height mm	Max. kg	PK	Cat. No.
200	310	70	300	25	1	**9.720 419**

3 Support rods galvaniser steel

Galvanised steel. To DIN 12893. External diameter 12mm.
With or without M10 thread.



Type	Length mm	PK	Cat. No.
With thread	600	1	**4.008 490**
With thread	750	1	**6.242 703**
With thread	1000	1	**4.008 491**
With thread	1500	1	**9.224 115**
Without thread	600	1	**9.224 126**
Without thread	750	1	**9.224 127**
Without thread	1000	1	**9.224 130**
Without thread	1500	1	**9.224 135**

4 Support rods 18/10 stainless steel

18/10 stainless steel. To DIN 12893. 12mm external diameter.

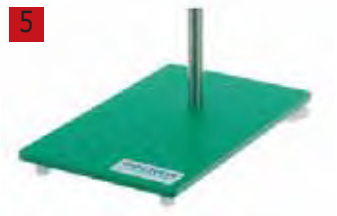


Thread	Length mm	PK	Cat. No.
M 10	600	1	**4.008 492**
M 10	750	1	**4.008 493**
M 10	1000	1	**4.008 494**
without	600	1	**9.224 226**
without	750	1	**9.224 227**
without	1000	1	**9.224 230**

5 Retort stand bases

Bochem

Lacquered steel with green finish, M10 thread hole on one short side, 1 foot adjustable. To DIN 12892. Laboratory stands are supplied without support rod. Please select the suitable rod from "support rods".



Width mm	Length mm	Thickness mm	Weight g	PK	Cat. No.
160	250	6	2000	1	**6.077 369**
200	315	6	3000	1	**9.224 041**
130	210	8	1800	1	**9.224 042**
160	250	8	2600	1	**9.224 043**
200	315	8	4000	1	**9.224 044**
200	315	10	5000	1	**9.224 045**

1



1 Rectangular retort stand bases 18/10 Stainless steel

Highly stable laboratory stand due to the steel rectangular base which is stove enamel coated. With an M10 threaded hole in the middle of one short side. Rubber support feet prevents the stand from sliding. Laboratory stands are supplied without support rod. Please select the suitable rod from "support rods".

Width mm	Length mm	Weight g	PK	Cat. No.
130	210	1725	1	**6.242 701**
150	300	2830	1	**4.008 486**
200	315	4000	1	**4.008 487**

2



2 Retort stand bases, Steel

Steel, powder-coated. With an M10 bore hole in the middle of one of the shorter sides. Laboratory stands are supplied without support rod. Please select the suitable rod from "support rods". *Juchheim Laborgeräte*

Width mm	Length mm	Weight g	PK	Cat. No.
130	210	1800	1	**6.301 718**
150	300	2900	1	**6.307 252**
200	315	4100	1	**6.074 044**

3



3 Tripod retort stand bases 18/10 Stainless steel

Highly stable laboratory stand due to the steel tripod base which is stove enamel coated. With an M10 threaded hole in the middle. Rubber support feet prevents the stand from sliding. Laboratory stands are supplied without support rod. Please select the suitable rod from "support rods".

Foot length mm	Weight g	PK	Cat. No.
115	805	1	**4.008 488**
150	1050	1	**4.008 489**

4



4 Retort stand base, tripod pattern

Steel, powder-coated. Tripod pattern, with rubber feet. With M10 threaded central hole. Laboratory stands are supplied without support rod. Please select the suitable rod from "support rods".

Foot length mm	Weight g	PK	Cat. No.
115	1000	1	**9.224 051**
150	1350	1	**9.224 054**

5



5 Retort stand base, tripod pattern

Cast iron varnished. Thread M10. Laboratory stands are supplied without support rod. Please select the suitable rod from "support rods". *Bochem*

Foot length mm	Weight g	PK	Cat. No.
105	1200	1	**6.401 256**
145	2000	1	**6.084 197**

6



6 Table clamps for rods, malleable cast iron, coated

For table tops with a thickness of max. 55mm. Rod diameter 12/13mm. *Bochem*

Description	PK	Cat. No.
Table clamps	1	**6.089 284**

1 2 Support ring

Steel. With or without bosshead, as outlined below. *Juchheim Laborgeräte*

Type	Ext. diam. mm	Weight g	PK	Cat. No.
without bosshead	70	157	1	**6.900 428**
without bosshead	100	216	1	**6.900 429**
without bosshead	130	230	1	**6.201 068**
without bosshead	160	260	1	**6.900 430**
without bosshead	180	346	1	**6.900 761**
with bosshead	70	210	1	**6.076 309**
with bosshead	100	236	1	**9.223 900**
with bosshead	130	266	1	**9.223 901**

1



2



3 4 Support rings

With or without bosshead, as outlined below. *Bochem*

Length mm	Int. diam. mm	Material	Description	PK	Cat. No.
200	70	18/10 steel	without bosshead	1	**9.225 027**
220	100	18/10 steel	without bosshead	1	**9.225 030**
220	120	18/10 steel	without bosshead	1	**9.225 033**
200	70	steel zincked	without bosshead	1	**6.239 507**
220	100	steel zincked	without bosshead	1	**6.239 804**
220	130	steel zincked	without bosshead	1	**6.239 822**
70	70	steel zincked	with bosshead	1	**9.225 081**
70	100	steel zincked	with bosshead	1	**6.238 844**
70	130	steel zincked	with bosshead	1	**7.651 881**

3



4



5 Bosshead

Malleable cast iron with lacquered chrome finish. DIN 12895. With lug screw.

Jaw opening mm	PK	Cat. No.
16.5	1	**9.224 254**
20	1	**6.225 278**
36	1	**6.802 614**

5



6 Bosshead

18/10 steel. To DIN 12895. Material number 4301. Electrolytically polished, with heart screw. Angle 90°.

Jaw opening mm	PK	Cat. No.
16.5	1	**9.224 252**

6



7 Swivelling bosshead

18/10 steel. To DIN 12895. Material no. 4301. Electrolytically polished, with heart screw. Angle 0 to 360°.

Jaw opening mm	PK	Cat. No.
16.5	1	**9.224 253**

7



1



1 Bosshead, standard

Chrome plated cast alloy with smoothly opening distance of 0 - 15mm.
Available as 2 types:
- with fix stem that holds the objects on fixed position.
- with swivel mechanism which enables the object to freely swivel 360° and lockable at any desired angle.

Jaw opening mm		PK	Cat. No.
swivel bosshead		1	**6.239 009**
solid stem bosshead		1	**6.238 711**

2



2 Cross bosshead

Malleable cast iron with chrome finish. DIN 12895. 90° and 180° angle with lug screw.

Jaw opening mm	PK	Cat. No.
16.5	1	**9.224 264**

3



3 Cross bosshead

18/10 steel. To DIN 12895. Material no. 4301. Electrolytically polished, with heart screws. Opening angles 90° and 180°.

Jaw opening mm	PK	Cat. No.
16.5	1	**9.224 263**

4



4 Bossheads

Aluminium alloy or stainless steel 18/10.
Angle 180° and 90°.

Jaw opening mm	Thread	Material	PK	Cat. No.
16.5	M8	Aluminium alloy	1	**9.224 268**
16.5	M8	stainless steel 18/10	1	**9.224 258**
27	M10	Aluminium alloy	1	**9.224 269**

5



5 Lightweight bosshead

Aluminium, polished finish. Angle 90°.

Jaw opening mm	PK	Cat. No.
16.5	1	**9.224 291**

6



6 Bosshead, malleable iron

Double bosshead malleable iron, epoxy coated. *Juchheim Laborgeräte*

Jaw opening mm	Description	PK	Cat. No.
20	with M8 brass thumb bolt	1	**9.223 902**

1 Bossheads, stainless steel

Stainless steel, electrolytically polished, for rods up to 16mm diameter. With tommy-bar screws.

Description	PK	Cat. No.
Bosshead	1	**6.071 888**



2 Base, flexible, zinc die casting

Zinc die casting, nickel-plated, vinyl-coated jaws. Stem length 300mm, with 82mm diameter, heavy, stable base.

Description	Jaw opening mm	PK	Cat. No.
Three-prong	0 to 40	1	**6.303 795**
Curved jaws	12 to 25	1	**7.605 582**



3 Clamp, flexible with bosshead, zinc die casting

Zinc die casting, nickel-plated, vinyl-coated jaws, with revolvable sleeve. Stem length 300mm.

Description	Jaw opening mm	PK	Cat. No.
Three-prong	0 to 40	1	**6.088 853**
Round jaws	12 to 25	1	**6.800 733**



4 Three-prong clamp, malleable iron

Malleable iron with epoxy coating for 1 burette *Juchheim Laborgeräte*

Jaw opening mm	Weight g	PK	Cat. No.
0 - 30	140	1	**9.223 915**



5 Cross bosshead, cast steel

Chrome plated cast steel. Suitable for frame works and fixing perpendiculars. Can be moved vertically and horizontally along the rods.

Description	PK	Cat. No.
suitable for rods 12mm	1	**9.224 278**



6 Cross bosshead, right-angle format, Aluminum alloy

LABOMECA. With hexagon socket screw. *Bochem*

Jaw opening mm	PK	Cat. No.
12 to 13 x 12 to 13	1	**9.224 274**



1



1 Bossheads, malleable cast iron, chromed

Swivelling (360°). For M8 rods.

Jaw opening mm	PK	Cat. No.
16.5	1	**6.079 307**

2



2 Bossheads, aluminium

For M8 rods. Angle 90° and 180°.

Jaw opening mm	PK	Cat. No.
13	1	**6.202 021**

3



3 Multi-purpose bosshead light alloy

Juchheim Laborgeräte

Clamping range mm	Weight g	Description	PK	Cat. No.
16	140	with M8 brass thumb bolt	1	**9.223 904**

4



9.223 905

5



9.223 906

Hook connector, steel/stainless steel

Hook bosshead steel, epoxy coated or stainless steel with brass pressure block. *Juchheim Laborgeräte*

Material	Clamping range mm	Description	PK	Cat. No.
stainless steel	13	M8 stainless steel thumb bolt	1	**9.223 905** 4
steel	13	M8 brass thumb bolt	1	**9.223 906** 5

6



6 Scaffold bosshead, cast iron

Malleable cast iron with lacquered chrome finish. With heart screws.

Jaw opening mm	Angle	PK	Cat. No.
13	90	1	**9.224 267**

We can **supply** this **manufacturer's** whole **product range !**

partner of the LLG Lab Logistics Group

BOCHEM LABORBEDARF

E & OE.

Clamp, 2 prongs

Chrome plated cast steel with two PVC coated prongs for gently holding the objects. Two seperately adjustable clamps enable perfect control of holding pressure and precise positioning of the objects. Clamps can be opened and closed smoothly with a grip width of 0-50mm.
Available as 2 types:
- with solid stem of 12mm rod diameter, the holding angle and distance from the support rod can be adjusted by a separate bosshead.
- with swivel mechanism which enables the object to freely swivel 360° and lockable at any angle. Complete with a integral bosshead, usable for rods maximum diameter of 21mm.

Description	Jaw opening mm	PK	Cat. No.
solid stem clamp	0 to 50	1	**6.237 648** 1
swivel clamp	0 to 50	1	**9.224 401** 2

1

6.237 648

2

9.224 401

3 Three-prong clamps, aluminium

PVC-coated jaws. *Bochem*

Jaw opening mm	PK	Cat. No.
0 to 70	1	**6.510 909**

3


4 Retort clamps

Standard to DIN 12894. With round jaws. *Bochem*

Jaw opening mm	Length mm	Material	PK	Cat. No.
25	150	Malleable cast iron, chromed	1	**9.224 470**
40	150	Malleable cast iron, chromed	1	**9.224 471**
60	150	Malleable cast iron, chromed	1	**9.224 472**
80	180	Steel, chromed	1	**6.306 164**

4


5 Support clamps

18/10 steel. DIN 12984. Prongs with cork and round jaws. *Bochem*

Clamping range mm	Length mm	PK	Cat. No.
25	150	1	**9.224 425**
40	150	1	**9.224 440**
60	150	1	**9.224 460**

5


6 Clamps, malleable iron

Stand clamp rounded jaws, malleable iron, epoxy coated. To DIN 12894. *Juchheim Laborgeräte*

Clamping range mm	Weight g	PK	Cat. No.
25	180	1	**6.800 204**
40	204	1	**6.200 398**
60	310	1	**6.800 126**
80	357	1	**9.223 913**

6


1



6.303 841

2



6.300 995

Retort clamps, nickel-plated

Flexible shaft. *Bochem*

Jaw opening mm	Description	Shaft length mm	PK	Cat. No.
0 to 30	Finger with silicone coating	220	1	**6.303 841** 1
40	Finger with cork	290	1	**6.300 995** 2

3



3 Retort clamp

18/10 stainless steel. 3-prong with plastic covered jaws. *Bochem*

Jaw opening mm	Length mm	PK	Cat. No.
0 to 120	190	1	**9.224 445**

4



4 Beaker and flask clamp

18/10 steel. 4 prong with silicone corered jaws. *Bochem*

Jaw opening mm	Length mm	PK	Cat. No.
0 to 120	150	1	**9.224 448**

5



5 Micro-clamps, die-cast zinc

DIN 12894, form A. Die-cast zinc, powder coated. With angular jaws.

Jaw opening mm	PK	Cat. No.
10 to 25	1	**9.224 307**

6



9.224 330

Micro clamps

Lacquered green finish. Malleable cast iron. Prongs with cork. *Bochem*

Type	Jaw opening mm	Length mm	PK	Cat. No.
1	15	150	1	**9.224 330** 6

7



9.224 310

Micro clamps, with cork or silicone

18/10 steel. Cork/silicone*coated jaws. *Bochem*

Type	Jaw opening mm	Length mm	PK	Cat. No.
1	15	150	1	**9.224 310** 7
2	15	150	1	**9.224 311** 8
3*	0 to 20	150	1	**9.224 312** 9

8



9.224 311

9



9.224 312

10



10 Universal clamp, with cork

Prongs with cork. *Bochem*

Jaw opening mm	Length mm	Material	PK	Cat. No.
0 to 80	180	Aluminium, DIN pattern	1	**9.224 501**
0 to 80	150	18/10 steel	1	**9.224 502**

E & OE.

1 Burette and thermometer clamp

"Automatic". Sprung-clip jaws with chrome-plated shaft. *Bochem*

Jaw opening mm	Length mm	PK	Cat. No.
0 to 25	115	1	**9.224 320**

1



2 Burette and thermometer clamp

'Automatic'. Sprung-clip jaws with attached chrome-plated bosshead for 13.5mm max. diameter rods. *Bochem*

Jaw opening mm	Length mm	PK	Cat. No.
0 to 25	100	1	**9.224 322**

2



3 Chain clamp, steel.

Chain 70cm, silicone coating. *Bochem*

Jaw opening mm	Shaft length mm	PK	Cat. No.
50 to 160	250	1	**6.079 772**

3



4 Condenser clamp, malleable iron

Condenser clamp moveable support rod, malleable iron, epoxy coated. *Juchheim Laborgeräte*

Jaw opening mm	Weight g	PK	Cat. No.
85 mm	480	1	**9.223 907**

4



5 Condenser clamp, malleable cast iron, chromed

Swivel type, silicone coated. *Bochem*

Jaw opening mm	Shaft length mm	PK	Cat. No.
50 to 100	150	1	**6.070 044**

5



6 Burette clamps, nickel plated brass

Burette clamp with boss, nickel plated brass, for 1 burette. *Juchheim Laborgeräte*

Jaw opening mm	Weight g	PK	Cat. No.
0 - 40	180	1	**9.223 916**

6



7 Burette clamps, nickel plated brass

Burette clamp with boss, nickel plated brass, for 2 burettes. *Juchheim Laborgeräte*

Jaw opening mm	Weight g	PK	Cat. No.
0 - 40	180	1	**9.223 917**

7



1



1 Burette roller clamp, steel

Burette roller clamp with boss, for 1 burette, epoxy coated. *Juchheim Laborgeräte*

Jaw opening mm	Weight g	PK	Cat. No.
0 - 30 mm	220	1	**9.223 918**

2



2 Burette roller clamp, steel

Burette roller clamp with boss, for 2 burettes, epoxy coated. *Juchheim Laborgeräte*

Jaw opening mm	Weight g	PK	Cat. No.
0 - 30 mm	380	1	**9.223 919**

3



3 Burette holders, aluminium

For two burettes. With bosshead. Distance between rollers 170mm. PVC rollers. *Bochem*

Jaw opening mm	PK	Cat. No.
0 to 13	1	**6.076 204**

4



4.008 313

5



6.240 474

Burette clamp

- Metal burette clamps are made out of steel and can hold one burette at a time. Graduations and meniscus line of the burette are clearly visible. They can be used on support rods of 8-14mm diameter.
- Polypropylene burette clamp can hold one burette at a time. Graduations and meniscus line of the burette are clearly visible. They can be used on support rods of 10-12mm diameter.

Description	PK	Cat. No.
Burette clamp, metal	1	**4.008 313** 4
Burette clamp, PP	1	**6.240 474** 5



Rechargeable NiMH batteries Energizer Profi

- rapid recharging
- no memory effect
- ecologically friendly
- economical

Type	Current mAh	Volt	PK	Cat. No.
HR6/AA/Mignon	2000	1.2	4	**9.012 925**
HR6/AA/Mignon	2300	1.2	2	**9.012 945** 1
HR22/9V/E-Block	175	8.4	1	**9.012 927** 2

1



9.012 945

2



9.012 927

3 Alkaline Special Batteries Energizer

For a variety of measuring devices; thermometers, digital balances, pocket calculators, watches, timers etc.

Type	Volt	PK	Cat. No.
A76/LR44/13GA	1.5	2	**9.012 932**
EPX76/SR44	1.5	2	**9.012 933**
189/LR54/10GA	1.5	2	**9.012 934**

3



Lithium Photo Batteries Energizer

For temperatures from -40°C to +60°C.

Type	Volt	PK	Cat. No.
EL123AP/CR17345	3.0	1	**9.012 935** 4
ELCR2AP	3.0	1	**9.012 936**
EL223AP/CRP2	6.0	1	**9.012 937** 5
EL2CR5AP/2CR5	6.0	1	**9.012 938**

4



9.012 935

5



9.012 937

6 Lithium batteries, Energizer

- for temperatures from -40°C to +60°C
- not rechargeable
- lasts up to 7 x longer in digital cameras
- carries a 15 year shelf life (guarantee: 90% of capacity after 15 years)
- 30% lighter than alkaline AA

Type	Volt	PK	Cat. No.
FR6/L91/AA/Mignon	1.5	2	**9.012 928**
FR03/L92/AAA/Micro	1.5	2	**9.012 929**

6



7 Alkaline Batteries, Energizer Industrial

Best performance for industrial, medical and laboratory applications.

Type	Volt	PK	Cat. No.
LR14/EN93/C/Baby	1.5	12	**9.012 921**
LR6/EN91/AA	1.5	10	**9.012 939**
LR03/EN92/AAA/Micro	1.5	10	**9.012 944**
LR20/EN95/D/Mono	1.5	12	**9.012 922**
6LR61/EN522/9V/E-Block	9.0	12	**9.012 923**

7



1



1 Lithium coin cells Energizer (Batteries)

For a variety of meters, thermometers, digital balances, pocket calculators, watches, timers etc.

Type	Volt	PK	Cat. No.
CR2032	3.0	1	**9.012 971**
CR2025	3.0	1	**9.012 972**
CR2016	3.0	1	**9.012 973**
CR1025	3.0	1	**9.012 974**
CR1220	3.0	1	**9.012 975**
CR1620	3.0	1	**9.012 976**

2



2 Universal Charger Energizer

- for NiCd and NiMH cells
- accomodates 1 to 4 round batteries, sizes AA/AAA/C or D, and 2 x 9V square batteries
- detects chemistry, capacity and inappropriate batteries

Type	PK	Cat. No.
Universal battery charger	1	**9.012 977**

3



3 Compact Battery Charger Quattro Charger

- charges AA, AAA and 9V rechargeable batteries
- with 4-LED's with overload protection maintenance charge
- wrong polarity protection
- detects defective batteries
- including 4 x AA 2450mAh

Type	PK	Cat. No.
Compact Battery Charger Quattro Charger	1	**9.012 940**

4



4 1 hr Charger, Energizer

The 1 hour charger combines the highest capacity cells (both AA and AAA) with the ultra fast charge.
- ideal for high drain and digital devices, especially digital cameras
- charges 1-4 "AA" or "AAA" NiMH rechargeable batteries at a time
- charges AA 2500mAh batteries in approximately 1 hour
- includes 2 x AA 2450 mAh NiMh batteries

Type	PK	Cat. No.
1 hr Charger	1	**9.012 978**

E & OE.

1 Aluminium foil

One side with a polished finish and the other side with a matt finish. Suitable for a wide range of laboratory applications, sealing, wrapping and forming temporary containers.



Description	Length m	Width mm	Thickness mm	PK	Cat. No.
Short roll	20	300	0.013	1	**9.106 013**
Short roll	10	450	0.015	1	**9.106 015**
Dispenser box	150	450	0.015	1	**9.106 102**
Dispenser box	100	300	0.013	1	**9.106 103**
Refilling roll	150	450	0.015	1	**9.106 104**
Dispenser box	100	500	0.030	1	**9.106 105**
Short roll	10	300	0.015	1	**9.106 106**
Short roll	10	300	0.030	1	**9.106 107**
Roll	200	500	0.050	1	**9.106 205**

2 Aluminium Pop-up sheets

NEW!

Embossed pure aluminium foils, extremely tare resistent
- Handy for everyday use
- Heat-resistant up to 600°C
- Air-tight and a barrier to light
- Dimensions (sheet): 230 mm x 270 mm

200 sheets in a box



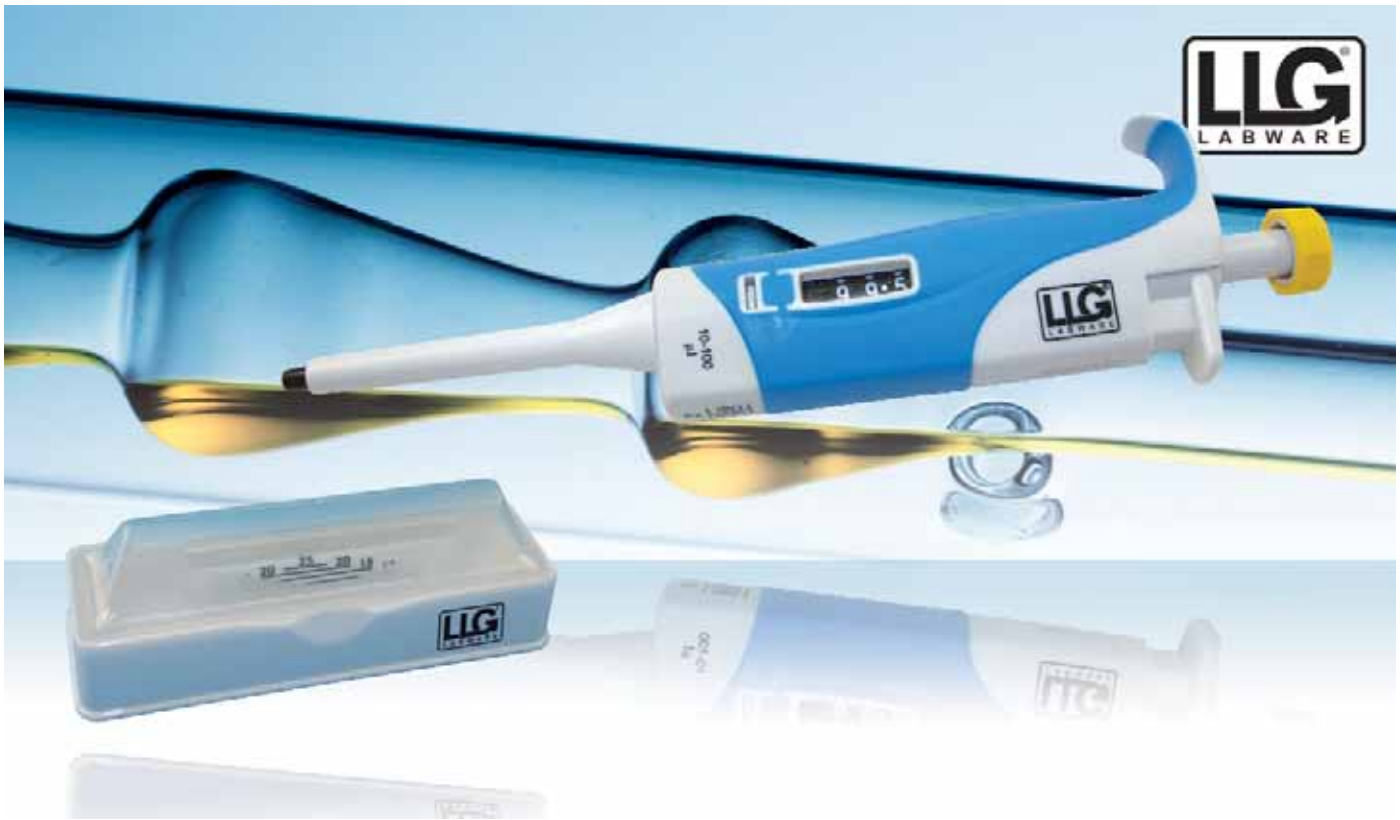
Description	PK	Cat. No.
Box à 200 sheets	1	**6.230 318**

3 Round aluminium discs

Interleaved with tissue paper. Foil thickness 0.03mm



Diam. mm	PK	Cat. No.
80	1000	**9.106 208**
100	1000	**9.106 210**
120	1000	**9.106 212**
130	1000	**9.106 213**
150	1000	**9.106 215**





1 Aluminium containers, round

Capacity ml	Top diam. mm	Bottom diam. mm	Fill height mm	PK	Cat. No.
28	64	51	13	100	**9.106 240**
110	80	56	34	100	**9.106 241**
110	99	70	25	100	**9.106 242**
125	96	78	24	100	**9.106 261**
280	114	58	50	50	**9.106 263**

4 Aluminium containers, square

With lid. *Novelis*

Capacity ml	Dimensions top (D x W) mm	Dimensions bottom (D x W) mm	Fill height mm	PK	Cat. No.
250	103 x 128	67 x 93	34	100	**6.226 802** 2
500	127 x 191	92 x 156	29	60	**9.106 266** 3



6.226 802



9.106 266







5 6 LLG-Surface protector DescProtect

DescProtect is a durable paper which quickly absorbs liquid spills. The PE-coated base layer stops liquids reaching the work surface.

- stays flat, does not ripple or curl to de-stabilise vessels
- white surface can be written on using pens or pencils
- rapid absorption of liquid spills
- excellent fluid protection
- no contamination of work surfaces or laboratory cabinets
- suitable for school laboratories, wet chemistry, industry

Type	Size	PK	Cat. No.
Sheets	460mm x 570mm	50	**9.160 270**
Spool	400mm x 50m	1	**9.160 271**



1 Benchkote surface protector®

NEW!

GE Healthcare



The upper side consists of a particularly absorbent filter paper, the lower side is a non-permeable, chemically resistant PE layer. This combination makes Benchkote into a protective paper with a particularly high wet strength for universal use, helping to meet the requirements of Good Laboratory Practice (GLP):
- Completely absorbs escaped liquids
- Prevents spills from reaching the workbench
- Protects against contamination

Applications:
- Surface protection for lab workbenches, trays or chemical cabinets
- Contamination protection, e. g. in isotope or bacteriological labs
- Adsorption of toxic or radioactive substances
- Hygienic protection in animal cages
- Atmospheric regulation in humidity chambers

Type	Width mm	Length mm	PK	Cat. No.
Pack of loose sheets	460	570	50	**9.106 280**
Roll	460	50000	1	**9.106 284**
Roll	920	50000	1	**9.106 286**
Pad of sheets	460	570	1	**9.106 287**
Sheets	600	500	50	**9.106 278**
Roll	600	50000	1	**9.106 279**

2 Bench protector, Labmat™

Bel-Art Products



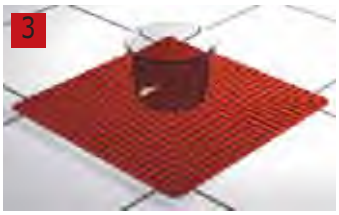
Labmat™ Bench Liner speeds clean-up and safeguards work surfaces from stains, spills and wear. Highly absorbent upper surface.Flexible polyethylene film backing is non-skid and prevents soak-through of most solutions.
Simply roll up and discard after contamination. Easily cut custom size sheets.
Color: white
Length: 15.2m
Width: 508mm

Length: 15.2m
Width: 508mm.

Type	PK	Cat. No.
Bench protector, Lab Mat™	1	**9.106 288**

3 Laboratory mats

Deutsch & Neumann



- non-slip
- silicone
- withstands temperatures up to 260°C
- available in black or red

Colour	Dimensions mm	PK	Cat. No.
Red	250 x 250	1	**9.390 090**
Black	250 x 250	1	**9.390 091**
Red	350 x 350	1	**9.390 092**
Black	350 x 350	1	**9.390 093**

4 Impulse heat sealing tongs polystar® 110 GE



Double impulse heating. LED readout allows a visual check on the sealing progress. Pressure switch triggers the welding process. A special pressure switch for generating the heat impulse guarantees constant welding results. Includes 3m connection cable.

Type	Length*	Weight g	PK	Cat. No.
200 D	200	750	1	**9.106 837**
300 D	300	800	1	**9.106 838**

* Seal length max. (mm)

5 Impulse generator polystar® 110 GE



For impulse heat sealing tongs 9.106 830

Electric current requirement:	3.7A max.
Power consumption:	approx. 0.1kW/hr.
Supply requirements:	220V 50Hz

Width mm	Depth mm	Height mm	PK	Cat. No.
296	195	132	1	**9.106 836**

1



1 Plastic film, rolls

Transparent. PE. Supplied in 25m rolls.
Other widths are available on request.

Thickness mm	Width mm	PK	Cat. No.
0.05	80	1	**9.106 508**
0.05	100	1	**9.106 510**
0.05	150	1	**9.106 515**
0.05	200	1	**9.106 520**
0.05	250	1	**9.106 525**
0.05	300	1	**9.106 530**
0.10	80	1	**9.106 538**
0.10	100	1	**9.106 540**
0.10	150	1	**9.106 545**
0.10	200	1	**9.106 550**
0.10	250	1	**9.106 555**
0.10	300	1	**9.106 560**

2



2 SAROGOLD®

Extra-strong foil. PVC-based. Good barrier properties protects the user against contact with dangerous substances (e.g. ethidium bromide or contaminated isotopes) from the sealed material and it is therefore suitable for covering sequencing gels in Electrophoresis applications.
Ideal characteristics for use:
- does not stick, easy to unravel
- with cutter
- non-flammable
- self-extinguishing
- microwaveable

Specifications

Film thickness:	11.5µm
Permeability in the visible area:	90%
UV-filtering:	300Å
IR-permeability:	88%
Width:	300mm
Length:	300m

Type	PK	Cat. No.
SAROGOLD®	1	**9.106 460**

3



3 Cling film Toppits®

- easy to use and better adhesion
- Our best freshness protection
- slight initial determination
- very easy to roll
- particularly strong
- With time beginning Finder
- Tear-off cap box with stable
- Role of fixation for easy rolling

Width mm	Length m	PK	Cat. No.
320	20	1	**9.106 450**

4



4 Freezer bags

Polar One. With tear-resistant seam.

Capacity Litres	Width mm	Length mm	PK	Cat. No.
1	190	240	40	**9.033 251**
3	250	320	30	**9.033 252**
6	290	470	20	**9.033 253**

E & OE.

1 LLG-Disposal bags, PE

Transparent. PE. Without seal.



Width mm	Length mm	Thickness mm	PK	Cat. No.
100	150	0.05	100	**9.404 128**
150	200	0.05	100	**9.404 130**
200	350	0.05	100	**9.404 140**
250	400	0.05	100	**9.404 150**
250	400	0.10	100	**9.404 151**
300	500	0.05	100	**9.404 152**
300	500	0.10	100	**9.404 153**

2 Pressure-seal bags with write on patch, PE

Transparent. PE. With rim channel seal that can be opened and closed repeatedly, and write-on patch.



Width mm	Length mm	Thickness mm	PK	Cat. No.
40	60	0.05	100	**9.404 176**
70	100	0.05	100	**9.404 173**
80	120	0.05	100	**9.404 179**
100	150	0.05	100	**9.404 171**
120	170	0.05	100	**9.404 172**
160	220	0.05	100	**9.404 177**
200	300	0.05	100	**9.404 178**

3 Pressure-seal bags, PE

Transparent. PE. With rim channel seal that can be opened and closed repeatedly.



Width mm	Length mm	Thickness mm	PK	Cat. No.
80	120	0.05	100	**9.404 160**
100	150	0.05	100	**9.404 161**
120	170	0.05	100	**9.404 162**
150	220	0.05	100	**9.404 163**
180	250	0.05	100	**9.404 164**
200	300	0.05	100	**9.404 165**
220	310	0.05	100	**6.304 307**
250	350	0.05	100	**9.404 166**
300	400	0.05	100	**9.404 167**

For sterile bags see page 520.

4 Sealing tape PetriSeal/ContainerSeal

NEW!

An ideal Sealing Tape for Petri Dishes, Microplates, Lids, Caps and other Lab Items. *Heathrow Scientific*
Tape stretches, conforms and seals the irregular perimeter of microtiter plates and petri dishes. Tape and adhesive resist most solvents and caustic agents. Seal remains flexible in moderate freezer temperatures and withstands intermittent exposure to 100°C.
Waterproof.



Colour	Width mm	PK	Cat. No.
Blue	13	1	**9.170 057**
Clear	13	1	**9.170 058**
Red	13	1	**9.170 059**
White	13	1	**9.170 060**
Yellow	13	1	**9.170 061**
Red	19	1	**9.170 051**
White	19	1	**9.170 052**
Yellow	19	1	**9.170 053**
Red	25	1	**9.170 054**
White	25	1	**9.170 055**
Yellow	25	1	**9.170 056**



1 Parafilm® M sealing film

Can be stretched up to 200% and clings around irregular shapes and surfaces.

Parafilm® M is resistant to many polar substances such as saline solutions, inorganic acids and alkaline solutions for up to 48 hours (After this time it may become brittle). Parafilm® M conforms to general FDA requirements if used below 55°C.

Parafilm® M data

Toxicity	Non-toxic
Melting temperature:	60°C
Burning point:	301°C
Continued use temperature:	-45°C to +50°C
Stretching ability:	200%
Elongation at tear:	300%
Gas permeability over 24 hours at 23°C and 50% relative air humidity	
O_2 (Oxygen):	less than 350cm³/m²
N_2 (Nitrogen):	less than 105cm³/m²
CO_2 (Carbon dioxide):	less than 1100cm³/m²
Steam permeability over 24 hrs. at 37°C and 90% relative air humidity:	0.8g/m²

Type	Width mm	Length m	PK	Cat. No.
PARAFILM® M	50	75	1	**9.170 003**
PARAFILM® M	100	38	1	**9.170 002**
PARAFILM® M	100	75	1	**9.170 005**
PARAFILM® M	500	15	1	**9.170 004**

PARAFILM® M dispenser

PARAFILM® M feeds through easily and is easy to cut using the safety cutting device. For rolls up to 100mm wide.

Type	PK	Cat. No.	
PARAFILM® M dispenser, Plexiglas®	1	**9.170 000**	2
PARAFILM® M dispenser, ABS	1	**9.170 001**	3
PARAFILM® M dispenser, plastic	1	**9.170 010**	4



9.170 000



9.170 001



9.170 010



5 PTFE spray

In canister.

Capacity ml	PK	Cat. No.
400	1	**9.220 980**

E & OE.

1 Silicone separating agent AK

To aid the separation of 'frozen' ground glass connections and lubricate stirrer bearings etc. Supplied in a spray as outlined below.

Capacity ml	PK	Cat. No.
200	1	**9.220 990**



2 Gas leak detection fluid

DIN 30657 gas, trace and leak detection fluid. Non-allergenic, non-toxic and odourless. Suitable for all pressure ranges. Non-flammable and therefore suitable for all technical gases such as ammonia, argon and other noble gases, freon, carbon dioxide, coal gas, compressed air, propane, oxygen, nitrogen, water etc.
Propellant-free. Unpressurised canister. Flash-point greater than 50°C. Unlimited shelf life. Tested and approved under DIN-DVGW-No. NG to 5170 AN 0456

Type	PK	Cat. No.
Gas leak detection fluid	1	**9.110 010**
Sprayhead	1	**9.110 011**



3 Sealing tape, PTFE

For covering areas which require protection against chemicals of all types at temperatures of -150 to +260°C. Non-swelling. Easy loosening of seams even after continuous operation. Supplied in rolls as outlined below.

Width mm	Length cm	Wall thickness mm	PK	Cat. No.
12.8	670	0.1	1	**9.404 952**
24.0	670	0.1	1	**9.404 955**





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1



1 LLG-Safety eye shields, clear

- CE approved to EN166 and EN170
- Visitor Spec with single polycarbonate lens
- Can be worn over prescription glasses
- Side venting
- Lens: clear
- Weight: 43g

Colour	Lens	PK	Cat. No.
Clear	Clear, uncoated	10	**9.006 002**

2



2 LLG-Safety eye shields, blue

- CE approved to EN166 and EN170
- Ultra-light allergy tested frame
- Integrated side shields
- Temple adjustable in length
- Weight: 34g
- Frame colour: blue
- Lens: clear
- Anti-scratch lens

Colour	Lens	PK	Cat. No.
Blue	Clear, anti-scratch lens	1	**9.006 001**

3



3 LLG-Safety eyeshields, black/orange

- CE approved to EN166 and EN170
- Model with sporty and colourful line
- High wearability
- Moulding nose bridge and temples for maximum comfort
- Hypo-allergenic rubber eyebrow protection
- Temple adjustable in length
- Weight: 30g
- Frame colour: black/orange
- Lense: clear
- Anti-scratch and anti-fog
- Protection against UV400

Colour	Lens	PK	Cat. No.
black/orange	clear, anti-scratch and anti-fog lens, UV protection	1	**9.006 003**

4



9.005 072

Safety eyeshields CLAREX

EKASTU Safety

- DIN EN 166 1 - FT
- approved design
- adapts to any head shape
- excellent all-round view
- scratch-resistant and anti-fog lens
- 99.99% UV protection using innovative UV 380 technology
- 4-position temple length adjustment

5



9.005 071

Type	PK	Cat. No.
CLAREX, transparent	1	**9.005 072** 4
CLAREX, tinted	1	**9.005 071** 5

6



6 Safety eyeshields uvex x-trend 9177

Uvex

With an anatomically shaped, wrap-around lens, the uvex x-trend is an expression of today's fashion - after all, eyewear with large lenses conquered the world long ago.
In addition to its stylish design, the uvex x-trend offers a high degree of safety with its large lens.It offers a clear view in all directions, 20 % more cover than traditional spectacles, gives UV protection of up to 400 nm and comfortable temples.

Coating of the lens
ultradura: excellent scratch resistance, 100 % UV protection

Colour	Lens	PK	Cat. No.
black	PC transparent / UV 2-1.2, ultradura	1	**9.005 147**
black	PC grey / UV 5-2.5, ultradura	1	**9.005 149**

E & OE.

1 Safety eyeshields uvex skylite 9174

Uvex

Red fashionable sports-style frame. Arms can be tilted. High impact resistant, optically correct, polycarbonate lens. Lenses have integral matt side panels. Weighing only 26g, these eyeshields are the lightest of their kind.
The lens coating is ultradura, excellent scratch resistance and gives 100% UV protection.

1



Colour	Lens	PK	Cat. No.
red	grey / UV 5-2.5 ultradura	1	**9.005 127**
red	transparent / UV 2-1.2 ultradura	1	**9.005 128**
blue	grey / UV 5-2.5 ultradura	1	**6.200 303**
blue	transparent / UV 2-1.2 ultradura	1	**6.900 098**

2 Industrial safety eyeshield Pulsafe Millennia

Sperian Protection

Pulsafe Millennia offers uninterrupted vision through 9 dioptre lens curves with constant distance from pupil, close fitting to the eye sockets, ergonomically shaped, non-pressing frame in a choice of colours, and modern styling. With non-misting FogBan lenses. Even in extreme situations such as erratic changes in temperature, high humidity etc. condensation is no longer an issue.

2



Colour	Lens	PK	Cat. No.
Black	Transparent, non-misting	1	**9.005 073**
Black	Grey, non-misting	1	**9.005 074**
Blue	Transparent, non-misting	1	**9.005 075**

3 Safety eyeshields uvex super g 9172

Uvex

The lightest safety eyeshields worldwide.
Using state-of-the-art manufacturing processes, an extremely thin lens with exceptional optical clarity can be created. The lenses have ideal aerodynamics and are angled forwards to provide excellent ventilation, keeping the eyes comfortable.
The frame is made of ultra light, high-tech polymers, guaranteeing maximum flexibility. The innovative side piece concept features Uvex x-stream-technology for an excellent, non-slip fit and a wide range of applications.
The super g is completely metal-free and provides top-level protection, with a weight of only 18g.

The coating of the lens is supravision HC-AF, outside scratch-resistant, inside non-fogging and gives 100% UV protection. Optidur NCH, excellent scratch and chemical resistance and gives 100% UV protection.

3



Colour	Lens	PK	Cat. No.
crystal	PC transparent/UV, 2-1.2, supravision HC-AF	1	**6.228 096**
titan	PC transparent/UV, 2-1.2, optidur NCH	1	**9.005 164**
navy blue	PC transparent/UV, 2-1.2, optidur NCH	1	**9.005 169**

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

uvex

1



1 Safety eyeshields uvex skyper 9195/skyper S 9196

Uvex

colour: blue, skyper 9195
Extremely lightweight (approx. 30g), modern, safety eyeshields with panoramic field of view and excellent fit. Five individual side-arm lengths with integral pull-out stops. The soft frame ensures a pressure-free fit and can be finely adjusted. Lenses and frame are made of impact resistant, synthetic material. Matt finish side shields offer extra protection from reflected light
colour: blue, skyper S 9196
Skyper S is a smaller model of Skyper 9195, specially designed for smaller head sizes. Provide the same features as Skyper 9195.

Coating of the lens
supravision HC-AF: outside scratch-resistant, inside non-fogging, 100 % UV protection
optidur NCH: excellent scratch and chemical resistance, 100 % UV protection

Type	Lens	PK	Cat. No.
Skyper 9195	transparent/UV, 2-1.2, supravision HC-AF	1	**9.005 123**
Skyper 9195	transparent/UV, 2-1.2, optidur NCH	1	**9.005 125**
Skyper S 9196	transparent/UV, 2-1.2, supravision HC-AF	1	**9.005 124**
Skyper S 9196	transparent/UV, 2-1.2, optidur NCH	1	**9.005 126**

2 Spectacles uvex racer MT 9153

Uvex

- colour: titan
- metal sunglasses, sports-type
- very low-profile metal frame, high flexibility and extremely low weight
- lens held in place without screws, making the glasses safe, even under mechanical strain, the glasses fit perfectly on all head sizes
- flexible nose piece, adjustable
- scratch-resistant lens

Colour	Lens	PK	Cat. No.
gunmetal grey	transparent/UV 2C-1.2, non-fogging	1	**9.005 134**

3 Eyeshields uvex i-vo 9160

Uvex

Fashionable, sports-style design, eyeshield with comfortable, semi-elastic frame incorporating two-component technology. Ultra-transparent lenses with scratch-proof, outer coating. Eyeshields for use when carrying out all potentially hazardous work in the laboratory.

The coating of the lens is supravision HC-AF, outside scratch-resistant, inside non-fogging and gives 100% UV protection. Optidur NCH, easy to clean coating, excellent scratch and chemical resistance and gives 100% UV protection.

Colour	Lens	PK	Cat. No.
blue/grey	transparent/UV 2-1.2, supravision HC-AF	1	**9.005 116**
blue/orange	transparent/UV 2-1.2, supravision HC-AF	1	**6.311 677**
black/grey	transparent/UV 2-1.2, supravision HC-AF	1	**6.901 653**
blue/orange	transparent/UV 2-1.2, optidur NCH	1	**6.324 668**
black/grey	grey/UV 5-2.5, optidur NCH	1	**9.005 117**
blue/orange	brown/UV 5-2.5, optidur NCH	1	**6.318 848**

2



3



E & OE.

Safety eyeshields uvex i-3 9190

NEW!

Uvex

These innovative protective spectacles are designed to perfectly fit the face. Their flexible side arms with variable inclination can be individually adjusted, while the integrated Softflex zone ensures outstanding wearer comfort for all head sizes.
The extremely soft Softflex nose piece ensures that even when worn for long periods, spectacles are comfortable, do not press on sensitive areas and remain firmly in place. Soft ear pieces and the Softflex zone at the temples ensure a secure fit in any situation.

Coating of the lens:
uvex supravision NCH : Scratch-resistant and non-fogging on the inside, while the outside is extremely scratchproof, resistant to chemicals and very easy to clean thanks to nano-technology.
uvex optidur NCH : extremely scratch-resistant and also highly resistant to chemicals. The lacquer system features nano technology, consid-erably increasing its non-stick properties.
uvex optidur 4C PLUS : combines 4 features in one lens for permanent antifog, scratchproof and antistatic properties plus 100% UV protection.
uvex supravision performance : prevent moisture from accumulating to ensure a permanent antifog effect, meaning the lenses cannot steam up.
uvex variomatic : darken within 10seconds, providing the wearer with 100% protection against UV radiation, and re-turn to their original tint after 30seconds.

1 6.253 649



2 6.253 408



3 7.629 639



4 7.629 638



Colour	Lens	PK	Cat. No.	
anthracite/blue	PC clear/UV 2C-1.2, uvex supravision NCH	1	**6.253 649**	1
graphite/olive	PC clear/UV 2C-1.2, uvex optidur NCH	1	**9.006 020**	
orange/light blue	PC clear/UV 2C-1.2, uvex optidur 4C PLUS	1	**6.253 408**	2
anthracite/yellow	PC amber/UV 2C-1.2, uvex supravision NCH	1	**7.629 639**	3
anthracite/red	PC grey/UV 5-2.5 uvex supravision NCH	1	**7.629 638**	4
white/lime	PC clear/UV 2C-1.2 uvex supravision performance	1	**7.629 636**	
anthracite/blue	PC light green UV 5-1.1<2.5/ uvex variomatic	1	**9.006 021**	

7 Safety eyeshields JACKSON SAFETY*V60 Nemesis RX

Kimberly-Clark

A stylish new standard in eye protection that improves personal comfort and safety and assists worker performance.
- Impact resistent polycarbonate lens that meets European standard EN166 1F
- Lightweight wrap-around design for added comfort and coverage
- 99.9% UVA/UVB Protection
- Black frame
- Bifocal style with diopters for vision assistance
- V60 Nemesis RX is a stylish solution for users who require protection reading diopters (strengths include), +1.0 to +3.0 available
- Enhanced nose piece design to channel away sweat
- Includes free neck cord

7



Diopter	PK	Cat. No.
+1.0	1	**9.005 171**
+1.5	1	**9.005 172**
+2.0	1	**9.005 173**
+2.5	1	**9.005 174**
+3.0	1	**9.005 175**

8 Safety eyeshields uvex astrospec 9168

Uvex

- Unrestricted peripheral vision
- Superlight, weight 36g
- With Uvex Duo-flex® frame for maximum comfort
- 3-position adjustable lens
- 4 adjustable side-arm lengths with built-in pull-out stops
- Lens made from impact resistant polycarbonate , 100% UV protection
- Integral side shields

Coating of the lens
optidur NCH: excellent scratch and chemical resistance
optidur 4C PLUS: anti-fog lens and scratch resistant

8



Colour	Lens	PK	Cat. No.
Silver-grey	transparent / 2-1.2 UV, optidur NCH	1	**9.005 105**
Yellow/black	transparent / 2-1.2 UV, optidur NCH	1	**9.005 106**
Blue	transparent / 2-1.2 UV, optidur NCH	1	**6.800 139**
Blue	transparent / 2-1.2 UV, optidur 4C PLUS	1	**9.005 109**
Yellow/black	grey / 5-2.5 UV, optidur NCH	1	**9.005 100**
Violet/green	transparent / 2-1.2 UV, optidur NCH	1	**9.005 157**

1



1 Safety eyeshields CARINA KLEIN DESIGN™ 12710, clear

NEW!

EKASTU Safety

- DIN EN 166 1 - FT
- trendy safety spectacles with additional protection against reflective light and particles
- Frame internal side with easily to clean soft component offers additional protection and comfort
- pull up frame as protection of eyebrows
- anti-fogging, anti-scratching, non-reflecting and distortion-free PC visor
- 99.99% UV protection with innovative UV 380 technology
- adjustable temple inclination for optimal adaptation to each head form

Type	PK	Cat. No.
CARINA KLEIN DESIGN™ 12710, clear	1	**9.005 070**

2



2 Safety eyeshields uvex skyguard NT 9175

Uvex

The uvex skyguard NT spectacles have been improved to provide all-round protection. Based on the existing uvex skylite spectacle we have added a conceptually simple, injection moulded TPU frame to significantly increase wearer protection levels, through minimising the risk of particle ingress. The flexible, closed-pore soft components of the frame enables a customised, individual fit and are easy to clean to promote long term use.Optional: uvex side arms can be adjusted to four different lengths and finely angled, guaranteeing a comfortable, customised fit.

Colour	Lens	PK	Cat. No.
blue/grey	clear/UV 2-1.2 supravision extrem	1	**9.005 078**
grey/orange	clear/UV 2-1.2 supravision HC-AF	1	**6.239 420**

3



3 Eyeshield uvex astroflex 9163

Uvex

Highly suited to overhead work. The soft, flexible sealing rim protects the face from frame pressure, dust and splashes from above. Additionally provides impact protection.

Coating of the lens
supravision HC-AF: outside scratch resistant, inside non-fogging, 100% UV protection

Colour	Lens	PK	Cat. No.
blue	transparent/UV 2-1.2, supravision HC-AF	1	**9.005 118**

Safety eyeshields SPERIAN SP1000

NEW!

Sperian Protection

Contemporary style that can be worn with temples or headband. Provides protection against impact, sun, wind, and debris. Ideal for high-particulate environments such as grinding, chipping and sanding.
- CE approved to EN166, 170 and EN172
- Frame colour: black

Colour	Lens	PK	Cat. No.
Black Frame	clear, anti-scratch and anti-fog lens	1	**9.006 101** 4
Black Frame	HDL yellow line, anti-scratch and anti-fog lens	1	**9.006 102** 5
Black Frame	grey anti-scratch and anti-fog lens	1	**9.006 103** 6

4



9.006 101

5



9.006 102

6



9.006 103

7



7 Panoramic eyeshield uvex ultrasonic 9302

Uvex

Extremely safe and comfortable, semi-elastic frame incorporating two-component technology. Panoramic lens with two separate lacquer coatings.

Coating of the lens
supravision HC-AF: outside scratch-resistant, inside non-fogging, 100 % UV protection

Colour	Lens	PK	Cat. No.
orange/grey	transparent / UV 2-1.2, supravision HC-AF	1	**9.005 115**

E & OE.

Spare lens for panoramic eyeshield uvex ultrasonic 9302

Coating of the lens supravision HC-AF: outside scratch-resistant, inside non-fogging. *Uvex*

Description	PK	Cat. No.
Spare lens for panoramic eyeshield ultrasonic 9302	1	**6.401 441**

1 Panoramic eyeshield uvex carbonvision 9307

Uvex

The intelligent use of ultra modern materials and manufacturing technologies enables uvex to design frames which combine reduced size/volume and high mechanical resistance. uvex carbonvision provides the wearer with unparalled comfort levels despite the very high level of mechanical stability. The TPU layer is permanently fixed to the frame, ensuring a perfect individual fit and it's easy to clean and maintain. The uvex carbonvision, weighing just 46g is undoubtedly one of the lightest wide-vision goggles on the market, enabling the wearer to work for longer periods without the distractions and problems caused by discomfort, thereby increasing his or her productivity. The newly developed supravision extreme coating technology prevent the goggles from steaming up, even in the most demanding conditions. Uvex carbonvision goggles are recommended for protection against dust, liquid splashes and mechanical hazards. The goggles are ideal for wearing with disposable respirators and bump caps.

1



Colour	Lens	PK	Cat. No.
black/grey	clear/UV 2-1.2 uvex supravision extreme	1	**9.005 079**

2 Panoramic eyeshield uvex 9405

Uvex

- large goggle with front ventilation system
- suitable for use with half masks and filtering half masks
- ideal for people who wear prescription glasses, easy headband adjustment, easy changing of lens
- crystal acrylic lens, non-fogging

2



Colour	Lens	PK	Cat. No.
transparent grey	transparent /UV 2-1.2, non-fogging	1	**9.005 090**



1



1 LLG-Visitor safety eye shields, clear

- CE approved to EN166 and EN170
- Visitor Spec with single polycarbonate lens
- Can be worn over prescription glasses
- Side venting
- Lens: clear
- Weight: 43g

Colour	Lens	PK	Cat. No.
Clear	Clear, uncoated	10	**9.006 002**

2



2 Eyeshield Armamax AX1H

Made of tough-coated PC. *Sperian Protection*

- Covers the whole eye area
- Complete side protection with wide frame
- Matt finish browpiece prevents glare
- High nosebridge prevents scratches on the lens
- Extra large
- Fits over almost all prescription spectacles

Type	PK	Cat. No.
Eyeshield	1	**9.005 065**

3



3 Overgoggles uvex 9161 and uvex 9161 duo-flex®

Uvex

- designed to fit over prescription spectacles
- unlimited side vision through super panorama lenses with a 180° field of view
- excellent, pressure-free fit
- effective indirect ventilation through special frame construction with side shields

Type 9161 duo-flex®
- frame can be adjusted four ways for optimal comfort
- scratch resistant lens

Type	Colour	Lens	PK	Cat. No.
9161	transparent*	transparent, PC lenses	1	**9.005 166**
9161 duo-flex®	blue/black	transparent, UV 2-1.2 optidur NCH	1	**9.005 107**

*autoclavable

Panoramic vision safety goggles uvex super OTG 9169

Uvex

The super OTG and the super f OTG are equipped with this state-of-the-art lens technology.
Alongside the tried and tested hingeless spectacles and highly flexible soft ear pieces, a hinged design has been developed.
The revolutionary new design of the super f OTG with hinge combines all the principles of contemporary spectacles with the advantages of state-of-the-art materials.
Both designs are well-suited to any wearer situation, and can also be used as overspecs for prescription wearers.

Coating of the lens
optidur NCH: excellent scratch and chemical resistance, 100% UV protection
supravision NCH: excellent scratch and chemical resistance and easy to clean (nano clean hybrid)

Type	Colour	Lens	PK	Cat. No.	
super OTG	navy blue	PC transparent/UV 2-1.2, supravision NCH	1	**6.234 320**	
super OTG	navy blue	PC transparent/UV 2-1.2, optidur NCH	1	**7.650 112**	5
super OTG	black	PC grey /UV 5-2.5, optidur NCH	1	**7.653 307**	6
super F OTG	black	PC transparent/UV 2-1.2, optidur NCH	1	**6.252 619**	
super F OTG	black	PC light green/UV 5-1,1 2,5/variomatic	1	**6.252 620**	4

4



6.252 620

5



7.650 112

6



7.653 307

GHS warning labels - please see page 240

1 Safety spectacles dispenser

Guards against dust.
Hinged cover.
With holes for wall mounting and label in German. To hold single pair of spectacles.

Internal dimensions (W x D x H) mm	PK	Cat. No.
180 x 85 x 75	1	**9.005 131**

1



2 Safety Glasses Dispenser Clearly Safe®

Ergonomically angled for easy dispensing. Translucent acrylic dispenser provides easy access to safety accessories. Flip open to fill from top; close to keep contents dust-free. Tilt-open bottom lid stays in place during repeated use. The safety glasses dispenser holds approximately 20 glasses. *Heathrow Scientific*

Description	Dimensions (W x D x H) mm	PK	Cat. No.
Clearly Safe®, Safety Glasses Dispenser	203 x 203 x 406	1	**6.238 548**

2



3 Lens cleaning tissues

NEW!

Non-abrasive cleaning for delicate optical surfaces. Lint-free fibre paper is ideal for cleaning lens and optics.
5 Booklets with 100 sheets. *Heathrow Scientific*

Length mm	Width mm	PK	Cat. No.
150	100	500	**9.056 899**

3



Cleaning tissues 9963

- suitable for all uvex lenses
- silicone-free
- 100 individually sealed tissues in a box.
- incl. clip for wall mounting

Please order wall mounting unit separately. *Uvex*

Description	PK	Cat. No.
Cleaning tissues 9963	100	**6.200 654** 4

4



6.200 654

5 Lens cleaning station 99700

For wall mounting. Easy operation. Frequent cleaning increases safety and enhances durability of spectacles.
Refills: Silicone-free paper 9.005 102, cleaning fluid 9.005 103 and plastic pump 9.005 104 *Uvex*

Description	PK	Cat. No.
Station, complete, with paper, plastic pump bottle and cleaning fluid	1	**9.005 101**

5



Accessories for lens cleaning station 99700

Uvex

Description	PK	Cat. No.
Silicone-free paper	1	**9.005 102**
Cleaning fluid, 0.5 L	1	**9.005 103**
Plastic pump	1	**9.005 104**

1 Safety equipment storage boxes SecuBox Midi

Necessary for safe and sanitary storage of protective equipment at work.

Overall dimensions: 23.6 x 22.5 x 12.5 cm
Internal dimensions: 23.0 x 21.8 x 11.8 cm

Colour	Type	PK	Cat. No.
blue	Eye protection, without inlet	1	**9.005 500**
transparent	Eye protection, without inlet	1	**9.005 501**
blue	Ear protection	1	**9.005 502**
transparent	Ear protection	1	**9.005 503**
blue	Eye + ear protection	1	**9.005 504**
transparent	Eye + ear protection	1	**9.005 505**
blue	Breathing protection	1	**9.005 506**
transparent	Breathing protection	1	**9.005 507**
blue	Protection gloves	1	**9.005 508**
transparent	Protection gloves	1	**9.005 509**
blue	Protection gloves, long	1	**9.005 511**
transparent	Protection gloves, long	1	**9.005 512**
blue	Hair protection	1	**9.005 513**
transparent	Hair protection	1	**9.005 514**
blue	Protective overall	1	**9.005 515**
transparent	Protective overall	1	**9.005 516**
anthrazit	Inlet for Box	1	**9.005 531**



2 3 Safety equipment storage boxes SecuBox Maxi

Necessary for safe and sanitary storage of protective equipment at work.

Overall dimensions: 23.6 x 31.5 x 20.0cm
Internal dimensions: 23.0 x 29.9 x 19.2cm

Colour	Type	PK	Cat. No.
blue	Eye protection with insert for 12 safety glasses	1	**9.005 549**
blue	Eye and ear protection	1	**9.005 544**
blue	Face shield	1	**9.005 547**
blue	Helmet	1	**9.005 541**
blue	Helmet and eye protection	1	**9.005 542**
blue	Helmet and ear protection	1	**9.005 543**
blue	Helmet and full face mask	1	**9.005 546**
blue	Full face mask	1	**9.005 545**





Noise protection please see page 211.

1 Face shields Clearways

Sperian Protection

Browguard CB14:
- Light weight
- Elastic napestrap allows individual adjustment
- Adjust headband while wearing the face shield

Browguard CB20:
- Light weight
- Browguard with ratched headband

Face shield visors:
- Impact and chemical resistant
- Comfortable and lightweight, even during extended usage
- Visor can be tilted upwards and locked in any position
- Easy exchangeable visors

Please order browguard and visor separately.

1



Type	Description	PK	Cat. No.
CB14	Browguard with elastic napestrap	1	**9.005 067**
CB20	Browguard with ratched headband	1	**7.617 935**
CV83 P	Face shield visor, PC with UV-protection, against mechanical hazards	1	**9.005 066**
CV84 A	Face shield visor, Acetat, against spilling chemical	1	**6.070 565**

2 Protective face shield CONTRACID I

Shield headband made from vulcanised fibre. With interchangeable cellulose acetate visor.
The large visor (410 x 285mm) gives unrestricted vision and also protects areas below and above the face.
Visor can be tilted up and locked in any position.

2



Type	PK	Cat. No.
Protective face shield 0.8mm	1	**9.005 145**
Protective face shield 1.15mm, UV-protection 3-1.2 (EN 170)	1	**9.005 146**
Replacement panels 0.8mm (PET)	1	**9.005 142**
Headband for contracid face shield CONTRACID I	1	**6.200 935**



Eye-wash bottles, Barikos

Barikos KS
Barikos KS and Mini Barikos KS are maintenance-free models of eye wash bottles. Containing water, they can be kept ready for use for at least two years in the sealed state. Both models are ideal for including within first aid boxes and sets. All above mentioned Barikos eyewash bottles comply with EN 15154-4. A protective cover clips onto the spray head of the eye wash bottle thus preventing any leakage. The tamper-evident seal guarantees proper function.

Barikos K
Barikos and Barikos K are designed to be filled with clear water. If the user is likely to be operating an eyewash bottle when standing, we recommend the Barikos. The user need only incline his head slightly downwards, ensuring good contact with the spray head of the bottle. The Barikos K eyewash bottle (vol.620 ml) can be used immediately, even when the injured person is lying down. As soon as the bottle is tilted downwards, a patented sliding valve opens and the washing fluid reaches the spray head unhindered. The Mini Barikos eyewash bottle (vol.175ml) is designed for persons who are frequently present in different working areas.

All bottles with sliding valve are suitable for use with upright and with the downward spray head.

Type	PK	Cat. No.	
Barikos KS, 620ml, filled	1	**9.005 009**	1
Mini Barikos KS, 175ml, filled	1	**9.005 008**	2
Barikos, 620ml, empty	1	**9.005 011**	
Mini Barikos, 175ml, empty	1	**9.005 020**	
Barikos K, 620ml, empty	1	**9.005 014**	
Barikos K / KS wall unit for 1 eye wash bottle, plastic coated steel wire	1	**9.005 015**	3
Barikos K / KS wall unit for 2 eye wash bottles, platic with transparent lid	1	**9.005 017**	4
Barikos K / KS wall unit for 1 eye wash bottle, platic with transparent lid	1	**6.076 057**	5

1



9.005 009

2



9.005 008

3



9.005 015

4



9.005 017

5



6.076 057

6



9.005 001

7



9.005 002

oculav Nit® Eye Wash

oculav NIT® Eye Wash
First aid eye wash sterile solution. 250ml of sterile solution for eye wash treatment at the accident scene. Especially effective against eye injuries stemming from acid and caustic burns as well as pepper, CS and tear gases.
- Easy to dispense, providing gentle removal of foreign bodies
- Temperature-resistant, no contamination, maintenance-free
- One handed use
- According to MPG (German Act on Medical Devices) DIN EN 15154-4.
- can be stored for at least 3 years

oculav NIT®-Box
Orange plastic box, size 260mm x 160mm x 80mm, with printed inscriptions and practical wall brackets. With 4 ready to use bottles oculav NIT® Eye Wash. The first-aid set for eye injuries contains DuOcul eye compresses, eye flaps, plaster strips, compress and disposable gloves.

Description	PK	Cat. No.	
oculav NIT® Eye Wash, 250ml bottle	1	**9.005 001**	6
oculav NIT®-Box with 4 x 250ml bottles	1	**9.005 002**	7

Eye wash bottle, 0.9% NaCl

B-SAFETY

- choice of 0.2 litre (washing time approx. 2 minutes) or 0.5 litre (washing time approx. 5 minutes) bottles
- Duo wash bottle for both eyes 1000 ml (washing time approx. 5 minutes)
- ergonomic eye cup - keeps the eyes open during application
- saline solution (0.9%)
- according to DIN EN 15154-4
- CE-marked
- shelf life: 3 years
- NEW: eye wash bottle DUO for simultaneous washing of both eyes

Applications:
- mobile application
- transportation of dangerous goods acc. GGVS
- emergency medication
- First-aid boxes
- refill unit for eye wash emergency station

1



9.733 794

2



6.240 397

Type	PK	Cat. No.
Eye wash bottle 0,9% NaCl, 200ml	1	**9.733 794** 1
Eye wash bottle 0,9% NaCl, 500ml	1	**9.733 793**
Eye wash bottle 0,9% NaCl, DUO, 1000ml	1	**6.240 397** 2

3 Eye wash bottle pH-neutral

B-SAFETY

A small, handy bottle containing 4.9% sterile phosphate buffer solution, that neutralises the eye's fluid after accidents involving acids and alkalies. The bottle is easy to take with you in the specially designed belt bag, the first aid box, the toolbox etc. The bottle is provided with an ergonomic eye cup, a dust cap and clear instructions. For refilling eye wash station.
NEW: eye wash bottle DUO for simultaneous washing of both eyes.

- shelf life: 3 years
- rinsing time: about 2 minutes
- according to DIN EN 15154-4

3



Description	PK	Cat. No.
Eye wash bottle, pH neutral, 200ml, single	1	**9.733 788**
Eye wash bottle, pH neutral DUO, 500ml	1	**9.733 817**

4 Eye wash emergency station DUO

B-SAFETY

For parallel treatment of both eyes. With one pH neutral DUO eye wash bottle with 500ml sterile phosphate buffer solution (4.9%) and one DUO eye wash bottle with 1000ml sterile sodium chloride solution (0.9%). With wall mounting, enclosed piktogram and mirror. Eye emergency plan included. Especially suitable for workplaces where chemicals and contaminents can penetrate the eye. Advice: Also after treatment with pH neutral solution continued flushing until medical treatment with sodium chloride solution is recommeded. Shelf life: 3 years. According to DIN EN 15154-4:2009.

4



Type	PK	Cat. No.
Eye wash emergency station DUO	1	**9.733 816**
Eye wash bottle pH neutral DUO, 500ml	1	**9.733 817**
Eye wash bottle sodium chloride solution DUO, 1000ml	1	**6.240 397**

GHS warning labels - please see page 240

1



9.733 787

2



6.253 311

3 Eye wash emergency station, wall-mounting

A dust-proof wall mounted station containing one bottle 200ml sterile phosphate buffer solution and one bottle 500ml sterile sodium chloride solution complete with pictogram and a mirror. Especially suitable for workplaces where on the spot rinsing is required, smaller workplaces, and mobile workplaces. According to DIN EN 15154-4. *B-SAFETY*

Dimensions eye wash station (WxDxH):	227 x 110 x 265mm
Dimensions eye wash station DUO (WxDxH):	250 x 115 x 355mm
Durability:	3 years
Flush time:	about 7 minutes

3



Type	PK	Cat. No.
Eye wash emergency station, wall-mounting	1	**9.733 787** 1
Eye wash emergency station DUO, for both eyes	1	**6.253 311** 2
Eye wash bottle, pH-neutral, 200ml	1	**9.733 788**
Eye wash bottle DUO, pH neutral , 500ml	1	**9.733 817**
Eye wash bottle, 0,9% NaCl, 500ml	1	**9.733 793**
Eye-wash bottle DUO, 0,9% NaCl, 1000ml	1	**6.240 397**

4



5



4 5 Mini eyewash station EyesFresh

NEW!

Ideal for the lab, filling stations or all work places where aggressive substances are used. "Eyes Fresh" can be attached to any standard cold water tap. For normal use of the tap, just press the button and the function changes back from the eye wash (returns automatically to eyewash-function when the tap is closed). Can be fitted onto taps with M22x1, 1/2" or 3/8" outer thread. *Bürkle*

Description	PK	Cat. No.
Mini eyewash station EyesFresh	1	**6.076 887**

E & OE.

1 2 Eye shower AXION™ eyePOD™

NEW!

Haws AG

The AXION™ eyePOD™ is a faucet-mounted eyewash that provides professional business facilities, such as laboratories and educational facilities. With a flick of the wrist your standard faucet becomes a thermally controlled AXION™ Medically Superior Response™ eyewash, and with another flick of the wrist it resets as a faucet.

- stainless steel
- easy to clean and use
- Installation is a snap, with a variety of standard adapters included
- an added safety precaution, the eyePODTM features a built-in thermostatic safety valve that will automatically shut off eyewash flows at 37ºC, diverting all water out through the aerator at the bottom of the unit.

Description	PK	Cat. No.
Eye shower AXION™ eyePOD™	1	**9.733 755**

1



2



5 Hand-held drench hoses

B-SAFETY

Two sprays in one. The hose can be used as a fixed eyewash when fitted into the mount. This allows the injured person to use both hands to hold open the eyes. The hose can also be removed from the mount so that other body parts and reclining patients can be treated.

- For wall and table mounting
- Wall-/ table mount included
- This drench hose meets EN 15154-2:2006 requirements
- DIN certification label included
- The spray heads ensure a wide distribution of water so that areas around the eyes are also covered and the exact positioning of the eyes is therefore not critical
- Large holes in the spray heads protect against limescale. The spray heads can be removed for cleaning purposes
- Rubber shrouds on the nozzles help prevent accidental injury
- Self-closing valve with squeeze lever operation
- Lightweight dust caps fall off automatically on operation
- Integral jet regulator keeps the water jet constant independent of the water pressure
- Built-in non-return valve prevents any backflow of contaminated water

Spray height:	250mm
Hose length:	1500mm
Connection:	1/2" swivel nut
Water output:	7 litres/min per spray head, regulated
Inlet fitting:	M 28 x 80mm.

3



9.733 779

Description	Connection	PK	Cat. No.
1 spray head, 45° angle	½" female	1	**9.733 778**
2 spray heads, 45° angle	½" female	1	**9.733 779** 3
1 spray head, vertical	½" female	1	**9.733 786** 4

5

DIN DVGW CERT

4



9.733 786

1 3 Safety eye showers

NEW!

B-SAFETY

- With two high performance spray heads
- Dust caps, which fall off automatically on operation, protect against dirt inside the spray heads
- Rubber sleeves protect the person seeking help against further injuries
- Table and wall mounting bracket
- Stainless steel covered hose 1500 mmm
- Flow rate: 7 liter/minute/spray head
- Integrated flow regulation which guarantees uniform jet of water independent from water pressure
- According to ANSI Z358.1-2004 and DIN EN 15154-2:2006
- DIN-DVGW tested and certified

Description	Connection	Attachment	PK	Cat. No.
Safety eye shower with two spray heads 45°	½" female	Table mounted	1	**6.254 947** 2
Safety eye shower with two spray heads 45°	½" female	Wall mounted	1	**9.733 819**
Safety shower with stainless steel bowl	¾" female	Wall mounted, exposed pipework	1	**7.653 251**

1



2



6.254 947

3

4



9.733 810

6 Body showers

B-SAFETY

Special showering heads ensure that large water quantities in gentle streams reaches the injured person without damaged the injured skin.

- The showers meet EN 15154-1:2006
- DIN-DVGW tested and certified
- Marked sign according to DIN is included
- Large dimensioned maintenance-free ball tap for large throughput quantities
- Throughput quantity: approx. 60 litres/min.
- Simple assembly
- Stable structure
- Chemical-resistant PE powder painting
- High speed showering heads made from plastic, with improved spray battern. Corrosion resistant, calcify- and maintenance free, very durable, even emptying.
- Large, easy-to-use release bar
- Comes with all mounting materials
- Connection 3/4"

5



9.733 812

Inlet	Attachment	Length mm	PK	Cat. No.
Surface mount	Wall flange	625	1	**9.733 810** 4
Concealed mount	Wall/60 mm - ¾" pipe	625	1	**9.733 811**
Surface mount	Over door wall flange	565	1	**9.733 812** 5

6

GHS warning labels - please see page 240

1 Surgical face masks, "Eco elastic bands"

- soft, non-irritating, elastic bands
- three-ply, non-fibre-glass, filter material
- integral nose bridge
- bacterial filtration efficiency 98%
- EN 14683 CE

Unigloves



Colour	PK	Cat. No.
white	50	**9.405 160**
green	50	**9.405 161**
blue	50	**9.405 162**

2 Surgical face masks "BASIC"

- tear-resistant, bands
- three-ply, non-fibre-glass filter material
- integral nose bridge
- bacterial filtration efficiency 98%
- EN 14683, CE

Unigloves



Colour	PK	Cat. No.
white	50	**9.405 165**

3 Surgical mask Tie-On

Made of lightweight, close-fitting rayon fabric. Superb, non-allergenic material. Hardly noticeable: close, safe fit, even over facial hair. 50% increase in air permeability - constant, high filter performance (99.7 %), which is not affected by inhaled dust or dampness of the material. Liquid repellent.

3M Deutschland



Type	PK	Cat. No.
Surgical mask	50	**9.405 106**

4 Surgical masks 1800+ Aseptex™

Aseptex™ Fluid Resistant Molded Surgical Mask 1800+ is ideal for general-purpose use. Closely fit both male and female face contours, leaving adequate room for breathing and speaking - without restricting mouth contact or impairing the excellent filtration characteristics. With practical, elastic rubber headband for quick fitting, removal or moving to side. Not suitable for those with facial hair. Liquid repellent, enhancing safety.

3M Deutschland



Type	PK	Cat. No.
Surgical masks	50	**9.405 101**

Fine dust mask ClassicLine

NEW!

ClassicLine fine dust masks are our advantageous standard programme. They offer a reliable and professional protection.

Description	Protection-level	PK	Cat. No.
ClassicLine without valve, folding mask	FFP 1	10	**9.005 731** 5
ClassicLine without valve, folding mask	FFP 2	10	**9.005 732**
ClassicLine with valve, folding mask	FFP 1	10	**9.005 733** 6
ClassicLine with valve, folding mask	FFP 2	10	**6.258 155**



9.005 731



9.005 733

Fine dust mask ClassicLine

NEW!

ClassicLine fine dust masks are our advantageous standard programme. They offer a reliable and professional protection.
- CE marked
- acc. to EN 149:2001

Description	Protection-level	PK	Cat. No.
ClassicLine without valve	FFP 1	10	**9.005 695** 1
ClassicLine without valve	FFP2	10	**9.005 696** 2
ClassicLine with valve	FFP 1	10	**9.005 697**
ClassicLine with valve	FFP2	10	**9.005 698** 3
ClassicLine with valve	FFP3	10	**9.005 699** 4

1



9.005 695

2



9.005 696

3



9.005 698

4



9.005 699

5



9.005 761

Half masks silv-Air c, foldable

Uvex

- foldable shape with V-shape-seam for perfect adaption to the facial structure
- innovative shape-optimised design - completely metal free
- anatomical design and soft material - edges avoid bruising
- compatible with safety spectacles because of the optimised nose-area
- seamless, continuous headband for comfortable and secure mask fit

Respiratory half-mask FFP1
- protection against contaminates up to 4 x OEL
- easy to differentiate by colour coding (blue - FFP1)

Respiratory half-mask FFP2
- protection against contaminates up to 10 x OEL
- easy to differentiate by colour coding (orange - FFP2)

Respiratory half-mask FFP 3
- protection against contaminates up to 30 x OEL
- easy to differentiate by colour coding (black - FFP3)
- circulatory venting via the soft edges prevents fogging of safety spectacles

Type	Description	Colour	PK	Cat. No.
silv-Air 3100	FFP 1	white	30	**9.005 756**
silv-Air 3110	FFP 1 with exhale valve	white	15	**9.005 757**
silv-Air 3200	FFP 2	white	30	**9.005 758**
silv-Air 3210	FFP 2 with exhale valve	white	15	**9.005 759**
silv-Air 3310	FFP 3 with exhale valve	white	15	**9.005 761** 5

Safety equipment storage boxes please see page 194.



Half-Masks silv-Air c

Uvex

- highest safety (certified according EN149)
- anatomical design and soft material-edges avoid bruising to the face
- compatible with safety spectacles because of the safe optimised nose-area
- seamless, continuous headband for comfortable and secure mask fit
- innovative shape-optimised design - completely metal free

Respiratory half-mask FFP1
- protection against contaminates up to 4 x OEL
- easy to differentiate by colour coding (blue - FFP1)

Respiratory half-mask FFP2
- protection against contaminates up to 10 x OEL
- easy to differentiate by colour coding (orange - FFP2)

Respiratory half-mask FFP 3
- protection against contaminates up to 30 x OEL
- easy to differentiate by colour coding (black - FFP3)
- circulatory venting via the soft edges prevents fogging of safety spectacles

1



9.005 753

Type	Description	Colour	PK	Cat. No.
silv-Air 2100	FFP1	white	20	**9.005 750**
silv-Air 2110	FFP1 with exhale valve	white	15	**9.005 751**
silv-Air 2200	FFP2	white	20	**9.005 752**
silv-Air 2210	FFP2 with exhale valve	white	15	**9.005 753** 1
silv-Air 2220	FFP2 with exhale valve and carbon filter	silver	15	**9.005 754**
silv-Air 2310	FFP3 with exhale valve	white	15	**9.005 755**

2 Respirator Comfort program Aura™ 9300+ series

NEW!

3M Deutschland

The new 3M™ Aura™ 9300+ respirators are the result of 3M's continuous drive to improve comfort. They are packed with groundbreaking ideas, technologies and materials and have also retained many of the features that helped make the 9300 series hugely popular. New features include low breathing resistance filter technology for easier breathing throughout your shift, an embossed top panel to reduce fogging of eyewear, a sculpted edge for improved compatibility with eyewear and an innovative chin tab to improve ease of fitting.

2



Features and advantages of the Aura™ 9300+ series
- NEW! Low breathing resistance filter technology, improved breathing ease and comfort
- NEW! Embossed top panel helps reduce fogging of eyewear
- NEW! Sculpted nose panel fits well to nose and eye contours
- NEW! Innovative chin tab improves ease of donning and adjustment to help achieve a comfortable fit
- NEW! P3 mask without respiration valve due to innovative filter technologie
- Ingenious 3-panel design fits a wide range of face shapes and sizes
- Foldable mask, hygienic individual packaging helps protect the respirator from contamination before use
- Colour coded elastic bands for fast recognition of protection class

Authorization: EU construction test (CE mark)
Testing standards: EN 149:2001 + A1:2009

Type	Description	Protection-level	Usage restrictions	PK	Cat. No.
Aura™ 9310+	without valve	FFP1	4 x OEL	20	**9.005 670**
Aura™ 9312+	with Cool-Flow valve	FFP1	4 x OEL	10	**9.005 671**
Aura™ 9320+	without valve	FFP2	12 x OEL	20	**9.005 672** 3
Aura™ 9322+	with Cool-Flow valve	FFP2	12 x OEL	10	**9.005 673** 4
Aura™ 9330+	without valve	FFP3	50 x OEL	20	**9.005 674**
Aura™ 9332+	with Cool-Flow valve	FFP3	50 x OEL	10	**9.005 675**

3



9.005 672

4



9.005 673

1



1 Particulate Respirator with Shrouded Valve Aura™ 1883+

NEW!

3M Deutschland

The 3M™ Aura™ Health Care Particulate Respirator 1883+ provides effective respiratory protection for use in medical environments where health care workers will be exposed to airborne dust particles, non-volatile liquid particles and bio-aerosols. This respirator limits the transmission of infectous agents from staff to patients and is suitable for use during surgical procedures and certain other medical procedures. This product also offers resistance to penetration of splashes of liquid.
Features and advantages as Aura™ 1800+ series

Authorisation: EU construction test (CE mark)
Testing standards: EN 149:2001 + A1:2009
EN14683:2005

Type	Description	Protection-level	Usage restrictions	PK	Cat. No.
Aura™ 1883+	with valve	FFP 3	30 x OEL	8	**9.005 681**

Respirator Comfort program 8300 series

NEW!

3M Deutschland

The 3M™ 8300 Series Respirators are one of the latest additions to the respiratory protection range. With them, you can enjoy a comfortable cushion-fi t', facing hard work from a soft place. The 3M 8300 Series respirators have been designed with comfort in mind. The super-soft, cushioned lining provides instant yet lasting comfort; whilst the robust design makes the 3M 8300 Series Respirators tough and durable - all this helps to increase user wearabilty. 3M offers a comprehensive range of respiratory protection - you can choose from diff erent protection levels and styles that best suit your needs.

- Braided Headbands
- M-Noseclip
- Robust Outer Shell
- 3M™ Cool Flow™ Valve
- 3M™ High Performance Filter Material
- Cushion-Fit' Lining
- Soft Waffle Edge

Type	Description	Protection-level	Usage restrictions	PK	Cat. No.	
8310		FFP1	4 x OEL	10	**9.005 666**	2
8312	with Cool-Flow valve	FFP1	4 x OEL	10	**9.005 667**	3
8320		FFP2	12 x OEL	10	**9.005 668**	4
8322	with Cool-Flow valve	FFP2	12 x OEL	10	**9.005 669**	5
8833	with Cool-Flow valve	FFP3	50 x OEL	10	**6.231 388**	6

2



9.005 666

3



9.005 667

4



9.005 668

5



9.005 669

6



6.231 388

7



7 Premium Fine dust mask

3M Deutschland

Robust and durable design. Adjustable braided headbands and soft inner face-seal improve fit and comfort. Soft Inner Face-Seal Ring can be cleaned for wearer hygiene if used for longer than one shift With Cool-Flow valve. Increased filter area helps extend the life of the respirator. Premium masks Type 8825 and 8835 are RD marked and can be used for more than one shift.
Type 8825: 12 x TLV against particles
Typ 8835: 50 x TLV against solid and liquid aerosols, poisonous dust, fog and smoke

Authorization: EU construction test (CE mark)
Testing standards: EN 149:2001

Type	Protection-level	Usage restrictions	PK	Cat. No.
8825	FFP2 RD	12 x TLV	5	**9.005 456**
8835	FFP3 RD	50 x TLV	5	**9.005 458**

E & OE.

1 Emergency respirator, BARIMASK ABEK 15

Half mask with inhalation and exhalation valves, a fitted cartridge filter (15 min ABEK) supplied in a sealed box with belt clip and additional hand loop (acc. DIN 58647-7). Shelf life: approximately 5 years.

Type	PK	Cat. No.
Emergency respirator, BARIMASK ABEK 15	1	**9.005 576**

1



2 3 Halfmask, X-plore® 3300, Chemistry set

NEW!

Safe and easy bayonet connection. A unique two-point bayonet connector attaches both filters to the mask using the same technique. Compact, low-profile design. The swept-back position of the filters guarantees a wide field of vision free from obstruction and ensures optimal fit for use under protective visors. High grade materials provide extreme comfort when worn. Innovative, X-guided, strap system. Cross-over straps ensure an even weight distribution.
Chemistry set supplied with Halfmask and 2 Filters.
Filter: pack of 14

Dräger

2



3



Type	Description	PK	Cat. No.
X-plore® 3300 Set	Dräger X-plore® 3300 M and A1B1E1K1 Hg P3 R D	1	**7.626 542**
Filter	Combination filter X-plore® Bayonet A1B1E1K1HgP3 R D, pack of 14 filters	1	**9.005 614**

Half mask 620 N and 620 S

All masks approved according to EN 140 and certified according to council directive 89/686/EEC. Standard thread connection according to EN 148-1 which allows cost-efficient use of standard screw-filters besides insert filters and reusable holders. The masks can be used as pure filtration device and also as a mask for light airline systems. Two exhalation valves ensure low respiratory resistance. Ergonomic design of the mask bodies and sealing zone as well allow one single size of mask for all faces.

Type	PK	Cat. No.
Half mask 620 N*	1	**6.800 724** 4
Half mask 620 S**	1	**9.005 575** 5
Carrying box for half-mask	1	**6.801 096**

* With quick adjustable rubber harness and faceblanc.
** With quick adjustable silicone harness and faceblanc.

4



6.800 724

5



9.005 575

1



2



9.005 580

3



9.005 585

1 Respiratory protection - plug-in filters for half mask 620 N and 620 S

Tested and approved to EN 143/EN 14387 standards with CE mark. Plug-in filters are connected to the mask by a filter mount. The filter mount is fitted with standard thread connections to EN 148-1.

Particle filters consist of a light PE housing with a built-in glas fibre filter. Special folding provides a large filter surface area in a confined space.

A pre-filter collects aerosol mist and dust and prevents rapid accumulation of dirt particles in the main filter, thereby prolonging its lifespan. Easy to exchange by inserting into the outer chamber of the filter mount. Flame resistant.

Filter type A:	Vapours from organic compounds with boiling point >65°C
Filter type B:	Inorganic gases and vapours e.g. chlorine
Filter type E:	Sulphur dioxide
Filter type K:	Ammonia
Filter type P 1:	Low particle filtration capacity
Filter type P 2:	Medium particle filtration capacity
Filter type P 3:	High particle filtration capacity

Type	Protection-level	PK	Cat. No.
Gas filter 19 A	A1	1	**9.005 580** 2
Gas filter 19 B	B1	1	**9.005 581**
Particle filter 25 P3	P3 R	1	**9.005 585** 3
Pre-filter 35/70	-	20	**9.005 577**
Filter mount 5570/35	for Filter 19A, 19B, 24 P2, 25 P3	1	**9.005 586**
Filter mount 5570/70	-	1	**9.005 587**

4



4 Half mask, DUETTA

Tested to EN 140 standards and certificated according to PPE guideline 89/686/EWG. With double filter connection. Plastic mask body with soft, sealing surface. Elastic adjustment straps with head gear.

- One mask size fits all face shapes
- Excellent field of vision, unrestricted freedom of movement and outstanding comfort
- Superior balance through double filter technology
- Non-allergenic
- Optimal sealing provided by newly designed sealing rim
- Easily dismantled for cleaning and maintenance
- One-piece headband for optimal fit
- Simple and secure filter attachment with bayonet connection

Type	PK	Cat. No.
Half mask, DUETTA	1	**9.005 590**

5



6



5 6 Filters for DUETTA half mask

(According to EN 143 and EN 14387)

Filter 203 A2:	Painting, varnishing, stripping
Filter 203 P3R:	Asbestos fibres, dust
Filter 203 ABEK:	Chemical industry (escape device), livestock owners
Filter 205 A2P3:	Paint spraying, dioxin
Filter 205 ABEKP3:	Hydrochloric acid, formic acid, disinfection work

Type	Protection-level	PK	Cat. No.
Gas filter 203 A2	A2	4	**9.005 592**
Particle filter 203 P3R	P3 R	4	**9.005 593**
Gas filter 203 ABEK	ABEK1	4	**9.005 594**
Filter 205 A2P3	A2-P3 R	4	**9.005 595**
Combination filter 205 ABEKP3	ABEK1-P3 R	4	**9.005 596**

1 Half mask, Polimask BETA

EKASTU Safety

- double filter half mask made of EPDM offering optimum protection during any type of activity
- 2 inhalation valves minimise the inhalation resistance
- 1 large exhalation valve ensures low exhalation resistance
- comfortable head harness with neck clip
- by turning the filter holder it is possible to change the angle of vision or expand the field of vision
- careful airflow routing allows use with spectacles

Type	Description	PK	Cat. No.
Polimask BETA	Half mask	1	**9.005 626**



2 Filters for polimask BETA half masks

EKASTU Safety

Gas Filter 200 A1
- Protection against organic gases and vapours with a boiling point > 65°C

Particle Filter 200 P3R D*
- Protection against particles of toxic and highly toxic substances, with innovative **BIOSTOP**

Multi-type Filter 200 A1B1E1K1
- Protection against organic gases and vapours with a boiling point > 65°C, inorganic gases and vapours, sulphur dioxide and ammonia

Multi-type Combined Filter 200 A1B1E1K1-P3R D*
- Protection against organic gases and vapours with a boiling point > 65°C, inorganic gases and vapours, sulphur dioxide, ammonia and particles (P3), with innovative **BIOSTOP**

Combined Filter 200 A1-P3R D*
- Protection against organic gases and vapours with a boiling point > 65°C, as well as particles (P3), with innovative **BIOSTOP**

Type	Description	PK	Cat. No.
200 A1	Gas filter	8	**9.005 627**
200 P3R D	Particle filter	8	**9.005 628**
200 A1B1E1K1	Multi-type filter	8	**9.005 629**
200 A1B1E1K1-P3R D	Multi-type combined filter	4	**9.005 637**
200 A1-P3R D	Combined filter	4	**9.005 638**

*BIOSTOP - prevents the growth of bacteria and/or fungi through the filter material.



3 Half Mask, Polimask 230

EKASTU Safety

- filter connection special thread 95 mm
- broad, supple inner sealing lips guarantee close fitting
- made of soft EPDM
- special construction ensures a large field of vision and low breathing resistance
- especially suitable for use over prescription spectacles

Type	Description	PK	Cat. No.
Polimask 230	Half mask	1	**9.005 630**



4 Filters for half mask polimask 230

EKASTU Safety

Particle filter 230 P3R D*
- protection against particles of toxic and highly toxic substances
- with innovative **BIOSTOP** treatment

Multi type combined-filter 230 A2B2E2K1-P3R D*
- protection against organic gases and vapours with a boiling point > 65°C, inorganic gases and vapours, sulphur dioxide, ammonia and particles as well as particles of toxic and highly toxic substances (P3), with innovative **BIOSTOP**

Type	Description	PK	Cat. No.
230 P3R D	Particle filter	2	**9.005 631**
230 A2B2E2K1-P3R D	Multi-type combined-filter	2	**9.005 632**

*BIOSTOP - prevents the growth of bacteria and/or fungi through the filter material.



1



1 Half Mask Polimask 330

EKASTU Safety

- with standard thread connection acc. to DIN EN 148-1
- mask body with exhalation valve and chin support
- made of soft EPDM
- especially suitable for use over prescription spectacles
- the connector allows the half mask to be used with screw filters up to 300g, pressure hose devices and turbo unit respiratory systems

Type	Description	PK	Cat. No.
Polimask 330	Halfmask	1	**9.005 530**

2



2 Full face mask C 607/Selecta

EKASTU Safety

- with standard thread connection to DIN EN 148-1
- anti-scratch, anti-fogging, non-reflecting and distortion-free polycarbonate window shield with very large field of vision
- ultimative level of comfort by ergonomic construction and design
- facepiece consists of non-irritating EPDM which is resistant to ageing and guarantees outstanding mechanical and chemical resistance
- 5-point harness locks the mask quickly and securely in place
- 2 cool down exhalation valves

Type	Description	Class	PK	Cat. No.
C 607 / Selecta	Full face mask	2	1	**9.005 634**

3



3 Full face mask C 607/F

EKASTU Safety

- with standard thread connection DIN EN 148-1
- anti-fogging, non-reflecting and distortion-free polycarbonate visor shield with large vision field
- facepiece consists of non-irritating EPDM which is resistant to ageing and guarantees outstanding mechanical and chemical resistance
- built-in speech diaphragm
- 5-point adjustable head strap for precise fitting
- 2 cool down exhalation valves

Type	Description	Class	PK	Cat. No.
C 607 F	Full face mask	3	1	**9.005 540**

Suitable filters - please see page 209

E & OE.

Respiratory filters for masks polimask 330 and C 607

Standard thread connection, DIN EN 148-1. *EKASTU Safety*

Gas filter DIRIN 230 A2
- protection against organic gases and vapours with a boiling point > 65°C

Combined filter DIRIN 230 A2-P3R D*
- protection against organic gases and vapours with a boiling point > 65°C, as well as particles of toxic and highly toxic substances (P3) with innovative **BIOSTOP**

Multi-type combined filter DIRIN 230 A2B2-P3R D*
- protection against organic gases and vapours with a boiling point > 65°C, inorganic gases and vapours as well as particles of toxic and highly toxic substances (P3) with innovative **BIOSTOP**

Multi-type filter DIRIN 230 A2B2E2K1
- protection against organic gases and vapours with a boiling point > 65°C, inorganic gases and vapours, sulphur dioxide and ammonia

Multi-type combined filter DIRIN 230 A2B2E2K2-P3R D*
- protection against organic gases and vapours with a boiling point > 65°C, inorganic gases and vapours, sulphur dioxide and ammonia as well as particles of toxic and highly toxic substances (P3) with innovative **BIOSTOP**

Multi-type combined filter DIRIN 500 A2B2E2K2-Hg-P3R D*
- protection against organic gases and vapours with a boiling point > 65°C, inorganic gases and vapours, sulphur dioxide, ammonia and mercury vapours, as well as particles of toxic and highly toxic substances (P3)
- with innovative **BIOSTOP** may only be used with full face masks

Multi-type combined filter DIRIN 530 A2B2E2K2 Hg NO 20CO-P3R D*
- protection against organic gases and vapours with a boiling point > 65°C, inorganic gases and vapours, sulphur dioxide, ammonia, oxides of nitrogen, carbon monoxide, mercury vapours and mercury compounds, as well as particles of toxic and highly toxic substances (P3)
- sealed in aluminium foil for safest storage, also under extreme conditions
- with innovative **BIOSTOP** (may only be used with full face masks)

Particle filter DIRIN 230 P3R D*
- protection against particles of toxic and highly toxic substances
- with innovative **BIOSTOP**

Type	Description	PK	Cat. No.	
DIRIN 230 A2	Gas filter	1	**9.005 660**	
DIRIN 230 A2-P3R D	Combined filter	1	**9.005 686**	
DIRIN 230 A2B2-P3R D	Multi-type combined filter	1	**9.005 687**	
DIRIN 230 A2B2E2K1	Multi-type filter	1	**9.005 691**	
DIRIN 230 A2B2E2K2-P3R D	Multi-type combined filter	1	**9.005 690**	1
DIRIN 500 A2B2E2K2-Hg-P3R D	Multi-type combined filter	1	**9.005 692**	2
DIRIN 530 A2B2E2K2 Hg NO 20CO-P3R D	Multi-type combined filter	1	**7.636 659**	
DIRIN 230 P3R D	Particle filter	1	**9.005 744**	3

*BIOSTOP - prevents the growth of bacteria and/or fungi through the filter material.

1



9.005 690

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9.005 692

3



9.005 744

4 Full face mask BRK 820

Tested and approved to EN 136 and CE certified. With polycarbonate visor. Speech diaphragm and round thread connection according to EN 148-1.

- Maximum field of vision thanks to low position nosepiece with two exhalation valves
- Heat resistant polycarbonate visor, tested and approved for use by firefighters
- Carefully designed airway ensures non-misting visor
- 5-point headstrap attachment
- Optimal sealing to face, can be fitted to all head sizes
- Shock-absorbing device reduces the risk of injuries caused by impacts to the mask
- Resistant PE speech membrane in stainless steel casing
- Variable fastening headstrap
- No special tools required for maintenance
- Simple operation for changing sealing rings and ventilation panels

Full face mask BRK 820 G
As facemask BRK 820, but with a scratch- and solvent-resistant surface-hardened polycarbonate lens.

4



Type	Class	PK	Cat. No.
BRK 820	3	1	**9.005 555**
BRK 820 G	3	1	**6.401 235**
Wall box for 1 full face mask		1	**6.202 219**

1



1

Respiratory protection - screw-type filters for full face mask BRK 820

The filters are tested and approved to EN143/EN 14387 and carry the CE mark. Offer very low breathing resistance. Their lifespan depends on the toxicity, humidity and air consumption of the user. Measurements differ with application so it is impossible to predict the working lifespan. Filter exhaustion can be detected as follows:
- Gas filters: appearance of odours, tastes or irritants in inhaled air.
- Particle filters: increase in breathing resistance.

Storage times for unused gas and combination filters (kept sealed in manufacturer's packaging) 6 years. Particle filters can be stored for 10 years.

Protection level A:	Vapours from organic compounds with boiling point >65°C
Protection level B:	Inorganic gases and vapours e.g. chlorine, hydrogen sulphide
Protection level E:	Sulphur oxide
Protection level K:	Ammonia
Protection level AX:	Gases and vapors from organic compounds with boiling point <65°C, low boilers in groups 1 and 2
Protection level Hg:	Mercury vapours
Protection level NOSt:	Nitrogen oxides, including nitric monoxide and particles P3
Protection level P 1:	Particles (fumes, smoke, dust) from inert substances
Protection level P 2:	Particles from non-toxic substances
Protection level P 3:	Particles from toxic substances

Type	Protection-level	PK	Cat. No.
Gas filter 66 A	A2	1	**9.005 558**
Gas filter 66 AB	AB2	1	**6.224 032**
Gas filter 66 B	B2	1	**9.005 559**
Gas filter 66 E	E2	1	**7.604 410**
Gas filter 66 K	K2	1	**9.005 561**
Gas filter 67 ABEK	ABE2K1	1	**9.005 563**
Gas filter 84 ABEK	ABEK2	1	**6.224 033**
Gas filter 84 AX	AX	1	**6.200 208**
Combination filter 80 ASt	A2-P2 R D	1	**9.005 565**
Combination filter 80 BSt	B2-P2 R D	1	**9.005 566**
Combination filter 81 ABEKSt	ABE2K1-P3 R D	1	**7.616 476**
Combination filter 81 ABSt	AB2-P3 R D	1	**6.228 471**
Combination filter 81 BSt	B2-P3 R D	1	**6.302 979**
Combination filter 86 ABEKSt	ABEK2-P3 R D	1	**9.005 570**
Combination filter 86 NOSt	NO-P3 R D	1	**6.201 023**
Combination filter 86 AXSt	AX-P3 R D	1	**6.227 097**
Combination filter 86 ABEKHgSt	ABEK2Hg-P3 R D	1	**6.232 031**



1 Ear plugs

Non-allergenic, comfortable polyurethane. Smooth surface, dirt-repellent and hygienic. Conical shape expands to fill the ear canal. Meets EN 352-2 requirements. Available with, or without, connecting cord. *3M Deutschland*

Sound protection (SNR): 37 dB(A)

Type	PK	Cat. No.
Without cord	200	**9.005 046**
With cord	100	**9.005 047**



2 Ear plugs with headband

These ear protectors are suitable for intermittent use. The soft plugs are made of non-allergenic material. The headband is made of hard-wearing material. Meets EN 352-2 requirements. *3M Deutschland*

Sound protection (SNR): 26 dB(A)

Type	PK	Cat. No.
Ear protectors, each	10	**9.005 048**
Replacement plugs, pair	20	**9.005 049**



3 Ear defender uvex 2

Uvex 2 is a foldable ear defender with the approved steel suspension headband system. The headband achieves perfect fitting to most facial profiles and is resistant against to bending and warping. Uvex 2 combines perfect protection, because of high attenuation, low weight and small volume with safe handling. The advantage lies in exceptional wearer comfort with the benefit of high wearer acceptance levels. *Uvex*

Sound protection (SNR): 27 dB(A)

Type	PK	Cat. No.
uvex 2	1	**9.005 061**



Safety equipment storage boxes - please see page 194.

Ultrasonic baths - please see page 1138.

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

3M



The Power to Protect Your World

3M – the best choice for your laboratory

Being a global enterprise, we are pioneers in many markets. This is reflected in the high quality of our products, our comprehensive advice and our employees' expertise in delivering solutions. Our broad 3M product portfolio in the area of personal protective equipment comprises not only a wide array of **particulate respirators**, but also **half-face** and **full-face masks**, **powered** and **supplied-air respirators**, **hearing protection**, **head**, **face** and **eye protection**, and **protective apparel**.
3M – your expert partner in the laboratory.

Further information
www.3M.com

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Explanation of levels

Test	Power stage				
	1	2	3	4	5
Abrasion resistance (number of cycles)	100	500	2000	8000	-
Cut resistance (factor)	1.2	2.5	5	10	20
Tear resistance N	10	25	50	75	-
Piercing power N	20	60	100	150	-

Standards for safety gloves

EN 374 EN 374 EN 374 EN 388 EN 407 EN 421 EN 511 EN 420



EN 374	Protective hand gloves against chemicals and microorganisms;
EN 388	Protective hand gloves against mechanical risks
EN 407	Protective hand gloves against thermal risks (heat and/or fire)
EN 420	note instructions for use
EN 421	Protective hand gloves against ionising radiations and radioactive contamination
EN 511	Protective hand gloves against cold
	Not harmful to food stuffs
AQL-Value:	acceptable quality level for penetration

1 Gloves POLYCLASSIC PE-LD

EN 420



Mensch

The glove POLYCLASSIC PE-LD is made from transparent low density Polyethylene. The PE-LD is embossed and therfore has a high tear resistance. It is cost-saving and provides excellent protection for short-time work in food industies and for medical applications. Supplied in dispenser box containing 100 gloves. **Cat. I**



Size	Colour	PK	Cat. No.
Men	transparent	100	**9.262 605**
Women	transparent	100	**9.262 606**

2 Vinyl medical examination gloves, "Standard", powdered



Unigloves

Non-sterile. With beaded cuff. AQL 1.5 EN 455 T 1-3, CE.
Supplied in dispenser box containing 100 gloves. **Cat. I**



Size	PK	Cat. No.
XS (5 to 6)	100	**9.405 154**
S (6 to 7)	100	**9.405 150**
M (7 to 8)	100	**9.405 151**
L (8 to 9)	100	**9.405 152**
XL (9 to 10)	100	**9.405 153**

3 Vinyl gloves, accelerant-free, "Premium"



Unigloves

Non-sterile, hypoallergenic, with beaded cuff. EN 455 T 1-3, CE. Applied in dispenser box containing 100 gloves. Supplied in dispenser box containing 100 gloves. **Cat. I**



Size	PK	Cat. No.
XS (5 to 6)	100	**9.005 349**
S (6 to 7)	100	**9.005 350**
M (7 to 8)	100	**9.005 351**
L (8 to 9)	100	**9.005 352**
XL (9 to 10)	100	**9.005 353**

1



1 Medical examination gloves, Vasco® Powdered

B. Braun

EN 374 EN 374

Non-sterile, medical examination gloves in natural latex rubber. Guaranteed quality. Ambidextrous, with beaded cuff. Free from Thiuram additives. Meet DIN EN 455 requirements. Supplied in dispenser box containing 100 gloves.
Personal protective equipment category III according to PPE 89/686/EEC and EN 420, tested according to EN 374. **Cat. III Low Chemical resistant.**

Size	PK	Cat. No.
S (6 to 7)	100	**9.405 286**
M (7 to 8)	100	**9.405 287**
L (8 to 9)	100	**9.405 288**

2



2 Medical examination gloves Vasco® Sensitive, powder free

B. Braun

EN 374 EN 374

Non-sterile, medical examination gloves in natural latex rubber. Guaranteed quality. With welt, fit left or right hand. Free from Thiuram additives. Meet DIN EN 455 requirements. Supplied in dispenser box containing 100 gloves.
According to ASTM F1671-07 (no virus penetration). Personal protective equipment category III according to PPE 89/686/EEC and EN 420, tested according to EN 374. **Cat. III Low Chemical resistant.** Suitable for food processing.

Size	PK	Cat. No.
S (6 to 7)	100	**9.405 289**
M (7 to 8)	100	**9.405 290**
L (8 to 9)	100	**9.405 291**

3



3 Latex gloves "Select Blue", powder free

NEW!

Unigloves

EN 374 EN 374

Non-sterile, with beaded cuff and micro-roughened surface. EN 455 T 1-4, CE. Type examination test acc. EN 374. Supplied in dispenser box containing 100 gloves. **Cat. III Low Chemical resistant.**

Size	PK	Cat. No.
S (6-7)	100	**6.238 376**
M (7-8)	100	**7.624 168**
L (8-9)	100	**7.624 167**
XL (9-10)	100	**6.238 377**

4



4 Latex gloves "Select Plus", powder free

Unigloves

EN 374 EN 374

Non-sterile, hypoallergenic, with beaded cuff and micro-roughened surface, Protein content <30µg/g. EN 455 T 1-3, CE. Type examination test acc. EN 374. Supplied in dispenser box containing 100 gloves. **Cat. III Low Chemical resistant.**

Size	PK	Cat. No.
XS (5 to 6)	100	**9.005 339**
S (6 to 7)	100	**9.005 340**
M (7 to 8)	100	**9.005 341**
L (8 to 9)	100	**9.005 342**
XL (9 to 10)	100	**9.005 343**

E & OE.

1 Latex medical examination gloves "Comfort", powder free

Unigloves

Non-sterile, hypoallergenic. With beaded cuff and micro-roughened surface. TÜV tested, AQL 1.5. Supplied in dispenser box containing 100 gloves. EN 455 T 1-3, CE. **Cat. I**



Size	PK	Cat. No.
XS (5 to 6)	100	**9.405 235**
S (6 to 7)	100	**9.405 236**
M (7 to 8)	100	**9.405 237**
L (8 to 9)	100	**9.405 238**
XL (9 to 10)	100	**9.405 239**

2 Disposable medical examination gloves Manufix® Sensitive and Powdered

B. Braun

EN 374 EN 374





Available either powdered or powder free. Made of transparent latex. Non-sterile. For higher demands. Ambidextrous. Supplied in dispenser box containing 100 gloves.

Tested according to EN 374. Personal protective equipment category III according to PPE 89/686/EEC and EN 420. **Cat. III Low Chemical resistant.** Suitable for food processing.

Additionally: Manufix® Sensitive tested according to ASTM F1671 (no virus penetration).

Size	Description	PK	Cat. No.
S (6 to 7)	powder free	100	**9.405 205**
M (7 to 8)	powder free	100	**9.405 206**
L (8 to 9)	powder free	100	**9.405 207**
S (6 to 7)	powdered	100	**9.405 211**
M (7 to 8)	powdered	100	**9.405 217**
L (8 to 9)	powdered	100	**9.405 220**

3 Biogel gloves, powder-free, sterile

EN 388 EN 374 EN 374 EN 420





Sterile. Disposable. With unique Biogel lining for maximum comfort. 50 pairs per pack.
Cat. III Low Chemical resistant.

Size	PK	Cat. No.
5.5	50	**9.405 351**
6	50	**9.405 352**
6.5	50	**9.405 353**
7	50	**9.405 354**
7.5	50	**9.405 355**
8	50	**9.405 356**
8.5	50	**9.405 357**
9	40	**9.405 358**



1



2



1 2 Disposable latex gloves Kimtech Science*Satin Plus, powder free

Kimberly-Clark

EN 374 EN 374 EN 420

LEVEL 2

Latex, powder free, non-sterile, disposable gloves, offering excellent finger sensitivity, DIN-EN-Standard approved and certified.
Supplied in dispenser box containing 100 or 90 gloves, as outlined below.

- natural rubber latex
- Beaded cuff
- smooth surface
- powder-free
- Ambidextrous

This product is classified by EC Council Directive 89/686/EWG.
It is tested in accordance with the EN Norms EN 420:2003
Meets AQL of 1.5
Manufactured in accordance with Quality System ISO 9001.
Cat. III Low Chemical resistant.

Size	PK	Cat. No.
XS (5 to 6)	100	**9.005 390**
S (6 to 7)	100	**9.005 391**
M (7 to 8)	100	**9.005 392**
L (8 to 9)	100	**9.005 393**
XL (9 to 10)	90	**9.005 394**

3



4



3 4 Latex gloves Kimtech Science*PFE, powder free

Kimberly-Clark

EN 374 EN 374 EN 420

LEVEL 2

Latex, powder free, non-sterile, disposable gloves, with roughened surface providing optimal grip in wet conditions.
Supplied in dispenser box containing 100 or 90 gloves, as outlined below.

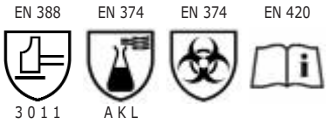
- Beaded cuff
- Ambidextrous
- Powder-free
- Available in all sizes and lengths of 240mm (XS - M), 250mm (L - XL)

Qualitiy standards:
- Classified by EC Council Directive 89/686/EWG. It is tested in accordance with the EN Norms EN 420:2003.
Cat. III Low Chemical resistant.

- Meets AQL of 1.5.
- Manufactured in accordance with Quality System ISO 9001.

Size	Length cm	PK	Cat. No.
XS (5 to 6)	24	100	**9.005 405**
S (6 to 7)	24	100	**9.005 406**
M (7 to 8)	24	100	**9.005 407**
L (8 to 9)	25	100	**9.005 408**
XL (9 to 10)	25	90	**9.005 409**

1 Cleaning gloves Marigold G43Y, latex nitrile



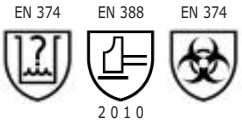


Fully coated latex nitrile gloves. With comfortable cotton flocklining. With special non-slip surface. 1 pair per pack.
Cat. III

Length: 310mm
Thickness: 0.5mm

Size	PK	Cat. No.
S (6 to 7)	1	**9.005 366**
M (7 to 8)	1	**9.005 367**
L (8 to 9)	1	**9.005 368**

2 Washing-up gloves Marigold G01R Classic





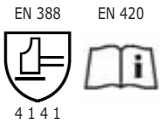
Latex gloves with special roughened surface.
With comfortable cotton lining.
1 pair per pack.
- **Cat. III Low Chemical resistant.**

Length: 325mm
Thickness: 0.45mm

Size	PK	Cat. No.
S (6 to 7)	1	**9.005 376**
M (7 to 8)	1	**9.005 377**
L (8 to 9)	1	**9.005 378**

Washing-up wipes please see page 1128.

3 Disposable latex gloves Matex R





Fully coated, latex gloves with special non-slip surface. With comfortable knitted coton lining. Resistance to chemicals, abrasions and cuts. 1 pair per pack. **Cat. II**

Length: approx. 290mm
Thickness: approx. 1.25mm

Size	PK	Cat. No.
M (8)	1	**9.005 327**
L (9)	1	**9.005 328**
XL (10)	1	**9.005 329**

1 LLG-Gloves ergo, *nitrile*, powder-free

NEW!

EN 374 EN 374 EN 420



Disposable glove made of nitrile with the tried and tested design for uses requiring very good tactile properties combined with high resistance.
According to EN 420.

- Thin - comfortable to wear
- Good sense of touch
- Tried and tested quality product made of nitrile - excellent resistance to skin irritants in foodstuffs
- More resilience through special formulation and greater wall thickness
- The problem-solver for single use in applications with an increased need for safety when handling chemicals
- Free from phthalates/softeners and allergenic latex proteins
- Easy to don and particularly skin-friendly through special finishing process
- Signal colour blue - suitable for areas subject to HACCP standards

Cat. III Low Chemical resistant

Glove shape	flat with rolled edge (ambidextrous)
Material	nitrile
Colour	blue
Outside	textured
Inside	powder-free halogenated
Size/total length	S, M, L, XL med. 240 mm
Thickness/measured in single layer	0.13 mm

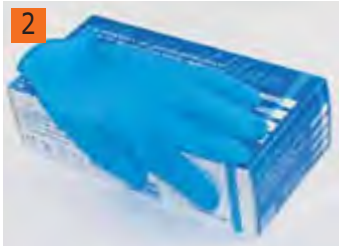
Size	PK	Cat. No.
S	200	**9.006 371**
M	200	**9.006 372**
L	200	**9.006 373**
XL	180	**9.006 374**

Available from November 2013.

1



2



2 3 Gloves, powder-free, Nitrile "Soft Nitril"

Unigloves

EN 374 EN 374



Blue, non-sterile, rolling edges.
Manufactured by EN 455, T. 1-3, AQL 1.5, CE.
Type examination test acc. EN 374 (for "Soft Nitril" blue only).
Suitable for handling food. Supplied in dispenser box containing 100 gloves. **Cat. III Low Chemical resistant** (for "Soft Nitril" blue only)**.**

3



Size	Colour	PK	Cat. No.
S (6-7)	blue	100	**9.005 312**
M (7-8)	blue	100	**9.005 313**
L (8-9)	blue	100	**9.005 314**
XL (9-10)	blue	100	**9.005 315**
S (6-7)	white	100	**9.005 362**
M (7-8)	white	100	**9.005 363**
L (8-9)	white	100	**9.005 364**
XL (9-10)	white	100	**9.005 365**

1 Gloves, powder-free, Nitrile "Format Blue"

NEW!

Unigloves



EN 374 EN 374



Blue, non-sterile, rolling edges.
Manufactured by EN 455, T. 1-2, EN 374, AQL 1.5, CE.
Suitable for handling food. Supplied in dispenser box containing 100 gloves. **Cat. III Low Chemical resistant**

Size	PK	Cat. No.
S (6-7)	100	**9.005 395**
M (7-8)	100	**9.005 396**
L (8-9)	100	**9.005 397**
XL (9-10)	100	**9.005 398**

2 "Format" nitrile gloves, powder free

Unigloves



EN 374 EN 374



Non-sterile, hypoallergenic, with beaded cuff and microroughened surface.
Supplied in dispenser box containing 100 gloves. EN 455 T 1-3, CE. Type examination test acc. EN 374. **Cat. III Low Chemical resistant.**

Size	PK	Cat. No.
XS (5 to 6)	100	**9.005 344**
S (6 to 7)	100	**9.005 345**
M (7 to 8)	100	**9.005 346**
L (8 to 9)	100	**9.005 347**
XL (9 to 10)	100	**9.005 348**

3 Disposable nitrile gloves, powder free, Touch N Tuff®

Ansell



EN 374 EN 374



- Manufactured from nitrile, TouchNTuff® offers up to four times the puncture resistance of comparable natural-latex gloves, and three times the resistance of similar neoprene gloves.
- It contains no natural rubber proteins, which means no risk of Type I allergies for the wearer. Primary skin irritation studies and Insult Patch tests have also shown no evidence of risk from irritation or allergic contact dermatitis.
- With a unique "Thin Nitrile Technology" formulation, this glove offers easy donning and strong grip in wet or dry conditions.
- The glove is highly versatile and suitable for many different uses.
- AQL 1.5 (EN374)
- 100% nitrile. 0.1mm thick.
- than gloves made of natural rubber or vinyl. Close fitting, and cause minimal hand fatigue.
- Supplied in dispenser box containing 100 gloves. **Cat. III Low Chemical resistant.**

TouchNTuff® is anti-staticity tested (EN 1149-1 & 1149-3) and meets the requirements defined in EN 1149-5

Size	PK	Cat. No.
S (6 to 7)	100	**9.005 400**
M (7 to 8)	100	**9.005 401**
L (8 to 9)	100	**9.005 402**
XL (9 to 10)	100	**9.005 403**

1



1 Disposable nitrile gloves, powder free, Touch N Tuff®T® Blue

NEW!

Ansell

EN 374 EN 374



- Made from an innovative nitrile compound which offers outstanding chemical and mechanical properties, comfort and dexterity.
- Three times the puncture resistance of latex or PVC disposable. Lighter and cooler, yet safer and more durable; better value for money.
- 100% nitrile; no waxes, silicone or plasticizers.
- Powder-free. No risk of contaminating food with corn starch used to powder gloves.
- Textured finish on fingertips. Improved grip.
- Rolled cuff. Provides added protection at wrist and ensures a secure fit.
- AQL 1.5 (EN374)
- **Cat. III Low Chemical resistant.**

Size	PK	Cat. No.
S	100	**6.090 788**
M	100	**6.090 366**
L	100	**6.091 887**
XL	100	**6.304 322**

2



2 Nitrile gloves, powder free, Kimtech Science*Sterling*

Kimberly-Clark

EN 374 EN 374 EN 420



- Synthetic nitrile polymer
- Contains no natural rubber latex
- Beaded cuff
- Textured fingertip for more sensitivity
- Ambidextrous
- Reduced storage up to 33%
- Reduces package waste up to 39%
- Up to 50% more gloves in a box
- Certificate of Analysis available online
- Available in all sizes and lengths of 24cm (XS - M), 25cm (L - XL)

Quality Standards
- This is a PPE Category III product classified by EC Council Directive 89/686/EEC. It is tested in accordance with the EN Norms EN 420:2003
- Meets AQL level of 1.5 for pinholes
- Manufactured in accordance with Quality System ISO 9001
- Virus protection according to ISO 16604
- Food contact approved to BfR XXI recommendation
- Smallest thickness 0.07mm
- **Cat. III Low Chemical resistant.**

Size	Length cm	PK	Cat. No.
XS (5-6)	24	150	**9.005 275**
S (6-7)	24	150	**9.005 276**
M (7-8)	24	150	**9.005 277**
L (8-9)	25	150	**9.005 278**
XL (9-10)	25	140	**9.005 279**



1 2 Nitrile gloves, KIMTECH SCIENCE*PURPLE NITRILE*, accelerant-free

EN 374 EN 374 EN 420



Kimberly-Clark





- Contains no natural rubber latex reducing the potential for TYPE I glove-associated reactions
- Textured fingertip, enhances wet and dry grip
- Powder-free
- Beaded cuff, for added strength and ease in donning
- Unique purple colour provides quick visual differentiation
- Ambidextrous
- Static dissipative in use
- Virus Protection
- Low AQL for pinholes

Quality Standards
- Meets or exceeds AQL 0.65 (level 3) G1 Inspection for water tightness
- This is a PPE Category III product classified by EC Council Directive 89/686/EEC. It is tested in accordance with the EN Norms EN 420:2003. **Cat. III Low Chemical resistant.**
- Manufactured in accordance with Quality System ISO 9001
- Virus protection according to ISO 16604 procedure B:2004
- Dexterity Classification (EN 420:2003) = 5

Size	Length cm	PK	Cat. No.
XS (5 to 6)	24	100	**9.005 420**
S (6 to 7)	24	100	**9.005 421**
M (7 to 8)	24	100	**9.005 422**
L (8 to 9)	25	100	**9.005 423**
XL (9 to 10)	25	90	**9.005 424**

3 4 Nitrile gloves, KIMTECH SCIENCE*GREEN NITRILE*, accelerant-free

NEW!

EN 374 EN 374 EN 420



Kimberly-Clark





KIMTECH SCIENCE*GREEN NITRILE Gloves offer the fit and feel of latex with the protection of a Category III PPE glove. As an alternative to latex, they could help you to reduce waste, space, costs and environmental impact.

- Reduces waste and disposal costs by at least 60%
- Reduced storage - 150% more gloves in the same sized box as conventional latex gloves
- Contains no natural rubber latex
- Textured fingertip, enhances wet and dry grip
- Powder-free
- Beaded cuff, for added strength and ease in donning
- Unique green colour provides quick visual differentiation
- Ambidextrous
- Static dissipative in use
- Virus Protection
- Low AQL for pinholes

Quality Standards
- Meets 0.65 G1 Inspection for water tightness
- This is a PPE Category III product classified by EC Council Directive 89/686/EEC. It is tested in accordance with the EN Norms EN 420:2003. **Cat. III Low Chemical resistant.**
- Manufactured in accordance with Quality System ISO 9001
- Virus protection according to ISO 16604 procedure B:2004
- Dexterity Classification (EN 420:2003) = 5

Size	Length cm	PK	Cat. No.
XS (5-6)	24	250	**9.005 176**
S (6-7)	24	250	**7.970 224**
M (7-8)	24	250	**7.970 225**
L (8-9)	25	250	**7.970 226**
XL (9-10)	25	225	**9.005 177**

1



1 Nitrile gloves, Kleenguard G 10, nitrile

Kimberly-Clark

EN 420

- Powder-free
- Latex-free
- Textured fingertips
- Designed for tasks requiring maximum dexterity without sacrificing protection
- Smallest thickness 0.05mm
- USDA and FDA approved for food handling
- 200 nitrile gloves per box (only size XS to L)
- **Cat. I**

Size	Length cm	PK	Cat. No.
XS (5-6)	24	200	**9.005 266**
S (6-7)	24	200	**9.005 267**
M (7-8)	24	200	**9.005 268**
L (8-9)	24	200	**9.005 269**
XL (9-10)	24	180	**9.005 270**

2



2 NeoTouch® gloves

NEW!

Ansell

EN 374 EN 374

- The NeoTouch® gloves were the first neoprene single-use gloves for industrial usage.
- With a latex-free formulation, NeoTouch® gloves are appropriate for the prevention of Type I allergies. Because they're powder-free, they also limit the risk of dermatitis for the wearer.
- They provide excellent resistance to acids, bases and alcohols. Thanks to an exclusive formulation, NeoTouch® gloves are convincingly the most comfortable synthetic single-use gloves available today.
- NeoTouch® gloves have a polyurethane inner-coating that ensures easy donning. Their textured fingertips provide a secure grip in both dry and wet conditions. The beaded cuff ensures a secure hold, and their green colour makes them easy to identify.
- NeoTouch® gloves are inspected to an AQL of 1.5 for pinholes, which matches the legal requirements for medical gloves.
- **Cat. III Low Chemical resistant.**

Size	Length cm	PK	Cat. No.
S	240	100	**6.229 608**
M	240	100	**6.229 607**
L	240	100	**6.229 606**
XL	240	100	**6.239 416**
S	285	100	**6.237 656**
M	285	100	**7.619 653**
L	285	100	**6.230 923**
XL	285	100	**6.237 684**

3



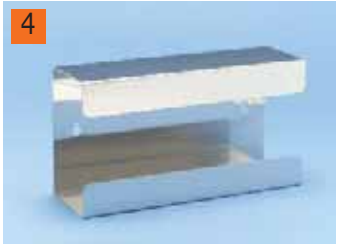
3 Skin protection gel proGlove, for glove-work

Greven

- ProGlove protects the skin against the undesirable effects of skin softening when wearing airtight gloves (e.g. latex or plastic)
- Crystal clear, alcohol-based gel without grease or perfumes, silicone-free, pH-neutral
- Manufactured according to G.M.P (Good Manufacturing Practice) requirements which include the most recent EC guidelines. The bacteria count is micro-biologically tested on a regular basis and is under 100 per gramme.

Capacity ml	PK	Cat. No.
100	1	**9.191 150**

4



4 Glove dispenser box

18/8-9 stainless steel, for wall mounting, incl. screws and wall plugs, suitable for dispensing boxes (WxDxH) 240 x 75 x 133mm.

Dimensions (W x D x H) mm	Weight g	PK	Cat. No.
250 x 80 x 135	730	1	**6.232 327**

E & OE.

1 Glove dispenser box Trio

18/8-9 stainless steel, for wall mounting, incl. screws and wall plugs, suitable for 3 dispensing boxes.
(WxDxH) 256 x 94 x 395mm.

Dimensions (W x D x H) mm	Weight g	PK	Cat. No.
258 x 96 x 392	1550	1	**6.228 502**



2 Glove box holder, PS, anti-microbial

Ideal for use in cleanroom, hospitals, and microbiological work areas. MICROBAN® additive prevents growth of moulds and bacteria. High impact, durable resin is resistant to harsh cleaning solutions. The versatile glove box holder can accommodate single box or adjoined together to hold multiple boxes. Modular design allows stacking horizontally. Screws and anchors provided. *Heathrow Scientific*

Dimensions (W x D x H) mm	PK	Cat. No.
254 x 156 x 97	1	**9.005 427**



3 Glove box holder Flexihold

NEW!

The adjustable holding points give you the true flexibility to hold up to four different boxed protective products and other lab essentials (size dependent) *Heathrow Scientific*
- Ideal for holding different boxed sizes of gloves, mop caps, ear defenders, face masks, shoe covers etc
- Adjustable universal fit, easy to clean, with a low profile
- Wall-or door-mountable, mounting hardware included

Dimensions (W x D x H) mm	PK	Cat. No.
152 x 762 x 76	1	**9.194 008**



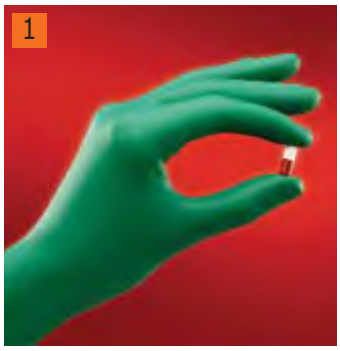
4 Gloves

100% Cotton. Monofilament. 1 pair per pack. **Cat. I**

Size	Length mm	PK	Cat. No.
6	250	1	**6.235 155**
7	250	1	**7.623 809**
8	250	1	**9.005 222**
9	250	1	**7.625 555**
10	250	1	**7.623 881**
11	250	1	**7.623 810**
12	250	1	**9.005 223**
13	250	1	**6.224 187**



1



1 Chemical protection glove DermaShield®

NEW!

Ansell

EN 374 EN 374 EN 421

- Made of poly-chloroprene, DermaShield® is the most technically advanced sterile glove available today. Free of latex proteins and accelerators, it minimises both Type I and Type IV allergies associated with natural rubber. While DermaShield® has the comfort and flexibility of natural rubber gloves, at a similarly competitive price, its neoprene composition offers better chemical resistance. And the new beaded cuff prevents the glove from rolling down, providing increased protection. DermaShield®: for optimal product and worker protection.
- The DermaShield® is sterile and specifically adapted to critical environments ISO 5 (Class 100 & GMP AB).
- AQL 0.65 (EN374) - Ideal Application - Handling of cytostatics
- Cat. III

Size	PK	Cat. No.
Gr. 6	1	**9.006 306**
Gr. 6 ½	1	**7.635 086**
Gr. 7	1	**7.635 087**
Gr. 7 ½	1	**9.006 307**
Gr. 8	1	**7.635 088**
Gr. 8 ½	1	**9.006 308**
Gr. 9	1	**7.635 089**

2



2 Chemical protection glove Duo-Mix 405

MAPA

EN 388 EN 374 EN 374 EN 421

2120

Gloves made from a mix of natural rubber and neoprene for high chemical and mechanical resistance. Anatomical shape. Grip finish on palm and fingers. Cotton flock on the inner side for better comfort. Good tactile sensitivity and dexterity, due to the reduced thickness. Packing with 1 pair.

Length: 330mm
Thickness: 0.7mm
Colour: yellow/blue
CE: **Cat. III**

Size	PK	Cat. No.
XS (6)	1	**9.005 307**
S (7)	1	**9.005 308**
M (8)	1	**9.005 309**
L (9)	1	**9.005 310**
XL (10)	1	**9.005 311**

3



3 Chemical protection glove Ultranitril 492, nitrile

MAPA

EN 388 EN 374 EN 374 EN 420

4101 AJKL

Green nitrile glove with cotton flock liner. Anatomical shape. Good grip finish on palm and fingers. High mechanical resistance. Excellent chemical protection against alcohols, oils, greases and hydrocarbons. Thin material for increased dexterity. Comfort, due to the quality of the flock-lining. Packing with 1 pair. **Cat. III**

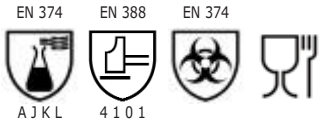
Length: 320mm
Thickness: 0.38mm
Colour: green

Size	PK	Cat. No.
XS (6 - 6,5)	1	**6.224 148**
S (7)	1	**9.005 170**
M (8)	1	**9.005 180**
L (9)	1	**9.005 190**
XL (10)	1	**9.005 200**
XXL (11 - 11,5)	1	**6.223 413**

E & OE.

1 Chemical protection glove uvex Profastrong, Nitrile

Uvex





Nitrile safety gloves, proven in environments involving exposure to acids, grease and solvents.
Non-sterile EN 374, 388. Packaging with 12 pairs. **Cat. III**

Characteristics
- outstanding abrasion resistance
- good grip for wet surfaces
- anatomic shape
- good dexterity

Applications
- printing industry
- chemical industry
- automotive industry
- food industry
- laboratories

Colour:	green
Length:	approx. 330mm
Thickness:	approx. 0.38mm
EN:	374, 388 (4101)

Size	PK	Cat. No.
7	12	**9.414 605**
8	12	**6.241 238**
9	12	**9.414 606**
10	12	**9.414 607**

2 Safety glove uvex Profapren, neoprene

Uvex





High-quality unsupported neoprene safety glove for use in protecting against a broad spectrum of different chemicals. The silicone-free safety glove provides an excellent balance of properties against chemical and mechanical risks. 1 pair per pack.

Characteristics:
- good combination of flexibility and strength
- resistance against a large number of chemicals and solvents

Applications: chemical industry, metal processing (cleaning), painting/coating

Length:	330mm
Thickness:	0.75mm
Colour:	blue
EN:	374, 388 **Cat. III**

Size	PK	Cat. No.
7	1	**6.228 856**
8	1	**9.414 600**
9	1	**9.414 601**
10	1	**9.414 602**

1



1 Chemical protection glove Stansolv AK-22 381, nitrile

MAPA



Nitrile glove with glued cotton liner for long term comfort. Due to the patented double layer technology, the glove offers enhanced security when handling chemicals.
Z-pattern-profile for safe grip of wet things. Comfort and thermal insulation, due to the cotton-knit lining.
Excellent resistance against oils, greases and lubricants.
Packing with 1 pair. **Cat. III**

Length:	355mm
Thickness:	0.85mm
Colour:	green

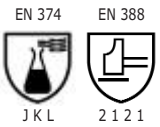
Size	PK	Cat. No.
S (7)	1	**9.005 206**
M (8)	1	**9.005 207**
L (9)	1	**9.005 208**
XL (10)	1	**9.005 209**
XXL (11)	1	**9.005 199**

2



2 Safety glove uvex Rubiflex S, NBR

Uvex



The comfortable NBR safety glove, seamlessly coated in a reinforced design, with excellent chemical resistance and outstanding abrasion resistance. 1 pair per pack.

Characteristics:
- anatomic shape
- highly flexible
- very good mechanical characteristics
- excellent resistance to many chemicals, acids, alkalis, mineral oils and solvents
- good water vapour absorption due to the cotton lining

Applications: chemical industry, automotive industry, metal processing industry, mechanical industry, sandblasting

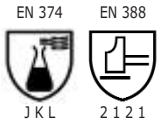
Tickness:	0.50mm
Colour:	green
EN:	374, 388, **Cat. III**

Size	Length mm	PK	Cat. No.
10	270	1	**7.602 595**
8	350	1	**9.414 608**
9	350	1	**9.414 609**
10	350	1	**9.414 610**
11	350	1	**9.414 611**
8	400	1	**6.231 389**
9	400	1	**6.231 425**
10	400	1	**6.231 447**



1 Safety glove uvex Rubiflex S, long version, NBR

Uvex





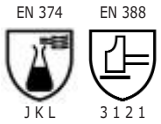
The comfortable Rubiflex S safety glove, seamlessly, coated in a reinforced design, with excellent chemical resistance and outstanding abrasion resistance. 1 pair per pack.
Characteristics:
- anatomic shape
- highly flexible
- very good mechanical characteristics
- excellent resistance to many chemicals, acids, alkalis, mineral oils and solvents
- good water vapour absorption due to the cotton lining

colour: green
length: 600mm
EN: 374, 388, **Cat. III**

Size	PK	Cat. No.
9	1	**6.301 526**
10	1	**9.414 612**
11	1	**9.414 613**

2 Safety gloves uvex Rubiflex XG, NBR

Uvex





The new, lightweight chemical-resistant safety glove with innovative xtra grip technology combines protection and grip with exceptional comfort and flexibility. 1 pair per pack.
In addition to a comfortable fit, stockinet chemical-resistant safety gloves provide excellent protection against chemicals and mechanical hazards. **Cat. III**

Characteristics:
- Exceptional dry and wet grip
- Multilayer design for excellent resistance time
- Ergonomic fit
- High flexibility
- Excellent resistance to many chemicals
- Ultra lightweight design
- Cotton lining for superior water vapour absorption

Applications: Chemical industry, Automotive industry, Painting, Laboratory work

Length: 350mm
Thickness: 0.40mm
Colour: blue/black
EN: 374/388 (3 1 2 1), Cat. III

Size	PK	Cat. No.
8	1	**9.414 617**
9	1	**9.414 618**
10	1	**9.414 619**
11	1	**9.414 620**



1



1 5 finger glove, cut protection

EN 388 EN 420

2 5 4 x

Cut protective, made of hybrid fibre (Kevlar, steel, nylon), cut level 5 (highest possible cut level). Certified EN 388 (mech. risk), Cat. II. Elastic, with Lycra, excellent fit and perfect tactility. Without uncomfortable stitching. Ambidextrous. Cellulose fibre lined, with seaweed extract and silver coating for maintaining good skin health.
1 pair per pack. **Cat. II**

Size	Length mm	PK	Cat. No.
7	270	1	**9.005 251**
8	270	1	**9.005 252**
9	270	1	**9.005 253**
10	270	1	**9.005 254**

2



2 Safety gloves uvex C500 dry, cut protection

Uvex

EN 388

2 5 4 x

The new uvex C500 range sets new standards in protection, comfort, flexibility, dexterity and economy. 1 pair per pack.

Characteristics:
- Patented uvex Profas Bamboo TwinFlex® technology
- innovative SoftGrip coating
- very high cut protection (Cut 5)
- for dry areas
- highest wearing comfort due to uvex climazone
- outstanding tactile feel
- high abrasion-resistance
- flexible
- silicone-free according to imprint test

Applications: Metal industry, Automobile industry, Transportation work, Assembly work, Glass industry, Maintenance and repair, Shipping/logistics, Brewery/beverage industry, Paper industry, Construction

Size	Length mm	PK	Cat. No.
7	270	1	**9.414 650**
8	270	1	**9.414 651**
9	270	1	**9.414 652**
10	270	1	**9.414 653**
11	270	1	**9.414 654**

3



3 Safety gloves, uvex C500 foam, cut protect

Uvex

EN 388

2 5 4 x

- patented uvex Profas Bamboo TwinFlex® technology
- innovative SoftGrip coating
- supreme cut protection (Cut 5)
- excellent wearing comfort due to uvex climazone
- outstanding tactile feel
- high abrasion-resistance
- flexible
- silicone-free, according to imprint test
- 1 pair per pack

Size	Length mm	PK	Cat. No.
7	270	1	**9.414 655**
8	270	1	**9.414 656**
9	270	1	**9.414 657**
10	270	1	**9.414 658**
11	270	1	**9.414 659**

E & OE.

1 Autoclave gloves Clavies®, heat protection up to 232°C



Fabricated with uncut cotton. Soft, flexible, washable. Heat resistant up to 232°C. 1 pair per pack.

Length Glove mm	Overall length mm	PK	Cat. No.
130	330	1	**9.005 271**
280	470	1	**9.005 272**

2 Safety gloves Nomex, heat protection up to 250°C



EN 407 EN 388 EN 420



4 2 3 1 x x 1 2 x x

Very supple, offering excellent movement. Knitted construction, without seams. Temperature resistant up to 250°C. 1 pair per pack. **Cat. II**

Description	PK	Cat. No.
Gloves, standard	1	**9.005 250**
Gloves with forearm protection	1	**9.005 260**

3 Safety gloves uvex K-Basic extra, heat protection up to +250°C



EN 388



1 3 4 x

Uvex

This coarse-knitted glove made of 100% Kevlar® is lined with cotton, making it ideal for protecting the wearer against heat and cuts.
The combination of Kevlar® and cotton guarantees good heat insulation and enables the handling of objects up to +250°C without losing anything in terms of cut resistance. 1 pair per pack.

Characteristics:
- Very good protection against cut injuries
- Additional cotton cladding
- Comfortable to wear

Applications: metal processing, automotive industry, glass industry, foundries

Length: 220mm to 270mm
Colour: yellow
EN: 388 (1 3 4 X)

Size	PK	Cat. No.
8	1	**9.414 660**
10	1	**9.414 661**
12	1	**9.414 662**

4 Safety gloves, heat protection up to +500°C

NEW!



EN 388 EN 407



Jutec GmbH

- 5-finger glove
- Protection against contact heat short term up to 500°C
- Made of aramide fabric with special insulation
- Usable on both sides
- Abrasion resistant

Length: 400mm
EN: 388, 407

Description	PK	Cat. No.
5 finger glove, heat protection	1	**9.006 893**

1



1 Safety gloves, heat protection up to 500°C

NEW!

EN 388 EN 407

Jutec GmbH

- Mitten
- Up to 500°C contact heat short term
- Made of aramide fabric with special insulation
- Usable on both sides
- Abrasion resistant

Length: 400mm
EN: 388, 407

Description	PK	Cat. No.
Heat protection glove	1	**9.006 892**

2



2 Arm protector, up to +500°C

NEW!

Jutec GmbH

- Arm protection sleeve made of Aramid
- Protection against short term radiation heat up to 500°C
- with elastic band at both ends

Length: 420 mm
EN: 388, 407

Description	PK	Cat. No.
Arm protector	1	**9.006 891**

3



3 Hand protectors

Made of thick-walled silicone.
Safe, non-slip protection against very hot or cold surfaces.
Measures 10cm x 19cm with durable silicone rubber construction that remains flexible from -57°C to +260°C.
End pockets accept thumb and fingers to grasp objects.
Mitts have multiple studs with concave tips thus providing secure grip on virtually all hot/cold surfaces.

Type	PK	Cat. No.
Hand protectors	1	**9.119 900**

4



4 Protection Gloves Cryo Gloves® Standard

EN 511 EN 388 EN 420

Developed to provide protection while working in deep-cold environments or handling ultra-cold objects and media (in the range of minus 160°C). Especially for secure handling dry ice (minus 79°C), sample handling (minus 86°C/minus 152°C) and handling ultra cold specimen - those stored in the vapour phase of liquid nitrogen. CE-marked, according normative EN 511, EN 420, EN 388, **CAT. III**
CAUTION: Not intended for immersion in liquid nitrogen or other liquid cryogens. 1 pair per pack.

Size	Description	PK	Cat. No.
S (8)	wrist length	1	**9.405 116**
M (9)	wrist length	1	**9.405 117**
L (10)	wrist length	1	**9.405 118**
XL (11)	wrist length	1	**9.405 119**
S (8)	forearm length	1	**9.405 120**
M (9)	forearm length	1	**9.005 446**
L (10)	forearm length	1	**9.005 447**
XL (11)	forearm length	1	**9.405 121**
M (9)	elbow length	1	**9.005 451**
L (10)	elbow length	1	**9.005 452**
XL (11)	elbow length	1	**9.405 122**
M (9)	shoulder length	1	**9.405 123**
L (10)	shoulder length	1	**9.405 124**
XL (11)	shoulder length	1	**9.405 125**

E & OE.

1 Cryogenic Gloves WATERPROOF Cryo-Gloves® WP

EN 511 EN 388 EN 420



An additional thin, seamless 100% waterproof liner, in the multi-layered shell provides protection from spills and splashes. Hand and arm protection when working with liquid nitrogen or other liquefied deep-cold gases (in a range of minus 160°C). We recommend to wear WATERPROOF Cryo-Gloves® when there is a risk of direct contact with ultra cold liquid cryogens as well as splashes. Typical applications are Cryopreservation and Filling of liquefied deep-cold gases. CE-marked, according normative EN 511, EN 420, EN 388, **CAT. III**
CAUTION: Not intended for immersion in liquid nitrogen or other liquid cryogens. 1 pair per pack.

Size	Description	PK	Cat. No.
S (8)	wrist length	1	**9.405 126**
M (9)	wrist length	1	**9.405 127**
L (10)	wrist length	1	**9.405 128**
XL (11)	wrist length	1	**9.405 129**
S (8)	forearm length	1	**9.405 130**
M (9)	forearm length	1	**9.405 131**
L (10)	forearm length	1	**9.405 132**
XL (11)	forearm length	1	**9.405 133**
M (9)	elbow length	1	**9.405 134**
L (10)	elbow length	1	**9.405 135**
XL (11)	elbow length	1	**9.405 136**
M (9)	shoulder length	1	**9.405 137**
L (10)	shoulder length	1	**9.405 138**
XL (11)	shoulder length	1	**9.405 139**

1



2 Cryo-temperature protection kit CRYO-TEMP-SHIELD®

Consisting of:
- 1 pair Cryo Gloves®, size: optional, **see table**
- 1 x face protection shield with adjustable head mounting
- 2 x safety labels, 300mm diameter, entitled "Face protection" and "Wear gloves"
- 1 x protection apron, Cryo Apron®, width: 610mm, length: 1070mm

Type	Type	Size	PK	Cat. No.
1001-S	Gloves forearm length	S (8)	1	**9.405 140**
1001-M	Gloves forearm length	M (9)	1	**9.405 141**
1001-L	Gloves forearm length	L (10)	1	**9.405 142**
1001-XL	Gloves forearm length	XL (11)	1	**9.405 143**
1102-M	Gloves elbow length	M (9)	1	**9.405 144**
1102-L	Gloves elbow length	L (10)	1	**9.405 145**
1102-XL	Gloves elbow length	XL (11)	1	**9.405 146**
1103-M	Gloves shoulder length	M (9)	1	**9.405 147**
1103-L	Gloves shoulder length	L (10)	1	**9.405 148**
1103-XL	Gloves shoulder length	XL (11)	1	**9.405 149**

2



For our cryogenic produkt range - please see page 746.

1



1 Deb® ClearFOAM Wash

Perfume-free and dye-free mild foam soap for general washroom use.

Capacity ml	Description	PK	Cat. No.
1000	Deb® ClearFOAM Wash Cartridge	1	**9.191 310**

2



2 Dispenser Deb® ClearFOAM Washroom 1000

Dispenser for Deb® ClearFOAM Wash soap.

For dispensing bottles ml	Label	PK	Cat. No.
1000	German, Dutch, French	1	**9.191 340**
1000	French, Portuguese, Spain, Italian	1	**9.191 341**
1000	English	1	**9.191 342**

3



9.191 155

Cleansing lotion Ivraxo® Soft V

Greven

- mild skin cleansing lotion for lightly soiled hands
- good skin tolerance because of a balanced cleanser combination
- very skin-friendly
- adapted to the natural pH-value of human skin
- remoisturizing
- soap-free

Capacity ml	PK	Cat. No.
250	1	**9.191 155** 3
1000	1	**9.191 156**

4



4 Cleansing lotion Ivraxo® Active Pearls

Greven

- hand cleansing paste with soft and smooth Active Soft Pearls for heavy soiling
- good skin tolerance through Active Soft Pearls (ASP), without sharp or hard abrasives
- skin-friendly, cleanser combination
- solvent-free and soap-free
- remoisturizing
- adapted to the natural pH-value of human skin

Capacity ml	PK	Cat. No.
250	1	**9.191 158**

Deb® InstantFOAM, sanitiser

Highly effective, perfume-free, dye-free alcohol-based foam **hand sanitiser** with moisturiser. Use without water to kill 99.999% of many common germs in just 15 seconds. The hypoallergenic foam formula is ideal for frequent use, leaving hands feeling refreshed, smooth and soft. Does not contain any gelling agents, so unlike alcohol gel' products, frequent use of Deb InstantFOAM does NOT leave hands feeling sticky. Also, the non-tainting and glove compatible formula is ideal for use in any food handling environment. The highly effective formula conforms to EN1500 in 15 seconds, prEN12054, EN1276, EN1275 & EN1040. Use biocides safely. Always read the label and product information before use.

1 2



9.191 320 9.191 321

Capacity ml	Description	PK	Cat. No.	
47	Deb® InstantFOAM Handy Pack	1	**9.191 320**	1
250	Deb® InstantFOAM Desk Pack	1	**9.191 321**	2
1000	Deb® InstantFOAM Cartridge	1	**9.191 322**	3

3



9.191 322

4 Dispenser Deb® Sanitise 1000

Dispenser for Deb® InstantFOAM

4



Capacity ml	Label	PK	Cat. No.
1000	German, Dutch, French	1	**9.191 343**
1000	French, Portuguese, Spain, Italian	1	**9.191 344**
1000	English	1	**9.191 345**

5 Softa-Man®/ ViscoRub hand disinfectant

Ready to use alcohol-based solution for gentle hand disinfection. *B. Braun*
- Effective against bacteria including fungi, lipophile viruses including HBV and HIV
- Offers safe, immediate and long-term action
- Gentle cleansing agents and non-greasy emollients make it non-allergenic
- Dermatologically approved
- DGHM- and BGA-listed
- For normal to dry skin

Softa-Man® ViscoRub: alcoholic ready-to-use solution with viscous consistency for normal to sensitive skin. DGHM/VAH listet and added in IHO-virucidal list.
Use disinfectants safely. Always read the label and product information before use.

5



Type	Capacity ml	PK	Cat. No.
Softa-Man® Dispenser	1000	1	**9.191 213**
Softa-Man® Canister	5000	1	**9.191 215**
Softa-Man® ViscoRub Dispenser	1000	1	**9.191 216**

6 Dosing dispenser, frame aluminium

NEW!

Hygienic extraction and precise dosing *B. Braun*
- Lever arm
- Aluminium housing
- Adjustable dosing from 0.8 to 1.8 ml
- for 500ml or 1000ml bottles

6



Type	For dispensing bottles ml	PK	Cat. No.
TLS plus	1000	1	**9.191 229**
ELS plus	500	1	**9.191 230**

1



1 Pump dispenser with reflux valve

B. Braun

For dispensing bottles ml	PK	Cat. No.
1000	1	**9.191 220**

2



2 Lindesa® skin protection cream with beeswax

Non-greasy, quickly absorbed. The cream strengthens the defensive functions of the skin, preventing skin damage from external pollution and soothes irritation. Smooths and cleans without leaving a residue. Lindesa® gives the skin elasticity and suppleness through its special caring agents. The sense of touch is not affected.
For low levels of soiling it provides protection against weak acids, alkalis and organic substances.

Capacity ml	PK	Cat. No.
50	1	**9.191 145**

3



3 Lindesa® O skin protection cream with beeswax

Moderately greasy. Particularly suitable for protecting the skin against organic solvents, varnishes, oils, petroleum spirit, resins, dyes, paints etc. as well as for after-work care for dry skin.

Capacity ml	PK	Cat. No.
100	1	**9.191 148**

4



4 Lindesa® K skin protection cream with beeswax and camomile

Quickly absorbed. The cream strengthens the defensive functions of the skin, preventing skin damage from external pollution and soothes irritation. Smooths and cleans without leaving a residue. Using Lindesa® K avoids greasy smears on surfaces and is therefore suitable for workers involved with enamelling, electronics production, or final inspection.

Capacity ml	PK	Cat. No.
50	1	**9.191 149**

5



5 Chinosol industrial health and safety cream

Medical skin ointment for protection against industrial skin allergies, e.g. caused by organic solvents, oils, varnishes, paints etc.
45ml tube.

Capacity ml	PK	Cat. No.
45	1	**9.191 010**

1 Tube holder Tubenboy®

Clean, aesthetic and for optimal storage and handling of paste and grease tubes. Holds metal and plastic-bodied tubes in an upright position. 66mm length, white, ABS/SAN

Hausmann-Vertrieb

Type	PK	Cat. No.
Tube holder Tubenboy®	1	**9.116 960**

1



2 Trixo® collagen cleaning lotion

Medical cosmetic skin cleansing lotion.
- Contains the natural elasticity of the skin
- Prevents chapping and dryness
- Hinders the build-up of infectious germs
- Non-greasy, non-sticky and quickly absorbed
- Ideal for normal to oily skin.

B. Braun

Type	Capacity ml	PK	Cat. No.
Tube	100	1	**9.191 231**
Dispenser	500	1	**9.191 233**

2



Deb® Pure Restore

Perfume-free and dye-free, highly effective mild after-work conditioning cream to provide effective skin care whether skin is dry,
sore, chapped or in normal condition.

Capacity ml	Description	PK	Cat. No.
1000	Deb® Pure Restore Cartridge	1	**9.191 330** 3
150	Deb® Pure Restore Tube	1	**9.191 331** 4

3



9.191 330

4



9.191 331

5 Dispenser Deb® Restore 1000

Dispenser for Deb® Pure Restore.

Capacity ml	Label	PK	Cat. No.
1000	German, Dutch, French	1	**9.191 346**
1000	French, Portuguese, Spain, Italian	1	**9.191 347**
1000	English	1	**9.191 348**

5





1 Visitors gown, PP

Unigloves

- shirt collar
- without pockets
- 4 press studs
- weight: 34g
- size universal
- individually packed in polybag

Size	PK	Cat. No.
universal	1	**9.414 046**



2 Protective overall KIMTECH Science*A7

Kimberly-Clark

Comfort and freedom of movement through a breathable, textile-type material. Antistatic to EN 1149-1 standards. Functional cut with fold-down collar, pockets and snap fasteners. Available in unisex sizes. Partial protection against spray from soluble chemicals.
Usage: Laboratory, electronic industry, visitor protection and/or industrial safety.

Size	PK	Cat. No.
S	15	**9.414 021**
M	15	**9.414 022**
L	15	**9.414 023**
XL	15	**9.414 024**
XXL	15	**9.414 025**



3 Ladies laboratory coats Type 81509

Uvex

With long sleeves and fitted waist.
Reversable collar, concealed buttons with press buttons, 1 outside breast pocket left, 2 side pockets with diagonal access, straight sleeve seam with press buttons for width adjustment with press buttons for width adjustment, Öko-Tex Standard 100.

Material:	100% cotton
Colour:	White
Weight:	approx. 210g/m²
Length:	approx. 105cm

Size	PK	Cat. No.
36 (S)	1	**9.414 351**
38 (S)	1	**9.414 352**
40 (M)	1	**9.414 353**
42 (M)	1	**6.323 052**
44 (L)	1	**9.414 355**
46 (L)	1	**9.414 356**
48 (XL)	1	**9.414 357**



4 Mens laboratory coats Type 81996

Uvex

Reversible collar, concealed buttons, 1 outside breast pocket left, 1 inside breast pocket right, 2 side pockets with diagonal access with light grey piping, 2 short side slits, straight, untapered back, straight sleeve seam, Öko-Tex Standard 100, UV-Standard 801

Material:	100% cotton
Colour:	White
Weight:	approx. 240g/m²
Length:	approx. 96cm

Size	PK	Cat. No.
44/46	1	**9.414 371**
48/50	1	**9.414 373**
52/54	1	**9.414 375**
56/58	1	**9.414 377**
60/62	1	**9.414 379**

1 LLG-Working and chemical protective apron Guttasyn®, PVC/PE

NEW!

Made from PVC with reverse side made of PE. Material thickness: 0.5mm. Side and neck ribbons made of woven plastic fabric and securely attached to the apron with welded PVC eyelets. Easy to clean, hygienic and dirt-repellent PVC surface. Liquids will not be absorbed but drain off the surface. Machine wash at 60°C. Colour: white. Acc. to 89/686/EWG (Cat. III), EN 467 and EN 14605:2005.

Width mm	Length mm	PK	Cat. No.
800	1000	1	**9.414 415**
800	1200	1	**9.414 417**
1000	1200	1	**9.414 419**



2 Cryogenic apron Cryo Apron®

The Cryo-Apron® provides a high-level of thermal protection to the operater's torso and upper legs against cryogenic splashes and ultra-cold vapour in harsh cryogenic atmospheres, typically whilst transferring cryogens (in a range of minus 160°C). With adjustable straps at neck and waist. Also useable in cleanroom environments.
CE-marked, according normative EN 511, EN 420, EN 388, **CAT. III**

Width mm	Length mm	PK	Cat. No.
610	1210	1	**6.227 849**
610	1070	1	**6.228 898**



3 Protective suits with hood, PP

White, with hood. CE category I. Weight: 37g. Individually packed in polybag. *Unigloves*

Size	PK	Cat. No.
L	10	**9.414 047**
XL	10	**9.414 048**
XXL	10	**9.414 049**



1



1 LLG-Overall tritex® pro white, Type 5/6

NEW!

Dust-tight chemical protective clothing, Cat. III/CE0516/Type 5/6

3-ply SMS material (spunbond-meltblown-spunbond). A meltblown filter membrane is embedded between two durable outer layers. The overall is breathable. Hood with elastic band, zipper cover as well as wrist and leg elastic.

Size	PK	Cat. No.
L	25	**9.413 245**
XL	25	**9.413 246**
XXL	25	**9.413 247**
XXXL	25	**9.413 248**

2



2 Disposable, chemical protection coverall 4B

NEW!

Material: polyethylene-laminate *Uvex*

- model no. 9878
- colour white/orange
- excellent wearer comfort due to the breathable, light and flexible material
- re-sealable zipper flap and taped seams ensure optimum protection against penetration by liquid aerosols and solid particles
- the hood is easily compatible with filtering face masks
- middle finger loops prevent sleeves from sliding up
- approved for protection against pesticides according to DIN 32781
- silicone free
- suitable for cleanroom environment (Class 7, ISO 14644-1)
- chemical protection: personal protective equipment category 3, EN 14605(Type 4), EN ISO 13982-1(Type 5), EN 13034(Type 6), EN 1149-5, EN 14126,

Size	PK	Cat. No.
S	5	**9.414 100**
M	5	**9.414 101**
L	5	**9.414 102**
XL	5	**9.414 103**
XXL	5	**9.414 104**
XXXL	5	**9.414 105**

3



3 Disposable, chemical protection coverall, Uvex 5/6

NEW!

Material: polyethylene laminate combined with spunbond (SMS) back section *Uvex*

- colour white/lime green
- polyethylene laminate combined with a back section to provide a high level of moisture management and breathability, without reducing protection
- the bound seams ensure a high level of protection against liquid splashes and solid particles
- hood allows easy use with face masks
- optimised body fit provides excellent wearer comfort
- bound seams and elastics in contrasting colours for "visible safety"
- middle finger loops prevent the sleeves from riding up e.g. during work carried out above head height
- silicone-free
- suitable for cleanroom enviroment (class 8, ISO 14644-1)
- chemical protection personal protective equipment category 3, EN ISO 13982-1(Type 5), EN 13034(Type 6), EN 1149-5

Size	PK	Cat. No.
M	5	**9.414 090**
L	5	**9.414 091**
XL	5	**9.414 092**
XXL	5	**9.414 093**
XXXL	5	**9.414 094**

1 Kleenguard*protective suits A50

Kimberly-Clark

High performance SMS fabric Outer layers, cloth-like, yet strong and abrasionresistant spunbond polypropylene. Middle layer intricates web of microfibres that filters out many water-based liquids and dry particulates.

- Protection against chemical splash and particles
- Anti-static EN 1149-1 for critical areas
- Low lint fabric and internal seams reduce the risk of fibre contamination
- Silicon free, ideal for paint spraying
- 2-way zip for quick easy access to work clothes
- Breathable fabric reduces the risk of heat stress
- Hood designed for respirator use and freedom of movement
- Strong triple stitched seams help to protect against tearing
- EN 1073-2 approved for radioactive dust protection


1

Size	Colour	PK	Cat. No.
S	blue	25	**9.414 011**
M	blue	25	**9.414 012**
L	blue	25	**9.414 013**
XL	blue	25	**9.414 014**

2 Bouffant caps

Unigloves

- non-woven fabric
- soft with elastic band
- free from fibre-glass and breathable
- 52cm circumference.


2

Colour	PK	Cat. No.
Green	100	**9.414 040**
White	100	**9.414 041**
Blue	100	**9.414 042**

3 Oversleeves KLEENGUARD*A40

NEW!

Kimberly-Clark

Light duty, antistatic.

Type	PK	Cat. No.
Oversleeves KLEENGUARD* A40	200	**9.414 030**


3

4 Disposable overshoes

Blue, PVC-free. Pack of 100 shoes.

Type	PK	Cat. No.
Disposable overshoes	100	**9.414 080**


4

5 Disposable overshoes

Unigloves

- white non-woven fabric
- blue CPE walking sole
- Length approx. 40cm

Type	PK	Cat. No.
Disposable overshoes	50	**9.414 050**


5

1



2



GHS 01 / GHS 02 / GHS 03

3



GHS 04 / GHS 05 / GHS 06

4



GHS 07 / GHS 08 / GHS 09

1 2 3 4 LLG-GHS warning labels, self-adhesive, roll in dispenser box

Dispenser box of 250 labels. These labels are produced using an extremely resistant 100µm PE film.
Due to their special surface coating they are resistant to most solvents and excellent for indoor or outdoor use.
The strong adhesive, although permanent, can be removed from glass containers without leaving any trace.
Trilingual signal word: German, English, French.
Available in 2 sizes.

Type	Description	Label	Dimensions mm	PK	Cat. No.
GHS 01	warning	exploding bomb	26 x 37	250	**9.105 700**
GHS 01	danger	exploding bomb	26 x 37	250	**9.105 701**
GHS 02	warning	flame	26 x 37	250	**9.105 702**
GHS 02	danger	flame	26 x 37	250	**9.105 703**
GHS 03	warning	flame over circle	26 x 37	250	**9.105 704**
GHS 03	danger	flame over circle	26 x 37	250	**9.105 705**
GHS 04	warning	gas cylinder	26 x 37	250	**9.105 706**
GHS 05	warning	corrosive	26 x 37	250	**9.105 707**
GHS 05	danger	corrosive	26 x 37	250	**9.105 708**
GHS 06	danger	skull and crossbones	26 x 37	250	**9.105 709**
GHS 07	warning	exclamation mark	26 x 37	250	**9.105 710**
GHS 08	warning	health hazard	26 x 37	250	**9.105 711**
GHS 08	danger	health hazard	26 x 37	250	**9.105 712**
GHS 09	warning	environment	26 x 37	250	**9.105 713**
GHS 01	warning	exploding bomb	37 x 52	250	**9.105 720**
GHS 01	danger	exploding bomb	37 x 52	250	**9.105 721**
GHS 02	warning	flame	37 x 52	250	**9.105 722**
GHS 02	danger	flame	37 x 52	250	**9.105 723**
GHS 03	warning	flame over circle	37 x 52	250	**9.105 724**
GHS 03	danger	flame over circle	37 x 52	250	**9.105 725**
GHS 04	warning	gas cylinder	37 x 52	250	**9.105 726**
GHS 05	warning	corrosive	37 x 52	250	**9.105 727**
GHS 05	danger	corrosive	37 x 52	250	**9.105 728**
GHS 06	danger	skull and crossbones	37 x 52	250	**9.105 729**
GHS 07	warning	exclamation mark	37 x 52	250	**9.105 730**
GHS 08	warning	health hazard	37 x 52	250	**9.105 731**
GHS 08	danger	health hazard	37 x 52	250	**9.105 732**
GHS 09	warning	environment	37 x 52	250	**9.105 733**

5



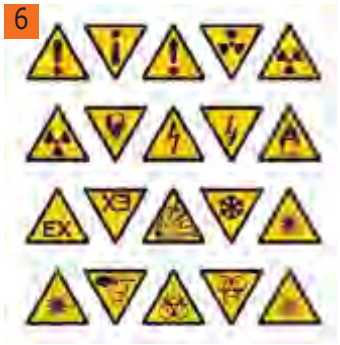
5 LLG-Labels with "biohazard" symbol

NEW!

Ø 9.5mm. Self-adhesive. Printing protected. For labeling of 0.5 to 2.0ml microtubes that contains potentially hazardous substances. The labels have excellent heat resistance, chemical resistance and UV resistance and a very good adhesion to various materials, even on rough or non-polar surfaces such as on plastics with low surface energy. The material is UL certified. (File MH26760).
1000 labels per roll, in dispensing box.

Description	PK	Cat. No.
"biohazard" symbol	1000	**9.105 740**

6



6 Hazard and prohibitive labels

Self-adhesive vinyl.

Type	Height mm	PK	Cat. No.
Minisymbol collecting sheet (Warning signs II)	20	20	**9.105 377**

7



9.105 380

Prohibitive warning labels

Self-adhesive vinyl.

Type	Diam. mm	PK	Cat. No.
Food and drink prohibited	200	1	**9.105 451**
Food and drink prohibited	100	1	**9.105 450**
Smoking prohibited	100	1	**9.105 452**
Smoking prohibited	200	1	**9.105 453**
Minisymbol collecting sheet	20	20	**9.105 380**

1 Mandatory labels

Self adhesive.

Type	Description	Diam. mm	PK	Cat. No.
M01	Use eye protection	50	1	**9.105 400**
M01	Use eye protection	100	1	**9.105 401**
M01	Use eye protection	200	1	**9.105 402**
M24	Use light breathing protection	100	1	**9.105 417**
M24	Use light breathing protection	200	1	**9.105 418**
M03	Use ear protection	100	1	**9.105 404**
M03	Use ear protection	200	1	**9.105 405**
M02	Use hard had	200	1	**9.105 406**
M06	Use hand protection	50	1	**9.105 407**
M06	Use hand protection	100	1	**9.105 408**
M06	Use hand protection	200	1	**9.105 409**
M05	Use protection shoes	200	1	**9.105 410**
M07	Use protection clothes	100	1	**9.105 411**
M07	Use protection clothes	200	1	**9.105 412**
M04	Use breathing protection	100	1	**6.239 788**
M04	Use breathing protection	200	1	**9.105 403**
M31	Smoking allowed	200	1	**9.105 414**
M46	Use hair protection	100	1	**9.105 415**
M46	Use hair protection	200	1	**9.105 416**
M22	Wash hands	200	1	**9.105 419**
M08	Use face shield	200	1	**9.105 413**

1



Mandatory labels, Minisymbol

Self adhesive.

Description	Diam. mm	PK	Cat. No.
Minisymbol collecting sheet (Bidding signs I)	20	20	**9.105 378** 2
Minisymbol collecting sheet (Bidding signs II)	20	20	**9.105 379** 3

2



9.105 378

3



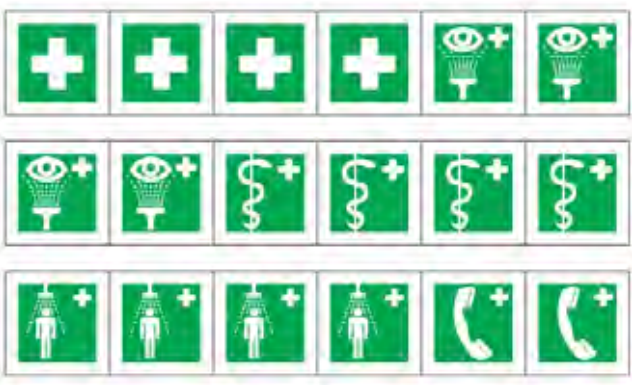
9.105 379

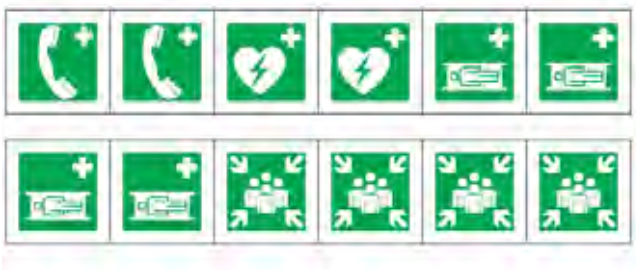
4 Emergency labels, Minisymbol

Self-adhesive vinyl.

Type	Height mm	PK	Cat. No.
Minisymbol collecting sheet (First Aid)	12	30	**9.105 376**

4







1 First aid box Office

White with screen-printed lettering. Small first aid box made from high grade plastic with hinges and lid locking clip. With insert tray for easier visibility of contents. With wall bracket.
Contents according to DIN 13157.

Type	Width mm	Depth mm	Height mm	PK	Cat. No.
Office	260	80	160	1	**9.264 172**

First aid boxes QUICK-CD/MT-CD

Orange. ABS-plastic, high-impact, resistant to deformation, heat resistant.
With two large storage trays, rubber seal, rounded corners and edges. Sealing tag provided. Smooth-running turn-lock fasteners and stable handle. Wall bracket with 90° locking device to support box lid when opened, providing a tray platform. Tray partitions have spacers and transparent covers. With screen-printed sign and text in German. (Refill pack: 6.264 229 for QUICK-CD standard, Refill pack: 6.264 242 for MT-CD).

Type	DIN	Width mm	Depth mm	Height mm	PK	Cat. No.
QUICK-CD filled	13157	260	110	170	1	**9.264 160** 2
MT-CD filled	13169	400	150	300	1	**9.264 164** 3



9.264 160



9.264 164

4 5 Heidelberg first aid cabinet

Contents to DIN 13157. Steel plate 0.7 mm thick. White electrostatic powder coated. Single door with profile seal and safety lock with two keys.
One-piece frame with rounded corners and edges. Additional support tableau for the hygienic storage of dressings for first aid service.
Open interior, with single shelf adjustable for height and separate compartments. Screen-printed label in German.

Width mm	Depth mm	Height mm	PK	Cat. No.
302	140	362	1	**9.264 170**





E & OE.

1 2 Rom first aid cabinet

Contents to DIN 13169. Sheet steel 0.7mm thick. White electrostatic powder coated. With lockable double doors and two keys. The doors have profile seals made of synthetic coated wire mesh. One-piece frame with rounded corners and edges. Open interior, with two shelves adjustable for height intervals and two separate drawers. Each door with three compartments. Additional support table for the hygienic storage of dressings for first aid service. With screen-printed sign and text in German.

Width mm	Depth mm	Height mm	PK	Cat. No.
404	170	462	1	**9.264 171**

1



2



Refills for first aid boxes

High-quality dressing refills.

Description	For	PK	Cat. No.
Refill update set according to DIN 13157	Office, Heidelberg, QUICK-CD	1	**6.239 227** 3
Refill update set according to DIN 13169	Rom, MT-CD	1	**6.239 228**
High class refill according to DIN 13157	QUICK-CD, Heidelberg	1	**6.239 229** 4
High class refill according to DIN 13169	MT-CD, Rom	1	**6.239 242**
Standard refill according to DIN 13157	Office, Heidelberg, QUICK-CD	1	**9.264 174** 5
Standard refill according to DIN 13169	Rom, MT-CD	1	**9.264 175** 6

3



6.239 227

4



6.239 229

5



9.264 174

6



9.264 175

7 Special first aid kit for laboratories and chemistry

ABS plastic. Orange. Basic contents to DIN 13157. Additionally includes industrial risk equipment for laboratories and chemistry, medical, technical and chemical research institutes and laboratories. With wall bracket, handle and turn-lock fasteners. Sealing tag provided. With screen-printed label with text in German.

Dimensions (W x H x D): 400 x 300 x 150mm.

Type	PK	Cat. No.
Laboratory and Chemistry	1	**9.264 163**

7





1 Cotton wool roll

NEW!

Alan & Co S.A.

- 100 % Cotton
- White cotton - non chlorine-bleached
- according to European Pharmacopoeia & Ecotex 100 Certificate
- Width - Max. 25cm, length ±7m

For absorbent cotton roll:
- highly absorbent
- Tenacity of water : appr. 23 ml/g of cotton

Description	PK	Cat. No.
Cotton roll 500g, absorbent	1	**9.413 155**
Cotton roll 500g, non-absorbent	1	**9.413 156**



2 Cotton wool

Meets requirements of German Pharmacopeia.
100% viscose.
Medical cotton wool for home use and general hygiene.

Type	Capacity g	PK	Cat. No.
Cotton wool	100	1	**9.413 152**

Surface protector - please see page 178



3 Cotton Applicator, non-sterile

- according to EN ISO 13485
- for sampling in laboratories
- with drug code (PZN 7469036)

Material	Wall thickness mm	Length mm	Head size	PK	Cat. No.
Wood	2.2	150	4 to 5.5 mm diam.	100	**9.413 160**



4 Cotton Applicator, sterile

- according to EN ISO 13485 and conforming to 93/42/EEC, enclosure V for medical products
- sterilised with ETO gas
- individually packed in Peel-Pack
- with drug code (PZN 1407459)

Material	Wall thickness mm	Length mm	Head size	PK	Cat. No.
Wood	2.2	150	Ø 4 to 5.5 mm	100	**9.413 161**



5 Extraset plasters refill

The most commonly occuring injuries are to the fingers and hands. The proportion of plasters in the average industrial first aid box is only limited. The Extraset plasters refill was created for precisely this reason and contains 116 plasters in high-grade, non-allergenic material in several formats and sizes.

Type	PK	Cat. No.
Extraset plasters refill	1	**9.264 165**

E & OE.

Plaster Dispenser aluderm®-aluplast

- Manufactured from highly tensile ABS
- Size 160 x 122 x 57mm
- With wall mounting
- Filled with five varieties of aluminium vaporised aluderm®-aluplast plasters. Sizes: 30 Strips 72 x 25mm, 30 Strips 72 x 19mm, 25 fingertip plasters, 20 finger dressings 120 x 20mm and 10 finger joint plasters.

Each plaster variety is stored independently in its own compartment and gives a clear product overview for the user.

Description	PK	Cat. No.	
Plaster Dispenser aluderm®-aluplast, filled with 115 plasters	1	**9.264 146**	1
Refill pack, complete for aluderm®-aluplast, with 115 plasters	1	**9.264 147**	2

1



9.264 146

2



9.264 147

QuickFix plaster dispenser

B-SAFETY

Pull and you immediately have a plaster ready for use. Each plaster is individually packed. This provides great hygienic safety. Ready for use at critical workplaces. The plasters are made of protective, low-allergenic, PE material that allows the skin to breathe and are especially suitable for damp workplaces.
The QuickFix dispenser is only 23cm wide and 13.5cm high. It contains 90 plasters in spite of its modest size so it can be installed precisely in those places where the need is greatest.
Refilling of the dispenser is also possible with other types of the QuickFix range.

QuickFix Elastic Long Refill, 30-parts finger dressing
Elastic plasters, conforming to the movements of the skin and therefore very comfortable to wear. The plasters allow the skin to breathe.
- Dimensions 120x20mm
- Solves most accidents quickly, easily and hygienically

3



9.733 808

Description	PK	Cat. No.	
QuickFix plaster dispenser including two water-resistant plaster refills	1	**9.733 808**	3
QuickFix water resistant plaster refill containing 45 plasters	1	**9.733 809**	
QuickFix 30-parts finger dressing	1	**9.733 825**	4

4



9.733 825

1



1 Fire blanket, fibreglass

NEW!

Jutec GmbH

The fire blanket is a small fire equipment principally used to extinguish small incipient (starting) fires by smothering the fire cutting off the oxygen supply from the fire.
- Made of texturized E-glass fabric
- Cut edges seamed
- Folded and packed in a red plastic bag with print "Löschdecke"
- Dimensions: 1800 x 1600 mm

Description	PK	Cat. No.
Fire blanket, fibreglass	1	**9.006 902**

2



2 Container for fire blanket, fibreglass

NEW!

Jutec GmbH

Fire blanket container made of galvanized welded steel sheet , to be opened upside, the blanket is removable. Cover is fixed with hinge, painted RAL 3000 red powder coating, with white
print "Löschdecke/Fire blanket"
- Opening upside
- Without fixing material
- Without fire blanket
- Dimensions (W x H x D): 200 x 300 x 240 mm

Description	PK	Cat. No.
Container for fire blanket, fibreglass	1	**9.006 903**

3



3 Powder fire extinguisher

Fire classes ABC. Inner carbon dioxide propellant container.
Adjustable high-pressure hose. With mounting bracket. 1 year guarantee. State tested and approved in Germany.

Type	Description	Charge	PK	Cat. No.
PL1J	Mini powder blotter	1kg	1	**9.006 910**
PS2J 13	Mini powder blotter	2kg	1	**9.006 911**
P6J	Power fire extinguisher	6kg	1	**9.006 907**



1 LLG-Disposal bags, PP

Constructed from very strong PP film with a broad seam at the bottom. For the disposal of contaminated labware. When autoclaving, the neck of the bag must be left open. Film thickness: 50µm.



Size	auto-clavable at	Description	Pack size	PK	Cat. No.
200 x 300	134 °C	standard	Dispenser box of 100 bags	100	**9.404 099**
300 x 500	134 °C	standard	Box of 500 bags	500	**9.404 220**
400 x 780	134 °C	standard	Box of 250 bags	250	**9.404 221**
500 x 780	134 °C	standard	Box of 250 bags	250	**9.404 222**
600 x 800	134 °C	standard	Box of 100 bags	100	**9.404 103**
600 x 780	134 °C	standard	Box of 250 bags	250	**9.404 223**
700 x 1100	134 °C	standard	Box of 250 bags	250	**9.404 224**
700 x 1100	134 °C	standard	Box of 75 bags	75	**9.404 105**
200 x 300	121 °C	highly transparent	Dispenser box of 100 bags	100	**9.404 020**
300 x 500	121 °C	highly transparent	Box of 500 bags	500	**9.404 100**
400 x 780	121 °C	highly transparent	Box of 500 bags	500	**9.404 101**
600 x 800	121 °C	highly transparent	Box of 500 bags	500	**9.404 102**
700 x 1100	121 °C	highly transparent	Box of 350 bags	350	**9.404 104**

2 LLG-Autoclavable Bags, PP

Clear bags imprinted with blue biohazard labeling designed for safe disposal. Constructed of 50µm thick polypropylene, allowing for repeated autoclaving. Strong side seams for securely holding items. Front write-on panel. Autoclavable at 250°F (121°C).



Width mm	Length mm	PK	Cat. No.
310	660	50	**9.404 050**
415	600	50	**9.404 051**
610	810	50	**9.404 052**

3 Biohazard Disposal Bags, PP, red, 38µm

NEW!

Bel-Art Products

- Thickness of film: 38 µm
- Material: polypropylene
- Color: red
- Print: standard biohazard warning symbol and precautionary protocols in four languages: English, French, German and Spanish
- With pre-printed sterilization indicator patch, which darkens when bag is autoclaved
- Can be autoclaved at 135°C



Description	Size	PK	Cat. No.
Biohazard Disposal Bags, red	360 x 480mm	200	**6.240 465**
Biohazard Disposal Bags, red	480 x 580mm	200	**9.404 010**
Biohazard Disposal Bags, red	640 x 890mm	200	**6.301 637**
Biohazard Disposal Bags, red	790 x 970mm	200	**6.253 096**
Biohazard Disposal Bags, red	970 x 1220mm	100	**9.404 011**

4 Biohazard disposal bags, PP, 50µm

NEW!

Bel-Art Products

Biohazard disposal bags, super strength
- maximum protection against dangerous tears and leaks
- Thickness of film: 50 µm
- Material: blended polymer
- Color: red-orange
- Print: standard biohazard warning symbol and precautionary procedures in four languages: English, French, German and Spanish
- With pre-printed sterilization indicator patch, which darkens when bag is autoclaved
- Can be autoclaved at 121°C.



Description	Size	PK	Cat. No.
Biohazard Disposal Bags, super strength	360 x 480mm	200	**9.404 012**
Biohazard Disposal Bags, super strength	480 x 580mm	200	**9.404 013**
Biohazard Disposal Bags, super strength	640 x 890mm	200	**6.253 092**
Biohazard Disposal Bags, super strength	790 x 960mm	200	**6.253 093**
Biohazard Disposal Bags, super strength	940 x 1220mm	100	**9.404 014**

1



1 Holder for waste sacks

Steel wire. Epoxy resin coating. With rubber feet.
Supplied with 100 PP waste sacks.

Int. diam. mm	Height mm	PK	Cat. No.
120	250	1	**9.404 030**

Warning: Never place sharp objects such as hypodermic needles, etc., in plastic bags! Always steam-sterilize bags unsealed.
Injury hazard!

2



2 Trash sacks, PE

Capacity Litres	Width mm	Length mm	PK	Cat. No.
120	700	1100	10	**9.000 996**

3



3 Waste sack holder

Green. Consists of floor plate and lid with frame made of stable plastic. Assembled with two dismountable metal tubes.

Width mm	Depth mm	Height mm	PK	Cat. No.
360	395	770	1	**9.000 956**

4



4 Rubbish bags, PE-HD

PE-HD. With adhesive strips. Can be fixed anywhere, e.g. walls and tables etc. Without holder. Autoclavable (121°C).
Carrying weight approx. 1.36 kg.

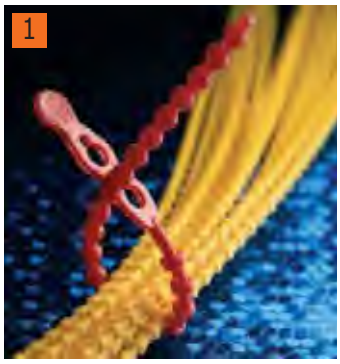
Width mm	Length mm	PK	Cat. No.
203	254	50	**9.404 065**
305	406	50	**9.404 066**

1 Quick-lock ties

Basic colour: natural and red Polyethylene, round, can be reopened. Further colours available on request.

Württ. Allplastik

Length mm	Diam. mm	PK	Cat. No.
120	3.5	1000	**9.404 182**
180	3.5	1000	**9.404 184**
240	3.9	1000	**9.404 186**
320	4.4	1000	**6.235 096**



2 Cable ties

Nylon, flat, single use - cannot be reopened

Württ. Allplastik

Length mm	Width mm	PK	Cat. No.
75	2.2	1000	**9.404 301**
98	2.5	1000	**9.404 303**
135	2.5	1000	**9.404 305**
160	2.6	1000	**9.404 306**
200	2.6	1000	**9.404 307**
140	3.6	1000	**9.404 309**
200	3.6	1000	**9.404 314**
290	3.6	500	**9.404 310**
160	4.5	1000	**9.404 311**
250	4.8	100	**9.404 316**
300	7.8	100	**9.404 326**



3 Safety Disposal System Kontamed

Dimensions: 225 x 160 x 70mm. A hygienic and safe container for the disposal of used medical materials such as syringes, cannulae and scalpels. Constructed in impact and heat resistant polypropylene and easily disposable materials. Physiologically harmless. With wall mounting and safety closing flap in red. The Kontamed safety container is designed with three drop slots. One for the disposal of cannulae and syringes, enabling you to avoid contact with them. The second slot is used for the disposal of potentially infected scalpels and blades. The third allows for the disposal of dressings, gloves etc. Before disposing of the full container, the built-in security aperture must be activated, thus ensuring that the contents are stored safe.

Description	Capacity ml	PK	Cat. No.
Sharps Disposal System Kontamed	1800	1	**9.264 148**



4 Needle Disposal System Kontamed Mini

115mm high x 50mm dia. Polypropylene construction. The Kontamed Mini is impact and temperature resistant as well as physiologically harmless. It can be disposed of safely and is environmentally friendly. Perfect for doctors or paramedics on the move. Easily stored in a doctor's bags, emergency kits or in medical clothing.
Kontamed Mini is equipped with a drop slot for cannulae and syringes. It also features a reinforced base, to stop syringes or other sharp objects from penetrating the container base.

Description	Capacity ml	PK	Cat. No.
Needle Disposal System Kontamed Mini	170	1	**9.264 149**



5 Needles and waste containers Medibox®

Containers for easy and safe disposal of all kinds of medical sharps. Medibox® sharps containers are complying with international standards.

Description	PK	Cat. No.
Medibox® 0.7l	1	**6.051 172**
Medibox® 3l	1	**9.264 180**
Medibox® 5l	1	**9.264 181**



1



1 2 Disposal cartons for broken glass

NEW!

Bel-Art Products

When the carton is filled, the safety cap is moved into place and the complete unit is ready for disposal.
- Safe puncture resistant receptacles for broken glassware
- Reduces chances for accidents
- Clearly labeled, dedicated containers available in 2 sizes: floor model: 18kg of waste; bench top: 5.5kg
- Lined with a 50 micron, clear polypropylene bag to store
- Printed in four languages: English, German, French, Spanish

model: Floor
length x width x height: 30 x 30 x 69cm

model: Benchtop
length x width x height: 20 x 20 x 25cm

Reusable cover for floor model:
Reusable safety cover for glass disposal carton. Dishwasher-safe and autoclave-safe. The Disposal Carton Cover opens quickly and easily by pressing the built-in release tab. Please do not dispose but reuse for the next glass disposal carton.

2



Description	Dimensions (W x D x H) mm	PK	Cat. No.
Disposal cartons for broken glass, floor model	300 x 300 x 690	6	**6.236 025**
Disposal cartons for broken glass, benchtop	200 x 200 x 250	6	**9.264 190**
Cover for glass disposal cartons		1	**9.264 191**

3



3 Roll pedal bin

Plastic. Very stable. Robust pedal opening mechanism. With twin wheels and handle. Suitable for 120L waste bags.

Capacity litres	Width mm	Length mm	Height mm	Colour	PK	Cat. No.
100	556	490	890	green	1	**9.000 965**

4



4 Waste containers

PP. With two nickel-plated handles for carrying and holding down the lid.

Capacity litres	Dimensions (dia. x H) mm	Colour	PK	Cat. No.
23	350 x 450	red	1	**9.000 943**
23	350 x 450	blue	1	**9.000 944**
23	350 x 450	dark green	1	**9.000 945**
46	430 x 570	dark green	1	**9.000 941**

5



7.300 223

Mercury collector

Bürkle

Bürkle's mercury collector enables the easy collection of spilt mercury, which can then be used again. The mercury collector is composed of a PE tub. Within the screw cap lid there is a special plastic foam insert. On pressing this foam gently on the spilt mercury, the foam's pores are opened and the mercury globules are absorbed. When raised, the foam's pores are sealed again, thus keeping hold of the mercury. The cap is then screwed on the tub, the globules are released again and fall through the perforated separation into the tub.

Description	PK	Cat. No.
Mercury collector	1	**7.300 223** 5
Replacement foam insert	1	**7.300 224**

E & OE.

1 Disposable spill kit SKH-MINI emergency kit

A fully disposable spill kit to clean up small chemical spills quickly, easily and without risk of injuries. *Brady*

- Highly visible green colour.
- The autoclavable disposal bag is heat resistant up to 145°C and therefore guarantees a safe disposal of laboratory waste.
- Adsorbs chemicals, dangerous liquids, water & oil based fluids.
- Suited for spills up to 1.7L.
- The specially designed disposable brush is intended to sweep up any broken glass or debris allowing a safe clean up without risk of injuries.
- Thanks to the compact design, the SKH-MINI can easily be placed in areas where spills are most likely to happen.
- Protective gloves are powder free, have roughened fingertips, increased tear resistance and a good chemical resistance for more safety.

1



Contents:
2 pads 41cm x 51cm
1 pair of disposable chemical protective gloves
1 autoclavable disposal bag
1 disposable brush
1 multilingual instruction guide

Type	PK	Cat. No.
SKH-MINI-Set	1	**9.404 080**

Chemical Sorbents

The sorbents have a high performance. Due to their new microfibre structure, they provide very high absorbing capacities. The light and absorbent material is easy to use and committed to absorb quickly and store the liquid. The absorbed liquid can be extracted, to be used again or to be disposed of separately. The optimal combination of features such as light weight, low volume, very high absorbance, easy handling and low sorbent disposal weight significantly reduces disposal costs in comparison to conventional binding materials. To reduce the final waste content, the used sorbets can be burnt. *3M Deutschland*

Can be used to absorb a variety of lab chemicals:
- acids, such as acetic acid, hydrofluoric acid, phosphoric acid, nitric acid, hydrochloric acid, sulphuric acid
- alkalis, such as sodium hydroxide, potassium hydroxide
- hydrazine: N_2H_4
- hydrogen peroxide

Type	Description	Dimensions (W x D) mm	Absorption*, litres	PK	Cat. No.
PF 2001	Multi-Format	15.2m x 12cm	37	1	**9.264 101** 2
P 110	Wipes	33cm x 28cm	0.25	50	**9.264 102** 3
P 300	Pillows	28cm x 18cm	2	16	**9.264 103** 4

*Capacity per piece

2



9.264 101

3



9.264 102

4



9.264 103

Chemical sorbents emergency kits

Each kit has the optimal combination of different sorbents. Ready to use.
Quick and safe aid for accidental spillages of almost all hazardous liquids.

3M Deutschland

Type	Size	Absorption*, litres	Capacity	PK	Cat. No.
SK5	7 x 40 x 28 cm	approx. 5	10 wipes, 1 pillow, 1 waste bag	1	**9.264 104** 1
SK26	40 x 63 cm	approx. 26	10 wipes, 5 pillows, 5 mini socks, 2 waste bags	1	**9.264 105** 2
SK75	53 x 78 x 32 cm	approx. 75	100 wipes, 12 pillows, 8 mini socks, 5 waste bags	1	**9.264 106** 3

*Capacity per kit

1



9.264 104

2



9.264 105

3



9.264 106

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

S·C·A·T® europe

E & OE.

1 Safety box

PC. Completely autoclavable. Used to carry tubes and containers under safe conditions. With silicone gasket and 4 sidelocks. Provided with a stainless steel handle and user sheet with instructions approved by WHO. With bio-hazard symbol printed on the box. *Kartell*

Description	Width mm	Length mm	Height mm	PK	Cat. No.
Safety box	175	330	180	1	**9.301 567**
Safety box rack				1	**9.301 568**
Set 4 sidelocks				1	**6.235 082**
silicone gasket				1	**9.301 569**

1



2 3 Safety box DURAPorter™, PC

NEW!

Ideal for transporting biological and clinical samples, as well as instruments and products that you want to keep clean and dry under testing environmental conditions. *Heathrow Scientific*
The clarity of the DuraPorter™ enables the user to visibly check sample integrity, so that it can be opened using the right precautions.
- Polycarbonate construction and available in three colors for use/owner identification
- Silicone water-tight seal and three lid clasps provide secure closure
- Carry handle folds neatly into body space allowing the units to be stacked
- Lid opens a full 180°, allowing total access to contents and making it easier to clean
- Will accommodate 13 and 16 mm tubes in a 72-place OneRack™, or similar sized/brand of rack
- Use the separators provided to create your own compartment sizes, or use empty to transport larger products and equipment
- Autoclavable
- Dimensions (WxDxH): 380 x 160 x 196 mm

Colour	PK	Cat. No.
Clear with blue handles	1	**9.194 005**
Yellow with yellow handles	1	**9.194 006**
Red with red handles	1	**9.194 007**

2



3



4 Safety funnels with hinged lid, white, PE-HD

NEW!

This compact funnel with lid is optimally suited for restricted space conditions in the laboratory. The hinged lid avoids evaporation of hazardous solvent vapours. With removable sieve to collect magnetic stirrers and residues. *Scat*
- For almost all chemicals
- With removable sieve for easy cleaning
- Funnel diameter 135mm
- Different thread sizes with free rotatable cap
- Safety lance ensures clean outflow without contaminating the container opening
- Length of Safety lance 200mm
- Also available without safety lance
- Chromatography vials can be disposed completely

Description	Thread	PK	Cat. No.
Funnel with safety lance	GL45	1	**6.248 077**
Funnel without safety lance	GL45	1	**6.241 723**
Funnel with safety lance	S50	1	**9.042 881**
Funnel without safety lance	S50	1	**9.042 882**
Funnel with safety lance	S51	1	**9.042 871**
Funnel without safety lance	S51	1	**9.042 872**
Funnel with safety lance	S55	1	**7.655 618**
Funnel without safety lance	S55	1	**9.042 873**
Funnel with safety lance	S60/61	1	**6.242 856**
Funnel without safety lance	S60/61	1	**6.242 855**
Funnel with safety lance	S65	1	**6.241 661**
Funnel without safety lance	S65	1	**9.042 874**
Replacement sieve, PE-HD, for funnel with hinged lid		1	**9.042 875**

4



Further safety funnels - please see page 253.

1



1 Waste disposal unit Standard, PE-HD

NEW!

Scat

Disposal unit for liquid waste, PE-HD, useful for the collection of solvent and sample waste. With funnel, hinged lid and removable sieve to collect magnetic stirrers and residues. The sieve is detachable for cleaning. Delivery with container and funnel, ready to use.

Capacity L	Dimensions (W x D x H) mm	PK	Cat. No.
2.5	115 x 150 x 305	1	**9.139 892**
5.0	150 x 195 x 345	1	**9.139 893**
10.0	190 x 230 x 395	1	**9.139 894**

2



2 Chemical waste disposal unit, PE/PP

VITLAB

PE/PP. For the safe collection of liquid chemicals in the workplace. The PE-HD filling inlet contains a self-closing ball float, an overfill spout and a spray shield.

Capacity Litres	Height mm	Diam. mm	PK	Cat. No.
10	560	222	1	**9.032 845**

3



7.626 422

Safety funnels with hinged lid, electro conductive, black, PE-HD

Scat

Safety funnel made of electro conductive PE-HD to prevent sparking hazards. This compact funnel with lid is optimally suited for restricted space conditions in the laboratory. The hinged lid avoids evaporation of hazardous solvent vapours. With removable sieve to collect magnetic stirrers and residues.

- For almost all chemicals
- Delivered with grounding cable
- With removable sieve for easy cleaning
- Funnel diameter 135mm
- Different thread sizes with free rotatable cap
- To be used for barrels too
- Safety lance ensures clean outflow without contaminating the container opening
- Length of Safety lance 200mm
- Also available without Safety lance

Description	Thread	PK	Cat. No.
Funnel without Safety lance	GL45	1	**9.042 862**
Funnel with Safety lance	S55	1	**9.042 864**
Funnel without Safety lance	S55	1	**9.042 861**
Funnel with Safety lance	S60/61	1	**7.626 422** 3
Funnel without Safety lance	S60/61	1	**9.042 860** 4
Funnel with Safety lance	S65	1	**9.042 866**
Funnel without Safety lance	S65	1	**9.042 863**
Funnel without Safety lance	R 2" BSP/G2"/2" Tri-Sure	1	**9.042 880**
Replacement sieve for funnels with lid		1	**9.042 867**

4



9.042 860

1



2



3



1 2 3 Safety funnels with ball valve, white, PE-HD

NEW!

Scat

The Safety funnel with ball valve closes automatically after the disposal of the liquid and avoids evaporation of hazardous solvent vapours. With removable sieve to collect magnetic stirrers and residues.
- For mostly all chemicals
- With removable sieve for easy cleaning
- Funnel diameter 180mm
- Different thread sizes with free rotatable cap
- Splash protection for safe discharge without splashes
- Safety lance ensures clean outflow without contaminating the container opening
- Length of Safety lance 200mm

Description	Thread	PK	Cat. No.
Funnel with safety lance	GL45	1	**6.248 078**
Funnel with safety lance	S50	1	**9.042 876**
Funnel with safety lance	S51	1	**6.252 181**
Funnel with safety lance	S55	1	**9.042 869**
Funnel with safety lance	S60/61	1	**9.042 868**
Funnel with safety lance	S65	1	**6.242 980**
Funnel with safety lance	S70/71	1	**9.042 877**
Funnel with safety lance	83B	1	**9.042 870**
Funnel with safety lance	S90	1	**9.042 878**
Replacement sieve, PE-HD for ball valve funnels		1	**6.241 673**

4 Safety funnels with ball valve, electro conductive, black, PE-HD

Scat

Safety funnel made of electro conductive PE-HD to prevent sparking hazards. The Safety funnel with ball valve closes automatically after the disposal of the liquid and avoids evaporation of hazardous solvent vapours. With removable sieve to collect magnetic stirrers and residues.
- For almost all chemicals
- Delivered with grounding cable
- With removable sieve for easy cleaning
- Funnel diameter 180mm
- Different thread sizes with free rotatable cap
- To be used for barrels too
- Splash protection for safe discharge without splashes
- Safety lance ensures clean outflow without contaminating the container opening
- Length of Safety lance 200mm

Description	Thread	PK	Cat. No.
Funnel with Safety lance	GL45	1	**9.042 852**
Funnel with Safety lance	S50	1	**9.042 859**
Funnel with Safety lance	S51	1	**9.042 854**
Funnel with Safety lance	S55	1	**9.042 855**
Funnel with Safety lance	S60/61	1	**9.042 851**
Funnel with Safety lance	S65	1	**9.042 856**
Funnel with Safety lance	S70/71	1	**9.042 858**
Funnel with Safety lance	S90	1	**9.042 853**
Funnel with Safety lance	83B	1	**9.042 857**
Funnel without Safety lance	R 2" BSP/G2"/2" Tri-Sure	1	**9.042 879**
Replacement sieve for ball valve funnels		1	**9.042 850**

4



1



1 Disposal unit with Safety funnel, electro conductive, PE-HD

Scat

This set contains a safety funnel with ball valve and a container both made of electro conductive PE-HD to prevent sparking hazards. The Safety funnel with ball valve closes automatically after the disposal of the liquid and avoids evaporation of hazardous solvent vapours. The built-in level control floater gives a warning in time to prevent overfilling of the container. With removable sieve to collect magnetic stirrers and residues.

- For mostly all chemicals
- Delivered with grounding cable
- With removable sieve for easy cleaning
- Funnel diameter 180mm
- Splash protection for safe discharge without splashes
- Safety lance ensures clean outflow without contaminating the container opening
- Length of Safety lance 200mm
- Container with 10L or 20L
- Avoids overfilling of the canister

Thread	Description	PK	Cat. No.
S60/61	with canister 10L and level control	1	**4.005 954**
S60/61	with canister 20L and level control	1	**4.005 955**

2



2 Safety funnels

Rötzmeier

For plastic container. Fixed to container with screw cap from PE. With earthing, cap, overfill protection and flame trap. Funnel made of high quality and durable stainless steel.
In flat design available on request (height 70mm, for example labortory cupboard).

Type	DIN	Diam. mm	Height mm	Weight kg	PK	Cat. No.
TK 50	50	140	125	0.60	1	**9.042 978**
TK 51	51	140	125	0.60	1	**9.042 979**
TK 61	61	140	125	0.60	1	**9.042 980**
TK 71	71	140	125	0.60	1	**9.042 988**

3



3 Safety container with viewing stripe, PE-HD, with UN-approval

NEW!

Scat

Electroconductive container for a safe collection and transportation of flammable solvents and solvent waste.
The clear viewing stripe allows a permanent control of the solvent level.

- weight 450g
- with UN-approval

Also available as set with safety funnel with ball valve.
Please order a grounding set consisting a stainless steel strap and grounding cable separately for each container.

Description	Capacity litres	Thread S	Dimensions (W x D x H) mm	PK	Cat. No.
Canister	10	90	195 x 400 x 195	1	**6.251 593**
Set Canister with funnel	10	90	195 x 630 x 195	1	**9.042 899**
Earthing set				1	**6.254 171**

E & OE.

1 2 Dispensing containers, oval, PE-HD

Düperthal

Manufactured in 4mm thick red PE-HD. For carrying and dispensing aggressive, flammable liquids. With stainless steel fittings and PTFE washer seal.
- spring action, self-closure
- automatic pressure/vacuum relief
- earthing connection at mouth with flame arrester
- separate carrying and closure operating handles
- portable
- space-saving, oval design
- robust
- durable materials used in construction
- container made to GefStoffV and BGV A8 regulations
- tested safety product

1



Capacity Litres	Width mm	Depth mm	Height mm	PK	Cat. No.
2	140	200	240	1	**9.039 813**
4	140	200	330	1	**9.039 814**

2

FM

3 Dispensing containers, PE-HD

Düperthal

Manufactured in 4mm thick white PE-HD. For carrying and dispensing aggressive, **non-flammable liquids**.
- for safe transport and storage of acids and alkali solutions
- automatic pressure relief valve
- combined carrying and closure operating handle
- robust
- container made to meet GefStoffV and BGV A8 regulations

3



Capacity l	Height mm	Spout dia. mm	PK	Cat. No.
7.5	350	90	1	**9.039 817**
10	370	35	1	**9.039 816**
20	450	90	1	**9.039 818**

4 Safety Cans

Rötzmeier

Polished, grade 1.4571, stainless steel, with PTFE gaskets, explosion-proofed by flame trap and pressure control valve, for safe storage, distribution and internal plant transport of inflammable liquids, with ergonomic handgrip made of powder-coated aluminium.

Type	Description	Capacity Litres	Height mm	Diam. mm	Weight kg	PK	Cat. No.
01 D	with 1¼", self-closing, metering device	1	235	111	0.70	1	**9.042 900**
02 D	with 1¼", self-closing, metering device	2	295	131	0.80	1	**9.042 901**
05 D	with 1¼, self-closing, metering device	5	405	165	1.20	1	**9.042 902**
01 K	with 1¼ screw-cap	1	235	111	0.65	1	**9.042 905**
02 K	with 1¼" screw-cap	2	295	131	0.75	1	**9.042 906**
05 K	with 1¼" screw-cap	5	400	165	1.15	1	**9.042 907**
D 125	1¼", self-closing, metering device				0.13	1	**9.042 940**
TR 1	Plug-in funnel, tube dia. 23mm		120	120	0.30	1	**9.042 975**

4



1 Safety canisters

Polished, grade 1.4571, stainless steel, with PTFE gaskets, explosion-proofed by flame trap and pressure control valve, for safe storage, distribution and internal plant transport of inflammable liquids, with ergonomic handgrip made of stainless steel.

Rötzmeier

Type	Description	Capacity Litres	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
05 KD	with 1½", self-closing, metering device	5	130 x 200 x 310	1.65	1	**9.042 910**
10 KD	with 1½", self-closing, metering device	10	130 x 280 x 380	2.50	1	**9.042 911**
20 KDL*	with 1½", self-closing, metering device	20	175 x 345 x 470	3.70	1	**9.042 912**
05 KK	with 1½" screw-cap	5	130 x 200 x 310	1.65	1	**9.042 915**
10 KK	with 1½" screw-cap	10	130 x 280 x 380	2.50	1	**9.042 916**
20 KK	with 1½" screw-cap	20	175 x 345 x 470	3.70	1	**9.042 917**
05 KZ*	with 1½", self-closing tap	5	130 x 200 x 310	1.65	1	**9.042 920**
10 KZ*	with 1½", self-closing tap	10	230 x 280 x 380	2.50	1	**9.042 921**
20 KZ*	with 1½", self-closing tap	20	175 x 345 x 470	3.70	1	**9.042 922**
D 150	self-closing, 1½" metering device with vent for 5 + 10 L			0.17	1	**9.042 941**
Z 150	1½" self-closing tap			0.17	1	**9.042 943**
TR 2	Plug-in funnel, inclined, tube dia. 34mm		H: 120, dia. 120	0.35	1	**9.042 976**

* with separate ventilation.

1



2



2 Safety Barrels

Polished, grade 1.4571/1.4301, stainless steel, with PTFE gaskets, explosion-proofed by flame trap and pressure control valve, for safe storage, distribution and internal plant transport of inflammable liquids.
Wall thickness: 10L with 0.8mm/25L with 1.2mm/50L with 1.5mm.

Rötzmeier

Type 10 D: with separate vent.

Type	Description	Capacity Litres	Height mm	Diam. mm	Weight kg	PK	Cat. No.
10 Z	with ¾", self-closing tap	10	330	260	2.48	1	**9.042 925**
25 Z	with ¾", self-closing tap	25	540	315	6.54	1	**9.042 926**
50 Z	with ¾", self-closing tap	50	600	365	12.20	1	**9.042 927**
10 K	with screw-cap 1½"	10	330	260	2.20	1	**9.042 930**
25 K	with 1½" screw-cap	25	540	315	6.40	1	**9.042 931**
50 K	with 2" screw-cap	50	600	365	12.10	1	**9.042 932**
10 ZI*	with ¾", self-closing tap	10	330	260	2.82	1	**9.042 934**
25 ZI*	with ¾", self-closing tap	25	540	315	7.52	1	**9.042 935**
50 ZI*	with ¾", self-closing tap	50	600	365	13.20	1	**9.042 936**
10 D	with 1½", self-closing, metering device	10	340	260	2.25	1	**9.042 937**
Z 34	with ¾", self-closing tap				0.22	1	**9.042 942**
TR 3	Plug-in funnel, straight-lined, tube dia. 34mm		120	120	0.35	1	**9.042 977**

* with PTFE level indicator and with separate vent.

1 Transportation Containers

UN-approval acc. GGVSEB. Polished, grade 1.4571, stainless steel, with PTFE gaskets, screw cap, without pressure control valve, approved for transportation of dangerous materials by road, sea and railway acc. to ADR, RID, IMDG, ICAO-TI).

Rötzmeier

Type	Description	Capacity Litres	Height mm	Dimensions mm	Weight kg	PK	Cat. No.
01 T	Safety transport can	1	230	dia. 111	0.65	1	**9.042 945**
02 T	Safety transport can	2	295	dia. 131	0.75	1	**9.042 946**
05 T	Safety transport can	5	400	dia. 165	1.15	1	**9.042 947**
05 KT	Safety transport canister	5	310	130 x 200	1.65	1	**9.042 950**
10 KT	Safety transport canister	10	380	130 x 280	2.50	1	**9.042 951**
20 KTL*	Safety transport canister	20	470	175 x 345	3.70	1	**6.241 199**
25 TZ*	Safety transport container	25	530	dia. 300	6.40	1	**9.042 956**
LB 2	2 x wooden support blocks for containers			280 x 80	1.10	1	**9.042 972**
Z 150	1½" self-closing tap for TZ 25				0.17	1	**9.042 943**

* with separate ventilation.

1



2 3 Dispensing containers with tap

For easy delivery of flammable liquids. Constructed in red powder-coated sheet steel with tin-plate lining.
Accopac seal on main opening, PTFE seal on tap.

Düperthal

- spring action, self-closure
- automatic pressure/vacuum relief
- flame arrester in spout and tap
- highly stable design
- rugged construction
- container made to GefStoffV and BGV A8 regulations
- tested safety product

Capacity Litres	Height mm	Diam. mm	PK	Cat. No.
10	310	295	1	**9.039 811**
19	410	295	1	**9.039 812**

2



3

FM

1



1 Laboratory Trolley clax Mobil comfort

Stable, multi-use trolley with parking brake.
Push-button collapsing/unfolding
Load capacity:

Total:	60kg
Upper shelf:	20kg
Lower shelf:	40kg
Dimensions	
unfolded (L x W x H):	900 x 580 x 1020mm
collapsed (L x W x H):	710 x 550 x 190mm

Type	PK	Cat. No.
Laboratory Trolley clax Mobil comfort, incl. 1 clax folding box, 46 litres	1	**9.148 100**
clax folding box single, 46 litres	1	**9.148 099**

2



2 Laboratory trolleys, PE-HD

Langkavel

Hard-wearing, sturdy, PE-HD construction resists chemicals and routine knocks and scratches in use, ensuring a long working life.

Advantages:
- stable and high load bearing capacity
- long life
- not electrically conductive
- easy to clean
- hygienic
- high density polyethylene
- easy to assemble without screws
- legs and bases can be recycled
- top tray has integral handles

Type	Colour	Description	Width mm	Length mm	Height mm	PK	Cat. No.
WT 26	beige	2 trays	460	610	660	1	**9.148 200**
WT 34	beige	3 trays	460	610	860	1	**9.148 212**
WT 42	beige	3 trays	460	610	1060	1	**9.148 216**
Cabinet	beige	suitable for WT 26, 34 and 42	460	610	660	1	**9.148 203**

Further colours available on request.

3



3 Bowl trolleys, PE-LD

Gorr GmbH & CO.KG

Trolley
- Blue-grey solid rubber (non-marking) tyres
- Welded frame for 85 or 100 litres platic bowls
- Dimensions frame (L x W x H): approx. 750 x 490 x 720mm
- Height with red bowl approx. 760mm, with white bowl approx. 840mm
- 4 swivel castors with 75mm diam.
- ball bearing mounted
- powder coated

Bowl, red
- PE-LD
- 85 litres
- Overall Dimensions (L x W x H): approx. 780 x 530 x 350mm

Bowl, white
- PE-LD
- Tapering sides
- 100 litres
- Overall Dimensions (L x W x H): approx. 895 x 530 x 375mm

Description	Colour	Width mm	Length mm	Height mm	PK	Cat. No.
Trolley	black-silver	750	490	720	1	**9.148 300**
Bowl	red	780	630	350	1	**9.148 301**
Bowl	white	895	530	375	1	**9.148 302**

4



4 LLG Trolleys, stainless steel

Made of CNS 18/10, material no. 1.4301, with micro-polished surface. All shelves are produced with an all round raised profile edge. This prevents anything from slipping over the edge. A noise-insulation mat is mounted on the bottom side of each shelf. The round tubes at the front edges are used as handgrips.
The trolleys are equipped with galvanized steel castors (4 swivel castors, 2 with brakes, castor diam. 125mm) which are inserted in the tubular frame. Wall bumpers made of plastic (polyamide) on all four corners protect against damage.

Description	Width mm	Depth mm	Height mm	PK	Cat. No.
2 shelves, vertical spacing 585mm	900	600	950	1	**9.148 101**
3 Shelves, vertical spacing 275mm	900	600	950	1	**9.148 104**

E & OE.

LLG Laboratory chairs, PU foam

According to EN 1728, EN 1021-1 and 1021-2, EN 61340-5-1. Surface enables easy cleaning and disinfecting. Revolving, height adjustable seat. Seat depth and angle and height of the backrest can be adjusted which always guarantees an ergonomic seating position. Metal 5-star bar with castors for hard floors or gliders. Armrests and chromed footring as outlined below.

Type	Seat height adjustment mm	Description	PK	Cat. No.	
LLG-Chair PUR Standard I	425 - 560	5 castors	1	**9.732 203**	4
LLG-Chair PUR Standard I plus	525 - 770	5 gliders + footring	1	**9.732 202**	3
LLG-Chair PUR Standard I plus	500 - 790	5 gliders + footring	1	**6.258 636**	
LLG-Chair PUR Standard II plus	525 - 770	5 gliders + footring + armrests	1	**9.732 200**	1
LLG-Chair PUR Standard II	450 - 580	5 castors	1	**9.732 201**	2

1



9.732 200

2



9.732 201

3



9.732 202

4



9.732 203

5 Laboratory chair Isitec

Bimos

The colour of the frame is black.
The seat and backrest are made from sealed SoftTouch integral foam. This material can be
disinfected and is easy to clean. Despite Isitec Laboratory's minimalist approach, it is still very well equipped, making it an attractive budget solution for laboratory applications. Instead of the sturdy plastic 5 star base, it can also be supplied with a steel 5 star base as an option.
Functions:
- seat height adjustment
- backrest height adjustment
- contact backrest with seat tilt adjustment

5



Type	Seat height adjustment mm	PK	Cat. No.
Isitec 1 with glides	430 to 600	1	**9.733 680**
Isitec 2 with castors	430 to 600	1	**9.733 681**
Isitec 3 with glides and base ring	580 to 850	1	**9.733 682**

Accessories: Ring-shaped armrest, Multifunction armrest and base ring

6 Standing aid

Black metal frame with glides.
With inclinable and rotatable seat, height adjustable via gas strut: 56 to 82cm. Polyurethane foam seat.

Type	PK	Cat. No.
54 S / GL / SH	1	**9.733 655**

6



LLG Laboratory stools, PU foam

According to EN 1728, EN 1021-1 and 1021-2, EN 61340-5-1. Surface enables easy cleaning and disinfecting. Revolving height adjustable seat. Seat depth and angle and height of the backrest can be adjusted which always guarantees an ergonomic seating position. Metal 5-star bar with castors for hard floors or gliders. Chromed footring as outlined below.

Type	Seat height adjustment mm	Description	PK	Cat. No.	
PUR Special plus	525 - 770	5 gliders + footring	1	**9.732 204**	1
PUR Standard plus	525 - 770	5 gliders + footring	1	**9.732 208**	2
PUR Standard	425 - 540	5 castors	1	**9.732 209**	3

1



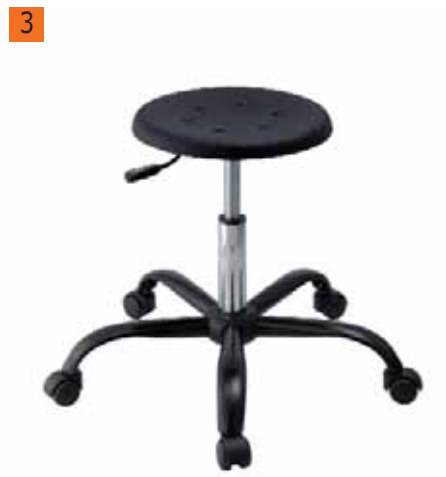
9.732 204

2



9.732 208

3



9.732 209

4



4 Swivel stool with castors

Comfortable swivel stool with black aluminium cross tube base and gas-strut height adjustment. Soft-wheeled castors.

Type	Seat height adjustment mm	PK	Cat. No.
Beech seat	420 to 540	1	**9.733 653**
PU foam seat	420 to 540	1	**9.733 644**
Artificial leather seat	420 to 540	1	**9.733 658**
Artificial leather seat	470 to 640	1	**9.733 654**

Further versions availlable on request.

5



5 Roller container, Sitting and standing workbenches

NEW!

Stainless steel furniture according to Part 9 DIN ISO 14644 for surface particle cleanliness (SPC)

Dürr Metalltechnik

Rustproof stainless steel. Roller container for sitting and standing workbenches, brush-finished surface, self-supporting warp-resistant construction. Hermetically-sealed box drawers: stainless steel telescopic drawer runner, rustproof with noise-insulated Delrin rollers.
- Load weight per drawer or shelf: 40 kg
- Maximum load weight: 135 kg
- 4 castors (2 of which are adjustable) for easier handling
- Delivery range: FI cupboards are delivered with a shelf.

Description	Dimensions (W x D x H) mm	PK	Cat. No.
Sitting workbenches, FLR	540 x 600 x 635	1	**9.731 805**
Sitting workbenches, FLL	540 x 600 x 635	1	**9.731 806**
Sitting workbenches, FLR, 1 drawer	540 x 600 x 635	1	**9.731 807**
Sitting workbenches, FLL, 1 drawer	540 x 600 x 635	1	**9.731 808**
Sitting workbenches, 3 drawers, exchangeable runner stop	540 x 600 x 635	1	**9.731 809**
Standing workbench, FLR	540 x 600 x 815	1	**9.731 810**
Standing workbench, FLL	540 x 600 x 815	1	**9.731 811**
Standing workbench, FLR, 1 drawer	540 x 600 x 815	1	**9.731 812**
Standing workbench, FLL, 1 drawer	540 x 600 x 815	1	**9.731 813**
Standing workbench, 3 drawers, exchangeable runner stop	540 x 600 x 815	1	**9.731 814**

1 Sitting and standing workbench

NEW!

Stainless steel furniture according to Part 9 DIN ISO 14644 for surface particle cleanliness (SPC)

Dürr Metalltechnik

- Rustproof stainless steel
- Laboratory workbench top (DIN 12916, DIN EN 135)
- CNS bench top 37 mm, fully lined underneath with
- melamine resin, in accordance with DIN EN 312
- C base with height adjustment

Description	Dimensions (W x D x H) mm	PK	Cat. No.
Sitting workbench	1200 x 550 x 750	1	**9.731 800**
Sitting workbench	1500 x 550 x 750	1	**9.731 801**
Standing workbench	1200 x 550 x 900	1	**9.731 802**
Standing workbench	1500 x 550 x 900	1	**9.731 803**

1



2 Writing desk, 3 drawers

NEW!

Stainless steel furniture according to Part 9 DIN ISO 14644 for surface particle cleanliness (SPC)

Dürr Metalltechnik

Rustproof stainless steel. Writing desk for pharmaceutical areas: brush-finished, CNS top, enclosed with CNS below, 3 box drawers, hermetically welded, 50 mm high, studs for height adjustment.
- Easy nickel chromium steel movements
- Runners cannot be fully extended
- Removable for cleaning
- Clearance for feet: 750 mm

Description	Dimensions (W x D x H) mm	PK	Cat. No.
Writing desk, 3 drawers	1200 x 800 x 850	1	**9.731 804**

2



3 4 Roller steps, WEDO-Step

Colour: blue or red. PP. Very easy to move on 3 castors. Easily assembled.
Plastic material steps feature non-slip surface.

Colour	Height mm	Int. diam. mm	Ext. diam. mm	Max. load kg	PK	Cat. No.
Blue	430	290	440	150	1	**9.700 400**
Red	430	290	440	150	1	**9.700 401**

3



4

5 Folding steps

Extra wide (31 x 23cm) treads allow the user to stand comfortably without tiring, even over prolonged periods.
With automatic safety catch.

Number of steps	Height*	PK	Cat. No.
2	46	1	**9.704 403**
3	70	1	**9.704 404**

* Height of top step (cm)

5



1



1 Safety steps, collapsible

- Particularly useful for working in places where there is not a lot of height.
- Minimum space requirement for storage and transportation.
- Non-slip serrated aluminium treads.
- Work comfortably and safely on a large standing surface (treads 360mm wide and 230mm deep).
- Side rails made from aluminium extruded profiles for maximum stability.
- Stiles made from tubular steel (25mm diameter) with powder-coated surface.
- With plastic inserts to prevent slipping.

Number of steps	Platform height m	Weight kg	PK	Cat. No.
2	0.45	3.9	1	**9.704 405**
3	0.70	6.6	1	**9.704 406**
3	0.70*	8.4	1	**9.704 407**
4	0.90*	10.6	1	**9.704 409**
5	1.15*	12.8	1	**9.704 410**

* Also equipped with a collapsible safety bar, wide platform and bucket hook.

2



9.604 701

3



9.604 702

Extraction kits EK 500/1.000/1.500

NEW!

Nederman GmbH

The bench top extractor kit includes FX Original extraction arm(s) with hood or nozzle, fan N3 with speed control and standard filter (particle, HEPA and gas), hose(s), connection details and bench bracket(s).

Fan with speed control and filter element, electric plug: 240V/50Hz Power: 170W, weight fan and filter element: approximately 8 kg, table clamp for extraction arm, connecting hose and accessories: including, temperature range: -10 to +70°C, filtration efficiency: 99.97%, hose: 3 m.

Extraction kit 500
1 x fan and filter element, 1 x original extraction arm dia. DN 32 with dome hood and table clamp, length: 1 m, extraction capacity: 42m³/h, incl. connection material

Extraction kit 1000
1 x fan and filter element, 2 x original extraction arm dia. DN 32 with dome hoods and table clamp, length: 1m each, extraction capacity: 2 x 42m³/h, incl. connection material

Extraction kit 1500
1 x fan and filter element 3 x original extraction arm diameter DN 32 with dome hoods and table clamp, length: 1m each, extraction capacity: 3 x 38m³/h, incl. connection material

Type	PK	Cat. No.
EK 500	1	**9.604 701** 2
EK 1.000	1	**9.604 702** 3
EK 1.500	1	**9.604 703**



E & OE.

Extraction kit EK 2.000/2.500/3.000

NEW!

Nederman GmbH

The bench top extractor kit includes FX Original extraction arm(s) with hood or nozzle, fan N3 with speed control and standard filter (particle, HEPA and gas), hose(s), connection details and bench bracket(s).

Fan with speed control and filter element, electric plug: 240V/50Hz Power: 170W, weight fan and filter element: 8kg, table clamp for extraction arm, connecting hose and accessories, extraction arm with optimized flow performance, integrated shut-off valve and cover, temperature range: -10 to +70°C, filtration efficiency: 99.97%

Extraction kit 2000
1 x fan and filter element, 1 x orig. extraction arm diam. DN 50 with combination hood and table clamp, length: 1.1m, arm connection: below, extraction power: 100m³/h, reduction diam. 75 to 80mm, 3m connecting hose diam. DN 75mm gray, incl. connection material

Extraction kit 2500
1 x fan and filter element, 2 x orig. extraction arm diam. DN 50 with mini hoods and table clamp, length: 1.1m, arm connection: below, extraction power: 75m³/h each, reduction diam. 100mm, 3m connecting hose diam. DN 100mm gray, t-piece adapter diam. DN 125 - 100, incl. connection material

Extraction kit 3000
1 x fan and filter element, 1 x orig. extraction arm diam. 75mm diameter with mini hood and table clamp, length: 1.1m, arm connection: below, extraction power: 150m³/h, reduction diam. 100mm, 3m connecting hose diam. DN 100 gray, reduction diam. DN 125 - 100, ESD reduction diam. DN 125/75 white, incl. connection material

1



9.604 704

2



9.604 705

3



9.604 706

Type	PK	Cat. No.	
EK 2.000	1	**9.604 704**	1
EK 2.500	1	**9.604 705**	2
EK 3.000	1	**9.604 706**	3

4 Ductless Fume Hoods Type Ascent Opti™/Ascent Opti™ Basic

Compact, energy saving fume hood without ducting system. *Esco*

- Independent tested and complies with AFNOR NFX 15-211 standard
- Average Inflow Air Velocity: 0.5m/s
- Easy Filter change
- Sentinel-Microprocessor with LCD-Display, air velocity alarm and 24-hour-clock*
- Fluorescent lighting provides superior illumination of the work zone*
- Sloped polycarbonate front window
- Optional with transparent back wall
- Polycarbonate side walls
- ISOCIDE™ antimicrobial coating on all painted surfaces minimises contamination.
- Stainless steel spill-retaining work top.*
- Sampling port
- Pass-through ports in the back wall

Hood is delivered unassembled. On-site assembly can be completed in 60 mins. without special tools.

Please order filters separately

More options, support stands, installation on request.

4



Type	Size	External dimensions (W x D x H) mm	PK	Cat. No.
Ascent Opti™ Basic SBP-2A1	0.6 m	542 x 700 x 990	1	**7.939 153**
Ascent Opti™ SPD-3A1	0.9 m	840 x 700 x 1125	1	**7.939 161**
Ascent Opti™ SPD-4A1	1.2 m	1140 x 700 x 1125	1	**7.939 170**

* doesn´t apply to Ascent Opti Basic (SPB-2A1)

1



1 Fume hood workstations LABOPUR® H series

ECOSAFE

Manipulation of liquid chemicals where and when needed.
Advantages: eliminates installation costs, saves substantially capital and running costs,
mobile and easy to relocate wherever needed; protects the user and environment against toxic fumes.
- Low Energy consumption: less than 200KWh /year (for 2100 hours usage)

Choice of two activated charcoal filters (Please order separately!):
- „ORG" filter for flammables and organics
- „CORG" filter, suitable for the most common laboratory chemicals

Other specific filters (e.g. methanol, hexane, mercury) available on request

Standard equipment:
- Built in 15/10 steel, covered with white Epoxy (RAL 9010) with blue stripes
- HPL-Worktop (standard) laid on removable retention tank; or tempered glass worktop (optional)
- Transparent polycarbonate glazed walls on all four sides for confortable working or lectures
- Ergonomic hand traps for convenient manipulation of chemicals
- 2 or 4 protective caps for easy usage of external supplies (e.g. power cables, water, gas)
- Air velometer; sampling outlet for reactive tube measurement

Recirculating air filter system (CLASS 2) and coal filters Norm NFX 15-211
- Noiseless fan: 49dB(A), 220-240V, 50 Hz, 47W, 0.2 A
- Air flow: 203m³/h; face velocity: 0.4 to 0.6m/s
- Ventilation system with lighting control in case of system failure

Please choose fume hoods, charcoal filters, trolleys and accessories according to your needs. Delivered mounted.

Further dimensions available on request.

2



2 Fume hoods LABOPUR® H series

ECOSAFE

Type	External dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
H 200	610 x 620 x 980	34	1	**4.007 810**
H 300	800 x 620 x 750	33	1	**4.007 812**
H 400	800 x 620 x 980	44	1	**4.007 814**
H 1300	1000 x 740 x 1200	60	1	**4.007 809**
H 2300	1300 x 740 x 1200	78	1	**4.007 811**
H 3500	1600 x 740 x 1200	97	1	**4.007 813**

3



3 Charcoal filters for ductless fume hoods LABOPUR® H series

Charcoal filter „ORG": for flammables and organics
Charcoal filter „CORG": suitable for the most common laboratory chemicals

ECOSAFE

Type	For model	PK	Cat. No.
ORG200	H 200	1	**4.007 817**
CORG201	H 200	1	**4.007 802**
ORG1300	H 300, H 400, H 1300, H 2300	1	**4.007 816**
CORG1301	H 300, H 400, H 1300, H 2300	1	**4.007 801**
CORG3501	H 3500	1	**4.007 804**

Accessories for Fume hoods LABOPUR® H series

ECOSAFE

Type	Description	PK	Cat. No.
LU20	Lighting for Fume hoods	1	**4.007 815**
SFA2	Filteralarm with acoustic / visual alarm	1	**4.007 832**

Worktops made from tempered glass available on request.

E & OE.

1 Trolleys for Fume hoods LABOPUR® H series

Trolley with 1 removable shelf for sitting or standing position. Height without castors: 800mm. Height with castors: 860mm. *ECOSAFE*

Type	For model	Weight kg	PK	Cat. No.
TR 20	H 200	30	1	**4.007 834**
TR 34	H 300, H 400	33	1	**4.007 837**
TR 135	H 1300	37	1	**4.007 833**
TR 235	H 2300	39	1	**4.007 835**
TR 335	H 3500	42	1	**4.007 836**

1



2 Workstation with deaerated storage cabinet LABOPUR® H series Package

Manipulation and storage in the laboratory: all in one. *ECOSAFE*
The storage cabinet is connected to the fume hood in order to extract and absorb the toxic fumes from both items. The self-contained system provides mobility, security and highly reduces running costs. No ductwork or exhaust system required, no discharge of toxic gases to the environment. No heating or cooling of air.

Technical specifications of the cabinet:
- Blue stripes built in steel 15/10, white Epoxy paint (RAL 9010) pictogram ISO 3864, EU 92/58/CEE
- Self-closing wing doors, locking system
- 1 height-adjustable retention shelf, 1 retention tank
- 4 castors (height of castors: 60mm)
- Vent grids in the lower part, connection element to the fume hood

LABOPUR® Workstation supplied with:
- Ventilated storage cabinet
- Fume hood with recirculating air filtration system CLASSE 2, certified Norm NF X 15-211, May 2009
- Charcoal filter „CORG": absorbs inorganic/organic acids vapors and organic preparations and solvents

2



Type	External dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
PMSF200	610 x 620 x 1880	68	1	**4.007 826**
PMSF300	800 x 620 x 1650	77	1	**4.007 827**
PMSF400	800 x 620 x 1880	88	1	**4.007 828**
PMSF500	900 x 740 x 2100	111	1	**4.007 829**
PMSF1300	1000 x 740 x 2100	123	1	**4.007 825**

3 Hazardous material workplace Comfort Line GAP.125.12.7

- specified workplace limit values are maintained *asecos*
- Ventilation test according to DIN EN 14175-3 (5.4.4)
- maximum user safety
- made of chemically resistant, anodised aluminium profiles
- glazed at the side made from 5mm ESG (tempered safety glass)
- highly effective pollutant capture through special, internally mounted fresh air curtain equipment
- connecting pieces (DN160) in the ceiling region for connecting to the customer's exhaust air plant

Standard equipment:
- integrated, workplace lighting mounted to avoid glare
- transparent side panels
- fold-away deflector
- melamine resin coated rear panel
- stainless steel (V2A/1.4301) work plate (vat sealed by welding)
- on and off function, exhaust air control and light switch at the lower right front side

Dimensions (WxDxH): 1200 x 750 x 1400mm

3



Description	PK	Cat. No.
Hazardous material workplace Comfort Line GAP.125.12.7	1	**9.840 627**
Transparent rear panel	1	**9.840 628**
Under frame (H=865 mm)	1	**9.840 588**

Safety Cabinets please see page 1360.

1



1 Ductless Fume Hoods Type Ascent™ Max

Compact, energy saving fume hood without ducting system. *Esco*

- Independent tested and comply with AFNOR NFX 15-211 standard
- Easy Filter Change
- Average Inflow Air Velocity: 0.4m/s
- Sentinel-Microprocessor with LCD-Display, air velocity alarm and 24-hour-clock
- Fluorescent lighting provides superior illumination of the work zone
- Tempered glass sliding sash
- Tempered glass side panel
- ISOCIDE™ antimicrobial coating on all painted surfaces minimizes contamination.
- Stainless steel worktop
- Electrical outlets

Other units:
- Secondary Backup HEPA filter - suitable when the application involves the generation of biohazardous aerosols in the work zone
- Secondary Backup Carbon filter, offers a higher filtration efficiency against toxic fumes

Please order filters separately.

More options, support stands, installation on request

Type	Size	External dimensions (W x D x H) mm	PK	Cat. No.
Ascent™ Max ADC-2B1	0.6 m	730 x 735 x 1460	1	**7.939 174**
Ascent™ Max ADC-3B1	0.9 m	1035 x 714 x 1410	1	**7.939 193**
Ascent™ Max ADC-4B1	1.2 m	1340 x 714 x 1410	1	**7.939 195**
Ascent™ Max ADC-5B1	1.5 m	1645 x 714 x 1410	1	**7.939 204**
Ascent™ Max ADC-6B1	1.8 m	1959 x 714 x 1410	1	**7.939 213**
Ascent™ Max ADC-3C1*	0.9 m	1035 x 714 x 1460	1	**7.939 215**
Ascent™ Max ADC-4C1*	1.2 m	1340 x 714 x 1460	1	**7.939 223**
Ascent™ Max ADC-5C1*	1.5 m	1645 x 714 x 1460	1	**7.939 331**
Ascent™ Max ADC-6C1*	1.8 m	1950 x 714 x 1460	1	**7.939 339**
Ascent™ Max ADC-3E1**	0.9 m	1035 x 714 x 1485	1	**7.939 351**
Ascent™ Max ADC-4E1**	1.2 m	1340 x 714 x 1485	1	**7.939 352**
Ascent™ Max ADC-5E1**	1.5 m	1645 x 714 x 1485	1	**7.939 353**

*secondary filter, charcoal
**secondary filter, HEPA

2



2 Laboratory safety shield, Makrolon®

- with impact-resistant Makrolon® panels *Buddeberg*
- mounted in a metal frame with stable feet to provide a secure stand
- centre panel adjustable to four heights
- with folding side panels (W:220mm)
- full opening possible up to 950mm wide
- Makrolon® panels 6mm thick

Description	Width mm	Height mm	Weight kg	PK	Cat. No.
safety shield	660	700	9.90	1	**9.005 132**
add top section	660	250	3.65	1	**9.005 133**

3



3 Flow monitor

For fume cupboards. *Buddeberg*
Indicates if the fume cupboard is switched on.

Type	PK	Cat. No.
Flow monitor	1	**9.003 890**

E & OE.

1 Filtration safety cabinets LABOPUR® 12X series

Safe storage in laboratories and working premices without duct-infrastructure *ECOSAFE*

- No ductwork required, no connection to extraction systems needed, very easy to set-up
- High filter efficiency due to specially engineered active coal technology
- Tested and approved according to Norm NFX 15-211
- Protects laboratory users and environment from toxic fumes. Reduces total carbon footprints
- Low energy consumption: less than 500KWh per year, approx. filter life: 10 to 12 months
- Vertical compartment architecture allows segregated and secure storage

Storage capacity/Number of perforated shelves and retention tanks

- AF2X : 140L (140 x 1L or 60 x 2.5L bottles)/4 x shelves, 1 x tank
- AF2-2X : 120L (120 x 1L or 56 x 2.5L bottles)/8 x ½-shelves, 2 x ½- tanks
- AF4-2X : 280L (280 x 1L or 120 x 2.5L bottles)/8 x shelves, 2 x tanks
- AF4-4X : 240L (240 x 1L or 112 x 2.5L bottles)/16 x ½-shelves, 4 x ½ tanks

Equipped with:

- Built in 15/10steel, covered with white Epoxy (RAL 9010) with blue stripes
- Large glazed door(s) with framing; double air inlet at the bottom
- 4 perforated shelves adjustable in height, extractable retentions tanks

Ventilation/filtration system and charcoal filters

- According to Norm NFX 15-211
- Noiseless fan: 49 dB(A), 220-240V, 50Hz, 47W, 0.2A
- Airflow: 203 m³/h, ventilation system with lighting control
- Filteralarm: sounding led for control of any airflow irregularities and filter obstruction (optional)

Charcoal filters - please order separately.

1



Type	Description	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
AF 2X	with 1 partition	800 x 545 x 1900	780 x 500 x 1660	140	1	**4.007 796**
AF 2-2X	with 2 partitions	800 x 545 x 1900	(2x) 380 x 500 x 1660	150	1	**4.007 795**
AF 4-2X	with 2 partitions	1600 x 545 x 1900	(2x) 780 x 500 x 1660	280	1	**4.007 798**
AF 4-4X	with 4 partitions	1600 x 545 x 1900	(4x) 380 x 500 x 1660	300	1	**4.007 799**

Accessories for Filtration cabinets LABOPUR® 12.X series

ECOSAFE

Type	Description	Dimensions (W x D x H) mm	PK	Cat. No.
ORG1300	charcoal filter for 12.X series (organic / flammable materials)	200 x 100 x 400	1	**4.007 816**
CORG1301	charcoal filter for 12.X series (corrosive / flammable materials)	200 x 100 x 400	1	**4.007 801**
ESAF	additional shelf for AF 2X, AF 4-2X	780 x 470 x 20	1	**4.007 807**
ESAF2	additional ½-shelf for AF 2-2X, AF 4-4X	370 x 470 x 20	1	**4.007 808**



Safety storage cabinets Q-PEGASUS-90 with wing doors

asecos

- safe and approved storage of hazardous materials in workrooms
- type proved according to EN 14470-1, fire resistance 90 minutes
- GS-approved, CE confomal
- outer body made of sheet steel, interior with chemical resistant surface, colour: body anthracite grey RAL 7016, doors light grey (RAL 7035), door colour pure white(RAL 9010) available on request
- convenient handling: one-hand operation for double-door cabinets (AGT)
- standard door open arrest system holds doors open, safe and convenient storage and removal
- serial automatic door closing (TSA) releases arrested doors after approx. 60 seconds. Acoustic and visual signal before closing
- lockable doors with cylinder lock (integration into a locking system possible), integrated locking state indicator (red/green)
- integrated transport base with removable, optional base cover, easy indoor transport
- adjusting aids for compensation for uneven floor
- ventilation connection (NW 75)in the cabinet ceiling

Shelves, height adjustable (32 mm increments), load capacity 75 kg (evenly distributed load), bottom collecting sump with perforated insert as a first storage level. Capacity bottom collecting sump: 33 litre (model width 1200 mm), 22 litre (model width 600 mm)

Supplied with: Safety Storage Cabinet Q-PEGASUS-90 Model Q90.195.120.WDAC or Q90.195.060.WDAC incl. interior equipment with 3 shelves, bottom collecting sump with perforated insert

A wide variety of cabinet versions is available. Please enquire.

Specifications

Outer dimensions (WxDxH)	
Q90.195.120.WDAC:	1200 x 615 x 1955 mm
Q90.195.060.WDAC:	600 x 615 x 1955 mm
Inner dimensions (WxDxH)	
Q90.195.120.WDAC:	1050 x 520 x 1645 mm
Q90.195.060.WDAC:	450 x 520 x 1645 mm
Shelf (WxDxH)	
Q90.195.120.WDAC:	1043 x 435 x 30 mm
Q90.195.060.WDAC:	443 x 435 x 30 mm
Weight	
Q90.195.120.WDAC:	434 kg
Q90.195.060.WDAC:	265 kg

1

9.840 681

2

9.840 682

3

9.840 650

Description	PK	Cat. No.	
Safety storage cabinet Q90.195.120.WDAC	1	**9.840 681**	1
Safety storage cabinet Q90.195.060.WDAC	1	**9.840 682**	2
Additional shelf, 1200mm	1	**9.840 532**	
Additional shelf, 600mm	1	**9.840 514**	
Recirculating air filter system (option)	1	**9.840 650**	3
Ventilation system (option)	1	**9.840 616**	
Plinth panel for Safety storage cabinet Q90.195.120.WDAC	1	**9.840 700**	
Plinth panel for Safety storage cabinet Q90.195.60.WDAC	1	**9.840 699**	

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

asecos®

E & OE.

Safety storage cabinets S-PHOENIX Vol. 2-90 with folding doors

NEW!

asecos

- safe and approved storage of hazardous materials in workrooms
- type proved according to EN 14470-2, fire resistance 90 minutes
- GS-approved, CE confomal
- outer body made of sheet steel in light grey (RAL 7035), interior with chemical resistant surface
- space saving folding doors, less required space in front of the cabinet while doors are open
- convenient handling - one-hand operation for double-door cabinets (AGT))
- standard door open arrest system holds doors open, safe and convenient storage and removal
- serial automatic door closing (TSA) releases arrested doors after approx. 60 seconds. Acoustic and visual signal before closing
- lockable doors with cylinder lock (integration into a locking system possible)
- adjusting aids for compensation for uneven floor
- ventilation connection (NW 75)in the cabinet ceiling

Model S90.196.120.FDAC and Model S90.196.060.FDAC with shelves:
Shelves, height adjustable (32 mm increments), load capacity 75 kg (evenly distributed load), bottom collecting sump with perforated insert as a first storage level
Capacity bottom collecting sump: 33 litre (model width 1200 mm), 22 litre (model width 600 mm)
Supplied with: Safety Storage Cabinet S-PHOENIX Vol. 2-90 Model S90.196.120.FDAC or S90.196.060.FDAC incl. interior equipment with 3 shelves, bottom collecting sump with perforated insert

Model S90.196.120.FDAC and Modell S90.196.060.FDAC with drawer:
Large storage capacity, optimal to maximize storage space, ideal for the storage of containers < 5 litre
Model width 1200 mm: self-closing in the event of fire, load capacity: 60 kg (evenly distributed), capacity 30 litre
Model width 600 mm: permanent self-closing, load capacity: 25 kg (evenly distributed), capacity 5 litre
Supplied with: Safety Storage Cabinet S-PHOENIX Vol. 2-90 Model S90.196.120.FDAC or S90.196.060.FDAC incl. interior equipment with 6 drawers

A wide variety of cabinet versions is available. Please enquire.

1



9.840 696

2



9.840 697

Specifications

Outer dimensions (WxDxH)	
S90.196.120.FDAC:	1200 x 615 x 1968 mm
S90.196.060.FDAC:	600 x 615 x 1968 mm
Inner dimensions (WxDxH)	
S90.196.120.FDAC:	1050 x 520 x 1740 mm
S90.196.060.FDAC:	450 x 520 x 1740 mm
Shelf (WxDxH)	
S90.196.120.FDAC:	1043 x 435 x 30 mm
S90.196.060.FDAC:	443 x 435 x 30 mm
Drawer (WxDxH)	
S90.196.120.FDAC:	865 x 510 x 90 mm
S90.196.060.FDAC:	345 x 500 x 50 mm
Weight	
S90.196.120.FDAC:	410 kg
S90.196.060.FDAC:	265 kg

Description	PK	Cat. No.
Safety storage cabinet, S90.196.120FDAC, 3 shelves	1	**9.840 695**
Safety storage cabinet, S90.196.120FDAC, 6 drawers	1	**9.840 696** 1
Safety storage cabinet, S90.196.60FDAC, 3 shelves	1	**9.840 697** 2
Safety storage cabinet, S90.196.60FDAC, 6 drawers	1	**9.840 698**
Additional shelf, 1200 mm	1	**9.840 532**
Additional shelf, 600 mm	1	**9.840 514**
Recirculating air filter system (option)	1	**9.840 650**
Ventilation system (option)	1	**9.840 616**

1



9.840 693

Safety Storage Cabinets Q-CLASSIC-30 with wing doors

NEW!

asecos

- safe and approved storage of hazardous materials in workrooms
- type proved according to EN 14470-1, fire resistance 90 minutes
- GS-approved, CE confomal
- outer body made of flame retardant, melamine coated special plates, door front made of sheet steel with structured paint finish, colour: body anthracite grey (similar to RAL 7016), doors light grey (RAL 7035), door colour pure white (RAL 9010) available on request
- easy handling with comfort: doors stop in any position, self-closing in the event of fire
- standard door open arrest system holds doors open, safe and convenient storage and removal
- integrated transport base for an easy indoor transport
- removable base cover with integrated adjusting aids optional
- lockable doors with cylinder lock (integration into a locking system possible)
- ventilation connection (NW 75)in the cabinet ceiling

Shelves, height adjustable (32 mm increments), load capacity 75 kg (evenly distributed load), bottom collecting sump with perforated insert as a first storage level. Capacity bottom collecting sump: 33 litre (model width 1200 mm), 22 litre (model width 600 mm)
Supplied with: Safety Storage Cabinet Q-CLASSIC-30 Model Q30.195.116 or Q30.195.056 incl. interior equipment with 3 shelves, bottom collecting sump with perforated insert

A wide variety of cabinet versions is available. Please enquire.

Specifications

Outer dimensions (WxDxH)	
Q30.195.116:	1164 x 615 x 1955 mm
Q30.195.056:	564 x 615 x 1955 mm
Inner dimensions (WxDxH)	
Q30.195.116:	1050 x 520 x 1645 mm
Q30.195.056:	450 x 520 x 1645 mm
Shelf (WxDxH)	
Q30.195.116:	1043 x 435 x 30 mm
Q30.195.056:	443 x 435 x 30 mm
Weight	
Q30.195.116:	260 kg
Q30.195.056:	200 kg

2



9.840 694

Description	PK	Cat. No.	
Safety Storage Cabinet Q30.195.116	1	**9.840 693**	1
Safety Storage Cabinet Q30.195.056	1	**9.840 694**	2
Additional shelf, 1200mm	1	**9.840 532**	
Additional shelf, 600mm	1	**9.840 514**	
Recirculating air filter system (option)	1	**9.840 650**	
Ventilation system (option)	1	**9.840 616**	3

3



9.840 616

4



5



4 5 Sump liners for asecos safety storage cabinets, PP, PE

asecos

- Increased protection of drawers when storing mildly aggressive liquids and in case of a leakage
- Removable for safe disposal of leakages and easy cleaning

For	Material	PK	Cat. No.
for drawers, for safety cabinet of width 1200mm	PP	1	**9.840 619**
for drawers, for safety cabinet of width 600mm	PP	1	**9.840 626**
for shelves, for safety cabinet of width 1200mm	PE	1	**9.840 612**
for shelves, for safety cabinet of width 600mm	PE	1	**9.840 614**

E & OE.

Safety Storage Cabinets S-CLASSIC-90 with wing doors

asecos

- safe and approved storage of hazardous materials in workrooms
- type proved according to EN 14470-2, fire resistance 90 minutes
- GS-approved, CE confomal
- outer body made of sheet steel, colour light grey (RAL 7035), interior with chemical resistant surface
- lockable doors with cylinder lock (integration into a locking system possible)
- adjusting aids for compensation for uneven floor
- ventilation connection (NW 75)in the cabinet ceiling
- standard door open arrest system holds doors open, safe and convenient storage and removal

Shelves, height adjustable (32 mm increments), load capacity 75 kg (evenly distributed load), bottom collecting sump with perforated insert as a first storage level. Capacity bottom collecting sump: 33 litre (model width 1200 mm), 22 litre (model width 600 mm).
Supplied with: Safety Storage Cabinet S-CLASSIC-90 Model S90.196.120.WDAS or S90.196.060.WDAS incl. interior equipment with 3 shelves, bottom collecting sump with perforated insert

A wide variety of cabinet versions is available. Please enquire.

Specifications

Outer dimensions (WxDxH)	
S90.196.120.WDAS:	1200 x 615 x 1968 mm
S90.196.060.WDAS:	600 x 615 x 1968 mm
Inner dimensions (WxDxH)	
S90.196.120.WDAS:	1050 x 520 x 1740 mm
S90.196.060.WDAS:	450 x 520 x 1740 mm
Shelf (WxDxH)	
S90.196.120.WDAS:	1043 x 435 x 30 mm
S90.196.060.WDAS:	443 x 435 x 30 mm
Weight	
S90.196.120.WDAS:	410 kg
S90.196.060.WDAS:	265 kg

1



9.840 690

Description	PK	Cat. No.	
Safety Storage Cabinets S90.196.120.WDAS	1	**9.840 689**	
Additional shelf, 1200mm	1	**9.840 532**	
Safety Storage Cabinets S90.196.060.WDAS	1	**9.840 690**	1
Additional shelf, 600mm	1	**9.840 514**	
Recirculating air filter system (option)	1	**9.840 650**	
Ventilation system (option)	1	**9.840 616**	

Cabinets for acids and alkalis SL-CLASSIC with wing doors

NEW!

asecos

- safe and approved storage of aggressive, non-flammable hazardous materials in workrooms
- robust construction and longevity, safety elements assembled outside the storage compartment for increased protection against corrosion, easy to clean
- safe storage with two hermetically separated storage compartments
- doors lockable with cylinder locking (integration in locking system possible)
- integrated adjusting aids to compensate for uneven floor
- integrated metal-free air ducts ready for connection (NW 75) to a technical exhaust system with only one extraction air Inlet
- pull-out shelves: high quality and sturdy construction with removable plastic sump, load capacity 25 kg (evenly distributed load), capacity 15 litre

Supplied with: Cabinet for acids and alkalis SL-CLASSIC incl. interior equipment, Model SL.196.120.MV with 8 or 12 pull-out shelves, Model SL.196.060.MH with 4 or 6 pull-out shelves

A wide variety of cabinet versions is available. Please enquire.

2



9.840 691

3



9.840 692

Description	PK	Cat. No.	
Cabinets for acids and alkalis SL.196.120.MV, 8 pull-out shelves	1	**9.840 691**	2
Cabinets for acids and alkalis SL.196.120.MV, 12 pull-out shelves	1	**9.840 701**	
Cabinets for acids and alkalis SL.196.060.MH, 4 pull-out shelves	1	**9.840 692**	3
Cabinets for acids and alkalis SL.196.060.MH, 6 pull-out shelves	1	**9.840 702**	

Fire Resistant Gas Cylinder Cabinets G90 series

asecos

- colour: grey RAL 7035
- exhaust air connection (NW75) on top of the cabinet
- adjusting aids to compensate for uneven floor
- large interior height of 1858mm (Model for two 10 litre bottles interior height of 1246mm)
- lead-through points for pipes, sensors etc. in the ceiling of the cabinet
- complete with mounting rails, rolling ramp, bottle retainer with ratchet straps

Approved and safe
- labelling in accordance with EN 14470-2, fire resistance 90 minutes
- GS approved, CE compliant

Description	Weight kg	Dimensions (W x D x H) mm	PK	Cat. No.	
for two 10 litre bottles	278	600 x 615 x 1450	1	**6.252 068**	3
for one 50 litre bottle	365	600 x 615 x 2050	1	**9.840 610**	
for two 50 litre bottles	365	600 x 615 x 2050	1	**9.840 651**	2
for three 50 litre bottles	490	900 x 615 x 2050	1	**9.840 609**	
for four 50 litre bottles	610	1200 x 615 x 2050	1	**9.840 608**	
for four 50 litre bottles	690	1400 x 615 x 2050	1	**9.840 607**	1
Ventilation system (option)			1	**9.840 616**	

1



9.840 607

2



9.840 651

3



6.252 068

4



4 Gas cylinder regulators

To EN ISO 2503. Valve body and cap made of high quality, hot-pressed brass. Provide sensitive adjustment of working pressure. Safety valve blows off upwards.

Type	Pressure bar	PK	Cat. No.
Oxygen	0 to 10 / 16	1	**9.223 701**
Acetylene	0 to 1.5 / 2.5	1	**9.223 705**
Carbon dioxide	0 to 10 / 16	1	**9.223 710**
Compressed air	0 to 10 / 16	1	**9.223 721**
Compressed air	0 to 20 / 40	1	**9.223 722**
Hydrogen	0 to 1.5 / 2.5	1	**9.223 730**
Hydrogen	0 to 10 / 16	1	**9.223 731**
Nitrogen	0 to 10 / 16	1	**9.223 741**
Nitrogen	0 to 20 / 40	1	**9.223 742**
Propane	0 to 1.5 / 2.5	1	**9.223 751**
Propane with 1 pressure gauge	0 to 1.5 / 2.5	1	**9.223 752**
Helium	0 to 10 / 16	1	**9.223 756**
Test gas	0 to 10 / 16	1	**9.223 771**
Nitrous oxide	0 to 10 / 16	1	**9.223 791**

5



5 Gas cylinder supports

For holding gas cylinders up to 230mm diameter in a vertical position.
For benches/worktops up to 65mm thick.
Rapid release, safety catch.

Type	PK	Cat. No.
Gas cylinder support	1	**7.605 462**

Cabinets for chemicals CS-CLASSIC with wing doors

NEW!

asecos

- safe and approved storage of non-flammable chemicals and toxic substances in workrooms
- robust construction and longevity, body made of sheet steel with high grade structured paint finish, colour: body anthracite grey RAL 7016, doors light grey (RAL 7035), door colour pure white(RAL 9010) available on request
- doors lockable with cylinder locking (integrated in the turning handle)
- integrated adjusting aids to compensate for uneven floor
- reduction of odours inside the cabinet with natural ventilation due to vent openings at the cabinet bottom
- doors optional with large glas openings for an optimal view on stored chemicals while doors are closed
- interior equipment sheet steel galvanised, pull-out shelf with sump made of PE

Shelves, height adjustable (25 mm increments), bottom collecting sump with perforated insert as a first storage level. Shelf load capacity (evenly distributed load): 100 kg (model width 1055 mm), 50 kg (model width 545 mm). Capacity bottom collecting sump: 33 litre (model width 1105 mm), 22 litre (model width 545 mm).

Supplied with: Cabinet for chemicals CS-CLASSIC Model CS.195.105 or CS.195.054 incl. interior equipment with 3 shelves, bottom collecting sump with perforated insert as a first storage area

A wide variety of cabinet versions is available. Please enquire.

1



9.840 687

2



9.840 688

Specifications

Outer dimensions (WxDxH)	
CS.195.105:	1055 x 520 x 1950 mm
CS.195.054:	545 x 520 x 1950 mm
Inner dimensions (WxDxH)	
CS.195.105:	996 x 496 x 1835 mm
CS.195.054:	486 x 493 x 1835 mm
Shelf (WxDxH)	
CS.195.105:	993 x 492 x 30 mm
CS.195.054:	484 x 492 x 30 mm
Weight	
CS.195.105:	68 kg
CS.195.054:	46 kg

Description	PK	Cat. No.	
Cabinet for chemicals CS.195.105	1	**9.840 687**	1
Cabinet for chemicals CS.195.054	1	**9.840 688**	2

asecos

FlameFlex / ChemFlex





Multifunctional recirculating air cabinets

FlameFlex - fire resistant storage of most different flammable chemicals

ChemFlex - storage of most different non-flammable chemicals

FlameFlex/ChemFlex recirculating air system with filtration, including

- multi-stage filter system, connection cable and connector
- integrated electronic (VDE-tested) for monitoring of the exhaust air and filter
- visual and acoustic alarm incl. potential-free alarm contact
- active personal protection – safe capture of vapours that are harmful to health in the cabinet interior
- no on-site exhaust air system necessary

Available from 2014

For information material, please register at **www.asecos.com**

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BARTENBACH

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1



9.129 800

LLG-Universal indicator paper, rolls

For the determination of pH values. Plastic dispensing reel with 1 roll à 5m.

Range	PK	Cat. No.
pH		
1 - 11	1	**9.129 800** 1
1 - 14	1	**9.129 802**

2



2 Refill packs containing 3 rolls.

Range	PK	Cat. No.
pH		
1 - 11	3	**9.129 801**
1 - 14	3	**9.129 803**

3



3 Universal indicator papers

For determination of pH- value. *MACHEREY-NAGEL*
Plastic dispensing reel with 1 roll of indicator paper and colour scale.

Range	PK	Cat. No.
pH		
1 - 11	1	**9.130 200**
1 - 14	1	**9.130 210**

Further indicatorpapers available on request.

4



4 Refill packs universal contain 3 rolls. *MACHEREY-NAGEL*

Range	PK	Cat. No.
pH		
1 - 11	3	**9.130 203**
1 - 14	3	**9.130 213**

Further indicatorpapers available on request.

5



5 Special indicator papers

For determination of pH- value. *MACHEREY-NAGEL*
Plastic dispensing reel with 1 roll of indicator paper and colour scale.

Range	PK	Cat. No.
pH		
0.5 - 5.5	1	**9.130 305**
5.5 - 9.0	1	**9.130 325**

Further indicator papers available on request.

6



6 Refill packs special contain 3 rolls. *MACHEREY-NAGEL*

Range	PK	Cat. No.
pH		
0.5 - 5.5	3	**9.130 306**
5.5 - 9.0	3	**9.130 326**

Further indicatorpapers available on request.

1 Indicator paper, Duotest

Roll length 5m, 10mm width. With two colour zones. *MACHEREY-NAGEL*
Plastic box with 1 roll of indicator paper and colour scale.

Range	PK	Cat. No.
pH		
1 - 12	1	**9.130 344**
1,0 - 4,3	1	**9.130 356**
3,5 - 6,8	1	**9.130 359**
5,0 - 8,0	1	**9.130 347**
7,0 - 10,0	1	**9.130 362**
9,5 - 14,0	1	**9.130 363**

1



2 **Refill packs Duotest contain 3 rolls.** *MACHEREY-NAGEL*

Range	PK	Cat. No.
pH		
1 - 12	3	**9.130 355**
5.0 - 8.0	3	**9.130 358**

2



3 Indicator paper, Tritest

For determination of pH-value. *MACHEREY-NAGEL*
Roll length 5M, 10mm width. With three colour zones, without hydrophobic zone.
Plastic container with 1 roll of indicator paper and colour scale.

Range	PK	Cat. No.
pH		
1 - 11	1	**9.130 367**

3



4 Refill packs Tritest contain 3 rolls. *MACHEREY-NAGEL*

Range	PK	Cat. No.
pH		
1 - 11	3	**9.130 368**

4



5 Universal indicator paper Tritest L

For determination of pH- value. *MACHEREY-NAGEL*
Roll length 6M, 14mm width. With 3 colour zones and 2 hydrophobic zones.
The zones are separated by a hydrophobic barrier, which effectively prevents mixing of the reaction colours and increases mechanical stability.
Plastic container with 1 roll of indicator paper and colour scale.

Range	PK	Cat. No.
pH		
1 - 11	1	**9.130 360**

5



6 Refill packs Tritest L contain 3 rolls. *MACHEREY-NAGEL*

Range	PK	Cat. No.
pH		
1 - 11	3	**9.130 361**

6



1



1 LLG-Indicator paper strips

Range pH	Description	PK	Cat. No.
0 - 11	pad of 100 strips	100	**9.129 804**
0 - 14	pad of 100 strips	100	**9.129 805**
0 - 14	50 strips per pack	50	**9.129 806**
0 - 14	100 strips per pack	100	**9.129 807**

2



2 Indicator paper, PEHANON®

For determination of pH-value in coloured solutions. *MACHEREY-NAGEL*
Supplied in packs of 200, 11 x 100mm W x L strips.

Range pH	PK	Cat. No.
1 - 12	200	**9.130 657**
0 - 1.8	200	**9.130 658**
1.0 - 2.8	200	**9.130 651**
1.8 - 3.8	200	**9.130 652**
2.8 - 4.6	200	**9.130 656**
3.8 - 5.5	200	**9.130 603**
4.0 - 9.0	200	**9.130 659**
5.2 - 6.8	200	**9.130 605**
6.0 - 8.1	200	**9.130 626**
7.2 - 8.8	200	**9.130 660**
8.0 - 9.7	200	**9.130 366**
9.5 - 12.0	200	**9.130 661**
10.5 - 13.0	200	**9.130 663**
12.0 - 14.0	200	**9.130 666**

3



3 pH-Fix indicator strips

For determination of pH- value. Permanent colour. Non bleeding. *MACHEREY-NAGEL*

Range pH	PK	Cat. No.
0 - 6.0	100	**9.130 382**
0 - 14	100	**9.130 381**
0 - 14 PT*	100	**9.130 379**
0.3 - 2.3	100	**9.130 385**
1.7 - 3.8	100	**9.130 386**
2.0 - 9.0	100	**9.130 380**
3.1 - 8.3 CE**[1)]	100	**9.130 377**
3.6 - 6.1 PT* CE**[1) 2)]	100	**9.130 378**
3.6 - 6.1 CE**[1) 2)]	100	**9.130 387**
4.5 - 10.0 CE**[1)]	100	**9.130 383**
5.1 - 7.2	100	**9.130 388**
6.0 - 7.7	100	**9.130 389**
6.0 - 10.0	100	**9.130 392**
7.0 - 14.0	100	**9.130 384**
7.5 - 9.5	100	**9.130 390**
7.9 - 9.8	100	**9.130 391**

* PlopTop tube.
** CE-marked according to the 1) IvD-directive 98/79/EG 2) the directive for medical products 93/42/EWG.

4



4 pH indicator strips

Non-bleeding. Ranges as indicated. Supplied in packs of 100 strips. *Merck*

Type	Range pH	Increments pH units	PK	Cat. No.
Universal	0 - 14	1	100	**9.130 001**
Acilit	0 - 6	0.5	100	**9.130 016**
Neutralit	5 - 10	0.5	100	**9.130 017**
Alkalit	7,5 - 14	0.5	100	**9.130 018**

1 Special indicator strips

Non-bleeding. Supplied in packs of 100 strips. *Merck*

Range pH	PK	Cat. No.
0.0 - 2.5	100	**9.130 002**
2.0 - 9.0	100	**9.130 003**
2.5 - 4.5	100	**9.130 004**
4.0 - 7.0	100	**9.130 007**
5.2 - 7.2	100	**9.130 009**
6.5 - 10.0	100	**9.130 010**
11.0 - 13.0	100	**9.130 013**

1



2 Litmus paper

Litmus paper, available in blue, red and neutral. Supplied in booklets of 100 strips, 10 x 70mm W x L. *MACHEREY-NAGEL*

Type	Measuring range	Colour change	PK	Cat. No.
Litmus paper, blue	8.0 to 5.0	blue - red	1	**9.130 112**
Litmus paper, red	5.0 to 8.0	red - blue	1	**9.130 116**
Litmus paper, neutral	5.0 to 8.0	red - violett - blue	1	**9.130 118**

Also available as reel. Refill packs available separately.

2



3 pH tester Checker 1

Pocket pH tester with exchangeable electrode. *Hanna*
Ideal for pH testing small amounts of liquid and in narrow vessels.

Specifications:

Measuring range:	0.00 to 14.00 pH
Accuracy:	±0.2 pH
Battery:	2 x 1.5V cells
Probe dimensions:	66 x 55 x 25 mm
Weight:	63g

Type	PK	Cat. No.
Checker 1	1	**9.773 930**
Spare electrode HI1270	1	**9.773 931**
Calibration kit, 5 x 20 ml pH 4 and pH 7	1	**9.773 932**
Calibration kit, 10 x 20 ml pH 7	1	**9.773 933**

3



4 Pocket pH meters, PICCOLO

Handy pocket pH meters with built-in amplifier electrode for greater measurement stability. Automatic temperature compensation via built-in temperature sensor. *Hanna*
Two point calibration.
Piccolo Plus model has additional temperature display.
Supplied complete with electrode, batteries and buffer solutions in ABS case.

Specifications:

Measuring range:	0.00 to 13.00pH 0 to 70°C (Piccolo Plus only)
Accuracy:	±0.01pH ±1°C (Piccolo Plus only)
Batteries:	3 x 1.5V cells giving up to 100 hours operation
Dimensions:	172mm x 29mm x 15mm
Weight:	80g

Type	PK	Cat. No.
PICCOLO I	1	**9.773 946**
PICCOLO II	1	**9.773 945**
PICCOLO Plus	1	**9.773 944**
Spare electrode HI 1280 for PICCOLO I	1	**9.773 947**
Spare electrode HI 1290 for PICCOLO II	1	**9.773 948**
Spare electrode HI 1295 for PICCOLO Plus	1	**9.773 950**

4



1



1 pH/°C tester pHep®-4

Hanna

Recently developed waterproof pH °C tester (IP67).
First pH tester with handheld measuring device features.
Automatic two point calibration with 3 pre-programmed standard buffers (pH 7.01; pH 4.01; pH 10.01).
Stability indicator for high-precision measurements. Simultaneous display of pH value and °C.
Optional automatic or manual temperature compensation. Includes exchangeable HI 73127 pH electrode.

Specifications:

Measuring range:	0.0 to 14.0 pH 0.0 to 60.0°C
Accuracy:	±0.1 pH ±0.5°C
Batteries:	4 x 1.5V
Environmental conditions:	0 to +50°C
Dimensions:	163 x 40 x 26mm
Weight:	100g

Type	PK	Cat. No.
pHep®-4	1	**9.773 920**
Spare electrode HI 73127	1	**9.773 921**
Calibration Kit pH 7.01 + 10.01, 5 x 20 ml	1	**9.773 934**
Calibration kit pH 4.00 + 7.01, 5 x 20 ml	1	**9.773 932**

2



2 pH/°C Meter HI 991001

Hanna

- Portable pH/°C -Meter for laboratory use
- displays pH and temperature simultaneously
- stabilty Indicator prevents unstable measurements
- automatic 2 point calibration with pre-programmed standard buffers (pH 7.01; 4.01; 10.01)
- automatic temperature compensation enables highest accuracy
- supplied with amplified pH Electrode HI 1296D with integral temperature sensor

Specifications:

Measuring ranges:	-2.00 to 16.00 pH -5.0 to 105°C
Accuracy:	±0.02 pH ±0.5°C
Battery:	1x 9 Volt
Operating temp. range:	0 to 50.0°C
Weight:	500g

Type	PK	Cat. No.
HI 991001	1	**9.733 998**
Spare electrode HI 1296D	1	**9.773 982**

3



3 pH/ mV/ °C Meters HI 8314N/HI 83141

Hanna

HI 8314N: supplied complete with plastic-bodied pH electrode HI1217D with integral temperature sensor, calibration screwdriver, 9 Volt Battery.

HI 83141: supplied complete with plastic-bodied pH electrode HI1230B, separate temperature probe, calibration screwdriver, 9 Volt battery.

Measuring range/Accuracy:

pH:	0.00 to 14.00/±0.01
mV:	0 to ±1999 (ORP)/±1
°C:	0.0 to 100.0/±0.4
pH calibration:	manual, 2 point, through trimmers, (offset ±1 pH; slope 85 to 105%)
Temperature compensation:	automatic, 0 to 70°C (32 to 158°F) or fix at 25°C without temperature probe
Dimensions:	185mm x 82mm x 45mm
Battery type/operating life:	1 x 9V/approx. 100 hours of continuous use

Type	PK	Cat. No.
HI 8314N	1	**9.773 959**
HI 83141	1	**9.773 953**
Spare electrode HI 1217D for HI 8314N	1	**6.234 050**
Spare electrode HI 1230B for HI 83141	1	**6.050 012**

E & OE.

1 Waterproof pH-/mV-/°C- Meters HI 9125 and HI 9126

Hanna

- rugged waterproof pH Meters
- pH or mV value and temperature are displayed simultaneously
- graphical symbols guide the user through calibration and measurement
- automatic one or two point calibration with pre-programmed standard buffers (pH 4.01, 6.86, 7.01, 9.18, 10.01)
- automatic or manual temperature compensation
- additionally, HI 9126 displays the electrode status, 2 customs buffers can be programmed
- HI 9125 & HI 9126 are supplied with plastic pH electrode, temperature probe buffer solutions pH 4.01 and 7.01 (20ml each), 3 x 1.5V batteries all contained within a carrying case

1



Specifications

Range:	
pH	-2.00 to 16.00
mV	-1999 to +1999
°C	-20.0 to +120.0
Accuracy:	
pH	±0.01
mV	±1
°C	±0.4
Dimensions:	192 x 72 x 36mm
Weight:	525g

Type	PK	Cat. No.
HI 9125	1	**9.773 978**
HI 9126	1	**9.773 979**
Spare electrode HI 1230B	1	**6.050 012**

2 Foodcare pH Meter HI 99161 with penetration electrode

Hanna

The FC202D electrode supplied is highly suitable for measurements in Food products like fruit juices, yoghurt, butter, cheese and meat, due to its conical profile. It has a built in temperature sensor. pH and temperature are displayed simultaneously. With Stability indicator. Automatic 1- or 2-point calibration with pre-programmed standard buffers (pH 4.01; 7.01; 10.01).

Instrument is supplied with Foodcare Electrode FC202D, pH 7.01 & pH 4.01 buffer solutions (one sachet of 20ml each), cleaning solutions (2 x 20ml) 4 x 1.5 Volt batteries, all contained in a carrying case.

2



Measuring range/Accuracy:

pH:	-2.00 to 16.00/±0.01
°C:	-5.0 to 105.0/±0.4
Battery type:	4 x 1.5 Volt AAA
Operating range:	0 to 50°C
Weight:	205g

Type	PK	Cat. No.
HI 99161	1	**6.233 767**
Spare electrode FC 202D	1	**6.235 596**

1



2



1 2 pH/Redox-Meter SD300pH

NEW!

AQUALYTIC

Rugged, water resistant (IP67) designed for field use
- Waterproof Hand-held Meter for pH/Redox/Temperature
- Automatic buffer detection for calibration
- Data logger and alarm function (min./max.)
- Good Laboratory Practice (GLP-features)
- Clear, concise result reading: easy-to-read backlit LCD display
- Automatic temperature compensation
- PC interface for data download (USB/serial or analog)
- High resolution (0.001 pH/0.1 mV)

Supplied with:
SD300PH: Meter without electrode, incl. batteries and manual
SD300PH Set-1: Meter complete in case, incl. manual and batteries, pH electrode with temperature sensor plastic/gel-BNC plug, buffer solution 4/7/10 pH (90 ml each)
SD300PH Set-2: Meter complete in case, incl. manual and batteries, pH electrode with temperature sensor plastic/gel-BNC plug, temperature sensor PT 100, buffer solution 4/7/10 pH (90 ml each)

Specifications

pH:	-2.000 to 16.000
Accuracy:	±0.005
Temperature:	-5.0 to +150°C
Accuracy:	±0.2°C
Redox (ORP):	-2000.0 to 2000.0mV
Accuracy:	±0.05% FS (mV or mVH)
Dimensions (WxDxH):	86 x 160 x 37mm
Power supply:	2 x AAA battery
Power consumption:	< 1.0mA
Protection class acc. to:	IP 67

Type	PK	Cat. No.
SD300PH	1	**9.699 275**
SD300PH Set-1	1	**9.699 276**
SD300PH Set-2	1	**9.699 277**

3



3 Portable pH meter Education Line EL2

NEW!

Experience science with portable pH meters.

Mettler-Toledo Online

- Simple intuitive operation helps you save time during classes
- Ideally suited for classroom and field-based measurements alike
- Robust, low-maintenance, yet reliable electrodes available in kit version

EL2-Basic: pH instrument incl. electrode clip, wrist strap, operating manual, "Quick guide", 4 x batteries
EL2-Kit: Instrument and accessories as with EL2 Basic, also with LE407 pH electrode, IP54 connection caps, 2 x pH 4.01 and 2 x pH 7.00 buffer sachets
EL2-Fieldkit: Instrument and accessories as for EL2 Kit, also with carry bag incl. 4 sample bottles

Please note: These articles are only available for schools and universities.

Specifications

pH-range/accuracy:	0.00 to 14.00/±0.01
mV-range/accuracy:	-1999 to +1999/±1
Temperature range/accuracy:	0.0 to +100.0°C/±0.5°C
Calibration:	Max. 2 points, 3 predefined buffer groups
Free disk space:	30 datasets
Display:	LCD
Batteries:	4 AAA, 1.5V
Dimensions (WxDxH):	169 x 82 x 36mm
Weight:	180g (without batteries)

Type	PK	Cat. No.
EL2-Basic	1	**9.704 000**
EL2-Kit	1	**9.704 001**
EL2-Fieldkit	1	**9.704 002**
Spare electrode LE407	1	**9.041 619**
Additional electrode LE409	1	**9.041 620**

E & OE.

1 pH meter FiveGo™ pH FG2

NEW!

Mettler-Toledo Online

FiveGo™ pH is a handy, portable meter ideal for those who require rapid and reliable results on the go. This meter is suitable for a wide range of applications in various areas such as food and beverage, agriculture, industry, water and environment

- Outstanding functions including storage capacity for up to 30 measurements, mV/ORP measuring mode and IP54 protection against dust and water ingress are combined with useful features such as automatic endpoint recognition and calibration with automatic buffer recognition.
- Five self-explanatory operating and function buttons for easy measurement, menu access, saving and recalling results and calibration recall
- A big, well organised display that simultaneously shows readings, temperature and endpoint criteria along with helpful icons
- Useful accessories such as the electrode clip, wrist strap and laminated quick guide are enclosed with every FiveGo. The electrode kit version also includes the LE438 electrode (Food Kit with LE427 puncture electrode) and the Field Kit version comes in a handy carry bag with 4 sample bottles.

FG2-Basic: pH instrument incl. electrode clip, wrist strap, operating manual, "Quick guide", 4 x batteries
FG2-Kit: Instrument and accessories as with FG2-Basic, with LE438 pH electrode, IP54 connection caps, 2 x pH 4.01 and 2 x pH 7.00 buffer sachets
FG2-Fieldkit: Instrument and accessories as for FG2-Kit, with carry bag incl. 4 sample bottles
FG2-Food Kit: Instrument and accessories as with FG2-Basic, with LE427 puncture pH electrode, IP54 connection caps, 2 x pH 4.01 and 2 x pH 7.00 buffer sachets, with carry bag incl. 4 sample bottles

Specifications:

Measuring range (Accuracy)	
pH:	0.00 to 14.00pH (±0.01pH)
mV:	-1999 to +1999mV (±1mV)
Temperature:	0 to +100°C (±0.5°C)
Calibration:	2 points, 4 predefined buffer groups
Input:	BNC/Cinch (NTC)
Temperature compensation:	ATC and MTC
Memory:	30 measurements
Power supply:	4 x AAA
Protection class acc. to DIN EN 60529:	IP 54

Type	PK	Cat. No.
FG2-Basic	1	**9.972 060**
FG2-Kit	1	**7.619 615**
FG2-Fieldkit	1	**9.972 061**
FG2-Food Kit	1	**9.972 062**

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1 pH-meter SevenGo™ SG2

NEW!

Mettler-Toledo Online

Routine model (IP67) for portable pH measurement.
- Clear display of measured values and settings
- Continuous indication of electrode and battery status
- 3-point calibration with automatic buffer recognition and temperature compensation
- Data memory for 30 data points
- Power requirements: 4 x 1.5V AA or rechargeable 1.3V NiMH batteries

Items supplied:
SG2-B: pH-meter, wrist strap, four 1.5V AA batteries, operating instructions, a test certificate and a declaration of conformity.
SG2-ELK: pH-meter with InLab®413 SG IP67 rated "3-In-1" electrode (1.8m fixed cable) complete with batteries, wrist strap, SevenGo™ clip, buffer sachets (2 each ; 4.01, 7.00 and 9.21), operating instructions, test certificate and declaration of conformity
SG2-FK: pH-meter with InLab®413 SG IP67 rated "3-In-1" electrode (1.8m fixed cable) with field compact case, rubber holster, field electrode arm, calibration bottles, and same accessories as SG2-ELK SevenGo™ pH kit
SG2-FoodKit: pH-meter with InLab® Solids Pro IP67 rated "3-In-1" electrode (1.8m fixed cable) complete with batteries, wrist strap, Food Compact Case, SevenGo™ clip, buffer sachets (2 each ; 4.01, 7.00 and 9.21), operating instructions, test certificate and declaration of conformity

Specifications:

Dimensions (WxDxH):	90 x 45 x 220mm
pH	
Measuring range:	0.00 to 14.00
Resolution:	0.01
Accuracy:	±0.01
mV	
Measuring range:	-1999 to 1999mV
Resolution:	1
Accuracy:	±1
Relative mV-measurement:	no
Temperature	
Measuring range:	-5.0 to +105.0°C
Resolution:	0.1°C
Accuracy:	±0.5°C

Type	PK	Cat. No.
SG2-B	1	**9.704 103**
SG2-ELK	1	**9.704 104**
SG2-FK	1	**6.232 917**
SG2-FoodKit	1	**9.704 301**

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E & OE.

1 pH/Ion-meter SevenGo pro™ SG8

NEW!

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Mettler-Toledo Online



Professional portable pH/Ion meter (IP67) for highest demands
- Simple ion concentration determination
- Time interval measurement with automatic data logging
- Data memory for 200 GLP data points
- Segmented or linear calibration as desired
- 5-point calibration with choice of 6 predefined and one user-defined buffer groups
- Contact-free IR communication for data transfer to a printer or PC

Items supplied:
SG8-B: pH/ion meter with BNC fitting, complete with batteries, wrist strap, operating instructions, test certificate and declaration of conformity, no electrode
SG8-ELK: pH/ion with InLab®413 SG IP67 rated "3-In-1" electrode (1.8m fixed cable) complete with batteries, wrist strap, SevenGo™ clip, buffer sachets (2 each; 4.01, 7.00 and 9.21), operating instructions, test certificate and declaration of conformity
SG8-FK: pH/ion meter with InLab®413 SG IP67 rated "3-In-1" electrode (1.8m fixed cable), with field compact case, field electrode arm, calibration bottles, rubber holster and same accessories as SG8-ELK

Specifications:

pH	
Measuring range:	-2.000 to 19.000
Resolution:	0.001
Accuracy:	±0.002
mV (rel. mV)	
Measuring range:	-1999 to 1999mV
Resolution:	0.1
Accuracy:	±0.2
Temperature	
Measuring range:	-5.0 to 130.0°C ATC -30.0 to 130.0°C MTC
Resolution:	0.1°C
Accuracy:	±0.2°C

Type	PK	Cat. No.
SG8-B	1	**9.704 105**
SG8-ELK	1	**9.704 106**
SG8-FK	1	**9.704 328**

Pocket pH meters ProfiLine Serie

WTW

The WTW ProfiLine, hand-held, pH/mV meters are robust and waterproof, according to IP67. They have LCD or graphics displays. The proven DIN socket for connecting pH electrodes permits pH measurement even in wet environments.
The instruments can be operated by standard alkaline or rechargeable batteries.

2 3 pH meter pH 3110 ProfiLine

WTW

Make testing simple. Easy operation virtually eliminates errors. All function keys of the 3110 can be operated even when wearing gloves; automatic calibration and AutoRead functions ensure stable and reproducible results.
The multifunctional display for pH, and temperature is always easy to read.

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Measuring ranges

pH:	-2.0 ... +20.0 -2.00 ... +20.0 -2.000 ... +19.999
Accuracy:	±0.01 pH (±1 digit) ±0.005 from +15°C to +35°C
mV/Accuracy:	±1200.0/±0.3 ±2000/±0.1
Temperature:	-5.0 to +105.0°C
Accuracy:	±0.1°C
Temperature compensation:	Automatic via pH electrodes with integral temperature probe, TFK 325 or Pt100

Type	Description	PK	Cat. No.
pH 3110	meter only	1	**9.774 367**
pH 3110 Set 1	case set including SenTix 21 and accessories	1	**9.774 376**
pH 3110 Set 2	case set including SenTix 41 and accessories	1	**9.774 354**
pH 3110 Set 3	case set including SenTix 81 and accessories	1	**9.774 317**

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1 2 pH meter pH 3210/pH 3310 ProfiLine

pH meter pH 3210 *WTW*

Convenient and versatile pH/mV meter with backlit graphics display and menu controlled operation. Waterproof and robust. With 5 point calibration for WTW technical or DIN/NIST buffers. Additional 20 pre-programmed buffer sets. The new CMC function (Continuous Measurement Control) helps maintain the optimum measuring range and warns when limits are exceeded.

pH meter pH 3310

The pH/mV handheld meter with integral, time controlled, data logger and memory for 5000 GLP compliant records is ideal for extended data collection. With 1 to 5-point pH calibration. Menu controlled, with backlit graphics display for comfortable and safe operation. Unique CMC-function for controlling the optimum measuring range. 100% waterproof, USB interface for fast data transfer. Includes driver software and cable.

Measuring ranges

pH:	-2.0 ... +20.0
	-2.00 ... +20.00
	-2.000 ... +19.999
Accuracy:	±0.005 pH from +15°C to +35°C
mV/Accuracy:	±1200.0/±0.3 mV
	±2500/±0.1 mV
Temperature:	-5.0 to +105°C
Accuracy:	±0.1°C
Interface (pH3310 only):	Mini USB-B
Memory	
pH3210:	200 records (measured value, temperature, date, time, ID)
pH3310:	5000 records (measured value, temperature, date, time, ID)

Type	Description	PK	Cat. No.
pH 3210	meter only	1	**9.774 377**
pH 3210 Set 2	case set including SenTix 41 and accessories	1	**9.774 355**
pH 3210 Set 3	case set including SenTix 81 and accessories	1	**9.774 318**
pH 3210 Set 4	case set including SenTix 51 and accessories	1	**9.774 319**
pH 3310	meter only	1	**9.774 337**
pH 3310 Set 2	case set including SenTix 41 and accessories	1	**9.774 356**
pH 3310 Set 3	case set including SenTix 81 and accessories	1	**9.774 375**
pH 3310 Set 4	case set including SenTix 51 and accessories	1	**9.774 329**

Protective armouring SM Pro, for ProfiLine handheld meters

Soft rubber, shock absorbing cover for ProfiLine handheld meters *WTW*

Type	PK	Cat. No.
SM Pro	1	**9.774 118**

3 Storage and maintenance kit for pH meters

Kit with one pH storage sleeve, technical buffer solution pH 4 and pH 7, 30ml KCl, 50ml cleaning and 50ml storage solutions. *WTW*

Type	PK	Cat. No.
Safe Kit	1	**9.774 117**

3



1 Laboratory pH Meter with built in Magnetic Stirrer, HI 208-02

NEW!

Hanna



Compact, easy to use pH Meter with built in Magnetic Stirrer, suitable for educational purposes.
- pH and temperature value are displayed together on the Dual Level LCD
- Automatic 1- /2- Point Calibration with pre-programmed buffers (pH 4.01, 7.01 and 10.01)
- Automatic temperature compensation from -5.0 to 105.0°C

HI 208-02 is supplied with pH Electrode HI 1291D (with internal temperature sensor), pH Electrode holder and plastic beaker, stirring bar, 9V battery, 12V adapter, pH buffer solutions (2 sachets of 20ml each)

Specifications

Measuring range/Accuracy:	-2.00 to 16.00pH/±0.01pH
Temperature range/Accuracy:	-5.0 to +105.0°C/±0.5°C (up to 60°C)
Power Supply:	12V Adapter or 9V battery (included)
Weight:	500g

Type	PK	Cat. No.
pH meter HI 208-02	1	**6.233 844**
Spare electrode HI 129D	1	**6.235 794**
Measuring beaker HI 740036P, 50ml	10	**9.773 919**

2 pH Meters, Lab 850 and 860

SI Analytics GmbH



CalClock function keeps your calibration under control: This unique combination of sensor evaluation and calibration timer monitors all calibration relevant parameters (buffer, electrode, curve slope, zero-point, time) and immediately indicates any errors.

Features:
- keypad
- clock
- large LCD display
- calibration interval adjustable
- alarm

Lab 850 is now equipped with:
- bi-directional RS 232C interface
- memory: 800 data records
- GLP compliant
- 3 point calibration

Additional features Lab 860:
- USB (slave) connection
- 5 point calibration

Items supplied: pH meter Lab 850 or pH meter Lab 860, electrode BlueLine pH14 with temperature sensor, support, cover, power supply and DIN buffers 4.01 and 6.87.

Specifications:

Measuring range:	-2.00 to +19.999pH or -999.9 to +999.9mV and -1999 to +1999mV
Temperature range:	-5.0 to +120.0°C

Type	PK	Cat. No.
Lab 850 Set	1	**9.773 850**
Lab 860 Set	1	**9.773 855**



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1 pH measuring instrument Lab 870

SI Analytics GmbH

ID electrodes and meters with automatic identification and data exchange and allocation.
- Reliable and precise measuring values due to perfect matching with the measuring system consisting of meter, electrode and buffer solutions.
- Fast pH measurement and calibration through advanced measuring algorithm.
- Maintains reliablity with "CalClock", sensor recognition and calibration timer.
- Fast and easy documentation complying with GLP through perfect communication via USB (slave) and RS232.
- Highest safety for measuring and calibrating through wireless sensor recognition.
- ID electrodes and meters with automatic identification and data exchange and allocation.
- The special stand - mounting with one click and the stand is positioned firmly and safely.

Items supplied in set:
- measuring instrument
- ID-electrode with integrated temperature sensor
- buffer solutions
- stand
- universal power supply unit
- cover

Specifications

pH measuring range:	-2.000pH to +19.999pH -2.00pH to +19.99pH
Accuracy (±1digit):	±0.005 ±0.01
mV measuring range:	-999.9mV to +999.9mV; -999mV to +999mV
Accuracy (±1digit)	±0.3mV ±1mV
Temperature measuring range:	-5.0°C to + 120.0°C
Accuracy (±1digit):	0.1°C

Type	PK	Cat. No.
Lab 870 DIN Set	1	**9.773 851**
Lab 870 BNC Set	1	**9.773 852**

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2 3 Laboratory instrument inoLab® pH 7110

WTW

The new inoLab® pH 7110 is a basic pH/mV benchtop meter for fast and accurate results without efforts. A big LCD segment display makes readings easy; a well-arranged keypad provides convenient operation. The automatic AutoRead function supports correct and repeatable results. An adjustable built-in calibration timer reminds the user of periodical calibration. Each meter comes including stand and accessories.

Specifications

Ranges	All values ±1 digit
pH:	-2.0 ... 20.0 ±0.1 pH -2.00 ... 20.00 ±0.01 pH -2.000 ... 19.999 ±0.005 pH
mV:	±(1200.0 ±0.3) mV ±(2000 ±1) mV
Calibration:	1-, 2- or 3 point WTW technical buffer or DIN/NIST
Temperature:	-5.0 ... 105.0°C ±0.1°C
Power supply:	Universal power supply 100 to 240V, 50/60Hz, 4 x 1.5V AA or 4 x 1.2V NiMH rechargeable batteries

Type	Description	PK	Cat. No.
pH 7110	Single unit incl. accessories	1	**9.920 090**
pH 7110 SET 2	Meter incl. SenTix® 41 and accessories	1	**9.920 091**
pH 7110 SET 4	Meter incl. SenTix® 81 and accessories	1	**9.920 092**
pH 7110 BNC	Single instrument including accessories, BNC input	1	**9.920 093**
7110 BNC SET 7	Meter incl. SenTix® 42 and accessories	1	**9.920 094**
7110 BNC SET 9	Meter incl. SenTix® 82 and accessories	1	**9.920 095**

1 Laboratory instrument inoLab® pH 7310

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Reliable Documentation for pH measurement, if desired also available with built-in printer: *WTW*
This is the new inoLab® pH 7310 or inoLab® pH 7310P. A modern backlit graphic display with menu controlled user interface allows easy and intuitive operation.
The mini USB-B interface provides fast data transfer to a PC. The internal memory can record up to 5000 GLP complying data including ID, date and time. The housing and the keypad are easy-to-clean.
Up to five calibration points cover almost the complete pH range. A calibration history of the 10 last calibrations allows conclusions on the state of the sensor. An integrated thermal printer (58mm width) is ready for printout of the measured data (option).
Supplied with: meter, power supply, stand and USB cable.

Specifications

Ranges	All values ±1 digit
pH:	-2.0 ... 20.0 ±0.1 pH
	-2.00 ... 20.00 ±0.01 pH
	-2.000 ... 19.999 ±0.005 pH
mV:	±(1200.0 ±0.3) mV
	±(2500 ±1) mV
Temperature:	-5.0 ... 105.0°C ±0.1°C
Calibration:	1-, 2-, 3-, 4-, 5 point WTW technical. DIN, NIST and 20 additional buffer sets
Calibration memory:	Up to 10 calibrations recallable
Display:	LCD Graphic, backlit
Memory:	manual 200/5000 automatic
Logger:	manual/time controlled
Interface:	Mini USB-B
Power supply:	Universal power supply, 100 to 240V, 50/60 Hz, 4 x 1.5V AA or 4 x 1.2V NiMH

Type	Description	PK	Cat. No.
pH 7310	Meter only incl. accessories	1	**9.920 100**
pH 7310 Set 2	Meter incl. SenTix® 41and accessories	1	**9.920 101**
pH 7310 Set 4	Meter incl. SenTix® 81 and accessories	1	**9.920 102**
pH 7310P	Meter incl. integrated printer	1	**9.920 104**
pH 7310P Set 2	Meter with integrated printer, incl. SenTix® 41and accessories	1	**9.920 105**
pH 7310P Set 4	Meter with integrated printer, incl. SenTix® 81 and accessories	1	**9.920 106**
pH 7310P BNC	Meter with integrated printer, incl. accessories, BNC input	1	**9.920 107**

2 Benchtop pH meter Education Line EL20

NEW!

2



Experience science with pH bench meters *Mettler-Toledo Online*

- Simple intuitive operation: helps you save time during classes
- Compact, robust benchtop instrument
- Robust, low-maintenance, yet reliable electrodes available in kit version
- Ideal for schools and universities

EL20-Basic: pH instrument incl. operating manual, "Quick guide", power adapter
EL20-Kit: Instrument and accessories as with EL20 Basic, also with LE407 pH electrode, electrode arm, 2 x pH 4.01 and 2 x pH 7.00 buffer sachets

Please note: These articles are only available for schools and universities.

Specifications

pH-range/accuracy:	0.00 to 14.00/±0.01
mV-range/accuracy:	-1999 to +1999/±1
Temperature range/accuracy:	0.0 to +100.0°C/±0.5°C
Calibration:	Max. 2 points, 3 predefined buffer groups
Display:	LCD
Power supply:	100-240V/50-60Hz, 9V DC
Dimensions (WxDxH):	200 x 175 x 52mm
Weight:	600g

Type	PK	Cat. No.
EL20-Basic	1	**9.704 147**
EL20-Kit	1	**9.704 148**
LE407	1	**9.041 619**
LE409	1	**9.041 620**

1 pH meter FiveEasy™ pH FE20/FiveEasy Plus™ pH FEP20

NEW!

Mettler-Toledo Online

FiveEasy™ and FiveEasy Plus™ pH are compact, easy to use bench meters suitable for a wide range of applications in various areas such as food and beverage, agriculture, industry, water and environment.

- Outstanding functions include a separate reference electrode input, mV/ORP measuring mode and a self-test combined with useful features such as automatic endpoint recognition and calibration with automatic buffer recognition.
- Five self-explanatory operating and function buttons for easy measurement, menu access and calibration recall
- A big, well organised display that simultaneously shows readings, temperature and endpoint criteria along with helpful icons

FE20-Basic: pH instrument incl. operating manual, "Quick guide", power adapter
FE20-Kit: Instrument and accessories as with FE20-Basic, also with LE409 pH electrode, electrode arm, 2 x pH 4.01 and 2 x pH 7.00 buffer sachets
FE20 ATC Kit: Instrument and accessories as with FE20-Basic, also with LE438 "3-in-1" pH electrode, electrode arm, 2 x pH 4.01 and 2 x pH 7.00 buffer sachets
FEP20-Basic: pH instrument incl. operating manual, "Quick guide", power adapter
FEP20 ATC Kit: Instrument and accessories as with FEP20-Basic, also with LE438 "3-in-1" pH electrode, electrode arm, 2 x pH 4.01 and 2 x pH 7.00 buffer sachets

Specifications

Measuring range (Accuracy)	
pH:	0.00 to 14.00 pH (±0.01pH)
mV:	-1999 to 1999 (±1mV)
Temperature:	0°C to 100°C (±0.1°C)
Input:	BNC/RCA, Cinch (NTC)
Temperature compensation:	ATC and MTC
Power supply:	100-240V/50-60Hz/9V DC
Calibration FE20:	2 points, 4 predefined buffer groups
Calibration FEP20:	3 points, 4 predefined buffer groups
FEP20 only:	
Memory:	99 measurements
Interface FEP20:	RS232

Type	PK	Cat. No.
FE20-Basic	1	**6.234 716**
FE20-Kit	1	**6.232 715**
FE20 ATC Kit	1	**9.972 070**
FEP20-Basic	1	**9.773 702**
FEP20 ATC Kit	1	**9.773 703**
FiveEasy AC adaptor (incl. connectors) input 230V, output DC 9V	1	**7.900 515**
FiveEasy electrode arm (complete)	1	**6.235 935**



1 pH/Ion meter SevenCompact™

NEW!

Mettler-Toledo Online

The colour display with its well-designed icons and menu settings in 10 languages makes operation genuinely intuitive. Applications range from routine measurements through sample analysis, data handling and data archiving in compliance with GLP regulations.
Simply innovative design that meets the requirements for a universal, easy-to-operate pH/Ion meter.

- User friendly instrument for demanding users
- Security and high reproducibility thanks to Intelligent Sensor Management (ISM®)
- Improved quality of measurements through professional calibration support
- Comprehensive service package including IQ/OQ
- Integrated USB and RS232 interfaces for data exchange

Supplied with:
S220-Basic: Instrument, electrode holder, protective cover, operating instructions, quick guide, declaration of conformity and test certificate
S220-Kit: As per S220-Basic, additionally with InLab® Expert Pro-ISM, guide to pH measurements and 2 buffer sachets for pH 4.01, 7.00, 9.21 and 10.00.
S220-Bio: As per S220-Kit, but with InLab® Routine Pro-ISM cable kit instead of InLab® Expert Pro-ISM.
S220-U: As per S220-Kit, but with InLab® Versatile Pro instead of InLab® Expert Pro-ISM.

Specifications:

pH-range:	-2.000 to 20.000
pH-relative accuracy:	±0.002
pH-resolution User-definable:	0.001/0.01/0.1
mV-range:	-2000.0 to 2000.0
mV-relative accuracy:	±0.2
mV-resolution User-definable:	0.1/1
Ion-Concentration range:	1.00E-9 to 9.99E+9
Ion-Concentration accuracy:	±0.5%
Temperature range	
MTC:	-30.0 to 130.0°C
ATC:	-5.0 to 130.0°C
Temperature accuracy:	±0.1°C
Display:	4.3 inch, TFT color
Ext. power supply:	9-12V/10W

Type	PK	Cat. No.
S220-Basic	1	**9.704 160**
S220-Kit	1	**9.704 161**
S220-Bio	1	**9.704 162**
S220-U	1	**9.704 163**

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1 2 pH meter, SevenExcellence™ S400

NEW!

Mettler-Toledo Online

Modular professional system for measurements of pH, redox potential, conductivity, salinity/TDS and ion concentration. Fits up to three modules in any composition and order, can be expanded with additional measurement parameters at any time.
- Large, high resolution 7" colour touch display (capacitive), very clear and easy to operate.
- Modularity and flexibility; up to 3 measuring modules can work in parallel, expansion to 2 or 3 channels possible.
- Universal communication via 2 x USB, Ethernet (LAN) and RS232.
- Plain text user interface in 10 languages with menu guidance in full sentences.
- OneClick™ operation concept to quickly start frequently used functions and preferred methods.
- Storage for user methods.
- Highest security and GxP support (ID protection, sophisticated user management, limits/alarms, integrated radio clock, etc.).
- Intelligent sensor management (ISM®).
- Connection of stirrer, sample changer, PC, barcode reader, keyboard, local or network printer possible.
- Storage up to 20000 data sets (measurements, calibrations, methods).
- 17 predefined, 60 user-defined methods
- 5 point calibration (pH), 8 pre-defined and 20 user-defined buffer groups, incl. temperature chart
- uPlace™ electrode arm with perfect vertical movement.
- Compatible with all METTLER TOLEDO electrodes (Recommended: ISM® electrodes).

S400-Basic: Includes instrument, 1 x pH/mV expansion unit, 2 x blank expansion units, uPlace™ electrode holder, semi-transparent cover, operating instructions, installation and quick guide, LabX® direct pH PC software, declaration of conformity and test certificate.
S400-Kit: As S400-Basic, but also with InLab® Expert Pro-ISM, guide to pH measurements and 2 buffer sachets for pH 4.01, 7.00, 9.21 and 10.00.
S400-Bio: As S400-Kit but with InLab® Routine Pro-ISM cable kit instead of InLab® Expert Pro-ISM.
S400-ISFET: As S400-Kit but with InLab® 490 instead of InLab® Expert Pro-ISM.

Specifications	**Measuring range // Resolution // Accuracy**
Temperature range MTC/ATC:	-30.0 to 130.0°C // 0.1°C // ±0.1°C
pH:	-2.000 to 20.000 // 0.001/0.01/0.1 // ±0.002
mV:	-2000.0 to 2000.0 // 0.1/1 // ±0.1
Rel. mV:	-2000.0 to 2000.0 // 0.1/1 // ±0.1
ISFET pH:	0.000 to 14.000 // 0.001/0.01/0.1 // ±0.05

Type	PK	Cat. No.
S400-Basic	1	**9.704 350**
S400-Kit	1	**9.704 351**
S400-Bio	1	**9.704 352**
S400-ISFET	1	**9.704 353**

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LLG-pH-Electrodes econony line

The LLG- pH-Electrodes of the economy line are high-quality measurement sensors with a good price/performance ratio. They are equipped with low-resistance UW glass for fast and safe measurement results.
A polymerized solid KCl electrolyte is used in these electrodes. A cartridge-style conduction system, that has proved its worth over the years, keep the electrolyte free of silver ions throughout the life of the sensor, making it less susceptible to electrode poisons.
The LLG- pH-electrodes have a high-quality ceramic diaphragm and the shaft, made from black PPO, has an integrated protection basket.

Areas of application:
- Drinking water monitoring and treatment
- Swimming pools
- Aquariums (also marine aquariums)
- Greenhouse systems
- Lightly polluted service water, process water and wastewater
- Rainwater, pond water and surface water
- Hand-held meters

1



9.040 811

2



9.040 810

Specifications:

Temperature range:	0 to +60°C
pH range:	UW-Glass: pH 0 to 12, briefly pH 14
Dimensions (L x dia.):	120 x 12mm
Electrolyte:	solid electrolyte
Diaphragm:	1 x ceramic

Description	Cable m	PK	Cat. No.	
Electrode with cable (DIN plug)	2	1	**9.040 812**	
Electrode with cable (BNC plug)	2	1	**9.040 811**	1
Electrode without cable (S7 connector head, please order Art. no. 9.040 817 or 9.040 818 separately)	-	1	**9.040 810**	2
Cable, diam. 5mm, applicable up to +75°C, with DIN plug	3	1	**9.040 817**	
Cable, diam. 5mm, applicable up to +75°C, with BNC plug	3	1	**9.040 818**	

3 LLG-pH-Electrodes labobratory line

The LLG- pH-Electrodes of the Laboratory serie are high-quality measurement sensors with a shaft, made from glas. They are equipped with low-resistance UW glass for fast and safe measurement results and with a sturdy platinum tip for safe measurements and easy cleaning of the sensor.
A acrylamide-free KCl gel is used for electrolyte in these electrodes. A cartridge-style conduction system, that has proved its worth over the years, keep the electrolyte free of silver ions throughout the life of the sensor, making it less susceptible to
electrode poisons.
The LLG- pH-electrodes of the Laboratory line have a sturdy ceramic diaphragm in zirconium dioxideglas.

Areas of application:
- surface measurements on paper and textiles
- pharmaceutical and cosmetic applications
- measurements in small sample volumes
- measurements in low-ion media

3



4



9.040 813

Specifications:

Temperature range:	-5 to +80°C
pH range:	UW- Glass: pH 0 to 12, briefly pH 14
Dimensions (L x dia.):	120 x 12mm
Electrolyte:	gel-sealed
Diaphragm:	1 x zircon dioxide

Description	Cable m	PK	Cat. No.	
Electrode with cable (DIN plug)	1	1	**9.040 815**	
Electrode with cable (BNC plug)	1	1	**9.040 814**	
Electrode without cable (S7 connector head, please order Art. no. 9.040 817 or 9.040 818 separately)	-	1	**9.040 813**	4
Connecting cable, diam. 5mm, applicable up to +75°C, with DIN plug	3	1	**9.040 817**	
Connecting cable, diam. 5mm, applicable up to +75°C, with BNC plug	3	1	**9.040 818**	

1



1 pH combination electrodes, gel electrolyte, SenTix®

Basic pH combination electrodes, with gel electrolyte. *WTW*

Type	Connector	Cable m	Int. temp. probe	PK	Cat. No.
SenTix® 20	Plug-in head	-	no	1	**9.040 851**
SenTix® 21	DIN, waterproof	1	no	1	**9.040 872**
SenTix®21-3	DIN, waterproof	3	no	1	**9.040 873**
SenTix® 22	BNC	1	no	1	**9.040 840**
SenTix® 41	DIN, waterproof	1	yes	1	**9.040 876**
SenTix® 41-3	DIN, waterproof	3	yes	1	**9.040 877**
SenTix® 42	BNC	1	yes	1	**9.040 841**

2



2 pH combination electrodes, liquid electrolyte, SenTix®

Standard pH combination electrodes with non-solid electrolytes, length 120mm. *WTW*

Type	Connector	Cable m	Int. temp. probe	PK	Cat. No.
SenTix® 51	DIN + pin plug	1	yes	1	**6.223 092**
SenTix® 60	Plug head	-	no	1	**9.040 842**
SenTix® 61	DIN, watertight	1	no	1	**9.040 881**
SenTix® 62	BNC	1	no	1	**9.040 843**
SenTix® 81	DIN, watertight	1	yes	1	**9.040 886**
SenTix® 82	BNC	1	yes	1	**9.040 844**

3



3 pH combination electrode, liquid electrolyte, SenTix® H with plug head

Precision pH combination electrodes with plug head. Length 165mm. *WTW*

Description	PK	Cat. No.
SenTix® H	1	**9.040 845**

4



4 pH electrodes, SenTix®

pH electrodes with plug head for special applications. *WTW*

Type	Description	PK	Cat. No.
SenTix® Sp	for penetration measurements	1	**9.040 890**
SenTix® Sur	for surface measurements	1	**9.040 891**
SenTix® Mic	pH micro combination electrode	1	**9.040 892**

5



9.040 895

Accessories for combination electrodes

Connection cable for pH electrodes with plug head connection to plugs as indicated. *WTW*

Type	Connector	Cable m	PK	Cat. No.
AS/DIN	DIN	1	1	**9.040 895** 5
AS/DIN-3	DIN	3	1	**9.040 896**
AS/BNC	BNC	1	1	**9.040 897**

6



6 Electrode stand

With flexible electrode holder for two electrodes and temperature sensor. *WTW*

Type	PK	Cat. No.
Electrode stand	1	**9.040 870**

SI Analytics GmbH - Glassmaking tradition in Mainz from the beginning



General Manager Dr. Robert Reining

Sensors and instruments from Mainz

We already express our core competence, namely the production of analytical instruments, with our company name *SI Analytics*. Moreover, SI is representative for the main products of our company: Sensors and instruments.
Now, after some 75 years of experience in glass technology and the development of analytical instruments, our products are still made in Mainz at high standards of innovation and quality.


The basic Titrator TitroLine® 6000

Inventor of the glass electrode

With the development of the glass electrode in 1937, *SCHOTT* laid the foundation for the success of the electrochemical measurement. With innovative electrodes and measuring instruments, piston burettes and titrators, we have since ensured that the electrochemical analysis has become a reliable and indispensable process all over the world.

History

Evolved from *SCHOTT* history with producing electrodes and capillary viscometers, todays SI Analytics expanded its product range with automatic visosity measuring systems, pH meters and titrators from 1973 on.

In 2009, *SCHOTT Instruments GmbH* became the *SI Analytics GmbH*. At the beginning of 2010, *SI Analytics* was acquired by *ITT*. In 2011, the independent publicly traded company *Xylem* evolved from the fluid technology sector of the I*TT Group*, to which SI Analytics belongs.

Xylem is headquartered in White Plains, NY, USA, an is a leading global provider of problem solutions for water issues. This includes the areas of transport, treatment, effective use and analysis. *Xylem* is represented in more than 150 countries by multiple leading brands, and had total sales of 3.8 billion US Dollars in 2012 and employs worldwide more than 12,700 employees.

Product range

SI Analytics manufactures laboratory instruments for the global market. The product range also includes:

- Laboratory instruments and electrodes for pH, LF, Redox, ISE and oxygen
- Armatures
- Titrators and piston burettes
- Spectrophotometers
- Automatic viscometry measuring systems
- Capillary viscometers
- Hotplates and stirrers for laboratory applications

New products

The newly developed titrator group with the devices TitroLine® 6000, TitroLine® 7000 and TITRONIC® 500 not only combines the most recent design with great user-friendliness, but also with flexibility at the highest accuracy and robustness. Recently, this product group was expanded by the titrators TitroLine® 7500 KF for applications according to Karl Fischer and TitroLine® 7500 KF trace for the coulometric water analysis according to Karl Fischer and the multi-purpose titrator TitroLine® 7750.

SI Analytics – A name that stands for quality and tradition!

SI Analytics GmbH
Hattenbergstr. 10
55122 Mainz, Germany
Tel.: +49.6131.66.5111
Fax: +49.6131.66.5001
si-analytics@xyleminc.com

Application table for the BlueLine pH electrodes

Application	Sample type	BlueLine Type-Nr.	Integrated temperature probe
General Laboratory	General purpose	**14 pH**	YES
		12 pH	NO
	Small sample volume	**16 pH**	NO
	High ionic strength - extreme pH Non-aqueous -solvents, alcohols	**13 pH**	NO
	Titration	**14 pH**	YES
		12 pH	NO
	Harsh environment, rugged use	**54 pH**	YES
	Low maintenance	**24 pH**	YES
		23 pH	NO
Food, Beverage and Dairy	Flat surface - cheese, meat, agar	**27 pH**	NO
	Semi solids - fruit, meat, cheese, jam	**21 pH**	NO
	Titration	**14 pH**	YES
		12 pH	NO
	Juices	**14 pH**	YES
		12 pH	NO
Cosmetics	General purpose	**14 pH**	YES
		12 pH	NO
	Emulsions - cosmetics, oil	**13 pH**	NO
Manufacturing	Flat surface - paper	**27 pH**	NO
	Harsh environment - rugged use, field or plant	**54 pH**	YES
	Emulsions - petroleum, paint	**13 pH**	NO
Education	Economic	**24 pH**	YES
		23 pH	NO
	Research Grade	**13 pH**	NO

1



1 Electrode BlueLine 11 pH

SI Analytics GmbH

pH combination electrode with glass body, Ag/AgCl reference system, cone membrane, platinum junction and screw head.
LB 1A or LB 1BNC cable combination please order separately.
Application: Universal use in chemical, pharmaceutical and food industries.

Specifications:

Temperature range:	-5 to 100°C
pH range:	0 to 14pH
Temperature sensor:	No
Length/ Dia.:	120mm/12mm
Electrolyte:	Liquid, KCl 3 mol/l
Diaphragm:	Platinum
Membrane resistance at 25°C:	250MΩ
Refill hole cover:	Slide

Type	PK	Cat. No.
BlueLine 11 pH	1	**9.041 140**

2



2 Electrode BlueLine 12 pH

SI Analytics GmbH

Generally as BlueLine 11 pH, but with 1 metre x 3mm dia. fixed cable and DIN plug connection.

Type	PK	Cat. No.
BlueLine 12 pH	1	**9.041 141**

E & OE.

1 Electrode BlueLine 13 pH



pH-combination electrode with glass body, Ag/AgCl reference system and plug-in head. *SI Analytics GmbH*
LB 1A or LB 1BNC cable combination please order separately.
Applications: Universal use in chemical, pharmaceutical and food industries.
Ideal for low ionic strength materials (Cremes, Emulsions, Dispersions and Suspensions).

Specifications:

Temperature range:	-5 to 100°C
pH range:	0 to 14pH
Temperature sensor:	No
Length/Dia.:	170mm/12mm
Electrolyte:	Fluid, KCl 3mol/l
Diaphragm:	Ground joint
Membrane resistance at 25°C:	300 MΩ
Refill hole cover:	Slide

Type	PK	Cat. No.
BlueLine 13 pH	1	**9.041 142**

2 Electrode BlueLine 14 pH with temperature sensor



pH-combination electrode with glass shaft, Ag/AgCl reference system and *SI Analytics GmbH*
1 metre x 5mm dia. fixed cable, with DIN and 4mm pin plug connections.
Applications:Universal use in the chemical, pharmaceutical and food industries.

Specifications:

Temperature range:	-5 to 100°C
pH range:	0 to 14pH
Temperature sensor:	NTC 30kΩ
Length/Dia.:	120mm/12mm
Electrolyte:	Fluid, KCl 3mol/l
Diaphragm:	Platinum
Membrane resistance at 25°C:	300MΩ
Refill hole cover:	Slide

Type	PK	Cat. No.
BlueLine 14 pH	1	**9.041 143**
BlueLine 14 pH ID	1	**6.233 381**

3 Electrode BlueLine 15 pH



As BlueLine 14 pH, but with built-in ATC, 1 metre long x 5mm diameter fixed cable, *SI Analytics GmbH*
BNC plug and 4mm banana plug.

Type	PK	Cat. No.
BlueLine 15 pH	1	**9.041 144**
BlueLine 15 pH ID	1	**9.041 155**

4 Micro Electrode BlueLine 16 pH



micro-pH-combination electrode with glass body, Ag/AgCl reference system and *SI Analytics GmbH*
plug-in head. LB 1A or LB 1BNC cable combination please order separately.
Ideal for small sample volumes.

Specifications:

Temperature range:	-5 to 100°C
pH range:	0 to 14pH
Temperature sensor:	No
Length // Dia.:	40/80mm // 12/5mm
Electrolyte:	Fluid, KCl 3mol/l
Diaphragm:	Platinum
Membrane resistance at 25°C:	300MΩ
Refill hole cover:	Slide

Type	PK	Cat. No.
BlueLine 16 pH	1	**9.041 145**

1



1 Spear-tip electrode, BlueLine 21 pH

pH combination electrode with glass body, Ag/AgCl reference system, spear membrane tip and plug head. LB 1 A or LB 1 BNC cable combination please order separately.
Particularly suitable for penetration measurements in semi-solid media.

SI Analytics GmbH

Specifications:

Temperature range:	-5 to + 80°C
pH range:	2 to 13 pH
Temperature sensor:	No
Taper length // Dia. max./min.	65/25mm // 12/5mm
Electrolyte:	Referid®
Diaphragm:	Hole
Membrane resistance at 25°C:	400 MΩ
Refill hole cover:	No refill hole

Type	PK	Cat. No.
BlueLine 21 pH	1	**9.041 146**

2



2 Plastic bodied electrode, BlueLine 22 pH

pH combination electrode with plastic body, Ag/AgCl reference system and plug head LB 1A or LB 1BNC cable combination please order separately.
Use: Universal application in chemical, pharmaceutical and food industries, and in water/waste water plants and for field use.

SI Analytics GmbH

Specifications:

Temperature range:	-5 to 80°C
pH range:	0 to 14pH
Temperature sensor:	No
Length/Dia.:	120mm/12mm
Electrolyte:	Gel
Junction:	Fibre
Membrane resistance at 25°C:	400MΩ
Refill hole cover:	No refill hole

Type	PK	Cat. No.
BlueLine 22 pH	1	**9.041 147**

3



3 Electrode BlueLine 23 pH

As BlueLine 22 pH, but with 1 metre long x 3mm diameter fixed cable and DIN plug.

SI Analytics GmbH

Type	PK	Cat. No.
BlueLine 23 pH	1	**9.041 148**

4



4 Electrode, BlueLine 24 pH, with temperature sensor

pH combination electrode with plastic body, Ag/AgCl reference system and 1 metre fixed cable with 5mm DIN and 4mm pin plug connections.
Applications: Universal use, such as in water supply and effluent treatment departments of chemical, pharmaceutical and food factories and for field use.

SI Analytics GmbH

Specifications:

Temperature range:	-5 to 80°C
pH range:	0 to 14pH
Temperature sensor:	NTC 30kΩ
Length/Ø:	120mm/12mm
Electrolyte:	Gel
Diaphragm:	Fibre
Membrane resistance at 25°C:	400MΩ
Refill hole cover:	No refill hole

Type	PK	Cat. No.
BlueLine 24 pH	1	**9.041 149**

5



5 Electrode, BlueLine 25 pH

As BlueLine 24 pH, but without temperature sensor and with 1 metre long, 3mm dia. fixed cable, BNC plug.

SI Analytics GmbH

Type	PK	Cat. No.
BlueLine 25 pH	1	**9.041 150**

E & OE.

1 Electrode, BlueLine 26 pH, with temperature sensor



As BlueLine 24 pH, but with built-in ATC, 1 m long, 5mm dia. fixed cable, BNC plug and 4mm banana plug. *SI Analytics GmbH*

Type	PK	Cat. No.
BlueLine 26 pH	1	**9.041 151**

2 Electrode, BlueLine 27 pH, for surface measurements



pH-combination electrode with glass body, Ag/AgCl reference system and plug head. *SI Analytics GmbH*
LB 1A or LB 1BNC cable combination please order separately.
Specially suitable for surface measurements.

Specifications:

Temperature range:	-5 to 50°C
pH range:	2 to 13 pH
Temperature sensor:	no
Length/Dia.:	120mm/12mm
Electrolyte:	Referid®
Diaphragm:	Annular space
Membrane resistance at 25°C:	400 MΩ
Refill hole cover:	No refill hole

Type	PK	Cat. No.
BlueLine 27 pH	1	**9.041 152**

3 Redox (ORP) electrodes, BlueLine 31 RX



Redox combination electrode with glass body, Ag/AgCl reference system and plug head. *SI Analytics GmbH*
LB 1A or LB 1BNC cable combination please order separately.
Application: Universal applications in chemical and food industries.

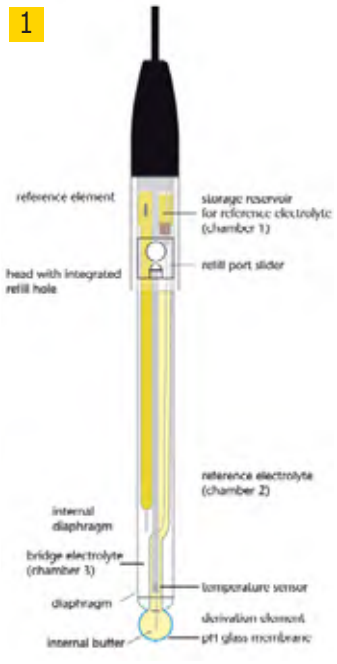
Specifications:

Temperaturbereich:	-5 to 100°C
Sensor:	Pt disc
Temperature sensor:	No
Length/Dia.:	120mm/12mm
Electrolyte:	liquid, KCl 3mol/l
Junction:	Ceramic
Membrane:	Platinum
Refill hole cover:	Slide

Type	PK	Cat. No.
BlueLine 31 RX	1	**9.041 153**



1



1 2 Electrodes, IoLine

pH electrodes for the most demanding measuring tasks — *SI Analytics GmbH*

The IoLine electrode family with iodine/iodide reference system has been developed to meet the most demanding laboratory measurement tasks. These electrodes are metal ion free and hence ideally suited for measurements that may cause sample contamination by such ions (e.g. silver ions) and for pH measurements in Tris buffers too.

Advantages of IoLine Electrodes over classical Ag/AgCl reference systems are notably by:
- longer service life thanks to a patented three-chambers Iodine reservoir in the reference electrode.
- fast reaction, precise measurement and clearly improved stability of measurement values, especially with changing temperatures or at temperatures other than the calibration temperature. This is due to the lower temperature sensitivity of the iodine/iodide reference potential.
- free choice of the bridge electrolyte, hence optimum adaptation to the sample by double electrolyte system.

The electrodes are available in different membrane glass shapes and types and with different plugs to ensure that the user gets the instrument best suited to his needs. ID versions are available for use with Schott Instruments' ProLab line of high-end laboratory meters.

IoLine electrodes are the right choice for the most critical pH measurements in research and quality control in pharmacy, biotechnology or food industry.

Specifications:

Temp. range	-5 to +100°C
Zero point	pH = 7.00 ±0.25
pH range	0 to 14
Shaft material	Glass
Diaphragm:	Platinum

2



Type	Length mm	PK	Cat. No.
IoLine-pHT-A 120-MF*	120	1	**9.041 163**
IoLine-pHT-A 170-MF*	170	1	**9.041 164**
IoLine-pHT-A 120-MF-DIN	120	1	**9.041 165**
IoLine-pHT-A 120-MF-DIN N**	120	1	**9.041 166**
IoLine-pHT-A 170-MF-DIN N**	170	1	**9.041 167**

*S7
**banana plug

3



3 ID-Electrodes for pH measurement

SI Analytics GmbH

Specifications

Shaft material:	glass
Zero point:	pH = 7.00 ±0.25
pH range:	0 to 14
Fixed cable:	1m long, with DIN (BNC plug available on request)

Type	PK	Cat. No.
A 7780 1M-DIN-ID	1	**6.235 995**
A 157 1M-DIN-ID	1	**9.041 156**

4



4 Cable combinations, LB 1 A and LB 1 BNC

For BlueLine pH electrodes, ScienceLine and IoLine. — *SI Analytics GmbH*

Type	PK	Cat. No.
LB1-A	1	**9.041 303**
LB1-BNC	1	**9.041 304**

5



9.041 160

6



9.041 217

7



Combination pH Electrodes

SI Analytics GmbH

Type	PK	Cat. No.
Combination electrode N 6000 A	1	**9.041 160** 5
Combination pH electrode N 1042 A	1	**9.041 217** 6

7 Metal (ORP) electrodes, ScienceLine

SI Analytics GmbH

Type	PK	Cat. No.
Redox electrode Pt 6280	1	**9.041 207**
Electrode Ag 6280	1	**9.041 211**

E & OE.

1 pH-Electrodes ScienceLine

With plug head, glass shaft, ceramic diaphragm, 3mol/l KCl electrolyte, 12mm dia, spherical membrane, pH range: 0 to 14. *SI Analytics GmbH*

Type	Temp. range °C	Length mm	Membrane	PK	Cat. No.
N 6280, with plug head	-5 ... +100	120	N-glass	1	**9.041 117**
N 6180	-5 ... +100	170	N-glass	1	**9.041 180**
N 42 A	-5 ... +100	120	A-glass	1	**9.041 182**

1



2 SCHOTT® Instruments pH-combination electrodes

With plug head, glass shaft, platinum diaphragm, 3mol/l KCl electrolyte, Silamid® reference system and 12mm dia. spherical membrane. *SI Analytics GmbH*

Type	Temp. range °C	Length mm	Membrane	PK	Cat. No.
N 61	-5 ... +100	170	A-glass	1	**9.041 100**
H 61	+10 ... +100	170	H-glass	1	**9.041 105**
N 62	-5 ... +100	120	A-glass	1	**9.041 110**
H 62	+10 ... +100	120	H-glass	1	**9.041 112**
N 64	-5 ... +100	170	A-glass	1	**9.041 120**

2



pH electrodes InLab® Routine Series

NEW!

Combined pH electrode, glass shaft, ARGENTHAL™ reference with silver-ion trap, detachable cable. *Mettler-Toledo Online*

Specifications:

Temperature range:	0 to +100°C
pH range:	0 - 14
Electrode Dia.:	12 mm
Electrolyte:	Liquid, KCl 3 mol/l
Diaphragm:	ceramic
Membrane resistance at 25°C:	< 600 MΩ

Description	Shaft length min. mm	Temperature sensor	Electrode head	PK	Cat. No.
InLab®Routine	120	-	S7	1	**9.041 450** 3
Set InLab®Routine + DIN cable	120	-	S7	1	**9.041 451**
Set InLab®Routine + BNC cable	120	-	S7	1	**9.041 452**
InLab®Routine Pro	120	NTC 30 kΩ	MultiPin™	1	**9.041 454**
Set InLab®Routine Pro + BNC/Cinch cable	120	NTC 30 kΩ	MultiPin™	1	**9.041 455**
InLab®Routine Pt1000	120	Pt1000	MultiPin™	1	**9.041 456** 4
InLab®Routine Pro-L	170	Pt1000	MultiPin™	1	**9.041 457**
InLab®Routine Pro ISM	120	NTC 30 kΩ	MultiPin™	1	**7.629 195**
InLab®Routine Pro ISM Set	120	NTC 30 kΩ	MultiPin™	1	**9.041 458**

3

4



9.041 450

9.041 456

5 pH electrodes InLab® Expert Pro

NEW!

pH-combination electrode with chemically resistant PEEK shaft, ARGENTAL™ reference system. Fixed BNC/RCA (Cinch) cable. InLab® Expert Pro ISM for SevenCompact and SevenExcellence. *Mettler-Toledo Online*

Specifications

Temperature range:	0 to +100°C
pH range:	0 - 14
Temperature sensor:	NTC 30kΩ
Length/Diam.:	120mm/12mm
Electrolyte:	XEROLYT® polymer
Diaphragm:	open junction
Membrane resistance at 25°C:	< 250MΩ

Type	PK	Cat. No.
InLab® Expert Pro	1	**9.041 506**
InLab® Expert Pro ISM	1	**9.041 508**

5



Application table for Electrodes Mettler

Common Industries	Common Application(s)	InLab® Electrode Model	Electrode Cat. No.	Cable Cat. No.	Cables available for other manufacturers meters	Temp. Sensor
General, Cosmetic, Food, Beverage, Agriculture, Paint	Aqueous samples, TRIS, Gels/Soaps/Shampoo, Dairy, Soft Drinks, Beer & Wine, Fertilizer, Soil, Suspensions/Emulsions, Water Based Paint	Expert Pro	9.041 506	--	No	Yes
General, Cosmetic, Water, Food, Beverage, Chemical	Aqueous samples, TRIS, Gels/Soaps/Shampoo, Drinking Water, Soft Drinks, Beer & Wine, Jam/Preserves, Galvanic Baths, Corrosive/Hot Acids & bases,	Routine Pro	9.041 454	9.041 757	Yes	Yes
General, Cosmetic, Water, Food, Beverage, Chemical	Aqueous samples, TRIS, Gels/Soaps/Shampoo, Drinking Water, Soft Drinks, Beer & Wine, Jam/Preserves, Galvanic Baths, Corrosive/Hot Acids & bases,	Routine	9.041 450	9.041 759	Yes	No
Pharmaceutical/Biological, Cosmetic, Water, Food, Beverage, Paint, Chemical	Aqueous samples, TRIS, Serums/Gastric Juices, Medicinal formulas, Enzyme solutions, Gels/Soaps/Shampoo, Waste Water, Drinking Water, Dairy, Dough/Cocoa, Suspensions/Emulsions, Water Based Paint, Oily Samples, Varnish/Glue, Colorants/Dyes, Galvanic Baths, Corrosive/Hot Acids & bases, Hydrocarbons	Science Pro	9.041 471	9.041 757	Yes	Yes
Pharmaceutical/Biological, Cosmetic, Water, Food, Beverage, Paint, Chemical	Aqueous samples, TRIS, Serums/Gastric Juices, Medicinal formulas, Enzyme solutions, Gels/Soaps/Shampoo, Waste Water, Drinking Water, Dairy, Dough/Cocoa, Suspensions/Emulsions, Water Based Paint, Oily Samples, Varnish/Glue, Colorants/Dyes, Galvanic Baths, Corrosive/Hot Acids & bases, Hydrocarbons	Science	9.041 470	9.041 759	Yes	No
Pharmaceutical/Biological, Cosmetic	Aqueous samples, TRIS, Vials/NMR Samples, Serums/Gastric Juices, Samples in Test Tubes, Medicinal formulas, Enzyme solutions, Cosmetic Creams/Mascara	Micro Pro	9.041 562	9.041 757	Yes	Yes
Pharmaceutical/Biological, Cosmetic	Aqueous samples, TRIS, Vials/NMR Samples, Serums/Gastric Juices, Samples in Test Tubes, Medicinal formulas, Enzyme solutions, Cosmetic Creams/Mascara	Micro	9.041 560	9.041 759	Yes	No
Pharmaceutical/Biological, Cosmetic, Water, Food, Beverage, Paint	Aqueous samples, TRIS, Serums/Gastric Juices, Samples in Test Tubes, Medicinal formulas, Enzyme solutions, Gels/Soaps/Shampoo, Cosmetic Creams/Mascara, Natural/Synthetic Resins, Dairy, Water Based Paint, Oily Samples	Semi Micro	9.041 565	9.041 759	Yes	No
Pharmaceutical/Biological, Cosmetic, Food	Aqueous samples, TRIS, Medicinal formulas, Enzyme solutions, Cosmetic Creams/Mascara, Butter, Yoghurt, Cheese, Ice Cream, Meats, Fruit/Vegetables, Dough/Cocoa	Solids	9.041 553	9.041 759	Yes	No
Pharmaceutical/Biological, Cosmetic, Textile, Paper	Gelled Agars, Skin, Leather, Textiles/Prints, Paper, Laminates, Drop Size Samples	Surface	9.041 557	9.041 759	Yes	No

For more information please visit www.electrodes.net

E & OE.

1 pH electrode InLab® Science

NEW!

pH-combination electrode with glass shaft, ARGENTAL™ reference system with Ag^+ trap and S7 electrode head. Cable - please order separately.

Mettler-Toledo Online



Specifications

Temperature range:	0 to +100°C
pH range:	0 - 12
Temperature sensor:	no
Length/Diam.:	120mm/12mm
Electrolyte:	Fluid, KCl 3mol/l
Diaphragm:	movable glass sleeve
Membrane resistance at 25°C:	< 600MΩ

Type	PK	Cat. No.
InLab® Science	1	**9.041 470**

2 pH electrode InLab® Science Pro

NEW!

pH-combination electrode with glass shaft, ARGENTAL™ reference system with Ag^+ trap and MultiPin™ electrode head. Cable - please order separately.
InLab® Science Pro ISM for SevenCompact and SevenExcellence.

Mettler-Toledo Online



Specifications

Temperature range:	0 to +100°C
pH range:	0 - 12
Temperature sensor:	NTC 30kΩ
Length/Diam.:	170mm/12mm
Electrolyte:	Fluid, KCl 3mol/l
Diaphragm:	movable glass sleeve
Membrane resistance at 25°C:	< 600MΩ

Type	PK	Cat. No.
InLab® Science Pro	1	**9.041 471**
InLab® Science Pro ISM	1	**9.041 472**

3 pH electrode InLab® Micro

NEW!

pH-combination electrode with glass shaft, ARGENTAL™ reference system with Ag^+ trap and S7 electrode head. Cable - please order separately.

Mettler-Toledo Online



Specifications

Temperature range:	0 to +80°C
pH range:	0 - 14
Temperature sensor:	no
Length/Diam.:	60mm/3mm
Electrolyte:	Fluid, KCl 3mol/l
Diaphragm:	Ceramic type Z (pore size 0.9µm)
Membrane resistance at 25°C:	< 1000MΩ

Type	PK	Cat. No.
InLab® Micro	1	**9.041 560**

4 pH electrode InLab® Semi-Micro

NEW!

pH-combination electrode with glass shaft, ARGENTAL™ reference system and S7 electrode head. Cable - please order separately.

Mettler-Toledo Online



Specifications

Temperature range:	0 to +100°C
pH range:	0 - 12
Temperature sensor:	no
Length/Diam.:	100mm/6mm
Electrolyte:	XEROLYT®EXTRA Polymer
Diaphragm:	open junction
Membrane resistance at 25°C:	< 300MΩ

Type	PK	Cat. No.
InLab® Semi-Micro	1	**9.041 565**

1



1 pH electrode InLab® Micro Pro

NEW!

pH-combination electrode with glass shaft, ARGENTAL™ reference system with Ag^+ trap and MultiPin™ electrode head. Cable - please order separately.
InLab® Micro Pro ISM for SevenCompact and SevenExcellence.

Mettler-Toledo Online

Specifications

Temperature range:	0 to +100°C
pH range:	0 - 14
Temperature sensor:	NTC 30kΩ
Length/Diam.:	130mm/5mm
Electrolyte:	Fluid, KCl 3mol/l
Diaphragm:	Ceramic
Membrane resistance at 25°C:	< 300MΩ

Type	PK	Cat. No.
InLab® Micro Pro	1	**9.041 562**
InLab® Micro Pro ISM	1	**6.243 633**

2



2 pH combination electrode InLab® Solids

NEW!

With spear-tip membrane. With glass shaft, Argenthal™ reference system and S7 plug head. Cable - please order separately.

Mettler-Toledo Online

Specifications

Temperature range:	0 to +80°C
pH range:	0 - 11
Temperature sensor:	no
Length/Diam.:	25mm/6mm
Electrolyte:	XEROLYT® PLUS polymer electrolyte, non-refillable
Diaphragm:	open junction
Membrane resistance at 25°C:	< 250 MΩ

Type	PK	Cat. No.
InLab® Solids	1	**9.041 553**

3



3 pH electrode InLab® Surface

NEW!

pH-combination electrode with polysulfone shaft, Ag/AgCl reference system and S7 electrode head. Cable - please order separately.

Mettler-Toledo Online

Specifications

Temperature range:	0 to +50°C
pH range:	1 - 11
Temperature sensor:	no
Length/Diam.:	100mm/6mm
Electrolyte:	Fluid, KCl 3mol/l, AgCl saturated
Diaphragm:	Safelock™ ABS ring
Membrane resistance at 25°C:	< 800MΩ

Type	PK	Cat. No.
InLab® Surface	1	**9.041 557**

4



9.041 757

5



9.041 758

6



9.041 759

Connection cables

NEW!

For connecting pH electrodes with built-in temperature sensors and MultiPin plug head or with S7 plug head (without temperature sensor) as indicated.
Cables suitable for connection of Mettler Toledo electrodes to a variety of other manufacturers meters.
Cat. No. 9.041 757, 7.629 194 (ISM electrodes) and 9.041 759 should be used for connection to Mettler Toledo meters.

Mettler-Toledo Online

Length m	Connector	Electrode head	PK	Cat. No.	
1.2	DIN + 4 mm	MultiPin™	1	**9.041 754**	
1.2	BNC + 4 mm	MultiPin™	1	**9.041 755**	
1.2	DIN + Cinch	MultiPin™	1	**9.041 756**	
1.2	BNC + Cinch	MultiPin™	1	**9.041 757**	4
2.5	BNC + Cinch	MultiPin™	1	**9.041 765**	
1.2	Lemo 00 + 2 x 4 (Metrohm)	MultiPin™	1	**9.041 760**	
1.8	BNC + Cinch - ISM	ISM-MultiPin™	1	**7.629 194**	
1.2	DIN	S7	1	**9.041 758**	5
1.2	BNC	S7	1	**9.041 759**	6
1.2	RM	S7	1	**9.041 761**	
5.0	-	S7	1	**9.041 764**	
1.2	-	S7	1	**6.700 357**	

E & OE.

1 LLG-Buffer solution

NEW!

Tested and certified at 20°C. Provided with label that gives the pH value at different temperatures.
Tolerance ±0.02 pH. Supplied in PE-HD containers. Traceable to NIST (SRM). Temperature dependence data is printed on the label as well as batch numbers and expiry dates. Buffers have a 24 month shelf life from date of manufacture.

pH-value at 20 °C	Capacity ml	Buffer	PK	Cat. No.
4.00 ±0.02	1000	citrate	1	**9.041 367**
7.00 ±0.02	1000	phosphate	1	**9.041 368**
10.00 ±0.02	1000	borate	1	**9.041 369**

1



2 Technical pH buffer solutions

Reagecon

Colour coded. Tested and Certified at 25°C. Provided with label that gives the pH value at different temperatures. Tolerance ±0.02 pH.
These buffer solutions are suitable for use where very accurate measurements are required.
All buffers are supplied with a detailed Certificate of Analysis which outlines traceability to N.I.S.T (the N.I.S.T SRM(s) Lot No. is stated on the certificate). Temperature dependence data is printed on the label as are lot numbers and expiry dates. This item has a 24 month shelf life from date of manufacture.

pH-value at 25 °C	Capacity ml	Colour	PK	Cat. No.
2.0	250	Red	1	**9.040 949**
4.01	250	Red	1	**9.040 950**
4.01	500	Red	1	**6.206 907**
4.01	1000	Red	1	**9.040 955**
7.02	250	Yellow	1	**6.240 744**
7.02	500	Yellow	1	**6.229 762**
7.02	1000	Yellow	1	**6.238 677**
9.21	250	Blue	1	**9.040 951**
10.00	250	Blue	1	**6.240 745**
10.00	1000	Blue	1	**6.238 676**

2



3 Technical buffer solutions

WTW

Identified by colour-coded labels.

Type	Capacity ml	pH-value	PK	Cat. No.
STP 4	50	4.01	1	**9.040 734**
TEP 4	1000	4.01	1	**9.040 722**
STP 7	50	7.00	1	**9.040 735**
TEP 7	1000	7.00	1	**9.040 723**
TEP 10	1000	10.00	1	**9.040 724**
TEP 10 TRACE	1000	10.01*	1	**9.040 725**
TPL 4	250	4.01	1	**9.040 727**
TPL 7	250	7.00	1	**9.040 728**
TPL 10	250	10.00	1	**9.040 729**

* For handheld meters 315i, 330i, 340i, 350i, 3110, 3210, 3310 and Inolab® versions from 2004 onwards

3



4 pH buffer solutions

SI Analytics GmbH

Without colour coding. Stated pH values at 25°C. Available in 250ml containers.
Shelf life approx. 2 years, accuracy ±0.02 pH. Calibration set for pH measurement.
Set contains 20 x 17ml ampoules filled with pH 4.00, 7.00 and 10.00 solutions (at 25°C).

Type	Capacity ml	Colour	PK	Cat. No.
pH 4,00	250	clear	1	**9.041 043**
pH 7,00	250	clear	1	**9.041 045**
pH 10.01	250	clear	1	**9.041 048**
Set	17	3 x 20 x 17 ml ampoules	1	**9.041 081**

4



5 pH buffer solutions

SI Analytics GmbH

Colour coded. pH values at 25°C. Provided with label that gives the pH value at different temperatures. Supplied in 250ml containers. Tolerance ±0.02 pH.

Type	Capacity ml	Colour	PK	Cat. No.
pH 4.01	250	yellow	1	**9.041 050**
pH 7.00	250	green	1	**9.041 051**
pH 10.01	250	orange	1	**9.041 052**

5



1



1 pH buffer solutions

Clear, Colourless Solutions. Tested and Certified at 20°C, produced in accordance with NIST standard (NBS). Available in 500ml or 1L containers. Accuracy ±0.01 pH.

Reagecon

pH-value at 20 °C	Capacity ml	PK	Cat. No.
pH 2.00	500	1	**6.228 059**
pH 3.50	1000	1	**7.632 597**
pH 4.00	500	1	**9.040 911**
pH 4.00	1000	1	**9.040 912**
pH 6.00	500	1	**6.203 561**
pH 6.00	1000	1	**6.321 027**
pH 6.80	500	1	**6.206 693**
pH 6.865	500	1	**7.900 066**
pH 7.00	500	1	**9.040 913**
pH 7.00	1000	1	**9.040 914**
pH 9.00	500	1	**6.225 161**
pH 9.00	1000	1	**6.206 691**
pH 10.00	500	1	**9.040 915**
pH 10.00	1000	1	**9.040 916**
pH 12.00	500	1	**6.234 641**

2



3



2 3 pH buffer solutions (Coloured)

Coloured solutions. Tested and Certified at 20°C. Formulated in accordance with NIST standards (NBS). Supplied in 500ml, 1L or 5L containers. Tolerance ±0.01 pH.

Reagecon

pH-value at 20 °C	Capacity ml	Colour	PK	Cat. No.
pH 4.00	500	Red	1	**9.040 920**
pH 4.00	1000	Red	1	**9.040 921**
pH 4.00	5000	Red	1	**9.040 922**
pH 7.00	500	Yellow	1	**9.040 923**
pH 7.00	1000	Yellow	1	**9.040 924**
pH 7.00	5000	Yellow	1	**9.040 925**
pH 10.00	500	Blue	1	**9.040 926**
pH 10.00	1000	Blue	1	**9.040 927**
pH 10.00	5000	Blue	1	**9.040 928**

4



4 pH buffer solutions with colour code, with/without certificate

Colored buffer solutions, standardized against NIST references, accuracy ±0.01 pH at 25°C, 500ml bottles with label that indicates correlation between pH-value and temperature.

Hanna

pH-value at 25 °C	Description	PK	Cat. No.
pH 7.01	with certificate	1	**6.225 206**
pH 4.01	with certificate	1	**6.225 208**
pH 10.01	with certificate	1	**6.225 207**
pH 7.01	without certificate	1	**6.053 384**
pH 4.01	without certificate	1	**6.053 383**
pH 10.01	without certificate	1	**6.090 412**

5



5 Standard buffer solutions

To DIN/NIST. Supplied in 250ml bottles.

WTW

pH-value at 25 °C	Tolerance	PK	Cat. No.
4.01	± 0,02 pH	1	**9.040 744**
6.87	± 0,02 pH	1	**9.040 746**
9.18	± 0,02 pH	1	**9.040 749**

1 Buffer solutions, sterile

Steam sterilised. Individually batch numbered. Without preservatives. *SI Analytics GmbH*

Type	Capacity	PK	Cat. No.
pH 4.01	250ml DURAN® bottle	1	**9.041 004**
pH 6.87	250ml DURAN® bottle	1	**9.041 007**
pH 9.18	250ml DURAN® bottle	1	**9.041 009**

Other buffer solutions available on request.

1



2 Calibration Kits for pH meters

20ml sachets. Without certificate of analysis . *Hanna*

Description	PK	Cat. No.
Calibration Kit pH 7.01 & 4.01 (5 x 20ml each)	1	**9.773 932**
Calibration Kit pH 7,01 & 10,01 (5 x 20ml each)	1	**9.773 934**

2



3 pH buffer solutions in sachets with certificate of analysis

One 20ml sachet is sufficient for each calibration. Sachets are well sealed and protected against light. Single use only, so no risk of contamination. Accuracy: ±0.01 pH at 25°C. *Hanna*
The outer box contains a certificate of analysis, showing the date of production and Lot Nr. (Expiry date).
The solutions are produced again NIST standards.

pH-value at 25 °C	PK	Cat. No.
pH 4.01	25	**6.803 609**
pH 7.01	25	**6.803 610**
pH 10.01	25	**6.803 611**

3



4 Storage and cleaning solutions for electrodes

Hanna

Type	PK	Cat. No.
Storage Solution, 500ml	1	**9.773 987**
Cleaning solution, general purpose, 500ml	1	**6.080 217**
Cleaning solution for proteins, 500ml	1	**6.223 522**

4



5 Cleaning and storage solutions for pH-probes

Reagecon

Type	Capacity ml	PK	Cat. No.
Pepsin / HCL, for cleaning media containing protein	500	1	**9.040 940**
Thiourea / HCL, for cleaning media containing sulphide	500	1	**9.040 941**
Organic cleaning solution	500	1	**9.040 942**
Regeneration solution	100	1	**9.040 943**
Storage solution	100	1	**9.040 945**
Storage solution	500	1	**9.040 944**

5



6 Regeneration solution and storage solution

For pH-probes. *SI Analytics GmbH*

Type	Capacity ml	PK	Cat. No.
Regeneration solution / Storage solution	250	1	**9.041 034**

6



1



1 Calibration and maintenance solution set SORT/K

Supplied in box with three 250ml bottles of pH 4.01, 6.87, 9.18 buffer solutions, pepsin cleaning solution and KCl filling solution 3mol/l.

WTW

Type	PK	Cat. No.
SORT/K	1	**9.040 760**

2



2 Pepsin cleaning solution PEP/pH

DIN. Supplied in bottles of 250ml.

WTW

Type	PK	Cat. No.
Pepsin cleaning solution	3	**9.040 796**

3



3 LLG Electrolyte solutions, KCL

NEW!

Potassium chloride electrolyte for pH electrodes - Filling solution for reference electrolyte.

Type	PK	Cat. No.
3mol/l, 1000ml	1	**9.041 370**
3mol/l, 250ml	1	**9.041 371**
3mol/l, (AgCl saturated.), 250ml	1	**9.041 372**

4



4 KCL electrolyte solutions

For refilling or replacing reference electrolyte. Supplied in 250ml bottles.

Reagecon

Type	PK	Cat. No.
3 mol/l KCL, free from silver ions, 250ml	1	**9.040 957**
3 mol/l KCL, saturated with AgCl, 250ml	1	**9.040 958**

5



5 KCL electrolyte solutions

For refilling or replacing reference electrolyte. Supplied in 250ml DURAN® bottles.

SI Analytics GmbH

Type	PK	Cat. No.
2mol/L KNO_3 + 0.001mol/l KCI for Ag-probes	1	**9.041 072**
3 mol/l KCl	1	**9.041 092**
3 mol/l KCI, Ag/AgCl saturated	1	**9.041 036**
4.2 mol/l KCl	1	**9.041 033**

6



6 Redox buffer solution

For testing ORP electrodes. 427mV, pH7.
Supplied in pack of 250ml.

WTW

Type	PK	Cat. No.
Redox	1	**9.040 782**

E & OE.

1 Conductivity testers, DIST 3 and DIST 4

Pocket measuring device with digital display for testing the conductivity in drinking water and industry *Hanna*

DIST 3:
suitable for measuring drinking water, reverse osmosis monitoring and in the laboratory.

DIST 4:
ideal for measurements required in industry, horticulture, sewage, cooling towers.

Specifications:

Measuring range:	DIST 3: 0 to 1990µS
	DIST 4: 0 to 19.90mS
Resolution:	DIST 3: 1µS/cm
	DIST 4: 0.01mS
Accuracy:	±2% measuring range
Batteries:	4 x 1.5V button cells (MP 675H)
Dimensions:	175 x 41 x 23mm
Weight:	78g

Type	PK	Cat. No.
DIST 3	1	**9.704 010**
DIST 4	1	**9.704 014**

1



2



2 Conductivity testers, Dist 5 and Dist 6

Watertight pH-/ conductivity-/ TDS- /°C-testers. Simultaneous display of conductivity and/or TDS and temperature values. Automatic temperature compensation for highest measuring accuracy. User selection of temperature coefficient enables use in alkaline and acidic media. Stability indicator prevents incorrect measurements *Hanna*

Specifications:

Measuring range:	DIST 5 : 0 to 3990mS (0 to 2000ppm)
	DIST 6 : 0 to 20.00mS (0 to 10.00ppm)
Temperature range:	0.0 to 60.0°C
Resolution EC/TDS:	±2% in each measuring range
Resolution:	±0.5°C
Batteries:	4 x 1.5V button cells
Operating temp. range:	0 to 50.0°C
Weight:	100g

Type	PK	Cat. No.
DIST 5	1	**9.704 012**
DIST 6	1	**9.704 013**

1



1 Conductivity meters HI 99300/HI 99301

Hanna

- Waterproof conductivity meters with microprocessor
- Conductivity (or TDS value) and temperature are displayed simultaneously
- Automatic temperature compensation from 0 to 60.0°C
- Temperature compensation coefficient is adjustable from 0 to 2.4%/°C
- Automatic one point calibration with conductivity solution 1413µS (HI 99300) or 12.880µS (HI 99301)

Supplied with:
Conductivity probe with 1 meter cable, 4x 1.5V AAA alkaline batteries and transport case

Specifications:

Measuring range/Resolution EC:	
HI 99300:	0 to 3999µS/1µS
HI 99301:	0.00 to 20.00mS/0.01mS
Measuring range/Resolution TDS:	
HI 99300:	0 to 2000ppm (mg/l)/1ppm (mg/l)
HI 99301:	0.00 to 10.00ppt (g/l)/0.01ppt (g/l)
Accuracy:	±2% full scale
Measuring range/Resolution T:	0.0 to 60°C/±0.5°C
Battery:	4 x 1.5V
Dimensions (L x W x H):	143mm x 80mm x 38mm
Weight:	210g

Type	PK	Cat. No.
HI 99300	1	**7.618 482**
HI 99301	1	**6.240 795**
Spare electrode HI 76306 for HI 99300 / HI 99301	1	**6.241 639**

2



2 Conductivity meter HI 8733

Hanna

- Multi range conductivity meter for laboratory use
- Can be used for various applications from deionized water to brine
- Automatic temperature enables highest accuracy
- For various strong acids or bases the temperature coefficient can be adjusted between 0% and 2.5% per °C
- Instrument is supplied with 4-ring, potentiometric probe for all 4 ranges

Specifications:

Ranges/Resolution:	0.00 to 199µS/0.1 µS 0 to 1999µS/1 µS 0 to 19.99mS/0.01mS 0 to 199.9mS/ 0.1mS
Accuracy:	±1% Full Scale
Temperature compensation:	automatic from 0 to +50°C
Calibration:	manual single point trough trimmer
Battery:	1 x 9 Volt
Operating temp. range:	0 to +50°C
Dimensions:	164mm x 76mm x 45mm
Weight:	500g

Type	PK	Cat. No.
HI 8733	1	**9.704 016**
Spare probe HI 76302W	1	**6.200 643**

E & OE.

1 Conductivity meter HI 9033

Waterproof housing, perfect for laboratory and field work. *Hanna*

- 4 different ranges from 0 to199.9mS can be selected by simply pressing a button
- automatic temperature compensation grants highest accuracy
- manual calibration at 1 point trough trimmer

Supplied in a transport case, complete with 4 ring conductivity probe with 1 metre cable, calibration screwdriver and battery.

Specifications:

Measuring range/Resolution:	0.0 to 199.9µS/0.1µS 0 to 1999 µS/1 µS 0 to 19.99 mS/0.1 mS 0 to 199.9 mS/1 mS
Accuracy:	±1% full scale
Temperature compensation:	automatically from 0 to 50°C
Operating range:	0 to 50°C
Battery:	1 x 9V
Weight:	1kg (incl. transport case)

Type	PK	Cat. No.
HI 9033	1	**6.095 234**
Spare probe HI 76302W	1	**6.200 643**

1



2 Conductivity meter SD320CON

NEW!

Electrochemistry instrument for the determination of Conductivity, Resistance, Salinity and TDS. *AQUALYTIC*

- Rugged, water resistant (IP65), water proof plug connections
- Use of different electrodes
- Data Logger and alarm function
- GLP features (Good Laboratory Practice)
- Interface for Data transfer
- Large backlit display
- Low power consumption, long battery shelf life

Delivery content:
Hand-held meter complete in case with 4-pol graphite electrode (diameter 12 mm) measuring range up to 200 ms/cm, batteries, instruction manual.

Specifications

Conductivity:	0.0 ... 500.0µS/cm (cell constant 1/cm) 0.000 ... 5.000µS/cm (cell constant 0.01/cm) 0.0 ... 500.0mS/cm (cell constant 1/cm) 0 ... 5000µS/cm (cell constant 0.01/cm) 0 ... 1000mS/cm (cell constant 1/cm)
Temperature:	-5.0 ... +150.0°C
TDS:	0.000 ... 10000mg/l*
Resistance:	0.0010kOhm cm... 50.00MOhm cm*
Salinity:	0.0 ... 70.0g/kg (PSU)
Protection class:	IP65
Power supply:	2 x AAA batteries (incl.)

Type	PK	Cat. No.
SD320CON	1	**9.699 292**

*depends on cell constant

2



1



1 Portable conductivity meter Education Line EL3

NEW!

Experience science with portable conductivity meters

Mettler-Toledo Online

- Simple intuitive operation helps you save time during classes
- Ideally suited for classroom and field-based measurements alike
- Robust, low-maintenance, yet reliable electrodes available in kit version

EL3-Basic: Conductivity instrument incl. electrode clip, wrist strap, operating manual, "Quick guide", 4 x batteries
EL3-Kit: Instrument and accessories as with EL3 Basic, also with LE703 conductivity sensor, IP54 connection caps, 2 x 1413 µS/cm and 2 x 12.88 mS/cm standard sachets
EL3-Fieldkit: Instrument and accessories as for EL3 Kit, also with carry bag incl. 4 sample bottles

Please note: These articles are only available for schools and universities.

Specifications

Measuring range/accuracy:	
Condictivity:	0.1µS/cm to 199.9mS/cm/±0.5%
Temperature:	0.0°C to +100°C/±0.3°C
Calibration:	1-point, 3 predefined standards
Free disk space:	30 data sets
Display:	LCD
Batteries:	4 x AAA
Dimensions (WxDxH):	169 x 82 x 36mm
Weight:	180g (without batteries)

Type	PK	Cat. No.
EL3-Basic	1	**9.704 003**
EL3-Kit	1	**9.704 004**
EL3-Fieldkit	1	**9.704 006**
Spare elektrode LE703	1	**9.041 621**

2



2 Conductivity meter FiveGo™ FG3

NEW!

FiveGo Conductivity is a handy, portable meter ideal for those who require rapid and reliable results on the go. This meter is suitable for a wide range of applications in various areas such as food and beverage, agriculture, industry, water and environment

Mettler-Toledo Online

- Outstanding functions such as storage capacity for 30 measurements, TDS and salinity modes and IP54 ingress protection combined with features such as automatic endpoint, 1 point calibration, linear temperature compensation and selectable reference temperatures
- Five self-explanatory buttons for starting and ending a measurement, for saving and accessing measurement results and for reviewing the latest calibration data.
- A big, well organised display simultaneously showing readings, temperature, endpoint criteria and various helpful icons

FG3-Basic: Conductivity instrument incl. electrode clip, wrist strap, operating manual, "Quick guide", 4 x batteries
FG3-Kit: Instrument and accessories as with FG3-Basic, with LE703 conductivity sensor, IP54 connection caps, 2 x 1413 iS/cm and 2 x 12.88mS/cm standard sachets
FG3-Fieldkit: Instrument and accessories as for FG3-Kit, with carry bag incl. 4 sample bottles

Specifications:

Measuring range (Accuracy)	0.1µS/cm to 199.9mS/cm (±0.5% of measured value)
TDS:	0.1mg/L to 199.9g/L (±0.5% of measured value)
Salinity:	0.00 to 19.99psu (±0.5% of measured value)
Temperature:	0 to +100°C (±0.3°C)
Calibration:	1 point, 3 predefined standards
Input:	Mini-DIN
Temperature compensation:	Linear: 0.00%/°C to 10.00%/°C
Reference temperature:	20 and 25°C
Memory:	30 measurements
Power supply:	4 x AAA
Protection class acc. to DIN EN 60529:	IP 54

Type	PK	Cat. No.
FG3-Basic	1	**9.773 720**
FG3-Kit	1	**9.773 721**
FG3-Fieldkit	1	**7.652 924**

E & OE.

1 Conductivity meter SevenGo™ SG3

NEW!

Routine model (IP67) for mobile conductivity measurement *Mettler-Toledo Online*
- Automatic endpoint recognition and temperature compensation
- 1-point calibration from three pre-defined standards (84ìS/cm, 1413ìS/cm or 12.88mS/cm)
- Data memory for 30 data points
- Clear display of measured value and settings

Items supplied:
SG3-B: Conductivity meter (no electrode), complete with batteries, wrist strap, operating instructions, test certificate and declaration of conformity
SG3-ELK: Conductivity meter with InLab®738 conductivity sensor IP67 rated (1.8M fixed cable) complete with batteries, wrist strap, SevenGo™ clip, conductivity standard sachets, operating instructions, test certificate and declaration of conformity
SG3-FK2: Conductivity meter with InLab®738 conductivity sensor IP67 rated (1.8M fixed cable) with field compact case, rubber holster, field electrode arm, calibration bottles and same accessories as SG3-ELK
SG3-FK10: Conductivity meter with InLab®738 conductivity sensor IP67 rated (10M fixed cable) with field compact case, rubber holster, field electrode arm, calibration bottles and same accessories as SG3-ELK

Specifications:

Conductivity	
Measuring range:	0.01µS/cm to 500mS/cm
Resolution:	0.01 to 1
Accuracy:	±0.5%
Temperature	
Measuring range:	-5.0 to 105.0°C
Resolution:	0.1°C
Accuracy:	±0.2°C
TDS (Total Dissolved Solids)	
Measuring range:	0.01mg/l to 300g/l
Resolution:	0.01 to 1
Accuracy:	±0.5
Specific resistance	
Measuring range:	0.00 to 100M Ohm
Salinity	
Measuring range:	0.00 to 80.00ppt

Type	PK	Cat. No.
SG3-B	1	**9.704 302**
SG3-ELK	1	**9.704 107**
SG3-FK2	1	**9.704 108**
SG3-FK10	1	**7.618 344**

1



1 Conductivity meter SevenGo pro™ SG7

NEW!

Professional portable conductivity meter (IP67) for highest demands

Mettler-Toledo Online

- Linear and non-linear temperature compensation
- Measurement of ultra-pure water as per USP/EP
- Data storage for 200 GLP data records
- Contact-free IR communication for data transfer to a printer or PC

Items supplied:
SG7-B: Conductivity meter (no electrode), complete with batteries, wrist strap, conductivity standard sachets, operating instructions, test certificate and declaration of conformity
SG7-USP/EP: Conductivity meter with InLab®742 conductivity sensor (1.8M fixed cable, IP67), complete with batteries, wrist strap, SevenGo™ clip, conductivity standard sachets, operating instructions, test certificate and declaration of conformity
SG7-ELK: Conductivity meter with InLab®738 conductivity sensor IP67 rated (1.8M fixed cable) complete with batteries, wrist strap, SevenGo™ clip, conductivity standard sachets, operating instructions, test certificate and declaration of conformity
SG7-FK2: Conductivity meter with InLab®738 conductivity sensor IP67 rated (1.8M fixed cable) with field compact case, rubber holster, field electrode arm, calibration bottles and same accessories as SG7-ELK
SG7-FK10: Conductivity meter with InLab®738 conductivity sensor IP67 rated (10M fixed cable) with field compact case, rubber holster, field electrode arm, calibration bottles and same accessories as SG7-ELK

Specifications:

Conductivity	
Measuring range:	0.01µS/cm to 1000mS/cm
Resolution:	0.01
Accuracy:	±0.5%
Temperature	
Measuring range:	-5.0°C to +105°C
Resolution:	0.1°C
Accuracy:	±0.1°C
TDS	
Measuring range:	0.01mg/l to 600g/l
Resolution:	0.01 to 1
Accuracy:	±0.5%
Specific resistance	
Measuring range:	0.00 to 100.00M Ohm
Salinity	
Measuring range:	0.00 to 80.00ppt

Type	PK	Cat. No.
SG7-B	1	**9.704 326**
SG7-USP/EP	1	**9.704 327**
SG7-ELK2	1	**9.704 123**
SG7-FK2	1	**9.704 109**
SG7-FK10	1	**6.252 905**

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Pocket conductivity meters ProfiLine

The new ProfiLine hand-held conductivity meters have a waterproof (IP 67) housing and a new, completely sealed silicone membrane keypad with tactile feedback. A separate battery compartment allows easy exchange of standard alkaline, or rechargeable, batteries.
The carefully laid out, large displays indicate the reading and other important information. 3210 and 3310 series meters have a backlit, graphics display and menu-controlled operation. A selection of application specific conductivity cells cover virtually all measurement tasks.

1 2 Portable conductivity meter ProfiLine Cond 3110

WTW

Easy to operate rugged conductivity meter for measurement of conductivity and salinity.
Simplified keypad for clear and secure operation. Simultaneous display of measurement value and temperature. Large LCD display for easy reading. Automatic nlF compensation for all grades of natural water.
Works with four-electrode cell TetraCon® 325 or two-electrode cell KLE 325.

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Specifications

Measuring ranges/Resolution

Conductivity:	0.0µS/cm to 1000mS/cm with 5 measuring ranges in the Auto Range mode
Temperature:	-5.0°C to +105.0°C ±0.1°C
Salinity:	0.0 to 70.0
T_{ref}:	20°C/25°C switchable

2



Type	Description	PK	Cat. No.
Cond 3110	meter only	1	**9.774 372**
Cond 3110 Set 1	cased set including conductivity probe TetraCon 325 and accessories	1	**9.774 358**
Cond 3110 Set 2	cased set including conductivity probe TetraCon 325 (3m) and accessories	1	**9.774 403**
Cond 3110 Set 3	cased set including conductivity probe KLE 325 and accessories	1	**9.774 404**

3 Portable conductivity meter ProfiLine Cond 3210

WTW

Convenient and versatile, hand-held, conductivity meter with backlit graphics display and menu-controlled operation. Waterproof and robust. For the measurement of conductivity, specific resistivity, salinity and TDS. Includes a 200 x GLP-compliant record memory.
Wide selection of different conductivity cells attachable. Automatic and manual temperature compensation with linear temperature function and non-linear function for ultra-pure water and natural water in accordance with EN 27888.

3



Specifications

Measuring ranges/Resolution:

Conductivity:	as Cond 3110, but additionally with 0.00µS/cm to 19.99µS/cm (when K=0.1cm^{-1}) 0.000µS/cm at 1.999µS/cm (when K=0.01 cm $^{-1}$)
TDS:	0 to 1999mg/l 0.0 to 199.9g/l
Spec. resistance:	0.0 to 999MΩ/cm
Memory:	200 data records (measured value, temperature, date, time, ID)

Type	Description	PK	Cat. No.
Cond 3210	meter only	1	**9.774 379**
Cond 3210 Set 1	cased set including conductivity probe TetraCon 325 and accessories	1	**9.774 398**
Cond 3210 Set 2	cased set including 4-pole conductivity probe TetraCon 325 (3m) and accessories	1	**9.774 405**
Cond 3210 Set 4	cased set including 2-pole conductivity probe LR 325 / 01and accessories	1	**9.774 399**

Conductivity cell probes please see page 326.

1



2



1 2 Conductivity meter ProfiLine Cond 3310

WTW

Comfortable and versatile conductivity meter with integral, time controlled, data logger and 5000 GLP-compliant record memory for extended data collection. Menu controlled, with backlit, graphics display for comfortable, safe operation. Wide range of conductivity cells attachable. GLP-supporting functions, enhanced choice of cell constants, automatic and manual temperature compensation (which can be switched off) with linear and non-linear functions for pure water and natural waters acc. to EN 27888.

Specifications:

Measuring ranges/Resolution:

Conductivity:	as Cond 3110, but additionally with 0.00µS/cm to 19.99µS/cm (when K=0.1cm^{-1}) 0.000µS/cm at 1.999µS/cm (when K=0.01 cm $^{-1}$)
TDS:	0 to 1999mg/l, 0.0 to 199.9g/l
Spec. resistance:	0.0 to 999MΩ/cm
Memory:	5000 records (measured value, temperature, date, time, ID)

Type	Description	PK	Cat. No.
Cond 3310	meter only	1	**9.774 409**
Cond 3310 Set 1	case set including conductivity probe TetraCon 325 and accessories	1	**9.774 400**
Cond 3310 Set 2	case set including 4-pole conductivity probe TetraCon 325 (3m) and accessories	1	**9.774 401**
Cond 3310 Set 4	case set including 2-pole conductivity probe LR 325 / 01 and accessories	1	**9.774 402**

3



3 VARIO C_{ond} Set conductivity instrument

WTW

The VARIO C_{ond} has a lot to offer. This instrument was designed with ergonomic requirements in mind. It is ideal for service work and inspection measurements on process equipment. The TetraCon® 325 measuring cell, recognised around the world, was shortened and modified especially for the VARIO C_{ond}. If that is not enough; an adapted ultra-pure water cell with plug-in head and flow-through vessel can also be used with the VARIO C_{ond}

Specifications:

Measurement range/Resolution

Conductivity:	0.0µS/cm to 200mS/cm
Temperature:	-0.5 to +105.0°C
Salinity:	0.0 to 70.0°C
TDS:	0 to 1999mg/l
Spec. resistance:	0.000 to 1999 Mohm/cm
Accuracy (±1 digit)	
Conductivity:	±0.5% of measurement
Temperature:	±0.1K
Reference temp. (T_{ref}):	selectable 20°C or 25°C
Cell constant:	fixed 0.475 cm^{-1}, 0.1 cm^{-1}
Temperature comp.:	automatic or switched off
Temperature coefficient:	- non-linear function of natural water (nLF) per EN 27888 and ultra-pure water function - linear compensation of 0.01 to 2.99%/K - no compensation

Type	Description	PK	Cat. No.
VARIO C_{ond} Set A	incl. transport case, TetraCon® 325 and KCL solution	1	**9.774 390**
VARIO C_{ond} Set B	incl. transport case and LR 01/V	1	**9.774 391**

E & OE.

The new inoLab® series from WTW

The new inoLab® benchtops are perfectly designed for modern laboratory surroundings. *WTW*
The key pads are clearly outlined and easy-to-operate, their smooth surfaces are easy-to-clean and the operation is self-explanatory.
All meters include a universal power supply and a convenient stand with sensor support.
If desired they can be ordered in application oriented sets including sensors and accessories.

1 Laboratory instrument inoLab® Cond 7110

Modern conductivity measurement is east to do. the inoLab® Cond 7110 has all important functions for measuring conductivity like adjustable reference temperature and different methods of temperature compensation. A big LCD segment display makes readings easy and a well-arranged keypad provides convenient operation. The automatic AutoRead function supports correct and repeatable results. Each meter come with a stand and accessories. *WTW*

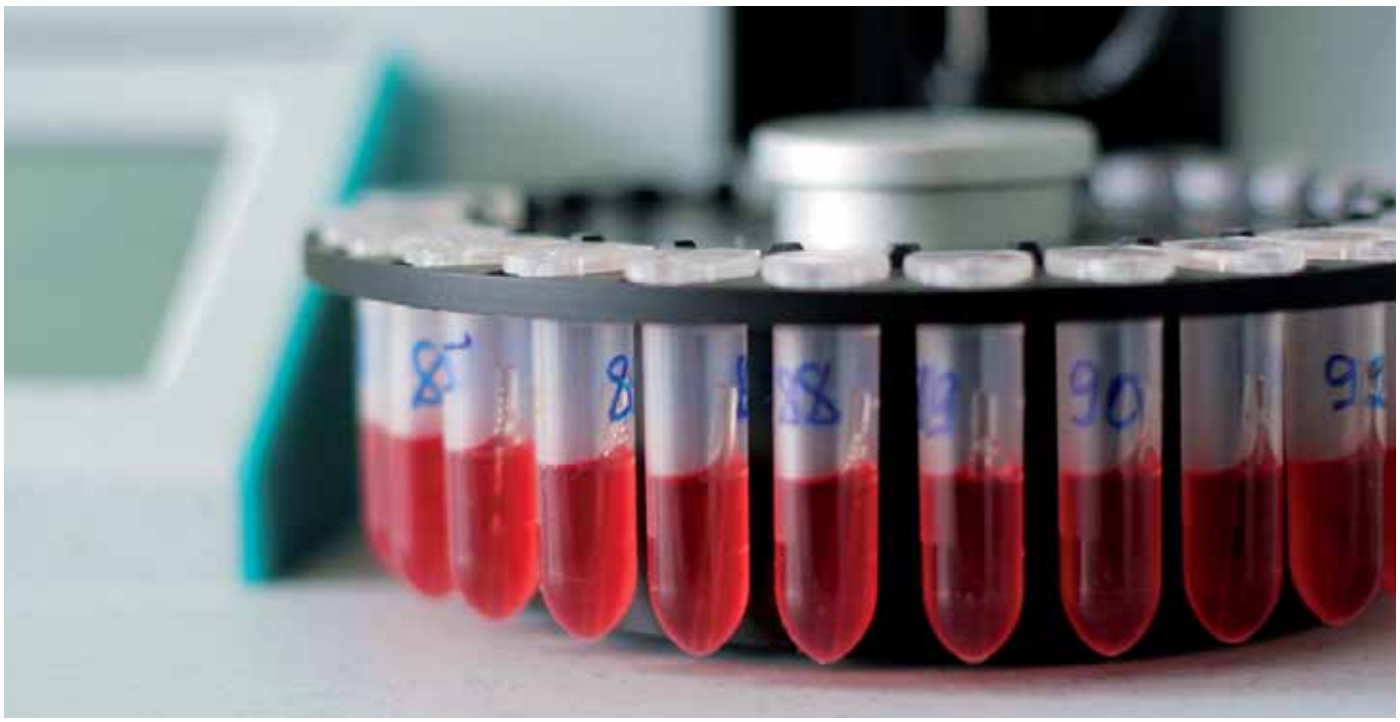
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Specifications:

Ranges:	All values ±1 digit
Conductivity:	0.00 … 1000 mS/cm ±0.5 % v. Mw. 0.00 … 19.99 µS/cm at K= 0.1 cm^{-1})
Salinity:	0.0 … 70.0 (acc. IOT)
Temperature:	-5.0 … 105.0°C ±0.1°C
Cell constants:	0.450…0.500cm^{-1}, 0.09 … 0.110cm^{-1}, 0.800 to 0.880cm^{-1}
AutoRead:	automatic
Tref:	20°C/25°C
Temperature compensation:	nLF, lin 0.000 … 3.000%, switch off
Power supply:	Universal power supply, 100V to 240V, 50/60Hz, 4 x 1.5V AA or 4 x 1.2V NiMH

Type	Description	PK	Cat. No.
Cond 7110	Meter only including accessories	1	**9.920 096**
Cond 7110 Set 1	Meter including TetraCon® 325 and accessories	1	**9.920 097**
Cond 7110 Set 3	Meter including KLE 325 and accessories	1	**9.920 098**



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9.920 114

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9.920 117

Conductivity meter inoLab® Cond 7310

This is the new inoLab® Cond 7310 or inoLab® Cond 7310P. A modern backlit graphic display with menu controlled user interface allows easy and intuitive operation. The mini USB-B interface provides fast data transfer to a PC. The internal memory can record up to 5000 GLP complying data including ID, date and time. The housing and the keypad are easy-to-clean. The inoLab® Cond 7310 has the possibility to connect different standard and special conductivity electrodes and has automatic and manual temperature compensation (can even be switched off for pure water measurements according pharmacopeia) for linear and non-linear function according EN 27 888. An integrated thermal printer (58mm width) is ready for printout of the measured data (option). The scope of delivery includes meter, stand, power supply and USB cable.

WTW

Specifications

Ranges:	All values ±1 digit
Conductivity additional:	0.00 ... 1000 mS/cm ±0.5 % v. Mw. 0.000 ... 1.999 µS/cm, K= 0.01 cm^{-1} 0.00 ... 19.99 µS/cm, K= 0.1 cm^{-1}
Spcific resistance:	0.00 ... 20 MOhm cm
Salinity:	0.0 ... 70.0 (acc. IOT)
TDS:	1 ... 1999 mg/l, 0 to 199.9 g/l
Temperature:	-5.0 ... 105.0°C ±0.1°C
Cell constants:	Fix 0.01 cm-1, for calibration 0.450...0.500 cm-1, 0.800 ... 0.880 cm^{-1}, adjustable 0.09 ... 0.110cm^{-1}, 0.250 ... 25.0cm^{-1}
Calibration:	1 point
Tref:	20°C/25°C
Temperature compensation:	none, nlF, 0.000 ... 10.00 %/K
Calibration memory:	Up to 10 calibrations recallable
Display:	LCD Graphic, backlit
Memory:	manual 200/5000 automatic
Logger:	manual/time controlled
Interface:	Mini USB-B
Power supply:	Universal power supply, 100V to 240V, 50/60Hz, 4 x 1.5V AA or 4 x 1.2V NiMH

Type	Description	PK	Cat. No.	
Cond 7310	Meter incl. accessories	1	**9.920 114**	1
Cond 7310 Set 2	Meter incl. TetraCon® 325 and accessories	1	**9.920 115**	
Cond 7310 Set 6	Meter incl. USP Kit 1	1	**9.920 116**	
Cond 7310P	Meter with built-in printer and accessories	1	**9.920 117**	2
Cond 7310P Set 1	Meter with built-in printer, incl. TetraCon® 325 and accessories	1	**9.920 118**	
Cond 7310P Set 6	Meter incl. USP Kit 1	1	**9.920 119**	

3



3 Conductivity meter Education Line EL30

NEW!

Experience science with conductivity bench meters

Mettler-Toledo Online

- Simple intuitive operation: helps you save time during classes
- Compact, robust benchtop instrument
- Robust, low-maintenance, yet reliable electrodes available in kit version
- Ideal for schools and universities

EL30-BASIC: Conductivity instrument incl. operating manual, "Quick guide", power adapter
EL30-KIT: Instrument and accessories as with EL30 Basic, also with LE703 conductivity sensor, electrode arm, 2 x 1413ìS/cm and 2 x 12.88mS/cm standard sachets

Please note: These articles are only available for schools and universities.

Specifications

Measuring range/accuracy	
Condictivity:	0.1µS/cm to 199.9mS/cm/±0.5%
Temperature:	0.0°C to +100°C/±0.3°C
Calibration:	1-point, 3 predefined standards
Display:	LCD
Power supply:	100-240V/50-60Hz, 9V DC
Dimensions (WxDxH):	200 x 175 x 52mm
Weight:	600g

Type	PK	Cat. No.
EL30-Basic	1	**9.704 149**
EL30-Kit	1	**9.704 150**
LE703	1	**9.041 621**

1 Conductivity meters FiveEasy™/FiveEasy™ Plus

NEW!

Mettler-Toledo Online

FiveEasy and FiveEasy Plus Conductivity are compact, easy to use bench meters suitable for a wide range of applications in various areas such as food and beverage, agriculture, industry, water and environment.

- Outstanding functions such as TDS and salinity modes and meter self-test combined with features such as automatic endpoint, 1 point calibration, linear temperature compensation and selectable reference temperature
- Five self-explanatory buttons for starting and ending a measurement or calibration and for accessing the latest calibration data
- A big, well organised display simultaneously showing readings, temperature, endpoint criteria and various helpful icons

FE30-Basic: Conductivity instrument incl. operating manual, "Quick guide", power adapter
FE30-Kit: Instrument and accessories as with FE30-Basic, also with LE703 conductivity sensor, electrode arm, 2 x 1413µS/cm and 2 x 12.88mS/cm standard sachets
FEP30-Basic: Conductivity instrument incl. operating manual, "Quick guide", power adapter
FEP30-Kit: Instrument and accessories as with FEP30-Basic, also with LE703 conductivity sensor, electrode arm, 2 x 1413µS/cm and 2 x 12.88mS/cm standard sachets

Specifications

Measuring range (Accuracy)	
Conductivity:	0.1µS/cm to 199.9mS/cm (±0.5% of measured value)
TDS:	0.1mg/L to 199.9g/L (±0.5% of measured value)
Salinity:	0.00 to 19.99psu (±0.5% of measured value)
Temperature:	0°C to +100°C (±0.3°C)
Calibration:	1 point, 3 predefined standards
Input:	Mini-DIN
Temperature compensation:	Linear: 0.00%/°C to 10.00%/°C
Reference temperature:	20°C and 25°C
Power supply:	100-240 V/50-60 Hz/9V DC
FEP30 only:	
Memory:	99 measurements
Output:	RS232 interface

Type	PK	Cat. No.
FE30-Basic	1	**9.773 701**
FE30-Kit	1	**6.251 347**
FEP30-Basic	1	**9.773 711**
FEP30-Kit	1	**9.773 712**
FiveEasy AC adaptor (incl. connectors) input 230V, output DC 9V	1	**7.900 515**
FiveEasy electrode arm (complete)	1	**6.235 935**

1



1 Conductivity meter SevenCompact™

NEW!

Mettler-Toledo Online

The colour display with its well-designed icons and menu settings in 10 languages makes operation genuinely intuitive. Applications range from routine measurements through sample analysis, data handling and data archiving in compliance with GLP regulations.
Simply innovative design that meets the requirements for a universal, easy-to-operate conductivity meter.

- User friendly instrument for demanding users
- Security and high reproducibility thanks to Intelligent Sensor Management (ISM®)
- Improved quality of measurements through professional calibration support
- Comprehensive service package including IQ/OQ
- Integrated USB and RS232 interfaces for data exchange

Supplied with:
S230-Basic: Instrument, electrode holder, protective cover, operating instructions, quick guide, declaration of conformity and test certificate
S230-Kit: As per S230-Basic, additionally with InLab® 731-ISM, guide to conductivity measurements and 2 calibraton sachets for 1413µS/cm and 12.88mS/cm.
S230-USP/EP: As per S230-Kit, but with InLab® 741-ISM instead of InLab® 731-ISM and without calibration sachets for 12.88mS/cm.

Specifications:

Calibration:	13 pre-defined and 1 user-defined standard
Conductivity range:	0.001µS/cm to 1000mS/cm, autoscaling
Conductivity accuracy:	±0.5%
Salinity range:	0.00 to 80.00psu
TDS range:	0.00mg/L to 1000g/L, autoscaling
Resistivity range:	0.00 to 100MOhm*cm, autoscaling
Conductivity ash range:	0.000 to 2022%, autoscaling
Temperature range	
MTC:	-30.0 to 130.0°C
ATC:	-5.0 to 130.0°C
Temperature accuracy:	±0.1°C
Display:	4.3 inch, TFT color
Ext. power supply:	9-12V/10W

Type	PK	Cat. No.
S230-Basic	1	**9.704 164**
S230-Kit	1	**9.704 165**
S230-USP/EP	1	**9.704 166**

1



E & OE.

1 2 Conductivity meter ‚SevenExcellence™ S700

NEW!

Mettler-Toledo Online

Modular professional system for measurements of pH, redox potential, conductivity, salinity/TDS and ion concentration.
Fits up to three modules in any composition and order, can be expanded with additional measurement parameters at any time.
- Large, high resolution 7" colour touch display (capacitive), very clear and easy to operate
- Modularity and flexibility; up to 3 measuring modules can work in parallel, expansion to 2 or 3 channels possible
- Universal communication via 2 x USB, Ethernet (LAN) and RS232
- Plain text user interface in 10 languages with menu guidance in full sentences
- OneClick™ operation concept to quickly start frequently used functions and preferred methods
- Storage for user methods
- Highest security and GxP support (ID protection, sophisticated user management, limits/alarms, integrated radio clock, etc.)
- Intelligent sensor management (ISM®)
- Connection of stirrer, sample changer, PC, barcode reader, keyboard, local or network printer possible
- Storage up to 20000 data sets (measurements, calibrations, methods)
- 17 predefined, 60 user-defined methods
- Calibration: 13 pre-defined and 20 user-defined standards
- uPlace™ electrode arm with perfect vertical movement
- Compatible with all METTLER TOLEDO electrodes (Recommended: ISM® electrodes)

S700-Basic: Includes instrument, 1 x conductivity expansion unit, 2 x blank expansion units, uPlace™ electrode holder, semi-transparent cover, operating instructions, installation and quick guide, LabX® direct pH PC software, declaration of conformity and test certificate.
S700-Kit: As S700-Basic, but also with InLab® 731-ISM, guide to conductivity measurements and 2 calibration sachets for 1413 µS/cm and 12.88 mS/cm.
S700-Trace: As S700-Kit but with InLab® Trace instead of InLab® 731-ISM, with Flow-Cell and without calibration sachets.

Specifications	**Measuring range // Resolution // Accuracy**
Temperature MTC/ATC:	-30.0 to 130.0°C // 0.1°C // ±0.1°C
Conductivity:	0.001 to 999999 µS/cm // 0.001 to 1 // ±0.5%
	0.001 to 2000 mS/cm // 0.001 to 1 // ±0.5%
	0.001 to 200 S/m // 0.0001 to 1 // ±0.5%
	0.001 to 200000 mS/m // 0.0001 to 1 // ±0.5%
	0.1 to 999999 µS/m // 0.001 to 1 // ±0.5%
TDS:	0.001 to 1000 g/L , ppt // 0.001 to 1 // ±0.5%
	0.001 to 999999 mg/L , ppm // 0.001 to 1 // ±0.5%
Salinity:	0.01 to 80.0 psu , ppt // 0.01 to 0.1 // ±0.5%
Resistivity:	0.01 to 100.0 MΩxcm // 0.0001 to 1 // ±0.5%
	0.01 to 999999 Ωxcm // 0.01 to 1 // ±0.5%
Conductivity Ash:	0.000 to 2022% // 0.001 to 1 // ±0.5%

Type	PK	Cat. No.
S700-Basic	1	**9.704 354**
S700-Kit	1	**9.704 355**
S700-Trace	1	**9.704 356**

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9.041 443

Conductivity sensors for Mettler Toledo conductivity meters

NEW!

Mettler-Toledo

InLab® 731
4 graphite pole cell with integral temperature sensor. Cable length 1.2 metres.
Measuring range: 0.01 to 1000mS/cm.

InLab® 741
2 steel pole cell with integral temperature sensor. Cable length 1.2 metres. Measuring range: 0.001 to 500µS/cm

InLab® 710
4 platinum pole cell with integral temperature sensor. Cable length 1 metres. Measuring range: 0.01 to 500mS/cm

InLab® 720
2 platinum pole cell with integral temperature sensor. Cable length 1 metres. Measuring range: 0.1 to 500µS/cm

InLab® 751-4mm
2 platinum pole micro cell with integral temperature sensor. Cable length 1 meter.
Measuring Range: 0.01 to 100 mS/cm

InLab® 752-6mm
2 platinum pole semi-micro cell with integral temperature sensor. Cable length 1 meter.
Measuring Range: 0.01 to 112mS/cm

Type	Shaft material	Shaft diameter mm	Length mm	Cell constant	PK	Cat. No.
InLab® 731	Graphite	12	120	K=0.57	1	**9.041 447**
InLab® 731-ISM	Graphite	12	120	K=0.57	1	**9.041 448**
InLab® 741	V4A steel	12	120	K=0.105	1	**6.242 844**
InLab® 741-ISM	V4A steel	12	120	K=0.105	1	**9.041 442**
InLab® 710	Glass	12	120	K=0.80	1	**9.041 443** 1
InLab® 720	Glass	12	120	K=0.06	1	**9.041 446**
InLab® 751-4mm	Glass	4	120	K=1.0	1	**9.041 475**
InLab® 752-6mm	Glass	6	120	K=1.0	1	**9.041 476**

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9.704 081

3



9.704 078

Conductivity cell probes

WTW

TetraCon® 325 standard conductivity cell probe:
4-pole cell with integral temperature sensor. Cable length 1.5 metres.
Measuring range: 1µS/cm to 2S/cm.

LR 325/01 ultra-pure water conductivity cell probe:
With integral temperature sensor and flowthrough vessel D 01/T for measuring very low conductivity ranges (<1 µS/cm) e.g. boiler feed water or deionised water. Cable length 1.5 metres. Min./max. insertion depth 35/110mm and flowthrough, measuring range: 0.001µS/cm to 200µS/cm.

TetraCon® DU/T conductivity flowthrough cell:
4-pole conductivity cell with integral temperature sensor for standard applications. Connection via 10mm diameter tubing nozzles (the adapter cable KKDU with 1 metre cable is required for connection). Filling volume 7ml.
Measuring range: 1µS/cm to 1000mS/cm.

Type	Electrode	Shaft	Length mm	Cell constant	PK	Cat. No.
TetraCon® 325	Graphite	Epoxy resin	120	K =0,475	1	**9.704 081** 2
LR 325/01	V4A steel	V4A steel	121	K = 0.1	1	**9.704 083**
TetraCon® DU/T	Graphite	Epoxy resin	155	K approx. 0.8	1	**9.704 078** 3
KKDU 325	Connection cable	-	100	-	1	**9.704 079**

4



4 Conductivity solutions for Conductivity meters

Bottles with 500ml.

Hanna

Type	PK	Cat. No.
12880 µS	1	**9.704 017**
1413 µS	1	**9.704 018**
84 µS	1	**9.773 992**
80.000 µS	1	**9.773 993**

Conductivity solutions with Certificate of Analysis

NEW!

Bottles with 500ml.

Hanna

Type	PK	Cat. No.
84 µS	1	**6.230 626**
1413 µS	1	**7.970 290**

E & OE.

1 Conductivity Solutions

- Directly traceable to NIST
- ISO17025 Certificate including actual value, expiration date and uncertainty of measurement
- Actual expiry and temperature dependence data on label.
- All standards are aqueous based and non-hazardous.
- Supplied in unbreakable PE-HD bottle.

Reagecon

1



Type	Capacity ml	PK	Cat. No.
1.3 µS/cm	250	1	**6.225 059**
5 µS/cm	500	1	**6.901 629**
10 µS/cm	500	1	**6.901 622**
20 µS/cm	500	1	**6.802 901**
50 µS/cm	500	1	**6.074 754**
84 µS/cm	500	1	**9.040 904**
100 µS/cm	500	1	**6.234 859**
147 µS/cm	500	1	**9.040 905**
200 µS/cm	500	1	**6.802 902**
500 µS/cm	500	1	**6.205 415**
1000 µS/cm	500	1	**6.901 670**
1413 µS/cm	500	1	**9.040 906**
5000 µS/cm	500	1	**6.205 412**
10000 µS/cm	500	1	**6.901 671**
12880 µS/cm	500	1	**9.040 907**
50000 µS/cm	500	1	**6.210 129**
100000 µS/cm	500	1	**6.205 413**
450000 µS/cm	500	1	**6.243 175**

2 Conductivity testing solutions

Values stated at 25°C. Supplied in containers as indicated. Accuracy ±2%.

SI Analytics GmbH

2



Type	Capacity ml	PK	Cat. No.
147µS/cm*	17	18	**9.041 053**
12.9mS/cm*	17	18	**9.041 055**
1413µS/cm	250	1	**9.041 056**

* Supplied in vials!



1 Portable dissolved oxygen meter FiveGo™ DO

NEW!

Mettler-Toledo Online

FiveGo™ DO is a handy, portable meter ideal for those who require rapid and reliable results on the go. This meter is suitable for a wide range of applications in various areas such as food and beverage, agriculture, industry, water and environment

- Outstanding functions such as storage capacity for 30 measurements, %, mg/L and ppm measuring modes plus IP54 ingress protection combined with features such as automatic endpoint recognition, calibration in air and automatic temperature compensation when a temperature sensor is connected
- Five self-explanatory buttons for starting and ending a measurement, for saving and accessing measurement results and for reviewing the latest calibration data.
- A big, well organised display simultaneously showing readings, temperature, endpoint criteria and various helpful icons

FG4-Basic: Dissolved oxygen meter incl. electrode clip, wrist strap, operating manual, "Quick guide", 4 x batteries
FG4-Kit: Instrument and accessories as for FG4-Basic, but with LE621 sensor, NTC 30 kΩ temperature sensor, IP54 connection caps
FG4-Fieldkit: Instrument and accessories as for FG4-Kit, with carry bag incl. 4 sample bottles

1



Specifications:

Measuring range (Accuracy)	
DO:	0.0 to 199.9% and 200 to 400% (±1%) 0.0 to 45.0mg/L (±1%) 0.0 to 45.0ppm (±1%)
Temperature:	0 to +50°C (±0.3%)
Salinity (Resolution):	0.0 to 50.0ppt (0.1ppt)
Barometic pressure (Resolution):	375 to 825mm Hg (1mm Hg) 500 to 1100mbar (1mbar) 500 to 1100hPa (1hPa)
Calibration:	2 points, 100% and 0%
Input:	BNC, Cinch, NTC 30 kΩ
Temperature compensation:	ATC and MTC
Memory:	30 measurements
Power supply:	4 x AAA
Protection class acc. to DIN EN 60529:	IP 54

Type	PK	Cat. No.
FG4-Basic	1	**9.773 722**
FG4-Kit	1	**9.773 723**
FG4-Fieldkit	1	**9.773 724**

partner of the LLG Lab Logistics Group

We can supply this manufacturer's whole product range !

METTLER TOLEDO

E & OE.

1 Dissolved oxygen meter SevenGo pro™ SG6

NEW!

Professional portable dissolved oxygen meter (IP67) for highest demands *Mettler-Toledo Online*
- Manual or automatic air pressure compensation with built-in barometer
- High-performance O_2 sensor
- Data memory for 200 GLP data points
- Contact-free IR communication for data transfer to a printer or PC

Items supplied:
SG6-B: Dissolved oxygen meter (no electrode), complete with batteries, wrist strap, operating instructions, test certificate and declaration of conformity
SG6-ELK: Dissolved oxygen meter with InLab®605 oxygen sensor IP67 rated (1.8M fixed cable), complete with batteries, wrist strap, SevenGo™ clip, operating instructions, test certificate and declaration of conformity
SG6-FK2: Dissolved oxygen meter with InLab®605 oxygen sensor IP67 rated (1.8M fixed cable) with field compact case, rubber holster, field electrode arm, calibration bottles and same accessories as SG6-ELK
SG6-FK10: Dissolved oxygen meter with InLab®605 oxygen sensor IP67 rated (10M fixed cable) with field compact case, rubber holster, field electrode arm, calibration bottles and same accessories as SG6-ELK

Specifications:

Saturation	
Measuring range:	0.0 to 600%
Resolution:	0.1 to 1
Accuracy:	±0.5%
Temperature	
Measuring range:	0.0 to +60°C
Resolution:	0.1°C
Accuracy:	±0.1°C
mg/L, ppm	
Measuring range:	0.00 to 99.00
Resolution:	0.01
Accuracy:	±0.5%, max. 0.03
Pressure	
Measuring range:	500 to 1100mbar
Resolution:	1
Accuracy:	±1

Type	PK	Cat. No.
SG6-B	1	**9.704 324**
SG6-ELK	1	**9.704 112**
SG6-FK2	1	**9.704 114**
SG6-FK10	1	**9.704 325**

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1 Waterproof Oxygen Meter HI9146

Hanna

DO measurements can be displayed in ppm (mg/l) or in % saturation, together with temperature value. Automatic calibration in the air, at 100%. Automatic temperature compensation from 0 to 50°C. Instrument allows manual compensation of altitude and salinity. Hold-Function allows the user to "freeze" the reading on the LCD. Auto-off after 4 hours of inactivity, input for 12V d.c. adapter.

Waterproof Oxygen Meter supplied complete with Oxygen Probe, electrolyte solution for DO probe (30 ml), 2 membranes, 4 batteries and a hard carrying case.

Measuring range/Accuracy:

O_2 concentration:	0.00 to 45.00mg/l
	±1.5% of Measuring range
O_2 saturation:	0.0 to 300.0%
	±1.5% of Measuring range
Temperature:	0.0 to 50.0°C/±0.5°C
Resolution:	
O_2 concentration:	0.01mg/l
O_2 saturation:	0.1%
Temperature:	0.1°C
Temperature compensation:	automatic from 0 to 50°C
Height compensation:	0 to 4km/resolution 0.1km
Salinity compensation:	0 to 80g/l/resolution 1g
Environment:	0 to 50°C
Dimensions:	196 x 80 x 60mm
Weight:	500g

Type	Description	PK	Cat. No.
HI 9146-04	incl. Oxygen Probe with 4m cable	1	**9.773 997**
HI 9146-10	incl. Oxygen Probe with 10m cable	1	**9.773 999**

2



2 Portable dissolved oxygen meter Oxi 3205

WTW

Robust and easy to use dissolved oxygen meter for standard alkaline, or rechargeable, batteries. Menu-controlled with backlit graphics display for ease of use under all lighting conditions. Suitable for use in harsh environments.

Measuring ranges:

O2 concentration:	0.00 to 20.0mg/l (19.9mg/l*)
	0.0 to 90.0mg/l (90mg/l*)
O2 saturation:	0.0 to 200.0% (200%*)
	0 to 600%
Temperature:	0.0 to +50°C, ±0.1°C
	* when using DurOx oxygen sensor probes
Accuracy:	
O2 concentration:	±0.5% of reading
O2 saturation:	±0.5% of reading

Type	Description	PK	Cat. No.
Oxi 3205	meter only	1	**9.774 378**
Oxi 3205 Set 1	case set including DO sensor CellOx 325 and accessories	1	**9.774 340**
Oxi 3205 Set 2	case set including DO sensor CellOx 325 (3m) and accessories	1	**9.774 406**
Oxi 3205 Set 3	case set including DO sensor DurOx 325 (3m) and accessories	1	**9.774 343**

StirrOx®, CellOx® and DurOx® electrodes please see page 333.

E & OE.

1 Portable dissolved oxygen meter Oxi 3210

Convenient and versatile dissolved oxygen meter. Menu controlled, with backlit, graphics display. Memory, including GLP supporting functions, temperature compensation, barometric pressure and salinity. Powered by standard alkaline, or rechargeable, batteries. *WTW*

Measuring ranges:

O2 concentration:	0.00 to 20.00mg/l (19.9mg/l*) 0.0 to 90.0mg/l (90mg/l*)
O2 saturation:	0.0 to 200.0% (199%*) 0 to 600%
Partial pressure:	0.0 to 200.0mbar (199 mbar*) 0 to 1250mbar
Temperature:	0.0 to +50.0°C, ±0.1°C * when using DurOx oxygen sensor probes

Accuracy:

O2 concentration:	±0.5% of reading
O2 saturation:	±0.5% of reading
Partial pressure:	±0.5% of reading
Datalogger:	200 records (Reading, Temperature, Date, Time, ID)

Type	Description	PK	Cat. No.
Oxi 3210	meter only	1	**9.774 350**
Oxi 3210 Set 1	cased set including DO sensor CellOx 325 and accessories	1	**9.774 351**
Oxi 3210 Set 2	cased set including DO sensor CellOx 325 (3m) and accessories	1	**9.774 407**
Oxi 3210 Set 3	cased set including DO sensor DurOx 325 (3m) and accessories	1	**9.774 357**

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The new inoLab® series from WTW

The new inoLab® benchtops are perfectly designed for modern laboratory surroundings. *WTW*
The key pads are clearly outlined and easy-to-operate, their smooth surfaces are
easy-to-clean and the operation is self-explanatory. All meters include a universal power supply and a convenient stand with sensor support.
If desired they can be ordered in application oriented sets including sensors and accessories.

1 Oxygen meter inoLab® Oxi 7310

Reliable Documentation for dissolved oxygen measurement, if desired also available with *WTW*
built-in printer. This is the inoLab® Oxi 7310 or inoLab® Oxi 7310P. A modern backlit
graphic display with menu controlled user interface allows easy and intuitive operation. The mini USB-B interface provides fast data transfer to a PC.
The internal memory can record up to 5000 GLP complying data including ID, date and time. The housing and the keypad are easy-to-clean.
The inoLab® Oxi 7310 supports the long proven WTW galvanic sensors, CellOx® 325 and StirrOx® G. A calibration history of the 10 last calibrations allows conclusions on the state of the sensor. Calibrations versus external standards e.g. Winkler titration, are possible, too.
The meter includes automatic barometric pressure and temperature compensation. An integrated thermal printer (58 mm width) is ready for printout of the measured data (option).
The scope of delivery includes meter, stand, power supply and USB cable.

Specifications

Ranges:	All values±1 digit
Dissolved oxygen concentration:	0.00 ... 20.00 mg/l ±0.5 % Mw.
	0 ... 90 mg/L ±0.5 %
Saturation:	0.0 ...200.0 % ±0.5 % v. Mw.
	0 ... 600 % ±0.5 v Mw.
Partial pressure:	0 ... 200.0 hPa, 0 ...1250 hPa
Temperature:	-5.0 ... 105.0°C ±0.1°C
Calibration:	1-point air calibration (water vapour saturated air) or versus external standard
Calibration memory:	Up to 10 calibrations recallable
Display:	Backlit graphic LCD
Memory:	manual 5/5000 automatic
Logger:	manual/time controlled
Interface	Mini USB-B
Power supply	Universal power supply, 100 to 240 V, 50/60 Hz, 4 x 1.5 V AA

Type	Description	PK	Cat. No.
Oxi 7310	Meter only including accessories	1	**9.920 108**
Oxi 7310 Set 1	Meter including CellOx® 325 and accessories	1	**9.920 109**
Oxi 7310 Set 4	Meter including StirrOx® G and accessories	1	**9.920 110**
Oxi 7310P	Meter including integrated printer	1	**9.920 111**
Oxi 7310P Set 1	Meter including integrated printer, incl. CellOx® 325 and accessories	1	**9.920 112**
Oxi 7310P Set 4	Meter including integrated printer, incl. StirrOx® G and accessories	1	**9.920 113**

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E & OE.

1 Accessories for Oxygen meters



StirrOx® G: *WTW*

For inoLab® Oxi 730, ProfiLine 197i/1970i, inoLab® 740 Oxi, inolab Oxi 7310
Self-stirring oxygen sensor.
- single-handed use
- high reproducibility
- ready for immediate use, no polarisation period necessary
- extremely low internal consumption of oxygen by the electrode
- no zero point calibration necessary
- OxiCal®-SL calibration and storage vessel included
- 6 months operation with one electrolyte filling
- IMT function compensation
- membrane leakage monitoring, damaged membranes are indicated.

Supplied with case, spare parts and maintenance solutions.

CellOx® 325:

For Oxi 3xx, Oxi 3xxi, ProfiLine Oxi 197, ProfiLine Oxi 197i, ProfiLine Multi 197i, Multi 340i, Oxi 3205, Oxi 3210, Oxi 3310, ProfiLine Oxi 1970i, ProfiLIne Multi 1970i, inoLab®
Membrane-covered, galvanic oxygen sensor.
- ready for immediate use, no polarisation period necessary
- IMT function compensation
- 6 months operation with one electrolyte filling
- stable zero point
- 1.5 metre cable and waterproof plug (to IP 67) (other cable lengths available on request)
- OxiCal®-SL calibration and storage vessel included

Type	PK	Cat. No.
StirrOx® G	1	**9.822 560**
CellOx® 325	1	**9.822 551**

2 Oxygen sensor DurOx® 325



For use with Oxi 3xxi, ProfiLine Oxi 1970i, ProfiLine 3205, 3210, 3310. *WTW*
Membrane-covered oxygen sensor with low flow requirement and removable cage guard, for field applications (fish farm revival pools) and for educational purposes.

- ready to measure - no polarisation time
- IMT compensation via two integral temperature sensors
- service life with one electrolyte filling approx. 6 months
- minimal flow requirement
- no zero current
- sensor is watertight (IP 68 - 2)
- standard with 3m cable and watertight plug
- standard with calibration/storage vessel OxiCal® -D
- standard with cage guard SK-D

Type	PK	Cat. No.
DurOx® 325	1	**9.920 045**

BOD (Karlsruher) bottles - please see page 1193.

1



1 Combined pH/conductivity/temperature testers

Hanna

Simultaneous display of pH- and/or conductivity measurement value and temperature.
Automatic temperature compensation of pH- and/or conductivity measurement gives enhanced accuracy. User selection of temperature coefficient enables use in alkaline and acidic media.
Easy calibration with pre-programmed pH and conductivity solution values.
Integral, robust, carbon conductivity probe. Exchangeable pH electrode HI 73127.
Model HI 98130 features a very wide measuring range of 0 to 19.99 mS

Specifications

Measuring ranges:

pH:	0.0 to 14.0
EC:	0 to 3999µS (HI 98129)
	0 to 19.99mS (only HI 98130)
TDS:	0 to 2000mg/l (HI 98129)
°C:	0 to 10.00g/l (HI 98130)
Accuracy:	
pH:	±0.05
EC/TDS:	±2% of the upper range value
°C:	±0.5
Batteries:	4 x 1.5 Volt
Ambient conditions:	
	0 to 50.0°C
Weight:	100g

Type	PK	Cat. No.
HI 98129	1	**9.773 995**
Spare electrode HI 73127	1	**9.773 921**
HI 98130	1	**9.773 996**

2



2 Waterproof Multimeters HI991300/HI991301 N

Hanna

pH or conductivity (TDS) values are displayed together with temperature. Supplied with multi-parameter probe, all measurements can be taken without changing the probe.
Automatic temperature compensation ensures high accuracy of the measurements.
Automatic calibration with pre-programmed pH buffer (pH 7.01, pH 4.01, pH 10.01) and conductivity solutions 1413µS (for HI 991300) or 12880µS (for HI 991301 N). Graphic symbols guide the user through calibration and measurements.

HI991300 and HI991301 are supplied complete with multi-parameter probe with 1metre cable, 4 x 1.5 Volt batteries, altogether in a carrying case.

Specifications

Measurement range/Accuracy:

pH:	0.00 to 14.00/±0.01
EC:	0 to 3999µS/cm (HI991300)
	0 to 20.00mS (HI991301 N)/
	±2 % of the measurement range
TDS:	0 to 2000 mg/l (HI991300)
	0 to 10.00 g/l (HI991301 N)/
	±2 % of the measurement range
°C:	0.0 to 60.0
Resolution:	
pH:	0.01
EC:	1µS/cm (HI991300)
	0.01mS/cm (HI991301 N)
TDS:	1mg/l (HI991300)
	0.01g/l (HI991301 N)
°C:	0.1°C
Batteries:	4 x 1.5 Volt AAA
Dimension:	145 x 80 x 36mm
Weight:	210g

Type	PK	Cat. No.
HI 991300	1	**6.231 448**
HI 991301 N	1	**6.241 705**
Spare probe HI 1288	1	**6.901 328**

1 Multiparameter meters AL15

NEW!

AQUALYTIC

Dissolved Oxygen/O2-concentraion in mg/l/Conductivity/TDS/pH/Redox/Temperature.
The AL15 combines the features of several electrochemistry meters.
It is designed for multi purpose operation and measures pH/Redox, dissolved oxygen and conductivity/TDS.
The AL15 incorporates an intuitive user interface, large, easy to read display and is supplied with a sturdy handy case with electrodes, buffer solution and accessories.

Specifications
Measuring range

pH:	0 - 14pH
ORP:	-1999 to +1999mV
Conductivity:	0 to 200.0µS
	0.2 to 2.000mS
	2 to 200.0mS
TDS:	0 to 132.000 ppm
Temperature:	0 to +60°C or +32 to +140°F
Oxygen:	0 to 20.0mg/l
	0 to 100.0% in Air
Display:	Large LCD with contrast adjustment
Interface:	USB, RS232
Power supply:	DC 1.5V battery (UM3, AA) x 4 PCs or DC 9V Adapter

Type	PK	Cat. No.
AL15 pH/Con/Oxi	1	**6.241 474**
AL15 pH/Con	1	**6.241 983**
AL15 pH/Oxi	1	**6.256 805**
AL15 pH/Redox	1	**9.699 295**



WTW

a xylem brand

THE WORLDWIDE NO. 1 FOR ELECTROCHEMISTRY METERS

Founded in 1945, WTW has provided outstanding leadership in the design and production of superior quality water testing instrumentation world-wide for more than 65 years.

Today WTW is offering the world's most complete line of pH/ORP, D.O./BOD/Respirometry and Conductivity Instruments, Turbidity Meters, Photometers with reagents.





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Let's Solve Water

1 2 3 4 MultiLine® IDS

WTW

Multiparameter measurement new defined. The new MultiLine® handhelds with intelligent digital IDS sensors are perfectly suited for all multiparameter applications. The biggest advantage - signals are directly processed in the sensor. Each sensor logs onto the instrument and transfers its ID data including calibration records. There is no danger of confusion, the digital signal transfer allows the use of long cables for all parameters. The unique QSC functionality for IDS pH sensors gives a realistic rating of the current sensor condition. The pH CMC indicates the optimum pH measuring range. A wide range of IDS pH, conductivity and DO probes covers almost any application. Universal waterproof quick-locks secure the sensor against loss. The robust and waterproof (IP67) MultiLine® handhelds are equipped with a colour graphic display for optimum information. A special silicone keypad provides excellent handling comfort. Two USB host interfaces are provided for data transfer to USB sticks or the user's PC. The latest software updates are provided via the internet. NiMH-rechargeable batteries provide an energy-efficient operation. Available as field case sets including sensors and accessores.

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5 6 Multiparameter meters, ProfiLine Multi 3410/3420/3430

There are 3 different models available:

Multi 3410: A single channel meter for pH, ORP, conductivity and DO measurement. It is particularly aimed at those users measuring one parameter but occasionally having requirements for measuring a second or third.

Multi 3420: A dual channel instrument for simultaneous measurement of two equal or different parameters

Multi 3430: A triple channel instrument for simultaneous measurement of up to three equal or different parameters

Selected IDS-Sensors:

SenTix® 940: Low maintenance combined pH electrode with ATC, QSC suitable, memory for 10 calibrations, stored serial number, pH 0.000 to 14.000 (±0.004pH), temperature range 0.0 to 80.0°C, ±0.2°C

SensoLyt® 900: Low maintenance polymer electrolyte pH electrode with built-in temperature sensor, pressure resistant up to 10 bar, QSC suitable, memory for 10 calibrations, saved serial number, pH 2.000 to 12.000 (±0.004pH), temperature range from 0.0 to 60.0°C, ±0.2°C

SenTix® 950: Combined pH-electrode with plastic shaft, 3 mol/l KCl, ATC, QSC-suitable, memory for 10 calibrations, stored serial number, pH 0.000 to 14.000 (±0.004pH), temperature range 0.0 to 80.0°C, ±0.2°C

SenTix® 980: Combined pH-electrode with plastic shaft, 3 mol/l KCl, ATC, platinum wire junction, QSC-suitable, memory for 10 calibrations, stored serial number, pH 0.000 to 14.000 (±0.004pH), temperature range 0.0 to 100.0°C, ±0.2°C

TetraCon® 925: Robust, general purpose 4-electrode conductivity cell with graphite electrodes incorporating integral temperature sensor. Memory for 10 calibrations, stored serial number, measuring range 10 µS/cm to 2000 mS/cm ±0.5% of value, 0.0 to 100.0°C, ±0.2°C

LR 925/01: 2-electrode stainless steel conductivity cell for low conductivities, integrated temperature sensor, flow through vessel, memory for 10 calibrations, stored serial number, measuring range 0.01 µS/cm to 200µS/cm ±0.5% of value, 0.0 to 100.0°C, ±0.2°C

FDO® 925: Extremely fast (T99< 60 s) and precise optical DO sensor for field and laboratory applications. Handy, suits in different BOD bottles. Waterproof for depth measurement to 100m. Bevelled, air bubble repelling membrane, Green light technology for extended operation time. Insensitive against H_2S. O_2 concentration: 0.00 to 20.00mg/l, O_2 saturation: 0.0 to 200.0% O_2 partial pressure: 0.0 to 400hPa. Accuracy: ±0.5% of value.
The information for meter precision refers to the sensors' built-in, electronic, measuring technology.

5



6



Multiparameter meters, ProfiLine Multi 3410/3420/3430

WTW

Measurement ranges

pH:	-2.000 to 20.000
mV:	-2.00 to +20.00 ±2500, ±1250

Oxygen measurement

O2 concentration:	0.00 to 20.00 mg/l
O2 saturation:	0.0 to 200.0%
O2 partial pressure:	0.0 to 400%
Conductivity measurement:	0.0mS/cm to 2000mS/cm in 5 mode 0.00µS/cm to 19.99µS/cm (at K=0.1cm^{-1}) 0.000µS/cm to 2.000µS/cm (at K=0.01cm^{-1})
Temp.:	-5.0°C to +105°C
Memory:	manual or time controlled logger, 10000 records
Power supply:	4 x 1.2V NiMH, A-Type, battery charger

Type	Description	PK	Cat. No.	
Multi 3410	meter only	1	**9.920 051**	
Multi 3410 Set 1	incl. SenTix®940	1	**9.920 052**	
Multi 3410 Set 2	incl. SenTix®940-3	1	**9.920 053**	
Multi 3410 Set 3	incl. SensoLyt®900-P incl. 6m cable	1	**9.920 054**	
Multi 3410 Set 4	incl. FDO® 925	1	**9.920 055**	
Multi 3410 Set 5	incl. FDO® 925-3 m	1	**9.920 046**	
Multi 3410 Set 6	incl. FDO® 925-P incl. 6m cable	1	**9.920 056**	
Multi 3410 Set 7	incl. TetraCon® 925	1	**9.920 057**	
Multi 3410 Set 8	incl. TetraCon® 925-3	1	**9.920 058**	
Multi 3410 Set 9	incl. TetraCon® 925-6	1	**9.920 059**	
Multi 3410 Set A	incl. LR 925/01	1	**9.920 060**	
Multi 3410 Set B	incl. SenTix® 940-3, FDO® 925-3	1	**9.920 061**	
Multi 3410 Set C	incl. SenTix® 940, TetraCon® 925	1	**9.920 062**	
Multi 3410 Set D	incl. SenTix® 940-3, TetraCon® 925-3	1	**9.920 063**	
Multi 3410 Set E	incl. SenTix® 980, LR 925/01	1	**9.920 047**	1
Multi 3420	meter only	1	**9.920 064**	
Multi 3420 Set B	incl. SenTix® 940-3, FDO 925-3	1	**9.920 065**	
Multi 3420 Set C	incl. SenTix® 940, TetraCon® 925	1	**9.920 066**	
Multi 3420 Set D	incl. SenTix® 940-3, TetraCon® 925-3	1	**9.920 067**	
Multi 3420 Set E	incl. SenTix®980, LR 925/01	1	**9.920 068**	
Multi 3420 Set H	incl. SenTix® 950, TetraCon® 925	1	**9.920 048**	2
Multi 3420 Set G	incl. SenTix® 940-3, FDO® 925-3,TetraCon® 925-3	1	**9.920 049**	
Multi 3430	meter only	1	**9.920 069**	
Multi 3430 Set C	incl. SenTix®940, TetraCon® 925	1	**9.920 070**	
Multi 3430 Set D	incl. SenTix®940-3, TetraCon® 925-3	1	**9.920 071**	
Multi 3430 Set E	incl. SenTix®980, LR 925/01	1	**9.920 072**	
Multi 3430 Set F	incl. SenTix®940, FDO 925, TetraCon® 925	1	**9.920 073**	
Multi 3430 Set G	incl. SenTix® 940-3,FDO® 925-3, TetraCon® 925-3	1	**9.920 050**	3
Multi 3430 Set K	incl. SenTix® 980, FDO® 925, TetraCon® 925	1	**6.241 477**	

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9.920 047

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9.920 048

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9.920 050

1 pH/mV/°C meter HI 2211-02/HI 2215-02

Hanna

- Extra wide LCD, displays pH/mV value and temperature simultaneously
- The stability indicator makes the calibration procedure calibration error free
- Automatic calibration at two points with pre-programmed standard buffers (pH 7.01; 4.01; 10.01)
- Automatic temperature compensation from -10°C to +120°C
- Graphic symbols guide the user through calibration and measurement

Further specifications (HI 2215-02 only):

- Resolution: 0.01 or 0.001pH
- Automatic calibration at two points with 7 pre-programmed standard buffers (pH 1.68; 4.01; 6.86; 7.01; 9.18; 10.01; 12.45) and 2 selectable buffers.
- Recording of up to 100 values with date and time via keystroke
- Data transfer to PC via USB interface

Supplied with:

HI 2211-02 is supplied with pH glass electrode HI 1131B, temperature probe, pH 7.01 and pH 4.01 buffer solution (20ml each), electrolyte solution, electrode holder, 12V adapter

Measuring range/Accuracy:

pH:	-2.00 to 16.00/±0.01
mV:	±399.9 (ISE); ±2000 (ORP)/ ±0.2 (±699.9); ±1 (2000)
°C:	-9.9 to 120/±0.5 (0.0 to 100.0)
Resolution:	
pH:	0.01 0.01 or 0.001 (HI 2215-02 only)
mV:	0.1 (±399.9); ±1 (2000)
°C:	0.1
Power supply:	12V d.c. adapter (included)
Operating temp. range:	0 to 50°C
Weight:	2.5

Type	PK	Cat. No.
HI 2211-02	1	**9.773 981**
HI 2215-02	1	**9.773 994**
Spare electrode HI 1131B for HI 2211-2 / HI 2215-02	1	**9.040 993**

1



Multiparametermeters ProLab 3000/ProLab 4000

SI Analytics GmbH

- "Windows" interface and operation
- In ISE measuring mode controll of Titronic® burettes for dosing of TISAB, standards or sample.
- Flexible display of measuring values on a high resolution, bright, backlit, colour-graphics display (320x240 pixels)
- 2-channel pH/mV (galvanically isolated) inputs and dU differential measurement
- ID electrodes with automatic identification and data exchange or allocation with the meter
- Automatic user identification with electronic identity card including password entry
- Recorder functions: display of measurement against time, scalable coordinate axis
- Numerical display of measurement value via mouse click (time, data, measurement value, temperature)
- Interfaces: RS232C interface (bi-directional), USB connection (slave, bi-directional), USB master connection with direct connection (without configuration) to: USB-hub, USB-printer, USB-memory, keyboard, mouse, USB-stick

Specifications

pH measuring range:	-2.000 pH to +20.000pH -2.00 pH to +20.00pH -2.0 pH to +20.0pH
Accuracy (±1digit):	±0.002 ±0.01
mV measuring range:	-2200.0mV to +2200.0mV; -2200mV to +2200mV
Accuracy (±1digit)	±0.1mV ±1mV
ISE measuring range:	$1.0E^{-40}$ to $9.9E^{39}$ mg/l
Temperature measuring range:	-35.0°C to + 150.0°C
Accuracy (±1digit):	0.1°C
ProLab 4000 only:	
Conductivity measuring range:	0.000µS/cm to 2000mS/cm
Accuracy (±1digit):	0.5% from measurment value at an ambient temperature of 5°C to 30°C

Type	PK	Cat. No.	
ProLab 3000 DIN Set	1	**9.773 857**	1
ProLab 3000 BNC Set	1	**9.773 859**	
ProLab 4000 DIN Set	1	**9.773 861**	2
ProLab 4000 BNC Set	1	**9.773 863**	

1



9.773 857

2



9.773 861

E & OE.

The new inoLab® series from WTW

The new inoLab® benchtops are perfectly designed for modern laboratory surroundings. *WTW*
The key pads are clearly outlined and easy-to-operate, their smooth surfaces are
easy-to-clean and the operation is self-explanatory. All meters include a universal power supply and a convenient stand with sensor support.
If desired they can be ordered in application oriented sets including sensors and accessories.

1 2 Laboratory instrument inoLab® Multi 9310 IDS

The Multi 9310 IDS features a new technology: No longer has the meter determining the parameter but only the sensor. *WTW*
Intelligent, digital IDS sensors promotes the inoLab® Multi 9310 IDS to a perfect all-rounder.
The universal digital input is ready for all available laboratory IDS sensors. No matter whether pH, conductivity or dissolved oxygen,
when plugged into a suitable sensor the inoLab® Multi 9310 becomes either a pH, conductivity or dissolved oxygen meter.
Of course it has a modern backlit graphic display with menu-controlled user interface for easy and intuitive operation.
The mini USB-B interface provides fast data transfer to a PC. The internal memory can record up to 5000 GLP complying data including ID,
date and time. The housing and the keypad are easy-to-clean. An integrated thermal printer (58mm width) is ready for printout of the
measured data (option). Includes meter, power supply, stand and USB cable.

Specifications

Display:	backlit graphic LCD
Memory:	manual: 500/automatic: 5000
Logger:	manual/time controlled
Interface:	Mini USB-B
Power supply:	Universal power supply, 100 to 240 V, 50/60 Hz, 4 x 1.5 V AA or 4 x 1.2 V NiMH

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Type	Description	PK	Cat. No.
Multi 9310	Single instrument	1	**9.920 120**
Multi 9310 Set 1	Incl. SenTix® 940	1	**9.920 121**
Multi 9310 Set 2	Incl. SenTix® 980	1	**9.920 122**
Multi 9310 Set 3	Incl. TetraCon®925	1	**9.920 123**
Multi 9310 Set 4	Incl. FDO® 925	1	**9.920 124**
Multi 9310 Set C	Incl. SenTix® 940, TetraCon® 925	1	**9.920 125**
Multi 9310 Set K	Incl. SenTix® 980, FDO® 925 and TetraCon® 925	1	**9.920 126**
Multi 9310P*	Single instrument	1	**9.920 127**
Multi 9310P Set 1*	Incl. SenTix® 940	1	**9.920 128**
Multi 9310P Set 2*	Incl. SenTix® 980	1	**9.920 129**
Multi 9310P Set 3*	Incl. TetraCon®925	1	**9.920 130**
Multi 9310P Set 4*	Incl. FDO® 925	1	**9.920 131**
Multi 9310P Set C*	Incl. SenTix® 940, TetraCon® 925	1	**9.920 132**
Multi 9310P Set K*	Incl. SenTix® 980, FDO® 925 and TetraCon® 925	1	**9.920 133**

Laboratory instruments inoLab® Multi 9420 IDS/9430 IDS

NEW!

Securely traceable with the cutting edge inoLab® Multi 9430 IDS and inoLab® Multi 9420 IDS

WTW

- Secure measurement data
- Digital sensor recognition
- Complete documentation

High-tech made by WTW for challenging applications. Two digital inoLab® multi parameter instruments for IDS sensors for simultaneous measurement of equal or different parameters and sensors. Two (inoLab® Multi 9420 IDS) or three sensors (inoLab Multi 9430 IDS) could be connected. A large color graphic display protected by a glass plate supports the representation of readings and information, The anti-bacterial keypad minimizes the danger of microbiological contaminations. The robust lower case made of zinc diecast provides proper stand and perfect shielding against interferences. A high quality stand for alternative left or right mounting allows easy adaptation to the requirements at the working place. By end of 2013 firmware packages for ISE applications will be available.

Secure measurements
- Digital data transfer eliminates interferences, provide secure calibration data and makes documentation of sensor data easy.
- The smart sensor rating (QSC) gives information about the true condition of an IDS pH electrode and increases safety of operation
- The CMC function for pH visualizes the optimum measuring range and supports correct measurements.
- Visual display for the channel in order to provide correct allocation of channel and sensor.

Documentation according GLP/AQA
- Automatic digital recording of all sensor data for distinct documentation
- Optional user administration for clear allocation of user and measurement results
- Transfer of data as *.csv format via USB to PC, if desired transfer direct to Excel (MultiLab Importer, part of scope of delivery or as download from internet)
- Additional transfer to USB memory drive or selected printer

Compatible to conventional pH measurement
- pH module (accessory) capable of being integrated for pH, ISE and ORP electrodes with DIN or BNC plug and 4 mm banana plug. For temperature sensor.

Specifications

Measuring channels	
inoLab® Multi 9420 IDS:	2
inoLab® Multi 9430 IDS:	3
Display:	Color graphic, glass plate protected
Memory:	manual: 500/automatic: 10000
Logger:	manual/time controlled
Interface:	USB-A, Mini USB-B
Power supply:	Universal power supply, 100 to 240 V, 50/60 Hz

Type	Description	PK	Cat. No.
Multi 9420	Single instrument	1	**6.257 359** 1
Multi 9420 Set C	Incl. SenTix® 980 and TetraCon® 925	1	**7.656 860**
Multi 9430	Single instrument	1	**9.920 134** 2
Multi 9430 Set C	Incl. SenTix® 980 and TetraCon® 925	1	**6.254 755**

Separate IDS electrodes available on request.

1



6.257 359

2



9.920 134

Electrodes - please see page 297

1 2 pH/Ion meter SevenExcellence™ S500

NEW!

Mettler-Toledo Online

Modular professional system for measurements of pH, redox potential, conductivity, salinity/TDS and ion concentration. Fits up to three modules in any composition and order, can be expanded with additional measurement parameters at any time.
- Large, high resolution 7" colour touch display (capacitive), very clear and easy to operate
- Modularity and flexibility; up to 3 measuring modules can work in parallel, expansion to 2 or 3 channels possible
- Universal communication via 2 x USB, Ethernet (LAN) and RS232
- Plain text user interface in 10 languages with menu guidance in full sentences
- OneClick™ operation concept to quickly start frequently used functions and preferred methods
- Storage for user methods
- Highest security and GxP support (ID protection, sophisticated user management, limits/alarms, integrated radio clock, etc.)
- Intelligent sensor management (ISM®)
- Connection of stirrer, sample changer, PC, barcode reader, keyboard, local or network printer possible
- Storage up to 20000 data sets (measurements, calibrations, methods)
- 17 predefined and 60 user-defined methods
- 12 most commonly used ion types pre-programmed for convenience
- 5 point calibration (pH), 8 pre-defined and 20 user-defined buffer groups, incl. temperature chart
- uPlace™ electrode arm with perfect vertical movement
- Compatible with all METTLER TOLEDO electrodes (Recommended: ISM® electrodes)
- Capable of ion concentration measurements using a suitable Ion Selective Electrode
- Methods included for the most common incremental ion measurement techniques

S500-Basic: Includes instrument, 1 x pH/Ion expansion unit, 2 x blank expansion units, uPlace™ electrode holder, semi-transparent cover, operating instructions, installation and quick guide, LabX® direct pH PC software, declaration of conformity and test certificate.
S500-Kit: As S500-Basic, but also with InLab® Expert Pro-ISM, guide to pH measurements and 2 buffer sachetsfor pH 4.01, 7.00, 9.21 and 10.00.
S500-Bio: As S500-Kit but with InLab® Routine Pro-ISM cable kit instead of InLab® Expert Pro-ISM.
S500-F: As S500-Kit but with PerfectION™ Fluoride instead of InLab® Expert Pro-ISM.

Specifications	**Measuring range // Resolution // Accuracy**
Temperature MTC/ATC:	-30.0 to 130.0°C // 0.1°C // ±0.1°C
pH:	-2.000 to 20.000 // 0.001/0.01/0.1 // ±0.002
mV:	-2000.0 to 2000.0 // 0.1/1 // ±0.1
Rel. mV:	-2000.0 to 2000.0 // 0.1/1 // ±0.1
Ion concentration:	0 to 999 999 mg/L, ppm // 0.001to 1 // ±0.5%
	0 to 100 mol/L, % // 0.0001 to 1 // ±0.5%
	0 to 100 000 mmol/L // 0.001 to 1 // ±0.5%
	-2 to 20 pX // 0.001 to 1 // ±0.5%

Type	PK	Cat. No.
S500-Basic	1	**9.704 357**
S500-Kit	1	**9.704 358**
S500-Bio	1	**9.704 359**
S500-F	1	**9.704 360**

1



2



1 2 pH/mV, pH/Ion, Conductivity meter, SevenExcellence™ S475

NEW!

Mettler-Toledo Online

Modular professional system for measurements of pH, redox potential, conductivity, salinity/TDS and ion concentration. Fits up to three modules in any composition and order, can be expanded with additional measurement parameters at any time.

- Large, high resolution 7" colour touch display (capacitive), very clear and easy to operate
- Modularity and flexibility; up to 3 measuring modules can work in parallel
- Universal communication via 2 x USB, Ethernet (LAN) and RS232
- Plain text user interface in 10 languages with menu guidance in full sentences
- OneClick™ operation concept to quickly start frequently used functions and preferred methods
- Storage for user methods
- Highest security and GxP support (ID protection, sophisticated user management, limits/alarms, integrated radio clock, etc.)
- Intelligent sensor management (ISM®)
- Connection of stirrer, sample changer, PC, barcode reader, keyboard, local or network printer possible
- Storage up to 20000 data sets (measurements, calibrations, methods)
- 17 predefined, 60 user-defined methods
- 5 point calibration (pH), 13 pre-defined and 20 user-defined buffer groups, incl. temperature chart
- uPlace™ electrode arm with perfect vertical movement
- Compatible with all METTLER TOLEDO electrodes (Recommended: ISM® electrodes)
- Measurement of the ion concentration with the corresponding electrode

S475-Basic: Includes 1 x pH/Ion expansion unit, 1 x pH/mV expansion unit, 1 x conductivity expansion unit, uPlace™ electrode holder, semi-transparent cover, operating instructions, installation and quick guide, LabX® direct pH PC software, declaration of conformity and test certificate.

Specifications	**Measuring range // Resolution // Accuracy**
Temperature range MTC/ATC:	-30.0 to 130.0°C // 0.1°C // ±0.1°C
pH:	-2.000 to 20.000 // 0.001/0.01/0.1 // ±0.002
mV:	-2000.0 to 2000.0 // 0.1/1 // ±0.1
Rel. mV:	-2000.0 to 2000.0 // 0.1/1 // ±0.1
ISFET pH:	0.000 to 14.000 // 0.001/0.01/0.1 // ±0.05
Ion concentration:	0 to 999 999 mg/L, ppm // 0.001to 1 // ±0.5%
	0 to 100 mol/L, % // 0.0001 to 1 // ±0.5%
	0 to 100 000 mmol/L // 0.001 to 1 // ±0.5%
	-2 to 20 pX // 0.001 to 1 // ±0.5%
Conductivity:	0.001 to 999999 µS/cm // 0.001 to 1 // ±0.5%
	0.001 to 2000 mS/cm // 0.001 to 1 // ±0.5%
	0.001 to 200 S/m // 0.0001 to 1 // ±0.5%
	0.001 to 200000 mS/m // 0.0001 to 1 // ±0.5%
	0.1 to 999999 µS/m // 0.001 to 1 // ±0.5%
TDS:	0.001 to 1000 g/L , ppt // 0.001 to 1 // ±0.5%
	0.001 to 999999 mg/L , ppm // 0.001 to 1 // ±0.5%
Salinity:	0.01 to 80.0 psu , ppt // 0.01 to 0.1 // ±0.5%
Resistivity:	0.01 to 100.0 MΩxcm // 0.0001 to 1 // ±0.5%
	0.01 to 999999 Ωxcm // 0.01 to 1 // ±0.5%
Conductivity Ash:	0.000 to 2022% // 0.001 to 1 // ±0.5%

Type	PK	Cat. No.
S475	1	**9.704 364**

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2



E & OE.

1 Compact balances Type EMB



Kern & Sohn GmbH

Economically priced, battery-operated models. Large LCD readout with 16mm high digits.
"Weigh-in" function simplifies mixing. Supplied with 4 x 1.5V AA batteries.
With d.c. power connection socket (accessory mains adapter available at extra cost).
Auto-off function activates after 3 minutes without use for saving battery power.

Dimensions WxDxH: 170 x 240 x 38mm
Net weight: approx. 600g

Type	Capacity g	Readability g	Reproducibility ± g	Linearity ± g	Plate diam. mm	PK	Cat. No.
EMB 100-3	100	0.001	0.001	0.003	82	1	**6.238 426**
EMB 200-2	200	0.01	0.01	0.02	105	1	**9.901 320**
EMB 600-2	600	0.01	0.01	0.03	105	1	**9.901 321**
EMB 1000-2	1000	0.01	0.01	0.03	150	1	**6.235 728**
EMB 500-1	500	0.1	0.1	0.2	150	1	**9.901 322**
EMB 1200-1	1200	0.1	0.1	0.3	150	1	**9.901 323**
EMB 5.2K1	5200	1.0	1.0	3.0	150	1	**9.901 324**
EMB 2200-0	2200	1.0	1.0	2.0	150	1	**9.901 371**
EMB 5.2 K 5	5200	5.0	5.0	10.0	150	1	**9.901 372**

2 Pocket Balances Type JE



OHAUS

Simple, compact and handy. Ideal for precise weighing in the field.
- Automatic calibration, using external weight
- Large, high-contrast, liquid crystal display with back light
- Robust plastic housing
- Auto-off function prolongs battery life
- Includes protective cover and batteries
- Dimensions (WxDxH): 136 x 83 x 20mm

Type	Capacity g	Readability g	Plate dimensions mm	PK	Cat. No.
JE120	120	0.1	83 x 76	1	**9.902 413**
JE250	250	0.1	83 x 76	1	**9.902 414**
JE500	500	0.1	83 x 76	1	**9.902 415**

3 Portable electronic balances, CS series



OHAUS

Compact and practical with choice of weighing ranges from 200g to 5000g
- Sleek, low-profile housing
- Stainless steel weighing pan
- Large, 11mm high digital display
- Energy-saving, automatic switch-off
- Robust plastic construction
- Battery or mains operation

Supplied with 3 x 1.5V AAA batteries and mains adapter.

Dimensions WxDxH: 135 x 193 x 39mm
Accessories: 1050ml plastic container

Type	Capacity g	Readability g	Plate dimensions mm	PK	Cat. No.
CS200	200	0.1	146 x 133	1	**9.950 222**
CS2000	2000	1.0	146 x 133	1	**9.950 223**
CS5000	5000	1.0	146 x 133	1	**9.950 224**

Accessories for Portable electronic balances, CS series

OHAUS

Description	PK	Cat. No.
Plastic container, 1050ml	1	**9.947 300**
Stainless steel weighing pan cover	1	**9.947 302**

1



2



1 2 Portable Balances, Scout® Pro series

OHAUS

The Scout® Pro offers simple operation and higher resolution to accommodate more applications than ever before:

- High contrast, LCD display.
- Parts counting, percentage weighing, check weighing, totalisation, weigh-below facility, display-hold-function
- Simple, two-button operation
- Density determination kit for automatic specific gravity calculations (optional accessory)
- Optional USB or RS232 interface accessories (cable included)
- Battery or AC operation (AC adapter included)
- 1 mg readability model supplied with draught shield
- Energy saving, auto switch-off
- Below-balance weighing (weighing hook included)

Type	Capacity g	Readability g	Plate dimensions mm	PK	Cat. No.
SPU123	120	0.001	90 dia.	1	**9.902 420**
SPU202	200	0.01	120 dia.	1	**9.902 421**
SPU402	400	0.01	120 dia.	1	**9.902 422**
SPU401	400	0.1	120 dia.	1	**9.902 423**
SPU602	600	0,01	120 dia.	1	**9.902 428**
SPU601	600	0.1	165 x 142	1	**9.902 424**
SPU2001	2000	0.1	165 x 142	1	**9.902 425**
SPU4001	4000	0.1	165 x 142	1	**9.902 426**
SPU6000	6000	1	165 x 142	1	**9.902 427**
SPU6001	6000	0,1	165 x 142	1	**9.902 429**

3



3 Balances, electronic, precision, 572 series

Kern & Sohn GmbH

Weighing speed adjustable in two stages. Unit transfer to bullion and non-metric units of weight. With calibration adjustment programme. With net/total weighing. Piece counting: 1, 5, 10 or 20 reference pieces. Percentage weighing. Bi-directional RS232C data output supplied.
Ultra low-profile, metal casing (WxDxH): 150 x 310 x 60mm. Supplied with mains adapter for 230V 50/60Hz.
Balances can be alternatively operated by accessory batteries.
Also available with DKD certified calibration weight, thermal printer, statistic printer, rechargeable battery pack or label printer at additional cost.

Type	Capacity g	Readability g	Reproducibility ± g	Linearity ± g	Plate dimensions mm	PK	Cat. No.
572-31*	301	0.001	0.001	0.005	106 diam.	1	**9.900 990**
572-32*	421	0.001	0.001	0.005	106 diam.	1	**6.229 315**
572-33	1610	0.01	0.01	0.03	150 diam.	1	**9.901 333**
572-35	2410	0.01	0.01	0.03	150 diam.	1	**9.901 335**
572-37	3010	0.01	0,01	0.05	160 x 200	1	**6.227 789**
572-45	12100	0.05	0.05	0.15	160 x 200	1	**9.900 991**
572-49	16100	0.1	0.1	0.3	160 x 200	1	**9.901 336**
572-57	24100	0.1	0.1	0.3	160 x 200	1	**9.901 354**

*with removable draught shield



1 Precision Balances Pioneer™

Designed to meet simple weighing needs at best price *OHAUS*

- Weighing (18 units + 1 custom unit), parts counting, percentage weighing
- LCD readout
- Mains power
- RS232 for sending balance ID and weight
- Solid, diecast, metal housing, stainless steel pan
- Fixed, integral, weigh-below hook, all-glass draught shield with 3 sliding doors for 1mg models, front levelling bubble, menu and calibration locks
- EC Type approved versions also available (models ending in M)

1



Type	Capacity g	Readability	Plate diam. mm	Description	PK	Cat. No.
PA213	210	1mg	120	external calibration	1	**9.902 130**
PA213C	210	1mg	120	internal calibration	1	**9.902 131**
PA213CM	210	1mg	120	internal calibration	1	**9.902 132**
PA413	410	1mg	120	external calibration	1	**9.902 133**
PA413C	410	1mg	120	internal calibration	1	**9.902 134**
PA413CM	410	1mg	120	internal calibration	1	**9.902 135**
PA512	510	0.01g	180	external calibration	1	**9.902 136**
PA512C	510	0.01g	180	internal calibration	1	**9.902 137**
PA512CM	510	0.01g	180	internal calibration	1	**9.902 138**
PA2102	2100	0.01g	180	external calibration	1	**9.902 139**
PA2102C	2100	0.01g	180	internal calibration	1	**6.234 850**
PA2102CM	2100	0.01g	180	internal calibration	1	**9.902 141**
PA4102	4100	0.01g	180	external calibration	1	**9.902 142**
PA4102C	4100	0.01g	180	internal calibration	1	**9.902 143**
PA4102CM	4100	0.01g	180	internal calibration	1	**9.902 144**
PA4101	4100	0.1g	180	external calibration	1	**9.902 145**
PA4101C	4100	0.1g	180	internal calibration	1	**9.902 146**
PA4101CM	4100	0.1g	180	internal calibration	1	**9.902 147**

Precision balance KB

Convenience model at an economical price *Kern & Sohn GmbH*

- for applications that require verification, please order verification at the same time, verification at a later date is not possible.
- user guidance step by step in the display
- freely programmable weighing units, e.g. display directly in special units such as the length of thread g/m, paper weight g/m², or similar
- precise counting. The automatic reference optimization gradually improves the average value of the piece weighing
- numerical tare deduction for container weighing. Useful when checking loads
- ring-shaped draft shield standard, 90 x 40mm dia. x ht. for models with readability d = 0.001g

Also available with DKD certified calibration weight, thermal printer, statistics printer at additional cost.

2



9.901 403

Type	Capacity g	Readability g	Reproducibility ± g	Linearity ± g	Plate dimensions mm	PK	Cat. No.
KB 120-3N	121	0.001	0.001	0.003	81 diam.	1	**6.234 511**
KB 240-3N	241	0.001	0.001	0.003	81 diam.	1	**6.235 214**
KB 360-3N	361	0.001	0.001	0.003	81 diam.	1	**9.901 402**
KB 1200-2N	1210	0.01	0.01	0.03	130 x 130	1	**6.233 613**
KB 2000-2N	2010	0.01	0.01	0.03	130 x 130	1	**6.231 607**
KB 2400-2N	2410	0.01	0.01	0.03	130 x 130	1	**9.901 403** 2
KB 3600-2N	3610	0.01	0.01	0.05	130 x 130	1	**9.901 404**
KB 10K0.05N	10100	0.05	0.05	0.15	150 x 170	1	**9.901 405**
KB 10000-1N	10100	0.1	0.1	0.3	150 x 170	1	**9.901 406**
KB 650-2NM	650	0.01	0.01	0.03	130 x 130	1	**9.901 407**
KB 6500-1NM	6500	0.1	0.1	0.2	150 x 170	1	**9.901 409**

1



9.901 329

Precision balance PLE-N

NEW!

Low-cost precision balance with wide range of functions *Kern & Sohn GmbH*

- Compact size, practical for small spaces
- Percentage determination: makes it possible to store a given weight value (100%) and to determine deviations from this target value
- Weighing with tolerance range (checkweighing): Input of an upper/lower limit value. A visual signal assists with portion division, dispensing or grading
- Weighing sum memory adds individual weighing results
- Ring-shaped draft shield standard, only for models with weighing plate sizes dia. 80mm. Removable metal cover with pipette opening. Weighing space (Ø x H): 125 x 70mm

Specifications

Overall dimensions, without draft shield (WxDxH):	185 x 250 x 80mm
Dimensions weighing space (Ø x H):	125 x 70mm
Weight:	approx: 2.5kg

2



9.901 356

Type	Capacity g	Readability g	Reproducibility ± g	Linearity ± g	Plate diam. mm	PK	Cat. No.
PLE 420-3N	420	0.001	0.002	0.004	80	1	**9.901 329** 1
PLE 4200-2N	4200	0.01	0.02	0.04	135	1	**9.901 356** 2
ALT-A02 Density set						1	**9.900 968**

3



3 Precision balances type EW-N and EG-N

High quality laboratory balances, housed in a robust and stable plastic casing. *Kern & Sohn GmbH*
With bar graph capacity display which shows the current available weighing range remaining.
Fitted with protective working cover for casing and keyboard. Suitable for EC verification (factory option at additional cost - details on request). Convenient, internal automatic calibration (only type EG-N) as well as extensive configuration and a menu of applications. Draught shield supplied with all 0.001g readability models. Additionally supplied with parts counting facility, percentage weighing function, flush-mounted platform. Optional available: Thermal printer, statistics printer, internal Akku-Pack, DKD calibration certificate for balance and optional test weight.

Type	Capacity g	Readability g	Reproducibility ± g	Linearity ± g	Plate dimensions mm	External dimensions (W x D x H) mm	PK	Cat. No.
EW220-3NM	220	0.001	0.001	0.002	Ø 118	182 x 235 x 75	1	**9.901 007**
EW420-3NM	420	0.001	0.001	0.003	Ø 118	182 x 235 x 75	1	**9.901 008**
EW620-3NM	620	0.001	0.001	0.003	Ø 118	182 x 235 x 75	1	**9.901 009**
EW820-2NM	820	0.01	0.01	0.01	170 x 142	182 x 235 x 75	1	**9.901 010**
EW2200-2NM	2200	0.01	0.01	0.01	180 x 160	192 x 265 x 87	1	**9.901 011**
EW4200-2NM	4200	0.01	0.01	0.02	180 x 160	192 x 265 x 87	1	**9.901 012**
EW6200-2NM	6200	0.01	0.01	0.03	180 x 160	192 x 265 x 87	1	**9.901 013**
EW12000-1NM	12000	0.1	0.1	0.2	180 x 160	192 x 265 x 87	1	**9.901 014**
EG220-3NM*	220	0.001	0.001	0.002	Ø 118	182 x 235 x 75	1	**9.901 018**
EG420-3NM*	420	0.001	0.001	0.003	Ø 118	182 x 235 x 75	1	**9.901 019**
EG620-3NM*	620	0.001	0.001	0.004	Ø 118	182 x 235 x 75	1	**9.901 015**
EG2200-2NM*	2200	0.01	0.01	0.01	180 x 160	192 x 265 x 87	1	**9.901 016**
EG4200-2NM*	4200	0.01	0.01	0.02	180 x 160	192 x 265 x 87	1	**9.901 017**

*calibratable
Outer dimensions without wind shield.

1 Precision balance PKT

NEW!

Touchscreen laboratory balance with extensive range of functions

Kern & Sohn GmbH



- Large touch-sensitive, backlit screen with very good contrast for easy operation and convenient reading, digit height 15mm, screen diagonal 4.3" (approx. 109mm): Easy input of text and values, clear menu structure, weighing with tolerance range (checkweighing), 40 memories for each mode
- Robust metal housing, ensures stability, protects the weighing technology elements and is robust enough to cope with everyday use
- Ring-shaped draft shield standard for models with weighing plate sizes of 106mm, weighing space (Ø x H): 157mm x 57mm

Modes: weighing, counting, dispensing, recipe weighing, checkweighing, totalising with daily total, percentage determination, animal weighing, surface weight
Functions: capacity display, dispensing assistance (subtractive, additive), Net/Gross display, permanently on, variable reference quantity, automatic reference optimisation, tare deduction numerical or from the memory unit, input of item or batch description, operator etc., freely programmable weighing unit, e.g. display directly in special units such as length of thread g/m, paper weight g/m2, or similar, date/time, statistical function, GLP printout, individual printout configuration

Specifications

Overall dimensions, without draught shield (WxDxH):	180 x 310 x 90 mm
Dimensions weighing space (Ø x H):	157 x 57 mm
Permissible ambient temperature:	10°C/40°C

Type	Capacity g	Readability g	Reproducibility ± g	Linearity ± g	Plate dimensions mm	PK	Cat. No.
PKT 300-3	301	0.001	0.002	0,005	Ø 106	1	**9.901 423**
PKT 420-3	421	0.001	0.002	0,005	Ø 106	1	**9.901 424**
PKT 3000-2	3010	0.01	0.02	0.05	Ø 150	1	**9.901 425**
PKT 12K0.05	12100	0.05	0.05	0.15	160 x 200	1	**9.901 426**
PKT 16K0.1	16100	0.1	0.1	0.3	160 x 200	1	**9.901 427**
PKT 24K0.1	24100	0.1	0.1	0.3	160 x 200	1	**9.901 428**

Precision balance Type PLS

Kern & Sohn GmbH

- ergonomically optimised keypad for left and right-handed users
- ring-shaped glass draught shield standard for all models with 0.001g resolution.
  Removable metal cover with pipette opening. Weighing space 150mm dia., height 60mm
- count/weight switchover at the press of a button
- precise counting. The automatic optimisation of reference weight gradually improves the average value of the piece weight.
  The automatic optimisation of reference weight gradually improves the average value of the piece weight
- weighing with tolerance range Input of an upper/lower limit value. A visual signal assists with portion division, dispensing or grading
- percentage determination makes it possible to store a given weight value (100%) and to determine deviations from this target value in %
- density determination of liquids and solids with immediate display of the density on the display
- pre-Tare function for manual deduction of a known container weight. Useful for checking fill-levels

Type	Weighing range g	Readability g	Reproducibility ± g	Linearity ± g	Plate dimensions mm	PK	Cat. No.
PLS 420-3F	420	0.001	0.001	0.004	Ø 110	1	**9.901 442** 2
PLS 720-3A	720	0.001	0.001	0.002	Ø 110	1	**9.901 413**
PLS 1200-3A	1200	0.001	0.001	0.002	Ø 110	1	**9.901 414**
PLS 4200-2F	4200	0.01	0.01	0.04	Ø 160	1	**9.901 422**
PLS 6200-2A	6200	0.01	0.01	0.03	Ø 160	1	**9.901 418** 3
PLS 8000-2A	8000	0.01	0.01	0.03	Ø 160	1	**9.901 443**
PLS 20000-1F	20000	0.1	0.1	0.4	200 x 175	1	**9.901 444** 4

2



9.901 442

3



9.901 418

4



9.901 444

Brushes please see page 1135.

1



9.901 357

Precision balance Type PFB

NEW!

Kern & Sohn GmbH

Low-cost model based on a concept of easy use: All primary functions have their own key on the keypad
- Calibratable
- Compact size, practical for small spaces
- Capacity display: A bar lights up to show how much of the weighing range is still available
- Level indicator and foot screws to level the balance precisely, fitted as standard, to give the most accurate weighing results
- Draft shield standard for models with weighing plate sizes diam. 120mm. Removable metal cover with pipette opening.
- Separate second display standard for models PFB 600-1M and PFB 6000-0M. Suitable for direct sales to the public when the verification value is the same as the readout. Large backlit LCDdisplay, Digit height 16 mm. Interface cable to the balance, Cable length approx. 1 m, and Mains adapter external standard.
  Dimensions (WxDxH): 250 x 180 x 105mm

2



7.658 057

Specifications

Overall dimensions, without draft shield (WxDxH):	200 x 260 x 87mm
Dimensions weighing space (WxDxH):	158 x 143 x 64mm
Weight:	approx: 2kg

Type	Capacity g	Readability g	Reproducibility ± g	Linearity ± g	Verifiable readability g	Plate dimensions mm	PK	Cat. No.
PFB 600-2M	600	0.01	0.01	0.02	0.1	Ø 120	1	**9.901 357** 1
PFB 600-1M	600	0.1	0.1	0.1	0.1	Ø 120	1	**9.901 358**
PFB 6000-1M	6000	0.1	0.1	0.3	1	155 x 145	1	**7.658 057** 2
PFB 6000-0M	6000	1	1	1	1	155 x 145	1	**9.901 359**



KERN
WAAGEN · GEWICHTE · BALANCES · WEIGHTS

KERN – Precision in weighing technology

Custom-made weighing solutions with the latest weighing technology for highest demands - through the **KERN Single Cell Technology.**

Efficiency and user friendliness - use the many advantages of the innovative **KERN touch-screen models.**

We can **supply** this **manufacturer's whole product range !**

partner of the LLG Lab Logistics Group

KERN
WAAGEN · GEWICHTE · BALANCES · WEIGHTS

E & OE.

1 Platform balance "Precise" Type IKT

NEW!

Kern & Sohn GmbH



1

- Innovative touchscreen: Large touch-sensitive, backlit screen (digit height 18mm) with very good contrast for easy operation and convenient reading
- Maximum transparency: All function keys are labelled with plain text which ensures that they are easily understood. The menu tree overlay in the info bar allows you to see at a glance which function is currently in use
- No more errors or lost time through keys which have several functions or unclear markings
- Large keys, which can also be operated while wearing gloves
- Convenient recipe weighing: 5 recipes each with 7 components can be stored in plain text
- Permissible ambient temperature 10°C/40°C
- only IKT-M: with EC type approval

Standard Data interfaces:
- Data interface RS-232 to connect the balance to a printer, PC or network
- Control outputs (optocoupler, digital I/O) to connect relays, signal lamps, valves etc. (35V/80mA)

Type	Readability g	Capacity g	Min. piece weight (PW min) g/piece	Plate dimensions mm	PK	Cat. No.
IKT 3K0.01S	0.01	3000	0.01	228 x 228	1	**9.901 460**
IKT 8K0.05	0.05	8000	0.05	305 x 315	1	**9.901 461**
IKT 10K0.1S	0.1	10000	0.1	228 x 228	1	**9.901 462**
IKT 30K0.1	0.1	30000	0.1	305 x 315	1	**9.901 463**
IKT 60K0.2L	0.2	60000	0.2	450 x 350	1	**9.901 464**
IKT 6K1M	1.0	6000	1	305 x 315	1	**9.901 465**
IKT 12K2M	2.0	12000	2	305 x 315	1	**9.901 466**
IKT 30K5M	5.0	30000	5	305 x 315	1	**9.901 467**
IKT 60K10LM	10.0	60000	10	450 x 350	1	**9.901 468**

Precision balance "Precise" Type PBS/PBJ

NEW!

Kern & Sohn GmbH



2

6.255 611

- only PBJ: Automatic internal adjustment in the case of a change in temperature or time-controlled at defined intervals
- Metal housing: robust and sturdy
- Large backlit LCDdisplay, digit height 14 mm
- Dosage aid: High-stability mode and other filter settings can be selected
- Weighing with tolerance range (checkweighing): Input of an upper/lower limit value. A visual signal assists with portion division, dispensing or grading
- Totalizing of individual weighing results
- Identification number: 4 numeric positions, printed on calibration protocol
- Automatic data output to the PC/printer every time the balance is steady
- Draft shield standard, on all models with readout d = 0.001 g, weighing space (WxDxH): 180 x 193 x 87mm

Single-cell advanced technology:
- Fully automatic manufactured weighing cell from one piece of material
- Stable temperature behaviour
- Short stabilisation time: 3 sec
- Shock proof construction
- High corner load performance



3

7.910 128

Specifications

Overall dimensions, without draft shield (WxDxH):	209 x 322 x 78mm
Dimensions weighing space (WxDxH):	180 x 193 x 87mm
Permissible ambient temperature:	10°C/30°C
Weight:	approx. 3kg

Type	Readability g	Capacity g	Reproducibility ± g	Linearity ± g	Plate dimensions mm	PK	Cat. No.
PBS 620-3M	0,001	620	0,001	0,002	108 x 105	1	**7.657 889**
PBS 4200-2M	0,01	4200	0,01	0,02	170 x 180	1	**6.255 611** 2
PBS 6200-2M	0,01	6200	0,01	0,02	170 x 180	1	**9.901 445**
PBJ 620-3M	0,001	620	0,001	0,002	108 x 105	1	**7.910 128** 3
PBJ 4200-2M	0,01	4200	0,01	0,02	170 x 180	1	**6.245 038**
PBJ 6200-2M	0,01	6200	0,01	0,02	170 x 180	1	**6.236 719**
PBJ 8200-1M	0,1	8200	0,1	0,2	170 x 180	1	**6.257 002**

1



1 Analytical balance KERN ABS-N/ABJ-NM

NEW!

The bestseller in analytical balances, now with high-quality single-cell weighing system and EC type approval (Type ending M) *Kern & Sohn GmbH*

- Only ABJ-N: Automatic internal adjustment in the case of a change in temperature >2°C or time-controlled every 4 hours
- Only ABS-N: Adjusting program CAL, external test weights at an additional price
- Dosage aid: High-stability mode and other filter settings can be selected
- Simple recipeweighing and documenting with a combined tare/print function. In addition, the mixing ingredients for the recipe are numbered automatically and printed out with their corresponding number and weight value
- Identification number: 4 numeric positions, printed on calibration protocol
- Automatic data output to the PC/printer each time the balance reaches a steady state

Single-cell advanced technology:
- Fully automatic manufactured weighing cell from one piece of material
- Stable temperature behaviour
- Short stabilisation time: Steady weight values within approx. 3sec under laboratory conditions
- Shock proof construction
- High corner load performance

Specifications

Overall dimensions (WxDxH):	210 x 340 x 325mm
Dimensions weighing space (WxDxH):	174 x 162 x 227mm
Permissible ambient temperature:	10°C/30°C
Net weight:	approx. 6kg

Type	Capacity g	Readability mg	Reproducibility ± mg	Linearity ± mg	Plate diam. mm	PK	Cat. No.
ABS 80-4N	80	0.1	0.2	0.3	91	1	**9.901 451**
ABS 120-4N	120	0.1	0.2	0.3	91	1	**9.901 452**
ABS 220-4N	220	0.1	0.2	0.3	91	1	**9.901 453**
ABS 320-4N	320	0.1	0.2	0.3	91	1	**9.901 454**
ABJ 80-4NM	80	0.1	0.2	0.3	91	1	**9.901 455**
ABJ 120-4NM	120	0.1	0.2	0.3	91	1	**9.901 456**
ABJ 220-4NM	220	0.1	0.2	0.3	91	1	**6.257 572**
ABJ 320-4NM	320	0.1	0.2	0.3	91	1	**9.901 457**

2



2 Analytical balances AES-N/AEJ-NM

NEW!

Compact high-end semi micro balance with useful pipette calibration program *Kern & Sohn GmbH*

- only AEJ-NM: Automatic internal adjustment in the case of a change in temperature > 0.8°C or time-controlled every 3 hours
- Intuitive pipette calibration function to ensure data integrity and to minimise the risks in the daily work with your pipettes
- Vmin: 10% of the volume, Va: Arithmetic mean, Es: Systematic error, Vmax: 100 of the volume, Sr: Standard deviation
- GLP/ISO record keeping of weight values with date, time and serial number
- Higher weighing speed by switching off the last digit
- Totalizing of weights (manual/automatic)
- Modern all glass draft wind shield for optimal visibility of the weighing object
- Dispensing mode: By pressing one key you can set all relevant parameters for this dispensing process
- Large backlit LCD display, digit height 17 mm
- Calibratable (only AEJ-NM)

Specifications

Overall dimensions (WxDxH):	206 x 335 x 335 mm
Dimensions weighing space (WxDxH):	168 x 160 x 225 mm
Permissible ambient temperature:	18°C/30°C
Net weight:	approx. 5.4kg

Type	Weighing range g	Readability mg	Reproducibility ± mg	Linearity ± mg	Plate diam. mm	PK	Cat. No.
AES 100-4N	160	0.1	0.2	0.2	85	1	**9.900 945**
AES 200-4N	220	0.1	0.2	0.2	85	1	**9.900 946**
AEJ 100-4NM	160	0.1	0.2	0.3	85	1	**9.900 947**
AEJ 200-4NM	220	0.1	0.2	0.3	85	1	**9.900 948**
AEJ 200-5NM	80 / 220	0.01 / 0.1	0.04 / 0.1	0.1 / 0.2	85	1	**9.900 949**

1 Balances, electronic, analytical, "Precise" ABT series

Kern & Sohn GmbH

Analytical and semi-microbalances which are suitable for verification.
All models have automatic calibration adjustment function by internal, motor-driven, calibration weight. It is possible to log ISO/GLP-compliant weighing or calibration data at any time via an accessory printer (not supplied) or data interface (bi-directional RS232-C).
Additionally, the balances have formulation, piece counting and percentage determination functions, as well as a flush-mounted weighing platform. All models are supplied with a modern, all-glass draught shield with sliding doors to the left, right and top.
Also available with DKD certified, calibration weight, ionizer, thermal printer, statistic printer at additional cost.

Single-cell advanced technology:
- Fully automatic manufactured weighing cell from one piece of material
- Stable temperature behaviour
- Short stabilisation time: Steady weight values within approx. 5 sec under laboratory conditions
- Shock proof construction
- High corner load performance

1



Weighing pan, stainless steel:	80mm dia.
Weighing chamber (WxDxH):	168 x 172 x 223mm
Dimensions (WxDxH):	217 x 356 x 338mm
Mains adapter:	220V

Type	Weighing range g	Readability mg	Reproducibility ± mg	Linearity ± mg	Plate diam. mm	PK	Cat. No.
ABT 120-4M	120	0.1	0.1	0.2	80	1	**9.900 955**
ABT 220-4M	220	0.1	0.1	0.2	80	1	**9.900 956**
ABT 320-4M	320	0.1	0.1	0.3	80	1	**9.900 957**
ABT 100-5M	101	0.01	0.05	0.15	80	1	**6.241 274**
ABT 120-5DM	42 / 120	0.01 / 0.1	0.02 / 0.1	0.05 / 0.2	80	1	**9.900 958**
ABT 220-5DM	82 / 220	0.01 / 0.1	0.05 / 0.1	0.1 / 0.2	80	1	**9.900 959**

2 Analytical balance Pioneer™

OHAUS

Designed to meet simple weighing needs at the best price
- Weighing (18 units + 1 custom unit), parts counting, percentage weighing
- LCD readout
- Mains power
- RS232 for outputting balance ID and weight
- Solid, diecast, metal housing, stainless steel pan
- Fixed, integral, weigh-below hook, all-glass draught shield with 3 sliding doors, front levelling bubble, menu and calibration locks
- EC Type approved versions also available (models ending in M)

2



Type	Weighing range g	Readability mg	Plate diam. mm	PK	Cat. No.
PA64	65	0.1	90	1	**6.234 827**
PA64C	65	0.1	90	1	**9.902 151**
PA64CM	65	0.1	90	1	**9.902 152**
PA114	110	0.1	90	1	**6.233 682**
PA114C	110	0.1	90	1	**9.902 154**
PA114CM	110	0.1	90	1	**9.902 155**
PA214	210	0.1	90	1	**9.902 156**
PA214C	210	0.1	90	1	**6.233 795**
PA214CM	210	0.1	90	1	**9.902 158**

1 Analytical and Precision Balances Explorer®

NEW!

OHAUS

Highest performance, most technically advanced balance from OHAUS
- High resolution multi-lingual colour VGA touch display with icons for simple operation
- Programmable multi-functional touch-free sensors for cleanliness, speed and safety
- Multiple application modes plus library for storage of personal application settings
- EC Type approved versions also available (models ending with M)

Application: Weighing (17 units + custom units), Parts Counting, % weighing, Animal/Dynamic Weighing, Checkweighing, Filling, Totalization, Formulation, Differential weighing, Density determination, Peak hold, Ingredient costing, Pipette adjustment, Gross/Net/Tare Weighing
Display: High resolution 14.5cm (diagonal) full colour VGA touch display including QWERTY and numeric key pads plus weighing capacity indication
Operation: Mains Operation
Communication: Easy access communication ports (USB, RS232) plus 3rd communication port slot (Ethernet or 2nd RS232). GLP and GMP including date and time, Direct Data Transfer
Construction: Metal base, ABS top housing, stainless steel pan, glass draftshield with flip-top, replaceable in-use cover
Design features: 3-door draftshield with removable panels on 0.1mg and 1mg models with draftshield light. Modular display design with adjustable angle (attach to base, wall or optional tower). AutoCal automatic internal calibration. Level assist feature with illuminated level indicator. Selectable environmental and auto-print settings. Integral weigh below hook. Protective in-use cover. Software lock switch

Type	Capacity g	Readability	Plate dimensions mm	PK	Cat. No.
EX124	120	0.1 mg	Ø 90	1	**9.902 370**
EX224	220	0.1 mg	Ø 90	1	**9.902 371**
EX224M	220	0.1 mg	Ø 90	1	**9.902 372**
EX324	320	0.1 mg	Ø 90	1	**9.902 373**
EX324M	320	0.1 mg	Ø 90	1	**9.902 374**
EX223	220	1 mg	Ø 130	1	**9.902 375**
EX423	420	1 mg	Ø 130	1	**9.902 376**
EX423M	420	1 mg	Ø 130	1	**9.902 377**
EX623	620	1 mg	Ø 130	1	**9.902 378**
EX1103	1100	1 mg	Ø 130	1	**9.902 379**
EX1103M	1100	1 mg	Ø 130	1	**9.902 380**
EX2202	2200	0.01 g	180 x 210	1	**9.902 381**
EX4202	4200	0.01 g	180 x 210	1	**9.902 382**
EX4202M	4200	0.01 g	180 x 210	1	**9.902 383**
EX6202	6200	0.01 g	180 x 210	1	**9.902 384**
EX10202	10200	0.01 g	180 x 210	1	**9.902 385**
EX10202M	10200	0.01 g	180 x 210	1	**9.902 386**
EX6201	6200	0.1 g	180 x 210	1	**9.902 387**
EX10201	10200	0.1 g	180 x 210	1	**9.902 388**
EX10201M	10200	0.1 g	180 x 210	1	**9.902 389**

1



Accessories for analytical balance Explorer®

NEW!

OHAUS

Type	PK	Cat. No.
Second RS232 interface	1	**9.902 360**
Ethernet interface	1	**9.902 361**
Terminal extension cable	1	**9.902 362**
Density determination kit	1	**9.902 363**
Tower kit	1	**9.902 364**
Foot switch	1	**9.902 365**
Draft Shield Kit	1	**9.902 366**
USB Interface Cable (Type A to B)	1	**9.902 368**
Theft protection clamp	1	**9.947 316**

1 Semi-Micro and Analytical Balances Discovery

The Professional´s Choice for Analytical Applications up to 0.01mg *OHAUS*

- Rear mount load cell for ultimate accuracy
- Advanced AutoCal™ (2 internal calibration weights)
- 2 line backlit LCD & SmarText™ software to guide user through set-up and applications

Application: Weighing (11 units + 1 custom unit), parts counting, checkweighing, percentage weighing, totalisation, dynamic weighing, gross/net/tare, pipettecalibration, density determination, statistics, high point

Display: 2-line backlit LCD

Communication: RS232, GLP including date and time

Construction: Steel and shatter proof glass, stainless steel weighing pan

Design Features: Fixed integral weigh-below hook, 3-door draught shield, environmental settings, in-use display cover, advanced AutoCal™ (2 internal weights), SmarText™ software

EC Type approved versions also available.

1



Type	Weighing range g	Readability mg	Plate diam. mm	PK	Cat. No.
DV114C	110	0.1	90	1	**9.902 160**
DV 114CM**	110	0.1	90	1	**9.902 161**
DV214C	210	0.1	90	1	**6.232 314**
DV 214CM**	210	0.1	90	1	**6.233 833**
DV 314C	310	0.1	90	1	**9.902 164**
DV 314CM**	310	0.1	90	1	**9.902 165**
DV 215CD*	81/210	0.01/0.1	90	1	**6.229 783**
DV 215CDM* **	81/210	0.01/0.1	90	1	**6.227 197**

*Autoranging
**EC Type approved

partner of the LLG Lab Logistics Group

We can supply this manufacturer's whole product range !

OHAUS®

1



1 Halogen Moisture Analyser MLB 50-3N

Kern & Sohn GmbH

- 2 Halogen quartz glass heaters, each 400W
- 10 sample dishes included
- 3 displays for temperature, drying in %, drying time
- Application table. Various examples in the user manual
- CAL adjustment programme. External calibration weights are available at additional cost
- The last value measured remains on the display until it is replaced by a new measurement
- RS 232 interface

Optional accessories: aluminum sample plates , round fiber-glass filter, temperature calibration set, thermo-printer, DKD-calibration certificate for analyzer and optional test weight.

Specifications

Readability:	0.01%/0.001g
Weighing range, max:	50g
Reproducibility, weight of sample 2 g:	0.5%
Reproducibility, weight of sample 10 g:	0.02%
Linearity:	±0.003g
Temperature range:	+50 to +160°C
Dimensions (WxDxH):	201 x 335 x 156mm

Type	PK	Cat. No.
MLB 50-3N	1	**9.901 400**

2



2 Halogen Moisture Analyser DBS 60-3

NEW!

Modern moisture analyser with 10 memories and graphic display

Kern & Sohn GmbH

- Halogen quartz glass heater 400 W
- Backlit LCD display, digit height 15 mm: Previous drying time, current temperature, unit for displaying the results, current moisture content in %, drying mode/Status display drying
- Observation window over the sample, useful during initial adjustment
- Internal memory for automatic sequence of 10 drying programs and 100 drying processes carried out
- The last value measured remains on the display until it is replaced by a new measurement
- Sample description for up to 99 samples, 2 digits, freely programmable, and is printed in the measuring protocol
- Date and time display as standard
- 10 sample plates included
- Table of applications: There are many practical examples in the operating instructions

Specifications

Readability:	0.01 %/0.001g
Weighing range, max:	60g
Reproducibility, weight of sample 2 g:	0.15%
Reproducibility, weight of sample 10 g:	0.02%
Temperature range:	+50 to +200°C
Dimensions (WxDxH):	202 x 336 x 157mm

Type	PK	Cat. No.
DBS 60-3	1	**9.901 441**

Sample dishes - please see page 360

E & OE.

1 Moisture analyser DLT 100-3

NEW!

1



Kern & Sohn GmbH

- Halogen quartz glass heater 400 W
- The last value measured remains on the display until it is replaced by a new measurement
- Innovative touchscreen: Large touch-sensitive, backlit screen with very good contrast for easy operation and convenient reading
- Clear menu structure with plain text labels on the display. The menu and processes are self-explanatory.
- 10 sample plates included
- Balance contains memories for automatic sequence of 300 drying programs (12 free characters for each memory) as well as a further 100 memories for drying processes which have been carried out, which can be recalled individually
- Net weighing assistance to a defined target value (g) with adjustable tolerance range 1% to 25% of the target value
- Simple „step-by-step" user guidance in the display in the following languages: English, German, French, Italian, Spanish, Portuguese

Specifications

Readability:	0.01%/0.001g
Weighing range, max:	160g
Reproducibility, weight of sample 10g:	0.001g
Temperature range:	+35 to +160°C
Dimensions evaluation device (WxDxH):	200 x 150 x 63mm
Overall dimensions (WxDxH):	210 x 340 x 225mm

Type	PK	Cat. No.
DLT 100-3	1	**9.901 440**

2 Moisture balances MB-23 and MB-25

NEW!

2



OHAUS

The Ohaus MB Series Moisture Analyzers MB-23 and MB-25 provide stable results with 0.1% or 0.05% moisture resolution because of precision weighing technology. They are supplied with either an infra-red, or halogen, heating system. Applicable for most applications. Graphical interface control. No programming necessary.

- Halogen (MB-25) or infra-red (MB23) technology
- 110g capacity
- Operating temperature 50^C to 160°C, set in 5°C
- Displayed data: 0.005g/0.05% (MB25) and 0.001g/0.1% (MB23)
- Sample holder included in MB25 but as option in MB23
- Delivered with 50 x 90mm aluminium sample dishes and protective cover

Specifications

Capacity (g):	110
Electricity supply:	100 to 240V 50/60 Hz a.c.
Dimensions (WxHxD):	17 x 13 x 28cm
Net weight (kg):	2.3

Type	Heating	Reproducibility ± g	Readability mg	PK	Cat. No.
MB23	Infra-red heating (no glass)	0.2% (10g sample)	10	1	**9.947 604**
MB25	Halogen heating	0.05% (10g sample)	5	1	**9.947 605**

3 Halogen moisture balance MB-35

3



OHAUS

The basic model MB35 offers the perfect combination of user friendly operation and high resolution (1mg/0.01% readability).

- Halogen-technology (up to 40% faster than infra-red)
- 35g capacity with 0.01%/0.001g readability
- Reproducibility 0.10% - 0.03%
- Temperature range: 50°C to 160°C (5°C increments)
- Backlit graphics display
- One automatic shut-off mode
- Menu-driven in 5 selectable languages
- RS232 Interface
- Compact and robust housing.

Type	Readability	Weighing range g	Plate diam. mm	PK	Cat. No.
MB 35	0.01% / 0.001 g	35	90	1	**9.947 500**

Sample dishes - please see page 360

1



1 Moisture balance MB-45

The professional's choice for high resolution analysis (1mg/0.01% readability). *OHAUS*

- Halogen heating technology
- Menu navigation in 5 selectable languages
- Four, user defined, temperature profiles
- Large, back-lit graphical LCD display
- Three selectable automatic shut-off modes
- Fifty, user-defined, drying programmes
- RS232 data interface
- Statistical function

Specifications

Weighing range:	45g
Readability:	0.01%/0.001g
Temperature range:	50 to 200°C (1°C stages)
Timer:	1.0 to 120 mins. (0.1 min. increments)
Measurement display:	% moisture, % dry substance, % ratio, gram or user defined
Shut-off modes:	Manual, time-controlled, Auto30, Auto60, Auto90 (automatic can be freely selected)
Temperature profile:	Standard, rapid, gentle, gradual
Memory:	50 named drying procedures
Weight calibration:	20g external calibration weight, optional
Dryer calibration.:	100°C and 200°C with optional temperature calibration set
Dimensions WxDxH:	190 x 350 x 150mm
Weight:	4.6kg
Accessories, optional:	Disposable sample dishes, reusable sample dishes, glass fibre filters, theft protection, protective cover, temperature calibration set, calibration weight, printer

Type	PK	Cat. No.
MB-45	1	**9.950 065**

OIML classes

Classes of Accuracy Nominal value	(Tolerance ±)						
	E1	E2	F1	F2	M1	M 2	M 3
1mg	± 0.003 mg	± 0.006 mg	± 0.020 mg	± 0.006 mg	± 0.20 mg		
2mg	± 0.003 mg	± 0.006 mg	± 0.020 mg	± 0.006 mg	± 0.20 mg		
5mg	± 0.003 mg	± 0.006 mg	± 0.020 mg	± 0.006 mg	± 0.20 mg		
10mg	± 0.003 mg	± 0.008 mg	± 0.025 mg	± 0.008 mg	± 0.25 mg		
20mg	± 0.003 mg	± 0.010 mg	± 0.03 mg	± 0.10 mg	± 0.3 mg		
50mg	± 0.004 mg	± 0.012 mg	± 0.04 mg	± 0.12 mg	± 0.4 mg		
100mg	± 0.005 mg	± 0.016 mg	± 0.05 mg	± 0.16 mg	± 0.5 mg	± 1.6 mg	
200mg	± 0.006 mg	± 0.020 mg	± 0.06 mg	± 0.20 mg	± 0.6 mg	± 2.0 mg	
500mg	± 0.008 mg	± 0.025 mg	± 0.08 mg	± 0.25 mg	± 0.8 mg	± 2.5 mg	
1g	± 0.010 mg	± 0.03 mg	± 0.10 mg	± 0.3 mg	± 1.0 mg	± 3.0 mg	± 10 mg
2g	± 0.012 mg	± 0.04 mg	± 0.12 mg	± 0.4 mg	± 1.2 mg	± 4.0 mg	± 12 mg
5g	± 0.016 mg	± 0.05 mg	± 0.16 mg	± 0.5 mg	± 1.6 mg	± 5.0 mg	± 16 mg
10g	± 0.020 mg	± 0.06 mg	± 0.20 mg	± 0.6 mg	± 2.0 mg	± 6.0 mg	± 20 mg
20g	± 0.025 mg	± 0.08 mg	± 0.25 mg	± 0.8 mg	± 2.5 mg	± 8.0 mg	± 25 mg
50g	± 0.03 mg	± 0.10 mg	± 0.3 mg	± 1.0 mg	± 3.0 mg	± 10 mg	± 30 mg
100g	± 0.05 mg	± 0.16 mg	± 0.5 mg	± 1.6 mg	± 5.0 mg	± 16 mg	± 50 mg
200g	± 0.10 mg	± 0.3 mg	± 1.0 mg	± 3.0 mg	± 10 mg	± 30 mg	± 100 mg
500g	± 0.25 mg	± 0.8 mg	± 2.5 mg	± 8.0 mg	± 25 mg	± 80 mg	± 250 mg
1kg	± 0.5 mg	± 1.6 mg	± 5.0 mg	± 16 mg	± 50 mg	± 160 mg	± 500 mg
2kg	± 1.0 mg	± 3.0 mg	± 10 mg	± 30 mg	± 100 mg	± 300 mg	± 1000 mg
5kg	± 2.5 mg	± 8.0 mg	± 25 mg	± 80 mg	± 250 mg	± 800 mg	± 2500 mg
10kg	± 5.0 mg	± 16 mg	± 50 mg	± 160 mg	± 500 mg	± 1600 mg	± 5000 mg
20kg	± 10 mg	± 30 mg	± 100 mg	± 300 mg	± 1000 mg	± 3000 mg	± 10 g
50kg	± 25 mg	± 80 mg	± 250 mg	± 800 mg	± 2500 mg	± 8000 mg	± 25 g
100kg		± 160 mg	± 500 mg	± 1600 mg	± 5000 mg	± 16 g	± 50 g
200kg		± 300 mg	± 1000 mg	± 3000 mg	± 10 g	± 30 g	± 100 g
500kg		± 800 mg	± 2500 mg	± 8000 mg	± 25 g	± 80 g	± 250 g
1000kg		± 1600 mg	± 5000 mg	± 16 g	± 50 g	± 160 g	± 500 g
2000kg			± 10 g	± 30 g	± 100 g	± 300 g	± 1000 g
5000kg			± 25 g	± 80 g	± 250 g	± 800 g	± 2500 g

1 Weight sets, cylindrical shape, polished stainless steel, wooden box, class E2

NEW!

In fully lined wooden boxes, milligram weights in special plastic tray. With a special glove for handling weights, tweezers and dust brush.

Kern & Sohn GmbH

We provide your individual set of weights.

Description	PK	Cat. No.
1 mg - 200 g	1	**6.222 582**

Also available: Single weights from 1mg - 2000 kg or complete weight sets from 1mg - 10kg in OIML-classes E1, E2, F1, F2, M1, M2, M3.



2 LLG weighing scoops, porcelain

NEW!

Length mm	PK	Cat. No.
37	1	**9.115 350**
53	1	**6.241 255**
64	1	**9.115 351**



3 Weighing scoops, stainless steel 18/10

Capacity ml	PK	Cat. No.
3	1	**6.238 169**
6	1	**6.238 170**
10	1	**6.238 171**



4 Weighing scoops, aluminium or glass

Without counterweight.

Length mm	Material	PK	Cat. No.
70	Aluminium	1	**9.301 006**
90	Aluminium	1	**9.301 008**
105	Aluminium	1	**9.301 010**
60	Glass	1	**9.301 026**
80	Glass	1	**9.301 028**
100	Glass	1	**9.301 030**



5 Weighing scoops, glass

Glass. Ideal for powders or granules which are dispensed via the tubular stem.

Capacity ml	PK	Cat. No.
3	1	**9.301 066**
6	1	**9.301 067**
10	1	**9.301 068**



6 Kjeldahl weighing boat 609, parchment paper

Ideal for weighing and transporting all types of sample. Especially for determination of nitrogen according to Kjeldahl (e.g. determination of total protein content in foodstuff).
Made of nitrogen-free parchment paper. Can be dropped into the Kjeldahl flask and be dissolved together with the sample.

GE Healthcare

Width mm	Length mm	Height mm	PK	Cat. No.
10	55	10	100	**9.069 011**





1 LLG-Weighing bottles with NS Stopper, Borosilicate glass 3.3

NEW!

With writing area.
Available in tall or low shape.

Capacity ml	Diam. mm	Height mm	NS	Form	PK	Cat. No.
6	25	25	19/12	low	1	**9.300 151**
10	25	40	19/12	tall	1	**9.300 160**
15	35	30	29/12	low	1	**9.300 152**
15	40	25	34.5/12	low	1	**9.300 150**
20	30	50	24/12	tall	1	**9.300 161**
30	50	30	45/12	low	1	**9.300 153**
45	35	70	29/12	tall	1	**9.300 162**
45	60	30	50/12	low	1	**9.300 154**
70	40	80	34.5/12	tall	1	**9.300 163**
80	80	30	80/12	low	1	**9.300 155**
110	50	80	45/12	tall	1	**9.300 164**



2 Weighing bottles DURAN® with NS Stopper

DURAN®. DIN 12605. With interchangeable NS stopper. With white inscription label.
Burned-in imprint of capacity and size.
Available in high or low shape.

Capacity ml	Diam. mm	Height mm	NS	Form	PK	Cat. No.
6	25	25	24/12	low	1	**9.300 022**
10	25	40	24/12	high	1	**9.300 113**
15	40	25	40/12	low	1	**9.300 021**
15	35	30	34/12	low	1	**9.300 023**
30	50	30	50/12	low	1	**9.300 032**
45	35	70	34/12	high	1	**9.300 123**
45	60	30	60/12	low	1	**9.300 037**
70	40	80	40/12	high	1	**9.300 124**
80	80	30	80/12	low	1	**9.300 041**
110	50	80	50/12	high	1	**9.300 127**



3 LLG-Aluminium weighing dish

Aluminium foil, for sample handling. With a flanged, crimped wall for rigidity.
Finger-tab handle can be etched for identification prior to weighing (Not included on Cat. No. 6.236 854).
Made from oil-free, lightweight aluminium.

Diam. mm	Height mm	PK	Cat. No.
43	12	100	**6.238 138**
57	14	100	**6.238 139**
70	16	100	**6.238 140**
101	8	50	**6.236 854**



4 Sample dishes, Aluminium

Highest quality. Fat free, perfectly flat over entire surface. Ideal for moisture determination in infrared ovens. Sample material can be distributed evenly and reflects the heat uniformly over the complete dish area. Can also be used for precision and analytical weighing. *schuett-biotec*

Diam. mm	Height mm	PK	Cat. No.
100	7	80	**9.106 265**



5 LLG-Weighing boats, antistatic, PS

Biologically inert and resistant to dilute and weak acids, aqueous solutions, alcohols, and bases.
Temperature range -10 to +70°C. Can be used with microwave moisture analysers.
Features a diamond shape that easily flexes for accurate pouring and a wide, flat bottom to resist tipping.

Capacity ml	Dimensions mm	Colour	PK	Cat. No.
5	55 x 35 x 6	white	1000	**9.900 788**
30	78 x 56 x 14	white	500	**9.950 194**
100	119 x 90 x 19	white	250	**9.950 195**
5	55 x 35 x 6	black	1000	**9.900 801**
30	78 x 56 x 14	black	500	**9.950 196**
100	119 x 90 x 19	black	250	**9.950 197**

E & OE.

1 LLG-Hexagonal weighing boats, antistatic, PS

Biologically inert and resistant to dilute and weak acids, aqueous solutions, alcohols, and bases.
Temperature range -10 to +70°C. Can be used with microwave moisture analyzers. Bend flexible boats at points to form pour spouts. Flat bottoms to resist tipping. Sloping sides provide accurate transfer.

Size	Dimensions mm	Colour	PK	Cat. No.
Small	38 x 25 x 9	white	500	**9.900 893**
Medium	64 x 51 x 19	white	500	**9.900 894**
Large	102 x 76 x 22	white	500	**9.900 895**
X-Large	127 x 89 x 31	white	500	**9.900 896**

1



2 LLG-Square weighing boats, antistatic, PS

Biologically inert and resistant to dilute and weak acids, aqueous solutions, alcohols, and bases.
Temperature range -10 to +70°C. Can be used with microwave moisture analysers.
Boats are shallow with a wide, flat bottom to resist tipping. Rounded corners simplify transfer.

Capacity ml	Dimensions (W x D x H) mm	Colour	PK	Cat. No.
7	46 x 46 x 8	White	1000	**9.900 785**
100	85 x 85 x 24	White	1000	**9.900 786**
250	140 x 140 x 22	White	1000	**9.900 787**
7	46 x 46 x 8	Black	1000	**9.900 789**
100	85 x 85 x 24	Black	1000	**9.900 791**
250	140 x 140 x 22	Black	1000	**9.900 800**

2



3 Weighing bottles, PP

PP. Transparent. With push-on lid. *Kartell*

Capacity Litres	Diam. mm	Height mm	PK	Cat. No.
30	30	50	1	**9.300 805**
25	40	30	1	**9.300 810**
65	40	60	1	**9.300 815**
65	60	35	1	**9.300 820**
50	50	30	1	**9.300 825**
200	60	90	1	**9.300 830**
400	70	120	1	**9.300 835**

3



4 Planar weighing apparatus

Glass. For all weighing procedures involving the dispersal of material into a thin layer.

Type	PK	Cat. No.
Planar weighing apparatus	1	**9.300 500**

4



5 Weighing boats MN 808, Paper

Pack of 100 pieces. *MACHEREY-NAGEL*
Paper
Dimensions: 58mm x 10mm x 10mm

Type	PK	Cat. No.
MN808	100	**9.301 069**

Other sizes and weighing aids available on request.

5



1



1 Weighing paper MN 226

Transparent, smooth.
Block of 100 sheets.

MACHEREY-NAGEL

Type	Width mm	Length mm	PK	Cat. No.
MN 226	90	115	100	**9.058 975**

Further weighing aids available on request.

2



2 Weighing Papers

NEW!

- Nitrogen free for a very smooth surface and good sample recovery
- Strong enough to support dense material

Heathrow Scientific

Dimensions (D x W) mm			PK	Cat. No.
76	x	76	500	**9.059 016**
102	x	102	500	**9.059 017**
152	x	152	500	**9.059 018**

3



3 Playing card rejects

Standard size for use as disposable sample carriers or spatulas. Printed and laminated on both sides.
Pack size: 1kg

Type	PK	Cat. No.
Playing card rejects	1	**9.190 940**

4



4 Anti-vibration platform, Vibrasorb

For absorbing and damping vibrations down to 16Hz. Comprises a moulded terazzo slab supported on four vibration absorbers with non-slip feet. Suitable for isolating sensitive analytical instruments such as balances and microscopes. Will support up to 16kg.

Bel-Art Products

Width mm	Depth mm	Height mm	Weight kg	PK	Cat. No.
350	350	76	19	1	**9.941 600**
450	560	76	39	1	**9.951 600**



1 LLG-General purpose thermometer, red filling

Graduation resistant against acids and alkalies.
Breakage protected versions with FEP-coating available on request.



Measuring range °C	Length mm	Graduations °C	Diam. mm	Immersion depth	Capillary	PK	Cat. No.
-35 ... +50	300	1	6 ±1	total	white enameled, round	1	**9.236 720**
-20 ... +110	300	1	6 ±1	total	white enameled, round	1	**6.206 594**
-20 ... +150	300	1	6 ±1	total	white enameled, round	1	**9.236 723**
-10 ... +110	260	1	6 ±1	total	yellow enameled, round	1	**9.236 721**
-10 ... +110	270	1	6 ±1	76mm	yellow enameled, round	1	**9.236 727**
-10 ... +150	260	1	6 ±1	total	yellow enameled, round	1	**9.236 722**
-10 ... +150	260	1	6 ±1	76mm	yellow enameled, round	1	**9.236 728**
-10 ... +200	300	1	6 ±1	total	yellow enameled, round	1	**9.236 724**
-10 ... +200	300	1	6 ±1	total	white enameled, round	1	**9.236 725**
-10 ... +200	300	1	6 ±1	76mm	yellow enameled, round	1	**9.236 729**
-10 ... +250	300	1	6 ±1	total	yellow enameled, round	1	**9.236 726**

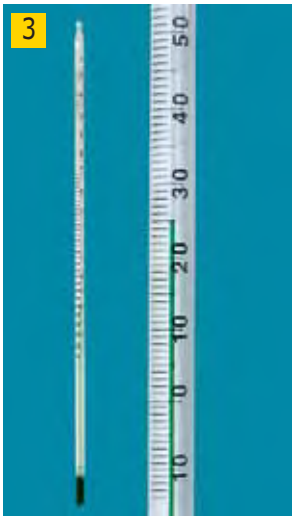
2 LLG- General-purpose thermometers, red filling

Enclosed-scale type, with eyelet. With uncoated, prismatic measuring capillary.
Red spirit filling (except 9.235 265: blue).

Measuring range °C	Length mm	Graduations °C	Diam. mm	Immersion depth	PK	Cat. No.
-10/0 ... +50	200	1	7-8	total	1	**9.235 245**
-10/0 ... +100	260	1	7-8	total	1	**9.235 250**
-10/0 ... +150	260	1	7-8	total	1	**9.235 255**
-10/0 ... +200*	300	1	7-8	total	1	**9.235 260**
-10/0 ... +250*	300	1	7-8	total	1	**9.235 265**

* Note: With these types the colour can fade after extended periods of use at higher temperatures.





3 LLG- General-purpose thermometers, green filling

Glass, solid stem, with loop, white backed. Environmentally friendly thermometer, with biodegradable, green spirit filling.

Measuring range °C	Length mm	Graduations °C	Diam. mm	Immersion depth mm	PK	Cat. No.
-10/0 ... +110	300	1.0	6-7	76	1	**9.235 275**
-10/0 ... +110	300	0.5	6-7	76	1	**9.235 276**
-10/0 ... +150	300	1.0	6-7	76	1	**9.235 277**
-10 ... +250	300	2.0	6-7	76	1	**9.235 278**
-10 ... +360	300	2.0	6-7	76	1	**9.235 279**

1



1 LLG-Precision thermometer, calibratable, red filling

Capillary: yellow enameled, round. Optional available with official calibration certificate, works certificate or DKD-calibation certificate. Please specify with order.
Breakage protected versions with FEP-coating available on request.

Measuring range °C	Length mm	Graduations °C	Diam. mm	Immersion depth	PK	Cat. No.
-50 ... +50	280	1.0	6 ±1	total	1	**9.236 800**
-10 ... +100	305	1.0	6 ±1	total	1	**9.236 783**
-10 ... +150	305	1.0	6 ±1	total	1	**9.236 784**
-10 ... +200	350	1.0	6 ±1	total	1	**9.236 788**
-50 ... +50	300	0.5	6 ±1	total	1	**9.236 801**
-10 ... +100	270	0.5	6 ±1	total	1	**9.236 785**
-10 ... +150	350	0.5	6 ±1	total	1	**9.236 786**

2

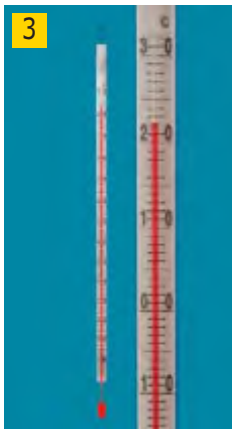


2 LLG-High-Precision thermometers, red filling

For precise measuring. Capillary: yellow enameled, round, immersion depth: total.
Optional available with works certificate or DAkkS-calibation certificate. Please specify with order.
Breakage protected versions with FEP-coating available on request.

Measuring range °C	Length mm	Graduations °C	Diam. mm	Immersion depth	PK	Cat. No.
-1 ... +101	610	0.1	610	total	1	**9.236 790**
-0 ... +50	420	0.1	420	total	1	**9.236 787**
-1 ... +200	610	0.2	610	total	1	**9.236 789**

3



3 LLG-Low temperature thermometers, -200 to +30°C

Suitable for official calibration. Enclosed scale type, 8 to 9mm diameter, with translucent glass scale and Richter seal. Prismatic, uncoated measuring capillary. The -200 to +30°C thermometer has a luminous blue measuring capillary, and is pentane filled. Further thermometers are available, red toluene filled with uncoated measuring capillary. Graduated every 1°C.

Measuring range °C	Length mm	PK	Cat. No.
-50 ... +50	300	1	**9.235 705**
-80 ... +30	300	1	**9.235 708**
-100 ... +30	300	1	**9.235 710**
-200 ... +30	300	1	**9.235 720**

4



4 Laboratory thermometers

NEW!

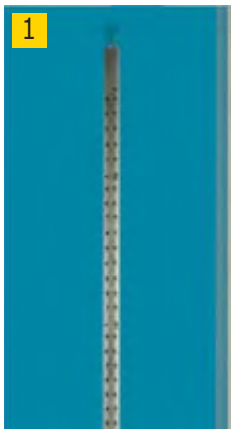
To DIN standards as indicated. Calibrated with state certificate. Enclosed scale type, 8 to 9 mm diameter. Prismatic measuring capillary, uncoated. Mercury filled.

Measuring range °C	Resolution °C	Length mm	DIN	PK	Cat. No.
0 to +50	1 / 2	220	12775	1	**9.235 505**
0 to +50	1 / 10	420	12775	1	**9.235 545**
0 to +50	1 / 5	350	12775	1	**9.235 546**
0 to +100	1 / 2	270	12775	1	**9.235 510**
0 to +100	1 / 1	305	12775	1	**9.235 547**
0 to +100	1 / 5	420	12775	1	**9.235 548**
0 to +100	1 / 10	550	12775	1	**9.235 549**
0 to +150	1 / 1	305	12775	1	**9.235 550**
0 to +250	1 / 1	350	12778	1	**9.235 525**
0 to +360	1 / 1	380	12778	1	**9.235 536**

1 Thermometers, ground glass joint

NEW!

With NS14.5/23 cone. With fixed immersion (immersion length = lower section + ground joint). Enclosed-scale type, NS 14.5/23. Translucent glass scale. Upper section approx. 11mm diameter, lower section 7.5mm diameter. Richter-top finish seal without button. Suitable for official calibration. Graduated every 1°C.



Measuring range °C	Corpus mm	Immersion length mm	Charge colour	PK	Cat. No.
-10 to +150:1	250	75	red	1	**9.236 021**
-10 to +150:0.5	350	75	red	1	**9.236 022**
-10 to +250:1	300	75	blue	1	**9.236 023**
-10 to +360:1	350	75	green	1	**9.236 024**
-10 to +150:1	250	100	red	1	**9.236 025**
-10 to +150:0.5	350	100	red	1	**9.236 026**
-10 to +250:1	300	100	blue	1	**9.236 027**
-10 to +360:1	350	100	green	1	**9.236 028**

2 Precision ground thermometer

NEW!

2

Schneider

Acc. to DIN 12784, with standard gound joint NS 14.5/23. Enclosed-scale type, capillary: transparent prismatic, diam. top: 11mm (±0.5mm), calibratable.



Measuring range °C	Graduations °C	Immersion length mm	Charge	PK	Cat. No.
-100 ... +30	1.0	68	red	1	**9.236 601**
-100 ... +30	1.0	75	red	1	**9.236 602**
-100 ... +30	1.0	95	red	1	**9.236 603**
-100 ... +30	1.0	125	red	1	**9.236 604**
-100 ... +30	0.5	68	red	1	**9.236 605**
-100 ... +30	0.5	75	red	1	**9.236 606**
-100 ... +30	0.5	95	red	1	**9.236 607**
-100 ... +30	0.5	125	red	1	**9.236 608**
-38 ... +50	1.0	68	blue	1	**9.236 609**
-38 ... +50	1.0	75	blue	1	**9.236 610**
-38 ... +50	1.0	95	blue	1	**9.236 611**
-38 ... +50	1.0	125	blue	1	**9.236 612**
-38 ... +50	1.0	150	blue	1	**9.236 613**
-38 ... +50	1.0	175	blue	1	**9.236 614**
-38 ... +50	1.0	200	blue	1	**9.236 615**

3 Support Labo-Clip

Amarell

Stable support for clamping test tubes, thermometers, pH electrodes and other laboratory instruments onto laboratory containers (e.g. beakers). Extensive chemical resistance, with strong flexible foam rubber plate perforated with 5 apertures of varying diameters. Metal components are corrosion-resistant. Applicable from -40°C to +120°C.



Type	PK	Cat. No.
Labo-Clip	1	**9.234 990**

1



1 LLG-Exact-Temp thermometers

For monitoring critical temperature conditions in
- deep freezes
- refrigerators
- cold rooms
- blood bank refrigerators
- incubators
- warming chambers

Characteristics:
- thermometer certifiable to National Standards
- supplied with works test certificate
- thermometer stem safely encapsulated in PTFE
- each thermometer is mounted in a square-shaped shatter-proof plastic bottle filled with a liquid to ensure accurate readings despite the opening and closing of instrument doors.
- each thermometer has an individual serial number.

LLG-Exact-Temp Standard thermometers, red spirit-filled

For	Measuring range °C	Grad. °C	Length mm	Bottle filling	PK	Cat. No.
Freezers	-90 ... +20	1.0	145	Sand	1	**9.235 663**
Refrigerators	-30 ... 0	0.5	125	Ethylene Glycol	1	**9.235 664**
Blood banks	-5 ... +20	0.5	145	Ethylene Glycol	1	**9.235 665**
Coolers	-5 ... +15	0.5	125	Ethylene Glycol	1	**9.235 666**
Incubators	+18 ... +50	0.5	135	Ethylene Glycol	1	**9.235 667**
Warming rooms, ovens	+20 ... +130	1.0	135	Vermiculite	1	**9.235 668**
Warming rooms, ovens	+35 ... +200	1.0	145	Vermiculite	1	**9.235 669**

LLG-Exact-Temp Standard thermometers, mercury-filled

For	Measuring range °C	Grad. °C	Length mm	Bottle filling	PK	Cat. No.
Freezers	-30 ... 0	0.5	115	Ethylene Glycol	1	**9.235 670**
Refrigerators	-5 ... +15	0.5	125	Ethylene Glycol	1	**9.235 671**
Incubators	+18 ... +50	0.5	135	Ethylene Glycol	1	**9.235 672**
Warming rooms, ovens	+20 ... +130	1.0	135	Vermiculite	1	**9.235 673**
Warming rooms, ovens	+35 ... +200	1.0	145	Vermiculite	1	**9.235 674**

LLG-Precision thermometers Exact-Temp, blue spirit-filled

For	Measuring range °C	Grad. °C	Length mm	Bottle filling	PK	Cat. No.
Freezers	-25 ... -5	0.1	210	Ethylene Glycol	1	**9.235 675**
Refrigerators	-2 ... +10	0.1	180	Ethylene Glycol	1	**9.235 676**
Blood banks	-2 ... +10	0.1	180	Ethylene Glycol	1	**9.235 677**
Incubators	+15 ... +30	0.1	180	Ethylene Glycol	1	**9.235 678**
Incubators	+25 ... +45	0.1	190	Ethylene Glycol	1	**9.235 679**
Warming rooms, ovens	+50 ... +115	0.1	200	Vermiculite	1	**9.235 680**

LLG-Precision thermometers Exact-Temp, mercury-filled

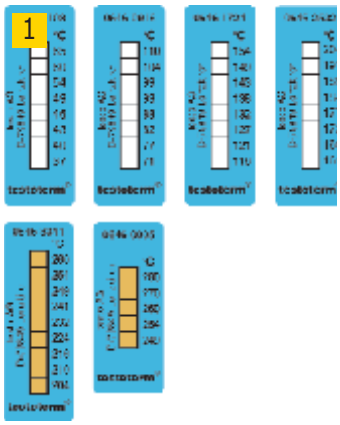
For	Measuring range °C	Grad. °C	Length mm	Bottle filling	PK	Cat. No.
Cold rooms, Freezers	-25 ... -5	0.1	210	Ethylene Glycol	1	**9.235 681**
Refrigerators	-2 ... +10	0.1	180	Ethylene Glycol	1	**9.235 682**
Blood banks	-2 ... +10	0.1	180	Ethylene Glycol	1	**9.235 683**
Incubators	+15 ... +30	0.1	180	Ethylene Glycol	1	**9.235 684**
Incubators	+25 ... +45	0.1	190	Ethylene Glycol	1	**9.235 685**
Warming rooms, ovens	+95 ... +115	0.1	200	Vermiculite	1	**9.235 686**

E & OE.

1 8-step irreversible temperature strips

Thermax strips, 8-step. 5 types cover the measuring range +37 to +280°C, each strip displays 8 different temperatures.
Each strip measures 50 x 18mm.

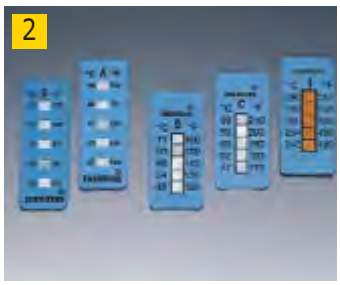
Testo



Type	Measuring range °C	Description	PK	Cat. No.
06460108	+37 ... +65	8 temperature changing points	10	**9.246 002**
06460916	+71 ... +110	8 temperature changing points	10	**9.246 003**
06461724	+116 ... +154	8 temperature changing points	10	**9.246 004**
06462532	+160 ... +199	8 temperature changing points	10	**9.246 005**
06463341	+204 ... +260	8 temperature changing points	10	**9.246 006**

2 5-step irreversible temperature strips

5-step irreversible temperature measuring strips covering the temperature range 29 to 290°C.
Each strip measures 35 x 15mm.



Type	Measuring range °C	PK	Cat. No.
S	+29 ... +40	10	**9.246 310**
A	+37 ... +46	10	**9.246 311**
B	+49 ... +71	10	**9.246 312**
C	+77 ... +99	10	**9.246 313**
D	+104 ... +127	10	**9.246 314**
E	+132 ... +154	10	**9.246 315**
F	+160 ... +182	10	**9.246 316**
G	+188 ... +210	10	**9.246 317**
H	+ 216 ... +249	10	**9.246 318**
I	+249 ... +290	10	**9.246 319**

3 Refrigerator thermometer

Plastic, with loop or hook clip mountings. Measuring range -40 to +40°C. Graduated every 1°C.
Dimensions (L x dia.) 185 x 20mm.



Type	PK	Cat. No.
Refrigerator thermometer	1	**9.242 340**

4 Maxima-Minima-Thermometer

TFA Dostmann

- ivory plastic
- beige
- with push button
- mercury-free

Dimensions: 230 x 60mm
Weight: 120g



Type	PK	Cat. No.
Maxima-Minima-Thermometer	1	**9.241 134**

1



1 LLG Min/Max Thermometer with outdoor sensor

NEW!

Digital thermometer with outdoor sensor.
- Two-tier LCD display
- Measuring temperature range -50°C to +70°C
- Display resolution 0.1°C
- Accuracy ±1°C
- Dimensions 110 x 70 x 20mm
- Display size 40 x 30mm
- AAA 1.5V battery included
- Length of the cable 190cm

Type	PK	Cat. No.
LLG Min/Max Thermometer with outdoor sensor	1	**9.243 165**

2



2 Maximum/Minimum Indoor/outdoor thermometer

Optimal for controlling of refrigerator and freezer temperatures. Measuring range *Amarell*
- 50 to +70°C, accuracy 0.1°C. External remote sensor cable, length 3m, with stand and accessories for wall mounting. Dimensions: approx. 80 x 55 x 20mm, with battery.

Official calibration certificate with one or two test points available on request.

Type	PK	Cat. No.
Maximum/Minimum indoor/outdoor thermometer	1	**9.235 120**

3



3 Digital Maxima-Minima-Thermometer

Digital thermometer, wall hanging, for indoor or outdoor use. *TFA Dostmann*
With blue, splash-proof casing, selectable °C/°F ranges and battery.
weight: 161g

Measuring range °C	Width mm	Depth mm	Height mm	PK	Cat. No.
-50 ... +70	75	44	115	1	**9.241 131**

4



4 Laboratory Max./Min. thermometer

Display of current, highest and lowest temperature, hold function, alarm at freely adjustable temperature values (upper/lower limit), measuring range -50 to +70°C, accuracy ±0.5°C at -20 to +25°C, otherwise ±1°C, selectable °C/°F readout. Supplied with table stand and magnet, probe with 3m cable and 3V Lithium CR2032 button cell (acc. to EN 13485).

Type	PK	Cat. No.
Laboratory Max./Min. thermometer	1	**9.851 022**

E & OE.

1 Thermometer Checkfridge

Hanna

- specially designed to monitor the internal temperature of freezers and refrigeration units
- magnetic backing provides an easy way to attach the thermometer to all metal refrigerators and freezers
- the sensor with 1 metre cable can be easily placed within the freezer/fridge cabinet
- Very high accuracy
- The unique Cal Check Function enables the user to check the internal electronics of the thermometer

Specifications:

Measuring range:	-50 to +150°C
Accuracy:	±0.3°C (-50 to +90°C)
Probe:	40 x 5mm, with 1 metre cable
Battery type:	1 x 1.5V
Weight:	100g

Type	PK	Cat. No.
Checkfridge	1	**9.851 098**

1



2 Digital Maxima-Minima-Thermometers Exact-Temp

NEW!

Schneider

High-precision instruments to monitor freezers, blood bank freezers, incubators, climate chambers and ovens.
The unbreakable plastic bottle is filled with a special medium to ensure accurate measurments even at open doors.

- Thermometers traceable to international standards (with certificate of conformance and accuracy)
- Accuracy: ±0.5°C, resolution 0.1°C
- Temperature units: °C or °F
- 3 display modes: maximum, minimum and ambient temperature
- Alarm function
- 3 m long cable (diameter: 1mm)
- Alkaline battery (AAA) included
- Breakage protected PETG plastic bottles (with 30ml ethylene glycol mixture)
- Bottles with magnets attached for easy wall or door mounting
- Individual serial numbers
- The instruments are available with works certificate on request.

Application	Measuring range °C	Certified Temperature °C	PK	Cat. No.
Freezers	-50 to 70	-20	1	**9.236 710**
Freezing point	-50 to 70	0	1	**9.236 711**
Refrigerators	-50 to 70	4	1	**9.236 712**
Incubators/Water baths	-50 to 70	37	1	**9.236 713**
Climate chambers	-50 to 70	21	1	**9.236 714**

2



3 LLG-Digital pocket themometer Type 12060

Measuring range -50 to +150°C, accuracy ±1°C. With hold function. Probe made of stainless steel, 125 x 3.5mm, with protective plastice sleeve and clip, with battery 1 x 1.5V (LR44). Dimensions (L x W): 60 x 20mm.

Type	PK	Cat. No.
LLG-Digital pocket themometer Type 12060	1	**9.236 701**

3



4 LLG-Digital pocket themometer Type 12090

Waterproof. Measuring range -50 to +150°C/-58 to +302°F, accuracy ±1°C. With hold function.
Probe made of stainless steel, 85 x 3.5mm, with protective plastic sleeve, with battery 1 x 1.5V (LR44).
Overall dimensions (L x W): 185 x 30mm.

Type	PK	Cat. No.
LLG-Digital pocket themometer Type 12090	1	**9.236 707**

4



5 LLG-Digital pocket themometer Type 12080

Waterproof. Measuring range -50 to +300°C/-58 to +572°F, accuracy ±1°C until 150°C, above ±2°C.
With hold function and Max/Min function. Probe made of stainless steel, 85 x 3.5mm, with protective plastic sleeve, with battery 1 x 1.5V (LR44). Overall dimensions (L x W): 195 x 50mm.

Type	PK	Cat. No.
LLG-Digital pocket themometer Type 12080	1	**9.236 703**

5



1



1 Thermometer Pocket-Digitemp

Waterproof instrument in plastic housing (food-grade).
Low budget, durable instrument for measuring temperature in air, gas, liquid and platical substances (acc. to EN 13485).
Range of applications: Food (HACCP), industry, agriculture and hobby.
Features: waterproof, 1-second measuring frequency, Max-Min-Hold function, °C/°F-selectable.

Sensor:	NTC
Measuring range:	-40°C to +200°C
Resolution:	0.1°C
Accurancy:	±0.8°C (at 0°C to 100°C) others 1.5°C
Dimensions:	202 x 20 x 16mm (long version) 150 x 20 x 16mm (short version)
Probe dimensions:	126 x 3.5mm (long version) 75 x 3.5mm (short version)
Weight:	40g

Type	PK	Cat. No.
short version	1	**9.851 028**
long version	1	**9.851 029**

2



3



2 3 Mini-Thermometer TDC 110

NEW!

ebro

- Probe length 120 mm
- Pointed probe, fixed
- Robust and impact-resistant
- Exchangeable battery
- °C/°F switchable
- Automatic deactivation after approx. 10 min.
- With needle guard and spare battery

Specifications

Measuring range:	-50°C to +150°C
Accuracy (±1 Digit):	±1°C (-10°C ... -120°C). ±2°C for remaining measuring range
Readabilty:	±1°C
Operating range:	0 to +50°C
Batterie:	1.5 V, G 10-A
Dimensions:	50 x 40 mm
Weight:	approx. 13g

Description	PK	Cat. No.
Mini-Thermometer TDC 110	1	**6.237 979**

4



9.851 997

Digital pocket themometer ThermoJack/ThermoJack PRO

NEW!

Dostmann electronic

Foldable pocket themometer, watertight. Ideal for measuring foods (acc. to EN13485), liquids etc. ThermoJack PRO with calibration certificate.

Type	Measuring range °C	Accuracy °C	Resolution °C	Probe	PK	Cat. No.
ThermoJack	-40 ... +250	± 0.5 (-20 ... +150)*	0.1	70	1	**9.851 997** 4
ThermoJack PRO	-50 ... +350	± 0.5 (-30 ... +150)*	0.1	110	1	**9.851 999**

*otherwise ±1.0°C or 1%, the larger value applies

5



5 Digital thermometer, Checktemp C

Hanna

With very high measurement accuracy of ±0.3°C (-20 to +90°C) and integral stainless steel insertion probe. Equipped with the unique "Checkcal" function which tests internal instrument electronics when the Checktemp is switched on.

Range:	-50 to +150°C
Resolution:	0.1°C
Accuracy:	±0.3°C (-20 to 90°C) ±0.5°C (rest of range)
Overall L x W x H:	170 x 50 x 25mm
Probe L x dia.:	105 x 3mm
Weight:	100g

Type	PK	Cat. No.
Checktemp C	1	**9.950 179**

1 Digital thermometer Checktemp 1 C

Hanna

With very high measurement accuracy of ±0.3°C (-20 to +90°C) and integral stainless steel insertion probe with handle and 1 metre cable, ensuring flexibility in use.
Equipped with the unique "Checkcal" function which tests internal instrument electronics when the Checktemp 1 is switched on.

Specifications

Range:	-50 to +150°C
Resolution:	0.1°C
Accuracy:	±0.3°C (-20 to 90°C) ±0.5°C (rest of range)
Overall L x W x H:	170 x 50 x 25mm
Probe length L x dia.:	106 x 3mm
Weight:	80g

Type	PK	Cat. No.
Checktemp 1 C	1	**9.950 180**

1



2 Digital hand held thermometer Type 12010

Measuring range -50 bis +150°C, accuracy ±1°C. With hold function. Penetration probe 105 x 3.5mm.
With battery 1 x 1.5V (LR44). Overall dimensions (L x W): 75 x 40mm.

Type	PK	Cat. No.
Digital hand held thermometer Type 12010	1	**9.236 700**

2



3 Digital hand held thermometer Type 12100

Waterproof. Measuring range -50 to +150°C/-58 to +302°F, accuracy ±1°C until 150°C above ±2°C. With hold function and Max/Min function. Memory capacity 10. Penetration probe made from stainless steel, 130 x 3.5mm with 1m cable and handle. With battery 1 x 1.5V AAA. Overall dimensions (L x W): 180 x 85mm.

Type	PK	Cat. No.
Digital hand held thermometer Type 12100	1	**9.236 704**

3



4 Digital hand held thermometer Type 12200

Waterproof. Measuring range -50 to +300°C/-58 to +572°F, accuracy ±1°C until 150°C above ±2°C.
With hold function and Max/Min function. Penetration probe made of stainless steel, 140 x 3.5mm with 1m cable and handle. With battery 1 x 1.5V AAA. Overall dimensions (L x W): 140 x 75mm.

Type	PK	Cat. No.
Digital hand held thermometer Type 12200	1	**9.236 705**

4





1



9.236 708

Hand held thermometer Type 12300

Suitable for all probes Type K (NiCr-Ni). Measuring range -200 to +1370°C/-328 to +2498°F. With hold and Max/Min function and 10 values memory function. With temperature limit alarm function, integrated display light and holster. With battery 1 x 1.5V AAA. Overall dimensions (L x W): 200 x 85mm. Accuracy: ±1°C from -49°C to +740°C.

Probe (9.236 709) - please order separately.

Type	PK	Cat. No.
Hand held thermometer Type 12300, without sensor	1	**9.236 708** 1
Mineral-insulated thermocouple 1 x NiCr-Ni type K acc. to DIN EN 60584 class 1	1	**9.236 709** 2

2



9.236 709

3



3 Food and frozen goods thermometers, Type 105

One-handed, penetration thermometer. *Testo*
For measurements according to the EU Directive concerning the control of foodstuffs (HACCP). Waterproof, IP65protection level, can be rinsed. With battery.

Sensor (Dia. x L):	5 x 100mm
Measuring tip dia.:	3.5mm
Accuracy:	-20 to +100°C: ±0.5°C rest of range: ±1°C.

Type	Measuring range °C	PK	Cat. No.
105	-50 ... +275	1	**9.718 002**

4



4 Digital thermometer ama-digit ad 14 th

Temperature range: -35 to +500°C, resolution 1°C. Rapid response and ergonomic design. Dimensions (WxDxH) 90 x 60 x 25mm. With stainless steel probe (L x dia.) approx. 100 x 2.5mm. With battery. *Amarell*

Type	PK	Cat. No.
ama-digit ad 14 th	1	**9.243 100**

5



5 Digital thermometer ama-digit ad 15 th

Color back (available in 4 additional colors)Range: -40 to +120°C, resolution 0.1°C. *Amarell*
Precise and cost-effective. Dimensions (WxDxH) 90 x 60 x 25mm.
With stainless steel probe approx. 30 x 2.5mm (L x dia). With battery.

Type	PK	Cat. No.
ama-digit ad 15 th	1	**9.243 101**

E & OE.

1 Digital thermometer ama-digit ad 20 th

Temperature range: -50 to +300°C. Resolution 0.1°C from -50 to +180°C, 1°C for the rest of the range. Dimensions (WxDxH) 90 x 60 x 25mm. With battery. For appropriate temperature probes see order no. 9.243 111 to 114.

Amarell

Type	PK	Cat. No.
ama-digit ad 20 th	1	**9.243 102**

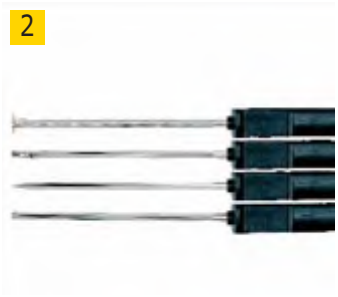


2 Temperature probes, Pt100 for ama-digit ad 20 th

Class A. Stainless steel sheathed probe, approx. 105 x 3mm L x dia.
With handle and approx. 1m cable.

Amarell

Type	PK	Cat. No.
Pt100 immersion probe	1	**9.243 111**
Pt100 penetration probe	1	**9.243 112**
Pt100 surface probe	1	**9.243 113**
Pt100 air probe	1	**9.243 114**





-ebro-

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xylem

Thermometers TFN-Series

1- or 2-Channel thermometers for use with thermocouples (Type K, J, T, E) *ebro*
TFN 520/TFN 520 SMP/TFN 530/TFN 530 SMP

Ex-proof versions also available!

Applications:
Heating/Air-conditioning, ventilation/Air, gases, fluids/Surface temperature/Plastic materials/Laboratories

Attributes:
- Robust and impact resistant
- Min/Max, Hold facility
- °C/°F selectable
- Battery charge status indicator
- Changeable battery
- Factory calibration certificate

Specifications:

Measuring range Type K	-200 to +1200°C
Measuring range Type J	-100 to +800°C
Measuring range Type T	-50 to +300°C
Measuring range Type E	-100 to +600°C
Accuracy at +25°C, Type K	±0.3°C (-100 to +250°C)
Accuracy at +25°C, Type J	±0.3°C (-50 to +190°C)
Accuracy at +25°C, Type T	±0.3°C (-50 to +220°C)
Accuracy at +25°C, Type E	±0.3°C (-50 to +150°C)
	±0.5 % for remaining range
Resolution Type K	0.1°C (-200 to +250°C)
Resolution Type J	0.1°C (-100 to +190°C)
Resolution Type T	0.1°C (-50 to +220°C)
Resolution Type E	0.1°C (-100 to +150°C)
	1°C for remaining range
Protection class:	IP 67 (TFN 520/TFN 530); IP 40 (TFN 520 SMP/TFN 530 SMP)
Dimensions:	115 x 54 x 22mm
Housing:	ABS
Weight:	approx. 90g
Sensor:	external; thermocouple Type K, J, T, E
Sensor connection:	LEMO (TFN 520/TFN 530); SMP (TFN 520 SMP/TFN 530 SMP)
Number of channels:	1 (TFN 520/TFN 520 SMP); 2 (TFN 530/TFN 530 SMP)
Battery:	Lithium, 3 V; battery life approx. 5 years
Measuring rate:	0.5 to 15 secs.

Type	Description	PK	Cat. No.
TFN 520	1-Channel Thermometer (Lemo connection)	1	**9.908 060**
TFN 520-SMP	1-Channel Thermometer (SMP Connection)	1	**9.908 061** 1
TFN 530	2-Channel Thermometer (Lemo Connection)	1	**9.908 062**
TFN 530-SMP	2-Channel Thermometer (SMP Connection)	1	**9.908 063** 2
TPN 211	Penetration probe, SMP	1	**9.908 064**
TPN 341	Paddle probe, SMP	1	**9.908 065**
TPN 140	Rod probe, 3mm dia., 185mm length, Lemo	1	**9.908 066**
TPN 360	Surface probe up to 500°C, 15mm dia., 30mm length, 1m silicone cable, Lemo	1	**9.908 067**
TPN 230	Penetration probe up to 500°C, 2.1mm dia., 100mm length, silicone cable, Lemo	1	**9.908 068**

1



9.908 061

2



9.908 063

Core Thermometer TTX 100/110

ebro

- according DIN EN 13485
- fast measurement
- robust and impact resistant, replaceable battery
- factory calibration certificate

Specifications

Measuring range:	-50 to +350°C
Accuracy:	±0.8°C or ±0.8%, with the bigger value being applicable
Resolution:	0.1°C from -60°C to + 199°C and 1°C, for the remaining measuring range
Housing material:	ABS
Operating temperature:	-20°C to +50°C
Storage temperature:	-30°C to +70°C
Reaction time (90%):	5s
Dimensions:	90mm x 42mm x 17mm
Battery life:	typical 100 h with uninterrupted use
Battery:	CR 2032, replaceable
Cable for TTX 100:	Blue silicone cable, diam. 4mm, length 600mm
Protection class:	IP 55
Temperature probe TTX 100:	Needle diam. 3mm, length 110mm, pointed
Temperature probe TTX 110:	Needle diam. 3mm, length 90mm, pointed

Type	Description	PK	Cat. No.
TTX 100	Fixed probe with cable	1	**6.231 995** 1
TTX 110	Fixed probe without cable	1	**6.230 658** 2
TTX-WM	Wall holder for TTX 100/TTX 110	1	**9.908 026**

1



6.231 995

2



6.230 658

3



6.236 035

Thermometer - Thermocouple Type K TTX 120 with SMP connection, without probe

NEW!

ebro

- Different probes available
- Fast, hígh-accuracy measurement
- Robust and impact-resistant
- Replaceable battery
- Factory calibration certificate

Specifications:

Measurement range type K:	-60°C to +1.200°C
Accuracy Type K:	(at +25°C) ±1°C or ±1%, whichever is larger
Resolution:	0.1°C (-60°C ... +199.9°C) 1°C for the remaining measurement range
Housing material:	ABS
Operating temperature:	-20°C to +50°C
Storage temperature:	-30°C to +70°C
Reaction time (t_{90}):	Depends on probe
Dimensions (L x W x H):	90 x 42 x 17 mm
Battery:	CR 2032, replaceable
Battery lifetime:	Typically 100 hours of uninterrupted use
Protection class:	IP 40

Type	Description	PK	Cat. No.
TTX 120	Thermometer Thermocouple Type K (without probe)	1	**6.236 035** 3
TPN 211	Penetration probe, SMP	1	**9.908 064**
TPN 341	Paddle probe, SMP	1	**9.908 065**

E & OE.

1 Laboratory Thermometer TFX 410-1, without probe

NEW!

ebro

Robust and impact resistant temperature measurement device for Pt 1000 penetration probe (connection Lemo size 0). For control measurements in laboratories, food sector, storage and incoming goods. For temperature determination of air, liquids, plastic substances, core temperature of food. Conform to HACCP and DIN EN 13485. Please order probes separately. With battery and factory calibration certificate.

Specifications:

Measurement range:	-50°C to +300°C
Accuracy:	±0.3°C
Resolution:	0.1°C
Sensor:	Pt 1000 (connection Lemo size 0)
Operating temperature:	-25°C to +50°C
Automatic switch-off:	After 2 hours, optional
Dimensions (L x W x H):	54 x 22 x 109 mm (without probe)
Weight:	Approximately 90 g
Battery:	3.0 V Lithium, replaceable
Battery lifetime:	Approximately 5 years
Protection class:	IP 67

Type	Description	PK	Cat. No.
TFX 410-1	Laboratory thermometer (without probe)	1	**6.207 171**

1



Measurement Probes Pt 1000 for TFX 410-1, Stainless Steel

NEW!

ebro

- Tube: stainless steel, up to +400°C
- Accuracy: exceeds DIN IEC 584, class 1

Type	Description	Length mm	Diam. mm	PK	Cat. No.
TPX 100	Blunt probe, without cable	120	3	1	**9.908 021** 2
TPX 200	Pointed probe, without cable	120	3	1	**6.251 438**
TPX 200-20	Pointed probe, without cable	200	3	1	**9.908 022**
TPX 200-30	Pointed probe, without cable	300	3	1	**9.908 023**
TPX 200-40	Pointed probe, without cable	400	3	1	**9.908 024**
TPX 400	Pointed probe with 60 cm silicone cable (red) and grip	120	3	1	**6.233 543** 3
TPX 400-40	Pointed probe with 40 cm silicone cable (red) and grip	120	3	1	**9.908 025**
TPX 400-150	Pointed probe with 150 cm silicone cable (red) and grip	120	3	1	**6.254 169**

2



9.908 021

3



6.233 543

4 Laboratory Thermometer TFX 422, calibratable

NEW!

ebro

- PTB approved
- Robust and impact resistand
- High accuracy
- Waterproof IP 67
- Approx. 5 years battery life
- According to EN 13485

Also available with calibration certificate

Specifications:

Measurement range:	-50°C to +200°C
Accuracy:	±0.3°C
Resolution:	0.1°C
Sensor:	Pt 1000 (l 120mm, Ø 3mm)
Operating temperature:	-25°C to +50°C
Deactivation:	Automatically after 2 hours, deactivalable
Dimensions (L x W x H):	109 x 54 x 22 mm (without probe)
Weight:	Approximately 90 g
Battery:	3.0 V Lithium, 1 Ah, type CR 2477, replaceable
Battery lifetime:	Approximately 5 years
Protection class:	IP 67

Type	Description	PK	Cat. No.
TFX 422	Laboratory Thermometer, calibratable	1	**6.207 122**

4



1



9.908 075

Precision thermometer TFX 430 (without probe)

ebro

Applications:
- temperature monitoring
- laboratory
- air, liquids, plastic masses
- aggressive media, surfaces
- process monitoring
- reference measurement

Features:
- high accuracy
- four-wire measuring system
- waterproof IP67
- approx. 5 years battery life
- factory calibration certificate
- different probes for different applications

Specifications

Measuring range:	-100 to +500°C
Accuracy:	without probe: ±0.1°C (from -50 to +100°C); remaining measuring range: ±0.2°C with probe: ±0.05°C (from -50 to +199.99°C); remaining measuring range: ±0.2°C
Resolution:	without probe: 0.02°C (from -50.00 to +99.98°C); remaining measuring range: 0.1°C with probe: 0.01°C (from -100 to +199.99°C); remaining measuring range: 0.1°C
Operating temperature:	-20 to +50°C
Storage temperature:	-30 to +70°C
Probes:	Pt100
Measurement interval:	1 to 15 secs, adjustable
Battery:	Lithium 3V, 1Ah, Type CR2477
Deactivation:	Automatically after 2 hours, deactivatable
Dimensions:	109 x 54 x 22mm
Weight:	approx. 90g
Protection class:	IP67
Housing material:	ABS

Type	Description	PK	Cat. No.
TFX 430	Precicion-Thermometer, without probe	1	**9.908 075** 1
TFX 430 + TPX 130	Precicion-Thermometer, with probe (length 130mm, 3mm dia., blunt)	1	**9.908 076**
TFX 430 + TPX 230	Precicion-Thermometer, with probe (length 130mm, 3mm dia., pointed)	1	**9.908 077**
TFX 430 + TPX 330	Precicion-Thermometer, with probe (length 190mm, 8mm dia., glass-coated)	1	**9.908 078**

2



2 Digital thermometer testo 922/925

Testo

Without probe. **With battery and calibration protocol.** For °C, °F, °K. Hold function and battery display.

Model testo 925:
Economical. Very robust. With 1 measuring input.

Model testo 922:
With 2 measuring inputs.

Measuring range:	-50 to +1000°C
Sensor:	Type K (NiCr-Ni)
Accuracy:	-40 to +900°C : ±0.5°C, ±0.3% remaining range: ±0.7°C, 0.5%
Battery:	9V, 6F22

Type	PK	Cat. No.
testo 925	1	**9.851 324**
testo 922	1	**9.851 325**

Digital thermometers, testo 925 /922, accessory probes

Testo

- Waterproof immersion/penetration probe
- Precise, watertight food probe, stainless steel, resistant to cleaning by aggressive materials and oven-proof up to 205°C
- Precise and rapid, waterproof immersion probe
- Rapid reaction surface probe
- Robust food penetration probe with special handle
- Robust, economical, air probe

Description	PK	Cat. No.
Immersion / penetration probe	1	**9.718 200**
Stainless steel food probe	1	**9.718 201**
Immersion probe	1	**9.718 202**
Surface probe	1	**9.718 222**
Penetration food probe	1	**9.718 203**
Air probe	1	**9.718 230**

Accessories for temperture meters testo 925/922

Testo

Type	For	PK	Cat. No.
TopSafe testo 925	protective cover against impact and dust	1	**9.718 011**
TopSafe testo 922	protective cover against impact and dust	1	**9.718 020**

Digital thermometers testo 110/112

Testo

For use with accessory NTC sensor probes. For control measurements in the food industry and laboratories. Features: switchable °C readout, with Hold function, low battery indicator and battery saving automatic switch-off after a period without use.

With battery and calibration certificate.

Accuracy testo 110:
System accuracy using immersion/penetration probes. -20 to +80°C : ±0.2°C, ±0.3°C: rest of range
Model testo 112:
Suitable for verification use between -50 to +120°C. Accuracy in accordance with notified requirements, with internal temperature monitoring.

Battery: 9V, 6F22

Type	Measuring range °C	PK	Cat. No.	
testo 110	-50 ... +150	1	**9.851 300**	1
testo 112	-50 ... +300	1	**9.851 299**	2

1



9.851 300

2



9.851 299

Digital thermometers testo 110/112, accessories

Testo

For	Type	Diam. mm	Length mm	Measuring range °C	PK	Cat. No.
testo 110	TopSafe (IP68 protective boot)			-	1	**9.718 020**
testo 112	TopSafe (IP68 protective boot)			-	1	**9.718 011**
testo 110	NTC immersion/penetration probe	4	110	-50 ... +150	1	**9.851 716**
testo 110	NTC laboratory probe, glass sheathed	6	200	-50 ... +150	1	**9.851 717**
testo 110	NTC surface probe, with widened measuring tIP	5	115	-50 ... +150	1	**9.851 720**
testo 110	NTC air probe, robust	5	115	-50 ... +125	1	**9.851 723**
testo 112	NTC food probe, appropriate for verification	4	124	-25 ... +120	1	**9.851 315**
testo 112	NTC immersion/penetration probe, appropriate for verification	5	115	-25 ... +120	1	**9.851 348**
testo 112	NTC air probe, appropriate for verification	5	115	-25 ... +120	1	**9.851 349**
testo 110	Robust food penetration probe with special handle	5	115	-25 ... +150	1	**9.851 352**

1



1 Infrared-Thermometer Slim Flash

NEW!

Non-contact temperature measurement via infrared. Response time 1 second.
Measuring range -33 to +199°C, Accuracy ±2°C or 2%, incl. CR2032 button cell.

Dostmann electronic

Type	PK	Cat. No.
Infrared-Thermometer Slim Flash	1	**9.851 998**

2



2 Infra-red thermometer ScanTemp 385

With IR thermometers you can measure surface temperature. A short response time and non-contact measurement are key advantages. ideal for monitoring applications such as:
- moving parts (running paper webs...)
- registering the surface temperature of gears and motors
- checking live electrical parts (components, transformers...)
- newly coated or painted parts
- food and corrosive substances

Specifications

Temperature range:	-35°C to +365°C
Precision:	±2% or 2°C, the higher value counts
Response time:	< 1 sec
Spectral sensitivity:	6 to 14µm
Operating temperature:	0 to 50°C
Optical resolution:	12:1
Laser:	Spot laser
Dimensions (L x W x H):	147.9 x 112.6 x 41.4mm
Weight:	150g (incl. packaging)
Battery:	2 x 1.5V AAA Batteries

Type	PK	Cat. No.
ScanTemp 385	1	**9.851 996**

3



3 Infra-red thermometer ScanTemp 410

Infra-red thermometer with laser aiming. For quick, easy and safe measurement of surface temperatures.
Easy to use: just point, press the button and read the measurement from the large, illuminated display.

Specifications

Temperature range:	-33°C to 500°C
Precision:	±2 % of measurement or 2°C
Response time:	0.5 secs.
Spectral sensitivity:	7 to 18µm
Operating temperature:	0 to 50°C
Optical resolution:	11:1
Laser:	Spot laser
Dimensions (L x W x H):	175 x 39 x 79mm
Weight:	300g (incl. packaging)
Battery:	2 x 1.5V AAA Batteries

Type	PK	Cat. No.
ScanTemp 410	1	**9.851 919**

E & OE.

Infrared Thermometers TFI 250/TFI 54

NEW!

ebro

Non-contact measurement of the surface temperature with infrared. Ideal for fast and secure measurements of moving or energized parts and food. With batteries and factory calibration certificate.

Specifications:

Measurement range:	-60°C to +550°C
Accuracy:	±2°C or 2% (at 0°C to +550°C), whichever is larger
Resolution:	0.1°C
Optical resolution:	12:1
Operating temperature:	0°C to +50°C
Response time:	1 sec.
Emissivity factor:	0.95 fixed (0.1 to 1.0 possible)
Dimensions (L x W x H):	153 x 115 x 48 mm (TFI 250) 144 x 117 x 43 mm (TFI 54)
Weight (with batteries):	177 g (TFI 250), 180 g (TFI 54)
Battery:	2 x 1.5 V AAA, replaceable
Protection class:	IP 20 (TFI 250), IP 54 (TFI 54)

Type	Description	PK	Cat. No.	
TFI 250	Infrared thermometer	1	**9.908 031**	1
TFI 54	Splash water proof infrared thermometer	1	**9.908 032**	2

1



9.908 031

2



9.908 032

3 Dual Infrared Thermometer TFI 550 with NiCr-Ni Connection

NEW!

ebro

Addtional connection for NiCr-Ni temperature probes with SMP-connection.
Please order probes separately.
- Optics D:S = 30:1
- Dual laser
- NiCr-Ni connection for core temperature measurement with penetration probe
- Alarm when Min/Max exceeded
- Factory calibration certificate

Specifications:

Measurement range:	-60°C to +550°C (-76°F to 1022°F)
Accuracy:	±2°C at -18°C to +23°C (±3.6°F at 0°F to 73°F) ±1 % of measurement ±1°C (whichever is larger) at +23°C to +510 C ±1.8°F (whichever is larger) at 73°F to 950°F
Resolution:	0.1°C at -9.9°C to +199°C, otherwise 1°C (0.2°F at 14°F to 391°F, otherwise 1.8°F)
Response time (t_{99}):	Approximately 1 s
Emissivity factor:	0.1 to 1.0
Distance : spot ratio:	30:1
NiCr-Ni probe measurement:	
Measurement range:	-64°C to +1400°C (-83°F to 2552°F)
Connection:	SMP
Accuracy:	±1 % of measurement value/±1°C (±1.8°F), whichever is larger
Battery:	2 x AAA (Micro)
Battery lifetime:	Typically 180 hours
Operating temperature:	0°C to +50°C (32°F to 122°F)
Storage temperature:	-20°C to +65°C (-4°F to 149°F)
Protection class:	IP 20
Weight:	approx. 180g

Type	Description	PK	Cat. No.
TFI 550	Dual Infrared Thermometer (without probe)	1	**6.238 001**

3



1



1 Infrared thermometers, ProScan series

- highest precision due to special glass lens (spot size up to a distance of 14 cm: 1.3 cm constant), measuring time: 0.3 seconds
- relation measuring distance/spot size 20:1(ProScan 510)/ 40:1 (ProScan 520)
- display of current, highest and lowest temperature, hold function, alarm at freely adjustable temperature values (upper/ lower limit),
- with laser sighting, for contact-free measuring of surface temperature
- adjustable visual and acoustic alarm
- ProScan 520: incl. thermocouple sensor type K, USB interface and Windows software.

Accuracy (IR):	±1°C or 1% from +20 ... +530°C ±1.5°C from 0 ... +20°C ±2.5°C from -0.1 ... -20°C ±3.0°C from -20 ... -32°C
Reproducibility:	±0.7°C or 0.5%
Time:	300ms
Spectral sensitivity:	8 to 14µm
Display resolution:	0.1°C (4-digit LCD)
Working temperature range:	0 to 50°C
Voltage supply:	9 V PP3 battery
Dimensions L x W x H:	190 x 38 x 45mm
Weight:	500g (incl. packaging)
Dot laser	

Type	Temp. range °C	Emissivity	Optical resolution	PK	Cat. No.
ProScan 510	-32 ... +530	0.100 - 1.000	20 : 1	1	**9.851 928**
ProScan 520	-32 ... +760	0.100 - 1.500	40 : 1	1	**9.851 929**

2



2 Infrared thermometer, DualTemp Pro, with penetration probe

For simple, rapid, non-contact, temperature measurement.
- dual display
- wide measurement ranges:
- infra-red: -33 to +250°C
- conventional penetration probe: -55 to + 250°C
- measuring spot:distance ratio 2.5:1
- Max./ Min., Hold functions
- auto-off after 15 secs.
- belt-clip included
- accessories: certificate of calibration & pilot drill for taking measurements from frozen items

Specifications:

Resolution:	0.2°C
Accuracy (IR):	-33°C to 0°C ±1.0°C ±0.1/1°C 0°C to +65°C ±1.0°C +65°C to +200°C ±1.5%
Accuracy (penetration probe):	below -5°C ±1.0°C -5°C to +65°C ±0.5°C above +65°C ±1%
Spectral sensitivity:	6 to 14µm
Adjustable emissivity:	0.10 to 1.00
Operating temperature:	0 to 50°C
Battery:	Lithium cell CR2032
Dimensions:	24.2 x 39.8 x 156mm
Weight:	380g (incl. packaging)

Type	PK	Cat. No.
DualTemp Pro	1	**9.851 023**

E & OE.

Combination Infrared and Penetration Thermometer TLC 730

NEW!

ebro

Handy, waterproof infrared thermometer with large measurement range for noncontact measurement of the surface temperature and secure core temperature measurement with the folding penetration probe. For time-saving, precise temperature measurements at incoming goods, production and storage of diverse goods and food. Conform to HACCP and DIN EN 13485.
With battery and factory calibration certificate.

Specifications:

Measurement range:	-50°C to +350°C
Accuracy infrared:	±4°C at -50°C to -30.1°C ±2.5°C at -30°C to -18.1°C ±1.5°C at -18°C to -0.1°C ±1.0°C at 0°C to +65°C ±2.0°C or 2 % at +65°C to +350°C
Accuracy penetration probe:	±0.5°C at -18°C ... +120°C Otherwise ±1°C [1%], whichever is larger
Resolution:	0.1°C
Sensor:	Type K
Operating temperature:	-25°C to +50°C
Dimensions (L x W x H):	48 x 24 x 172 mm (without probe)
Weight:	Approximately 140 g
Battery:	2 x 1.5 V AAA, replaceable
Deactivation:	Automatically after 15 sec., deactivatable
Protection class:	IP 55

1



6.241 105

Type	Description	PK	Cat. No.
TLC 730	Combination infrared and penetration thermometer	1	**6.241 105** 1
AG 121	Nylon case for TLC 730	1	**6.207 112**

Disposable data logger ITAG-PDF

NEW!

Dostmann electronic

ITAG-PDF, the innovative single-use data logger with a built-in USB connector, is ideal solution for low-cost temperature monitoring of transports.
ITAG-PDF loggers will be supplied according each customer's specifications.

Product features

- Recording cycle (24h, 5 days, 10 days, 15 days, 30 days, 60 days)
- ON-Board PDF report generator, no software required
- Built-in USB connector, no hardware required
- Bank-card size
- Quick-start with START-STRIP TM
- Easy to read LED ind
- Food-safe packaging
- Free costumisation service
- Includes Certificate

At quantities of 100 pieces, the ITAG logger can be customized.
Following pre-programmed settings can be made free of charge:

- Upper and lower alarm set point (e.g. <+2°C and >+8°C)
- Alarm delay (default: 30 min.)
- Start delay (default: 0 min.)

Specifications:

Temperature Range:	-30°C to +70°C
Accuracy:	±0.3°C from -20°C to +30°C, otherwise ±0.5°C
Resolution:	0.1°C
Data Memory:	7200 measurements
Recording Cycle*:	24 hours to 60 days
Sampling Interval*:	12 sec. to 12 min.
Shelf Life:	12 months
Dimensions (L x W x H):	80mm x 52mm x 4mm
Weight:	16.5g
Protection Class:	IP 65
System Requirements:	Adobe® Reader
Certifications:	Calibration Certificate, CE, RoHS

2



9.726 425

For	Interval	PK	Cat. No.
24 hours	12 sec	1	**9.726 425** 2
5 days	1 min	1	**9.726 426**
10 days	3 min	1	**9.726 427**
15 days	3 min	1	**9.726 428**
30 days	6 min	1	**9.726 423**
60 days	12 min	1	**9.726 424**

*dependent on model

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9.908 069

Data Logger EBI-20 T1/EBI-20 TH1/EBI-20-TE1

ebro

Applications:
- reliable temperature and temperature/humidity recording
- transport
- storage monitoring
- refrigeration areas and coldrooms

Features:
- excellent price/performance ratio
- waterproof
- visual Alarm
- max/min values on display
- stores 40.000 readings, can be read off at any time
- replaceable battery

Specifications

Measuring range temperature:	-30 to +60°C
Measuring range humidity:	0% to 100% R.H.
Accuracy, temperature:	±0.5°C (-20 to +40°C); ±0.8°C for remaining measuring range
Accuracy, humidity:	±3% R.H. (10 to 90% R.H.)
Resolution temperature:	0.1°C
Resolution humidity:	0.1% R.H.
Memory:	40.000 samples
Sensor:	NTC for temperature/capacitive for humidity
Operating temperature:	-30 to +60°C
Storage temperature:	-40 to +60°C
Measuring period:	1 minute to 24 hours
Measuring mode:	immediate loop measurement, measurement from starting point, start immediately until memory full, start/stop measuring, start when button pressed
Battery:	3V lithium (CR 2450), can be replaced by user
Protection class:	IP 67 (EBI-20 T1); IP 52 (EBI-20 TH1)
Housing:	ABS
Dimensions:	69mm x 48mm x 22mm
Weight:	approx. 45g

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6.228 382

Type	Description	PK	Cat. No.	
EBI-20 T1	Temperature Logger	1	**9.908 069**	1
EBI-20 TH1	Temperature Humidity Logger	1	**9.908 070**	
EBI-20-TE1	Temperature Logger with external probe	1	**6.228 382**	2
EBI-20 T1-Set	Starter-Set (Temperature Logger, evaluation software, Interface)	1	**9.908 073**	
EBI-20 TH1-Set	Starter-Set (Temperature Humidity Logger, evaluation software, Interface)	1	**9.908 074**	
EBI-20-TE1-Set	Starter-Set (Temperature Logger with external sensor, evaluation software, Interface)	1	**6.240 382**	
EBI-20 AUF	Wall mounting	1	**9.908 079**	
EBI 20-WM1	Truck wall holder	1	**6.242 239**	

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

-ebro- a xylem brand

E & OE.

Standard USB Data Logger EBI 300

NEW!

ebro

- For temperature monitoring related to HACCP/IFS issues or other perishable goods
- Transportation of fresh, cool and deep cool products
- Monitoring of fridges and deep freezers
- Evaluation without software

Benefits:
- Access the data anywhere with the automatically generated PDF report and any PDF software
- Minimise training, user errors and IT costs using EBI 300's simple, easy to use design and standard software.
- Ensure data integrity since no data manipulation is possible
- EN 12830, ATP, VO(EG) 37/2005 Compliant
- Factory calibration certificate included

Specifications

Measuring range:	-30°C to +60°C
Accuracy:	±0.5°C (-20°C to +40°C); ±0.8°C for remaining measuring range
Resolution:	0.1°C
Memory:	40.000 samples
Sensor:	NTC for temperature
Battery life time:	up to two years
Measuring period:	1 minute to 24 hours
Maximum Start Delay:	72 hrs
Housing material:	Polycarbonate
Measuring modes:	Start/Stop, endless loop, start with button
Alarms:	High and low limits
Weight:	35g
Protection class:	IP 65
Programming Software:	Winlog.basic, Winlog.light and Winlog.pro

Type	Description	PK	Cat. No.	
EBI 300	Standard USB Data Logger with calibration certificate	1	**7.655 865**	1
TPC 300	External NTC probe	1	**9.908 027**	2
EBI 300 WM	Wall Bracket	1	**9.908 101**	

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7.655 865

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9.908 027

High Precision USB Data Logger EBI 310

NEW!

ebro

- Transport of drugs, inoculants, blood products and primary products
- Transport of all temperature sensitive products
- Storage of reference samples in refrigerators and deep-freezers

Attributes:
- USB-Port for PC and Notebook
- automatic pdf-report creation with temperature/time values
- easy battery exchangeable
- "traffic light principle" by limit exceeded
- waterproof

Specifications

Operating Temperature:	-30°C to +75°C
Accuracy:	±0.2°C (-30°C to +30°C) ±0.5°C for the remainder
Resolution:	0.1°C
Sensor:	Pt1000/NTC
Channel:	1
Memory Capacity:	120.000 measurements
Battery Life:	2 Years
PDF/LED:	Yes
Weight with battery:	35g
Protection class:	IP 65

Type	Description	PK	Cat. No.	
EBI 310	High Precision USB Data Logger	1	**9.908 098**	3
TPX 220	Temperature Probe	1	**9.908 099**	4
TPX 250	Temperature Probe	1	**9.908 100**	
EBI 300 WM	Wall Bracket	1	**9.908 101**	

3



9.908 098

4



9.908 099

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7.626 604

Mini data logger testo 174T

The mini data logger for temperature, testo 174T, is ideal for accompanying transports. *Testo*
Simply positioned close to the goods, e. g. in containers and refrigerated rooms, the data logger monitors temperature continuously, securely and unobtrusively.
The free software ComSoft testo 174 allows fast programming of the data logger and easy analysis.

- High data integrity, even with empty battery
- Large measurement data memory
- Watertight in accordance with IP65
- Compact and robust
- Conforms to EN12830
- Issue of alarms via display
- Data transfer to the PC via USB interface
- Reliable temperature measurement for the monitoring of sensitive goods and cold chain during storage and transport

2



7.626 614

Specifications

Probe type:	Internal NTC temperature sensor
Measuring range:	-30 to +70°C
Accuracy:	±0.5°C
Resolution:	0.1°C
Operating temperature:	-30 to +70°C
Storage temperature:	-40 to +70°C
Battery type:	2 x 3V button cell (2 x CR 2032 lithium), can be changed by user
Battery life:	500 days (15 min measuring cycle, +25°C)
Protection class:	IP65
Meas. cycle:	1min - 24h (can be selected)
Memory:	16.000 readings
Software:	can be used with Windows XP, Vista, Win7

Type	Description	PK	Cat. No.
testo 174T	Mini data logger, 1-channel, incl. wall bracket, battery (2 x CR 2032 Lithium) and calibration protocol	1	**7.626 604** 1
testo 174T set	Mini data logger, 1-channel, incl. USB interface for programming and reading out the logger, wall bracket, battery (2 x CR 2032 lithium) and calibration protocol	1	**7.626 614** 2



E & OE.

Mini data logger testo 174H

Testo

The mini data logger for temperature and humidity, testo 174H, is ideal for monitoring temperature and humidity sensitive goods in storage. The testo 174H also monitors building climate, continuously, securely and unobtrusively. The free software ComSoft testo 174 allows fast programming of the data logger and easy analysis.

- Humidity sensor with long-term stability
- High data integrity, even with empty battery
- Large measurement data memory
- Display of the current temperature or humidity value
- Large measuring range
- Compact and robust
- Issue of alarms via display
- Data transfer to the PC via USB interface

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6.239 884

Specifications

Probe type:	NTC temperature sensor and internal capacitive humiditiy sensor
Measuring range:	0 to 100% RH, -20 to +70°C
Accuracy:	±0.5°C, ±3% RH
Resolution:	0.1% RH, 0.1°C
Operating temperature:	-20 to +70°C
Storage temperature:	-40 to +70°C
Battery type:	2 x CR 2032 lithium
Battery life:	1 year (15 min measuring cycle, +25°C)
Protection class:	IP20
Meas. cycle:	1min to 24h (can be selected)
Memory:	16000 readings
Software:	can be used with Windows XP, Vista, Win7

2



6.239 883

Type	Description	PK	Cat. No.
testo 174H	Mini data logger, 2-channel, incl. wall bracket, battery (2 x CR 2032 lithium) and calibration protocol	1	**6.239 884** 1
testo 174H-Set	Mini data logger, 2-channel, incl. USB-interface for programming and reading out the logger, wall bracket, battery (2 x CR 2032 lithium) and calibration protocol	1	**6.239 883** 2

3 Data logger LOG100 for temperature and LOG 110 for humidity

Dostmann electronic

Large display for actual value, battery status display, easy to use software. Perfect designed instrument for transportation or storage.

- quality surveillance in laboratories, at the production or in the storage
- ambient conditions in manufacturing facilities
- monitoring from storages after HACCP
- ambient conditions in power plants
- monitoring of fridges for the pharma industry

Please order Software with USB-cabel separately (9.726 413)

3



Specifications

Temperature

Measuring range:	-30 to +70°C
Accuracy:	0.1°C
Precision:	±0.5°C (0 to +40°C), otherwise ±0.7°C

Humidity (Art. No. 9.726 412)

Measuring range:	0 to 99% R.H.
Resolution:	0.1% R.H.
Accuracy:	±3% R.H.
Housing:	Plastic (ABS)
Battery:	1 x CR2032 3V
Dimensions:	92 x 55 x 21mm
Weight:	95g (incl. packaging)
Alarm function:	Alarm for too low or too high temperatur and/or humidity values Calibration reminder

Type	PK	Cat. No.
Temperature data logger LOG 100	1	**9.726 411**
Temperature / Humidity data logger LOG 110	1	**9.726 412**
Windows Software DE-Graph for LOG 100 and LOG 110 with USB-cabel	1	**9.726 413**
external temperature sensor, 3 x 40 mm, -50 to +120°C with 3 m wire	1	**9.726 416**
external temperature sensor, 3 x 40 mm, -50 to +120°C with 8 m wire	1	**9.726 417**

1 2 3 LOG32 Temperature/Humidity logger

- Can store up to 32000 measurements (16000 per sensor)
- Freely selectable measuring intervals from 2 seconds up to 24 hours
- battery life time approx. 2 years
- status indication using 2 x LED lamps
- built-in USB interface
- WindowsTM-compatible software (german/english/french) included
- wall mounting

Applications:
Offers the best solution to record ambient humidity and temperature data of transport containers, storage, laboratory, production plant, greenhouses etc.
- quality control in laboratory, production or warehouse facilities
- monitoring warehouse and cooled transport according to HACCP
- ambient temp in power plants
- monitoring medical refrigeration equipment

Specifications

Temperature

Measuring range:	-40 to +70°C
Accuracy:	0.1°C
Precision:	±1.0°C (-20 to +50°C), otherwise ±2.0°C

Humidity

Measuring range:	0 to 100%R.H.
Resolution:	0.1% R.H.
Accuracy:	±3% R.H.
Housing:	Plastic (ABS)
Battery:	1 x 3.6V ½ AA Lithium
Dimensions:	130 x 30 x 25mm
Weight:	117g (incl. packaging)

Type	PK	Cat. No.
LOG32	1	**9.726 407**

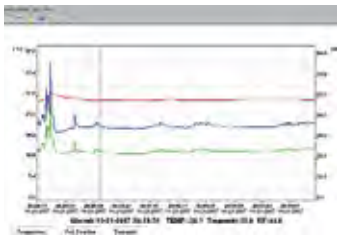
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3





1 Mechanical stopwatch



Start/stop/reset by single crown, clockwork mechanism, 13 jewels,
chrome metal case, measuring range 15 minutes,
1/10 second increments. Supplied with lanyard and soft case, diam. 50mm, 250g (incl. packaging)

Type	PK	Cat. No.
Mechanical stopwatch	1	**9.851 021**

2 Stopwatch, mechanical



Amigo. Impact resistant. Unbreakable spring movement. 55mm diameter ABS case. *Hanhart*
Supplied with 120cm lanyard.

Time intervals secs.	Display mins.	PK	Cat. No.
1 / 10	15	1	**9.262 410**
1 / 5	30	1	**9.262 411**

3 Stopwatch Tristop, mechanical



Separate 1/10 second display magnified 10 times. *Hanhart*
Chrome-plated ABS housing with neck cord (120cm), 7 jewel, pin lever movement.
1/5 sec. divisions. 0 to 30 minute face.

Type	PK	Cat. No.
Tristop	1	**9.262 510**

4 Stopwatch, mechanical



Impact resistant, dustproof and water resistant. *Hanhart*
With diamond-turned metal case. 55mm diameter. Built-in strap ring.

Time intervals secs.	Display mins.	PK	Cat. No.
1 / 5	30	1	**9.262 005**
1 / 10	15	1	**9.262 010**

1



1 Stopwatch, mechanical

Impact resistant, dustproof, water resistant. With diamond-turned metal case. 55mm diameter. Built-in strap ring. 2 push-buttons.

Hanhart

Time intervals secs.	Display mins.	PK	Cat. No.
1 / 5	30	1	**9.262 205**
1 / 10	15	1	**9.262 210**

2



2 Stopwatch SL 110

- 1/100 sec. timer up to 40 minutes, 1 sec. timer for 40 minutes up to 24 hours
- lap time function
- time in 12/24-hour-format
- time, month, day, alarm
- snooze function
- splash water resistant
- Incl. 1 x 1.5V button cell SR44
- dimensions: 70 x 60 x 23 mm
- weight: 51g

Type	PK	Cat. No.
SL 110	1	**6.230 554**

3



3 Stopwatch, HiTRAX Run

1/100 seconds,max. 23 hours, 59 minutes, 59 seconds, split time, clock, date, alarm. Supplied with 3V Lithium long-life battery CR 2032 button cell:
Dimensions: 78 x 58 x 12 mm
Weight: 60g

Type	PK	Cat. No.
HiTRAX Run	1	**9.851 020**

4



4 Stopwatch Stopstar 2, digital

Stopstar 2. ABS housing with lanyard. Temperature range -10 to +55°C. With 7-digit, 7mm high LCD readout. Start/Stop/Reset, Cumulative (as often as required), Split interval timing (as often as required), dual measurement of two events in quick succession.
Time display: 9hrs, 59mins, 59.99sec.
Battery life approx. 2 to 3 years.
Supplied with button cell (IEC R 6).

Dimensions: 82 x 61 x 28mm
Weight: 70g

Type	PK	Cat. No.
Stopstar 2	1	**9.262 062**

E & OE.

1 Stopwatch, digital



Profile LCD.
2 button operation, with 5 event memory, each with split and lap times, 8 mm high LCD readout, 7-figure + 2 event counter, display range: 9hrs, 59mins, 59.99secs. With Start/Stop/Reset, Add./Split/Lap, time functions.

Type	PK	Cat. No.
Stopwatch, digital	1	**9.262 111**

2 Stopwatches, Delta E series



Delta E 100
- 65 memories with evaluation, fast run/memory functions
- Large, clear, 2.5-line LCD readout with 7mm high digits
- Battery status indicator
- Function window for Lap, Short-Lap and time. Date indicator and pre-settable split time from the real-time clock
- Mode function button
- Display and memory button.

Delta E 200
Generally as Delta E 100 model, but additionally with:
- Pacer function (1 to 300 strokes/min.)
- Countdown function
- Countdown and stopwatch can be used simultaneously.

Type	Colour	PK	Cat. No.
Delta E 100	black	1	**9.262 520**
Delta E 100	red	1	**9.262 521**
Delta E 200	black	1	**9.262 530**

3 Stopclock, analogue, Mesotron



Quartz-accurate timer with large, analogue display.
Measuring range: 0 to 60 secs, 0 to 60 mins. Inner scale 1 to 100 secs/100 mins.
110 mm dia.
Battery life over 18 months with a 1.5 V button cell.
Dimensions (WxDxH): 130 x 40/95 x 175 mm
Weight: 375 g

Type	PK	Cat. No.
Mesotron stopclock	1	**9.262 080**

4 Interval timer with alarm



Benchtop mechanical timer. Suitable for standing, hanging and in addition on the back of two magnets, which allows the fitting of metal parts. Casing and rotary setting knob are white, the dial is black. Running time max. 60mins.

Dimensions (WxDxH): 65 x 35 x 65mm

Type	PK	Cat. No.
Interval timer with alarm	1	**9.260 020**

1



1 LLG-Short period timer

Timer and stopwatch, up to 99min. and 59sec., rubber coated, with magnetic attachment, battery LR 44 inclusive, diam. 54 x 16.5mm, approx. 40g
Easy to use, great display.

Type	PK	Cat. No.
Electronic Countup Timer	1	**9.260 150**

2



2 Short period timer

Electronic timer and stopwatch with large display and 10-key setting. Counts up or down from 10 hours to 1 second. With pocket clip, bench stand, magnetic attachment and battery. Overall 70 x 60 x 25mm, weight 95g.

Type	PK	Cat. No.
Timer II	1	**9.851 027**

3



3 Short period timer KT188

- countdown timer from max. 99 mins., 59 secs.
- 30 Sec. loud audible alarm sounds when 'zero' reached
- with magnet.
- supplied with 'SR 44' 1.5 V button cell.

Dimensions (WxDxH): 88 x 12 x 46 mm
Weight: 30 g

Type	PK	Cat. No.
Short period timer KT188	1	**9.260 188**

4



4 Electronic timer clock

Count down/count up timer with loud alarm signal at end of timed period. *Amarell*
With Clock, Stopwatch and Memory functions. Timer up to 24 hours.
Fittings: magnet, stand and clip.
Dimensions (WxDxH): 68mm x 53mm x 20mm, with battery.

Type	PK	Cat. No.
Electronic Timer Clock	1	**9.235 145**

5



5 Countdown timer TR 113

- large, 4 digit, LCD readout *Oregon Scientific*
- countdown/countup 99 min. 59 sec.
- measuring cylinders Audible alarm sounds when 'zero' reached
- with pocket clip/bench stand and magnet
- with 1x 1.5V AAA battery
- dimensions: 73 x 66 x 18mm
- weight: 61g

Type	PK	Cat. No.
TR 113	1	**6.700 333**

E & OE.

1 3-channel-short period timer

Indispensable for laboratories. Triple timer with large display. *Dostmann electronic*

- Indicates three separate times simultaneously
- Stopwatch function
- Integrated quartz watch
- Supplied with magnet and clip

Technical Specifications

Range:	1sec to 20hours
Operating temperature:	0 to 50°C
Power supply:	1.5V AAA
Dimensions (WxDxH):	88 x 71 x 24mm
Weight:	115g

Type	PK	Cat. No.
3-channel-timer	1	**6.233 690**

1



2 Laboratory Short period timer Compact

Compact.
Countdown/Countup.
Digital reading, with alarm and repeat function.
12hr. clock function.
Countdown and countup display: 23hrs, 59mins, 59secs.
Dimensions (WxDxH): 64 x 60 x 16mm
Weight: 40 g

Type	PK	Cat. No.
Compact	1	**9.262 071**

2



3 Short period timer with clock

Easy to operate.
Quartz-accurate. With electronic alarm signal.
Adjustable from 1 sec. to 24 hrs.
Memory.
Dimensions (WxDxH): 80 x 45 x 85 mm
Weight: 120 g

Type	PK	Cat. No.
Microchronometer with clock	1	**9.260 187**

3



4 Short period timer WB 388

Three separate timers in one instrument. Countdown/countup.
Audible alarm sounds when 'zero' reached. 12/24 hour clock. Loud/soft alarm switch.
Dimensions (WxDxH): 83 x 22 x 70mm
Weight: 80g

Type	PK	Cat. No.
WB 388	1	**9.260 184**

4



5 Dual short period timer WB 388 TR 118 OS

- Large, 6 digit, LCD readout
- 2 separate timers in one instrument
- Countdown/countup 99 hrs. 59 mins. 59 secs.
- Clock function switch
- Audible alarm sounds when 'zero' reached
- With pocket clip/bench stand and magnet
- Supplied with AAA 1.5V battery

Dimensions (WxDxH): 73 x 66 x 18mm
Weight: 63g

Type	PK	Cat. No.
TR 118 OS	1	**9.260 186**

5



1



1 Digi-Clock timer, TR 119 OS

- Large, 6-digit LCD display
- Programmable for up to 23 hrs, 59 mins, 59 secs.
- 1-minute audible alarm when timed period has expired
- Countdown or countup functions
- Time display
- Case incorporates combined bench stand/pocket clip with magnet.
- Supplied with 1 x 1.5V AAA battery.

Dimensions (WxDxH): 73 x 70 x 19mm
Weight: 50g

Type	PK	Cat. No.
TR 119 OS	1	**9.260 189**

2



2 Microchronometer, TR 112 OS

- 4-figure LCD time readout for minutes and seconds
- Programmable for up to 99 mins, 59 secs.
- 30-second audible alarm when timed period has expired
- Countdown
- Timer memory function
- Case incorporates combined bench stand/pocket clip with magnet
- Supplied with 1 x 1.5V AAA battery

Dimensions (WxDxH): 66 x 56 x 18mm
Weight: 45g

Type	PK	Cat. No.
TR 112 OS	1	**9.260 181**

3



3 Benchtop timers, countdown/countup, Prisma series

Prisma 200.
- ABS plastic case
- Large, easy to read LCD display
- Stopwatch function
- Normal time display
- Selectable time resolution 999mins., 59 secs. or 9 hrs., 59 mins., 59 secs., 1/10 sec.
- Loud audible alarm
- 2 channels with start/stop operation, either separately or together.

Prisma 400.
Generally as Prisma 200, but additionally with:
- Sequence programming
- Function window
- 4 channels.

Type	Colour	PK	Cat. No.
Prisma 200	white	1	**9.260 178**
Prisma 400	white	1	**9.260 179**

4



4 Time switches

With earthed plug. *Theben*

Timer 26
- Daily programme adjustable in 15 min. segments

Eltimo 020 S
- Switch-on intervals: 10 to 120 min.
- Switching capacity 3500 W
- Power reserve 500 h
- Shortest switching time: 1 min
- Digital plug-in timer with weekly program

Type	PK	Cat. No.
Timer 26	1	**9.000 030**
Eltimo 020 S	1	**9.000 031**

E & OE.

1 Radio alarm clock RM 912 BOS



- time adjustment and synchronization via radio signal DCF-77 for Central European time zones only
- with 24 hour display with hh: mm: ss
- date display: day/month
- weekday display in choice of 4 languages
- second time zone function
- time and date manually adjustable
- radio signal strength display in 3 stages
- backlighting by pressing on the snooze button (5 sec.) and during the alarm (5 sec.)
- alarm function
- snooze function (8 mins.)
- 2-minute crescendo alarm
- easy adjustment "24h Alarm off" and "Permanent On/Off"
- two independent alarm times can be set
- battery change display
- supplied with 2 x 1.5V 'AAA' batteries.
- colour: silver-blue

Dimensions (WxDxH): 85 x 47 x 107 mm
Weight: 160 g

Type	PK	Cat. No.
RM 912 BOS	1	**6.237 724**

2 Radio controlled wall clock



- Highest precision radio-controlled clock
- Analogue display with second hand
- Digital display of date
- Large dial
- Ideal for home, office, waiting room, lobby or entrance hall and as a gift
- Ø 300mm
- Battery included 1.5 V AA

Type	PK	Cat. No.
Radio controlled wall clock	1	**9.851 019**

3 Thermohygrometer, Klimatherm



Spun metal case with dial, separate humidity and temperature indicators, and brass hanging ring. *TFA Dostmann*

Measuring range
Relative humidity: 15 to 100%
Temperature: 0 to 40°C
Weight: 90g

Diam. mm	PK	Cat. No.
100	1	**9.726 404**

4 Thermohygrometer, analogue



Synthetic hair, spun metal case with dial and brass hanging ring. *TFA Dostmann*

Measuring range
Relative humidity: 0 to 100%
Temperature: -15 to 55°C
Wieght: 105g

Diam. mm	PK	Cat. No.
100	1	**9.726 403**

1



1 Thermohygrometer

Amarell

Universal application thermohygrometer with outdoor probe and stand/attachment device. Accessory wall mounting (screws or adhesive tape) are available on request.

Specifications

Measuring range:	-50 to +70 x 0.1°C switchable to °F 20 to 90 x 1% R.H.
Dimensions (WxDxH):	approx. 65mm x 20mm x 97mm

Type	PK	Cat. No.
Thermohygrometer	1	**9.235 135**

2



2 Thermohygrometer, TA 100

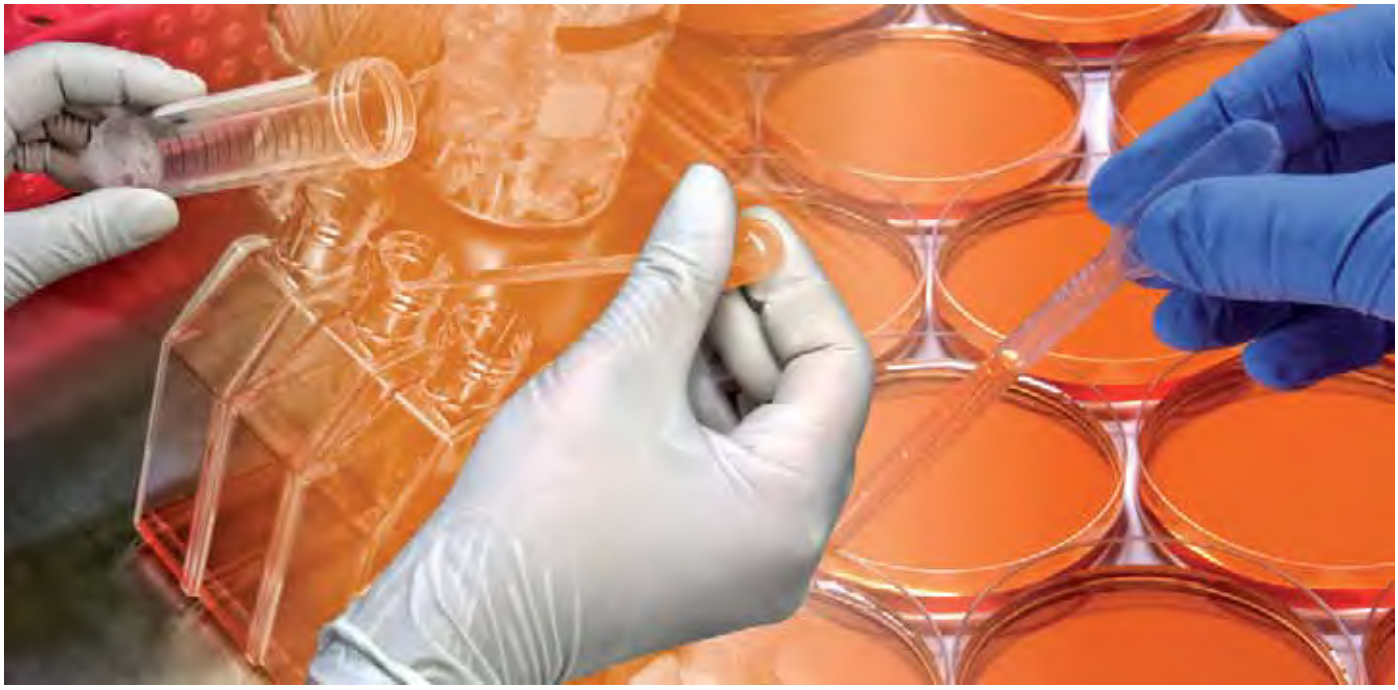
TFA Dostmann

- Very fast humidity sensor
- Dewpoint and max./min. function
- °C/°F-switchable
- Hi-Lo alarm with red warning LED

Specifications

Temperature	
Measuring range:	-40°C to +70°C
Display resolution:	0.1°C
Accuracy:	±0.5°C (0°C to 60°C) remaining range ±1°C
Humidity	
Measuring range:	0% to 99% R.H.
Display resolution:	0.1%
Accuracy:	±3% from 35% to 75% remaining range ±5%
Working temperature:	-40°C to +70°C
Batteries:	2 x 1.5 Volt AAA
Dimensions:	105mm x 105mm x 44mm
Weight:	150g (incl. packaging)

Type	PK	Cat. No.
TA 100	1	**9.726 405**



1 Thermohygrometers testo 623

1



Testo

- The new testo 623 thermohygrometer displays current and past temperature and humidity values on a large, clear display.
- Histogram shows current and recent historical temperature or humidity values
- Large, highly legible display
- Curve display of the last 90 days

Specifications:

Meas. units:	Temperature: °C, °F Humidity: %r.F., td, wb
Meas. range:	-10 to +60°C 0 to 100% RH
Resolution:	0.1°C 0.1% RH
Accuracy ±1 digit:	±0.4°C ±2% RH at +25°C (10 to 90% RH) ±3% RH (rest of range) Time: ±3 minutes/year
Display:	LCD
Measuring rate:	20 secs
Alarm function:	LED alarm for too low or too high temperatur and/or humidity values Calibration reminder
Storage temp.:	-20 to +60°C
Oper. temp:	-10 to +60°C
Battery type:	4 x AA
Battery life:	12 months
Dimensions (L x W x H):	185 x 105 x 36mm
Weight:	240g (without batteries)

Type	PK	Cat. No.
testo 623	1	**9.718 668**

2 Thermohygrometer testo 622

2



Testo

In addition to temperature and humidity, the testo 622 also measures barometric pressure. The large, clear display indicates current readings, as well as the date and time. It thus provides all important values at a glance.

Specifications:

Meas. units:	Temperature: °C,°F Humidity: %rH, td, wb Pressure: hPa, mbar, kPa, in Hg, in H_2O, psi
Meas. range:	-10 to +60°C 0 to 100%RH 300 to 1200hPa
Resolution:	0.1°C 0.1% RH 0.1hPa
Accuracy ±1 digit:	±0.4°C ±2%RH at +25°C (10 to 90%RH) ±3%RH (rest of range) ±3hPA
Display:	LCD
Measuring rate:	10secs
Alarm function:	LED alarm for too low or too high temperatur and/or humidity values Calibration reminder
Storage temp.:	-20 to +60°C
Oper. temp:	-10 to +60°C
Battery type:	4 x AA
Battery life:	12 months
Dimensions (L x W x H):	185 x 105 x 36mm
Weight:	240g (without batteries)

Type	PK	Cat. No.
testo 622	1	**9.718 667**

1



1 Hygrothermograph with spring movement or quartz clock

White plastic-coated metal casing, with high quality bimetallic temperature measuring system. *Thies*

Spring movement type:

Measuring range:	0 to +40°C 0 to 100% R.H.
Dimensions (H x D x W):	280 x 140 x 260mm
Recording:	7 days/24 hrs selectable
Humidity measuring element:	"K"

Quartz clock type:

Measuring range:	-10 to +50°C/10 to 100% R.H.
Operation period:	1, 7 and 31 days selectable

Other measuring ranges are available on request.

Type	PK	Cat. No.
Spring clock	1	**9.726 560**
Quartz clock	1	**9.726 531**
Quartz clock, with plastic hood	1	**9.726 533**

2



2 Precision handheld instruments P700 series

For temperature, moisture and airflow. *Dostmann electronic*

For highly accurate temperature measurements with USB PC online interface.
(Optional: Windows SmartGraph software for graphical and tabular documentation, etc). Integral probe calibration for sensor tolerance compensation. Min.- Max.- Hold- and AVG- functions. The large LCD shows two measurements synchronously, even temperature differences can be displayed (P705, P755, P755-Log, P770).

Specifications

General (all models):
USB interface, Max-Min memory, Hold function, true average calculation over a freely selectable period, Auto-off function, measured quantities can be freely assigned to instrument channels, comprehensive calibration options (selectable 1-point, 2-point or 3-point calibration), large display with bar graph for simultaneous display of 2 measured values

P700/P705:
1/2 measurement channels (Pt100 4-wire probe, thermocouples type J, K, L, N, T, R, S), measurement ranges and accuracies: Pt100:-200 to +850°C (±0.1°C -100 to +200°C, otherwise ±0.1% of measurement value) thermocouples, DIN types (-200 to +1760°C)

P710/P715:
1/2 measurement channels (Pt100 4-wire probe, thermocouples type K, J, L, N, T), measurement ranges and accuracies: Pt100: -200 to +1370°C (±0.2°C -40 to +200°C, ±0.5 to 1000°C otherwise ±0.1°C of measurement value) Thermocouples acc. to EN 60584-1

P750/P755/P755-Log:
1/2 measurement channels (Pt100 4-wire probe, thermocouples type J, K, L, N, T, R, S, moisture, flow), measurement ranges and accuracies: Pt100: -200 to +850°C (±0.03°C -50 to +200°C, ±0.05°C -200 to +200°C, otherwise ±0.05% of measurement value), thermocouples, DIN type (types J, K, L, N, T 0 to 200°C, ±0.3°C, +200 to +1000°C ±1.0°C, otherwise ±.5°C;
type R, S ±1.0°C +0.1% of measurement value) humidity 0 to 100% R.H. (±0.5%R.H.), flow 0 to 40 m/s (±0.5% of measurement value +1.0% of final value)

P770:
2 measurement channels (Pt100, thermocouples type J, K, L, N, T, R, S, moisture, flow), measurement ranges and accuracies: Pt100: -200 to +850°C (±0.1°C -100 to +200°C, otherwise ±0.1% of measurement value) thermocouples, DIN types, humidity 0 to 100%R.H. (±0.5%R.H.), flow 0 to 40 m/s (±0.5% of measurement value)
Dimensions (L x W x D)/ weight: 200 x 85 x 40mm/300g

Type	Description	PK	Cat. No.
P700	1 channel, Pt100	1	**9.852 000**
P705	2 channel, Pt100	1	**9.852 001**
P710	1 channel thermocouples Type K, J, L, N, T	1	**9.852 002**
P715	2 channell thermocouples Type K, J, L, N, T	1	**9.852 003**
P750	1 channel, Pt100, moisture, dew piont, flow	1	**9.852 004**
P755	2 channel, Pt100, moisture, dew point, flow	1	**9.852 005**
P755-Log	2 channel, Pt100, moisture, dew point, flow, with datalogger for 6000 values	1	**9.852 006**
P770	2 channel, Pt100, moisture, dew point, flow	1	**9.852 007**
P770-Log	2 channel, Pt100, moisture, dew point, flow, with datalogger for 6000 values	1	**9.852 008**

E & OE.

Accessories for hand-held meters Serie P700

Description	PK	Cat. No.	
Immersion probe Pt100, -50 to +350°C, Cl. B, 150x3mm	1	**9.851 935**	1
Immersion probe Pt100, -50 to +350°C, Cl. B, 300x3mm	1	**9.851 936**	
Immersion probe Pt100, -200 to +450°C, ±0.03°C, 150x3mm	1	**9.851 937**	
Immersion probe Pt100, -200 to +450°C, ±0.03°C, 300x3mm	1	**9.851 938**	
Insertion probe Pt100, -200 to +500°C, Cl. B, 150x4mm	1	**9.851 948**	
Immersion probe NiCr-Ni/Type K, -40°C to +1100°C, Cl. 1, 300x1.5mm	1	**9.851 949**	
Surface probe NiCr-Ni/Type K, T90 3 sec., max. +400°C, 120x6mm	1	**9.851 957**	2
Temp. / relative Humidity -40 to 80°C / 0 to 100%, 120x20mm	1	**9.851 954**	3
Airflow Turbine probe 0 to 20m/s, diam. 22 x 28mm, 150mm lg.	1	**9.851 955**	4
Software DE-Graph for 95 / 98 / 2000 / NT / Vista	1	**9.851 925**	5
Service case suitable up to 3 probes & accessories	1	**9.851 924**	
PC-Cable for USB port	1	**6.242 171**	
Power supply 230 V	1	**9.851 959**	

1



9.851 935

2



9.851 957

3



9.851 954

4



9.851 955

5



9.851 925

6 CO_2 Meter, Air CO_2ntrol 3000

- Large display
- Measuring range: 0 to 3000ppm
- Incl. Power supply for 230 VAC
- 24-hour data logger
- Adjustable Alarm
- C°/°F-selectable
- Relay output for ventilation control

Applications:
Ideal for monitoring the environment (CO_2 concentration) in public buildings, such as universities,schools
- Hospitals
- Education
- Office
- Production plants
- Public Facilities

Specifications

CO_2

Range:	0 up to 3000ppm
Resolution:	1ppm (0 up to 1000ppm); 5ppm (1000 up to 2000ppm); 10ppm (<2000ppm)
Accuracy:	50ppm or 5%, larger value applies

Temperature

Range:	0 up to +50°C
Resolution:	0.1°C
Accuracy:	±1% or 1°C, larger value applies
Display:	7 segment LCD(twin-lined)
Housing:	Plastic (ABS)
Supply requirements:	230 VAC adapter or 4 x AA Batteries
Dimensions:	165 x 80 x 23mm
Weight:	600g (incl. packaging)

Type	PK	Cat. No.
Air CO_2ntrol 3000	1	**9.726 408**

6



1



1 Weather station, Diva Plus

TFA Dostmann

- transmission of outdoor temperature and humidity via up to 3 transmitters (max. 100m)
- indication of indoor temperature and humidity,
- Max./min. function
- weather forecast, tendency of atmospheric pressure, bar graph indication of atmospheric pressure of the last 24 hours
- radio controlled clock with date, time zone ±12 hrs
- interchangeable °C/°F display
- wall or table mounting

Supplied with: Outdoor temperature and humidity transmitter, batteries 5 x 1.5V AA.

Specifications

Temperature range	
outdoors:	-40 to +60°C (-14 to 140°F)
indoors:	-10 to +60°C (-4 to 140°F)
Humidity:	1 to 99%
Dimensions basis station:	180 x 100 x 35mm
Dimensions transmitter:	160 x 43 x 28mm
Weight:	520g

Type	PK	Cat. No.
Diva Plus	1	**9.726 410**

2



2 Weather info center, Meteotime Star

TFA Dostmann

Weather info center "meteotime star" weather forecast via DCF signal made by professional meteorologists for 470 cities (90 meteorological weather regions) in Europe,
60 regions with 4 days forecast (today + 3 days), 30 regions with 2 days forecast, separated into day and night with expected highest and lowest temperatures, for the current day text display for critical weather situations, rain/snow/hail probability, wind velocity and direction, time for sun rising and setting, wireless transmission of outdoor temperature and humidity via transmitter (max. 30m), indication of indoor temperature and humidity, max.- min.-function,
radio controlled clock with date, for hanging or standing, equipment: outdoor temperature and humidity transmitter, batteries 2 x 1.5V AA display station, 2 x 1.5V AA transmitter.

Specifications

Temperature range	
outdoors:	-40 to +70°C
indoors:	0 to +60°C
Humidity:	1 to 99%
Dimensions basis station:	132 x 120 x 39mm
Dimensions transmitter:	101 x 56 x 24mm
Weight:	570g

Type	PK	Cat. No.
Meteotime Star	1	**9.726 420**

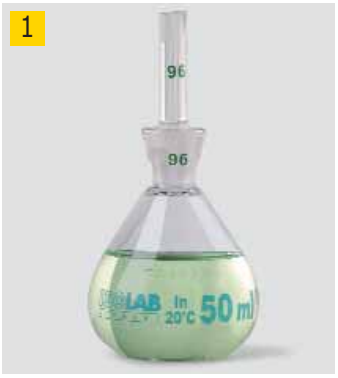


1 Pycnometers, calibrated, Borosilicate glass 3.3.

DIN 12797. Individually calibrated to contain (In) to 0.001ml. Net volume capacity is engraved on the body. Each bottle is calibrated together with its stopper. In order to differentiate easily, both the body and the stopper have the same code numbers printed on themselves. *Isolab*

Capacity ml	PK	Cat. No.
5	1	**4.008 327**
10	1	**6.241 602**
25	1	**4.008 328**
50	1	**6.241 603**
100	1	**4.008 329**

1



2 Pycnometers, BLAUBRAND®, Borosilicate glass 3.3.

DIN ISO 3507, gay-lussac type . Including individual certificate. Adjusted. With NS10/19 capillary stopper. Stopper top ground and polished. Inscription in highly contrasting blue enamel. The volume in cm³ is specified to a precision of 3 decimal places. Calibrated to contain. Every pycnometer is calibrated with its own stopper; hence, stoppers are not interchangeable. Each bottle and its stopper is marked with an unique matching identification number. *BRAND*

Nom. capacity cm³	PK	Cat. No.
5	1	**9.277 305**
10	1	**9.277 310**
25	1	**9.277 325**
50	1	**9.277 350**
100	1	**9.277 400**

2



3 Pycnometers, BLAUBRAND®, with thermometer and side capillary, Borosilicate glass 3.3.

DIN ISO 3507, guy-lussac type . Including individual certificate. Adjusted. With thermometer and side capillary. Calibrated to contain. The volume in cm³ is specified to a precision of 3 decimal places. Inscription in highly contrasting blue enamel. Thermometer with translucent glass scale, with conical ground joint 10/19. Measuring range 10 to 35°C (0.2°C increments), mercury filled. Side capillary with conical ground joint cap 7/16. Every pycnometer is calibrated with its own stopper; hence, stoppers are not interchangeable. Each bottle and its stopper is marked with an unique matching identification number. *BRAND*

Nom. capacity cm³	PK	Cat. No.
10	1	**9.277 410**
25	1	**9.277 425**
50	1	**9.277 450**
100	1	**9.277 500**

3



4 LLG-Precison-Hydrometer, Alcoholmeters, with thermometer

Measuring range, graduation: 0.1% vol, with thermometer 0 to +30°C, graduation: 0.5°C, calibrated at 20°C.
Filling: blue. Overall length: 380mm
Optionally available with official calibration certificate, works certificate or DKD-calibation certificate.
Please specify with order.

Type	Measuring range % vol	PK	Cat. No.
1	0 - 10	1	**9.236 810**
2	10 - 20	1	**9.236 811**
3	20 - 30	1	**9.236 812**
4	30 - 40	1	**9.236 813**
5	40 - 50	1	**9.236 814**
6	50 - 60	1	**9.236 815**
7	60 - 70	1	**9.236 816**
8	70 - 80	1	**9.236 817**
9	80 - 90	1	**9.236 818**
10	90 - 100	1	**9.236 819**

4





1 Hydrometers, relative density (S.G.)

Shot poised. Without thermometer. Reference temperature: +20°C.

Measuring range g / ml	Sub-divisions g / ml	Length mm	PK	Cat. No.
0.600 - 0.800	0.002	280	1	**9.004 006**
0.800 - 1.000	0.002	280	1	**9.004 008**
1.000 - 1.200	0.002	280	1	**9.004 010**
1.200 - 1.400	0.002	280	1	**9.004 012**
1.400 - 1.600	0.002	280	1	**9.004 014**
1.600 - 1.800	0.002	280	1	**9.004 016**
0.700 - 1.000	0.005	300	1	**9.004 057**
1.000 - 1.500	0.005	300	1	**9.004 060**
1.500 - 2.000	0.005	300	1	**9.004 065**

Further models availlable on request.



2 Hydrometers, density, adjustable

DIN 12791 (and BS718). Adjustable. M100 series. Shot poised.
Without thermometer. Reference temperature: +20°C.

Measuring range g / ml	Sub-divisions g / ml	Length mm	PK	Cat. No.
0.800 - 0.900	0.002	250	1	**9.004 108**
0.900 - 1.000	0.002	250	1	**9.004 109**
1.000 - 1.100	0.002	250	1	**9.004 110**
1.100 - 1.200	0.002	250	1	**9.004 111**
1.200 - 1.300	0.002	250	1	**9.004 112**
1.300 - 1.400	0.002	250	1	**9.004 113**
1.400 - 1.500	0.002	250	1	**9.004 114**
1.500 - 1.600	0.002	250	1	**9.004 115**

Further models availlable on request.



3 Hydrometers, density

Shot poised. Without thermometer. Reference temperature: +20°C.

Measuring range g / ml	Sub-divisions g / ml	Length mm	PK	Cat. No.
0,760 - 0,820	0.001	160	1	**9.004 153**
0,820 - 0,880	0.001	160	1	**9.004 154**
0,880 - 0,940	0.001	160	1	**9.004 155**
0,940 - 1,000	0.001	160	1	**9.004 156**
1,000 - 1,060	0.001	160	1	**9.004 157**
1,060 - 1,120	0.001	160	1	**9.004 158**
1,120 - 1,180	0.001	160	1	**9.004 159**
1,180 - 1,240	0.001	160	1	**9.004 160**
1,240 - 1,300	0.001	160	1	**9.004 161**
1,300 - 1,360	0.001	160	1	**9.004 162**
1,360 - 1,420	0.001	160	1	**9.004 163**

Further models availlable on request.

Thermometers please see page 363.

1 Hydrometers, Baumé

Baumé type. Shot poised. Without thermometer. Reference temperature: +15°C.

Measuring range Bé	Sub-divisions Bé	Length mm	PK	Cat. No.
0 - 5	0,1	260	1	**9.004 305**
0 - 10	1,0	220	1	**9.004 310**
0 - 15	1,0	230	1	**9.004 315**
0 - 20	1,0	230	1	**9.004 320**
0 - 30	1,0	250	1	**9.004 330**
0 - 40	1,0	250	1	**9.004 340**
0 - 50	1,0	280	1	**9.004 350**
0 - 70	1,0	300	1	**9.004 370**

Further models availllable on request.



2 Hydrometers, mineral oil

With -10 to +60°C thermometer.
Adjustable.
Reference temperature: +15°C.

Measuring range g / ml	Sub-divisions g / ml	Length mm	PK	Cat. No.
0,610 - 0,700	0,001	390	1	**9.004 561**
0,680 - 0,770	0,001	390	1	**9.004 568**
0,750 - 0,840	0,001	390	1	**9.004 575**
0,820 - 0,910	0,001	390	1	**9.004 582**
0,890 - 0,990	0,001	390	1	**9.004 589**



3 Hydrometers, lime water $Ca(OH)_2$

For lime water $Ca(OH)_2$.
Without thermometer.
Reference temperature: +20°C.

Measuring range	Length mm	PK	Cat. No.
0 - 340 g/l	300	1	**9.004 640**





1 Salinometers, Bischoff type

For common salt.
Without thermometer.

Measuring range g / ml	Length mm	PK	Cat. No.
0 - 27	240	1	**9.004 650**



2 Hydrometers for acids/bases in %

Without thermometer.
Total length: 250mm to 280mm

For	Measuring range	Reference temperature °C	PK	Cat. No.
Ammonia	0 to 35 x 0.5 %	20	1	**9.004 651**
Sodium hydroxide	0 to 27 x 1 %	15	1	**9.004 652**
Sodium hydroxide	0 to 10 x 0.1 %	15	1	**9.004 653**
Nitric acid	0 to 47 x 1 %	15	1	**9.004 654**
Hydrochloric acid	0 to 39 x 1 %	15	1	**9.004 655**
Sulphuric acid	0 to 45 x 1 %	15	1	**9.004 656**
Hydrogen peroxide	0 to 30 x 1 %	15	1	**9.004 657**



3 Alcoholometer

Richter-Tralles type.
0 to 100% at reference temperature: +20°C.
Without thermometer.

Type	PK	Cat. No.
Alcoholometer	1	**9.004 400**



E & OE.

1 Hydrometers, high-quality plastics

NEW!

Ludwig Schneider

We use state-of-the-art processes to manufacture hydrometers made of high-quality plastics (polycarbonate). Each hydrometer is accurately adjusted, passes strict quality control and is marked with its individual serial number. Therefore, the determined values are traceable to the measurement device. Hydrometers made of plastics can even be used as test medium within quality management systems with the highest standards of quality, safety and reliability due to an optional calibration of our accredited calibration lab.

- Breakage protected (no glass breakage)
- Fully made of resistant polycarbonate (PC)
- High transparency (like glass), easy-to-read scales
- High precision and reproducibility
- Suitable for applications in food, pharmaceutical and cosmetic industries as well as many others
- Measuring units: specific gravity, density, Oechsle, % mas, Brix, ° Baumé, etc.
- Made in Germany: We are the only German manufacturer producing both precision glass and plastic hydrometers
- DAkkS or works certificates on request
- Food safety according to HACCP

1



Measuring range	Scale	Length mm	PK	Cat. No.
1.000 - 1.220g/cm³	0.002g/cm³	300	1	**9.236 840**
1.200 - 1.420g/cm³	0.002g/cm³	300	1	**9.236 841**
1.400 - 1.620g/cm³	0.002g/cm³	300	1	**9.236 842**
0 - 100°	1°	300	1	**9.236 843**
0 - 26%mas.	0.2%	300	1	**9.236 847**
0 - 12Bé	0.2Bé	250	1	**9.236 844**
9 - 21Bé	0.2Bé	250	1	**9.236 845**
19 - 31Bé	0.2Bé	250	1	**9.236 846**
0 - 35%mas./Brix	0.5%mas.	300	1	**9.236 848**
0 - 50%mas./Brix	0.5%mas.	300	1	**9.236 849**

2 Hydrometer jars, PP

BRAND

With overflow chamber so that hydrometer can be read when cylinder is completely full. Impact resistant and flexible. With spout.

2



Capacity ml	Int. diam. mm	Height mm	PK	Cat. No.
500	50	350	1	**9.004 900**

3 Hydrometer jars, glass

With spout and base.

3



Height mm	Diam. mm	PK	Cat. No.
150	38	1	**9.950 034**
200	38	1	**9.950 035**
200	50	1	**9.950 036**
250	50	1	**9.950 037**
300	50	1	**9.950 038**
350	63	1	**9.950 039**

1



1 Battery hydrometer

Battery acid tester 1.10 to 1.30.
Boxed complete with glass tube, rubber bulb and hydrometer.

Type	PK	Cat. No.
Battery hydrometer	1	**9.004 710**

2



2 Density meter Densito 30PX

NEW!

Mettler-Toledo Online

- Wide range of applications
- Easy to use: take a sample and read the final result
- Results within seconds displayed in the unit of your choice
- Choice of temperature correction coefficient before each measurement
- Intuitive user guidance and plain language display
- Clearly visible measuring cell
- External sample tip/external syringe connection for high viscosity samples

Supplied with: Protective case, density standards, cleaning tissues, instruction manual, flasks for cleaning solution, batteries, LabX® direct DE/RE data transfer software for data collection and manipulation.

Specitications

Density measuring range:	0 to 2g/cm³
Resolution:	0.0001g/cm³
Accuracy:	±0.001 g/cm³
Measuring units:	Density, relative density, density temperature compensated, relative density temperature compensated, Brix %, alcohol (gravity-%, volume-%, US Proof and UK Proof), Baumé, Plato, API (scales A, B and D), %sulphuric acid (gravitypercents), user-defined units
Temperature:	0 to 40°C
Measuring range:	0.1°C
Resolution:	either in °C or °F
Calibration:	with dry air and pure water or other density standards
Data storage:	storage space for up to 1100 results
Display:	Matrix-LCD with background lighting
Interface:	Infrared, protocol selectable (IrDA or RS232C)

Type	PK	Cat. No.
Densito 30PX	1	**9.947 550**
Density standards (6mL), 10-piece set with certificate	1	**9.947 551**



E & OE.

1 Dipping flow cups Frikmar

Aluminium. DIN 53211 viscometer.
For all types of liquid chemicals, varnishes, fluid enamels, gravure printing inks and leather dyes, oils, fats, foodstuffs etc.
With 4mm flow nozzle. Accessory 2, 3, 5, 6, 7 and 8mm nozzles are available on request.

Type	PK	Cat. No.
Dipping flow cups Frikmar	1	**9.149 898**



2 Flow cups

DIN 53211.
With fixed nozzle, 4mm.
(Also available with 2, 3, 5, 6, 7 and 8mm nozzles - details on request)

Type	PK	Cat. No.
Flow cups	1	**9.149 862**



3 Flow cups, without nozzles

For 2, 3, 4, 5, 6, 7 and 8mm outlet detachable nozzles.

Type	PK	Cat. No.
Flow cups	1	**9.149 860**



Flow cup nozzles

Flow cup nozzles to DIN 53211. For flow cup 9.149 860.

Int. bore diam. mm	PK	Cat. No.
2	1	**9.149 872**
3	1	**9.149 873**
4	1	**9.149 874**
5	1	**9.149 875**
6	1	**9.149 876**
7	1	**9.149 877**
8	1	**9.149 878**

4 Flow cup stand, ring stand

Stainless steel.

Type	PK	Cat. No.
Flow cup stand, ring stand	1	**9.149 881**



1



1 Viscometers, glass, kinematic, Ubbelohde

To ISO/DIS 3105. DIN 51562. BS 188. NF T 60 to 100. *SI Analytics GmbH*
Without documentation of the constants.
For manual and automatic relative measurements.

Type	Capillary	Constant K	PK	Cat. No.
53001	0a	0.005	1	**9.268 301**
53003	0c	0.003	1	**9.268 303**
53010	I	0.01	1	**9.268 310**
53013	Ic	0,03	1	**9.268 313**
53020	II	0.1	1	**9.268 320**
53023	IIc	0.3	1	**9.268 323**
53030	III	1	1	**9.268 330**
53033	IIIc	3	1	**9.268 333**
53040	IV	10	1	**9.268 340**

2



2 Viscometers Ubbelohde, glass, kinematic

ISO 3105, DIN 51562, NF T60-107 *SI Analytics GmbH*
For manual (type 501 ..) or automatic (type 532 ..) measurements.
Constants documented in manufacturer's certificate.

Type	Capillary	Capillary i.d. mm	Constant K	Measuring range mm²/ sec	PK	Cat. No.
501 00	0	0.36	0.001	0.2 to 1	1	**9.268 100**
501 03	0c	0.47	0.003	0 to 3	1	**9.268 103**
501 01	0a	0.53	0.005	0.8 to 5	1	**9.268 101**
501 10	I	0.63	0.01	1.2 to 10	1	**9.268 110**
501 13	Ic	0.84	0.03	3 to 30	1	**9.268 113**
501 11	Ia	0.95	0.05	5 to 50	1	**9.268 111**
501 20	II	1.13	0.1	10 to 100	1	**9.268 120**
501 23	IIc	1.50	0.3	30 to 300	1	**9.268 123**
501 21	IIa	1.69	0.5	50 to 500	1	**9.268 121**
501 30	III	2.01	1	100 to 1000	1	**9.268 130**
501 33	IIIc	2.65	3	300 to 3000	1	**9.268 133**
501 31	IIIa	3.00	5	500 to 5000	1	**9.268 131**
501 40	IV	3.60	10	1000 to 10000	1	**9.268 140**
532 10	I	0.63	0.01	1.2 to 10	1	**9.268 210**
532 13	Ic	0.84	0.03	3 to 30	1	**9.268 213**
532 20	II	1.13	0.1	10 to 100	1	**9.268 220**
532 23	IIc	1.50	0.3	30 to 300	1	**9.268 223**
532 30	III	2.65	3	300 to 3000	1	**9.268 230**
532 33	IIIc	3.60	10	1000 to 10000	1	**9.268 233**

3



3 Viscometer holders

Type 05392. VA steel. *SI Analytics GmbH*
Suitable for all Ubbelohde viscometers without TC sensors.
For manual and automatic measurements. Holds the viscometer perpendicularly.
Accuracy <1°. Protects the viscometer from damage.

Type	PK	Cat. No.
05392	1	**9.268 790**

4



4 Viscometer heating jacket

With support plate for Ubbelohde and capillary viscometers. *SI Analytics GmbH*
Can be thermoregulated in mantles in the temperature range 0 to 180°C.

Type	PK	Cat. No.
Viscometer heating jacket	1	**9.269 420**

1 Automatic viscometer ViscoClock



Introductory model for automatic viscosity analysis. *SI Analytics GmbH*
For determining absolute and relative viscosity.

The most precise method for determining the viscosity of liquids is to measure it in capillary viscometers.
The ViscoClock works in accordance with this method. Optical fibres precisely determine the liquid meniscus on two measuring planes, the running time is determined and displayed with a resolution of 0.01 secs. Since the measuring process runs automatically, subjective sources of error are reliably excluded. The 0.01% accuracy of the measured time for calculating the absolute and relative viscosity is given as a measuring uncertainty with a confidence level of 95 %.

The ViscoClock was designed to use of Ubbelohde, micro Ubbelohde or micro Ostwald viscometers and can be operated in all thermostatic baths with transparent tanks.

Measuring range:	Up to 999.99 secs./resolution 0.01 sec.
Timing accuracy:	±0.01 sec. ±1 digit, but not more accurate than 0.1%, given as measuring uncertainty with a confidence level of 95%
Measuring range viscosity:	0.35 to 10000 mm²/sec. (cSt) The absolute, kinematic viscosity is also dependent on the uncertainty of the numerical value of the viscometer constants and on the measuring environment, in particular the measuring temperature
RS 232C interface:	For connecting a printer with a serial interface or a computer (PC) for documenting the data
Operating temperature:	Stand: -40 to +150°C Electronic measuring unit: +10 to +40°C
Dimensions (WxDxH):	approx. 95 x 50 x 490 mm
Weight:	approx. 450g (without viscometer) Power pack approx. 220g
Viscometers accepted:	Ubbelohde (DIN, ISO, ASTM, micro), micro Ostwald.

Type	PK	Cat. No.
ViscoClock	1	**9.269 480**

2 Laboratory Viscometer ProRheo R180



ProRheo R180 is both a portable and "stand alone" rotational viscometer.
- rugged instrument housing
- easy to use and wide measurement range
- relevant parameters can be stored
- measuring systems according to DIN 53019
- measurement accuracy: < 1 %
- measurement range: 5 mPas to 540.000 mPas
- Torque: 0.25 to 10 mNm ±0.01 mNm
- rotational speed: 5 to 1000 rpm
- Measurement programmes: 8 measurement points at different shear rates:
  2 predefined test set-ups, 8 programmable test set-ups.

R180 viscometer includes:
- Power supply
- stand
- measuring tubes 1, 2 and 3
- measuring bobs 1, 2 and 3
- tube caps 1, 2 and 3
- Instrument case
- Operating instructions

Application table for measuring tubes and bobs

Type	Measuring system	Tube diam. mm	External body diam. mm	Viscosity min. mPa.	Viscosity max. mPa.	Volume ml	PK	Cat. No.
R180*	11	32.5	30	5	10000	approx. 24	1	**9.106 650**
R180*	22	26.1	24	10	20000	approx. 16	1	**9.106 650**
R180*	33	15.2	14	20	100000	approx. 9	1	**9.106 650**

* All applications are done with the same instrument.

1 LLG-Melting point apparatus

NEW!

Ideal for determination of the melting point of powders and substances that do not have a clear transparent melting point.

Both models have the following properties:
- Digital temperature control
- Sample can be monitored through a magnifying glass with integrated light
- For capillaries with 1.4mm outer diameter
- Automatic fan cooling that activates to cool off the device after completion of the measurement
- Text display of error messages
- Keyboard covered with foil for easy cleaning
- With operating instructions in German and English; brief instructions right at the device
- With integrated printer for saving space (only HV2)

H2 for visual, semi-automatic measurement with magnifying glass, without printer:
In this model, the melting point is determined visually and then saved by pushing the "Save" key. The starting temperature (approx. 3°C below the expected melting point) is set. A signal sounds when this temperature is reached. The sample is introduced and observed at a heating rate of 1°C/min. after the "start" key is pushed again. When the melting point is determined, the value can be stored by pushing the memory button and read on the display until the device is switched off or a new measurement is performed.

HV2 for visual measurement with magnifying glass or automatic measurement, with printer:
Either fully automatic or visual measurements, 1 sample each.
With this version, you can specify whether you want to observe the melting process through the magnifying glass or have the melting point determined automatically after the pre-set starting temperature is reached (indicated by sound signal). The device starts the heating rate of 1°C/min after introduction of the capillaries into the corresponding opening for automatic measurements. If you chose automatic measurement, a transparency progression is printed from the time the substance starts to become transparent (melting process) to absolute transparency (light-permeability). For visual measurement, only the melting point determined by you will be printed.

The scope of delivery contains 100 melting point determination capillaries and a device protection hood.
Refill pack melting point tubes for LLG-Melting point apparatus please order Cat. No. 9.208 131.

Specifications

Measuring range:	25.0°C to 360.0°C
Resolution:	0.1°C
Accuracy:	±0.5°C (+25°C to +200°C)
	±0.5% of measured value °C (rem. measuring range)
Heating rate at fast heating:	to 200°C, approx. 4 min
	to 350°C, approx. 8 min
Heating rate when measuring:	1°C/min
Magnifying glass:	10x
Lighting:	2 x LED
Dimensions (WxDxH):	230mm x 220mm x 315mm
Dimensions capillaries:	1.4mm x 80mm
Weight:	4.5kg
Power supply:	115-230V, 50Hz

Type	Description	PK	Cat. No.
MPM-H2	Visual measuring / magnifier	1	**9.208 120**
MPM-HV2	Visual or automatical measuring with printer	1	**9.208 121**
Melting point tubes	Sealed one end, length 80mm, OD 1.40mm	100	**9.208 131**



E & OE.

1 2 Melting point apparatus, Electrothermal IA 9100/9200/9300

Electrothermal

With microprocessor heating oven control. Up to 3 melting points can be quickly and accurately determined simultaneously. The starting temperature of the approximate melting range can be input via the keyboard. The unit quickly heats up to this temperature and gives an optical and acoustic signal once it has been reached. When the operator then presses another key, the device begins to heat up at a constant rate (IA 9100 fixed at 1°C/min., IA 9200 and IA 9300 adjustable between 0.2 to 10°C/min. in increments of 0.1°C).
Up to 4 melting points(IA 9300 up to 6 melting points) can be recorded and transferred to the memory as discreet temperatures for later recall on the display. The different phases of a melt or the critical melting temperatures of various samples can be investigated under the same conditions in this way. Model IA 9200/9300 provides the opportunity for computer-supported data analysis. The initial temperature and heating rate can be set via the keyboard in order that various test protocols are available. An accessory printer enables documentation of the results, date, time (real time) and sample number. Model IA 9200/9300 can allocate continuous sample numbers or recall data via the keyboard. Information can be transferred directly to a LIMS computer via the RS 232 C interface. The 8X magnifier has a Ø of 40mm and an adjustable focal point. Units comply with VDE requirements (CE marked).
Model IA 9300 can be used for pharmacopeia requirements.

1



2



Specifications

Dimensions (WxDxH):	200mm x 350mm x 85mm
Weight:	2.5kg
Input:	220V -240V
Output:	12V
Power:	45W
Oven output:	18W
Oven chamber illumination:	12V/ 2.2W
Oven temperature range:	45 to 400°C
Digital thermometer	
Sensor:	linearised industrial platinum resistance thermometer, compensated.
Measuring range:	Amb. to 400°C
Resolution:	0.1°C
Accuracy:	±0.6°C at 20°C ±1 digit
	±1.0°C at 350°C ±1 digit
Display:	Four-digit, 12mm high LCD

Type	PK	Cat. No.
IA 9100	1	**9.830 441**
IA 9200	1	**9.830 442**
IA 9300	1	**9.830 443**

Accessories for melting point appratus Electrothermal IA 9100/9200/9300

Type	PK	Cat. No.
Cold finger	1	**9.830 445**
Dust cover	1	**9.830 446**
Calibration set	1	**9.830 451**
Capillary tubes, 2.0mm Ø	100	**9.830 447**
Printer with connection cable	1	**9.830 448**
Cal. std. Carbazole (245.61°C) 0.5g	1	**9.830 469**
Capillary tubes, 1.5mm Ø	100	**9.830 463**

1



2

1 2 Melting point apparatus, model SMP10/SMP20

Supplied with 100 melting point tubes, open one end. *Stuart*
With BioCote, silver-based, antimicrobial protection.

Specifications	**SMP10/SMP20**
Number of samples:	2
Temperature range:	Ambient to 300ºC
Temperature accuracy:	±1.0ºC at 20ºC, ±2.5ºC at 300ºC
Display:	Three digit LED/Four digit LED
Display resolution:	1ºC/0.1ºC
Display hold facility:	No/ Yes
Ramp rates:	20ºC per minute to plateau, 2ºC per minute to melt/20ºC per minute to plateau, variable between 1 and 10ºC per minute to melt
Dimensions (w x d x h):	160 x 220 x 170mm
Net weight:	1.8kg
Electrical supply:	230V, 50Hz, 75W

Type	PK	Cat. No.
SMP10	1	**9.950 177**
SMP20	1	**9.830 430**
Lampe	1	**6.227 895**

3



4



5



3 4 5 Melting Point Apparatus, advanced, SMP30

Stuart

- Maximum temperature 400°C
- Patented head up display
- Integrated cooling 350°C to 50°C in 12 minutes
- Large easy to read user friendly interface

The SMP30 can take three samples simultaneously within the optimised heating block. To allow maximum flexibility a plateau facility is included with variable ramp rate between 0.5 and 10°C in 0.1°C increments. The tubes are illuminated with bright white LED's to give the clearest view of the samples during the melt. The block has been designed for easy access for cleaning. To allow the most comfortable viewing angle the SMP30 features a two stage head adjustment. The SMP30 features the patent pending head up display, this unique feature displays a floating image of the block temperature, visible through the eyepiece, in front of the tubes.

An accessory printer is available separately to produce a written record of the melt.

Specifications

No of samples:	3
Temperature range:	Ambient to 400°C
Temperature resolution:	0.1°C
Display:	40 x 4 segment LCD
Ramp rates:	0.5 to 10°C in 0.1°C increments
Memory:	8 results per tube
Date/time display:	Yes
Cool down time:	350 to 50°C (~12 mins)
Heat up time:	50 to 350°C (~ 6 mins)
Supply requirements:	120V/230V 50Hz
Language variants:	English, German, French, Italian
Temperature unit:	°C

Type	PK	Cat. No.
Melting point apparatus, complete with pack of 100 melting point tubes, closed at one end.	1	**9.950 188**
Melting point tubes, closed at one end.	100	**6.803 067**
Accessory printer with power supply	1	**9.950 399**

E & OE.

1 2 Automatic Melting Point Apparatus, SMP40

Stuart

- maximum temperature 400°C
- utilises latest technology in digital imaging
- 5.7" colour VGA touch screen display
- unique split design concept
- integrated cooling: 350°C to 50°C in 10 minutes





The SMP40 automatic melting point uses the latest technology in digital image processing to accurately identify the melt of up to three samples simultaneously. The unit comes with a 5.7" colour VGA display, on which the melt can be watched real time, or the melt video will automatically be saved as an AVI file that can be reviewed later, either on the unit or via PC. The result can also be overridden if for any reason the operator does not agree with the result calculated by the image processing algorithm. The SMP40 has an innovative split design concept, the unit can be used as normal or the control side and the melt side can be separated, allowing maximum footprint flexibility. Once the unit has been split the control panel side can be used in two orientations, either landscape or portrait to allow the perfect viewing angle whether you are sat or stood at the bench, the screen automatically changes orientation with the unit. The unit can store up to 200 result files with videos, if required data can be easily transferred from the unit to a flash memory drive or PC via one of the USB connectors. All units are supplied with a calibration certificate showing individual serial numbers for traceability. The SMP40 conforms to Pharmacopeia and GLP.

The SMP40 is also available with IQ/OQ documentation according to FDA guidelines.

Specifications

No of samples:	3 simultaneously
Temperature range:	Ambient to 400°C
Temperature resolution:	0.1°C
Display:	5.7" Colour VGA touchscreen
Ramp rates:	0.1 to 20°C in 0.1°C increments
Memory:	200 results with video
Date/time display:	Yes
Cool down time:	350 to 50°C (approx. 10 mins)
Heat up time:	50 to 350°C (approx. 6 mins)
Flash memory/PC interface:	USB
Supply requirements:	120V, 230V 50Hz a.c.
Language:	English
Temperature units:	°C, °F

Type	PK	Cat. No.
Melting point apparatus, incl. 100 melting point tubes, closed at both ends	1	**9.950 398**
Glass melting point tubes, closed at both ends	100	**9.950 400**

3 Melting point tubes

Capillary tubes for melting point analysis. Clear glass, different diameters and lengths.
Special remarks are available. Other sizes on request.



Type	Length mm	Ext. diam. mm	Int. diam. mm	Material	PK	Cat. No.
Sealed one end	75	1.55	1.15	Soda glass	100	**9.208 076**
Sealed one end	80	1.00	0.80	Duran®	100	**9.208 081**
Sealed one end	100	1.00	0.80	Duran®	100	**9.208 101**
Sealed one end	80	1.40	1.00	Soda glass	100	**9.208 131**
Open both ends	80	1.00	0.80	Duran®	100	**9.208 080**
Open both ends	100	2.00	1.50	Soda glass	100	**9.830 447**
Open both ends	100	1.00	0.80	Duran®	100	**9.208 100**
Open both ends	100	1.50	0.90	Soda glass	100	**9.830 463**

4 Hot bench, Kofler system

Wagner & Munz

Very easy to use. Various characteristics can be observed simultaneously.
Linear temperature scale adjustment. Enables quick identification of organic substances.
Supplied with test and standard material sets. CE marked.



Dimensions (WxDxH):	430 x 100 x 140mm
Supply requirements:	230 V/50 Hz, 100 W
Temperature range:	+50 to +260°C

Type	PK	Cat. No.
Hot bench	1	**9.830 160**

1



1 Microscope hot stage, Kofler, PolyTherm A

Wagner & Munz

Kofler system. Ensure the most accurate resolution for analysis on unknown melting points. Ready-made assembly with control transformer and microscope observation unit with accessories. CE marked. With digital temperature measuring system.

Supply requirements:	230 V/50/60 Hz
Sub-stage illumination:	6 V/20 W
Temperature range:	+50 to +350°C
Binocular observation tube:	45° angled, with 360° rotation

Type	PK	Cat. No.
PolyTherm A	1	**9.830 133**

E & OE.

Shaker overview 416

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Shakers overview

Movement	Load capacity (kg)	Rotation speed (rpm)	Orbit (mm)	Variable speed range	Variable amplitude	IP class
orbital - vibrating	0	750-3000	2	Yes	No	5-40ºC / IP 20
orbital - vibrating	0	0-2500	5	Yes	No	IP 22
orbital - vibrating	0	0-2500	5	Yes	No	IP 22
orbital - vibrating	0	500-2850	4	Yes	No	-
orbital - vibrating	0	600-2700	4	Yes	No	-
orbital - vibrating	0.1	2800	4.5	No	No	IP 40
orbital - vibrating	0.4	500-2500	4	Yes	No	IP 21
orbital - vibrating	0.5	0-3000	4.5	Yes	No	IP 21
orbital - vibrating	0.5	0-3000	4.5	Yes	No	IP 21
orbital - vibrating	1.5	150-2000	3	Yes	No	IP 30
orbital - vibrating	2	0-2200	4	Yes	No	IP 21
orbital - vibrating	2	150-1350	1.5	Yes	No	IP 30
orbital - vibrating	2	150-1350	3	Yes	No	IP 30
orbital - vibrating	2	150-1350	3	Yes	No	IP 30
orbital - vibrating	2	150-2500	1.5	Yes	No	IP 30
orbital - vibrating	5	150-1350	1.5	Yes	No	IP 40
orbital - vibrating	8	20-250	20	Yes	No	4-40ºC / IP 20
orbital	0.2	0-1100	3	Yes	No	IP 21
orbital	1	150-1000	2	Yes	No	4-40ºC / IP 20
orbital	2	20-300	20	Yes	No	IP 30
orbital	2	80-800	4	Yes	No	IP 21
orbital	2.5	100-800	4	Yes	No	IP 21
orbital	3	50-450	10	Yes	No	4-40ºC / IP 20
orbital	3	30-300	16	Yes	No	5-40ºC / IP 31
orbital	4.5	20-300	19.2	Yes	No	-
orbital	5	30-500	10	Yes	No	IP 40
orbital	7.5	100-500	10	Yes	No	IP 21
orbital	7.5	10-500	10	Yes	No	IP 21
orbital	7.5	20-500	10	Yes	No	IP 21
orbital	8	20-500	10	Yes	No	IP 20
orbital	10	20-400	20	Yes	No	IP 20
orbital	10	50-400	10	Yes	No	IP 21
orbital	10	30-300	16	Yes	No	5-40ºC / IP 31
orbital	12	10-300	35	Yes	No	-
orbital	15	20-300	30	Yes	No	IP 20
orbital	15	20-300	30	Yes	No	IP 20
orbital	15	0-300	30	Yes	No	IP 21
orbital	15.9	15-500	19	Yes	No	IP 20
orbital	15.9	40-400	19	Yes	No	IP 20
orbital	22.7	15-500	25.4	Yes	No	IP 20
orbital	22.7	40-400	25.4	Yes	No	IP 20
orbital	30	20-250	32	Yes	No	IP 20
orbital	30	20-250	32	Yes	No	IP 20
orbital	32	25-525	25	Yes	No	IP 20
orbital	32	25-525	25	Yes	No	IP 20
orbital	32	25-525	25	Yes	No	IP 20
orbital	32	25-525	25	Yes	No	IP 20
reciprocating	2.5	100-350	4	Yes	No	IP 21
reciprocating	5	30-250	32	Yes	No	IP 40
reciprocating	7.5	100-350	10	Yes	No	IP 21
reciprocating	7.5	10-300	20	Yes	No	IP 21
reciprocating	7.5	20-300	20	Yes	No	IP 21
reciprocating	8	20-300	20	Yes	No	IP 20
reciprocating	10	20-400	20	Yes	No	IP 20
reciprocating	10	25-250	20	Yes	No	5-40ºC / IP 31
reciprocating	15	20-300	30	Yes	No	IP 20
reciprocating	15	20-300	30	Yes	No	IP 20
reciprocating	15	0-300	30	Yes	No	IP 21
3D 7° and rotation	1	5-30	22	Yes	Yes	4-40ºC / IP 20
wave, 10°	5	2-50	-	Yes	No	IP 40
wave, 10°	10	2.5-50	-	Yes	No	IP 20
wave, 3°	15	2-50	-	Yes	No	IP 20
wave, 3°	15	2-50	-	Yes	No	IP 20
wave 3-12° / 3D	3	5-70	-	Yes	Yes	5-40ºC / IP 30
wave 3-12° / 3D	10	5-70	-	Yes	Yes	5-40ºC / IP 30
wave, 5°	5	2-50	-	Yes	No	IP 40
wave, 5°	10	2.5-50	-	Yes	No	IP 20
wave, 7°	0.5	10-30	-	Yes	No	4-40ºC / IP 20
wave, 8°	5	5-50	-	Yes	No	IP 21
overhead	0	6-80	-	Yes	No	IP 20
overhead	0.8	10-100	-	Yes	Yes	4-40ºC / IP 20
overhead	8	6-60	-	Yes	No	IP 31
overhead	20	1-20	-	Yes	No	IP 20
overhead	2.3	5-35	-	Yes	No	-
overhead	0.4	5-30	-	Yes	No	4-40ºC / IP 20
rocking, 10°	5	2-50	-	Yes	No	IP 40
rocking, 10°	5	5-50	-	Yes	Ja	4-40ºC / IP 20
rocking, 3°	15	2-50	-	Yes	No	IP 20
rocking, 3°	15	2-50	-	Yes	No	IP 20
rocking, 5°	5	2-50	-	Yes	No	IP 40
rocking, 7°	0.5	7.5-30	-	Yes	No	4-40ºC / IP 20
rocking, 7°	3	5-70	-	Yes	No	5-40ºC / IP 30
rocking, 7°	10	5-70	-	Yes	No	5-40ºC / IP 30
arc, 7.2°	3	8 - 800 osc.	-	Yes	No	IP 31

E & OE.

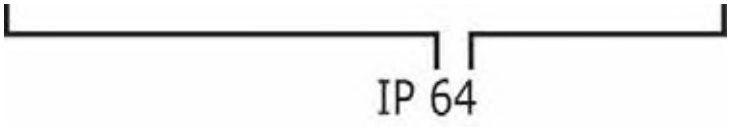
Shakers overview

Heating function	Cooling function	Incubating function	Product	Supplier	Cat. No.	Page
No	No	No	Mini-Vortex mixer PV-1	Grant	**9.721 000**	**465**
No	No	No	Test tubes shaker Reax top	Heidolph	**9.730 040**	**465**
No	No	No	Test tubes shaker Reax control	Heidolph	**9.730 042**	**465**
No	No	No	Vortex-Genie®-Serie 2 digital	Scientific Industries	**6.242 793**	**466**
No	No	No	Vortex-Genie®-Serie 2	Scientific Industries	**9.730 060**	**466**
No	No	No	Shaker lab dancer	IKA	**9.729 936**	**466**
No	No	No	Vortex Genius 3	IKA	**9.729 950**	**467**
No	No	No	Small-sized shaker MS 3 digital	IKA	**9.729 939**	**468**
No	No	No	Small-sized shaker MS 3 basic	IKA	**9.729 938**	**468**
No	No	No	Shaker Multi Reax	Heidolph	**9.839 810**	**465**
No	No	No	Orbitalshaker Vibrax VXR basic	IKA	**9.729 900**	**469**
No	No	No	Microtiter plate shaker Titramax 100	Heidolph	**9.839 831**	**470**
No	No	No	Microtiter plate shaker Titramax 101	Heidolph	**9.839 832**	**470**
No	No	No	Shaker Vibramax 100	Heidolph	**9.839 833**	**472**
No	No	No	Shaker Vibramax 110	Heidolph	**9.839 835**	**472**
No	No	No	Microtiter plates shaker Titramax 1000	Heidolph	**9.839 830**	**470**
No	No	No	Orbital shaker PSU-20i	Grant	**6.256 816**	**491**
No	No	No	Microtiter shaker MTS 2/4 digital	IKA	**9.838 195**	**471**
No	No	No	Microtiter shaker PMS-1000i	Grant	**9.721 074**	**471**
No	No	No	Shaker Rotamax 120	Heidolph	**9.839 837**	**473**
No	No	No	Orbital shaker KS 130 basic	IKA	**9.838 150**	**487**
No	No	No	Orbital shaker RS-OS 10	Phönix Instrument	**9.852 120**	**483**
No	No	No	Orbital shaker PSU-10i	Grant	**9.721 019**	**476**
No	No	No	Mini orbital shaker SSM1	Stuart	**9.728 830**	**482**
No	No	No	Orbital shaker Sea Star®	Heathrow	**9.839 701**	**475**
No	No	No	Shaker Unimax 1010	Heidolph	**9.839 851**	**473**
No	No	No	Orbital shaker RS-OS 20	Phönix Instrument	**9.852 121**	**483**
No	No	No	Laboratory shaker KS 260 control	IKA	**9.838 175**	**488**
No	No	No	Orbital shaker KS 260 basic	IKA	**9.838 074**	**488**
No	No	No	Shaker model 3005	GFL	**9.837 905**	**484**
No	No	No	Shaker Unimax 2010	Heidolph	**9.839 801**	**473**
No	No	No	Orbital shaker MO10	Ditabis	**9.777 253**	**476**
No	No	No	Orbital shaker SSL1	Stuart	**9.728 840**	**482**
No	No	No	Shaker Orbital-Genie®	Scientific Industries	**9.730 091**	**475**
No	No	No	Shaker model 3015	GFL	**9.837 915**	**484**
No	No	No	Shaker model 3017	GFL	**9.837 917**	**484**
No	No	No	Orbital shaker KS 501 digital	IKA	**9.838 040**	**489**
No	No	No	Max Q 2000 analog	Thermo Sci.	**4.011 045**	**477**
No	No	No	Max Q 2000 digital	Thermo Sci.	**4.011 057**	**477**
No	No	No	Max Q 3000 analog	Thermo Sci.	**4.011 048**	**477**
No	No	No	Max Q 3000 digital	Thermo Sci.	**4.011 059**	**477**
No	No	No	Shaker model 3019	GFL	**9.837 919**	**485**
No	No	No	Shaker model 3020	GFL	**9.837 920**	**485**
No	No	No	Shaker MaxQ 416 HP	Thermo Scientific	**9.721 201**	**477**
No	No	No	Shaker MaxQ 430 HP	Thermo Scientific	**9.721 202**	**477**
Yes	No	Yes	Shaker MaxQ 436 HP	Thermo Scientific	**9.721 207**	**480**
Yes	Yes	Yes	Shaker MaxQ 481 HP	Thermo Scientific	**9.721 208**	**480**
No	No	No	Shaker RS-LS 10	Phönix Instruments	**9.852 122**	**483**
No	No	No	Shaker Promax 1020	Heidolph	**9.839 853**	**491**
No	No	No	Shaker RS-LS 20	Phönix Instruments	**9.852 123**	**483**
No	No	No	Horizontal shaker HS 260 control	IKA	**9.838 185**	**494**
No	No	No	Horizontal shaker HS 260 basic	IKA	**9.838 063**	**494**
No	No	No	Shaker model 3006	GFL	**9.837 906**	**493**
No	No	No	Shaker Promax 2020	Heidolph	**9.839 802**	**491**
No	No	No	Reciprocating shaker SSL2	Stuart	**9.728 841**	**482**
No	No	No	Shaker model 3016	GFL	**9.837 916**	**493**
No	No	No	Shaker model 3018	GFL	**9.837 918**	**493**
No	No	No	Horizontal shaker IKA HS 501 digital	IKA	**9.838 041**	**489**
No	No	No	Multi function rotator 3D mixer PS-M3D	Grant	**9.721 017**	**501**
No	No	No	Shaker Polymax 1040 10°	Heidolph	**9.839 859**	**500**
No	No	No	Shaker Polymax 2040 10°	Heidolph	**9.839 800**	**500**
No	No	No	Shaker model 3011	GFL	**9.837 911**	**503**
No	No	No	Shaker model 3012	GFL	**9.837 912**	**503**
No	No	No	Mini-shaker SSM3	Stuart	**9.728 820**	**481**
No	No	No	Gyratory shaker SSL3	Stuart	**9.728 800**	**497**
No	No	No	Shaker Polymax 1040 5°	Heidolph	**9.839 857**	**500**
No	No	No	Shaker Polymax 2040 5°	Heidolph	**9.839 804**	**500**
No	No	No	Mini 3D platform mixer PS-3D	Grant	**9.721 014**	**500**
No	No	No	Shaker 3D ditabis	Ditabis	**9.777 250**	**501**
No	No	No	Test tube rotator 3025	GFL	**9.837 925**	**506**
No	No	No	Multi function rotator PTR-60	Grant	**9.721 030**	**505**
No	No	No	Shaker STR4	Stuart	**9.950 375**	**507**
No	No	No	Shaker model 3040	GFL	**9.837 931**	**507**
No	No	No	Rotator Genie™	Scientific Industries	**6.254 273**	**504**
No	No	No	Shaker PTR-25	Grant	**9.721 016**	**504**
No	No	No	Shaker Duomax 1030 10°	Heidolph	**9.839 856**	**496**
No	No	No	Shaker PMR-100	Grant	**9.721 015**	**496**
No	No	No	Shaker model 3014	GFL	**9.837 914**	**498**
No	No	No	Shaker model 3013	GFL	**9.837 913**	**498**
No	No	No	Shaker Duomax 1030 5°	Heidolph	**9.839 855**	**496**
No	No	No	Mini platform rocker PMR-30	Grant	**9.721 011**	**500**
No	No	No	Mini-shaker SSM4	Stuart	**9.728 821**	**481**
No	No	No	See-saw shaker SSL4	Stuart	**9.728 801**	**497**
No	No	No	Flask shaker SF1	Stuart	**9.950 372**	**494**

IP Protection classes

IP	Characteristic 1 for special protection
0	No special protection
1	Protection from solid objects greater than 50mm in diameter
2	Protection from object greater than 12mm in diameter
3	Protection from object greater than 2.5mm in diameter
4	Protection from object greater than 1mm in diameter
5	Complete protection against contact, Protection against dust deposit
6	Complete protection against contact, Protection from infiltration of dust

IP	Characteristic 2 for waterproofing
0	No waterproofing
1	Protection from dripping water
2	Protection from vertically dripping water (tilted up to 15°)
3	Protection from sprayed water (tilted up to 60°)
4	Protection from splashed water
5	Protection from water projected from a nozzle
6	Protection against heavy seas or powerful jets of water.
7	Protection against immersion
8	Protection against complete, continuous submersion in water.
9	Protection against the ingress of water from all directions even under greatly high pressure on the housing. (High-pressure/steam cleaner, 80-100 bar)



Magnetic stirrers without heating

Hei-Mix D/Hei-Mix L - For gentle stirring in biology and microbiology applications *Heidolph*

- Top plate is insulated from the motor and protects your heat-sensitive samples from any thermal damage
- To treat your sample gently and protect it from damage the rotation speed ramps up slowly until it has reached the pre-programmed speed
- Top plate diameter of 145mm and a speed range from 100rpm to 1400rpm is ideal for quantities up to 20l
- Hermetically-sealed housing prevents corrosion and increases the service life of your unit
- You can even work with dry ice, a robust thermal insulation prevents corrosion inside the housing thus minimising any dripping of condensate on the electronic components
- The Hei-Mix D comes with a digital display for set and actual speed
- These models come with a top plate material of finest-quality stainless steel

Hei-Mix S

- Stir quickly and efficiently with an extended speed range up to 2200rpm
- Long-lasting polyamide housing and PVDF top plate material
- Ideal for titrations due to white-colored top plate
- Space saving unit for efficiently mixing sample sizes up to 5l. Small footprint of 126 x 80 x 140mm (W x H x D) only, and the top plate comes with a diameter of 104mm

Type	Rotation speed	Stirring capacity	Plate material	Dimensions (W x D x H)	Protection-level	PK	Cat. No.
	rpm	ml		mm			
Hei-Mix D	1400	20000	V2A	173 x 277 x 94	32	1	**9.720 138** 1
Hei-Mix D UK	1400	20000	V2A	173 x 277 x 94	32	1	**9.720 133**
Hei-Mix L	1400	20000	V2A	173 x 277 x 94	32	1	**9.720 137**
Hei-Mix L UK	1400	20000	V2A	173 x 277 x 94	32	1	**9.720 135**
Hei-Mix S	2200	5000	PVDF	126 x 140 x 80	32	1	**9.720 167** 2
Hei-Mix S UK	2200	5000	PVDF	126 x 140 x 80	32	1	**6.201 570**

1



9.720 138

2



9.720 167

E & OE.

1 Magnetic stirrer HI190

Compact and lightweight stirrer. *Hanna*
- Speed is regulated by simply turning a button
- ABS plastic covered top plate
- Splashproof

Specifications

Max. stirring capacity (H_2O):	1000ml
Speed:	100rpm to 1000rpm
Dimensions (WxDxH):	120mm x 120mm x 45mm
Protection category:	IP 54
Permissible ambient temperature:	0°C to +50°C
Permissible relative humidity:	95%
Material:	ABS
Power supply:	230V

Type	PK	Cat. No.
HI 190M-2	1	**9.720 085**

1



2 Magnetic stirrer HI180

Without heating. Economical and lightweight stirrer. *Hanna*

- Available in different colours
- Splashproof

Speedsafe system ensures that maximum speed will never be exceeded.

Specifications

Max. stirring capacity (H_2O):	1000ml
Speed:	100rpm to 1000rpm
Dimensions (dia. x H):	127mm x 51mm
Protection category:	IP 54
Permissible ambient temperature:	0°C to +50°C
Permissible relative humidity:	95%
Material:	ABS
Power supply:	220V

Type	Colour	PK	Cat. No.
HI 180A-2	light yellow	1	**9.720 090**
HI 180B-2	light green	1	**9.720 091**
HI 180C-2	light blue	1	**9.720 092**
HI 180D-2	yellow	1	**9.720 093**
HI 180E-2	green	1	**9.720 094**
HI 180F-2	dark blue	1	**9.720 095**
HI 180G-2	red	1	**9.720 096**
HI 180H-2	grey	1	**9.720 097**
HI 180I-2	ivory	1	**9.720 098**

2



Magnetic stirrer UC151

NEW!

Without heating. Speed range 100 to 2000rpm. Maximum volume stirred is 15L. Glass ceramic top plate 150 x 150mm. Overall dimensions (WxDxH): 172 x 248 x 109mm. Electronic variable speed control with off position. *Stuart*

Type	PK	Cat. No.
UC151	1	**9.645 297** 3

3



9.645 297



1 Large Volume Stirrers Cimarec Mobil 10 and Mobil 25

Thermo Scientific

Cimarec Mobil 10 and Mobil 25 Large Volume Stirrers have the power to stir and mix volumes up to 10L and they are ideal for hard-to-stir viscous liquids.
- Compact space-saving design.
- Gradual low-shear acceleration on start-up.
- Quick Stop function stops the drive within three seconds, minimising after runs and reducing the risk of breakage.
- Easy to clean.
- Cimarec Mobil 25 can be used in autoclaves, water baths and climatic chambers (can be used at temperatures up to 121°C and high pressure up to 2 bars).
- Requires external Telemodul 10M controller (needs to be ordered separately).

Specifications

Operating conditions:	
Mobil 10:	-10°C to +56°C at 95% R.H.
Mobil 25:	-10°C to +121°C at 95% R.H.
Protection class	
Mobil 10:	IP 66
Mobil 25:	IP 68

Type	Rotation speed	Stirring capacity	Chamber dimensions (Dia. x H)	Power	Weight	PK	Cat. No.
	rpm	ml	mm	W	kg		
Mobil 10	-	100 - 10000	128 x 32	10	0.7	1	**4.010 022**
Mobil 25	-	100 - 10000	128 x 32	10	1.7	1	**4.010 023**
Telemodul 10 M*	100 - 1000	-	-	-		1	**4.010 027**

* Controller, 230V.



2 Magnetic stirrer steriMIXdrive with external control

2mag

Pressure, steam, vacuum and temperature resistant.
Maintenance-free 2mag-motor-drive with large speed range from 60rpm up to 1200rpm, fully encapsulated, pressure and vacuum resistant stainless steel housing, IP68, temperature resistant up to +150°C, extremely robust construction and performance, easy to clean and firm. 3 years warranty. Made in Germany.

Specifications

Operating conditions:	-10 to +150°C at 100% R.H. max.
Casing:	Stainless steel, hermetically sealed
Protection category:	**IP 68/IP 20 (control)**

Type	Rotation speed	Stirring capacity	Dimensions (W x D x H)	Rating	Weight	PK	Cat. No.
	rpm	l	mm	W	kg		
steriMIXdrive	-	1 - 40	140 x 140 x 32	20	9.0	1	**9.646 035**
steriMIXcontrol*	60 - 1200	-	200 x 175 x 48	20	1.8	1	**9.646 036**

* Control unit.



3 Magnetic stirrers MAXdrive with external control

2mag

Unheated. With extremely strong, magnetically coupled power for stirring very large volumes in heavy-walled vessels and over larger distances (max. 60mm).
Can be controlled remotely with a separate remote controller with digital speed indicator. Continuous or timed operation is selectable. Fast stop in 2 secs without motor overrun. Running time can be preselected in accordance with the viscosity. Overload protected and housed in an easy to clean, hermetically sealed casing which can be washed under running water. Adjustable soft-start (10 sec. to 60 sec.) based on viscosity of the sample. 3 years warranty.
Made in Germany.

Specifications

Speed accurancy:	±0.25%
Operating conditions:	-10°C to +50°C at 95% R.H. max.
Case:	Stainless steel
Portection according to DIN EN 60529:	IP 65/20 (control)

Type	Rotation speed	Stirring capacity	Dimensions (W x D x H)	Power	Weight	PK	Cat. No.
	rpm	l	mm	W	kg		
MAXdrive	-	1 - 250	260 x 260 x 68	40	9.0	1	**9.645 976**
MAXcontrol*	100 - 1200	-	200 x 175 x 48	40	1.8	1	**9.645 977**

* Control unit.
Please order control unit separately

E & OE.

1 Magnetic stirrer FABdrive with external control



Maintenance-free 2mag-motor-drive with large speed range from 80rpm up to 990rpm up to 1.000L. Fully encapsulated and tight stainless steel housing, IP65, extremely robust construction and performance, easy to clean under running water. Individual measurements on request. 3 years warranty. Made in Germany. *2mag*

Specifications

Operating conditions: -10 to +50°C at 95% R.H. max.
Casing: Stainless steel
Protection category: IP 65

Type	Rotation speed	Stirring capacity	Dimensions (W x D x H)	Power	Weight	PK	Cat. No.
	rpm	l	mm	W	kg		
FABdrive	-	1 - 1000	180 x 180 x 75	100	9.0	1	**9.645 990**
FABcontrol*	80 - 990	-	200 x 175 x 48	100	2.0	1	**9.645 991**

* Control unit

2 Magnetic stirrer maxMIX



Without heating. For universal stirring applications in science and industry up to 150L. Suitable for use with heavy-walled reservoir bases, round bottom flasks and jacketed reaction vessels. Can also stir over larger distances (max. 60mm). With long range, extremely powerful magnetic field, which produces dual torque when starting up. Offers optimal operation safety by consistent speed regulation and 3 second quick-stop without motor overrun. Adjustable SoftStart, digital speed display. Can be cleaned under running water. Supplied with mains adapter for 230V 50/60 Hz. 3 years warranty. Made in Germany. *2mag*

Specifications

Speed accuracy: ±0.25%
Digital display: Adjustable SoftStart (10 sec. to 60 sec.)
Operating conditions: -10°C to +50°C at 80% R.H. max.
Housing: Stainless steel
Protection category: IP 64

Type	Rotation speed	Stirring capacity	Dimensions (W x D x H)	Power	Weight	PK	Cat. No.
	rpm	ml	mm	W	kg		
maxMIX	100 to 1200	1 to 150000	265 x 320 x 68	40	9.3	1	**9.645 975**

Accessories for 2mag magnetic stirring systems

2mag

Description	PK	Cat. No.
Extension cable for MIXdrive, 3M	1	**9.646 041**
Extension cable for bioMIXdrive, 3M	1	**9.646 042**
Extension cable for MAXdrive/FABdrive, 3M	1	**9.646 043**
Connection cable 12 V car battery for MIX 1 eco	1	**9.646 044**
Mobile stand mixCADDY for MAXdrive/FABdrive	1	**9.646 045**

3 Magnetic stirrer for cell cultures with external control, bioMIXdrive 1/2/3/4/6



Magnetic stirrer with 1/2/3/4/6 stirring positions, for careful, protective and warming-free mixing of cell cultures and culture broths, also for viscous cultures, maintenance-free, large surface. 100% jerk-free, speed range 5rpm to 250rpm, encapsulated stainless steel housing, water-, dust-, germproof, IP68, submersible, easy to clean, robust construction, flat design, suitable for propeller and spinning ball culture flasks, individual measurement on request. 3 years warranty. Made in Germany. Suitable for underwater use. *2mag*

Specifications

Permitted operation conditions: -10°C up to +50°C at 100% H.R. max.
+50°C submerged in water
Housing: Stainless steel
Protection class: IP 68

Type	Rotation speed	Stirring positions	Stirring centre distances	Stirring capacity	Dimensions (W x D x H)	Power	Weight	PK	Cat. No.
	rpm		mm	ml	mm	W	kg		
bioMIXdrive 1	5 to 250	1		5 to 5000	180 x 180 x 38	5	2.5	1	**9.645 950**
bioMIXdrive 2	5 to 250	2	140	5 to 5000	130 x 270 x 38	5	2.5	1	**9.645 978**
bioMIXdrive 3	5 to 250	3	140	5 to 5000	130 x 410 x 38	5	3.5	1	**9.645 979**
bioMIXdrive 4	5 to 250	4	140	5 to 5000	270 x 270 x 38	5	4.7	1	**9.645 980**
bioMIXdrive 6	5 to 250	6	130	5 to 5000	295 x 375 x 38	5	7.8	1	**9.645 996**

1



9.645 981

2



9.645 982

Control units for stirring drives bioMIXdrive

bioMIXcontrol *2mag*

Control unit for 1x bioMIXdrive 1/2/3/4/6, speed range 5rpm to 250rpm, power setting (10 steps) for high power with regard to large and viscous media and reduced power for warming-free continuous operation e.g. in CO_2 incubators, digital display, SoftStart, stainless steel housing. 3 years warranty. Made in Germany.

bioMIXcontrol S

Identical to bioMIXcontrol, but with stackable housing and vertical control panel.

bioMIXcontrol MS4

Identical to bioMIXcontrol, but for 4x bioMIXdrive 1, individual and independent speed setting for each stirring drive, also ON-/OFF-function, synchronous speed mode for all drives with one touch.

Specifications

Operation conditions:	0 to +50°C at 80% H.R. max.
Operating voltage:	100-240V 50/60Hz, 1.5A
Housing:	Stainless steel
Protection category:	IP 20

Type	Rotation speed rpm	Dimensions (W x D x H) mm	Power W	Weight kg	PK	Cat. No.
bioMIXcontrol	5 to 200	200 x 155 x 38	4-40 (10-steps)	1.4	1	**9.645 951**
bioMIXcontrol S	5 to 200	215 x 120 x 50	4-40 (10-steps)	1.4	1	**9.645 981** 1
bioMIXcontrol 4MS*	5 to 200	200 x 155 x 40	6	2.5	1	**9.645 982** 2

* only for bioMIXdrive 1

3



3 Magnetic mini-stirrers topolino

Without heating. Extremely convenient magnetic mini-stirrer for mixing volumes up to 250ml. *IKA*

- Durable, brushless motor
- Infinitely variable speed range
- Strong magnetic coupling

Specifications

Stirring quantity max. (H_2O):	250ml
Speed range:	300rpm to 1800rpm
Dimensions (W x H x D):	95mm x 37mm x 115mm
Protection category:	IP 21
Permissible ambient temperature:	5°C to 40°C
Permissible relative humidity:	80%
Material:	PP
Power supply:	100 - 240 V

Type	Dimensions mm	PK	Cat. No.
topolino	95 x 115 x 40	1	**9.720 220**

Optional accessories: Ikaflon®- stirring bars, Trika®- stirring bars, RSE Stirring bar retriever



1 Magnetic stirrer color squid

1



Without heating. Small magnetic stirrers with digital speed display (LED). *IKA*
- Electronically controlled motor for more capacity
- Higher range of speeds from 0rpm to 2500rpm
- Max. stirring quantity 1L
- Excellent chemical resistance due to glass top and plastic base in TPE
- Manufactured in recyclable materials
- Power supply with adapter for EU/CH/UK/USA

Specifications

Magnetic drive

Stirring volume (H_2O):	1L
Speed display:	digital (LED)
Speed range:	0rpm to 2500rpm

Top plate

Material:	glass
Dimensions:	115mm diameter

General data

Dimensions (WxDxH):	145mm x 160mm x 45mm
Permissible ambient temperature:	5°C to 40°C
Permissible relative humidity:	80%
Protection class acc. to DIN EN 60529:	IP54
Supply requirements:	100V - 240V 50/60Hz

Tested to DIN EN IEC 61010-1.

Type	PK	Cat. No.
color squid white	1	**9.720 365**

Optional accessories: Ikaflon®- stirring bars, Trika®- stirring bars, RSE Stirring bar retriever
Further models available on request.

2 Magnetic stirrer big squid

2



Without heating. Small magnetic stirrers with digital speed display (LED). *IKA*
- Electronically controlled motor for more capacity
- Higher speed range from 0rpm to 2500rpm
- Excellent chemical resistance due to glass top and plastic base in TPC-ET
- Manufactured in recyclable materials
- Power supply with adapter for EU/CH/UK/USA

Specifications

Magnetic drive

Stirring volume max. (H_2O):	1.5L
Speed display:	digital (LED)
Speed range:	0rpm to 2500rpm

Top plate

Material:	glass
Dimensions:	160mm diameter

General data

Dimensions (WxDxH):	180mm x 195mm x 40mm
Ambient operating temperature:	5°C to 40°C
Ambient operating humidity:	80% R.H.
Protection class acc. to DIN EN 60529:	IP54
Supply requirements:	100-240V 50/60 Hz

Tested to DIN EN IEC 61010-1.

Type	PK	Cat. No.
big squid white	1	**9.720 470**

Optional accessories: Ikaflon®- Stirring bars, Trika®- Stirring bars, RSE Stirring bar retriever
Further models available on request.

1



1 Magnetic stirrer Mini MR standard

Without heating. *IKA*
- For stirring quantities up to 1L (H_2O).
- Infinitely variable speed from 0 to 2500rpm
- White top plate suitable for observing colour reactions
- Power supply with adapter for EU/CH/UK/USA

Specifications

Max. stirring volume, (H_2O):	1L
Speed range:	0 to 2500rpm
Top plate:	115mm x 115mm Polyester film
Size (WxDxH):	114mm x 127mm x 37mm
Protection to DIN EN 60529:	IP42
Supply requirements:	100-240V 50/60 Hz.
Tested to DIN EN IEC 61010-1.	

Type	PK	Cat. No.
Mini MR standard	1	**9.720 211**

Optional accessories: Ikaflon®- stirring bars, Trika®- stirring bars, RSE Stirring bar retriever

Magnetic stirrers C-MAG MS 4/C-MAG MS 7/C-MAG MS 10

Without heating. With glass ceramic top plate which offers excellent chemical resistance. *IKA*
- powerful motor for stirring quantities of up to 5l, 10l, or 15l (H_2O)
- raised control panel for protection against leaking liquids

Specifications

Magnetic stirrer

Stirring volume max. (H_2O)	
C-MAG MS 4:	5l
C-MAG MS 7:	10l
C-MAG MS 10:	15l
Motor rating input/output:	15/1.5W
Speed range:	100 to 1500rpm
Speed display:	scale
Max. magnetic bar (L x dia.)	
C-MAG MS 4:	30 x 8mm
C-MAG MS 7/MS 10:	80 x 10mm

Set-up plate

Material:	glass ceramic
Dimensions (WxDxH)	
C-MAG MS 4:	100 x 100mm
C-MAG MS 7:	180 x 180mm
C-MAG MS 10:	260 x 260mm
Protection class acc. to DIN EN 60529:	IP 21
Tested to DIN EN IEC 61010-1.	

Type	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.	
C-MAG MS 4	150 x 260 x 105	3	1	**9.720 493**	2
C-MAG MS 7	220 x 330 x 105	5	1	**9.720 494**	3
C-MAG MS 10	300 x 415 x 105	6	1	**9.720 495**	4

Optional accessories: Ikaflon®- stirring bars, Trika®- stirring bars, RSE Stirring bar retriever

2



9.720 493

3



9.720 494

4



9.720 495

1 Magnetic stirrer, KMO2 basic



IKA

Without heating. Small but very powerful magnetic stirrer.
- strong magnetic field resists stirrer bar decoupling
- opto-electronic speed control motor
- adjustable speed up to 1100rpm
- stainless steel housing for easy cleaning and sterilization
- with M10 thread for support rod H 16 V

Specifications

Max. volume stirred (H_2O):	5L
Motor rating input/output:	14/4W
Speed range (rpm):	0 to 1100rpm
Speed indication:	Scale
Surface:	140 x 120mm, stainless steel (AISI 304)
Dimensions (WxDxH):	140 x 200 x 75mm
Weight:	1.4kg
Housing IP rating to DIN EN 60529:	IP21
Supply requirements:	230V 50/60Hz

Tested to DIN EN IEC 61010-1.

Type	PK	Cat. No.
KMO 2 basic	1	**9.720 210**
KMO 2 basic UK	1	**4.007 982**

Optional accessories: Ikaflon®- stirring bars, Trika®- stirring bars, RS 1 Stirring bar set, RSE Stirring bar retriever, support rod H 16V

2 Magnetic stirrers, Midi MR 1 digital



IKA

Without heating.
- high power
- flat stable stainless steel housing
- non-locking motor
- adjustable speed
- LED digital speed display
- 0 to 56 minute timer, or continuous operation

Specifications

Motor rating input/output:	70/19W
Max. volume stirred (H_2O):	50L
Speed range:	0 to 1000rpm
Top plate:	350 x 350mm, Stainless steel (AISI 304)
Dimensions WxDxH:	360 x 430 x 110mm
Weight:	10.7kg
Protection system to DIN EN 60529:	IP21
Supply requirements:	230V 50/60Hz

Tested to DIN EN IEC 61010-1.

Type	PK	Cat. No.
Midi MR 1 digital	1	**9.720 306**

Optional accessories: Ikaflon®- stirring bars, Trika®- stirring bars, RSE Stirring bar retriever

Magnetic stirring bars and stirring bar retrievers please see page 444.

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

IKA®

Multi-position magnetic stirrers RO 5/10/15 series

NEW!

IKA

Without heating. 5, 10 or 15-position digital magnetic stirrers, designed for synchronous stirring.
The magnetic coil technology provides noiseless and consistent stirring on all positions. Speed remains constant, even when load changes.
The closed and compact design allows easy cleaning and protects the equipment against the penetration of liquids.
Additionally, a removable transparent anti-slip mat is included.

- Adjustable reverse operation
- Eco-mode for a low self-warming of the surface
- Wear free magnetic coils
- Error Code Display
- Easy operation with touch keypad
- Suitable for continuous operation
- Adjustable speed in increments of 10rpm

Specifications

Max. stirring quantity per stirring position (H_2O):	0.4l
Distance between stirring places:	90mm
Deviation for individual stirring positions:	0%
Speed range:	0 to 1200rpm
Speed display:	LED line
Set-up plate material:	stainless steel 1.4301
Protection class acc. to DIN EN 60529:	IP 40
Power supply:	100-240V, 50/60Hz

Type	Stirring positions	Dimensions (W x D x H) mm	PK	Cat. No.	
RO 5	5	120 x 570 x 60	1	**9.720 208**	1
RO 10	10	190 x 570 x 60	1	**9.720 222**	2
RO 15	15	280 x 570 x 60	1	**9.720 226**	3

1



9.720 208

2



9.720 222

3



9.720 226

4



9.720 501

Magnetic stirrer, Cimarec i Mono Direct

Thermo Scientific

With powerful magnets and no moving parts, these inductive-drive stirrers are the perfect choice for your general laboratory needs.

- Large, flat, easy to clean work surfaces
- Compact, space saving design
- Initital acceleration is gradual and gentle, ensuring optimum magnetic coupling
- Adjustable power settings are separate from the speed control
- Decreases power consumption
- Lowers heat output
- Easy-to-use rotary knob design
- Rugged powder coated stainless steel housing

Specifications

Operating conditions:	-10 to +40°C at 95% R.H. max.
Housing:	Stainless steel
Colour:	Grey

Type	Rotation speed rpm	Stirring capacity ml	Dimensions (W x D x H) mm	Power W	Protection-level	PK	Cat. No.	
Mono Direct	130 - 1200	1 - 3000	180 x 215 x 35	1-5	32	1	**9.720 501**	4

E & OE.

Magnetic stirrer, Cimarec i Maxi Direct

Thermo Scientific

With non-mechanical, electronic induction drive and dust/watertight, easy-clean stainless steel housing. Constant speed irrespective of load even if viscosity changes. With large footprint and a strong and more penetrating magnetic field. Not suitable for use in incubators. With mains adapter.


1

9.720 618

Specifications

Stirrer:	1
Speed range:	80rpm to 2000rpm
Operating conditions:	-10°C to +40°C at 95% R.H. max.
Casing:	Stainless steel
Protection class acc. to DIN EN 60529:	IP 64

Type	Stirring capacity ml	Power W	Dimensions (W x D x H) mm	PK	Cat. No.
Maxi Direct	100 - 5000	5 - 20	180 x 215 x 35	1	**9.720 618** 1

Magnetic stirrer, Cimarec Power Direct

Thermo Scientific

Super flat, powerful magnetic stirrer for volumes from 100ml up to 40L, with long-range, magnetic field for stirring over long distances up to max. 40mm, ideal for thick-walled, glass vessels, round bottom flasks or double-walled containers, wash- and abrasion-resistant, stainless steel housing, speed range 100rpm to 2000rpm with feedback control, quick stop within 2 sec., 4-step stirring power adjustment (5W/10W/15W/20W), digital speed display, bi-directional RS232 interface allowing up to 14 units to be directly and individually controlled by the user's PC and 24V d.c. output, a.c. adapter for 100 - 240V. Ambient operating temperature: -10 to +40°C.
Protection class: IP 22.


2

9.720 595

Type	Rotation speed rpm	Dimensions (W x D x H) mm	Power W	Weight kg	PK	Cat. No.
Power Direct	100 - 2000	240 x 295 x 35	5/10/15/20	2.5	1	**9.720 595** 2

Single magnetic stirrer systems, Cimarec i Mini, Micro, Compact und Maxi

Thermo Scientific

Cimarec i Mini for stirring very small volumes in cuvets or special autoanalyzer vials. Very suitable for integration in measuring systems, e.g. photospectrometers.
Operating conditions: -10 to +56°C at 95% RH.

Cimarec i Micro with thread on housing base for attaching to analytical instruments or mounting on a stand.
Operating conditions: -10 to +120°C at 95% RH or 0 to +95°C immersed in water.

Cimarec i Compact for routine use, ideal in water baths.
Operating conditions: -10 to +120°C at 56% in air, 0 to +50°C immersed in water.

Cimarec i Maxi with larger plate and a stronger and further-reaching magnetic field. For larger stirring volumes and media which are difficult to mix, e.g. samples which tend to form sediments.
Operating conditions: -10 to +120°C at 56% in air, 0 to +50°C immersed in water.
Available with three different controllers.

Type	Rotation speed rpm	Power W	Dimensions (W x D x H) mm	Protection-level	PK	Cat. No.
Mini with Telemodul	130 - 1000	0.1	12 x 12 x 5	68	1	**9.720 539** 3
Mini with Telemodul 20 C	130 - 1400	0.5/0.1/0.15/0.2	12 x 12 x 5	68	1	**9.720 541**
Micro Telemodul	130 - 1000	3	48 x 48 x 15	68	1	**9.720 540**
Micro Telemodul 20 C	130 - 1400	2/4/6/8	48 x 48 x 15	68	1	**9.720 542**
Compact with Telemodul	130 - 1000	5	120 x 120 x 35	68	1	**9.720 545** 4
Compact with Telemodul 20 C	130 - 1400	3/6/9/12	120 x 120 x 35	68	1	**9.720 547**
Maxi Telemodul	130 - 1000	6	180 x 180 x 35	68	1	**9.720 548**
Maxi Telemodul 20 C	130 - 1400	4.5/9/13.5/18	180 x 180 x 35	68	1	**9.720 636**
Maxi Telemodul 40 C	100 - 2000	3/36	180 x 180 x 35	68	1	**9.720 637**


3

9.720 539


4

9.720 545



1 Multi-position magnetic stirrers, Cimarec i Poly 15

Thermo Scientific

With non-mechanical, electronic induction drive. With 15 stirring spaces, for e.g. 6 x 1L erlenmeyer flasks or 15 x 250ml beakers.
For mass screening and biological applications, even in humidity incubators.
With built-in controller, digital speed indicator and soft-start drive. With mains adaptor.

Specifications

Stirring positions:	15
Protection class:	IP 32
Operating conditions:	-10 to +40°C at 95% R.H. max.
Housing:	stainless steel, powder coated
Colour:	grey

Type	Rotation speed rpm	Dimensions (W x D x H) mm	Power W	PK	Cat. No.
Poly 15	130 - 990	240 x 420 x 35	10	1	**9.720 650**



9.720 625

Multi-position magnetic stirrers, Multipoint

Thermo Scientific

With non-mechanical, electronic induction drive. Ideal for batch series stirring.
Choice of 6-place, stirring position models which can stir up to 6 x 1liter erlenmeyer flasks or 15-place models for up to 15 x 250ml beakers. With digital stirring speed display and soft-start function.
With 4 adjustable power level stirring speeds (5 to 20W), easy to clean, hermetically sealed casing which can be washed under running water, ultra flat, space-saving profile and 100% synchronous speed control in all stirring positions. Supplied with mains adapter for 230 V 50/60 Hz.
Operating conditions: -10 to +40°C at 95% R.H. max.
Housing: Stainless steel
Protection class: IP 64

Type	Stirring positions	Stirring centre distances mm	Stirring capacity ml	Rotation speed rpm	Dimensions (W x D x H) mm	PK	Cat. No.
Multipoint 6	6	130	1 - 3000	80 - 2000	240 x 420 x 35	1	**9.720 624**
Multipoint 15	15	65	1 - 3000	80 - 2000	240 x 420 x 35	1	**9.720 625**



E & OE.

1 Magnetic stirrer luMIX with light function

NEW!

2mag



Ultra flat, wear-free magnetic stirrer with 1 large stirring position and a luminescent plate, up to 3000ml stirring volume, also suitable for viscous media.
Stirring function and illumination function separately switchable.

Light: Bright and warming-free luminescent PMMA plate, white LEDs with homogenous brightness and variable light intensity (4-step), non-reflecting illumination.
Stirring: 100% maintenance-free and wear-free by inductive 2mag-Magnetic-Drive concept for powerful mixing of solutions, extremely wide speed range from 100rpm to 2000rpm, jerk-free stirring even at low speeds, 4-step power settings for high power with regard to large and viscous stirring volumes and reduced power for the warming-free continuous operation.
Clear digital display for light-, speed- and power settings.

Specifications

Perm. operating temperature:	-10 to +50°C at 80% R.H. max. -40°C to +70°C, 10 to 95%, 500 to 1060hPa
Housing:	Stainless steel
Protection class:	IP64

Type	Rotation speed	Stirring capacity	Dimensions (W x D x H)	Power	Weight	PK	Cat. No.
	rpm	ml	mm	W	kg		
luMIX	100 - 2000	1 - 3000	188 x 238 x 44	20	3.6	1	**9.645 992**

Magnetic stirrer MIX 1 eco, MIX 1 and MIX 1 XL

2mag

MIX 1 eco
Identical to MIX 1, but price optimized, up to 3 liters, speed range 120rpm-1.400rpm, extremely robust, simple operation by speed knob and scale.

MIX 1
Identical to MIX 1 XL, but up to 10 liters, speed range 100rpm-2.000rpm, without mixWATCH stirring bar monitoring and interval times, nonadjustable SoftStart.

MIX 1 XL
Motorless, 100 % wear-free magnetic stirrer, powerful, up to 40liters, 60-2.000rpm, internal controller with 20 watts, incl. mixWATCH stirring bar monitoring with fully automatic trim of the max. Reachable speed for reliable and unattended operation, digital display, 4-step power setting for high power with regard to large and viscous media and reduced power for warming-free continuous operation, adjustable SoftStart for different volumes/viscosity, QuickStop against after-run and breakage, reliable sealed stainless-steel housing, 3 years warranty. Made in Germany.

Specifications

Operating conditions:	-10°C to +50°C at 80% R.H. max.
Housing:	Stainless steel
Protection category:	IP 64

Type	Rotation speed	Stirring capacity	Dimensions (W x D x H)	Power	Weight	PK	Cat. No.	
	rpm	ml	mm	W	kg			
MIX 1 XL	60 - 2000	500 - 40000	225 x 280 x 35	20 (4-steps)	4.0	1	**6.236 109**	2
MIX 1	100 - 2000	1 - 10000	188 x 230 x 38	20 (4-steps)	4.0	1	**9.645 954**	3
MIX 1 eco	100 - 1400	1 - 3000	120 x 120 x 35	10	1.7	1	**9.645 955**	4



6.236 109



9.645 954



9.645 955

Multi-position magnetic stirrers MIXdrive with external control use in waterbath and oven

2mag

Without heating. With non-mechanical, electronic induction drive and dust/water tight housing. Ideal for batch series stirring and for use in water baths. Choice of 6-place stirring position models which can stir up to 6 x 1L erlenmeyer flasks, 15-place models for up to 15 x 250ml beakers (high form) and 60-place models for small sample containers and using appropriate test tube stands, up to 60 test tubes or centrifuge tubes. Available as price-optimized eco 10W, high-power 20W or ultra high-power 40W version. Preselectable mixing power. SoftStart. With external control unit. 3 years warranty. Made in Germany.

Sprecifications

Operating conditions:	-10°C to +50°C at 100% R.H. max.
Operating temp. range	
Standard:	in air and water +50°C
HT-Version:	in air (ovens) +200°C, in water +95°C
Stirrer unit housing:	Stainless steel
Protection category:	IP 68

Type	Stirring positions	Stirring centre distances	Stirring capacity	Dimensions (W x D x H)	Weight	PK	Cat. No.	
		mm	ml	mm	kg			
MIXdrive 1 XS	1		1 to 1000	48 x 48 x 18	0.3	1	**9.645 985**	
MIXdrive 1 XS HT (+200°C)	1		1 to 1000	48 x 48 x 18	0.3	1	**9.645 986**	
MIXdrive 1 eco	1		1 to 3000	120 x 120 x 35	1.5	1	**9.645 961**	
MIXdrive 1 eco HT (+200°C)	1		1 to 3000	120 x 120 x 35	1.5	1	**9.645 962**	
MIXdrive 1	1		1 to 10000	180 x 180 x 38	3.3	1	**9.645 959**	1
MIXdrive 1 HT (+200°C)	1		1 to 10000	180 x 180 x 38	3.3	1	**9.645 960**	
MIXdrive 6	6	130	1 to 3000	245 x 375 x 38	8.9	1	**9.645 963**	2
MIXdrive 6 HT (+200°C)	6	130	1 to 3000	245 x 375 x 38	8.9	1	**9.645 964**	
MIXdrive 15	15	65	1 to 3000	245 x 375 x 38	9.5	1	**9.645 965**	3
MIXdrive 15 HT (+200°C)	15	65	1 to 3000	245 x 375 x 38	9.5	1	**9.645 966**	
MIXdrive 60	60	32,5	1 to 500	245 x 375 x 38	9.5	1	**9.645 967**	
MIXdrive 60 HT (+200°C)	60	32,5	1 to 500	245 x 375 x 38	9.5	1	**9.645 968**	

Please order control unit **MIXcontrol** separately.



9.645 959



9.645 963



9.645 965



9.645 969

Control units for mixers MIXdrive

2mag

MIXcontrol eco:
Prize-optimized control unit, speed setting and ON/OFF by turning knot.

MIXcontrol 20:
Stainless steel housing, digital speed display, 4-step power setting, 20watts.

MIXcontrol 40:
Identical to MIXcontrol 20, but 10-step power setting, 40watts, 2 sockets for MIXdrive stirres.



9.645 971

Type	Rotation speed	Dimensions (W x D x H)	Rating	Weight	PK	Cat. No.	
	rpm	mm	W	kg			
MIXcontrol eco	120 to 1200	65 x 50 x 45	10	0.5	1	**9.645 969**	4
MIXcontrol 20	100 to 1600	200 x 155 x 38	20	1.4	1	**9.645 970**	
MIXcontrol 40	100 to 2000	200 x 155 x 38	40	1.4	1	**9.645 971**	5

Shaking water baths please see page 805

Magnetic stirrers cuvetteMIXdrive 1 for miniature volumes

2mag

Smallest stirrer in the world. Fully encapsulated and hermetically sealed stainless steel housing, IP68, water-, dust- and germproof. Extremely robust construction and performance, easy to clean and maximum resistance, submersible in water- resp. oil baths, suitable for the use in CO_2-incubators and ovens.

Sprecifications

Operating conditions:	-10°C to +50°C at 100% R.H. max.
Operating temp. range	
Standard:	in air and water +50°C
HT-Version:	in air (ovens) +200°C, in water +95°C
Stirrer unit housing:	Stainless steel
Protection category:	IP 68

Type	Stirring positions	Stirring capacity	Dimensions (W x D x H)	Weight	PK	Cat. No.
		ml	mm	kg		
cuvetteMIXdrive 1	1	1 bis 25	13 x 13 x 6	0.1	1	**9.645 987** 1

Inkl. separatem Steuergerät zur Bedienung des Magnetrührers sowie der integrierten Heizung.

1



9.645 987

2 Magnetic stirring atexMIXdrive 1 with external control

2mag

Explosion protected.

1 stirring position, 100% maintenance-free and wear-free by inductive 2mag-Magnetic-Drive concept for powerful mixing of solutions, jerk-free stirring even at low speeds. Fully encapsulated and hermetically sealed stainless steel housing, IP68, water, dust and germproof, extremely robust construction and performance. Easy to clean and maximum resistance, submersible in water, oil baths, suitable for the use in CO_2 incubators and ovens, temperate range up to +40°C. Certified according to ATEX II 2G Ex mb IIC T4.

2



Specifications

Operating conditions:	-10°C to +40°C at 100% R.H. max. +40°C immersed in water
Casing:	Stainless steel
Protection category:	IP 68

Type	Stirring capacity	Dimensions (W x D x H)	Power	Weight	PK	Cat. No.
	l	mm	W	kg		
atexMIXdrive 1	0.001 - 10	180 x 180 x 38	20	3.5	1	**6.238 005**
atexMIXcontrol cleanroom*	-	210 x 55 x 30	20 (4 steps)	3.6	1	**9.646 000**

* Control unit explosion protection zone 2.

Accessories for mixer MIXdrive

2mag

Description	PK	Cat. No.
DistriBOX 4 (4-way header)	1	**9.645 972** 3
DistriBOX 8 (8-way header)	1	**9.645 973**
MixBATH (stainless steel bath, electropolished), fits for MIXdrive 6/15/60 (also HT)	1	**9.645 974** 4

Special design on request.

3



9.645 972

4



9.645 974



1 Multiple Magnetic stirrer with internal control MIX 4 MS

2mag

Powerful 4-position stirring, 100% maintenance-free and wear-free, 2mag magnetic induction drive concept, **with individual and independent speed setting for each stirring position** (Master-Slave-Technology). On-/Off function, synchronous speed mode for all positions, extremely wide speed range of 100rpm to 2000rpm, jerk-free stirring even at low speeds. Clear digital display for settings of stirrer speeds, SoftStart procedure for reliable stirrer bar coupling/centring and safe acceleration, automatic memory function to save the last settings, outstanding long working life of the hermetically sealed drive system and resistant stainless steel housing for easy and fast cleaning.

Specifications

Housing:	Stainless steel
Protection class:	IP 64

Type	Rotation speed	Stirring positions	Stirring capacity	Dimensions (W x D x H)	Rating	Weight	PK	Cat. No.
	rpm		ml	mm	W	kg		
MIX 4 MS	100 to 2000	4	1 to 3000	245 x 425 x 38	28	8.9	1	**9.646 010**



2 Multi-position magnetic stirrers MIX 6/15

2mag

Without heating. With non-mechanical, electronic induction drive. Ideal for batch series stirring. Choice of 6-place, stirring position models which can stir up to 6L x 1L.
Erlenmeyer flasks or 15-place models for up to 15ml x 250ml beakers (high form). Digital stirring speed display and soft-start function. With 4 adjustable power level stirring speeds (5W to 20W). Easy to clean, hermetically sealed casing which can be washed under running water, ultra flat, space-saving profile and 100% synchronous speed control in all stirring positions. SoftStart. 3 years warranty, Made in Germay.

Specifications

Operating conditions:	-10°C to +50°C at 80% R.H. max.
Housing:	Stainless steel
Protection category:	IP 64

Type	Rotation speed	Stirring positions	Stirring centre distances	Stirring capacity	Dimensions (W x D x H)	Weight	PK	Cat. No.
	rpm		mm	ml	mm	kg		
MIX 6	100 to 2000	6	130	1 to 3000	245 x 425 x 38	8.8	1	**9.645 956**
MIX 15	100 to 2000	15	65	1 to 3000	245 x 425 x 38	8.8	1	**9.645 957**



3 Multi-position magnetic stirrers MIX 15 eco

2mag

Without heating. Non-mechanical, electronic induction drive. With 15 stirring positions, e.g. for 6L x 1L erlenmeyer flasks or 15ml x 250ml beakers (high form).
Suitable for mass screening and biological applications, even in humidity incubators.
With built-in controller, digital speed indicator and SoftStart drive. Supplied with mains adapter.
3 years warranty. Made in Germany.

Specifications

Operating conditions:	-10°C to + 50°C at 80% R.H. max.
Housing:	Stainless steel
Protection category:	IP 64

Type	Rotation speed	Stirring positions	Stirring centre distances	Stirring capacity	Dimensions (W x D x H)	Power	Weight	PK	Cat. No.
	rpm		mm	ml	mm	W	kg		
MIX 15 eco	120 - 1200	15	65	1 - 1500	245 x 425 x 38	10	8.8	1	**9.645 958**

We can **supply** this **manufacturer's whole product range !**

partner of the LLG Lab Logistics Group

2mag magnetic motion

Magnetic stirrers, lab disc

IKA

Without heating. Lab disc is an innovative, very flat, magnetic stirrer.
It's modern, toroidal coil technology with no moving parts guarantees a maintenance-free drive. Lab disc can automatically change it's rotational direction every 30secs. and therefore enhances mixing of the medium.
- High IP protection class (IP 65)
- Set-up plate and casing made from chemically resistant materials
- Slip-proof, safe stand

Specifications

Max. volume stirred (H_2O):	800ml
Motor rating input/output:	5W/3W
Speed range:	15rpm to 1500rpm
Stirring bar length max.:	25mm
Set-up plate material:	polyester
Set-up plate dimensions:	Ø 100mm
Dimensions (W x H x D):	117mm x 12mm x 180mm
Permissible ambient temperature:	5°C to 40°C
Permissible relative humidity:	80%
Protection category:	IP 65
Voltage/Frequency	100V - 240V/50/60Hz
Power input	5W

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9.720 480

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9.720 481

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9.720 482

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9.720 483

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9.720 484

Description	PK	Cat. No.	
lab disc white EU/CH	1	**9.720 480**	1
lab disc white UK	1	**4.008 137**	
lab disc stream	1	**9.720 481**	2
lab disc pattern	1	**9.720 482**	3
lab disc maracuja	1	**9.720 483**	4
lab disc meadow	1	**9.720 484**	5

Optional accessories: Ikaflon®- stirring bars, Trika®- stirring bars, RSE Stirring bar retriever

Magnetic stirring bars and stirring bar retrievers please see page 444.



1



1 Magnetic stirrer accuMIX, with battery operation

2mag

Mobile magnetic stirrer, 100% maintenance-free and wear-free by inductive 2mag-Magnetic-Drive concept for mixing of solutions, speed range from 120rpm up to 1600rpm, jerk-free stirring also at low speeds, two-step power setting for high power with regard to large and viscous stirring amounts and reduced power for battery-saving long-term operation. Constructed for the independent battery- and stationary mains operation, equipped with 8 commercially available high performance rechargeable batteries (Mignon/AA), universal charging/power supply device, intelligent battery charging station with single controlled charging slots as well as battery service function and 12V adapter cable for the operation at cigarette lighter car sockets.

Specifications

Operating conditions:	-10°C to +50°C at 80% R.H. max.
Casing:	Stainless steel
Protection category:	IP 30

Type	Rotation speed	Stirring capacity	Dimensions (W x D x H)	Power	Weight	PK	Cat. No.
	rpm	l	mm	W	kg		
accuMIX	100 - 1600	1 - 3000	215 x 130 x 40	2/10 (2-steps)	2.5	1	**9.646 011**

2



3

BioCote

2 3 Magnetic stirrer SM27, with battery operation.

Stuart

For use in the field or inside incubators or glove boxes where external power supply is impractical. With BioCote, silver-based, antimicrobial protection. Maximum speed 1300rpm. Maximum volume stirred 1.5L (H_2O). Top plate 150mm x 160mm. Variable speed control with battery status indicator. ABS casing 70mm high. Maximum operating conditions +60°C and 80% R.H. Weight 1.3kg. Supplied with 4 x 1.5V size 'D' alkaline batteries giving up to 600 hours operation, and a 25mm PTFE coated follower. Accessory adapters are available for use on 230V 50Hz mains or 12V vehicle supply using the cigar lighter socket.

Type	PK	Cat. No.
SM27	1	**9.950 408**

Accessories for magnetic stirrer, SM27

Stuart

Description	PK	Cat. No.
Mains adapter, SM27/1 for UK / Ireland, 230 V 50Hz single phase supplies	1	**9.950 409**
Mains adapter, SM27/2 for continental Europe, 230 V 50Hz single phase supplies	1	**9.950 410**
Vehicle battery adapter, SM27/3 with cigarette lighter plug	1	**9.950 411**

4



4 Magnetic stirrer, operated by water/air pressure

Kartell

PP-ABS construction. This unique stirrer is operated either by water pressure between 1kg/cm² and 2.5kg/cm² (15psi to 40psi) or by air pressure. No electrical supply is needed, thus eliminating heat, electric shock and explosion hazards. Corrosion-proof, all-plastic construction. Can be used on the bench or clamped to a stand with a 12mm (½") diameter rod using the integral bosshead.

Diam. mm	Height mm	PK	Cat. No.
129	61	1	**9.303 043**

1 2 LLG-RCT standard *safety control*

Magnetic stirrer with new technology and new functions:
- integrated temperature control
- incl. PT 1000 temperature sensor (PT 1000.60)
- exact temperature and speed setting via digital display, even when switched off
- digital display of set safety temperature limit
- hot top indicator, hot surface warning to prevent burns
- digital error code display
- with adjustable safety circuit of heating plate temperature (+50 to +360°C)
- safety magnetic stirrer with heating, suitable for unsupervised operation
- DIN 12878 connector for attaching a contact thermometer, e.g. ETS-D5; enables precise temperature control directly in the heated medium
- enhanced safety due to improved heat control technology
- enclosed assembly (IP42) guarantees long service life
- highly polished, aluminium hotplate for optimal heat transfer
- improved magnetic coupling
- supplied with housing protection cover H 98

1



2



Specifications

Drive unit	
Stirring quantity (H_2O):	20L
Motor rating input/output:	16/9W
Speed display:	digital
Speed range:	50 to 1500rpm
Max. magnetic bar (L x dia.):	80 x 10mm
Heating function	
Speed display:	digital
Heat output:	600W
Heating rate (1 litre H_2O in H 15):	6.5K/min
Temperature range:	RT to 310°C
Setting accuracy:	±1K
Temp. variation without temp. sensor:	±2K
Adjustable safety circuit:	50 to 360°C
Control accuracy with sensor:	PT 1000/±1K ETS-D5/±0.5K ETS-D6/±0.2K
Heating plate	
Material:	aluminium alloy
Dimensions:	135mm dia.
General data	
Dimensions (WxDxH):	160 x 270 x 85mm
Weight:	2.5kg
Operating temperature range:	5 to 40°C
Operating humidity range:	80% R.H.
Protection class acc. to DIN EN 60529:	IP42
Tested to DIN EN IEC 61010-1.	

Type	PK	Cat. No.
RCT Standard safety control incl. PT 1000	1	**9.720 250**

Optional accessories:
Electronic contact thermometer ETS-D5, Ikaflon® stirring bars, Trika® stirring bars, RS 1 stirring bar set, RSE Stirring bar remover, Quarter System, Reaction block System

LLG-Universal reaction block system for magnetic stirrers please see page 444.

1



9.720 156

2



9.720 145

3



9.720 183

Magnetic stirring hotplates MR Hei-Standard/Hei-Tec/Hei-End

Safe Heating and Mixing *Heidolph*

- The extended heating capacity of 800 W reduces heat-up times by 35 % compared to other units at 600 W
- The chemically resistant KeraDisk® hot plate allows for immediate heat transfer resulting in quick heat-up times
- In case the heating function fails, stirring will not be discontinued to prevent bumping
- A separate on/off button for heating prevents unintentional heat-up - the button is illuminated for visual control
- Damage to the stirrer is categorically ruled out even if exposed to highest temperatures - all models come with a fire-resistant aluminum die-cast housing
- In case of a short-circuit, a damage or removal of the temperature sensor from the media, the unit powers off completely
- The temperature sensor consists of two independent safety circuits which switches off heating in case of any overtemperature situation
- Hermetically-sealed housing protects all mechanical and electronic components from aggressive environments
- The average operational lifespan of 10 years is backed by a 3 year warranty and makes your purchase a truly worthwhile investment
- Speed is adjustable from 30rpm till 1400rpm at an accuracy of ±1% for gentle mixing
- Safety circuits avoid an overheat situation of your hotplate. If the temperature overshoots, heating will be powered off immediately
- The strong magnetic field allows for stirring of even higher viscosity media or stirring a volume of 20L of water with ease
- With a heating power of 800 W the hotplate reaches a maximum temperature of 300°C in a significantly reduced time period

MR Hei-Standard - Model for standard applications without display

- For your protection an independent safety circuit will switch off heating if the hotplate temperature exceeds 25°C over set temperature
- Upgrade this magnetic stirrer with the optional digital thermometer EKT Hei-Con that provides precise control of temperature to give you temperature overshoot protection and reproducible results
- A separate on/off switch for heating prevents an unintentional heat-up. If heating is switched on the on/off button is illuminated for visual control
- Analog knobs allow for convenient speed setting from 100rpm to 1400rpm at an accuracy of 2% and temperature setting up to 300°C

MR Hei-Tec - Model for higher requirements and reproducible results

- This units features a digital display and allows for easy setting and monitoring of values the illuminated readout
- For your protection an independent safety circuit will switch off heating if hotplate temperature exceeds 25°C over set temperature
- Digital speed setting from 100rpm to 1400rpm at an accuracy of 2% and temperature setting up to 300°C
- Upgrade this magnetic stirrer with the optional Pt 1000 temperature sensor for precise temperature control, overshoot protection and reproducible results
- A separate on/off switch for heating prevents an unintentional heat-up. If heating is switched on the on/off button is illuminated for visual control

MR Hei-End - Model for highest safety

- A separate on/off switch for heating prevents an unintentional heat-up. If heating is switched on the on/off button in illuminated for visual control
- An independent safety circuit switches off heating at an operator-programmed temperature value above your set temperature
- An additional operational safety step is required to change parameters which prevents unwanted changes to the actual setting
- The digital display allows for easy setting and monitoring of values on the illuminated readout. Speed setting from 30rpm to 1400rpm at an accuracy of 1% and temperature setting up to 300°C
- Hotplate residual heat indicator in the digital display illuminates when unit is turned off and hotplate temperature is above 50°C to prevent accidental operator injury
- To protect your sample from overheating a safety circuit switches off heating if the temperature sensor is not immersed in your media vessel
- Upgrade this magnetic stirrer with the optional Pt 1000 temperature sensor for precise temperature control, overshoot protection and reproducible results

Type	PK	Cat. No.	
MR Hei-Standard	1	**9.720 156**	1
MR Hei-Standard UK	1	**6.229 358**	
MR Hei-Tec	1	**9.720 145**	2
MR Hei-Tec UK	1	**6.240 766**	
MR Hei-End	1	**9.720 183**	3
MR Hei-End with 2 Lemo-Con	1	**9.720 184**	
MR Hei-End UK	1	**9.720 131**	

E & OE.

1 Accessories for MR 3000 to MR 3004 series magnetic stirrers/hotplates

NEW!

Heidolph

Type	PK	Cat. No.
Pt1000 temperature sensor, for MR 3004, V4A sensor	1	**9.720 163**
Pt1000 temperature sensor, for MR 3004, glass covered sensor	1	**9.720 164**

1



2 Contact thermometer EKT Hei-Con

Heidolph

- For precise temperature control we recommend the optional EKT Hei-Con with the MR Hei-Standard
- Take advantage of the built-in Fuzzy-Logic controller that ensures the fastest heat-up while preventing an overtemperature situation
- Works efficiently in high temperature environment or under high steamy conditions
- Double-spaced digital display for convenient monitoring of the illuminated readout
- By the press of the MAX-button you can see the overtemperature at which the unit will power off for safety reasons
- All heating settings of the hotplate will be indicated on the EKT Hei-Con display
- To make troubleshooting easy a sensor feature signals any short-circuit or breakage on the display to inform operator of disruption
- Equipment automatically switches off heating if the temperature sensor is not in contact with the media or is removed from the vessel unintentionally

Select between these two modes:
- The time-saving Fast-Mode-guarantees shortest heating-up times
- The precise Fine-Mode-ideal to categorically prevent an overtemperature situation

Accessories:
- Temperature sensors are available in two different options - stainless steel or glass-coated sensor for improved chemical resistance
- Please order stay bar and temperature sensor holder separately

2



Specifications

Temperature range:	-50 to +300°C
Resolution:	1°C
Accuracy of measurement:	±1°C
Measuring cycle:	1.5 sec
Control accuracy:	±0.5°C
Temperature sensor EKT Hei-Con:	Pt 1000, V2A
Temperature sensor EKT Hei-Con G:	Pt 1000, glass
Sensor length:	210mm
Cable length:	700mm
Min. immersion depth:	20mm
Ambient temperature range:	-5 to +60°C
Housing:	Polyamid
Weight:	0.3kg
Dimension (L x W x H):	54 x 22 x 126mm
Protection (DIN EN 60529):	IP 40
Power supply:	8 - 15V

Type	Description	PK	Cat. No.
EKT Hei-Con	stainless steel sensor (V2A)	1	**9.720 168**
EKT Hei-Con G	glass coated sensor	1	**9.720 169**

Accessories for Contact Thermometer EKT Hei-Con

Heidolph

Description	PK	Cat. No.
Support rod for Contact Thermometer	1	**9.730 018**
Temperature sensor holder	1	**9.730 017**

MR Plug & Play Packages

Safe Heating and Mixing *Heidolph*

MR Plug & Play Hei-Standard
- Magnetic Stirrer MR Hei-Standard
- EKT Hei-Con with temperature sensor
- Support Rod for EKT Hei-Con
- Clamp for temperature sensor

Package MR Hei-Tec with Pt 1000
- Magnetic Stirrer MR Hei-Tec
- Temperature sensor Pt 1000

Package MR Hei-End with Pt 1000
- Magnetic Stirrer MR Hei-End
- Temperature sensor Pt 1000

MR Plug & Play Hei-Tec
- Magnetic Stirrer MR Hei-Tec
- Temperature sensor Pt 1000
- Support rod for Pt 1000
- Clamp for Pt 1000

Type	PK	Cat. No.	
MR Plug & Play Hei-Standard	1	**9.720 157**	1
Paket MR Hei-Tec mit Pt 1000	1	**6.256 440**	2
Paket MR Hei-End mit Pt 1000	1	**6.256 442**	3
MR Plug & Play Hei-Tec	1	**6.256 441**	

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9.720 157

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6.256 440

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6.256 442

E & OE.

Magnetic stirrer/hotplate, US152/UC152

Stuart

- Choice of top plate: Robust coated aluminium or chemically resistant ceramic
- Flashing "Hot" warning light, mains independent
- Accurate temperature control with LED indicator scale
- Compact space saving design

Stylish and economical general purpose hotplate stirrers designed with safety as well as performance in mind. The compact shape takes up less bench space and makes storage easier. The hotplate has an innovative LED temperature indicator scale and can also be used in conjunction with the SCT1 digital contact thermometer to accurately control sample temperature. The "Hot" warning light will flash whenever the plate temperature is above 50°C even when the hotplate is turned off and unplugged from the mains. Powerful magnets and motor give stirring speeds up to 2000rpm and is capable of mixing large volumes (up to 15L).

Model US152 has a robust aluminium/silicon alloy top plate for excellent heat transmission. The top plate has a thin ceramic coating for added chemical resistance. A 700W element gives rapid heating and ensures even temperature distribution across the whole surface of the plate.

Model UC152 has a glass ceramic top which has excellent chemical resistance. The surface is easy to clean and the thermal properties allow very high plate temperatures while ensuring the edges stay cooler, reducing the chance of accidental burns. The white surface ensures good visibility of colour changes.

Both models have an integral fitting for a retort rod and are supplied with 2 x 25mm PTFE coated stirring bars.

Specification	**US152/UC152**
Plate Material:	Coated Aluminium/Silicon/Glass ceramic
Plate Dimensions:	150mm x 150mm
Heated Area:	150mm x 150mm/120mm x 120mm
Heater Power:	700W/500W
Max plate temp:	325°C/450°C
Stirrer Speed:	100-2000rpm
Maximum Stirring Capacity:	15L*
Dimensions (WxDxH):	172 x 248 x 120mm/172 x 248 x 122mm
Weight:	2.9kg
Electrical supply:	230V, 50Hz, 750W/230V, 50Hz, 550W
IP Rating:	IP 32

Type	Description	PK	Cat. No.	
US152	Magnetic stirrer/hotplate, coated aluminium plate	1	**9.645 295**	1
UC152	Magnetic stirrer/hotplate, ceramic plate	1	**9.645 296**	2
SCT1	Digital contact thermometer	1	**9.645 342**	3
SCT 1/2	PTFE probe	1	**9.645 344**	
SCT 1/1	Probe holder	1	**9.645 343**	
SR1	Retort rod, 600 x 12mm diameter	1	**9.645 335**	

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9.645 295

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9.645 296

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9.645 342

4 5 Magnetic stirrer/hotplate, 3-Position, SB162-3

Stuart

Maximum speed 1500rpm and maximum temperature 325°C. With 3 independently adjustable aluminium hotplates 160mm x 160 mm, overheat protection mechanism and warning light which switches on when the plate temperature exceeds 50°C.
With facility for mounting a 12.5mm retort rod at the rear of each plate and 3mm x 25mm PTFE coated followers.
Overall dimensions (WxDxH) 600 x 270 x 110mm. Weight: 11kg. For 230V, 50/60 Hz single phase supplies.
Hotplate: 2250W.
With BioCote, silver-based, antimicrobial protection.

Type	Stirring positions	PK	Cat. No.
SB162-3	3	1	**9.950 424**

4



5

BioCote

1



1 Laboratory hotplate/stirrer SLR, with glass ceramics plate

SI Analytics GmbH

For stirring, heating and controlling. As well as the ability for rapid and temperature-controlled heating, many applications also require liquids to be stirred.
You can use the SLR hotplate/stirrer to provide gentle or vigorous liquid stirring and, if required, gradual heating or cooling. All functions are displayed on the clear LCD panel and can be monitored. The stirrer and heater are individually controlled via manual control knobs. The stirrer can be set from 100rpm to 1100rpm x 10rpm increments. The average rpm is shown as a bar graph. True running is achieved even at the lower end of the rpm range. Heating can also be adjusted over 24 steps attaining an average of 0.9kW at the top of the range. It is possible to regulate temperatures between 25°C and 200°C with variations of between ±2°C and ±5°C using the Pt1000 temperature sensor, depending on the liquid volume, heat capacity and ambient temperature conditions. The display panel informs the user at 5 second intervals of the pre-set desired temperature and the actual temperature. The average thermal energy generated is also shown as a bar graph.

Type	Zones	Heated zone	Surface	Rating	Stirrer	Dimensions (W x D x H)	PK	Cat. No.
		mm	mm	W		mm		
SLR	1	155 dia.	235 x 235	900	integral	240 x 370 x 85	1	**9.720 130**

2



9.720 411

3



9.720 414

4



9.720 418

5



5 Magnetic stirrers RH basic/digital

NEW!

IKA

Newly designed, economic magnetic stirrer with heating. High heat output of 600 watts and steel-copper compound hot plate ensures rapid heating. Adjustable safety temperature from 50 to 370°C.

- Soft-start of the stirring motor
- Includes M 10 thread for a support rod
- Strong magnetic field and wide speed range for volumes up to 15 liters

RH digital only:
Bushing according to DIN 12878 for connecting an electronic contact thermometer, such as the ETS-D5.
Highly accurate temperature control is possible with sensor placed directly in the medium.
- Digital display of temperature and speed
- Error code display
- Easy operation with touch keypad

RH basic white/RH digital white with chemically resistant hot plate.

Specifications

Max. stirring quantity (H_2O):	15l
Motor rating input/output:	15/2W
Speed range:	50 to 2000rpm
Speed display RH basic:	scale
Speed display RH digital:	LED
Heat output:	600W
Heating rate (1l H_2O):	6K/min
Temperature range min./max.	50 to 320°C
Setting accuracy RH digital:	±5K
Adjustable safety circuit min./max.:	50 to 370°C
Connection for ext. temp. sensor:	DIN 12878
Control accuracy with sensor:	±1K
ETS-D5:	±0.5K
ETS-D6:	±0.2K
Set-up plate:	Stainless steel 1.4301, diam. 135mm
Dimensions (WxDxH):	160 x 246 x 90mm
Weight:	2kg
Protection class acc. to DIN EN 60529:	IP 21
Power supply:	220-240V, 50/60Hz

Type	PK	Cat. No.	
RH basic	1	**9.720 411**	2
RH basic S 2 UK	1	**9.720 412**	
RH basic S 3 CH	1	**9.720 413**	
RH basic white	1	**9.720 417**	
RH basic white S 2 UK	1	**9.720 421**	
RH basic white S 3 CH	1	**9.720 422**	
RH digital	1	**9.720 414**	3
RH digital S 2 UK	1	**9.720 415**	
RH digital S 3 CH	1	**9.720 416**	
RH digital white	1	**9.720 418**	4
RH digital white S 2 UK	1	**9.720 423**	
RH digital white S 3 CH	1	**9.720 424**	

1 Magnetic stirrer RET control

NEW!

IKA



Safety magnetic stirrer with heating and integrated balance. Clear, multilingual TFT display makes it easy to set all parameters. Integrated temperature control feature enables connection of a temperature probe, placed directly in the medium, to control medium temperature with a high degree of precision. PT 1000 temperature sensor is included with purchase of RET control. The stainless steel composite hot plate, reaching a temperature of 340°C, enables rapid heating. RS 232 and USB interfaces enable pc control of the magnetic stirrer and documentation of all test parameters. "Lock" function prevents inadvertent changes of speed and temperature settings. As a safety feature, "HOT" sign flashes when the unit is switched off but surface is still hot.

RET control white with chemically resistant hot plate.

- BNC socket for connection of a pH electrode
- Adjustable temperature control mode: rapid heating and very accurate temperature control
- Dual sensor for simultaneous control of heat transfer fluid temperature and medium temperature
- Timer and countdown functions
- Display of viscosity change trend
- Detached magnet detection
- Intermittent operation
- Several modes of operation available
- Safety circuit adjustable from 50 to 370°C
- Transparent protective cover included
- Error code display for easy troubleshooting
- Exact temperature and speed adjustment by means of digital display; even when function switched off
- Digital display of the safety temperature limit
- Suitable for unsupervised operation
- Sealed casing (IP 42) ensures a long service life
- labworldsoft® software included

Specifications

Max. stirring quantity (H_2O):	20l
Motor rating input/output:	16/9W
Speed:	50 to 1700rpm
Speed display:	TFT
Heat output:	600W
Heating rate (1l H_2O):	7K/min
Temperature range min./max.	RT to 340°C
Setting accuracy:	±0.1K
Adjustable safety circuit min./max.:	50 to 370°C
Connection for ext. temp. sensor:	DIN 12878
Control accuracy with sensor:	±0.2K
Interface:	USB/RS 232
Set-up plate:	Stainless steel 1.4301, diam. 135mm
Dimensions (WxDxH):	160 x 270 x 85mm
Weight:	3kg
Protection class acc. to DIN EN 60529:	IP 42
Power supply:	220-240V, 50/60Hz

Type	PK	Cat. No.
RET control	1	**9.720 261**
RET control S 2 UK	1	**9.720 262**
RET control S 3 CH	1	**9.720 263**
RET control white	1	**9.720 231**
RET control white S 2 UK	1	**9.720 232**
RET control white S 3 CH	1	**9.720 233**

Temperature sensor for RET control

IKA



9.720 350

Type	Description	Immersion depth mm	PK	Cat. No.
PT 100.50	AISI 316 Ti	230	1	**9.720 350** 2
PT 100.51	Borosilicate glass 3.3	230	1	**9.720 351**
PT 1000.50	Stainless steel	230	1	**9.720 348**
PT 1000.51	Stainless steel, glass coated, for corrosive media	230	1	**9.720 349**
PT 1000.80	Stainless steel	150	1	**9.720 352**

1



9.720 441

Magnetic stirrers C-MAG HS 4 digital/C-MAG HS 7 digital/C-MAG HS 10 digital

NEW!

IKA

New magnetic stirrer with heating and ceramic heating plate which offers excellent chemical resistance.

- Powerful motor for stirring quantities of up to 5l, 10l or 15l (H_2O)
- Simultaneous digital display of target and actual temperatures via LCD display
- Directly connection for a PT 1000 temperature sensor enable a precise temperature control (included in delivery)
- Control accuracy in medium ±0.5K (in combination with PT 1000)
- Display of actual temperature value in medium with 0.1K resolution when using PT 1000 temperature sensor
- 3 operating modes to choose (standard, safe, adjustment protection)
- Fixed safety circuit of 550°C
- Hot Top indicator: hot surface warning to prevent burns!
- Digital error code display
- Elevated control panel for protection against leaking liquids

2



9.720 443

3



9.720 445

Specifications

Magnetic drive	
Max. stirring quantity (H_2O)	
C-MAG HS 4:	5l
C-MAG HS 7:	10l
C-MAG HS 10:	15l
Motor rating input/output:	15/1.5W
Speed range:	100 to 1500rpm
Speed display:	Scale
Max. stirring bar length	
C-MAG HS 4:	30mm
C-MAG HS 7/HS 10:	80mm
Heating function	
Heat output:	
C-MAG HS 4:	250W
C-MAG HS 7:	1000W
C-MAG HS 10:	1500W
Heating rate (1l H_2O):	
C-MAG HS 4:	2.5K/min
C-MAG HS 7/HS 10:	5K/min
Temperature range min./max.	50 to 500°C
Setting accuracy:	±1K
Temperature display:	LCD
Safety circuit fixed:	550°C
Connection for ext. temp. sensor:	DIN 12878
Control accuracy with sensor:	±0.5K
Set-up plate	
Material:	ceramic
Dimensions	
C-MAG HS 4:	100 x 100mm
C-MAG HS 7:	180 x 180mm
C-MAG HS 10:	260 x 260mm
Protection class acc. to DIN EN 60529:	IP 21
Power supply:	230 V, 50/60 Hz

Type	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.	
C-MAG HS 4 digital	150 x 260 x 105	3	1	**9.720 441**	1
C-MAG HS 4 digital S 2 UK	150 x 260 x 105	3	1	**9.720 442**	
C-MAG HS 4 digital S 3 CH	150 x 260 x 105	3	1	**9.720 447**	
C-MAG HS 7 digital	215 x 330 x 105	5	1	**9.720 443**	2
C-MAG HS 7 digital S 2 UK	215 x 330 x 105	5	1	**9.720 444**	
C-MAG HS 7 digital S 3 CH	215 x 330 x 105	5	1	**9.720 448**	
C-MAG HS 10 digital	300 x 415 x 105	6	1	**9.720 445**	3
C-MAG HS 10 digital S 2 UK	300 x 415 x 105	6	1	**9.720 446**	
C-MAG HS 10 digital S 3 CH	300 x 415 x 105	6	1	**9.720 449**	

Overall accessories for IKA magnetic stirrers

IKA

Type	Description	For model	PK	Cat. No.
PT 1000.60	Temperature sensor	RCT basic	1	**6.229 702**
PT 1000.70	Temperature sensor, glass-coated	RCT basic	1	**6.231 283**
H 29	Oil bath attachment, i. d. : 136 - 180 mm, H: 81 mm, Vol. : 1 l	RET, RCT	1	**7.017 796**
H 30	Oil bath attachment, i.d. : 136 - 190 mm, H: 110 mm, Vol. : 1.5 l	RET, RCT	1	**7.017 797**
labworldsoft®	Software for control and data collection	RCT, RET control	1	**9.910 320**
H 104	Protective cover	RET control, RCT basic	1	**9.910 338**

E & OE.

1 Magnetic stirrer C-MAG HS 7 Package

C-MAG HS 7 Package includes: *IKA*
Magnetic stirrer/hotplate C-MAG HS 7, ETS-D5 Electronic contact thermometer,
H 38 Holding rod, H 16 V Support rod and H 44 Bosshead.

Type	PK	Cat. No.
C-MAG HS 7 Package	1	**6.235 183**

1



Electronic Contact thermometer ETS-D5/ETS-D6

3 possible operation modes guarantee optimum adjustment to your application: *IKA*
Operating mode A: Suitable for work with varying parameters (from -50°C to 450°C).
Adjustable safety temperature
Operating mode B: Suitable for repeated operation under uniform conditions and parameters
Operating mode C: Suitable for unsupervised operation
- with optimised PID control
- reset function
- includes stainless steel sensor probe H 62.51
- for all magnetic stirrers with a DIN 12878 class 2 contact thermometer connection, e.g. IKA®, Heidolph and Corning with adapter AD-C1.

ETS-D6 additionally with integrated pH measuring instrument (without pH electrode) and large, graphic LCD display with multilingual user guide.

2



9.720 241

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9.720 242

Specifications
Temperature

Measuring range:	-50 to 450°C
Resolution:	±0.1 K
Accuracy*:	±0.2K
Control accuracy:	0.1K
Control accuracy (with sensor)	±0.5K
Voltage:	8 to 16V d.c.
Current (at 9V)	15 mA
Connection:	DIN 12878 Class 2
Operating range:	0 to 60°C
Max. R.H.:	80%
Protection class:	IP54
Connector:	6-pole, DIN 45322
Weight:	0.2kg

Tested to DIN EN IEC 61010-1.

Type	Dimensions (W x D x H) mm	PK	Cat. No.
ETS-D5	82 x 22 x 83	1	**9.720 241** 2
ETS-D6	96 x 45 x 98	1	**9.720 242** 3

Dimensions without sensor.
*Sensor: PT1000 DIN IEC 751 Class A

Accessories for ETS-D5/ETS-D6 contact thermometer

IKA

Type	Description	PK	Cat. No.
H 44	Bosshead	1	**9.232 994**
H 16 V	Stainless steel support rod	1	**9.720 257**
H 62.51	Replacement sensor, stainless steel	1	**9.232 998**
H 66.51	Stainless steel sensor, glass sleeved	1	**9.232 999**
H 70	Extension cable, 1 metre	1	**9.233 000**
H 11	Replacement power cable	1	**9.720 276**
H 38	Holding rod	1	**9.232 996**

1 2 3

LLG-Universal reaction block system for magnetic stirrers

NEW!

Universal alternative to oil bath

The reaction block allows syntheses to be carried out in round flasks at temperatures of up to 250°C. As a result oil as a heat transfer media is made redundant and your lab is a safer place with this system. The reaction block ensures safety at work and preventing oil baths and heating mantles from overheating in your lab. The messy oil clean-ups that results from changing oil or removing flasks from an oil bath will be eliminated. Injuries and burns from hot oil will never happen again. Uniform mixing is also guaranteed because there is no interference to the magnetic field from the aluminium blocks. This system ensures optimal heat transfer from the heating plate directly into the medium.

- Universal model
- For round plates of 135 to 145mm diameter
- For square plates of min. 145mm length side

- Reaction blocks are available in four standard sizes.
- Delivered adapter allows the use with either IKA or Heidolph magnetic stirrers.
- Syntheses in round flasks without oil bath up to 250°C.
- Uniform and constant mixing
- High-precision thermal conduction directly into the reaction block
- Safe and clean working
- Made in Germany

Description	PK	Cat. No.
LLG-Universal reaction block system 50ml	1	**9.728 890**
LLG-Universal reaction block system 100ml	1	**9.728 891**
LLG-Universal reaction block system 250ml	1	**9.728 892**
LLG-Universal reaction block system 500ml	1	**9.728 893**
LLG-Universal reaction block system 1000ml	1	**9.728 897**
Spare adapter ring for reduction from 145mm to 135mm	1	**9.728 894**
Adapter plate for rectangular hotplates	1	**9.728 895**
2 spare screws and 1 wrench	1	**9.728 896**

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4



4 LLG-Magnetic stirring bars, cylindrical, PTFE, eco pack

Circular, smooth and PTFE-coated. Packaging size: 10 pieces

Length mm	Diam. mm	PK	Cat. No.
10	6	10	**9.198 910**
12	3	10	**9.198 766**
15	6	10	**9.198 919**
20	6	10	**9.198 920**
25	6	10	**9.198 925**
25	8	10	**9.198 767**
30	6	10	**9.198 930**
35	6	10	**9.198 935**
40	8	10	**9.198 940**
45	8	10	**9.198 945**
50	8	10	**9.198 950**
60	9	10	**9.198 960**
70	9	10	**9.198 970**
80	9	10	**9.198 980**

E & OE.

1 Magnetic stirring bars, cylindrical, PTFE

PTFE-coated. Cylindrical. Round, smooth surface. Versatile. Further sizes available on request. *BRAND*



Length mm	Diam. mm	PK	Cat. No.
2.5	2.5	1	**9.197 502**
3.5	3.5	1	**9.197 505**
5.0	2.0	1	**9.197 503**
6.0	3.0	1	**9.197 506**
7.0	2.0	1	**9.197 504**
8.0	3.0	1	**9.197 509**
10.0	3.0	1	**9.197 507**
10.0	6.0	1	**9.197 510**
12.0	4.5	1	**9.197 512**
13.0	3.0	1	**9.197 508**
15.0	6.0	1	**9.197 515**
15.0	4.5	1	**9.197 514**
20.0	6.0	1	**9.197 520**
25.0	6.0	1	**9.197 525**
30.0	6.0	1	**9.197 530**
35.0	6.0	1	**9.197 535**
40.0	8.0	1	**9.197 540**
45.0	8.0	1	**9.197 545**
50.0	8.0	1	**9.197 550**
60.0	9.0	1	**9.197 560**
70.0	9.0	1	**9.197 570**
80.0	9.0	1	**9.197 580**

2 Magnetic stirring bars, triangular, PTFE

Triangular. PTFE-coated. Wedge-shaped, ideal for dissolving solids and re-suspending sediments due to scraping action. Angular surface produces high turbulence, even at low stirring speeds. *BRAND*



Length mm	Diam. mm	PK	Cat. No.
12	6	1	**7.019 669**
20	8	1	**7.019 670**
25	8	1	**9.197 652**
25	14	1	**7.019 672**
35	10	1	**7.019 673**
40	14	1	**9.197 654**
50	12	1	**7.019 675**
55	14	1	**9.197 655**
80	14	1	**9.197 658**

3 Magnetic stirring bar Asteroid 40, triangular, PTFE

More than 4x higher torque transmissible. Unbeatably enhanced mixing effect in comparison to conventional stirring bars. Strong, stable, long-lasting magnetic field, with no demagnetization effect. Concave design for minimal surface contact and reliable rotation, triangular shape for powerful shear force and enhanced mixing at lower rotational speeds. Significantly higher rotation speeds achievable, high quality, even and sealed PTFE encapsulation. Conform to FDA requirements, steam sterilisable at 121°C. Multiple enhancements against all types of magnetic stirrers. *2mag*



Length mm	Diam. mm	Weight kg	PK	Cat. No.
40	28	0.06	1	**9.646 040**

4 Magnetic stirring bar, octagonal, PTFE

NEW!

- Interrupted profile provides greater surface area and added turbulence when compared to the smooth surface of cylindrical bars
- Pivot ring aids in reducing friction and chattering
- PTFE encapsulated Alnico magnet
- Autoclavable

Bel-Art Products



Length mm	Diam. mm	PK	Cat. No.
13	8	1	**9.197 460**
16	8	1	**9.197 461**
22	8	1	**9.197 462**
25	8	1	**9.197 463**
29	8	1	**9.197 464**
38	8	1	**9.197 465**
51	8	1	**9.197 466**



1 Magnetic stirring bars, dumbbell, PTFE

Plastibrand®. PTFE-coated. Dumbbell-shaped. Excellent centring, low surface contact and high turbulence even at low stirring speeds, ends 20mm diameter. Stem diameter 8mm. *BRAND*

Length mm	PK	Cat. No.
37	1	**9.197 643**
55	1	**9.197 645**



2 Magnetic stirring bars, oval, PTFE

Encapsulated in PTFE. Oval. Ideal for round bottom flasks. *BOLA*

Length mm	Diam. mm	PK	Cat. No.
20	10	1	**9.197 590**
25	12	1	**9.197 591**
30	15	1	**9.197 592**
35	15	1	**9.197 593**
40	20	1	**9.197 594**



3 LLG-Magnetic stirring bars, PTFE, spherical

PTFE coated. For test tubes or vigorous, eccentric stirring.

Diam. mm	PK	Cat. No.
12	10	**9.198 912**



4 Magnetic Stirring Beakerliner, PTFE

PTFE-encapsulated magnetic core (Alnico 5) axially mounted in a guide cage made of PTFE, universal chemical resistance. No shear action on the bottom of the beaker, smooth running in glass beakers also on an uneven bottom.
The cage acts like a baffel and thus provides optimum mixing results. *BOLA*

Beaker capacity ml	Ext. diam. mm	Height mm	Length mm	Diam. mm	PK	Cat. No.
250, 400	67	21	50.0	8.0	1	**9.197 585**
600, 800, 1000	74	29	60.0	9.0	1	**9.197 586**
2000	103	32	80.0	10.0	1	**9.197 587**
3000, 5000	125	48	106.0	25.0	1	**9.197 588**



5 LLG-Magnetic Stirring Bar Retrievers, PTFE-coated

PTFE-encapsulated stirring bar retriever with strong permanent magnet (Alnico 5), universal chemical resistance.
For the removal of stirring bars from aggressive liquids, prevents loss of stirring bars.
Lower end diameter 10mm.

Length mm	Diam. mm	PK	Cat. No.
150	8	1	**9.197 717**
250	8	1	**9.197 725**
300	8	1	**4.008 501**
350	8	1	**9.197 735**



6 Magnetic Stirring Bar Retrievers, PE

With a permanent magnet on one end and holding ring on the other one.
Magnet is completely encapsulated in a PE mantle. *VITLAB*

Length mm	PK	Cat. No.
300	1	**9.197 740**
450	1	**9.197 742**

E & OE.

Mechanical Stirrers RZR series

Powerful Stirring *Heidolph*

These models are ideal for standard stirring tasks. They are designed to mix and disperse media that require no-reproducible results of high-viscosity applications under high speeds.

- A through-shaft design allows for adjusting the impeller position to make height adjustment more convenient
- A 2-gear stage design guarantees the highest power over the entire speed range
- The speed is adjustable over a large scale from 40rpm to 2000rpm
- An optimal shaft guard prevents any accidents involving contact with the impeller shaft running at high speeds
- Shipment includes a 10mm chuck as a standard
- Sealed housing guarantees longevity and maintenance-free 24-hour operation in an aggressive environment
- Reduced process times by utilizing unique VISCO JET impellers for mixing gels and other challenging media with ease

RZR 1 - For media up to 40.000 mPa s and volumes up to 20 liters
The model is suitable for torque up to 100 Ncm at a power of 18 W
- Slim design fits nicely into your research environment
- A manual scale for speed adjustments from 35 - 2.200 rpm
- A 2-gear stage design allows for high torque at various speeds and provides excellent mixing in short times

RZR 2020 and RZR 2021 - For standard applications
Both are outstanding choices for all medium to high-viscosity mixing tasks with a maximum viscosity of 60000mPa s
- The RZR 2021 features a bright digital display for accurate speed settings. The RZR 2020 comes without a display and is designed for applications that do not require accurate settings.
- A 2-gear stage design guarantees the highest power over the entire speed range of 40rpm to 2000rpm
- A maintenance-free sparkles motor ensures 27W output power and performs stirring torque peaks up to 400Ncm

RZR 2041 - For high viscosity
The RZR 2041 is an excellent choice for any high-viscosity mixing with a maximum viscosity up to 100000mPa s
- The RZR 2041 features a bright digital display for accurate speed settings
- A 2-gear stage design guarantees the highest power over the entire speed range of 40rpm to 2000rpm
- A maintenance-free sparkles motor ensures 37W output power and performs stirring torque peaks up to 520Ncm

Type	Power	Speed range	Max. torque	Speed control	PK	Cat. No.
	W	rpm.	Ncm			
RZR 1	18	I: 35 - 250, II: 280 - 2200	100	dial	1	**9.816 510** 1
RZR 2020	27	I: 40 - 400, II: 200 - 2000	400	dial	1	**9.816 400** 2
RZR 2020 UK	27	I: 40 - 400, II: 200 - 2000	400	dial	1	**6.201 981**
RZR 2021	27	I: 40 - 400, II: 200 - 2000	400	digital	1	**9.816 402** 3
RZR 2021 UK	27	I: 40 - 400, II: 200 - 2000	400	digital	1	**6.240 191**
RZR 2041	37	I: 40 - 400, II: 200 - 2000	520	digital	1	**9.816 389** 4

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9.816 510

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9.816 400

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9.816 402

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9.816 389

Electronic Stirrers RZR Series

Powerful Stirring *Heidolph*

- A through-shaft design allows for adjusting the impeller position to make height adjustments more convenient
- All electronic stirrers accept 200% peak overload for a limited period of time without interrupting the process. Your process therefor will not be interrupted in short-term overload and similar conditions.
- Reduce process times by utilizing patented VISCO JET® impellers for mixing gels and other challenging media with ease
- The motor will be switched off if a high thermal load situation occurs to provide operator safety
- Sealed housing guarantees longevity and maintenance-free 24-hour operation in an aggressive environment
- Calibrate your torque at the beginning or even during your process to monitor viscosity changes. Reproducible results made easy
- Set your speed of choice on the self-explanatory panel or via digital interface from 30 - 2.000 rpm
- Enhanced bright digital display for torque and speed
- Constant speed under changing loads over the entire span of every gear setting
- Shipment includes a 10-mm chuck as a standard

RZR 2051 control and RZR 2052 control - For standard applications
Both RZR 2051 control and RZR 2052 control are 1-gear stage stirrers which hold speed constant under changing loads

- RZR 2051 control:
Accepts torque of 40Ncm in an overload situation and 20Ncm for continuous operation at speeds from 50rpm to 2000rpm.
- Viscosity range up to 10000mPa s

- RZR 2052 control: Accepts torque of 180Ncm in an overload situation and 90Ncm for continuous operation at speeds from 30rpm to 1000rpm.
- Viscosity range up to 40000mPa s
- Speed control uses rheostat or interface
- Enhanced bright digital display for torque and speed

RZR 2102 control and RZR 2102 control Z - For high viscosity
Both models RZR 2102 control and RZR 2102 control Z are 2-gear stage stirrers which hold speed constant under significant load changes such as sticky media like polymers
- Choose between 2 options for gear setting and experience the power of the 100W output motor which allows for torque of 400Ncm in an overload situation and 200Ncm for continuous operation at speeds from 12rpm to 2000rpm
- Speed control uses rheostat or interface
- Viscosity range up to 100000mPa s

RZR 2102 control Z - For high viscosity
Features identical technical specifications as the RZR 2102 control except for:
- Speed: 4rpm to 540rpm
- Torque: 800Ncm in an overload situation, 700Ncm at continuous operation
- An additionally flanged planet gear for extreme viscosities up to 350000mPa s

The RZR 2102 control Z does not feature the through-shaft design for impeller adjustment

Type	Power	Speed range	Max. torque	Speed control	PK	Cat. No.
	W	rpm.	Ncm			
RZR 2051 control	50 to 2000	40	Digital	50	1	**9.816 395** 1
RZR 2052 control	30 to 1000	180	Digital	100	1	**9.816 398** 2
RZR 2102 control	1: 12 to 400, 2: 60 to 2000	400	Digital	100	1	**9.816 396** 3
RZR 2102 control UK	100	1: 12 to 400, 2: 60 to 2000	400	Digital	1	**7.071 045**
RZR 2102 control Z	100	1: 4 to 108, 2: 17 to 540	800	Digital	1	**9.816 397** 4

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9.816 395

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9.816 398

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9.816 396

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9.816 397

E & OE.

Accessories for Overhead Stirrers

Heidolph

Type	PK	Cat. No.	
Stand clamp for holder rod 13 to 32mm	1	**9.816 562**	
Chuck, clamping range 10mm	1	**9.816 563**	1
Stand S 2, 425 x 420 x 700mm, 5.8kg	1	**9.816 564**	2
Stirrer shaft guard, Plexiglass, height-adjustable	1	**9.816 566**	3
Flexible shaft including chuck, 8mm	1	**7.047 043**	4
Software Watch & Control for Profibus	1	**6.203 518**	
Base Stand S2 XXL	1	**6.228 500**	
Stirrer Bearing NS 29/32	1	**6.076 532**	
Telescopic stand	1	**7.621 811**	
Chuck 8mm for RZR 1	1	**9.816 508**	
Remote control with start/stop function	1	**9.816 512**	

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9.816 563

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9.816 564

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9.816 566

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7.047 043

5 Overhead stirrer RW 20 digital

IKA

- Technical improvements on the trusted RW20 series design, mechanically controlled
- with digital display
- robust, ergonomic design
- constant power-drive
- two speed ranges for universal use from 60rpm to 2000rpm
- hollow-shafted chuck for rotor shaft height adjustment (only when stationary)

Specifications

Stirring volume max. (H_2O):	20L
Viscosity range:	up to 10000mPas
Motor rating input/output:	70/35W
Output max. at stirring shaft:	26W
Max. stirring shaft torque (at 100rpm.):	150Ncm
Speed range I (at 50Hz):	60 to 500rpm.
Speed range II (at 50Hz):	240 to 2000rpm.
Chuck range:	0.5 to 10mm
Diameter/length of extension arm:	13mm/160mm
Dimensions (WxDxH)	88 x 212 x 294mm
Weight:	3.1kg
Protection class acc. to DIN EN 60529:	IP20
Supply requirements:	230V 50/60Hz

Tested to DIN EN IEC 61010-1.

5



Type	PK	Cat. No.
RW 20 digital	1	**9.816 622**
RW 20 digital UK	1	**6.227 717**

Optional accessories: Stands: R 1825, R 1826, R 1827, R 182 Boss head, FK 1 Flexible coupling, RH 3 Strap clamp, R 301 Stirring shaft protection, Stirring elements: e.g. R 1342, R 1381

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1 Overhead stirrer EUROSTAR 20 digital

NEW!

IKA

Laboratory stirrer designed for simple stirring tasks for quantities up to 15l (H_2O). It automatically adjusts the speed through microprocessor controlled technology within the speed range of 0/30 to 2000rpm. Safety circuits installed ensures automatic cut-off in an anti-stall or overload conditions. Continuous comparison of shaft speed to desired speed is maintained and variations are adjusted automatically. This guarantees a constant speed even with changes in viscosities of the sample.

- Digital speed display
- Infinitely adjustable speed
- Push-through agitator shafts
- Overload protection
- Short-term overload operation
- Slim casing
- Quiet operation
- Error code display

Specifications

Stirring quantity max. (H_2O):	15l
Max. viscosity:	10000mPas
Motor rating input/output:	56/44W
Speed range:	0/30 to 2000rpm
Max. torque at stirring shaft:	20Ncm
Display:	LED
Chuck range:	0.5 to 10mm
Dimensions (WxDxH):	86 x 208 x 248mm
Protection class DIN EN 60529:	IP 40
Power supply:	230V, 50/60Hz

Type	PK	Cat. No.
EUROSTAR 20 digital	1	**9.816 691**
EUROSTAR 20 digital S 2 UK	1	**9.816 692**
EUROSTAR 20 digital S 3 CH	1	**9.816 693**

2



2 Overhead stirrer EUROSTAR 40 digital

NEW!

IKA

Universal laboratory stirrer designed for simple stirring tasks for quantities up to 25l (H_2O). It automatically adjusts the speed through microprocessor controlled technology within the speed range of 0/30 to 2000rpm. Safety circuits installed ensures automatic cut-off in an anti-stall or overload conditions. Continuous comparison of shaft speed to desired speed is maintained and variations are adjusted automatically. This guarantees a constant speed even with changes in viscosities of the sample.

- Digital speed display
- Infinitely adjustable speed
- Push-through agitator shafts
- Overload protection
- Short-term overload operation
- Slim casing
- Quiet operation
- Error code display

Specifications

Stirring quantity max. (H_2O):	25l
Max. viscosity:	30000mPas
Motor rating input/output:	112/87W
Speed range:	0/30 to 2000rpm
Max. torque at stirring shaft:	40Ncm
Display:	LED
Chuck range:	0.5 to 10mm
Dimensions (WxDxH):	86 x 208 x 248mm
Protection class DIN EN 60529:	IP 40
Power supply:	230V, 50/60Hz

Type	PK	Cat. No.
EUROSTAR 40 digital	1	**9.816 697**
EUROSTAR 40 digital S 2 UK	1	**9.816 698**
EUROSTAR 40 digital S 3 CH	1	**9.816 699**

Accessories for the IKA overhead stirrers please see page 456

E & OE.

Overhead stirrer EUROSTAR 60 digital/60 control

NEW!

IKA

Universally used strong laboratory stirrer for quantities up to 40l (H_2O). It automatically adjusts the speed through microprocessor controlled technology within the speed range of 0/30 to 2000rpm. Safety circuits installed ensures automatic cut-off in an anti-stall or overload conditions. Continuous comparison of shaft speed to desired speed is maintained and variations are adjusted automatically. This guarantees a constant speed even with changes in viscosities of the sample.

EUROSTAR 60 digital:
- Digital speed display
- Infinitely adjustable speed
- Push-through agitator shafts
- Overload protection
- Short-term overload operation
- Slim casing
- Quiet operation
- Error code display

EUROSTAR 60 control additionally:
- Multilingual TFT display
- Programmable functions
- Integrated temperature measurement
- Interval operation
- Timer function
- Adjustable safety circuit
- Locked function

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9.816 700

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9.816 703

Specifications

Stirring quantity max. (H_2O):	40l
Max. viscosity:	50000mPas
Motor rating input/output:	168/131W
Speed range:	0/30 to 2000rpm
Max. torque at stirring shaft:	60Ncm
Display 60 digital:	LED
Display 60 control:	TFT
Chuck range:	0.5 to 10mm
Dimensions (WxDxH) 60 digital:	86 x 208 x 248mm
Dimensions (WxDxH) 60 control:	86 x 230 x 267mm
Protection class DIN EN 60529:	IP 40
Power supply:	230V, 50/60Hz
EUROSTAR 60 control only:	
Temperature measurement:	PT 1000
Temperature measuring range:	-10 to +350°C

Type	PK	Cat. No.	
EUROSTAR 60 digital	1	**9.816 700**	1
EUROSTAR 60 digital S 2 UK	1	**9.816 701**	
EUROSTAR 60 digital S 3 CH	1	**9.816 702**	
EUROSTAR 60 control	1	**9.816 703**	2
EUROSTAR 60 control S 2 UK	1	**9.816 704**	
EUROSTAR 60 control S 3 CH	1	**9.816 705**	

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

IKA®

Overhead stirrer EUROSTAR 100 digital/100 control

NEW!

IKA

Powerful laboratory stirrer for highly viscous applications and intensive mixing for quantities up to 100l (H_2O).
It automatically adjusts the speed through microprocessor controlled technology within the speed range of 0/30 to 1300rpm.
Safety circuits installed ensures automatic cut-off in an anti-stall or overload conditions. Continuous comparison of shaft speed to desired speed is maintained and variations are adjusted automatically. This guarantees a constant speed even with changes in viscosities of the sample.

EUROSTAR 100 digital:
- Digital speed display
- Infinitely adjustable speed
- Push-through agitator shafts
- Overload protection
- Short-term overload operation
- Slim casing
- Quiet operation
- Error code display

EUROSTAR 100 control additionally:
- Multilingual TFT display
- Detachable remote control
- Programmable functions
- Integrated temperature measurement
- Interval operation
- Reverse function
- Timer function
- Adjustable safety circuit
- Locked function

Specifications

Stirring quantity max. (H_2O):	100l
Max. viscosity:	70000mPas
Motor rating input/output:	174/142W
Speed range:	0/30 to 1300rpm
Max. torque at stirring shaft:	100Ncm
Display 100 digital:	LED
Display 100 control:	TFT
Chuck range:	0.5 to 10mm
Dimensions (WxDxH) 100 digital:	86 x 208 x 248mm
Dimensions (WxDxH) 100 control:	86 x 230 x 267mm
Protection class DIN EN 60529:	IP 40
Power supply:	230V, 50/60Hz
EUROSTAR 100 control only:	
Temperature measurement:	PT 1000
Temperature measuring range:	-10 to +350°C

Type	PK	Cat. No.	
EUROSTAR 100 digital	1	**9.816 706**	1
EUROSTAR 100 digital S 2 UK	1	**9.816 707**	
EUROSTAR 100 digital S 3 CH	1	**9.816 708**	
EUROSTAR 100 control	1	**9.816 709**	2
EUROSTAR 100 control S 2 UK	1	**9.816 710**	
EUROSTAR 100 control S 3 CH	1	**9.816 711**	

1



9.816 706

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9.816 709

E & OE.

Overhead stirrer EUROSTAR 200 digital/200 control

NEW!

IKA

Extremely powerful laboratory stirrer for highly viscous applications and intensive mixing for quantities up to 100l (H_2O).
It automatically adjusts the speed through microprocessor controlled technology within the speed range of 0/6 to 2000rpm (two speed ranges).
Safety circuits installed ensures automatic cut-off in an anti-stall or overload conditions. Continuous comparison of shaft speed to desired speed is maintained and variations are adjusted automatically. This guarantees a constant speed even with changes in viscosities of the sample.

EUROSTAR 200 digital:
- Digital speed display
- Infinitely adjustable speed
- Push-through agitator shafts
- Overload protection
- Short-term overload operation
- Slim casing
- Quiet operation
- Error code display

EUROSTAR 200 control additionally:
- Multilingual TFT display
- Detachable remote control
- Programmable functions
- Integrated temperature measurement
- Interval operation
- Timer function
- Adjustable safety circuit
- Locked function

Specifications

Stirring quantity max. (H_2O):	100l
Max. viscosity:	100000mPas
Motor rating input/output:	121/99W
Speed range:	0/6 to 2000rpm
Speed range I (at 50/60 Hz):	0/6 to 400rpm
Speed range II (at 50/60 Hz):	0/30 to 2000rpm
Max. torque at stirring shaft:	200Ncm
Display 200 digital:	LED
Display 200 control:	TFT
Chuck range:	0.5 to 10mm
Dimensions (WxDxH) 200 digital:	91 x 209 x 274mm
Dimensions (WxDxH) 200 control:	91 x 231 x 274mm
Protection class DIN EN 60529:	IP 40
Power supply:	230V, 50/60Hz
EUROSTAR 200 control only:	
Temperature measurement:	PT 1000
Temperature measuring range:	-10 to +350°C

Type	PK	Cat. No.	
EUROSTAR 200 digital	1	**9.816 715**	1
EUROSTAR 200 digital S 2 UK	1	**9.816 716**	
EUROSTAR 200 digital S 3 CH	1	**9.816 717**	
EUROSTAR 200 control	1	**9.816 718**	2
EUROSTAR 200 control S 2 UK	1	**9.816 719**	
EUROSTAR 200 control S 3 CH	1	**9.816 720**	

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9.816 715

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9.816 718

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1 Overhead stirrer EUROSTAR 20 high speed digital

NEW!

IKA

High speed laboratory stirrer designed for intensive stirring tasks for quantities up to 20l (H_2O).
It automatically adjusts the speed through microprocessor controlled technology within the speed range of 0/150 to 6000rpm. Safety circuits installed ensures automatic cut-off in an anti-stall or overload conditions. Continuous comparison of shaft speed to desired speed is maintained and variations are adjusted automatically. This guarantees a constant speed even with changes in viscosities of the sample.

- Digital speed display
- Infinitely adjustable speed
- Cone seat for precision shaft
- Overload protection
- Short-term overload operation
- Slim casing
- Quiet operation
- Error code display

Specifications

Stirring quantity max. (H_2O):	20l
Max. viscosity:	10000mPas
Motor rating input/output:	171/133W
Speed range:	0/150 to 6000rpm
Max. torque at stirring shaft:	20Ncm
Display:	LED
Chuck range:	fixed
Dimensions (WxDxH):	86 x 208 x 325mm
Protection class DIN EN 60529:	IP 40
Power supply:	230V, 50/60Hz

Type	PK	Cat. No.
EUROSTAR 20 high speed digital	1	**9.816 694**
EUROSTAR 20 high speed digital S 2 UK	1	**9.816 695**
EUROSTAR 20 high speed digital S 3 CH	1	**9.816 696**

2



2 Overhead stirrer EUROSTAR 200 control P4

NEW!

IKA

Extremely powerful laboratory stirrer for highly viscous applications for quantities up to 100l (H_2O).
It is designed with a removable wireless controller and a digital TFT display.
It automatically adjusts the speed through microprocessor controlled technology within the speed range of 0/4 to 530rpm (two speed ranges). The stirrer comes equipped with a RS 232 and a USB interface to control and document all parameters. An integrated torque trend display is provided for the measurement of viscosity changes. Safety circuits installed ensures automatic cut-off in an anti-stall or overload conditions. Continuous comparison of shaft speed to desired speed is maintained and variations are adjusted automatically. This guarantees a constant speed even with changes in viscosities of the sample.

- Multilingual TFT display
- Detachable remote control
- Programmable functions
- Integrated temperature measurement
- Interval operation
- Timer function
- Adjustable safety circuit
- Locked function
- Infinitely adjustable speed
- Overload protection
- Short-term overload operation
- Slim casing
- Quiet operation
- Error code display

Specifications

Stirring quantity max. (H_2O):	100l
Max. viscosity:	150000mPas
Motor rating input/output:	121/99W
Speed range:	0/4 to 530rpm
Speed range I (at 50/60 Hz):	0/4 to 110rpm
Speed range II (at 50/60 Hz):	0/16 to 530rpm
Max. torque at stirring shaft:	660Ncm
Display	TFT
Chuck range:	0.5 to 10mm
Dimensions (WxDxH)	91 x 230 x 379mm
Protection class DIN EN 60529:	IP 40
Power supply:	230V/50/60Hz

Type	PK	Cat. No.
EUROSTAR 200 control P4	1	**9.816 712**
EUROSTAR 200 control P4 S 2 UK	1	**9.816 713**
EUROSTAR 200 control P4 S 3 CH	1	**9.816 714**

E & OE.

1 Overhead stirrer RW 28 digital

NEW!

IKA



Powerful, mechanically controlled laboratory stirrer designed for highly viscous applications for quantities up to 80l (H_2O). It is suitable for intensive mixing for use in laboratories and pilot plants. The stirrer comes equipped with a protection for overheating of the motor by means of self-locking temperature limiter. Additionally, to secure bowls, a stirring shaft protection and clamping fixture are optionally available.

- Digital speed display
- Infinitely adjustable speed in two speed ranges
- Push-through agitator shafts
- Overload protection
- Error code display
- Robust, ergonomic design
- Quiet operation
- With constant power-drive

Specifications

Stirring quantity max. (H_2O):	80l
Max. viscosity:	50000mPas
Motor rating input/output:	220/90W
Speed range (at 50/60 Hz):	60 to 1400rpm/72 to 1680rpm
Speed range I (at 50/60 Hz):	60 to 400rpm/72 to 480rpm
Speed range II (at 50/60 Hz):	240 to 1400rpm/288 to 1680rpm
Max. torque at stirring shaft:	900Ncm
Display:	LED
Chuck range:	1 to 10mm
Dimensions (WxDxH):	123 x 252 x 364mm
Protection class DIN EN 60529:	IP 40
Power supply:	220-240V,/50/60Hz

Type	PK	Cat. No.
RW 28 digital	1	**9.816 630**
RW 28 digital S 2 UK	1	**9.816 631**
RW 28 digital S 3 CH	1	**9.816 632**

2 Overhead stirrer RW 47 digital

NEW!

IKA



Universal laboratory stirrer designed for simple stirring tasks for quantities up to 200l (H_2O). It automatically adjusts the speed through microprocessor controlled technology within the speed range of 0/30 to 2000rpm. Safety circuits installed ensures automatic cut-off in an anti-stall or overload conditions. Continuous comparison of shaft speed to desired speed is maintained and variations are adjusted automatically. This guarantees a constant speed even with changes in viscosities of the sample.

- Digital speed display
- Infinitely adjustable speed
- Push-through agitator shafts
- Overload protection
- Short-term overload operation
- Slim casing
- Quiet operation
- Error code display

Specifications

Stirring quantity max. (H_2O):	200l
Max. viscosity:	100000mPas
Motor rating input/output:	513/370W
Speed range (at 50/60 Hz):	57 to 1300rpm/69 to 1560rpm
Speed range I (at 50/60 Hz):	57 to 275rpm/69 to 330rpm
Speed range II (at 50/60 Hz):	275 to 1300rpm/330 to 1560rpm
Max. torque at stirring shaft:	3000Ncm
Display:	LED
Chuck range:	3 to 16mm
Dimensions (WxDxH):	145 x 358 x 465mm
Protection class DIN EN 60529:	IP 54
Power supply:	3 x 400V, 50/60Hz

Type	PK	Cat. No.
RW 47 digital	1	**9.816 633**

1



1 Flexible clutch

Required for stirring tasks using glass stirring rods. *Buddeberg*
The flexible coupling compensates for any structural variances.

Clamping range: 6 to 10mm
Torque max. 10 Ncm

Type	PK	Cat. No.
FK 1	1	**9.197 060**

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9.197 053

3



9.197 055

Stirrers for overhead stirrer EUROSTAR 20 high speed digital

IKA

Type	Description	For Volume l	Rotor diam. mm	PK	Cat. No.
R 1401	Propeller	1 to 30	55	1	**9.197 054**
R 1405	Propeller	0.25 to 30	45	1	**9.197 053** 2
R 1402	Dissolver	1 to 30	42	1	**9.197 055** 3

Stands

IKA

Type	Description	Rod diam. mm	Height mm	Max. load kg	PK	Cat. No.
R 1825	Stand with baseplate	16	560	5	1	**9.224 031** 4
R 1826	Stand with baseplate	16	800	5	1	**9.224 032**
R 1827	Stand with baseplate	16	1000	5	1	**9.224 033**
R 2722	H-stand	34	1010	10	1	**9.224 026** 5
R 2723	Telescopic stand	34	620 - 1010	10	1	**9.224 028**
R 474	Telescopic stand	48	500 - 1000	30	1	**9.816 735** 6
R 472	Floor stand	80x80	980 - 1860	30	1	**9.816 736** 7

Further stands available on request.

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9.224 031

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9.224 026

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9.816 735

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9.816 736

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9.224 292

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9.224 293

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9.224 266

Bossheads

IKA

Type	Jaw opening mm	PK	Cat. No.
R 182	Stand / extension arm: 6 to 16	1	**9.224 292** 8
R 270	Stand / extension arm: 25 to 36 / 5 to 21	1	**9.224 293** 9
R 271	Stand / extension arm: 34 / 16	1	**9.224 266** 10

E & OE.

Strap clamps

IKA

Type	Rod diam. mm	Vessel diam. mm	PK	Cat. No.
RH 3	8 to 16	40 to 300	1	**9.224 761** 1
RH 5*	25 to 36	40 to 300	1	**9.224 762** 2

*with R 270 bosshead

1



9.224 761

2



9.224 762

5 PLR compressed air laboratory stirrers up to 25 L for use in potentially explosive atmospheres, without/with tachometer

Buddeberg

PLR compressed air laboratory stirrers are designed for all kinds of standard mixing tasks. The vane type, air-driven motor offers a high power density and is significantly lighter and smaller than an equivalent electric motor.

General specifications:
- operating pressure max. 6 bar
- air consumption 260 L/min. at 6 bar
- power output 200W at 6 bar
- clockwise rotation
- ATEX certification in accordance with Directive 94/9 EG

Basic models include:
- all-stainless steel housing, grade 1.4305
- continuously adjustable speed control valve
- support arm diam. 14mm
- tubing nozzle connector diam. 9mm
- output shaft L x diam. 26 x 10mm

3



9.778 950

4



9.778 960

5



Type	Rating W	Capacity max. litres	For fluid viscosity mPa.	Off-load speed rpm.	Load speed rpm.	Load torque Nm	Torque Nm		PK	Cat. No.
PLR 10	200	3	1000	18000	8200	0.2	0.3	Ex II 2G c T4	1	**9.778 950** 3
PLR 11	200	20	50000	1800	900	1.8	3.5	Ex II 2G c T5	1	**9.778 951**
PLR 12	200	25	70000	870	480	3.1	5.3	Ex II 2G c T5	1	**9.778 952**
PLR 28	200	25	100000	580	296	5.8	10.4	Ex II 2G c T5	1	**9.778 954**
PLR 13	200	25	150000	80	60	12.0	19.8	Ex II 2G c T5	1	**9.778 953**
PLR 10T*	200	3	1000	18000	8200	0.2	0.3	Ex II 2G c T4	1	**9.778 960** 4
PLR 11T*	200	20	50000	1800	900	1.8	3.5	Ex II 2G c T5	1	**9.778 961**
PLR 12T*	200	25	70000	870	480	3.1	5.3	Ex II 2G c T5	1	**9.778 962**
PLR 28T*	200	25	100000	580	296	5.8	10.4	Ex II 2G c T5	1	**9.778 964**
PLR 13T*	200	25	150000	80	60	12.0	19.8	Ex II 2G c T5	1	**9.778 963**

* analogue tachometer



Compressed air powered stirrers, PLR, accessories

Buddeberg

9.779 052: Chuck F8:
For quick, easy attachment of stirring rods.
Not to be used in potentially explosive atmospheres.

9.779 003: Connection couplings VK:
Fixed-diameter connection for motor/magnetic coupling drive shaft and stirring rod. Suitable for use in potentially explosive atmospheres.

9.198 010: Flexible glass stirring shaft couplings PK:
For stirring tasks using glass stirring rods. Elastic connector between motor and stirring shaft. Provides exact alignment of motor and shaft, and evens out axial and height differences. Accepts 6mm to 10mm diameter shafts.

9.779 013: Flexible glass stirring shaft couplings K:
For stirring tasks using glass stirring rods. Elastic connector between motor and stirring shaft. Provides exact alignment of motor and shaft, and evens out axial and height differences. Output drive accepts 6mm to 10mm diameter shafts, input shaft receiver fits 10mm or 10/13mm diameter drives, secured by allen screws.

9.779 065: Double-Cardan-Coupling DCK I:
With 8mm dia. hexagonal input drive receiver and 6mm square socket drive output.

Type	Description	Material No.	PK	Cat. No.	
F 8	Chuck for shafts 0.5 to 8.5mm		1	**9.779 052**	1
VK 10 x 6	Connection coupling	1.4305	1	**9.779 003**	2
VK 10 x 8	Connection coupling	1.4305	1	**9.779 005**	
VK 10 x 10	Connection coupling	1.4305	1	**9.779 006**	
K 10	Flex coupling receiver i. d. 10mm		1	**9.198 010**	3
K 10/13	Flex coupling receiver i. d. 10/13mm		1	**9.197 400**	
PK 10	Flex coupling receiver i. d. 10mm		1	**9.779 013**	4
PK 10/13	Flex coupling receiver i. d. 10/13mm		1	**9.779 014**	
DCK I	Stainless steel, L = 110mm		1	**9.779 065**	5

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9.779 052

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9.779 003

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9.198 010

4 
9.779 013

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9.779 065

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9.224 000

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6.225 791

Stands

Buddeberg

Floor stand BS
with angled foot, side length 600 mm, rod diam. 34 mm.

Wall bracket WS
Rod diam. 34 mm, clearance from wall: 200 mm.

Type	Description	Length mm	PK	Cat. No.	
BS 1	Floor stand	1000	1	**9.224 000**	6
BS 2	Floor stand	1500	1	**6.206 348**	
WS	Wall bracket	1000	1	**6.225 791**	7

8 

9 

8 9 Propeller stirring rotors, 3-blade, stainless steel 1.4305

The 3-blade propellers produce axial flow, and reduce shear forces to a minimum, even at high stirring speeds, thanks to their optimised blade design. Recommended for medium to high speed operations.
Other sizes available on request.

Ø agitator mm	Ø agitator shaft mm	Length mm	PK	Cat. No.
45	8	350	1	**9.197 021**
55	8	350	1	**9.197 022**
140	10	550	1	**9.197 023**
140	10	800	1	**9.197 024**

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11 

10 11 Diagonal blade stirring rotors, 4-blade, stainless steel 1.4305

The 4-blade diagonal blade stirring rotor provides axial flow and creates increasing shear forces at higher stirring speeds. Recommended for medium to high speed operations.
Other sizes available on request.

Ø agitator mm	Ø agitator shaft mm	Length mm	PK	Cat. No.
50	8	350	1	**9.197 006**
100	8	350	1	**9.197 009**
100	10	550	1	**9.779 320**

E & OE.

1 2 Turbine stirring rotors, 3-blade with guide ring, stainless steel 1.4305

The 3-blade turbine stirring rotor produces axial flow; the guide ring surrounding the blades reduces shear forces, and offers protection when contacting the wall or bottom of the vessel. Recommended for medium to high speed operations.

Ø agitator mm	Ø agitator shaft mm	Length mm	PK	Cat. No.
30	8	350	1	**9.197 030**
50	8	350	1	**9.197 031**
70	10	400	1	**9.197 032**

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3 Double blade stirring rotors, stainless steel 1.4305

NEW!

The double blade rotor creates two counter-currents. Vortices are prevented.
Recommended for medium to high speed operations.
Other sizes available on request.

Ø agitator mm	Ø agitator shaft mm	Length mm	PK	Cat. No.
60	8	500	1	**6.203 095**
80	8	500	1	**9.779 321**

3



4 5 Dissolver stirring rotors, stainless steel 1.4305

The dissolver stirring rotor creates a radial flow with high turbulence. The mixture is drawn from top to bottom.
High shear forces are created at the dissolver disk, which provides effective particle reduction.
Recommended for medium to high speed operations.

Ø agitator mm	Ø agitator shaft mm	Length mm	PK	Cat. No.
30	8	350	1	**9.779 322**
40	8	350	1	**9.197 007**
50	8	350	1	**9.779 323**
60	8	350	1	**6.050 915**
70	8	350	1	**9.779 324**
80	8	350	1	**9.197 001**
80	8	550	1	**9.779 325**
100	10	350	1	**9.197 003**

4



5



6 7 Centrifugal stirring rotors, 2-blade, stainless steel 1.4305

The folding blades of this 2-blade centrifugal stirring rotor open with increasing speed, allowing use with narrow-neck vessels. The stirring effect it provides is similar to a standard diagonal blade stirring rotor.
Recommended for medium to high speed operations.

Ø agitator open / closed mm	Ø agitator shaft mm	Length mm	PK	Cat. No.
60/15	8	350	1	**9.197 011**
100/24	8	550	1	**9.197 013**

6



7



8 9 Paddle stirring rotors, 6 holes, stainless steel 1.4305

The paddle stirring rotor creates a tangential flow with minimum turbulence. Its design ensures a gentle action on sensitive products and good heat exchange. Recommended for low to medium speed operations.
Other sizes available on request.

Ø agitator mm	Ø agitator shaft mm	Length mm	PK	Cat. No.
70	8	350	1	**9.197 019**
70	8	550	1	**6.229 422**
150	10	550	1	**9.197 020**

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1 2 Anchor stirring rotors, stainless steel 1.4305

The anchor-shape rotor creates a tangential flow and high shear forces between the vessel wall and stirring blades. This stirrer is especially suitable for medium to high viscosity fluids. Recommended for low speed operations.
Other sizes available on request.

Ø agitator mm	Ø agitator shaft mm	Length mm	PK	Cat. No.
45	8	350	1	**9.197 033**
80	8	350	1	**9.779 326**
90	8	350	1	**9.197 034**
100	8	550	1	**6.238 672**
150	10	550	1	**9.197 036**

3 

4 

3 4 BuddeMix Stirring System 1 - 4

NEW!

This novel stirring system has been conceived to mix low viscosity fluids as well as highly viscous media at slow speeds. Its special design creates inherent dynamic currents to produce perfectly homogeneous mixing results in very little time. Additional components like baffles, bottom bearings, etc. are not needed.

Advantages at a glance:
- suitable for low to highly viscous fluids
- stirs media containing solids and fibres without any difficulty
- gentle, low-shear stirring, due to slow stirring speed
- constant product temperature, with no heating effect
- short mixing times as the entire contents of the container are agitated
- no air addition, no foaming
- no baffles required
- low gear wear due to balanced forces
- minimal power consumption thanks to low speeds and short operation times
- easy cleaning
- material no. 1.4404

Particularly for potentially explosive atmospheres:
- a single stirring zone, near to the container base, ensures easy mixing of settled residues, e.g. in flow-through mixing containers
- no baffles required, thus no additional sources of ignition

Type	Ø agitator mm	Ø agitator shaft mm	Length mm	Material No.	PK	Cat. No.
BuddeMix 1	60	8	350	1.4404	1	**9.779 331**
BuddeMix 2	80	8	350	1.4404	1	**9.779 332**
BuddeMix 3	120	10	550	1.4404	1	**9.779 333**
BuddeMix 4	150	10	850	1.4404	1	**9.779 334**

5 

5 Impellers VISCO JET®

The all rounder for thick and thin
Worldwide the only impeller capable of completely mixing larger quantities of high-viscosity liquids and gels.

Principle of Functionality:
The worldwide patented VISCO JET® Mixing System is the result of the so-called cone-principle. Turbulent flows are created at the taper end by acceleration, displacement and retardation. These flows advance through the stirred medium and result in the new dynamic mixing motion.

Your advantages:
- One system for literally all mixing tasks for low to high viscosity media
- Patented cone-principle creates even at low speeds a turbulent flow which is unique to the VISCO JET®
- Even with high-viscosity media and gels which naturally do not mix by using common impellers you will observe an immediate flow through the entire beaker
- This technology allows for de-gassing of gels while preventing air intake and foaming
- Reduce your process times significantly while performing the best mixing result ever

Material	Ø agitator mm	Ø agitator shaft mm	Length mm	PK	Cat. No.
V4A	60	10	500	1	**9.816 595**
V4A	80	10	500	1	**9.816 596**
POM	80	10	500	1	**9.816 597**
V4A	120	10	500	1	**9.816 598**
POM	120	10	500	1	**9.816 599**

Other versions available.

Stirring rotors made of PTFE

Interesting facts about PTFE stirrers:
The stirrer shafts consist of a PTFE-jacketed, stainless steel shaft and a stirrer paddle made of solid PTFE. The stainless steel core assures stability of the stirrer shaft and allows safe attachment of the stirrer chuck. Thanks to the thick PTFE coat and the paddle made of solid PTFE, the medium will only come into contact with PTFE. High chemical resistance makes it almost universally suitable. PTFE is extremely nonstick so that residues are repelled from shaft and paddle. The stirrer shafts are similar in size to (KPG) glass stirring rods and are therefore interchangeable easily.

Operating temperature: -200°C to +250°C

Additional sizes and accessories are available on request.
Information on the mixing effects of the different stirring geometries can be found in the descriptions of the stainless steel stirring rotors.

1 2 Propeller, 3 blades, PTFE

The straight vanes are inclined at 45°. Recommended for medium to high speed operations.

Ø agitator mm	Ø agitator shaft mm	To fit chuck diam. mm	Length mm	PK	Cat. No.
50	6	4.7	450	1	**9.197 138**
75	8	6.5	350	1	**9.197 130**
75	10	8.0	450	1	**9.197 140**
75	10	8.0	600	1	**9.197 129**
75	10	8.0	800	1	**9.197 149**





3 4 Maxi-propeller, 3 blades, PTFE

The rounded blades are inclined at 45°. Recommended for medium to high speed operations.

Ø agitator mm	Shaft diam. mm	To fit chuck diam. mm	Length mm	PK	Cat. No.
140	10	8.0	600	1	**9.197 194**
140	10	8.0	800	1	**9.197 195**
200	16	14.0	1000	1	**6.244 067**





5 Crescent-shaped stirring rotors, PTFE

The semi-circular shape of the paddle is ideal for mixing in round-bottom flasks.
The pivoting blade allows insertion into vessels with narrow necks and/or ground joints.

Ø agitator mm	Ø agitator shaft mm	To fit chuck diam. mm	Length mm	PK	Cat. No.
65	8	6.5	350	1	**9.197 121**
90	8	6.5	450	1	**9.197 122**
90	10	8.0	350	1	**9.197 127**
90	10	8.0	450	1	**9.197 124**
90	10	8.0	510	1	**9.197 128**
90	10	8.0	600	1	**9.197 125**
125	16	14.0	800	1	**9.197 126**







1 2 Anchor stirrer, PTFE

Recommended for low speed operations.

Ø agitator mm	Ø agitator shaft mm	To fit chuck diam. mm	Length mm	PK	Cat. No.
60	8	6.5	350	1	**9.197 144**
100	8	6.5	600	1	**9.197 145**
80	10	8.0	350	1	**9.197 146**
100	10	8.0	600	1	**9.197 147**

Additional wings available on request

3 4 5 6 Additional wings available on request











7 Overhead stirrer rotors, centrifugal paddle, PTFE

With PTFE-coated, stainless steel shaft.

Length mm	Shaft diam. mm	To fit chuck diam. mm	Ø Paddle mm	PK	Cat. No.
350	6	4.7	50	1	**9.197 176**
450	8	6.5	90	1	**9.197 177**
450	10	8.0	90	1	**9.197 179**



8 Propeller stirring rotors, PP/PE

PP propeller, stirring shaft PE-coated. Good operating characteristics thanks to the steel core of the stirring shaft. Highly resistant to breakage and reduced scratching effect when contacting the vessel wall.

Ø agitator mm	Ø agitator shaft mm	Length mm	PK	Cat. No.
45	6	380	1	**9.197 101**

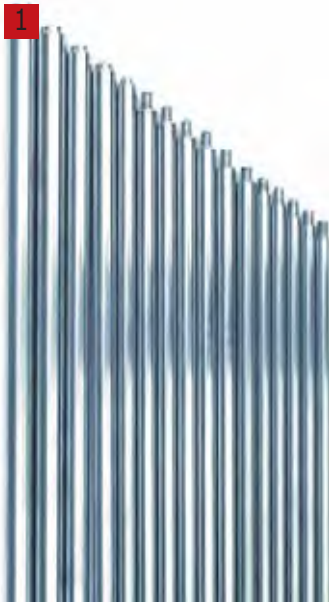
E & OE.

1 Rods for stirrer rotor shafts, M6 and 2 M10 screwthread end

Stainless steel 1.4301. With screwthread fitting as outlined below.
For subsequent stirrer heads.

Description	Diam. mm	Length mm	PK	Cat. No.
Rod, screwthread M 6	6	150	1	**9.156 100**
Rod, screwthread M 6	6	300	1	**9.156 101**
Rod, screwthread M 6	6	350	1	**9.156 102**
Rod, screwthread M 6	6	400	1	**9.156 103**
Rod, screwthread M 6	6	450	1	**9.156 104**
Rod, screwthread M 6	6	500	1	**9.156 105**
Rod, screwthread M 6	6	600	1	**9.156 106**
Rod, screwthread M 6	6	700	1	**9.156 107**
Rod, screwthread M 6	6	800	1	**9.156 108**
Rod, screwthread M 10	10	550	1	**9.156 129**
Rod, screwthread M 10	10	750	1	**9.156 130**
Rod, screwthread M 10	10	1000	1	**9.156 131**
Rod, screwthread M 10	10	1300	1	**9.156 132**
Rod, screwthread M 10	12	550	1	**9.156 133**
Rod, screwthread M 10	12	750	1	**9.156 134**
Rod, screwthread M 10	12	800	1	**9.156 135**
Rod, screwthread M 10	12	1000	1	**9.156 136**
Rod, screwthread M 10	12	1300	1	**9.156 137**
Rod, screwthread M 10	12	1500	1	**9.156 138**

1



2 Paddles, 2 blade propeller

For stirrer rotors with M6 thread. Stainless steel 1.4301.

Type	Blade mm	PK	Cat. No.
2 blades, M6	50	1	**9.156 164**
2 blades, M6	70	1	**9.156 165**
2 blades, M6	100	1	**9.156 166**
2 blades, 90° offset, M6	50	1	**9.156 167**
2 blades, 90° offset, M6	70	1	**9.156 168**
2 blades, 90° offset, M6	100	1	**9.156 169**

2



3 4 Paddles, 3 blade propeller.

Stainless steel 1.4301. With screwthread fitting as outlined below.

Type	Blade mm	PK	Cat. No.
3 blades, M6 thread	50	1	**9.156 170**
3 blades, M6 thread	70	1	**9.156 171**
3 blades, M6 thread	100	1	**9.156 172**
3 blades, M6 thread	140	1	**9.156 173**
3 blades, M10 thread	140	1	**9.156 148**

3



4



5 Paddles, 4 blade propeller

Stainless steel 1.4301. With screwthread shaft connection as outlined below.

Description	Blade mm	PK	Cat. No.
4 blades, M6 thread	50	1	**9.156 174**
4 blades, M6 thread	70	1	**9.156 175**
4 blades, M6 thread	100	1	**9.156 176**
4 blades, M6 thread	150	1	**9.156 177**
4 blades, M10 thread	150	1	**9.156 142**
4 blades, 90° offset, M6 thread	50	1	**9.156 178**
4 blades, 90° offset, M6 thread	70	1	**9.156 179**
4 blades, 90° offset, M6 thread	100	1	**9.156 180**

5



KPG stirring rods - please see page 613.

1



2



9.156 185

3



1 Paddles, flask with holes

Stainless steel 1.4301. With screwthread fitting as outlined below.

Description	Blade mm	PK	Cat. No.
3 hole, M6 thread	70 x 70	1	**9.156 185** 2
6 hole, M6 thread	70 x 70	1	**9.156 186**
10 hole, M6 thread	70 x 100	1	**9.156 187**
14 hole, M6 thread	70 x 150	1	**9.156 188**

3 Centrifugal stirrer heads

Stainless steel 1.4301. With screwthread fitting as outlined below.

Type	Blade mm	PK	Cat. No.
1 blade, M6 thread	60	1	**9.156 181**
2 blade, M6 thread	60	1	**9.156 182**
2 blade, M6 thread	90	1	**9.156 183**
2 blade, M6 thread	100	1	**9.156 184**

4



4 Magnetic Stirrer Heads P-MRK

BOLA

Ideal stirrer head for PTFE-jacketed stirrer shafts from BOLA. Consisting of capsuled drive shaft (stainless steel) with ball bearings, rotor and lower bearing made of PTFE/PEEK and a hollow shaft made of borosilicate glass. Requires little space due to compact construction. No leakage or memory effects due to non-porous, welded rotor. Compression fittings for safe fixing of stirrer shaft and optimum power transmission. Joint-Cone with nut (Safe-Lab) for easy locking and unlocking of the ground joint. Square size 6mm for accepting an agitator or a stirrer coupling. Insertion length of shaft 95mm. Drive shaft outside diameter 50mm.

- gastight stirrer head for perfect vacuum
- stirrer shaft's height adjustable, approx. 40mm
- also suitable for shortened stirrer shafts
- powerful transmission of up to 90Ncm
- excellent chemical resistance
- all products which are exposed to the medium do not contain any metals
- no grease required/save to run dry
- high speed of up to max. 1.500rpm
- drive shaft fixed for your safety
- high durability
- easy disassembly of all parts for cleaning

Joint size NS	For diam. stirring rod mm	Height mm	PK	Cat. No.
	8	145	1	**9.197 205**
	10	145	1	**9.197 206**
	10	145	1	**9.197 207**

5



9.197 202

6



6.240 637

Globe Stirrer Couplings, POM

BOLA

Made of POM, a plastic material with a good mechanical strength, powerful transmission of up to 300Ncm, suitable for a speed of up to 1.200 rounds per minute, maximum misalignment of axes 10mm. Ideal for balancing misalignment of axes between agitator and stirrer shaft, suitable for glass, metal or PTFE stirrer shafts. Opening for stirrer shaft diameter 8 + 10mm. Upper diameter 10mm.

- very low centrifugal forces due to low weight
- suitable for both left and right-handed rotation (except for GL 10 thread: no left-handed rotation possible)
- no resonance
- simple assembly by means of screw joints with clamp rings
- pivot (length 90mm) can be shortened by the user

7



7.632 676

8



6.231 539

recording below mm	recording above mm	Overall length mm	PK	Cat. No.
GL 10	10	170	1	**9.197 202** 5
Ø 6,5 + 10	10	190	1	**6.240 637** 6
Ø 8 + 10	10	190	1	**7.632 676** 7
Innen-4-kant SW6/inner sqare SW6	AW8	180	1	**6.231 539** 8

E & OE.

Test tube shakers Reax top/control

Vibrating *Heidolph*

Ideal for mixing samples in Eppendorf tubes, vials and similar vessels of different diameters at extremely high speed rates. The ridged mixing orbit yields consistent results and is ideal for product dissolution.

Reax top - The standard model
- The strong 5mm vibration orbit yields the best results even with high viscosity media or solidsout of solution an quickly gives a smooth and even dispersion
- Switch to continuous mode, the unit performs a permanent vibration motion
- Switch to automatic mode, the unit will start once a vessel is pressed to the plate and will stop automatically once this pressure is released
- Fast and dependable mixing results due to high vibration frequency that rates up to 2500rpm
- Features an analog dial speed control, no settings of specified rpm numbers

Dimensions (W x H x D) *[mm]:* 134 x 105 x 172
Voltage/frequency: 230 V/50 Hz (others also available)

Reax control - The accurate model
Includes all Reax top features, plus:
- Features analog dial speed control with accurate rpm numbers setting
- Improve your results by the electronic speed control that provides constant rpm output even at very low speed and under changing loads

1



9.730 040

2



9.730 042

Type	PK	Cat. No.
Reax top, incl. attachment	1	**9.730 040** 1
Reax top, incl. attachment UK	1	**9.730 041**
Reax control, incl. attachment	1	**9.730 042** 2
Attachment, large, for tubes or flasks up to 50 ml	1	**9.730 019**

Test tube shakers Multi Reax

Multi Reax - The all purpose - Vibrating *Heidolph*

Unique shaker to accommodate up to 26 vessels with various diameters
Shipment includes as standard:
- Attachment for 26 vessels with diameters from 10mm to 16mm
- Attachment for 12 vessels with diameters from 16mm to 32mm

- A digital process timer allows for unattended operation and can be set from 1 to 999 minutes. When the set time has elapsed, an acoustic alarm will sound and the operation stops.
- Set and continuously adjust the variable speeds from 150rpm to 2000rpm on the digital display
- The 3mm vibration orbit accomplishes excellent results especially in large vessels. The Multi Reax allows for ridged to smooth dispersion of viscous media and solids

Dimensions (wxhxd) (mm): 270 x 410 x 172
Supply voltage: 230/240V/50/60 Hz or 115V/50/60 Hz

3



9.839 810

Description	PK	Cat. No.
Multi Reax	1	**9.839 810** 3
Carousel for 26 test tubes (10 to 16 mm dia.)	1	**9.739 258**
Carousel for 12 test tubes (16 to 32 mm dia.)	1	**9.739 259**

4 Vortex mixer PV-1

With low profile and small footprint for gentle mixing to vigorous re-suspension of cell or chemical pellets. *Grant*
- variable speed: 750rpm to 3000rpm
- continuous or touch operation
- for tubes up to 20mm diameter

Specifications

Speed range:	250 bis 3000rpm
Dimensions (WxDxH):	82 x 145 x 75mm
Temperature range:	4 to 45°C

4



Type	PK	Cat. No.
PV-1	1	**9.721 000**

1



9.730 060

Vortex-Genie®-series

Robust and reliable shakers for speedy mixing and shaking of samples. *Scientific Industries, Inc.*
Multiple accessories: e.g. adapter tops for test tubes, beakers,
centrifuge tubes etc. Adapter tops can be changed easily with the snap fit system.

Vortex-Genie® 2
Variable speed for precise mixing from gentle to vigorous. Broad range of attachments for most tubes, plates and other containers. Hands-Free or Touch On control.

Vortex-Genie® 2T with an integrated timer
Timer function: (Touch On) 1-60 seconds, (Hands-Free) 1-60 minutes or continuous. Unit automatically stops at the end of userprogrammed time.

Digital Vortex-Genie 2 with digital control and display of speed and time
Digital display provides accuracy, reproducibility and repeatability. Timer function: (Touch On) 1-99 seconds, (Hands-Free) 1-99 minutes or continuous. Specially configured unit for Applied Biosystems protocol available.

Specifications	**Vortex-Genie® 2/Vortex-Genie® 2T/Digital Vortex-Genie® 2**
Shaking movement:	circular
Speed display/Timer:	Scale/No/Scale/Scale/Digital/Digital
Speed range:	600 - 2700rpm/600 - 2700rpm/500 - 2850rpm
Timer	
Interval operation:	-/1 to 60s/1 to 99s
Hands-free mode:	-/1 to 60min/1 to 99min
Dimensions (L x W x H):	165 x 122 x 165mm
Permissible ambient conditions:	0 to 38°C at 95% rh
Weight:	4kg
Power supply:	230V, 50/60Hz

Type	Connector	PK	Cat. No.
Vortex Genie® 2	EU	1	**9.730 060** 1
Vortex Genie® 2	UK	1	**6.251 939**
Vortex Genie® 2	CH	1	**6.235 684**
Vortex-Genie® 2T	EU	1	**6.252 823**
Vortex-Genie® 2T	UK	1	**6.252 946**
Vortex-Genie® 2T	CH	1	**9.730 121**
Digital Vortex-Genie® 2	EU	1	**6.242 793**
Digital Vortex-Genie® 2	UK	1	**9.730 120**
Digital Vortex-Genie® 2	CH	1	**6.240 599**

2



2 Test tube shaker, lab dancer

Inexpensive, compact, attractively designed, test tube vortex shaker. *IKA*
Designed for mixing small test samples by touch function.
- Small, compact and reliable
- For small containers up to 30mm in diameter, e.g. test tubes, centrifuge tubes, Eppendorf tubes
- Fixed speed (2800rpm)
- Excellent mixing
- Top of housing and the test tube accessories are made from chemically inert plastic.
  The bottom section is a coated, zinc die-casting.
- Includes lightweight 12V mains adapter

Specifications:

Mixing:	orbital/vortex
Orbit:	4.5mm
Capacity, volume:	1 tube, max. 50ml
Motor rating input/output:	1.2/0.8W
Speed:	2800rpm (fixed)
Dimensions (Diam. x H):	100 x 70mm
Weight:	550g
Material housing:	PP
Material attachment:	TPU
Material base:	Zinc, coated
Enclosure according to DIN EN 60529:	IP40
Supply requirements:	100-240V 50/60 Hz

Tested to DIN EN IEC 61010-1.

Type	PK	Cat. No.
lab dancer EU/CH	1	**9.729 936**
lab dancer UK	1	**4.008 065**

E & OE.

1 Shaker VORTEX 1



New test tube shaker with infinitely adjustable speed range. Specially for mixing small sample volumes with touch function. *IKA*

Specifications

Type of movement:	orbital/vortex
Orbital diameter:	4.5mm
Max. shaken quantity (1 test tube)	100ml
Motor rating input/output:	1.2/0.8W
Speed range:	1000 to 2800rpm
Dimensions (W x H x D):	95 x 110 x 70mm
Weight:	0.55kg
Enclosure according to DIN EN 60529:	IP 40

Type	PK	Cat. No.
VORTEX 1	1	**9.729 931**

Shaker VORTEX 4 basic/digital



9.729 932



9.729 933

Compact, universal small shaker suitable for shaking tasks with small vessels and microtiter plates *IKA*

Specifications

Type of movement:	orbital/vortex
Orbital diameter:	4.5mm
Max. permitted shaking weight (incl. attachment)	0.5kg
Motor rating input/output:	10/8W
Speed range:	0 to 3000rpm
Timer:	only for VORTEX 4 digital (1 sec. - 999 min)
Dimensions (W x H x D):	176 x 190 x 63mm
Weight:	3.0kg
Enclosure according to DIN EN 60529:	IP 21

Type	PK	Cat. No.	
VORTEX 4 basic	1	**9.729 932**	2
VORTEX 4 digital	1	**9.729 933**	3

4 Shaker Vortex Genius 3



Vortex shaker suitable for intermittent operation (touch function), activated by pressing shaker attachment, or for continuous operation. *IKA*

- Wide speed range, infinitely adjustable
- Versatile, due to 3 accessory interchangeable attachments and 7 inserts (e.g. Eppendorf tubes, microtitre plates, 250ml Erlenmeyer flasks etc.), please order separately
- Attachments securely click onto shaker in any position
- Strap clamp (VG3.36) ensures easy holding of round/Erlenmeyer flasks
- Sturdy, die cast zinc casing
- Stable at high speeds due to special feet (silicone base with ultra-high vibration damping)
- Eccentric drive with ball bearings
- Self-ventilated motor allows continuous operation with minimal warm-up of the housing

Supplied with standard attachment.

Specifications

Type of movement:	orbital/vortex
Orbital diameter:	4mm
Motor rating input/output:	58/10W
Speed range:	500rpm to 2500rpm
Speed indication:	scale 0 to 6
Dimensions (WxDxH):	127mm x 149mm x 136mm
Weight:	4.5kg
Protection class acc. to DIN EN 60529:	IP 21
Supply requirements:	230V 50/60 Hz
Tested to DIN EN IEC 61010-1.	

Type	PK	Cat. No.
VORTEX Genius 3 EU	1	**9.729 950**
VORTEX Genius 3 CH	1	**4.008 062**
VORTEX Genius 3 UK	1	**4.008 061**

Accessories for shaker Vortex Genius 3

IKA

Type	Description	PK	Cat. No.
VG 3.1	Standard attachment, for test tubes, small vessels*	1	**9.729 954**
VG 3.2	One-hand attachment 88mm, rubber inlet	1	**9.729 955**
VG 3.3	Standard tray 150mm, rubber inlet	1	**9.729 951** 1
VG 3.31	Insert for 54 Eppendorf tubes	1	**9.729 956**
VG 3.32	Insert for 18 x 10mm diameter test tubes	1	**9.729 957**
VG 3.33	Insert for 12 x 12mm diameter test tubes	1	**9.729 958**
VG 3.34	Insert for 8 x 16mm diameter test tubes	1	**9.729 959**
VG 3.35	Insert for 8 x 20mm diameter test tubes	1	**9.729 952** 2
VG 3.36	Attachment for Erlenmeyer and round vessels 100 to 250ml	1	**9.729 953** 3
VG 3.37	Holder for 1 standard microtitre plate	1	**9.729 960**

*included in delivery

1



9.729 951

2



9.729 952

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9.729 953

4



9.729 938

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9.729 939

Shaker MS3 basic/digital

IKA

Compact, universal small shaker suitable for shaking tasks with all small vessels and microtitre plates.
- Continuous or touch operation (with standard attachment)
- Two operating modes available:

Mode A (safe mode with attachment detection)
the maximum speed of 3000rpm is only attained with the standard attachment in touch mode.
When using other attachments the speed is limited to 1300rpm.
Mode B (without attachment detection)
a speed of 3000rpm is possible with all attachments.
- Stable in all speed ranges
- Sturdy, zinc, die-cast casing

MS 3 digital additionally with countdown function timer (1sec to 999min).
Items supplied with MS3 basic + digital:
Standard attachment, universal attachment, one-hand insert
Additional items supplied with MS3 digital:
Microtitre plate attachment, test tube insert with 6 holes for 12mm diameter tubes

Specifications

Type of movement:	orbital
Orbit:	4.5mm
Max. permitted shaking weight (incl. attachment):	0.5kg
Motor rating input/output:	10/8W
Speed display:	Scale
Speed range:	0 to 3000rpm
Dimensions (WxDxH):	148 x 205 x 63mm
Weight:	2.9kg
Protection class acc. to DIN EN 60529	IP21
Supply requirements:	100-240V 50/60Hz

Tested to DIN EN IEC 61010-1.

Type		PK	Cat. No.
MS 3 basic EU/UK/CH/US	Continuous mode and touch operation	1	**9.729 938** 4
MS 3 digital EU/UK/CH/US	Timer and continous mode, touch operation	1	**9.729 939** 5

E & OE.

Accessories for Shaker MS 3

IKA

Type	Description	PK	Cat. No.
MS 3.1	Standard attachment	1	**9.729 942** 1
MS 3.3	Universal attachment	1	**9.729 944** 2
MS 3.4	Microtitre plate attachment	1	**9.729 943** 3
MS 3.5	PCR attachment	1	**6.237 469** 4
MS 1.21	One-hand insert	1	**9.729 945** 5
MS 1.31	Test tube insert, with 14 holes for tubes diameter 10mm	1	**9.729 946**
MS 1.32	Test tube insert, with 6 holes for tubes diameter 12mm	1	**9.729 947**
MS 1.33	Test tube insert, with 4 holes for tubes diameter 16mm	1	**9.729 948**
MS 1.34	Test tube insert, plain, for user to drill	1	**9.729 949**

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9.729 942

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9.729 944

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9.729 943

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6.237 469

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9.729 945

6 Vibrating shaker, VXR basic

IKA

Optoelectronically controlled small shaker with a very wide speed range.
- Suitable for continuous operation
- New design and improved drive system
- Circular shaking motions
- Slow speeds are well maintained
- Attachments are interchangeable

Please order the required shaker attachment separately.

6



Specifications:

Shaking motion:	Orbital
Orbit:	4mm
Motor rating input/output:	35/13.2W
Speed range:	0 to 2200rpm
Dimensions (WxDxH):	157 x 247 x 130mm
Weight (without attachment):	6.1kg
Max. loading:	2kg
Protection class DIN EN 60529:	IP21
Supply requirements:	230V 50/60Hz
Tested to DIN EN IEC 61010-1.	

Type	PK	Cat. No.
VXR basic	1	**9.729 900**
VXR basic UK	1	**6.202 467**

Optional accessories: Attachements: VX 1, VX 2, VX 2E, VX 7, VX 8, VX 11, VX 11.1, VX11.2, VX 11.3, VX 11.4

Vibrating shaker, VXR basic, accessory attachments

IKA

VX 1 one-hand attachment
For shaking single, non-fixed vessels of 1ml to 250ml.
VX 2 test tube attachment
For up to 36 test tubes or centrifugal tubes with a diameter of 16 mm.
VX 2E "Eppendorf" attachment
For intensive shaking of up to 64 "Eppendorf" tubes (1.5ml).
VX 7 bowl attachment
For careful shaking of culture bottles, Petri dishes, etc.
VX 8 Universal attachment
For rapid and secure clamping, e.g. 2 Erlenmeyer flasks up to 500ml.

Type	Width mm	Depth mm	Height mm	PK	Cat. No.
VX 1	130	135	40	1	**9.729 901** 7
VX 2	140	145	115	1	**9.729 902** 8
VX 2E	210	210	65	1	**9.729 914** 9
VX 7	410	210	40	1	**9.729 907**
VX 8	265	136	60	1	**9.729 908**

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9.729 901

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9.729 902

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9.729 914

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6.231 284

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9.729 915

Accessories for Shaker VXR basic Vibrax®

VX 11 Basic holder
Attachment for test tube inserts.
VX 11.1 Test tube insert
Attachment for Eppendorf tubes or test test tube inserts.
VX 11.2/ VX 11.3/VX 11.4 Test tube inserts
For test tubes.

Type	No.of holes	Diam. of holes mm	PK	Cat. No.
VX 11			1	**6.231 284** 1
VX 11.1	70	10	1	**6.232 813**
VX 11.2	41	12	1	**6.231 285**
VX 11.3	32	16	1	**6.228 246**
VX 11.4	18	20	1	**9.729 915** 2

Your advantages Heidolph-Platform shakers

Heidolph

- Rule out accidents: all models have been designed with a low center of gravity which prevents gliding at high speed, even on a damp surface
- Choose between different shaking motions, orbits, angles and load capacities the right model for your specific application
- Unlimited visual reaction control at all times: the transparent, non-fogging PETG material offers it all
- For applications in microbiology: insulated drive system prevents any heat-up coming from the motor and consequently thermal damage to your sample
- Immediate access: optional incubator hood opens instantly and interlocks in any position
- An overtemperature sensor preventatively shuts off the unit in a dangerous heat-up situation, particularly valuable for you in case of continuous operation

3



9.839 832

4



9.839 830

Platform shakers Titramax 100/101/1000

Vibrating

Heidolph

Titramax 100 - The compact model
- Titramax 100 is a compact and space saving unit that accepts load capacities of 2kg and space for 4 microtiter plates
- Your analog process timer allows for unattended operation and can be set from 1 to 120 mins.When the set time has elapsed, an acoustic alarm will sound and the operation stops.
- Set and continuously adjust the variable speed on the analog control knob from 150rpm to 1350rpm
- The 1.5mm vibration orbit performs gentle mixing with best results using small sample volumes

Titramax 101 - The strong model
- Includes all Titramax 100 features, plus:
- The Titramax 101 has a 3.0-mm orbit which was designed for larger sample volumes

Titramax 1000 - The incubating model
- Includes all Titramax 100 features, plus:
- The use of 6 microtiter plates increases your throughput by 50%
- The 1.5mm vibration orbit performs gentle mixing with best results using small sample volumes
- Titramax 1000 is a medium-sized model and accepts load capacities of 5kg
- This model is suitable for the modular incubator system and is recommended for applications which require variable temperature control of up to 65°C

Platform Shaker Plug & Play Titramax
This package includes:
- Titramax 1000
- Heating module
- Flat incubator hood

Type	Orbit mm	Rotation speed rpm	Max. no. plates	Width mm	Depth mm	Height mm	PK	Cat. No.
Titramax 100	1,5	150 - 1350	4	245	310	125	1	**9.839 831**
Titramax 101	3,0	150 - 1350	4	245	310	125	1	**9.839 832** 3
Titramax 1000	1,5	150 - 1350	6	320	375	125	1	**9.839 830** 4
Paket Titramax 1000	1,5	150 - 1350	6	320	375	125	1	**9.839 838**

E & OE.

1 Microtitre shaker PMS-1000i


1

Reliable, regulated shaking for two or four microplates. Simple screw attachments allow quick and easy fitting of any standard depth 96 or 384 well plates, holding the plate securely in place. *Grant*

- direct drive
- brushless motor
- RPM set and display
- variable speed: 150rpm to 1000rpm
- orbit: 2mm
- continuous or timed operation
- integral timer: 1 min to 24 hours
- standard option for two microplates
- optional platform MPP-4 for four microplates
- ambient 5°C to 40°C

Type	Description	PK	Cat. No.
PMS-1000i	Microplate shaker	1	**9.721 074**
MPP-4	Platform for 4 micro plates	1	**9.721 026**

2 Microtitre shaker MTS 2/4 digital


2

Dedicated shaker for two or four microtitre plates. Orbital movement. *IKA*

- Electronic speed regulation
- Digital timer
- Acoustic signal at end of timed period
- With attachment but without plates

Specifications

Motor rating input/output:	35/13.2W
Orbit:	3mm
Capacity:	two or four microtitre plates
Speed range:	0rpm to 1100rpm
Speed range:	Analogue scale
Timer:	1 to 99 min/ continuous
Dimensions (WxDxH):	185mm x 320mm x 105mm
Weight:	2.7kg
Housing IP rating to DIN EN 60529:	IP 21
Supply requirements:	230V 50/60Hz
Tested to DIN EN IEC 61010-1.	

Type	PK	Cat. No.
MTS 2/4 digital with EU-plug	1	**9.838 195**
Mains cable with CH plug	1	**6.229 999**
Mains cable with UK plug	1	**6.240 684**

Incubator- and Thermo shaker please see page 1302

3 Shaker Multi Vortex Genie®


3

Robust and reliable shaking device for mixing and shaking of samples in Erlenmeyer flasks or vials.

Properties:

- Digital display for speed and time
- Speed increase in steps of 10rpm Robust metal case
- Secure stand at high speed thanks to supports with high vibration damping
- Can be loaded with e. g. max. 6 Erlenmeyer flasks 250ml or 2 multi racks each for 12 test tubes (max. tube diameter 29mm, length min. 85mm)
- After 10 minutes of non use, the mixer switches to "sleep" mode

Supplied with: incl. platform with clamp/tension roller (for securely attaching standing vessels) and 2 multi-racks.

Specifications

Type of movement:	vibrating
Dimensions (WxDxH):	310mm x 270mm x 195mm
Weight:	11.3kg
Supply requirements:	230V, 50Hz
Speed range:	250rpm to 950rpm

Type	Connector	PK	Cat. No.
Multi Vortex-Genie®	EU	1	**9.730 090**

Your advantages Heidolph-Platform shakers

- Rule out accidents: all models have been designed with a low center of gravity which prevents gliding at high speed, even on a damp surface *Heidolph*
- Choose between different shaking motions, orbits, angles and load capacities the right model for your specific application
- Unlimited visual reaction control at all times: the transparent, non-fogging PETG material offers it all
- For applications in microbiology: insulated drive system prevents any heat-up coming from the motor and consequently thermal damage to your sample
- Immediate access: optional incubator hood opens instantly and interlocks in any position
- An overtemperature sensor preventatively shuts off the unit in a dangerous heat-up situation, particularly valuable for you in case of continuous operation

Platform shakers Vibramax 100/110

Vibrating *Heidolph*

Vibramax 100 - The compact model
- A large selection of attachments is provided for the use of various vessels and sizes
- Vibramax 100 is a compact and space saving unit with a load capacity of 2kg
- The 3mm vibration orbit gives excellent results especially in large vessels, allows for smooth to ridged mixing of viscous media and solids
- Set and continuously adjust the variable speed on the analog control knob from 150rpm to 1350rpm
- An analog process timer allows for unattended operation and can be set from 1 to 120 minutes. When the set time has elapsed, an acoustic alarm will sound and the operation stops.
- Optional attachments with tension rollers accepts any glassware size

Vibramax 110 -The efficient model
includes all Vibramax 100 features, plus:
- The shaking orbit of 1.5mm performs a gentle motion for sensitive samples
- Set and continuously adjust the variable speed on the analog control knob from 150rpm to 2500rpm
- Ideal for the optional attachment to use 49 test tubes that increases your throughput significantly

Type	Orbit	Rotation speed	Max. loading	Internal dimensions (W x D x H)	PK	Cat. No.
	mm	rpm	kg	mm		
Vibramax 100	3,0	150 - 1350	2	245 x 310 x 125	1	**9.839 833** 1
Vibramax 110	1,5	150 - 2500	2	245 x 310 x 140	1	**9.839 835** 2

Attachments are not included - Please order separately

1



9.839 833

2



9.839 835

E & OE.

Platform Shakers Rotamax 120/Unimax 1010/2010 - orbital

Heidolph

Rotamax 120 - The compact model
- Wide range or accessories, attachments and clamps for up to 16 Erlenmeyer flasks available
- The shaking orbit of 20mm performs a gentle motion for sensitive samples and supports culture plates and Erlenmeyer flasks
- Set and continuously adjust the variable speed on the analog control knob from 20rpm to 300rpm
- Your analog process timer allows for unattended operation and can be set from 1 to 120 minutes. When the set time has elapsed, an acoustic alarm will sound and the operation stops.
- Rotamax 120 is a compact and space saving unit that accepts load capacities of 2kg and offers space for 4 medium sized culture plates

Unimax 1010 - The incubating model
- This model is suitable for the modular incubator system and is recommended for applications which require variable temperature control up to 65°C
- The shaking orbit of 10mm performs a gentle motion for sensitive samples and supports culture plates and Erlenmeyer flasks
- Set und continuously adjust the variable speed on the digital display from 30rpm to 500rpm
- Your digital process timer allows for unattended operation and can be set from 1 to 999 minutes. When the set time has elapsed, an acoustic alarm will sound and the operation stops.
- The Unimax 1010 is a medium sized model and accepts load capacities of 5kg

Platform Shaker Plug & Play Unimax
This package includes:
- Platform shaker Unimax 1010
- Heating modul
- High incubator hood

Unimax 2010 - The resilient model
includes all Unimax 1010 features, plus:
- The shaking orbit of 20mm performs a gentle motion for sensitive samples and supports culture plates and Erlenmeyer flasks
- Set and adjusturent continuously variable speed on the digital display from 20rpm to 400rpm
- Your digital process timer allows for unattended operation and can be set from 1 to 120 minutes. When the set time has elapsed, an acoustic alarm will sound and the operation stops.
- Increase your sample throughput with the optional multi-tier attachment for a variety of vessel sizes
- The Unimax 2010 is a large model and accepts a load capacity of 10kg for high sample throughput

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9.839 837

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9.839 851

3



9.839 801

Type	Orbit mm	Rotation speed rpm	Max. loading kg	Dimensions (W x D x H) mm	PK	Cat. No.
Rotamax 120	20	20 - 300	2	245 x 310 x 125	1	**9.839 837** 1
Rotamax 120 UK	20	20 - 300	2	245 x 310 x 125	1	**9.839 799**
Unimax 1010	10	30 - 500	5	320 x 125 x 375	1	**9.839 851** 2
Unimax 1010 UK	10	30 - 500	5	320 x 125 x 375	1	**9.839 797**
Unimax 1010 Package	10	30 - 500	5	320 x 125 x 375	1	**9.839 839**
Unimax 2010	20	20 - 400	10	426 x 135 x 435	1	**9.839 801** 3

Attachments are not included - Please order separately

Incubation hoods - please see page 837.

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

Heidolph Research made easy

Accessory-classes for shakers and mixers

Heidolph

Class:	Suitable for the following instruments:
A	Reax Top, Reax Control
B	Vibramax 100, Rotamax 120
C	Vibramax 110
D	Unimax 1010, Duomax 1030, Polymax 1040, Promax 1020
E	Unimax 2010, Promax 2020, Polymax 2040
F	Reax 2
G	Reax 20/4, Reax 20/8, Reax 20/12
H	Multi Reax

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2



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4



5



1 2 3 4 5 Accessories for shakers and mixers

Temperature Controlled Shaking

Heidolph

Type	Class	PK	Cat. No.
Attachment with 2 tension rollers	B	1	**9.839 844**
Test tube attachment for up to 49 test tubes, 12 x 80mm dia. x L	C	1	**9.839 841**
Test tube attachment for up to 36 test tubes, 16 x 80mm dia. x L	C	1	**9.839 842**
Attachment for up to 22 x 25ml erlenmeyer flasks	D	1	**9.839 861**
Attachment for up to 14 x 50ml erlenmeyer flasks	D	1	**9.839 862**
Attachment for up to 9 x 100ml erlenmeyer flasks	D	1	**9.839 863**
Attachment for up to 5 x 250ml erlenmeyer flasks	D	1	**9.839 864**
Attachment for up to 4 x 500ml erlenmeyer flasks	D	1	**9.839 865**
Attachment for up to 2 x 1000ml erlenmeyer flasks	D	1	**9.839 866**
Attachment with 2 tension rollers	D	1	**9.839 869**
Spare tension roller	D	1	**9.839 870**
Attachment for up to 4 conical separating funnels, 50ml or 100ml	D	1	**9.839 871**
Universal perforated platform 1000	D	1	**9.839 814**
Universal perforated platform 2000	E	1	**9.839 813**
Size 1, 25ml erlenmeyer clamp with attachment clip for the perforated platform, max. 36 per platform	B, C, D, E	1	**9.839 816**
Size 2, 50ml erlenmeyer clamp with attachment clip for the perforated platform, max. 36 per platform	B, C, D, E	1	**9.839 817**
Size 3, 100ml erlenmeyer clamp with attachment clip for the perforated platform, max. 23 per platform	B, C, D, E	1	**9.839 818**
Size 4, 250ml erlenmeyer clamp with attachment clip for the perforated platform, max. 12 per platform	B, C, D, E	1	**9.839 819**
Size 5, 500ml erlenmeyer clamp with attachment clip for the perforated platform, max. 9 per platform	B, C, D, E	1	**9.839 821**
Size 6, 1000ml erlenmeyer clamp with attachment clip for the perforated platform, max. 5 per platform	B, C, D, E	1	**9.839 822**
Size 7, 2000ml erlenmeyer clamp with attachment clip for the perforated platform, max. 3 per platform	B, C, D, E	1	**9.839 820**
Size 1 separatory funnel clamp for platform 2000 (250 ml - max. 4, 500/1000ml - max. 3 per platform)	E	1	**9.839 823**
Size 2 separatory funnel clamp for platform 2000 (2000 ml - max. 2 per platform)	E	1	**9.839 827**
Frame for tension roller only. Supplied without tension roller	E	1	**9.839 811**
Tension roller and frame complete. Order at least 2	E	1	**9.839 812**
Multi-storey attachment. Includes perforated platform 2000 and 4 supporting rods	E	1	**9.839 826**
Test tube stand for up to 6 Eppendorf vessels (1.5ml)	A	1	**6.229 903**
Tension plate for caps allows for the use of common bottles with dia. 94mm	G	1	**7.055 418**
V2A support rod with vessel holder	A	1	**9.730 021**
Attachment for 10 test tubes 10 or 60mm	A	1	**9.730 045**
Adapter for 20 test tubes dia. 10 to 18mm	F	1	**9.730 222**
Universal adapter (for flasks, bottles, test tube racks, etc.)	F	1	**9.730 223**
Set of holders for four 1l bottles	G	1	**9.839 808**
Set of holders for four 0.5l bottles	G	1	**9.839 809**



Sea Star® Digital Orbital Shaker

NEW!

Heathrow Scientific



9.839 701

The Sea Star® is designed with high-end features such as an electronic sensor that maintains gentle agitation or vigorous motion while compensating for full or unbalanced loads.
The slow, soft-start greatly decreases the risk of spills. The low adjustable rpm setting also provides gentle shaking - ideal for western blot, molecular biology and other immunology protocols and applications. For vigorous culture applications, simply turn the speed knob up to 300rpm. The large, back lit digital display tracks pre-set timed run, continuous run and rpm settings for improved test procedure repeatability. Non-stop optical motor feedback provides instantaneous speed adjustment. Aesthetically pleasing style and highly intuitive, the Sea Star can be set for continuous time or up to 49 hours. The LCD display shows speed and time remaining and an audible beep indicates ending time. The Sea Star is also designed for use in incubators.
Soft rubber feet minimise walking, and the skid-free rubber mat with unique wave design acts as a non-slip surface for Petri dishes, culture bottles, media flasks and dishes. Sturdy anodized platform provides a stable surface for samples with eight elastic ties for added security. Plug-in-place interchangeable power adapter meets all source requirements.

Platform capacity:
Erlenmeyer Flasks e.g.: 25ml x 50ml, 16ml x 125ml, 9ml x 250ml , 4ml x 500ml, 4ml x 1000ml, 1ml x 2000ml
Beakers e.g.: 36ml x 50ml , 25ml x 100ml, 16ml x 250ml, 9ml x 400ml, 4ml x 1000ml
Deep well assay plates e.g.: 6 x standard (more if stacking is an option)

Accessories available on request.

Specifications

Type of movement:	orbital
Orbit diameter:	19.2mm
Maximum load:	4.5kg
Speed range:	20rpm to 300rpm (adjustable)/1rpm increments
Ambient conditions:	4°C to 40°C; 20% to 80% RH, non-condensing
Speed display:	digital
Timer range:	0 to 49 hours/1 second increments
Power supply:	100 to 240 VAC, 50/60 Hz
Platform interior dimensions:	279mm x 279mm
Overall dimensions (W x H x D):	314mm x 183mm x 305mm

Type	Description	PK	Cat. No.
Sea Star®	Digital Orbital Shaker	1	**9.839 701** 1
Sea Star®	Rubber Mat	1	**9.839 702**
Sea Star®	Elastic Ties, pack of 8	8	**9.839 703**
Sea Star®	Universal Power Adapter	1	**9.839 704**

2 Shaker Orbital-Genie®



Benchtop Orbital Shaker with Universal Ratcheting Clamps provides the flexibility for using a mix of different size and shape vessels on a single platform. Unit is supplied with two ratcheting and one non-ratcheting cushioned clamps. Extra ratcheting clamps for more than two rows of smaller vessels are optional.

Specifications

Type of movement:	orbital
Dimensions (WxDxH):	500mm x 590mm x 170mm
Maximum load:	12kg
Supply requirements:	230V, 50Hz
Speed range:	10 to 300rpm

Description	PK	Cat. No.
Orbital-Genie®	1	**9.730 091**

1



1 Orbital Shaker PSU-10i

Grant

Microprocessor controlled shaking platform providing smooth and quiet horizontal orbital motion for mixing in bottles, flasks and beakers.
- Variable shaking speed: 30rpm to 450rpm
- Loads up to 3kg
- Continuous or timed operation with automatic switch-off
- Reliable direct drive system
- Automatic load balancing system
- The five interchangeable accessory platforms enable a wide choice of vessels to be used, including bottles, flasks and beakers, dishes, boxes and petri-dishes.

Type	PK	Cat. No.
PSU-10i	1	**9.721 019**

Accessories for Orbital shaking platform PSU-10i

Grant

Type	Description	PK	Cat. No.
Bio PP-4	Flat platform	1	**9.721 018**
PUP-12	Universal platform	1	**9.721 021** 2
P12-100	Platform with clamps for 12 x 100ml flasks / 150ml beakers	1	**9.721 023** 3
P6-250	Platform with clamps for 6 x 250ml flasks / 400ml beakers	1	**9.721 024** 4
P16-88	Platform with spring holders for 88 tubes up to 30mm	1	**9.721 049** 5

2



9.721 021

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9.721 023

4



9.721 024

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9.721 049

6



6 Orbital Shaker MO10

NEW!

Ditabis

The Orbital Shaker works with an orbital shaking motion.
Application areas for this device are life science, diagnostics, food science and chemics. It's rock-solid metal housing, the large accessories range and excellent price make the Orbital Shaker a real all-rounder.

Specifications

Speed:	50 to 400rpm
Timer:	0 to 120min
Max. capacity:	10kg
Platform dimensions (L x W):	350 x 400mm
Overall dimensions (WxDxH):	410 x 570 x 140mm
Power supply:	230V, 50Hz

Type	PK	Cat. No.
Orbital Shaker MO10	1	**9.777 253**
Orbital Shaker MO10 UK	1	**9.777 291**
Orbital Shaker MO10 CH	1	**9.777 292**

Accessories for Orbital shaker MO10

NEW!

Ditabis

Description	PK	Cat. No.
Non-slipping Platform, 350 x 400mm	1	**9.777 254**
Universal Platform with 5 rollers, 350 x 400mm	1	**9.777 256**
Platform fastening for Erlenmeyer clips	1	**9.777 259**
Erlenmeyer Clip 250ml	1	**9.777 262**
Erlenmeyer Clip 500ml	1	**9.777 263**

E & OE.

1 Open Air Platform Shakers MaxQ 2000 & 3000



Thermo Scientific

- Triple eccentric drive handles heavy loads, provides uniform agitation and continuous 24-hour operation, even at high speeds.
- Units operate in temperature ranges of 0°C to 40°C and humidity conditions from 20% to 80%, non-condensing enables them to be used in incubators, warm rooms, environmental chambers and refrigerators.
- Variable speed control from 15rpm to 500rpm.
- Minimise errors by viewing speed and operating time simultaneously on two individual LED displays.
- Shaker shutdown and visual/audible alarms signal if unit operates ±10% of set speed, preventing shaker from moving.
- User-adjustable speed calibration can be performed using a digital handheld tachometer, where verification is required and protocols can be standardised.
- Available as CO_2 Resistant Digital Operating System (only for MaxQ 2000)
- Five year warranty on parts, one year labor and LIFETIME on drive mechanism.

Specifications

Speed range:	15 to 500 ±1rpm digital 40 to 400 ±1rpm analog
Operating time:	Continuous and timed operation from 0.1 hour to 999 hours or 0.1 minute to 999 minutes.
Electrical supply:	240V, 50/60 Hz

Type	Description	Load max. kg	Amplitude mm	Dimensions (W x D x H) mm	PK	Cat. No.
MaxQ 2000	Benchtop orbital shaker, analog	15.9	19.0	343 x 442 x 163	1	**4.011 045**
MaxQ 2000	Benchtop orbital shaker, digital	15.9	19.0	343 x 442 x 163	1	**4.011 057**
MaxQ 2000	Benchtop orbital shaker, digital, CO_2 resistant	15.9	19.0	343 x 442 x 163	1	**4.011 058**
MaxQ 3000	Benchtop orbital shaker, analog	22.7	25.4	747 x 655 x 246	1	**4.011 048**
MaxQ 3000	Benchtop orbital shaker, digital	22.7	25.4	747 x 655 x 246	1	**4.011 059**

Accessories for MaxQ 2000 & 3000 - please see page 481.

2 Benchtop Shakers MaxQ 416 HP/MaxQ 430 HP

NEW!



Thermo Scientific

Both benchtops are used for a variety of applications and are designed to operate in reach-in incubators, environmental rooms, or on lab benches. They perform continuously, even in temperatures from 4ºC to 40ºC (39.2ºF to 104ºF) and in the following humidity conditions: 80% RH at or below 31ºC (87.8ºF), decreasing linearly to 50% RH at 40ºC (104ºF).

- Choice of two platform sizes maximizes capacity
- Triple counter-balanced mechanism for optimum handling of full or unbalanced loads regardless of vessel placement and completely eliminates walking
- Over-sized, adjustable, suction cup style, rubber feet minimize vibration and provide maximum stability
- Heavy-duty, triple counter-balanced eccentric drive allows extended speed ranges of 25 to 525 rpm

Specifications

Speed Range:	25 to 525rpm
Accuracy:	±1rpm
Orbit Diameter:	2.5cm
Timer Range:	1min to 199h 59min or continuous operation (hold)
Platform Size (L x W):	
MaxQ 416 HP:	47.5 x 47.5cm or 60.9 x 45.7cm
MaxQ 430 HP:	74.9 x 47.5cm or 91.4 x 60.9cm
Overall Dimensions (WxDxH):	61.7 x 66.0 x 19.8cm
Power supply:	230V, 50/60Hz

Type	Weight kg	PK	Cat. No.
MaxQ 416 HP	62,7	1	**9.721 201**
MaxQ 430 HP	62,7	1	**9.721 202**

Platforms for Orbital Shakers MaxQ 416 HP

NEW!

Thermo Scientific

Description	Dimensions mm	PK	Cat. No.
Universal Platform	457 x 457	1	**4.009 442**
Universal Platform	610 x 457	1	**4.009 445**
Special Platform with 49x25ml clamps	457 x 457	1	**4.009 446**
Special Platform with 49x50ml clamps	457 x 457	1	**4.009 447**
Special Platform with 25x125ml clamps	457 x 457	1	**4.009 448**
Special Platform with 18x250/300ml clamps	457 x 457	1	**4.009 449**
Special Platform with 16x500ml clamps	457 x 457	1	**4.009 450**
Special Platform with 8x1l clamps	457 x 457	1	**4.009 451**
Special Platform with 6x2l clamps	457 x 457	1	**4.009 452**
Special Platform with 80x25ml clamps	610 x 457	1	**4.009 470**
Special Platform with 80x50ml clamps	610 x 457	1	**4.009 471**
Special Platform with 40x125ml clamps	610 x 457	1	**4.009 472**
Special Platform with 35x250/300ml clamps	610 x 457	1	**4.009 473**
Special Platform with 20x500ml clamps	610 x 457	1	**4.009 474**
Special Platform with 12x1l clamps	610 x 457	1	**4.009 475**
Special Platform with 8x2l clamps	610 x 457	1	**4.009 476**
Special Platform with 5x4l clamps	610 x 457	1	**4.009 477**
Special Platform with 4x6l clamps	610 x 457	1	**4.009 478**
Special Platform with 5x2.8l clamps	610 x 457	1	**4.009 479**
Special Platform with 4x4l clamps	457 x 457	1	**4.009 480**
Special Platform with 2x6l clamps	457 x 457	1	**4.009 481**
Special Platform with 4x2.8l clamps	457 x 457	1	**4.009 482**
Special Platform with 36x125ml clamps	457 x 457	1	**4.009 483**
Special Platform with 25x250/300ml clamps	610 x 457	1	**4.009 486**
Special Platform with 4x5l clamps	457 x 457	1	**4.009 487**
Special Platform with 4x5l clamps	610 x 457	1	**4.009 489**

Platforms for Orbital Shakers MaxQ 430 HP

NEW!

Thermo Scientific

Description	Dimensions mm	PK	Cat. No.
Universal Platform	457 x 749	1	**4.009 443**
Universal Platform	610 x 914	1	**4.009 444**
Special Platform with 91x25ml clamps	457 x 749	1	**4.009 453**
Special Platform with 91x50ml clamps	457 x 749	1	**4.009 454**
Special Platform with 40x250/300ml clamps	457 x 749	1	**4.009 455**
Special Platform with 24x500ml clamps	457 x 749	1	**4.009 456**
Special Platform with 15x1l clamps	457 x 749	1	**4.009 457**
Special Platform with 12x2l clamps	457 x 749	1	**4.009 458**
Special Platform with 6x4l clamps	457 x 749	1	**4.009 459**
Special Platform with 4x6l clamps	457 x 749	1	**4.009 460**
Special Platform with 6x2.8l clamps	457 x 749	1	**4.009 461**
Special Platform with 96x125ml clamps	610 x 914	1	**4.009 462**
Special Platform with 70x250/300ml clamps	610 x 914	1	**4.009 463**
Special Platform with 30x500ml clamps	610 x 914	1	**4.009 464**
Special Platform with 24x1l clamps	610 x 914	1	**4.009 465**
Special Platform with 15x2l clamps	610 x 914	1	**4.009 466**
Special Platform with 11x4l clamps	610 x 914	1	**4.009 467**
Special Platform with 8x6l clamps	610 x 914	1	**4.009 468**
Special Platform with 11x2.8l clamps	610 x 914	1	**4.009 469**
Special Platform with 30x250/300ml clamps	457 x 749	1	**4.009 485**
Special Platform with 6x5l clamps	457 x 749	1	**4.009 488**
Special Platform with 8x5l clamps	610 x 914	1	**4.009 490**
Special Platform with 150x25ml clamps	610 x 914	1	**4.009 491**
Special Platform with 150x50ml clamps	610 x 914	1	**4.009 492**
Special Platform with 61x125ml clamps	457 x 749	1	**9.721 211**



E & OE.

1 Benchtop Incubated Shaker MaxQ 420 HP

NEW!



Thermo Scientific

Thermo Scientific MaxQ 420 HP Benchtop Incubated Orbital Shakers include class-leading temperature uniformity for optimum growth, the highest large-flask capacity for the best value, and durable components for long life. Performing over a wide temperature range of 5ºC above ambient to 80ºC with control of ±0.1ºC it ensures flexibility for a broad range of applications.

- Double-wall, insulated chamber contributes to optimum growth
- Twin blowers and gasketed lid ensure temperature uniformity of ±0.3°C (in flask) creating an ideal environment for temperature sensitive cultures
- Microprocessor functions are calibrated through keypad
- Audible/visual over and under-temperature alarms ensure sample protection
- Clear acrylic lid withstands years of use without cracking or discolouration
- Spill tray, sealed mechanism and control panel, and outside-the-chamber location of electronics ensure that shaker components are not damaged by spills, contributing to long unit life

Specifications

Speed Range:	25rpm to 525rpm
Accuracy:	±1rpm
Orbit Diameter:	2.5cm
Timer Range:	1min to 199h 59min or continuous operation (hold)
Overall Dimensions (WxDxH):	61.7 x 73.7 x 53.1cm
Chamber Dimensions (WxDxH):	54.4 x 53.8 x 32.0cm
Power supply:	230V, 50/60Hz

Type	Description	Temp. range °C	Weight kg	PK	Cat. No.
MaxQ 420 HP	with hood	RT +5 ... +80	83,9	1	**9.721 205**

Platforms for Orbital Shakers 420 MaxQ HP

Thermo Scientific

Description	Size cm	PK	Cat. No.
Universal Platform	457 x 457	1	**4.009 442**
Special Platform with 49x25ml clamps	457 x 457	1	**4.009 446**
Special Platform with 49x50ml clamps	457 x 457	1	**4.009 447**
Special Platform with 25x125ml clamps	457 x 457	1	**4.009 448**
Special Platform with 18x250/300ml clamps	457 x 457	1	**4.009 449**
Special Platform with 16x500ml clamps	457 x 457	1	**4.009 450**
Special Platform with 8x1l clamps	457 x 457	1	**4.009 451**
Special Platform with 6x2l clamps	457 x 457	1	**4.009 452**
Special Platform with 4x4l clamps	457 x 457	1	**4.009 480**
Special Platform with 2x6l clamps	457 x 457	1	**4.009 481**
Special Platform with 4x2.8l clamps	457 x 457	1	**4.009 482**
Special Platform with 36x125ml clamps	457 x 457	1	**4.009 483**
Special Platform with 4x5l clamps	457 x 457	1	**4.009 487**

partner of the LLG Lab Logistics Group

We can supply this manufacturer's whole product range !

Thermo SCIENTIFIC

1 Incubated and Refrigerated Floor Shakers MaxQ HP

NEW!

Thermo Scientific

Thermo Scientific MaxQ HP Incubated and Refrigerated Floor Shakers Models provide HEPA filtration for maximum protection from contamination, a directed airflow system for optimum temperature uniformity and ideal growth conditions, even when the units are full, and an ergonomic design for easy access to your product.

- HEPA filtration for maximum protection from contamination
- Crevice-free, stainless steel interior with coved corners for easy cleaning
- At-a-glance monitoring of time, speed, and temperature
- Foot pedal opens lid for hands free operation
- Angled sides, lower front, and convenient platform height ensure a comfortable reach into the chamber
- Thermal pane window provides a large viewing area
- Drain system with valve makes it easy to eliminate liquid, reducing the risk of water borne contamination
- Access port in rear of cabinet allows insertion of probes, CO_2 gassing manifolds or other equipment

Specifications

Speed Range:	25rpm to 525rpm
Accuracy:	±1rpm
Orbit Diameter:	2.5cm
Timer Range:	1min to 199h 59min or continuous operation (hold)
Platform Size (L x W):	74.9cm x 45.7cm
Overall Dimensions (WxDxH):	114.3cm x 76.2cm x 102.6cm
Chamber Dimensions (WxDxH):	87.1cm x 53.6cm x 47.0cm
Power supply:	230V, 50/60Hz

Type	Description	Temp. range °C	Weight kg	PK	Cat. No.
MaxQ 436 HP	incubated	RT +5 ... +60	263.1	1	**9.721 207**
MaxQ 481 HP	refrigerated	+4 ... +60	288.0	1	**9.721 208**

1



Platforms for Orbital Shakers MaxQ HP

Thermo Scientific

Description	Dimensions mm	PK	Cat. No.
Special Platform with 91x25ml clamps	457 x 749	1	**4.009 453**
Special Platform with 91x50ml clamps	457 x 749	1	**4.009 454**
Special Platform with 40x250/300ml clamps	457 x 749	1	**4.009 455**
Special Platform with 24x500ml clamps	457 x 749	1	**4.009 456**
Special Platform with 15x1l clamps	457 x 749	1	**4.009 457**
Special Platform with 12x2l clamps	457 x 749	1	**4.009 458**
Special Platform with 6x4l clamps	457 x 749	1	**4.009 459**
Special Platform with 4x6l clamps	457 x 749	1	**4.009 460**
Special Platform with 6x2.8l clamps	457 x 749	1	**4.009 461**
Special Platform with 30x250/300ml clamps	457 x 749	1	**4.009 485**
Special Platform with 6x5l clamps	457 x 749	1	**4.009 488**
Special Platform with 61x125ml clamps	457 x 749	1	**9.721 211**

E & OE.

Accessories for Thermo Scientific MaxQ HP Orbital Shakers

Thermo Scientific

Description	PK	Cat. No.
25ml Flask Clip	1	**4.009 427**
50ml Flask Clip	1	**4.009 428**
125ml Flask Clip	1	**4.009 429**
250/300ml Flask Clip	1	**4.009 430**
500ml Flask Clip	1	**4.009 431**
1l Flask Clip	1	**4.009 432**
2l Flask Clip	1	**4.009 433**
2.8l Flask Clip	1	**4.009 436**
4l Flask Clip	1	**4.009 434**
5l Flask Clip	1	**4.009 440**
6l Flask Clip	1	**4.009 435**
Flask Clip Starter Kit with 25ml, 50ml, 250/300ml, 500ml, 1l and 2l Flask Clips (2 each)	1	**4.009 441**
Microplate Flask Clip	1	**4.009 437**
Adhesive Flask Mat 210x210mm	1	**4.009 506**
Rubber Tube Mat for Holding Small Test Tubes and Vials	1	**4.009 401**
Test Tube Rack for 10-13mm (3-7ml) Tubes	1	**4.009 532**
Test Tube Rack for 16-20mm (10-20ml) Tubes	1	**4.009 533**
Test Tube Rack for 21-25mm (30ml) Tubes	1	**4.009 514**
Test Tube Rack for 26-30mm (50ml) Tubes	1	**4.009 515**
Replacement screws for mounting tube holders to platform	1	**4.009 394**
Adjustable Angle Test Tube Holder with Rack for 10-13mm (3-7ml) Tubes	1	**4.009 516**
Adjustable Angle Test Tube Holder with Rack for 16-20mm (10-20ml) Tubes	1	**4.009 517**
Adjustable Angle Test Tube Holder with Rack for 21-25mm (30ml) Tubes	1	**4.009 518**
Adjustable Angle Test Tube Holder with Rack for 26-30mm (50ml) Tubes	1	**4.009 519**
Microplate Rack for Standard Plates, 3 compartments	1	**4.009 522**
Microplate Rack for Deep Well Plates, 2 compartments	1	**4.009 521**
Tube Inserts, perforated to hold 3x50ml, 3x20ml and 8x 1.5/2.0ml Tubes	5	**4.009 353**
Utility Tray with Rubber Pad, 229x457mm	1	**4.009 438**
Utility Tray with Rubber Pad, 457x457mm	1	**4.009 439**
Quick Change Platform Adapter	1	**4.009 397**
MagNote wipe-off magnet and pen kit for benchtop models only	1	**4.009 403**
MagNote wipe-off magnet and pen kit for floor models only	1	**4.009 402**
Replacement Screws for mounting clamps and platforms	1	**9.721 212**
Console Shaker Shelf (for chest models only)	1	**4.009 395**
Gassing Manifold for direct gassing of flasks (for models 420 HP, 436 HP and 481 HP only)	1	**4.009 399**
Dual Stack Kit for Tabletop Shakers	1	**4.009 511**

1 2 Rocking Shaker SSM3/SSM4

Stuart

- Small space saving design, ideal for personal use
- Gentle rocking action
- Choice of two models: 3D gyratory action SSM3 and See-saw wave action SSM4
- Digital speed control and built-in timer
- Optional tier system available to increase capacity

These compact rockers are ideal where gentle mixing is required. There is a choice of two models:
Model SSM3 provides a 3D gyratory motion, ideal for low foaming agitation, DNA extractions, staining and de-staining procedures etc. The tilt angle can be adjusted to any position by hand to optimise mixing of vessels.
Model SSM4 has a see-saw rocking action that creates a wave motion within vessels such as culture flasks, Petri dishes etc.
Both models are supplied with a non-slip mat and have digital selection of both speed and time.
An accessory tier system is available. Fitted in seconds, without the need for tools, it triples the available space for samples.
With BioCote, silver-based, antimicrobial protection.

1



2

BioCote

Specifications	**SSM3/SSM4**
Rocking action:	3D gyratory/See-saw wave
Platform dimensions (W x D):	235 x 235mm/235 x 235mm
Speed range:	5 to 70rpm/5 to 70rpm
Angle of tilt:	3 to 12°/7°
Angle adjustable:	Yes by hand/No
Maximum load:	3kg/3kg
Overall dimensions (WxDxH):	240 x 300 x 165mm/240 x 300 x 150mm
Net weight:	5kg/5kg
Electrically supply:	230V 50Hz, 50W

Type	Description	PK	Cat. No.
SSM3	Rocker, gyratory, mini	1	**9.728 820**
SSM4	Rocker, see-saw, mini	1	**9.728 821**

1



9.728 830

2



9.728 831

3

BioCote

3 Shaker SSM1

Stuart

- Smooth orbital shaking action
- Built-in digital timer
- Variable speed control 30 to 300rpm
- Supplied with non-slip mat for microplates etc.
- Optional accessory cradle system for flasks and bottles

The compact SSM1 provides a smooth uniform circular motion with an orbit of 16mm. It is supplied with a non-slip mat that can hold up to four microplates or diagnostic cards. Alternatively, an accessory cradle system is available that can accommodate a variety of vessels including flasks, bottles or beakers via four rubber securing bars. It will hold up to: 4 x 250ml or 2 x 500ml or 1 x 1000ml Erlenmeyer Flasks or bottles.
Speed is variable from 30rpm to 300rpm. Once set on the digital display, the shaking speed is effectively maintained even over long periods of time. Shaking times can be set to run for 1 second to 9 hours on the built-in digital timer, or the unit can also be set for continuous operation.
With BioCote, silver-based, antimicrobial protection.

Technical specifications:

Platform dimensions (W x D):	220 x 220mm
Speed range:	30 to 300rpm
Orbit diameter:	16mm
Maximum load:	3kg
Overall dimensions (WxDxH):	240 x 300 x 140mm
Net weight:	5kg
Supply requirement:	230V, 50Hz, 50W

Type	Description	PK	Cat. No.
SSM1	Shaker, orbital, mini	1	**9.728 830** 1
SSM1/1	Accessory cradle with 4 securing bars	1	**9.728 831** 2

Attachments are not included. - Please order separately.

4



9.728 840

5

BioCote

5 Shakers, large platform, SSL1/SSL2

Stuart

- available with orbital or reciprocating action
- digital speed selection: SSL1 to 300rpm with soft start, SSL2 to 250rpm
- built-in digital timer
- reliable, quiet running mechanism
- fully adjustable cradle system

These lab scale platform shakers have powerful yet quiet shaking mechanisms and have been designed for trouble-free, continuous use. The cradle type platforms have six rubber cushioned horizontal securing bars which can be easily adjusted both vertically and horizontally to hold most sizes and types of vessel, including flasks, bottles and beakers. For example, they will accommodate the following Erlenmeyer flasks or bottles: 12 x 250ml or 8 x 500ml or 6 x 1000ml or 2 x 2000ml. Speed is continuously adjustable and is set digitally. The speed is accurately maintained, even over long runs. A built-in digital timer allows shaking times from 1 to 999 minutes to be set. Alternatively the unit can be set for continuous operation.
With BioCote silver based antimicrobial protection.

Technical Specification	**SSL1/SSL2**
Platform dimensions (W x D):	335 x 335mm
Speed range:	30 to 300rpm/25 to 250rpm
Orbit/stroke:	16mm/20mm
Maximum loading:	10kg
Overall dimensions (WxDxH):	360 x 420 x 270mm
Net weight:	11kg
Supply requirements:	230V, 50Hz, 50W

Type	Description	PK	Cat. No.
SSL1	Shaker, orbital, large platform	1	**9.728 840** 4
SSL2	Shaker, reciprocating, large platform	1	**9.728 841**
SSL1/1*	Accessory platform 510 x 510 mm with twelve rubber securing bars	1	**9.728 842**
SSL1/2	Accessory flat platform 350 x 350 mm without cradle	1	**9.728 843**

* For use with SSL1 only.

1 Orbital shaker - RS-OS /RS-LS

NEW!

Phoenix Instrument



A compact, orbital and linear shaker with ideal swivel motion, for a maximum shaking weight of 2.5kg and 7.5kg. The shakers can be set up individually by using the comprehensive range of accessories.
Features at a glance:
RS-OS 10/20 - RS-LS10/20
- compact shaker for a maximum shaking weight of 2.5 or 7.5 kg
- Backlight LCD display for speed and timer adjustment.
- Speed ,time and operating mode can be viewed simultaneously
- Comprehensive accessories
- Electronic time switching clock: control time or continuous operation mode
- PC control via RS232 interface, the special Shaker PC software can realise the setting of instrument parameters on the PC and the display of working curves real-time.
- 2 years warranty

Specifications

Type of movement:	
RS-OS 10/RS-OS 20	orbital
RS-LS 10/RS-LS 20	linear
Orbit diameter:	
RS-OS 10/RS-LS 10	4mm
RS-OS 20/RS-LS 20	10mm
Maximum load:	
RS-OS 10/RS-LS 10	2.5kg
RS-OS 20/RS-LS 20	7.5kg
Voltage:	100 to 240 VAC, 50/60 Hz
Power:	30W
Speed display:	digital
Interface:	RS-232
Housing IP rating	IP 21

Type	Description	Rotation speed rpm	Dimensions mm	Weight kg	PK	Cat. No.
RS-OS 10	digital orbital shaker	100-800	340 x 300 x 100	8.1	1	**9.852 120**
RS-OS 20	digital orbital shaker	100-500	420 x 370 x 100	13.5	1	**9.852 121**
RS-LS 10	digital linear shaker	100-350	340 x 300 x 100	8.1	1	**9.852 122**
RS-LS 20	digital linear shaker	100-350	420 x 370 x 100	13.5	1	**9.852 123**

2 Accessories linear and orbital shaker Phoenix

NEW!

Phoenix Instrument



Type	Description	PK	Cat. No.
RSS-E 100	universal attachment with clamping rolls for OS/LS 10	1	**9.852 125**
RSS-E 105	base plate for OS/LS 10 to be used with Erlenmeyer fixing clips	1	**9.852 126**
RSS-E 110	universal attachment with vertical adjustable clamping rolls for OS/LS 10	1	**9.852 127**
RSS-E 115	dish attachment for OS/LS 10	1	**9.852 128**
RSS-E 200	universal attachment with clamping rolls for OS/LS 20	1	**9.852 129**
RSS-E 205	base plate for OS/LS 20 to be used with Erlenmeyer fixing clips	1	**9.852 130**
RSS-E 210	universal attachment with vertical adjustable clamping rolls for OS/LS 20	1	**9.852 131**
RSS-E 215	dish attachment for OS/LS 20	1	**9.852 132**
RSS-E 120	fixing clip for Erlenmeyer flask 25 ml volume	1	**9.852 133**
RSS-E 125	fixing clip for Erlenmeyer flask 50 ml volume	1	**9.852 134**
RSS-E 130	fixing clip for Erlenmeyer flask 100 ml volume	1	**9.852 135**
RSS-E 135	fixing clip for Erlenmeyer flask 200/250 ml volume	1	**9.852 136**
RSS-E 140	fixing clip for Erlenmeyer flask 500 ml volume	1	**9.852 137**
RSS-E 145	clamping roll for universal attachment for OS/LS 10	1	**9.852 138**
RSS-E 245	clamping roll for universal attachment for OS/LS 20	1	**9.852 139**

1



2



1 2 Shakers, 3000 series

GFL

Housing made of high impact strength polystyrene, finished in off-white. The base plate is made of electrolytically galvanized, powder-coated sheet steel, the shaking platform of anodised aluminium, equipped with four plastic pins (models 3005 to 3018 and 3023) for secure attachment of accessory equipment (holds almost all shapes of vessels used in standard laboratory applications). Models 3019/3020: Shaking platform made of electrolytically galvanized, powder-coated sheet steel, equipped with four support rods with screw-type clamps made of stainless steel. Clearly laid out control panels for easy operation and an a.c. motor with overload protection drives the unit. Stepless, electronic speed control, with soft-start and quiet operation. Constant speed maintained during continuous operation, independent of load. Suitable for use in laboratories, incubation and controlled environment rooms at ambient temperatures between +10°C and +50°C. The devices are low-maintenance, have the German seal for proven Safety (GS) and the CE mark.

Analogue control models (1)
3005/3006/3011/3013/3015/3016/3019/3023.
Timer for operations up to 60min. and continuous operation.

Digitally control models (2)
3012/3014/3017/3018/3020.
Microprocessor controlled, with interface RS232. Timer: 1 min. up to 99:59 h or continuous operation. Speed and remaining time indicated by two LCD readouts.

Please see the different motion types of the 3000 series shakers in the relevant chapters.

3



3 Circle-Shaker 3005

GFL

With orbital motion.
Space-saving, universally applicable. Either for gentle movement of liquids or vigorous mixing. Applications are in biology and microbiology laboratories and in diagnostic test reactions. Compact, low-wear counterbalanced drive mechanism, ensuring high stability for continuous operation.

Specifications

Overall (WxDxH):	380mm x 510mm x 140mm
Platform (W x D):	330mm x 330mm
Max. loading:	max. 8kg
Type of movement:	orbital
Orbit:	10mm
Shaking speed:	20rpm to 500rpm
Supply requirements:	230V 50/60Hz, 65 W
Net/Gross weight:	10kg/12kg
Timer:	up to 60 min or continuous operation

Type	PK	Cat. No.
3005	1	**9.837 905**

4



4 Orbital shakers 3015 and 3017

GFL

With orbital motion.
For gentle motion or vigorous shaking of liquids. Quiet operation. For universal application, e.g. in biochemistry, biotechnology, microbiology, bacteriology and virology, especially suitable for growing microorganisms, cell and tissue cultures. Compact, low-wear counterbalanced drive mechanism for orbital shaking motion.

Specifications

Overall (WxDxH):	510 x 625 x 142mm
Platform (W x D):	450 x 450mm
Max. loading:	15kg
Type of movement:	Orbital
Orbit:	30mm
Shaking speed:	20 to 300rpm.
Supply requirements	
3015:	230V 50/60Hz, 65W
3017:	230V 50 or 60Hz, 65W*
Net/gross weight:	18/22kg
Timer:	
3015:	up to 60 min. or continous operation
3017:	1 min up to 99:59 hours or continous operation
Model 3017:	microprocessor controlled, with RS-232 interface

Type	PK	Cat. No.
3015	1	**9.837 915**
3017**	1	**9.837 917**

* Please specify when placing your order!
**Speed and remaining time indicated by 2 LC-displays.

E & OE.

1 Orbital shakers 3019 and 3020



With orbital motion. *GFL*
With a large shaking tray for accommodating heavier loads. Well-suited for gentle motion or vigorous mixing of the most varying liquids, thanks to its useful shaking amplitude and the option of adjusting its speed. Quiet, universally applicable, e.g. for analytical or diagnostic applications in the pharmaceutical industry, chemistry, biology, or in plant breeding or nutritional applications, in the growing of microorganisms, cell and tissue cultures. Compact, low-wear counterbalanced drive mechanism, ensuring high stability and dependability.
(3020 with RS 232 interface)

Specifications

Overall (WxDxH):	745 x 730 x 135mm
Platform (W x D):	676 x 540mm
Max. loading:	30kg
Type of movement:	Orbital
Orbit:	32mm
Shaking speed:	20 to 250rpm, when the rack frame is used 20 to 200rpm
Supply requirements:	
3019:	230V 50/60Hz, 90W
3020:	230V 50 or 60Hz, 90W*
Net/gross weight:	34/40 kg
Timer:	
3019:	Up to 60 min. or continuous operation
3020:	1 min. up to 99:59 h. or continous operation
Model 3020:	microprocessor controlled, with a built-in RS-232 interface

Type	PK	Cat. No.
3019	1	**9.837 919**
3020**	1	**9.837 920**

* Please specify when placing your order.
**Speed and remaining time indicated by 2 LC-displays.

2 Shaking Trays



Made of stainless steel with holes to accommodate clamps for Erlenmeyer flasks and other accessory equipment. *GFL*
Type 3950: for Shakers 3005 and 3006.

Type 3966: for Shakers 3011 to 3018 (**see also Shaking Incubator 3031**).

Type 3980: for Shakers 3019/3020 (**see also Shaking Incubator 3033**).

Made of 3mm thick anodised aluminium, with holes to accommodate clamps for Erlenmeyer flasks and other accessory equipment.

Type	For Type	PK	Cat. No.
3950	3005 / 3006	1	**9.837 972**
3966	3011 - 1018 / 3031	1	**9.837 936**
3980	3019 / 3020 / 3033	1	**9.837 980**

3 Clamps for Erlenmeyer Flasks



Stainless steel, for screwing onto shaking tray 3950, 3966 and 3980, supplied with attachment fittings (**see also Shaking Incubators 3031-3033**). *GFL*

Type	For flasks ml	Clips required shaker Model 3005, 3006	Clips required shaker Model 3011 to 3018	Clips required shaker Model 3019, 3020	PK	Cat. No.
3983	25	45	79	99	1	**9.837 983**
3984	50	25	49	99	1	**9.837 984**
3985	100	16	36	50	1	**9.837 985**
3986	200	12	22	26	1	**9.837 986**
3987	250-300	9	16	26	1	**9.837 987**
3988	500	9	12	26	1	**9.837 988**
3989	1000	4	9	12	1	**9.837 989**
3990	2000	2	4	9	1	**9.837 991**

Other clamps on request



1 Test tube rack

For **Shakers 3005 and 3006, 3015 to 3020 (see also Shaking Incubator 3031, 3032 and 3033).** *GFL*

Stainless steel, for max. 24 test tubes, 12mm to 17mm diameter, perforated section can be tilted by 90°, with clamping springs for secure grip and silent shaking of tubes. For screwing onto shaking trays 3950, 3966 and 3980.

For trays:	Number of racks:
3950	3
3966	6
3980	9

Type	PK	Cat. No.
3953	1	**9.837 974**

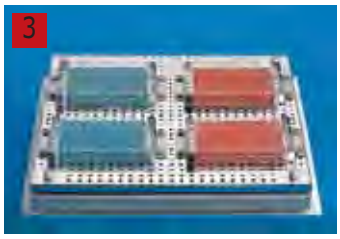


2 Clamps for Separating Funnels

Stainless steel, for screwing onto base trays 3950 and 3966. *GFL*

Type	Capacity ml	Max. clips per platform	Neck width	PK	Cat. No.
3957	50	6 / 11	19 / 26 (ISO / Squibb)	1	**9.837 975**
3958	100	6 / 11	19 / 26 (ISO / Squibb)	1	**9.837 976**
3959	250	4 / 8	19 / 26 (ISO / Squibb)	1	**9.837 977**
3955	250	4 / 8	29 / 32 (conical)	1	**9.837 970**
3956	500	3 / 6	29 / 32 (ISO / Squibb)	1	**9.837 978**

Other clamps on request



3 Holding Frame for a Test Plate

Stainless steel, for securing a test plate. Screws onto shaking trays 3950, 3966 and 3980 (**see also Shaking Incubator 3031**). Supplied with attachment material. *GFL*

For trays:	Number microtitration plates:
3950	4
3966	6
3980	15

Type	For Type	PK	Cat. No.
3910	3005/3006, 3015-3018, 3019/3020	1	**9.837 979**



4 Non-slip Mats

Used as a shaking platform. For the slow moving of e.g. nutrient media solutions in Petri dishes and flasks. **Type 3965 also for Shaking Incubator 3031**. *GFL*

Type	For Type	Width mm	Length mm	PK	Cat. No.
3951	3005 / 3006	300	300	1	**9.837 971**
3965	3011 - 3018 / 3031	420	420	1	**9.837 935**



5 Universal Mounts

For secure attachment of various shaking vessels. *GFL*

Type 3952 for Shakers 3005 and 3006. With 4 rubber coated bars.

Type 3967 for Shakers 3011/3012, 3013/3014, 3015/3017, 3016/3018 (**see also Shaking Incubator 3031**). With 6 rubber coated bars.

Type 3982 for Shakers 3019/3020. It consists of 2 longitudinal bars and 6 transverse bars. Screw-type clamps are used for adjusting the longitudinal bars vertically and the transverse bars horizontally.

Type	For Type	PK	Cat. No.
3952	3005 / 3006	1	**9.837 973**
3967	3011 - 3018 / 3031	1	**9.837 937**
3982	3019 / 3020	1	**9.837 982**

1 Platform Frame

For **Shakers 3011 to 3014.** *GFL*
With 4 levels, with top rims, 3 levels removable. Frame and trays made of stainless steel.
Distance between trays 60mm. Grooved rubber mats on trays to ensure secure grip of objects.



Type	For Type	PK	Cat. No.
3968	3011 - 3014	1	**9.837 938**

2 Rack Frame

For **Shakers 3019/3020**. *GFL*
For doubling the capacity by accomodating 2 **shaking trays 3980**. Distance between trays 205mm. The bottom tray can be loaded with flasks up to a max. of 500ml.



Type	For Type	PK	Cat. No.
3981	3019 / 3020	1	**9.837 981**

3 4 5 Orbital shaker, KS 130 basic/ Package

Small, quiet running, low-friction shaker with effective orbital movement and a maximum loading of 2kg. *IKA*
- Electronic speed control and timer adjustment
- LED scale bar speed and time display
- Large selection of attachments for different container types and sizes
- Attachments not included - Please order separately.

Package includes: KS 130 basic, adhesive mat STICKMAX, AS 130.3 Dish attachment

KS 130 control available on request.







Specifications

Shaking movement:	orbital
Orbit:	4mm
Max. capacity including attachment:	2kg
Motor rating input/output:	45 /10W
Speed range:	80 to 800rpm
Speed indication:	LED scale bar
Timer:	5 to 50 min/continuous
Dimensions (WxDxH):	270 x 316 x 98mm
Weight:	8.8kg
Housing IP rating to DIN EN 60529:	IP21
Power source:	230V 50/60Hz
Tested to DIN EN IEC 61010-1.	

Type	PK	Cat. No.
KS 130 basic	1	**9.838 150**
KS 130 basic Package (incl. adhesive mat STICKMAX, AS 130.3 Dish attachment)	1	**9.838 151**

Accessories for orbital shaker KS 130

IKA

AS 130.1 Universal attachment
Able to hold most types of container using adjustable tension rollers
AS 130.2 Fixing clip platform
For shaking round bottom vessels, volumetric and Erlenmeyer flasks. Supplied without clips
AS 130.3 Petri dish attachment
For gentle mixing and suspension of cell cultures or growth media in petri dishes, culture bottles and containers. With integral anti-slide mat (PP).
AS 130.4 Test tube holder
For intensive vibrating of small tubes, test tubes, cuvettes, centrifuge tubes.

Type	Description	Dimensions (W x D x H) mm	PK	Cat. No.
AS 130.1	Separating funnel attachment	325 x 234 x 88	1	**9.838 160** 1
AS 130.2	Fixing clip platform*	230 x 230 x 24	1	**9.838 161** 2
AS 130.3	Petri dish attachment	420 x 270 x 32	1	**9.838 162** 3
AS 130.4	Test tube holders	220 x 230 x 95	1	**9.838 163** 4
labworldsoft®	Software for control and data collection for KS 130 control		1	**9.910 320**

* Clips AS 2.1 (9.838 091), AS 2.2 (9.838 092), AS 2. 3 (9.838 093), AS 2.4 (9.838 094), AS 2.5 (9.838 095) please order separately.

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9.838 160

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9.838 074

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9.838 176

Orbital shaker, KS260 control/ Package

IKA

Compact, low-level, platform shaker with highly effective, orbital motion, maximum capacity 7.5kg.
- Electronic speed control and timer adjustment
- Separate digital speed and timer displays with operating mode indication
- Timer: 0 to 9 h 59 min or continuous operation
- Controlled stop-point positioning function (enables use in automated robotic sampling routines)
- All functions can be controlled and documented using labworldsoft® software
- Special variant with reverse rotation function available on request
- Large selection of attachments enable use with a wide variety of vessel shapes and sizes
- Attachments are not included - Please order separately

Specifications

Shaking motion:	orbital
Orbit:	10mm
Max. loading (incl. attachment):	7.5kg
Motor rating input/output:	45/10W
Speed range:	10 to 500rpm
Speed indication:	digital
Timer:	1 to 599 min./continuous
Dimensions (WxDxH):	360 x 420 x 98mm
Weight:	8.8kg
Housing IP rating to DIN EN 60529:	IP21
Interface:	RS232/analogue
Supply requirements:	230V 50/60Hz
Tested to DIN EN IEC 61010-1.	

Type	PK	Cat. No.
KS 260 basic	1	**9.838 074** 5
KS 260 basic Package (incl. 2 x STICKMAX, AS 260.3 Dish attachment)	1	**9.838 075**
KS260 control	1	**9.838 175** 6
KS 260 control Package (incl. 2 x STICKMAX, AS 260.3 Dish attachment)	1	**9.838 176** 7

Accessories for Orbital shaker, KS 260 see page 495.

E & OE.

1 Orbital shaker, KS501 digital

Low-profile laboratory shaker with large platform and 15kg load capacity. *IKA*
With continuously adjustable speed range: 0 to 300rpm, digital display and timer.
Continuous operation is guaranteed even under extreme loads. Requires accessory attachments for operation (these are not supplied)



Orbital shaker, KS501 digital
Ideally suited for vessel sizes over 250ml, e.g. round bottom flasks, erlenmeyer flasks, culture flasks, bottles etc.
Developed for biological and microbiological growth tests and for production of stock solutions.

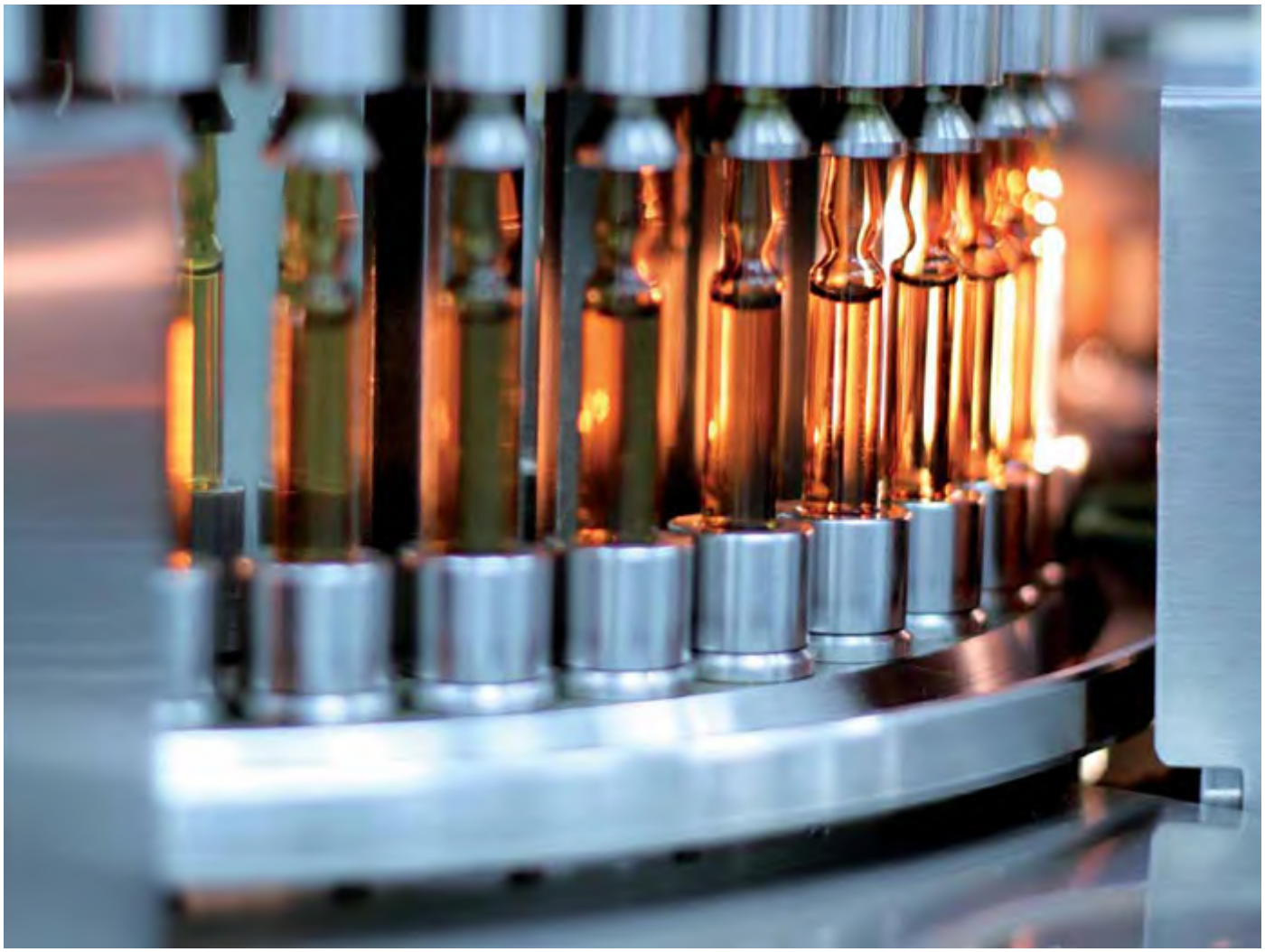
Reciprocating shaker, HS 501 digital
Ideally suited for flasks, measuring cylinders and particularly separating funnels. Developed for universal applications.

Specifications

Shaking movement	
KS 501 digital:	orbital
HS 501 digital:	reciprocal
Orbital diameter:	30mm
Max. shaking weight (with attachment):	15kg
Motor rating input/output:	70/19W
Speed range:	0 to 300rpm
Timer:	0 to 56 mins./continuous
Dimensions (WxDxH):	505 x 585 x 120mm
Weight (without attachment):	26kg
Protection class acc. to DIN EN 60529:	IP21
Supply requirements:	230V 50/60Hz
Tested to DIN EN IEC 61010-1.	

Type	PK	Cat. No.
KS 501 digital	1	**9.838 040**
HS 501 digital	1	**9.838 041**
HS 501 digital UK	1	**6.203 237**

Optional accessories: Shaking attachments: AS 501.1, AS 5014, AS 501.5, Non-slip mat STICKMAX



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9.838 046

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Shakers, KS/HS501 digital, accessories

IKA

For orbital shaker Ika KS501 digital and reciprocating shaker Ika HS501 digital.

AS 501.1 Universal attachment
For a variety of vessels (flasks, beakers etc.) with volumes of at least 50ml (ideally greater than 250ml).
With tension rollers that can be mounted on 2 levels.
Usable area: 420mm x 420mm.
Dimensions (WxDxH) 480mm x 500mm x 120mm.

AS 501.2 Separating funnel attachment
Only for HS 501 digital. For shaking separating funnels from 50ml to 250ml capacity.
Comprises basic holder, 6 tension rollers, 2 x 6 clamping devices.
Suitable for 12 x 50ml, 10 x 100ml or 6 x 250ml separating funnels.

AS 501.3 Separating funnel attachment
For HS 501 digital only. For shaking separating funnels of 500ml to 2000ml.
Comprises basic holder, 4 tension rollers, 2 x 4 clamping devices.
Suitable for 4 x 500ml, 3 x 1000ml or 2 x 2000ml separating funnels.

AS 501.6 Separating funnel attachment
Only for HS 501 digital. For shaking 4 x 1000ml separating funnels.
Comprising basic holder, 4 clamping devices, 4 support bars and 8 ground cone section holders.
Dimensions (W x D x H) 480mm x 505mm x 225mm, weight 5500g.

AS 501.4 Gridded clip attachment
(Without spring clips). For shaking round bottom, flat-bottom, pear-shaped, volumetric and erlenmeyer flasks etc.
Minimum volume 25ml. Dimensions (W x D x H) 475mm x 460mm x 95mm, weight 2640g.
Capacity: Number of fixing clips (volume held) 110 x AS 2.1 (25ml), 55 x AS 2.2 (50ml), 35 x AS 2.3 (100ml), 16 x AS 2.4 (250ml), 12 x AS 2.5 (500ml), 8 x AS 2.6 (1000ml)

AS 501.5 Dish attachment
For the gentle movement of petri dishes, but also suitable for gentle mixing in vessels with large, flat bottoms (wide mouth erlenmeyers, beakers). Fitted with a non-slip, plastic mat.
Dimensions (W x D x H) 450mm x 450mm x 45mm, weight 1120g. 4 clamping devices with rod AS 1.7.
Suitable for 4 x 500ml, 3 x 1000ml or 2 x 2000ml separating funnels.

Type	Description	PK	Cat. No.	
AS 501.1	Universal attachment	1	**9.838 046**	1
AS 501.2	Separating funnel attachment	1	**9.838 047**	2
AS 501.3	Separating funnel attachment	1	**9.838 048**	3
AS 501.6	Separating funnel attachment	1	**9.838 045**	4
AS 501.4	Gridded clip attachment*	1	**9.838 050**	5
AS 501.5	Dish attachment	1	**9.838 049**	6

* Clips AS 2.1 (9.838 091), AS 2.2 (9.838 092), AS 2. 3 (9.838 093), AS 2.4 (9.838 094), AS 2.5 (9.838 095) please order separately.

7


7 Accessories for orbital and reciprocating shakers

IKA

Clamps for orbital shakers Ika KS 130 basic/control, KS 260 basic/control and reciprocating shakers Ika HS 260 basic/control, HS 501 digital, KS 501 digital, KS 4000 i/ic control.

Type	For bottle ml	PK	Cat. No.
AS 2.1	25	1	**9.838 091**
AS 2.2	50	1	**9.838 092**
AS 2.3	100	1	**9.838 093**
AS 2.4	200/250	1	**9.838 094**
AS 2.5	500	1	**9.838 095**

E & OE.

Your advantages Heidolph-Platform shakers

Heidolph

- Rule out accidents: all models have been designed with a low center of gravity which prevents gliding at high speed, even on a damp surface
- Choose between different shaking motions, orbits, angles and load capacities the right model for your specific application
- Unlimited visual reaction control at all times: the transparent, non-fogging PETG material offers it all
- For applications in microbiology: insulated drive system prevents any heat-up coming from the motor and consequently thermal damage to your sample
- Immediate access: optional incubator hood opens instantly and interlocks in any position
- An overtemperature sensor preventatively shuts off the unit in a dangerous heat-up situation, particularly valuable for you in case of continuous operation

Platform shakers Promax 1020/2020 - reciprocating

Heidolph

Promax 1020 - The incubating model

- This model is suitable for the modular incubator system and is recommended for applications which require variable temperature control up to 65°C
- Wide range of accessories, attachments and clamps for separatory funnels available
- With a stroke length of 32mm the Promax model performs an ideal motion for separatory funnels
- Set and continuously adjust the variable speed on the digital display from 30rpm to 250rpm
- Your digital process timer allows for unattended operation and can be set from 1 to 999 minutes. When the set time has elapsed, an acoustic alarm will sound and the operation stops.
- The Promax 1020 is a medium sized model and accepts load capacities of 5kg

Promax 2020 - The resilient model
includes all Promax 1020 features, plus:

- With a stroke length of 20mm this Promax model can mix larger volumes with ease
- Set and continuously adjust the variable speed on the digital display from 20rpm to 400rpm; ideal for separations
- Your digital process timer allows for unattended operation and can be set from 1 to 120 minutes. When the set time has elapsed, an acoustic alarm will sound and the operation stops.
- The Promax 2020 is a large model land accept a load capacity of 10kg for high sample throughput

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Type	Orbit mm	Rotation speed rpm	Max. loading kg	Dimensions (W x D x H) mm	PK	Cat. No.	
Promax 1020	32	20 - 250	5	320 x 375 x 125	1	**9.839 853**	1
Promax 2020	20	20 - 400	10	426 x 435 x 135	1	**9.839 802**	2

Accessories for Promax 1020/2020 - please see page 474.

3 Orbital Shaker PSU-20i

NEW!

Grant

Powerful and efficient microprocessor controlled, multi-functional orbital shaker providing all that is required to mix your samples: rotation, reciprocation and vibration.
This enables optimisation of the mixing whether in flasks, beakers, Petri dishes or other laboratory vessels.

- Orbital motion (20 to 250rpm), reciprocation (20 to 250rpm) and vibration functions all in one product
- Loading capacity: 8kg
- Fully programmable sequence that can use one or all the functions
- 6 interchangeable platforms for vessels up to 1000ml including a multi-level platform to hold a large number of various microplates, Petri dishes and culture bags.
- Reciprocal rotation: 0 to 360° turning angle, in 30 degree steps
- Vibration: 0 to 5° turning angle, 1 degree steps

3



Type	PK	Cat. No.
PSU-20i	1	**6.256 816**

4 Accessories for Orbital shaker PSU-20i

NEW!

Grant

4



Type	Description	PK	Cat. No.
PUP-330	Universal plattform with adjustable bars	1	**9.721 081**
PP-20	Flat platform with non-slip mat	1	**6.256 809**
P30-100	Platform with clamps for 30 x 100 ml flasks	1	**9.721 061**
P16-250	Platform with clamps for 16 x 250 ml flasks	1	**9.721 062**
P9-500	Platform with clamps for 9 x 500 ml flasks	1	**9.721 063**
P6-1000	Platform with clamps for 6 x 1000 ml flasks	1	**9.721 064**

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9.728 840

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BioCote

2 Shakers, large platform, SSL1/SSL2

Stuart

- available with orbital or reciprocating action
- digital speed selection: SSL1 to 300rpm with soft start, SSL2 to 250rpm
- built-in digital timer
- reliable, quiet running mechanism
- fully adjustable cradle system

These lab scale platform shakers have powerful yet quiet shaking mechanisms and have been designed for trouble-free, continuous use. The cradle type platforms have six rubber cushioned horizontal securing bars which can be easily adjusted both vertically and horizontally to hold most sizes and types of vessel, including flasks, bottles and beakers. For example, they will accommodate the following Erlenmeyer flasks or bottles: 12 x 250ml or 8 x 500ml or 6 x 1000ml or 2 x 2000ml. Speed is continuously adjustable and is set digitally. The speed is accurately maintained, even over long runs. A built-in digital timer allows shaking times from 1 to 999 minutes to be set. Alternatively the unit can be set for continuous operation.
With BioCote silver based antimicrobial protection.

Specifications	**SSL1/SSL2**
Platform dimensions (W x D):	335 x 335mm
Speed range:	30 to 300rpm/25 to 250rpm
Orbit/stroke:	16mm/20mm
Maximum loading:	10kg
Overall dimensions (WxDxH):	360 x 420 x 270mm
Net weight:	11kg
Supply requirements:	230V, 50Hz, 50W

Type	Description	PK	Cat. No.
SSL1	Shaker, orbital, large platform	1	**9.728 840** 1
SSL2	Shaker, reciprocating, large platform	1	**9.728 841**
SSL1/1*	Accessory platform 510 x 510 mm with twelve rubber securing bars	1	**9.728 842**
SSL1/2	Accessory flat platform 350 x 350 mm without cradle	1	**9.728 843**

* For use with SSL1 only.

3



3 Linear shaker - RS-OS /RS-LS

NEW!

Phoenix Instrument

A compact, orbital and linear shaker with ideal swivel motion, for a maximum shaking weight of 2.5kg and 7.5kg. The shakers can be set up individually by using the comprehensive range of accessories.
Features at a glance:
RS-OS 10/20 - RS-LS10/20
- compact shaker for a maximum shaking weight of 2.5 or 7.5 kg
- Backlight LCD display for speed and timer adjustment.
- Speed ,time and operating mode can be viewed simultaneously
- Comprehensive accessories
- Electronic time switching clock: control time or continuous operation mode
- PC control via RS232 interface, the special Shaker PC software can realise the setting of instrument parameters on the PC and the display of working curves real-time.
- 2 years warranty

Specifications

Type of movement:	
RS-OS 10/RS-OS 20	orbital
RS-LS 10/RS-LS 20	linear
Orbit diameter:	
RS-OS 10/RS-LS 10	4mm
RS-OS 20/RS-LS 20	10mm
Maximum load:	
RS-OS 10/RS-LS 10	2.5kg
RS-OS 20/RSLS 20	7.5kg
Voltage:	100 to 240 VAC, 50/60 Hz
Power:	30W
Speed display:	digital
Interface:	RS-232
Housing IP rating	IP 21

Type	Description	Rotation speed rpm	Dimensions mm	Weight kg	PK	Cat. No.
RS-OS 10	digital orbital shaker	100-800	340 x 300 x 100	8.1	1	**9.852 120**
RS-OS 20	digital orbital shaker	100-500	420 x 370 x 100	13.5	1	**9.852 121**
RS-LS 10	digital linear shaker	100-350	340 x 300 x 100	8.1	1	**9.852 122**
RS-LS 20	digital linear shaker	100-350	420 x 370 x 100	13.5	1	**9.852 123**

Accessories for RS-OS/RS-LS - please see page 483.

1 2 Shakers, 3000 series





Housing made of high impact strength polystyrene, finished in off-white. The base plate is made of electrolytically galvanized, powder-coated sheet steel, the shaking platform of anodised aluminium, equipped with four plastic pins (models 3005 to 3018 and 3023) for secure attachment of accessory equipment (holds almost all shapes of vessels used in standard laboratory applications). Models 3019/3020: Shaking platform made of electrolytically galvanized, powder-coated sheet steel, equipped with four support rods with screw-type clamps made of stainless steel. Clearly laid out control panels for easy operation and an a.c. motor with overload protection drives the unit. Stepless, electronic speed control, with soft-start and quiet operation. Constant speed maintained during continuous operation, independent of load. Suitable for use in laboratories, incubation and controlled environment rooms at ambient temperatures between +10°C and +50°C. The devices are low-maintenance, have the German seal for proven Safety (GS) and the CE mark. *GFL*

Analogue control models (1)
3005/3006/3011/3013/3015/3016/3019/3023.
Timer for operations up to 60min. and continuous operation.

Digitally control models (2)
3012/3014/3017/3018/3020.
Microprocessor controlled, with interface RS232. Timer: 1 min. up to 99:59 h or continuous operation.
Speed and remaining time indicated by two LCD readouts.

Please see the different motion types of the 3000 series shakers in the relevant chapters.

3 Horizontal-Shaker 3006



With reciprocating motion. *GFL*
For gentle back and forth motion as well as intensive shaking of liquids, especially in separating funnels. Applications are in medical diagnostics or analysis, as well as for culturing micro-organisms, cell and tissue cultures. The stable, low-friction, counterbalanced drive mechanism ensures a reliable, continuous operation.

Specifications

Overall (WxDxH):	380 x 510 x 140mm
Platform (W x D):	330 x 330mm
Max. loading:	8kg
Type of movement:	Reciprocating
Stroke:	20mm
Shaking speed:	20 to 300rpm.
Net/gross weight:	10/12kg
Timer:	up to 60 min. or continuous operation

Type	PK	Cat. No.
3006	1	**9.837 906**

4 Horizontal shakers 3016 and 3018



With reciprocating motion. *GFL*
For vigorous and intensive shaking e.g. of clamped, recumbent flasks, mixing flasks or separating funnels. Quiet operation. The shaking platform's jerky, back and forth motion creates high turbulence, thus thoroughly mixing the media, e.g. when producing suspensions and emulsions. Applications are varied, e.g. medical diagnostics, foodstuffs or environmental analyses. Compact, low-wear, counterbalanced drive mechanism for reciprocal shaking motion.
(3018 supplied with RS232 interface)

Specifications

Overall (WxDxH):	510 x 625 x 145mm
Platform (W x D):	450 x 450mm
Max. loading:	15kg
Type of movement:	Reciprocating
Stroke:	30mm
Shaking speed:	20 to 300rpm.
Net/gross weight:	18/22kg
Timer:	
3016:	Up to 60 min. or contiunous operation
3018:	1 min. up to 99:59h. or continous operation

Type	PK	Cat. No.
3016	1	**9.837 916**
3018*	1	**9.837 918**

* Speed and remaining time indicated by 2 LC-displays.

Accessories for Model 3006/3016/3018 - please see page 485.

1 2 Flask shaker SF1

Stuart

Creates a vigorous shaking action. With clamps to accept 8 flasks up to 500ml capacity.
With stepless variable speed control from 8 to 800 oscillations/min. and 10 to 60 minute timer with off and continuous run settings. Electronic feedback control ensures a constant speed irrespective of the load.
Overall 780mm x 270mm x 240mm (WxDxH). Weight 8.3kg. For 230V 50Hz single phase supplies.
Accessory side-arms are available for converting 9.950 372 to shake up to 12 flasks. Maximum load: 3L.
Each side arm accepts six clamps. Supplied with 4 clamps.
With BioCote, silver-based, antimicrobial protection.

Type	PK	Cat. No.
SF1	1	**9.950 372**
Spare clamp	1	**9.950 373**
Accessory side arm	1	**9.950 374**

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9.838 063

Horizontal shaker, HS 260 control

IKA

Compact, low-level, platform shaker with highly effective, reciprocating motion, maximum capacity 7.5kg.
- Electronic speed control and timer adjustment
- Separate digital speed and timer displays with operating mode indication
- Timer: 0 to 9 h 59 min or continuous operation
- Controlled stop-point positioning function (enables use in automated robotic sampling routines)
- All functions can be controlled and documented using labworldsoft® software
- Large selection of attachments enable use with a wide variety of vessel shapes and sizes
- Attachments are not included - Please order separately

4



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Specifications

Shaking motion:	reciprocating
Stroke:	20 mm
Max. loading incl. attachment:	7.5 kg
Motor rating input/output:	45W/10 W
Speed range:	10 to 300 rpm
Speed indication:	digital
Time switch clock:	1 h 599 min/continuous
Dimensions (WxDxH):	360 x 420 x 100 mm
Weight:	8.8 kg
Housing IP rating to DIN EN 60529:	IP 21
Interface:	RS 232/analogue
Power source:	230 V 50/60Hz

Tested to DIN EN IEC 61010-1.

Type	PK	Cat. No.
HS260 basic	1	**9.838 063** 3
HS 260 control	1	**9.838 185** 4

E & OE.

Accessories for orbital shakers HS/KS 260

IKA

AS 260.1 Universal attachment
Able to hold most types of container using adjustable tension rollers.
Surface: 320 x 320mm

AS 260.2 Fixing clip platform
For shaking round bottom vessels, volumetric and Erlenmeyer flasks. Supplied without clips.
Max. number of clips (capacity held): 56 x AS 2.1 (25ml), 23 x AS 2.2 (50ml), 23 x AS 2.3 (100ml), 11 x AS 2.4 (250ml), 9 x AS 2.5 (500ml), 5 x AS 2.6 (1000ml)

AS 260.3 Petri dish attachment
For gentle mixing and suspension of cell cultures or growth media in petri dishes, culture bottles and containers.
With integral anti-slide mat (PP).

AS 260.5 Separating funnel attachment
For HS 260 basic and control
For shaking, elution, extraction, gassing out, dissolving, enriching. The 3 tension rollers supplied are height-adjustable to accommodate different separating funnel sizes. The separating funnels are secured by means of O-rings (6 O-rings supplied).

Capacity: Number of funnels (pear shaped) x volume 6 x 50ml, 5 x 100ml, 3 x 250ml, 3 x 500ml

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9.838 193

Type	Description	Dimensions (W x D x H) mm	PK	Cat. No.
AS 260.1	Universal attachment	425 x 335 x 135	1	**9.838 080** 1
AS 260.2	Gridded clip platform attachment*	330 x 330 x 24	1	**9.838 191** 2
AS 260.3	Petri dish attachment	410 x 370 x 32	1	**9.838 192** 3
AS 260.5	Separating funnel attachment	334 x 425 x 145	1	**9.838 193** 4
labworldsoft®	Software for control and data collection for HS/KS 260 control		1	**9.910 320**

* Clips AS 2.1 (9.838 091), AS 2.2 (9.838 092), AS 2. 3 (9.838 093), AS 2.4 (9.838 094), AS 2.5 (9.838 095) please order separately.

5 Reciprocating shaker, HS 501 digital

IKA

Low-profile laboratory shaker with large platform and 15kg load capacity.
With continuously adjustable speed range: 0 to 300rpm, digital display and timer.
Continuous operation is guaranteed even under extreme loads. Requires accessory attachments for operation (these are not supplied)

5


Orbital shaker, KS501 digital
Ideally suited for vessel sizes over 250ml, e.g. round bottom flasks, erlenmeyer flasks, culture flasks, bottles etc.
Developed for biological and microbiological growth tests and for production of stock solutions.

Reciprocating shaker, HS 501 digital
Ideally suited for flasks, measuring cylinders and particularly separating funnels. Developed for universal applications.

Specifications

Shaking movement	
KS 501 digital:	orbital
HS 501 digital:	reciprocal
Orbital diameter:	30mm
Max. shaking weight (with attachment):	15kg
Motor rating input/output:	70/19W
Speed range:	0 to 300rpm
Timer:	0 to 56 mins./continuous
Dimensions (WxDxH):	505 x 585 x 120mm
Weight (without attachment):	26kg
Protection class acc. to DIN EN 60529:	IP21
Supply requirements:	230V 50/60Hz
Tested to DIN EN IEC 61010-1.	

Type	PK	Cat. No.
KS 501 digital	1	**9.838 040**
HS 501 digital	1	**9.838 041**
HS 501 digital UK	1	**6.203 237**

Optional accessories: Shaking attachments: AS 501.1, AS 5014, AS 501.5, Non-slip mat STICKMAX

Accessories for shakers KS/HS501 digital, please see page 490.

Your advantages Heidolph-Platform shakers

Heidolph

- Rule out accidents: all models have been designed with a low center of gravity which prevents gliding at high speed, even on a damp surface
- Choose between different shaking motions, orbits, angles and load capacities the right model for your specific application
- Unlimited visual reaction control at all times: the transparent, non-fogging PETG material offers it all
- For applications in microbiology: insulated drive system prevents any heat-up coming from the motor and consequently thermal damage to your sample
- Immediate access: optional incubator hood opens instantly and interlocks in any position
- An overtemperature sensor preventatively shuts off the unit in a dangerous heat-up situation, particularly valuable for you in case of continuous operation

1



1 Platform shakers Duomax 1030 - rocking

Duomax 1030 - The incubating model

Heidolph

- This model is suitable for the modular incubator system and is recommended for applications which require variable temperature settings
- Choose your angle between these two options: Tilt angle to 5° for soft and gentle movements or tilt angle to 10° for a much stronger motion
- Set and continuously adjust the variable speed on the analog control knob from 2rpm to 50rpm, ideal for media bottles
- An analog process timer allows for unattended operation and can be set from 1 to 120 minutes. When the set time has elapsed, an acoustic alarm will sound and the operation stops.
- The Duomax 1030 is a medium sized model and accepts load capacities of 5kg

Type	Angle	Rotation speed rpm	Max. loading kg	PK	Cat. No.
Duomax 1030	5	2 - 50	5	1	**9.839 855**
Duomax 1030	10	2 - 50	5	1	**9.839 856**

Accessories for Duomax 1030 - please see page 474.

Incubation hoods - please see page 837.

2



2 Platform rocker PMR-100

NEW!

Grant

Large capacity, adjustable angle and speed platform rocker, providing soft or intensive side to side rocking for optimal mixing of samples. Suitable for Life Science applications.
Ideal for minigel destaining after electrophoresis, conducting reactions of Northern, Southern and Western blots, immunoblots, hybridisation washes, cell culture,
visualisation of blots, immunostaining, protein electrophoresis. For use in cold rooms or incubators with ambient operating temperature range +4°C to +40°C.

- Side to side rocking motion
- Variable speed 1 to 99rpm
- Tilt angle range adjustable from 0 to 10° (fixed at 10° over 50rpm)
- Load up to 5kg
- Continuous or timed operation, with automatic switch-off
- Integral timer: 1min to 99h 59min
- 460 x 360mm platform

Type	PK	Cat. No.
PMR-100	1	**9.721 015**

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

Grant

E & OE.

1 2 Rocking Shaker SSM3/SSM4

Stuart

- Small space saving design, ideal for personal use
- Gentle rocking action
- Choice of two models: 3D gyratory action SSM3 and See-saw wave action SSM4
- Digital speed control and built-in timer
- Optional tier system available to increase capacity

These compact rockers are ideal where gentle mixing is required. There is a choice of two models:
Model SSM3 provides a 3D gyratory motion, ideal for low foaming agitation, DNA extractions, staining and de-staining procedures etc. The tilt angle can be adjusted to any position by hand to optimise mixing of vessels.
Model SSM4 has a see-saw rocking action that creates a wave motion within vessels such as culture flasks, Petri dishes etc.
Both models are supplied with a non-slip mat and have digital selection of both speed and time.
An accessory tier system is available. Fitted in seconds, without the need for tools, it triples the available space for samples.
With BioCote, silver-based, antimicrobial protection.

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BioCote

Specifications	**SSM3/SSM4**
Rocking action:	3D gyratory/See-saw wave
Platform dimensions (W x D):	235 x 235mm/235 x 235mm
Speed range:	5 to 70rpm/5 to 70rpm
Angle of tilt:	3 to 12°/7°
Angle adjustable:	Yes by hand/No
Maximum load:	3kg/3kg
Overall dimensions (WxDxH):	240 x 300 x 165mm/240 x 300 x 150mm
Net weight:	5kg/5kg
Electrically supply:	230V 50Hz, 50W

Type	Description	PK	Cat. No.
SSM3	Rocker, gyratory, mini	1	**9.728 820**
SSM4	Rocker, see-saw, mini	1	**9.728 821**

5 Rocking shakers SSL3/ SSL4, large platform

Stuart

- Large platform rockers - ideal for multiple users
- Gentle rocking action
- Choice of two models
- Tumbling gyratory action SSL3
- See-saw, wave action SSL4
- Digital speed control and built-in timer
- Optional tier system available to increase capacity

These rockers have large platforms able to accommodate a number of samples, ideal for a busy lab.
They are very quiet in operation and designed to be run continuously. There are two models available:
Model SSL3 provides a tumbling gyratory motion, ideal for low foaming agitation, DNA extractions, staining and de-staining procedures etc. The tilt angle can be adjusted to any position by hand to optimise mixing of vessels.
Model SSL4 has a see-saw rocking action that creates a wave motion within vessels such as culture flasks, petri dishes etc.
Both models are supplied with a non-slip mat and have digital selection of both speed and time.
An accessory tier system is available. Fitted in seconds, without the need for tools, it triples the available space for samples.
With BioCote, silver-based, antimicrobial protection.

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9.728 800

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9.728 801

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BioCote

Specifications	**SSL3/SSL 4**
Rocking action:	Tumbling gyratory/See-saw wave
Platform dimensions (W x D):	355mm x 355mm/355mm x 355mm
Speed range:	5rpm to 70rpm/5rpm to 70rpm
Angle of tilt:	3°C to 12°C/7°C
Angle adjustable:	Yes by hand/No
Maximum load:	10kg/10kg
Overall dimensions (W xD xH):	360mm x 420mm x 170mm/360mm x 420mm x 160mm
Net weight:	10kg/10kg
Supply requirements:	230V, 50Hz, 50W

Type	Description	PK	Cat. No.
SSL3	Rocker, gyratory, lab scale	1	**9.728 800** 3
SSL4	Rocker, see-saw, lab scale	1	**9.728 801** 4
SSL3/1	Tier system (2 platforms plus 8 bars)	1	**9.728 802**

Attachments are not included - Please order separately





1 2 Shakers, 3000 series

GFL

Housing made of high impact strength polystyrene, finished in off-white. The base plate is made of electrolytically galvanized, powder-coated sheet steel, the shaking platform of anodised aluminium, equipped with four plastic pins (models 3005 to 3018 and 3023) for secure attachment of accessory equipment (holds almost all shapes of vessels used in standard laboratory applications). Models 3019/3020: Shaking platform made of electrolytically galvanized, powder-coated sheet steel, equipped with four support rods with screw-type clamps made of stainless steel. Clearly laid out control panels for easy operation and an a.c. motor with overload protection drives the unit. Stepless, electronic speed control, with soft-start and quiet operation. Constant speed maintained during continuous operation, independent of load. Suitable for use in laboratories, incubation and controlled environment rooms at ambient temperatures between +10°C and +50°C. The devices are low-maintenance, have the German seal for proven Safety (GS) and the CE mark.

Analogue control models (1)
3005/3006/3011/3013/3015/3016/3019/3023.
Timer for operations up to 60min. and continuous operation.

Digitally control models (2)
3012/3014/3017/3018/3020.
Microprocessor controlled, with interface RS232. Timer: 1 min. up to 99:59 h or continuous operation. Speed and remaining time indicated by two LCD readouts.

Please see the different motion types of the 3000 series shakers in the relevant chapters.



3 Shakers 3013 and 3014 rocking

GFL

With rocking motion.
Compact, low-wear counterbalanced drive mechanism for slow and uniform rocking motion, quiet. The devices create reproducible growth and processing conditions at low speeds for cell cultures and other media. Ideal rinsing and tumbling of the samples. Various applications, e.g for the supply of parallel cultures and cell lines or for staining or de-staining of gels.

Specifications

Overall (WxDxH):	510mm x 625mm x 168mm
Platform (W x D):	450mm x 450mm
Max. loading:	15kg
Platform angle:	3°
Shaking speed:	2rpm to 50rpm.
Supply requirements:	
3013:	230V 50/60Hz, 90W
3014:	230V 50 or 60Hz, 90W*
Net/gross weight:	18kg/21kg
Timer:	
Model 3013:	1min to 60min or continuous operation
Model 3014:	1 min to 99:59 hours or continuous operation
Model 3014:	microprocessor controlled, with RS-232 interface

Type	PK	Cat. No.
3013	1	**9.837 913**
3014**	1	**9.837 914**

* Please specify when placing your order!
**Speed and remaining time indicated by 2 LC-displays.

Accessories for Type 3013/3014 - please see page 485.

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

GFL

E & OE.

Rocking shaker Rocker 2D basic/2D digital

NEW!

1

IKA

Rocking shaker with fixed speed for smooth mixing tasks. For homogeneous mixing in flasks, culture flasks, Petri dishes and tubes. Even with load and voltage fluctuations the shaking speed remains constant. A fixed tilt angle ensures reproducible test results.

- Different attachments allow a variety of applications
- Usable at 4 to 50°C in incubators
- Anti-slip rubber mat included
- Easy operation by foil keypad
- Suitable for continuous operation

Rocker 2D digital only:
- Timer: Countdown, adjustable from 1s to 99h 59min
- Counter: Display of shaking time
- Error code display



9.729 984

Specifications

Type of movement:	rocking
Shaking diameter	
Rocker 2D basic:	8° (angle)
Rocker 2D digital:	0 - 15° (angle)
Permissible shaking weight (incl. attachment):	2kg
Motor rating input/output:	16/9W
Speed:	5 to 80rpm
Speed display:	7 segment LED
Dimensions (WxDxH):	280 x 330 x 150mm
Weight:	2.2kg
Protection class acc. to DIN EN 60529:	IP 21
Power supply:	100-240V, 50/60Hz

Type	PK	Cat. No.
Rocker 2D basic	1	**9.729 984** 1
Rocker 2D digital	1	**9.729 985**

Rocking shaker Rocker 3D basic/3D digital

NEW!

2

IKA

Shaker with three-dimensional tumbling motion and a fixed speed for smooth mixing tasks. For homogeneous mixing in flasks, culture flasks, Petri dishes and tubes. Ideal for e.g. the cultivation of cell cultures, DNA extractions, distributing of cells and staining and destaining of cells. Even with load and voltage fluctuations the shaking speed remains constant. A fixed angle ensures reproducible test results.

- Different attachments allow a variety of applications
- Usable at 4 to 50°C in incubators
- Anti-slip rubber mat included
- Easy operation by foil keypad
- Suitable for continuous operation

Rocker 3D digital only:
- Timer: Countdown, adjustable from 1s to 99h 59min
- Counter: Display of shaking time
- Error code display



9.729 986

Specifications

Type of movement:	tumbling
Shaking diameter	
Rocker 3D basic:	8° (angle)
Rocker 3D digital:	0 - 15° (angle)
Permissible shaking weight (incl. attachment):	2kg
Motor rating input/output:	16/9W
Speed Rocker 3D basic:	30rpm (fixed)
Speed Rocker 3D digital:	5 to 80rpm
Speed display (Rocker 3D digital only):	7 segment LED
Dimensions (WxDxH) Rocker 3D basic:	280 x 330 x 165mm
Dimensions (WxDxH) Rocker 3D digital:	280 x 330 x 185mm
Weight:	2.2kg
Protection class acc. to DIN EN 60529:	IP 21
Power supply:	100-240V, 50/60Hz

Type	PK	Cat. No.
Rocker 3D basic	1	**9.729 986** 2
Rocker 3D digital	1	**9.729 987**

Your advantages Heidolph-Platform shakers

Heidolph

- Rule out accidents: all models have been designed with a low center of gravity which prevents gliding at high speed, even on a damp surface
- Choose between different shaking motions, orbits, angles and load capacities the right model for your specific application
- Unlimited visual reaction control at all times: the transparent, non-fogging PETG material offers it all
- For applications in microbiology: insulated drive system prevents any heat-up coming from the motor and consequently thermal damage to your sample
- Immediate access: optional incubator hood opens instantly and interlocks in any position
- An overtemperature sensor preventatively shuts off the unit in a dangerous heat-up situation, particularly valuable for you in case of continuous operation

1



9.839 857

2



9.839 804

Platform shakers Polymax 1040/2040 - wave

Heidolph

Polymax 1040 - The incubating model

- This model is suitable for the modular incubator system and is recommended for applications which require variable temperature control up to 65°
- Choose your angle between these two options: Tilt angle to 5° for soft and gentle movements or tilt angle to 10° for a much stronger motion
- Use this model for any vessel, from culture plates, media bottles and Erlenmeyer flasks, there is no limit
- Set and continuously adjust the variable speed on the analog control knob from 2rpm to 50rpm, ideal for cell culture plates
- An analog process timer allows for unattended operation and can be set from 1 to 120 minutes. When the set time has elapsed, an acoustic alarm will sound and the operation stops.
- The Polymax 1040 is a medium sized model and accepts load capacities of 5kg

Polymax 2040 - The resilient model
includes all Polymax 1040 features, plus:

- Set and continuously adjust the variable speed on the digital display from 2.5rpm to 50rpm, ideal for cell culture plates
- An analog process timer allows for unattended operation and can be set from 1 to 120 minutes. When the set time has elapsed, an acoustic alarm will sound and the operation stops.
- The Polymax 2040 is a large model and accepts load capacity of 10kg for high sample throughput

Type	Angle	Rotation speed rpm	Max. loading kg	Dimensions (W x D x H) mm	PK	Cat. No.	
Polymax 1040	5	2 - 50	5	320 x 375 x 195	1	**9.839 857**	1
Polymax 1040	10	2 - 50	5	320 x 375 x 195	1	**9.839 859**	
Polymax 2040	5	2,5 - 50	10	426 x 435 x 208	1	**9.839 804**	2
Polymax 2040	10	2,5 - 50	10	426 x 435 x 208	1	**9.839 800**	

Accessories for Polymax 1040/2040 - please see page 474.

3



3 Platform rocker PMR-30

Grant

Smooth rocking motion for gentle sample agitation in tubes, culture flasks, dishes and boxes.

- Side to side rocking motion
- Variable speed: 7.5 to 30rpm
- Load up to 0.5kg
- Fixed position: 7° tilt angle
- Continuous or timed operation with automatic switch-off
- Integral timer: 1 min to 24 hours
- 210 x 210mm platform
- Operating ambient 4°C to 40°C

Type	PK	Cat. No.
PMR-30	1	**9.721 011**

4



4 Platform tumbling rotator PS-3D

Grant

Smooth tumbling orbital motion for mixing in tubes, culture flasks, dishes and boxes.

- Ideal size for personal use
- Variable speed: 10rpm to 30rpm
- Operating range: +5C° to +40°C
- Fixed position: 7°C tilt angle
- Loads up to 0.5kg
- 215mm x 215mm platform

Type	PK	Cat. No.
PS-3D	1	**9.721 014**

E & OE.

1 Multi-function tumbling rotator PS-M3D

Grant

With consistent and reproducible agitation throughout the speed range, multi segment program.
- Multi function: rotation, reciprocation, vibration
- Reciprocal tumbling rotation: 1° to 360°
- Vibration: 1° to 6°
- Loads up to 1kg
- Variable speed: 5rpm to 30rpm
- Fixed position: 7° tilt angle
- 215mm x 215mm platform


1

Type	PK	Cat. No.
PS-M3D	1	**9.721 017**

Accessories for tumbling-platform rotator PS-3D and multi-function rotator PSM-3D

Grant

Type	Description	PK	Cat. No.
PDM	Dimpled mat, prevents tubes from rolling around	1	**9.721 013** 2


2

9.721 013

3D Shaker

NEW!

Ditabis

The DITABIS 3D shaker works with a rotational 3D motion.
Application areas for this device are cultivation and ventilation applications, DNA-extractions as well as colouring and decolouring of gels in life science sectors.
The rock-solid metal housing and the excellent price of the DITABIS 3D shaker will elate you.

Specifications

Speed:	5 to 50rpm
Timer:	0 to 120min
Max. capacity:	5kg
Platform dimensions (L x W):	290 x 260mm
Distance double platforms:	17mm
Overall dimensions (WxDxH):	340 x 400 x 125mm
Power supply:	230V, 50Hz


3

9.777 250

Type	PK	Cat. No.
3D shaker	1	**9.777 250** 3
3D shaker UK	1	**9.777 287**
3D shaker CH	1	**9.777 288**
3D shaker, double platform	1	**9.777 251** 4
3D shaker, double platform UK	1	**9.777 289**
3D shaker, double platform CH	1	**9.777 290**
Mat with 12 channels, 260 x 290mm	1	**9.777 252**


4

9.777 251

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

HLC by DITABIS

1



9.728 800

2



9.728 801

3

3 Rocking shakers SSL3/ SSL4, large platform

Stuart

- Large platform rockers - ideal for multiple users
- Gentle rocking action
- Choice of two models
- Tumbling gyratory action SSL3
- See-saw, wave action SSL4
- Digital speed control and built-in timer
- Optional tier system available to increase capacity

These rockers have large platforms able to accommodate a number of samples, ideal for a busy lab. They are very quiet in operation and designed to be run continuously. There are two models available:
Model SSL3 provides a tumbling gyratory motion, ideal for low foaming agitation, DNA extractions, staining and de-staining procedures etc. The tilt angle can be adjusted to any position by hand to optimise mixing of vessels.
Model SSL4 has a see-saw rocking action that creates a wave motion within vessels such as culture flasks, petri dishes etc.
Both models are supplied with a non-slip mat and have digital selection of both speed and time.
An accessory tier system is available. Fitted in seconds, without the need for tools, it triples the available space for samples.
With BioCote, silver-based, antimicrobial protection.

Specifications	**SSL3/SSL 4**
Rocking action:	Tumbling gyratory/See-saw wave
Platform dimensions (W x D):	355mm x 355mm/355mm x 355mm
Speed range:	5rpm to 70rpm/5rpm to 70rpm
Angle of tilt:	3°C to 12°C/7°C
Angle adjustable:	Yes by hand/No
Maximum load:	10kg/10kg
Overall dimensions (W xD xH):	360mm x 420mm x 170mm/360mm x 420mm x 160mm
Net weight:	10kg/10kg
Supply requirements:	230V, 50Hz, 50W

Type	Description	PK	Cat. No.
SSL3	Rocker, gyratory, lab scale	1	**9.728 800** 1
SSL4	Rocker, see-saw, lab scale	1	**9.728 801** 2
SSL3/1	Tier system (2 platforms plus 8 bars)	1	**9.728 802**

Attachments are not included - Please order separately

partner of the LLG Lab Logistics Group

We can supply this manufacturer's whole product range !

stuart®

E & OE.

1 2 Shakers, 3000 series





Housing made of high impact strength polystyrene, finished in off-white. *GFL*
The base plate is made of electrolytically galvanized, powder-coated sheet steel, the shaking platform of anodised aluminium, equipped with four plastic pins (models 3005 to 3018 and 3023) for secure attachment of accessory equipment (holds almost all shapes of vessels used in standard laboratory applications). Models 3019/3020: Shaking platform made of electrolytically galvanized, powder-coated sheet steel, equipped with four support rods with screw-type clamps made of stainless steel. Clearly laid out control panels for easy operation and an a.c. motor with overload protection drives the unit. Stepless, electronic speed control, with soft-start and quiet operation. Constant speed maintained during continuous operation, independent of load. Suitable for use in laboratories, incubation and controlled environment rooms at ambient temperatures between +10°C and +50°C.
The devices are low-maintenance, have the German seal for proven Safety (GS) and the CE mark.

Analogue control models (1)
3005/3006/3011/3013/3015/3016/3019/3023.
Timer for operations up to 60min. and continuous operation.

Digitally control models (2)
3012/3014/3017/3018/3020.
Microprocessor controlled, with interface RS232. Timer: 1 min. up to 99:59 h or continuous operation.
Speed and remaining time indicated by two LCD readouts.

Please see the different motion types of the 3000 series shakers in the relevant chapters.

3 Wobble shakers 3011 and 3012



With orbital rocking motion. *GFL*
For gentle and uniform orbital rocking motion, quiet. Applications in AIDS research, for diagnostic tests with test plates or for growing cell cultures and microorganisms.
(3012 with RS 232 interface)

Technical Specifications

Overall (WxDxH):	510mm x 625mm x 168mm
Platform (W x D):	450mm x 450mm
Max. loading:	max. 15kg
Type of movement:	Three-dimensional, orbital rocking
Platform angle:	3°C
Shaking speed:	2rpm to 50rpm.
Supply requirements:	
3011:	230V 50/60Hz, 90W
3012:	230V 50 or 60 Hz, 90W*
Net/gross weight:	18kg/22kg
Timer:	
3011:	up to 60 min or continuous operation
3012:	1 min to 99:59 hours or continuous operation
Model 3012:	microprocessor controlled; RS232 interface

Type	PK	Cat. No.
3011	1	**9.837 911**
3012**	1	**9.837 912**

* Please specify when placing your order
**Speed and remaining time indicated by 2 LC-displays

Accessories for Type 3011/3012 - please see page 485.

1



1 Rotator Genie™

NEW!

Scientific Industries, Inc.

Holds a wide variety of tubes, flasks, microplates, and odd-shaped vessels. Available in two interchangeable platform configurations. Magnetic platform features unique spring clip plate system. The optional Standard platform (Cat. No. 9.730 104) is designed to turn 90 degrees allowing different mixing motions. Designed for cold room and incubator use. Will easily fit in most incubators. Uniquely designed for a wide selection of motions, which can be adjusted from gentle rolling to forceful end over end mixing. Continuous-duty quality motor provides smooth, quiet operation.

Specifications

Speed:	5rpm to 35rpm
Environmental:	ATEX-Installation Category 2, 0°C to 38°C, 95% max. relative humidity
Overall dimensions (WxDxH):	400 x 175 (290 platform horizontal) x 400mm
Dimensions magnetic platform:	290 x 315mm
Dimensions standard platform:	260 x 260mm
Weight:	5.2kg

Type	Description	PK	Cat. No.
SI-2202	incl. magnetic platform, EU plug	1	**6.254 273**
SI-2203	incl. magnetic platform, UK plug	1	**9.730 102**
SI-2204	incl. magnetic platform, CH plug	1	**9.730 103**

4 Accessories for Rotator Genie™

NEW!

Scientific Industries, Inc.

Type	Description	Figure	PK	Cat. No.
SI-2110	Standard platform with bands	a	1	**9.730 104** 2
SI-2210	Magnetic platform	h	1	**9.730 114** 3
SI-1123	1 Clip plate for 12 tubes, 10mm to 13mm*	b	1	**9.730 105**
SI-1124	1 Clip plate for 6 tubes, 15mm to 17mm*	c	1	**9.730 106**
SI-1125	1 Clip plate for 3 tubes, 28mm to 30mm*	d	1	**9.730 107**
SI-1120	6 Clip plate for 12 tubes, 10mm to 13mm*	b	6	**9.730 108**
SI-1121	6 Clip plate for 6 tubes, 15mm to 17mm*	c	6	**9.730 109**
SI-1122	6 Clip plate for 3 tubes, 28mm to 30mm*	d	6	**9.730 110**
SI-1134	2 Universal clip plates	e	2	**9.730 111**
SI-1135	1 Magnetic microtube box, 100 places**	f	1	**9.730 112**
SI-1136	1 Clip plate for volumetric flasks, 100ml	g	1	**9.730 113**

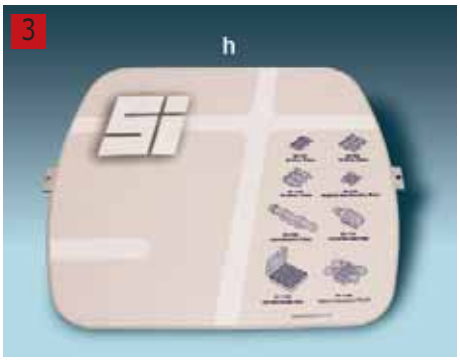
*Platform capacity: 12 Clip plates, **Platform capacity: 8 boxes

2



9.730 104

3



9.730 114

4



5



5 Vertical mini rotator PTR-25

NEW!

Grant

Compact, economy solution with simple to use controls, providing thorough mixing of samples in tubes up to 50ml. Suitable for preventing blood coagulation in tubes and for fulfilment of procedures of extraction of biological components. For use in cold rooms and incubators.

- 360° vertical rotation
- Vertical rotation speed range: 5rpm to 30 rpm
- Timer with audible alarm and automatic switch-off
- Simple to use controls
- Platform accommodating 22 tubes (up to 15mm diameter) is included as standard

Type	Description	PK	Cat. No.
PTR-25	for 22 microtubes	1	**9.721 016**

E & OE.

Attachements for Vertical mini rotator PTR-25

NEW!

Grant

Type	Description	PK	Cat. No.
PRS-22	for 22 tubes up to diam. 15mm, volume: 1.5 to 15ml	1	**9.721 046** 1
PRSC-18	for 18 tubes up to diam. 11mm	1	**9.721 047** 2
PPRS4-12	for 4 x 50ml and 12 x 1.5 to 15 ml tubes	1	**9.721 029** 3

1



9.721 046

2



9.721 047

3



9.721 029

4 Multi-function rotator PTR-35/PTR-60

Grant

Vertical multi-function rotator for thorough mixing in tubes, with multi-segment programme.
- Multi-function: vertical rotation, reciprocation, vibration
- Continuous or timed operation for each phase
- Choice of two models with different microtube capacities
- Speed: 10rpm to 100rpm
- Reciprocal rotation: 1° to 90° turning angle
- Vibration: programmable in a burst of 1 to 5 seconds
- Fully programmable sequence of functions, including pause
- Alternative platforms for larger tubes

4



Type	Description	PK	Cat. No.
PTR-35	for 26 microtubes	1	**9.721 028**
PTR-60	for 48 microtubes with 15 mm dia.	1	**9.721 030**

Platform for multi-function overhead shakers PTR-35

Grant

Type	For	PK	Cat. No.
PRS-26	26 x 1.5 to 15ml (up to diam. 15mm)	1	**9.721 045**
PRS-5-12	5 x 50ml (up to diam. 30mm) and 12 x 2 to 15ml (up to diam. 15mm)	1	**6.241 460** 5
PRS-10	10 x 50ml (up to diam. 30mm)	1	**9.721 038** 6
PRSC-10	10 x 50ml (up to diam. 30mm), with clips	1	**9.721 039** 7
PRSC-22	22 x 15ml (up to 15mm), with clips	1	**9.721 040** 8
PRS-1DP	1 x 96-well microplate	1	**9.721 065**

5



6.241 460

6



9.721 038

7



9.721 039

8



Platform for multi-function overhead shakers PTR-60

Grant

Type	For	PK	Cat. No.
PRS-8-26	8/24 tubes up to dia. 30mm/15mm	1	**9.721 031** 9
PRS-14	14 tubes up to dia. 30mm	1	**9.721 032** 10
PRS-48	48 tubes up to dia. 15mm	1	**9.721 048**

9



9.721 031

10



9.721 032

1



1 Overhead Shaker Reax 2

Heidolph

- Quickly clamps in 2 vessels of any size and accepts load capacities up to 1kg
- Speed continuously adjustable from 20rpm to 100rpm
- Universal adaptor allows for the use of various vessels of 50mm to 160mm height
- In addition an optional adaptor is available for the use of 20 test tubes at a time

Speed:	20 to 100rpm, electronically controlled
Size (B x T x H):	510 x 235 x 180mm
Weight:	5.2kg
Mains supply:	230V/50Hz

Type	PK	Cat. No.
REAX 2	1	**9.730 221**

2



9.839 805

Overhead shaker Reax 20

Heidolph

- Overhead Shaker for 4, 8 or 12 bottles
- Set and continuously adjust the variable speed on the analog control knob from 1rpm to 16rpm, ideal for waste water analysis. DIN38414-4 conformed.
- Other rotation speeds available upon request, for example 0.5rpm to 8rpm or 2rpm to 32rpm
- Easy and fast attachments of bottles
- Other vessels with 160mm to 290mm height and max. 136mm diameter can be used with attachements

Type	Width mm	Depth mm	Height mm	PK	Cat. No.
Reax 20 / 4	490	520	465	1	**9.839 805** 2
Reax 20 / 8	770	520	465	1	**9.839 806**
Reax 20 / 12	1050	520	465	1	**9.839 807**

3



3 Test Tube Rotator 3025

GFL

Constant uniform rotating tilting motion, particularly suitable for gentle to intensive shaking and mixing of powdered or liquid substances, e.g. for separating or mixing applications. The axle for max. 24 test tubes can be removed and can also be loaded outside the rotator. Can be exchanged with an axle with removable clamps.
Compact, low-wear drive mechanism. External housing is made of electrolytically galvanized powder coated sheet steel, the axle and the collecting trough are made of stainless steel. Electronic speed control, stepless. Maintenance-free, GS safety approval, comes with CE mark.

For max. 24 test tubes: Ø 12/17 mm/ length: 75 to 180 mm

Technical Specification

External dimensions (WxDxH):	490 x 330 x 220mm
Rotational speed:	6 to 60rpm.
Supply requirements:	230V 50/60Hz, 80W
Net/gross weight:	10/12kg

Type	PK	Cat. No.
3025	1	**9.837 925**



E & OE.

1 Rotating Shaker 3040



GFL

The specialist shaker with uniform rotating motion. Various applications, e.g. for precise sedimention, mixing and processing of soil samples (particularly well-suited for processing soil samples in glass/plastic wide mouth vessels up to 2000ml rated volume as per DIN 38414, Part 4 to German Standard Methods for Water, Wastewater and Sludge Analysis - Determination of Leachability by Water. Compact, low-wear drive mechanism. External housing is made of electrolytically galvanized, powder-coated sheet steel. Clearly laid out control panel for easy operation. With LED speed display. Holding device guarantees easy clamping of sample vessels on the shaking rack. Electronic, stepless speed control, constant speed during continuous operation. Rotating rack incorporates ball bearings on both sides, accommodating a max. of 12 flasks/vessels, round or rectangular, up to 110mm max. dia. and 270mm max. height, stacked in 4 levels, each level with 3 holding frames. Drive motion is achieved via a toothed belt and a sliding hub. With stainless steel clamping frame for safe securing of the sample vessels. For ambient temperatures from 10 to 40°C. Maintenance-free, GS safety approval, CE marked.

Specifications

Motion:	orbital rotating
Speed range:	1 to 20rpm.
Speed control:	Electronic, stepless
Speed display:	Digital
Capacity:	12 bottles/vessels
Bottle height range:	to max. 270mm height
Max. bottle dims.:	110mm, round or square
Drive:	d.c. motor with overload protection
Dimensions (WxDxH):	770 x 700 x 715mm
Supply requirements:	230V 50/60Hz, 100W
Max. load:	20kg
Net/gross weight:	approx. 62/78kg

Type	PK	Cat. No.
3040	1	**9.837 931**

2 3 Overhead shakers STR4



Stuart

For use with the STR4/1 drum, STR4/2 flask/bottle rotator Drum, STR4/3 figure 8 drum, STR4/4 bottle holder or STR4/5 eppendorf-type tube rack holder. Fitted with illuminated mains On/Off switch. Has variable speed with electronic speed control, range 6rpm to 60rpm, fitted with 10 to 60 minute timer with Off option and manual over-ride position. Fitted with panel mounted fuse. For use on 230V 50Hz single phase supplies. Overall dimensions (WxDxH) 650mm x 250mm x 250mm. Net weight 6.4kg. Requires accessory drums for operation.
With BioCote, silver-based, antimicrobial protection.
Drum and accessories sold separately.

Type	PK	Cat. No.
STR4	1	**9.950 375**

4 5 Drum STR4/1 for overhead shakersSTR4



Stuart

Square drum which accepts one plate of clips on each side.
The plates plug into the drum which is fitted with a push button release/lock mechanism.
Without accessory plates.
Drive Art. no 9.950 375 separately.

Type	PK	Cat. No.
STR4/1	1	**9.950 376**

* Tubes not included

Accessory plates for STR4/1

To fit drum 9.950 376. Fitted with clips to accept tubes vertically. Supplied in pairs.
Drive Art. no 9.950 375 separately.

Stuart

No. of tubes	Diam. mm	PK	Cat. No.
12	12	2	**9.950 378**
10	16	2	**9.950 379**
8	19	2	**9.950 380**
7	24	2	**9.950 381**

1



2

BioCote

1 2 Drum, Flask, STR4/2 for overhead shakers STR4

Stuart

Drum with two platforms for STR4. Accepts two 500ml conical flasks or reagent bottles. The support columns can be detached to give two platforms 10.5cm x 17.5cm each for separating funnels, jars or test tube racks.
With BioCote, silver-based, antimicrobial protection.
Drive Art. no 9.950 375 separately.

Type	PK	Cat. No.
STR4/2	1	**9.950 382**

3



4

BioCote

3 4 Drum figure-of-8 STR4/3 for overhead shakers STR4

Stuart

The drum has a platform which can be adjusted within the drum from horizontal to 45°. In this way the sample container can be rolled and turned end over end at the same time. Suitable for extractions, paint mixing, powders and granular samples. The sample container is held by an adjustable velcro strap. With BioCote, silver-based, antimicrobial protection.
Drive Art. no 9.950 375 separately.

Type	PK	Cat. No.
STR4/3	1	**9.950 384**

5



6

BioCote

5 6 Bottle holder STR4/4 for overhead shakers STR4

Stuart

Perspex four segment cradle with velcro straps for STR4. Holds 2 to 4 bottles each up to 1000 ml capacity.
With BioCote, silver-based, antimicrobial protection.
Drive Art. no 9.950 375 separately.

Type	PK	Cat. No.
STR4/4	1	**9.950 385**

7



9.950 386

8

BioCote

8 Rack cradle STR4/5 for overhead shakers STR4

Stuart

Holds four acrylic racks for end over end mixing of Eppendorf tubes by STR4. Supplied with four racks, each with a capacity of 60 Eppendorf tubes. With BioCote, silver-based, antimicrobial protection.
Drive Art. no 9.950 375 separately.

Type	PK	Cat. No.
Rack cradle STR4/5	1	**9.950 386** 7
Spare rack for STR4/5	1	**9.950 387**

Rotators SB2/SB3

Stuart

The Stuart rotators give gentle but effective mixing, ideal for life sciences applications such as keeping blood samples in suspension. The angle of tilt is fully adjustable. The Rotators can be used in incubators up to 60°C and in cold rooms down to 4°C.

There are six types of tube holder available. Please order separately.

SB2:
Fixed speed of 20rpm.

SB3:
Variable speed of 2rpm to 40rpm. Additional digital timer of 1 to 999 minutes. Digital speed control.

Specifications:

Dimensions (WxDxH):	200 x 270 x 230mm
Supply:	230 V/50 Hz, 50W
Weight:	3.2kg

Type	PK	Cat. No.
SB2	1	**9.645 322** 1
SB3	1	**9.645 323** 2

1



9.645 322

2



9.645 323

3 Tube holders for rotators SB2/SB3

Stuart

Type	For	No. of vessels	PK	Cat. No.
SB3/1	Micro tubes, 10 to 11.5mm dia.	40	1	**9.645 324**
SB3/2	Test/blood tubes, 9 to 20mm dia.	20	1	**9.645 325**
SB3/3	50ml centrifuge tubes, 25 to 35mm dia.	12	1	**9.645 326**
SB3/4	Culture tubes, 12mm dia.	63	1	**9.645 327**
SB3/5	Culture tubes, 16mm dia.	36	1	**9.645 328**
SB3/6	Culture tubes, 26mm dia.	30	1	**9.645 329**

Additional accessories on request.

3



Overhead shaker Trayster basic/digital

NEW!

IKA

Overhead shaker with vertical rotation for smooth but effective mixing with a fixed speed. Ideal for biological samples, particularly blood samples. Suitable for separating and mixing processes of powdered and liquid samples in Eppendorf tubes and Greiner tubes up to 50 ml. The easy removable attachments allow simple and quick cleaning of the unit of spilled samples.

- Different attachments allow a variety of applications
- Usable at 4 to 50°C in incubators
- Suitable for continuous operation
- Easy operation by foil keypad
- Suitable for continuous operation

Trayster digital only:
- Timer: Countdown, adjustable from 1s to 99h 59min
- Counter: Display of shaking time
- Error code display

Specifications

Type of movement:	overhead
Shaking diameter:	vertical or horizontal
Permissible shaking weight (incl. attachment):	2kg
Motor rating input/output:	16/9 W
Dimensions (WxDxH):	460 x 160 x 150mm
Protection class acc. to DIN EN 60529:	IP 21
Power supply:	100-240V, 50/60Hz

Type	Rotation speed rpm	PK	Cat. No.
Trayster basic	20	1	**9.837 870**
Trayster digital	5 - 80	1	**9.837 871** 4

4



9.837 871

1



9.729 983

Rotators Loopster basic/digital

NEW!

IKA

Rotators for smooth but effective mixing with a fixed speed. Ideal for biological samples, particularly blood samples. Suitable for separating and mixing processes of powdered and liquid samples in Eppendorf tubes and Greiner tubes up to 50ml. The easy removable attachments allow simple and quick cleaning of the unit of spilled samples.

- Freely adjustable rotary angle
- Different attachments allow a variety of applications
- Usable at 4 to 50°C in incubators
- Easy operation by foil keypad
- Suitable for continuous operation

Loopster digital only:
- Timer: Countdown, adjustable from 1s to 99h 59min
- Counter: Display of shaking time
- Error code display

Specifications

Type of movement:	rotating
Shaking diameter:	adjustable from horizontal to vertical
Permissible shaking weight (incl. attachment):	2kg
Motor rating input/output:	16/9W
Dimensions (WxDxH):	300 x 300 x 360mm
Protection class acc. to DIN EN 60529:	IP 21
Power supply:	100-240V, 50/60Hz

Type	Rotation speed rpm	PK	Cat. No.
Loopster basic	20	1	**9.729 982**
Loopster digital	5 - 80	1	**9.729 983** 1

Roller mixers RS-TR 5/10

NEW!

Phoenix Instrument

These tube roller mixers provide gentle and effective mixing by simultaneous rocking and rolling action. The adjustment and control of speed and time can be done easily via the LCD-Display, with the fully digital version or with a knob in the analog version.
Additionally a Timer-Function can be activated via the illuminated LCD-Display of the RS-TR 10.

Specifications:

Type of movement:	rocking and rolling
Amplitude:	17mm
Roller size (l x Ø)	
RS-TR 5:	280mm x 30 mm
RS-TR 10:	340mm x 30 mm
Ambient temperature:	+5°C to +40°C
Max. humidity:	80%
Protection class:	IP 21
Power supply:	100-240V/50-60Hz

Type	Rollers	Dimensions (W x D x H) mm	Rotation speed rpm	Load max. kg	PK	Cat. No.
RS-TR 5, analog	6	260 x 460 x 120	0 to 70	4.0	1	**9.852 140** 2
RS-TR 5 UK, analog	6	260 x 460 x 120	0 to 70	4.0	1	**9.852 141**
RS-TR 5 CH, analog	6	260 x 460 x 120	0 to 70	4.0	1	**9.852 142**
RS-TR 10, digital	6	260 x 530 x 120	10 to 70	5.0	1	**9.852 143** 3
RS-TR 10 UK, digital	6	260 x 530 x 120	10 to 70	5.0	1	**9.852 144**
RS-TR 10 CH, digital	6	260 x 530 x 120	10 to 70	5.0	1	**9.852 145**

2



9.852 140

3



9.852 143

2 Roller mixers SRT6/SRT9

Stuart

Recommended for mixing blood samples, viscous substances and liquid-solid suspensions where minimum aeration is required. Units can be used in incubators up to 60°C and humidity up to 80%, or in cold rooms down to 4°C.
A magnetic block, stacking system is available separately to stack up to three units without tools, optimizing bench space.

- Rocking and rolling action for complete mixing
- Choice of analogue fixed speed or digital variable speed model
- Digital models have integral timer function
- Designed for continuous quiet operation

Specifications:

Type of movement:	rocking and rolling
Amplitude:	16mm
Roller size (l x Ø):	340 x 30mm
Ambient temperature:	+4°C to +60°C
Max. humidity:	80%
Protection class:	IP 20
Power supply:	230 V, 50Hz, 50W

Type	Rollers	Dimensions (W x D x H) mm	Rotation speed rpm	Load max. kg	PK	Cat. No.
SRT6	6	565 x 240 x 110	33 (fixed)	5.0	1	**9.728 810**
SRT6D	6	565 x 240 x 110	5 to 60	5.0	1	**9.728 811** 1
SRT9	9	565 x 360 x 110	33 (fixed)	5.0	1	**9.728 812**
SRT9D	9	565 x 360 x 110	5 to 60	5.0	1	**9.728 813**

Stacking system for roller mixers *Stuart*

Type	PK	Cat. No.
SRT/STACK	4	**9.728 815**

1



9.728 811

2

BioCote

Roller mixers Roller 6 basic/6 digital/10 basic/10 digital

NEW!

IKA

Roller shaker with 6 or 10 rolls, with smooth rocking and rolling action and a fixed speed. Particular for mixing blood samples, solid and liquid suspensions and viscous samples. The unit can be used for all conventional tubes and cylindrical bottles.
The easy removable rolls allow simple and quick cleaning of the unit from spilled samples.

- Usable at 4 to 50°C in incubators
- Suitable for continuous operation
- By removable rolls suitable for larger tubes
- Easy operation by foil keypad
- Easy removable rolls

Roller 6 digital/10 digital only:
- Timer: Countdown, adjustable from 1s to 99h 59min
- Counter: Display of shaking time
- Error code display

Specifications

Type of movement:	rocking and rolling
Shaking diameter	24.5 (height)
Roller size (l x Ø):	310 x 32mm
Ambient temperature:	+4°C to +50°C
Max. humidity:	80%
Protection class:	IP 21
Power supply:	100-240V, 50/60Hz

Type	Rollers	Dimensions (W x D x H) mm	Rotation speed rpm	Load max. kg	PK	Cat. No.
Roller 6 basic	6	240 x 545 x 115	30 (fixed)	2.0	1	**9.729 970** 3
Roller 6 digital	6	240 x 545 x 115	5 - 80	2.0	1	**9.729 971**
Roller 10 basic	10	380 x 545 x 115	30 (fixed)	2.0	1	**9.729 972**
Roller 10 digital	10	380 x 545 x 115	5 - 80	2.0	1	**9.729 973** 4

3



9.729 970

4



9.729 973

Filling Machines | Sampling | Plastic Labware
for Laboratory, Industry, Science

bürkle







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- manual sampling systems
- plastic lab equipment

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1



2



1 2 Sampler Silo Drill, aluminium or stainless steel V2A

Designed for sampling powders, granulates or semi-solids from silos and vehicle tankers. *Bürkle*
When bulk goods are transported over a long distance (e.g. by HGV) the material can separate out, so if a sample is then taken only from the surface the result may not be representative. With the Silo Drill a sample can be drawn from deeper levels. The Silo Driil is screwed manually into the material and only opened once at the required sample depth. Depths of up to 2.5m can be reached by using extension rods. The Silo Drill is not only suitable for silos, but also can be used in numerous bulk goods containers in the pharmaceutical, chemical, foodstuffs and semi-luxury goods sectors.
Spiral diameter: 90mm, chamber: diameter 40mm, capacity 400ml.

Type	Length mm	PK	Cat. No.
Silo drill, aluminium	1500	1	**9.303 858**
Silo Drill, V2A	1500	1	**9.303 868**
Extension rods, V2A	1000	1	**9.303 859**

3



3 Pigment Lance

For pigments and pastes and agglomerating bulk goods. *Bürkle*

- With half-open flute 50% for heavily stiching products
- With one-quarter-open flute 25% for lightly stiching products
- Stainless steel V4A (1.4404)

Capacity ml	Flute opening	Length mm	Diam. mm	PK	Cat. No.
145	25%	300	30	1	**9.303 710**
85	50%	300	30	1	**9.303 711**
312	25%	600	30	1	**9.303 712**
179	50%	600	30	1	**9.303 713**
480	25%	900	30	1	**9.303 714**
273	50%	900	30	1	**9.303 715**

Wide mouth bottles please see page 68.

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

bürkle

E & OE.

1 2 Zone samplers, Multi/All-layer/Jumbo, steel V4A or aluminium

For sampling bulk goods of all types. Available in various different lengths and materials: *Bürkle*

Multi-sampler:
With several closed chambers for multi-target samples from several preset sample depths. Available in stainless steel V4A/PTFE, stainless steel V4A/V4A or aluminium. Tube diameter: 25mm.
All-layer-sampler:
With open chambers for cross-sectional sampling through all layers of the sample. Emptied via the open tube end of the collector. Available in stainless steel V4A or aluminium. Tube diameter: 25mm.
Jumbo-sampler:
Generally as the All-layer-sampler with open tube end. Tube diameter is 50mm making the sampler very good for coarser granule samples and large sample volumes. Available in stainless steel V4A or aluminium.
Uno-sampler:
with a closed chamber, for target samples from a pre-determined sample depth.

Easy emptying with the emptying device.

1



2

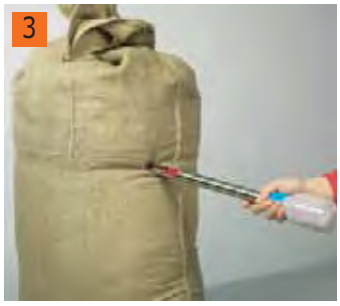


Type	Material	Length mm	Imm. depth mm	number openings	Chamber Capacity ml	PK	Cat. No.
Multi-Sampler	Stainless steel (V4A)/PTFE	550	430	3	14	1	**9.303 860**
Multi-Sampler	Stainless steel (V4A)/PTFE	850	710	3	17	1	**9.303 862**
Multi-Sampler	Stainless steel (V4A)/PTFE	1500	1355	5	17	1	**9.303 864**
Multi-Sampler	V4A/V4A	550	430	3	14	1	**7.631 201**
Multi-Sampler	V4A/V4A	850	710	3	17	1	**7.653 124**
Multi-Sampler	V4A/V4A	1500	1355	5	17	1	**9.303 866**
Multi-Sampler	Anodized aluminium	550	430	3	14	1	**9.303 870**
Multi-Sampler	Anodized aluminium	850	710	3	17	1	**9.303 872**
Multi-Sampler	Anodized aluminium	1500	1355	5	17	1	**9.303 874**
Cross-section sampler	Anodized aluminium	550	430	3	70	1	**9.303 875**
Cross-section sampler	Anodized aluminium	850	710	3	130	1	**9.303 876**
Cross-section sampler	V4A/V4A	1500	1355	5	260	1	**9.303 865**
Cross-section sampler	Anodized aluminium	1500	1355	5	260	1	**9.303 877**
Cross-section sampler	V4A/V4A	550	430	3	70	1	**6.232 190**
Cross-section sampler	V4A/V4A	850	710	3	130	1	**6.234 598**
Jumbo sampler	aluminium/PTFE	850	710	3	880	1	**9.303 878**
Jumbo sampler	aluminium/PTFE	1500	1355	5	1700	1	**9.303 879**
Jumbo sampler	aluminium/PTFE	2500	2355	7	2900	1	**9.303 883**
Jumbo sampler	aluminium/PTFE	850	710	3	390	1	**6.240 956**
Jumbo sampler	aluminium/PTFE	1500	1355	5	650	1	**7.625 884**
Jumbo sampler	aluminium/PTFE	2500	2355	7	910	1	**6.236 850**
Uno-Sampler	Stainless steel (V4A)/PTFE	550	430	1	17	1	**9.303 886**
Uno-Sampler	Stainless steel (V4A)/PTFE	850	710	1	17	1	**9.303 887**
Uno-Sampler	Stainless steel (V4A)/PTFE	1500	1355	1	17	1	**9.303 888**
Uno-Sampler	V4A/V4A	150	1355	1	17	1	**6.255 624**

3 Sampler QuickPicker, Stainless steel V4A or PP

Suitable for removing bulk materials from sacks or large bags and depositing them directly into sample bottles. Simple to use and clean. Crevice-free to prevent sample residues causing cross-contamination which could affect subsequent sample results. Complete with cleaning brush and two 250ml sample bottles. *Bürkle*

3



Material	Length mm	Imm. depth mm	Capacity ml	PK	Cat. No.
PP	500	300	75	1	**6.205 458**
V4A	500	300	75	1	**9.303 850**

Sample bottles for QuickPicker Sampler, PET

NEW!

Capacity ml	Type	PK	Cat. No.
250	Wide neck bottles with screw cap, PE-LD	10	**9.073 512**
500	Wide neck bottles with screw cap, PE-LD transparent, moulded graduation with tamper-evident cap	1	**9.001 054**

LLG-Wide neck bottles with screw cap - please see page 68.



1 Sampler Tubus, V4A stainless steel, according to ISTA

Bürkle

Sampler for free flowing, bulk goods up to approx. 1cm diameter. This makes it possible, for example, to remove hazel nuts, blends of tea, grain or similar items from large sacks.
Operation: Insert Tubus into a sack to the desired sampling depth, while keeping the collection tube closed using your hand. When you take away your hand, the sample flows directly through the open tube into the container or sampling bag beneath it.

- choice of 2 lengths, 40cm and 80cm
- also for coarse-grained bulk goods
- AISI 316 stainless steel
- corresponds to ISTA standard for seed lengths of 10mm and 5mm

Type	Length mm	Diam. mm	PK	Cat. No.
Tubus	400	40	1	**6.200 394**
Tubus	800	40	1	**6.204 492**



2 Sampling lance milky, stainless steel V4A, acc. to EN ISO 707

Bürkle

Universal powder and granules sampler collector made of AISI 316 stainless steel.
Developed especially for milk powder samples, conforms to standards of DIN and IDF (Int. Dairy Federation). The collector is inserted into bags or casks and the sample is removed using a semi-circular profile lance.

Type	Length mm	Imm. depth mm	Capacity ml	PK	Cat. No.
Milky	480	385	150	1	**6.051 629**



3 Zone sampler, accessory cleaning brush, PVC/stainless steel

For thoroughly cleaning of Zone samplers.

Length mm	Diam. mm	PK	Cat. No.
600	25	1	**9.303 880**
1000	25	1	**9.303 884**
1000	50	1	**9.303 885**



4 Spatula SteriPlast, PS, sterile

Bürkle

White spatula for powder, granules, pastes. With fixed handle, ideal for taking samples from sacks, containers or the manufacturing process. The rigid tip allows caked surfaces to be penetrated.
Sterilised, single packed.

Length mm	Imm. depth mm	Capacity ml	PK	Cat. No.
228	152	36	10	**6.059 018**

Disposable Samplers DispoSampler

Bürkle

In numerous situations, rapid and contamination-free samples have to be taken. DispoSamplers are perfect for this applications. They are individually packed and always ready to use. Avoid expensive decontamination or cleaning of soiled samplers.
Gamma sterilised versions are also available.
LiquiDispo
For liquids with low viscosity up to 10000cP.
MicroDispo
For pourable bulk goods up to 0.5mm diameter.
ViscoDispo
For high viscous media up to 100000cP.
PowderDispo
Disposable sampler for taking a cross sectional sample from within a bulk powder.
ZoneDispo
Disposable sampler for pourable bulk goods up to 2 mm particle size. Hole Ø 11 mm.

Type	Length mm	Capacity ml	Material	PK	Cat. No.	
LiquiDispo	500	100	PE-HD	20	**9.303 720**	1
LiquiDispo	1000	190	PE-HD	20	**9.303 722**	
MicroDispo	500	10	PE-HD	20	**9.303 728**	2
ViscoDispo	500	100	PE-HD	20	**9.303 732**	3
ViscoDispo	1000	190	PE-HD	20	**9.303 734**	
PowderDispo	620	100	PE-HD	20	**9.303 736**	4
ZoneDispo	620	100	PE-HD	20	**7.655 427**	5

1



9.303 720

2



9.303 728

3



9.303 732

4



9.303 736

5



7.655 427

6 7 8 Control seals for sampling **close-it**

Bürkle

Printed or plain. **close-it*food*** is an aluminium backed, vapour-proof adhesive label with extremely strong adhesion. Sacks, boxes etc. which have been pierced with samplers can be hermetically resealed. Can even adhere to slightly moist or dusty sacks coated with fine powders, e.g. plaster, flour etc.

close-it*food* ensures aswell the necessary success when resealing sample openings, as it reliably prevents products from escaping after sampling. The adhesive complies with the European guidelines for foodstuffs. Just like the original, **close-it*food*** has a barrier layer of aluminium foil. This means that **close-it*food*** is suitable for sampling foodstuffs, pharmaceuticals, cosmetics, food additives - in short, for all applications in which the product must not be contaminated by contact with the adhesive.

6



7



8



Type	Colour	Description	PK	Cat. No.
close-it	Red	Printed, 95 x 95mm	500	**9.303 910**
close-it	Green	Printed, 95 x 95mm	500	**9.303 911**
close-it	Yellow	Printed, 95 x 95mm	500	**9.303 912**
close-it	Blue	Printed, 95 x 95mm	500	**9.303 913**
close-it	Black	Printed, 95 x 95mm	500	**9.303 914**
close-it	White	Plain, 95 x 95mm	500	**9.303 915**
close-it Roller		95 x 95mm	1	**9.303 919**
close-it Maxi	Red	Printed, 150 x 150mm	250	**9.303 980**
close-it Maxi	Green	Printed, 150 x 150mm	250	**9.303 981**
close-it Maxi	Yellow	Printed, 150 x 150mm	250	**9.303 982**
close-it Maxi	Blue	Printed, 150 x 150mm	250	**9.303 983**
close-it Maxi	Black	Printed, 150 x 150mm	250	**9.303 984**
close-it Maxi	White	Plain, 150 x 150mm	250	**9.303 985**
close-it Maxi Roller		150 x 150mm	1	**9.303 989**
close-it*food*	Red	Printed, 95 x 95mm	500	**6.228 255**
close-it*food*	Green	Printed, 95 x 95mm	500	**9.303 998**
close-it*food*	Yellow	Printed, 95 x 95mm	500	**9.303 996**
close-it*food*	Blue	Printed, 95 x 95mm	500	**9.303 997**
close-it*food*	Black	Printed, 95 x 95mm	500	**9.303 999**
close-it*food*	White	Plain, 95 x 95mm	500	**9.303 986**
close-it*food*	Red	Printed,150 x 150 mm	250	**9.303 990**
close-it*food*	White	Plain, 150 x 150 mm	250	**9.303 991**
close-it tape	White	Roll, 95mm x 50m	1	**9.303 992**
close-it tape	White	Roll, 150mm x 50m	1	**9.303 993**
close-it tape food	White	Roll, 95mm x 50m	1	**9.303 994**
close-it tape food	White	Roll, 150mm x 50m	1	**9.303 995**

Jars - please see page 41



1 Anti-tamper seal-it, self-adhesive roll

Bürkle

If a container opening is closed with Seal-it, then the container cannot be opened without destroying the Seal-it label. Seal-it is additionally provided with several cross-perforations which immediately tear when manipulated like a motorcar tax disc. Seal-it can be used to securely seal bottles, sample bags, sacks, specimen bags, envelopes, etc. The white labelling field on Seal-it can be written on with all conventional writing tools with, for example contents information, sampling date, name of operator, etc.

- Clear identification via numbers in sequence
- Integrated control label with the same number, for accompanying documents
- 500 consecutirlely numbered labels in each roll
- Format 178mm long, 30mm wide
- Tear-off perforation for each label

Type	PK	Cat. No.
Seal-it	500	**7.622 477**



2 Scoops, Aluminium

Schröder

Length mm	PK	Cat. No.
135	1	**9.201 113**
185	1	**9.201 118**
210	1	**9.201 121**
250	1	**9.201 125**
265	1	**9.201 126**
310	1	**9.201 131**
350	1	**9.201 135**
400	1	**9.201 140**
430	1	**9.201 143**



3 Scoops, 18/10 steel

Dimensions scoop (W x L): 25 x 60mm

Isolab

Overall length mm	PK	Cat. No.
200	1	**4.008 514**



4 Scoops, Remanit® 4301

RSG

Length mm	Diam. mm	Length*	PK	Cat. No.
190	50	100	1	**9.201 219**
250	75	150	1	**9.201 222**
310	105	200	1	**9.201 232**
350	120	240	1	**9.201 235**
365	150	250	1	**6.080 286**

* Length Scoop (mm)





5 6 Sampling scoops and spoons, PS, sterile

White. For disposable use.

Bel-Art Products

- Individually sealed and sterilized in a polyethylene bag ready for one time use and disposal
- long handle increases the distance between the hand and the sample
- scoop stays vertical when packed or unpacked for use as weighing boat

Type	Capacity ml	PK	Cat. No.
Scoop	60	1	**9.150 461**
Scoop	125	1	**9.150 462**
Scoop	250	1	**9.150 463**
Spoon	1.23	1	**9.150 639**
Spoon	2.46	1	**9.150 640**
Spoon	4.93	1	**9.150 641**
Spoon	14.79	1	**9.150 642**

Other sampling devices are available on request.

1 Sampling scoops, PS, sterile, red

NEW!

Bel-Art Products

Red, for disposable use, individually packed
- Bright red color reduces the chance of residual sample staying in the scoop or the scoop being accidently left behind in a sample
- Color can also serve as a code to avoid cross contamination
- Stays vertical when packed or unpacked for use as weighing boat
- Longer handle keeps hand away from sample



Type	Capacity ml	PK	Cat. No.
Sample scoop, sterile, red	60	1	**9.150 464**
Sample scoop, sterile, red	125	1	**6.242 234**
Sample scoop, sterile, red	250	1	**9.150 465**

2 Measuring scoops, PP

VITLAB

White measuring scoops which are also suitable as weighing scoops. With precision formed filling edge and comfortable, stable handle.
Easily readable volume quantities on the upper side of the handle.
Food-safe products according to EC Directive No. 10/2011.



Capacity ml	Length mm	PK	Cat. No.
2	60	1	**9.201 052**
5	82	1	**9.201 053**
10	100	1	**9.201 055**
25	135	1	**9.201 057**
50	160	1	**9.201 058**
100	200	1	**9.201 059**
250	260	1	**9.201 061**
500	315	1	**9.201 062**
1000	385	1	**9.201 065**

Sterile spoons - please see page 518

3 Measuring scoops, PE-HD

VITLAB

Natural colouring. Conical in shape with tapered filling edge.
Food-safe product according to EC Directive No. 10/2011.



Capacity ml	Length mm	PK	Cat. No.
15	115	1	**7.008 959**
25	135	1	**7.008 960**
65	185	1	**7.008 961**
110	215	1	**7.008 962**
150	250	1	**9.201 025**
350	310	1	**9.201 030**
750	350	1	**9.201 035**
1250	400	1	**9.201 040**

Sampling products please see page 514

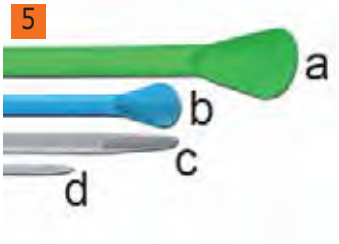
4 5 Powder spatula smartSPATULAS®, PP

NEW!

Heathrow Scientific

Single use polypropylene lab tools made to increase productivity and reduce costly contamination errors. They offer an Always there and always clean' alternative to metal spatulas.
- Size related designs to fit perfectly with standard 0.5, 1.5/2.0, 15 and 50 mL tubes
- Ideal for dispensing or sample collection of powders or soft solids
- Shatter resistant in liquid nitrogen and resistant to dilute acids and bases and can be used with hot liquids
- Anti-static, sterile and Eco-friendly versions available
- Autoclavable and complies with FDA standards for food contact





Description	Colour	For tubes ml	Length mm	Diam. mm	Figure	PK	Cat. No.
Micro Antistatic	Natural	0.2	14	3.5	d	300	**6.256 896**
Eco	Natural	15/1.5/2.0	14	7.0	-	300	**6.256 894**
Standard	Blue	15/1.5/2.0	21	7.0	b	300	**6.256 893**
Standard	Natural	15/1.5/2.0	21	7.0	c	300	**6.256 895**
Standard sterile	Natural	15/1.5/2.0	21	7.0	-	100	**6.256 898**
Macro	Green	50	31	1.0	a	150	**6.256 897**

1



1 Sample bags SteriBag, PE, sterile

Sterile, PE, liquid sample bags. For samples from chemistry, pharmaceutical, medical, food technology applications etc. *Bürkle*

Type A: Without write-on panel
Type B: With write-on panel.

Type	Capacity ml	Width mm	Length mm	PK	Cat. No.
A	60	76	127	500	**9.404 114**
B	60	76	127	500	**9.404 119**
A	150	76	178	500	**9.404 115**
B	150	76	178	500	**9.404 120**
A	450	114	229	500	**9.404 116**
B	450	114	229	500	**9.404 121**
A	650	140	229	500	**9.404 117**
B	650	140	229	500	**9.404 122**
A	900	114	305	500	**9.404 118**
B	900	114	305	500	**9.404 123**
A	1650	178	305	250	**6.223 094**
B	1650	178	305	250	**6.223 093**

2



2 Sample bags SteriBag StandUp, PE, sterile, with write-on panel

NEW!

Sterile, PE, liquid sample bags. For samples from chemistry, pharmaceutical, medical, food technology applications etc. *Bürkle*

This makes SteriBag StandUp stable and able to stand on its own without a separate stand or support, leaving both your hands free to take the sample and fill the bag.

Capacity ml	Width mm	Length mm	PK	Cat. No.
400	114	229	500	**9.404 124**
600	140	229	500	**9.404 125**

3



7.080 208

Whirl-Pak® Sample bag, PE, sterile

NEW!

Nasco

Type	Capacity ml	Filling volume ml	Dimensions (D x W) mm	Material	PK	Cat. No.
with label	30	20	65x125	LDPE	500	**7.080 208** 3
with label	60	40	75x125	LDPE	500	**7.058 005**
with label	120	80	75x185	LDPE	500	**7.077 212**
with label	540	360	115x230	LDPE	500	**7.058 120**
without label	120	80	75x185	LDPE	500	**9.404 234**
without label	540	360	115x230	LDPE	500	**9.404 235**
without label	720	480	150x230	LDPE	500	**6.228 639**
without label	1080	720	125x380	LDPE	500	**9.404 236**
without label	2070	1380	190x380	LDPE	500	**6.305 117**

4



9.404 231

Whirl-Pak® Sample bag, PE, free standing, sterile

NEW!

Whirl-Pak® bags are sterile polyethylene laboratory sample bags used to transport samples for biological testing and other applications. *Nasco*

Type	Capacity ml	Filling volume ml	Dimensions (D x W) mm	Material	PK	Cat. No.
with label, free standing	120	80	75x185	LDPE	500	**9.404 231** 4
with label, free standing	540	360	115x230	LDPE	500	**9.404 232**

Clips - please see page 150

E & OE.

Whirl-Pak® Sample bag/Homogenizing bag, sterile

NEW!

Nasco

Type	Capacity ml	Dimensions (D x W) mm	Material	PK	Cat. No.
without label	390	130x190	PE	500	**6.052 018** 1
without label	720	150x230	LDPE	500	**9.404 233**
with label	720	150x230	PE	500	**7.059 854**
with label	1650	190x300	PE	500	**7.059 855**

1



6.052 018

Adhesive Labels - please see page 155

2 Liquid sampler MiniSampler, PE

Bürkle

Taking samples is quick, easy, clean and practical.
With the MiniSampler, the sample liquid only comes into contact with the suction hose and the sample bottle. Cross contamination is largely prevented. Bottles can be tightly sealed immediately after the sample is taken with a tamper-evident cap.
The single use, PE suction hose can be quickly replaced, ensuring that samples are never contaminated. A newhose can be used for each sample if required. Because of its small diameter (8mm) and flexibility the hose can reach sampling areas that are otherwise inaccessible.

Included:
Supplied with ten 100ml PE bottles, 10m of PE suction hose (6 x 8mm), 1 hose cutter , 1 stainless steel hose weight and 20 seal-it safety seal labels in a carrying case.

2



Type	PK	Cat. No.
MiniSampler	1	**9.303 970**

3 Mini-Sampler PTFE

NEW!

Bürkle

For ultrapure sampling.
Also suitable for viscous oils.
Complete with one PFA Sample Jar 180 ml, 5 m PTFE suction tubing (6 x 8 mm), one tubing cutter, one stainless steel tubing weight and 20 seal-it safety seal labels in case.

3



Type	PK	Cat. No.
Mini sampler	1	**9.303 975**

4 Sampler ProfiSampler, aluminium

Bürkle

Vacuum-operated sample collector for sampling solventsand flammable liquids in "Explosion Categories IIA and IIb) out of drums, tanks, road tankers, railway wagons, ships, lakes, ground water.
- filling level control, automatic return flow and overfill protection by built-in venting valve.
- optimized draw volume: 200ml, suction pressure 0.5 bar and suction depth down to 4m of water.
- with bottle thread GL 45 (switable for Schott glas bottles 100 to 1000ml)
- can be supplied with optimized, straight suction tube for simpler sampling.
- transport case for tidy transport and disposal
- Always check the chemical resistance of parts coming into contact with the sample.

wear protective clothing!
When taking samples of flammable liquids, the device must be earthed. Antistatic-Set available as accessory.
ProfiSampler Aluminium
Comprises: aluminium vacuum pump, with feet, venting valve and GL45 bottle thread, 1 x 500ml glass bottle, 5 x 220mm long, conductive, black PA suction tubes, 1 tubing cutter, 1 brass hose weight, 24 seal-it bottle seals, earthing cable.

4



Type	PK	Cat. No.
ProfiSampler Aluminium	1	**6.225 622**
PA suction tubes, black, 220cm length, pack of 10 pieces	10	**6.226 207**



1 Sampler UniSampler "Ex", for sampling class A1 flammable liquids

Bürkle

Specially developed for sampling class A1 flammable liquids (e.g. benzene, petrol). Glass bottles and tubing electrically connected and grounded via an earthing cable. The UniSampler "EX" was developed in cooperation with "Gütegemeinschaft Tankschutz e.V."

Operation:
1. Earth the Uni-Sampler.
2. Lower the suction hose to the desired depth.
3. Attach the adapter to the sample bottle.
4. Generate vacuum with the hand pump and collect sample.
5. Remove the filled sample bottle, seal and label.

- PTB approval D-333-009 618/00
- Comprises 4M of sample tubing, glass sample bottle, manual vacuum pump and earthing cable in carry case

Type	PK	Cat. No.
UniSampler "Ex"	1	**9.303 831**



2 Vampire Sampler

Bürkle

For field sampling of liquids.
Portable, peristaltic tubing pump for all liquids. Ideal for sampling from drums, tanks, wells, water separators, sewage installations and treatment plants.
- Simple cleaning, liquids pumped only come into contact with tubing
- Independent of mains power with rechargeable battery and charger
- Sample taken directly into specific sample bottle
- Maximum depth that samples can be withdrawn: 5M
- Also suitable for contaminated or particle-laden liquids
- Good chemical resistance
- High flow rate up to 2.0L/min.

Supplied with bottle basket, drive unit, two re-chargeable batteries, battery charger, peristaltic pump 250ml LDPE bottle and 5M of PE suction tubing.

Type	PK	Cat. No.
Vampire sampler, complete	1	**9.303 851**
Extension tubing, PE, 5m	5	**9.303 839**
Wide-mouth sampling bottle, 250ml	1	**9.303 854**
Wide-mouth sampling bottle, 500ml	1	**9.303 855**
Bottle holder for 500ml bottle	1	**9.303 845**



3 Chemistry scoop, PP, with rod handle

Bürkle

Suitable for aggressive liquids. With beaker and PP rod handle.

Capacity ml	Length*	Stem diam. mm	PK	Cat. No.
250	1000	20	1	**9.303 840**
600	1000	20	1	**9.303 842**
1000	1000	20	1	**9.303 844**

* Stem

1 Sampling system TeleScoop

Bürkle

TeleScoop is a versatile sampling system with exchangeable tools for a wide range of applications.
The tools (angular beaker, pendulum beaker, bottle holder, stainless steel beaker and catch net e.g. for taking solid and organic samples from water courses) are attached to the rod by a practical snap-in joint.
Ideal for sampling from baths, tanks, shafts, open water courses etc.
Sampling depths down to 6M can be reached with the adjustable telescopic aluminum rod.



2 Telescopic rods for TeleScoop, aluminium

Bürkle

Aluminium, with red plastic fittings. The special construction prevents the bars rotating during retrieval of a sample. With screw clamps and end-stops to prevent the sections sliding apart.

Length m	PK	Cat. No.
0,65 - 1,20	1	**9.303 800**
0,95 - 2,80	1	**9.303 801**
1,25 - 2,50	1	**9.303 802**
1,15 - 3,00	1	**9.303 804**
1,65 - 4,50	1	**9.303 806**
1,75 - 6,00	1	**9.303 807**



3 Angular, sample beakers, angled for TeleScoop

Bürkle

With individually variable angle adjustment.

Capacity ml	Material	PK	Cat. No.
600	PP	1	**9.303 810**
1000	PP	1	**9.303 812**
2000	PP	1	**9.303 814**



4 Pendulum beaker for TeleScoop, PP

Bürkle

Automatically swings into a vertical position. Nothing can be spilt.
Ideal for deep and narrow shafts.

Capacity ml	Material	PK	Cat. No.
600	PP	1	**9.303 820**
1000	PP	1	**9.303 822**
2000	PP	1	**9.303 824**



5 Bottle holder for TeleScoop, PP/PA

Bürkle

For industrial dip samplers. Holds bottles up to max. 88mm diameter incl. 750ml bottle.
Suitable for plastic and glass bottles. With universal quick-action clamping strap.

Type	PK	Cat. No.
Bottle holder	1	**9.303 830**



1



1 Dip sampler for TeleScoop, stainless steel V2A

Beaker with scraper for pasty or powdery materials *Bürkle*

- With lip for scraping
- Sterilisable

Capacity ml	PK	Cat. No.
1000	1	**9.303 846**

2



2 Catch nets for TeleScoop

Ideal for sampling from basins, tanks, shafts, open waters etc. *Bürkle*
The telescopic aluminium rods TeleScoop allow sampling up to 6m depth.
- For industries and water treatment
- Mesh width: 2mm up to 5mm
- Depth catch, net depth: 250mm

Type	Material	Dimensions (W x D) mm	PK	Cat. No.
Surface catch net	PVC / PA	310 x 280	1	**9.303 828**
Depth catch net	PP / PA	190 x 430	1	**9.303 829**

3



3 Sampler LiquiSampler, PTFE/FEP or PP

DIN 53242. For liquids. Made of ultra pure and chemically inert PTFE/FEP or PP for contamination-free sampling. Practical push button, single-handed operation. Suitable for point, cross-sectional, and bottom sampling. Ideal for sampling from open and closed drums, kegs, tanks, silos, water sources (ponds, lakes, streams, rivers). Suitable for all commercial kegs and drums with openings of at least 25mm diameter. All surfaces are non-porous and crevice-free preventing accumulation of dirt. Only round-profile screwthreads, suitable for food hygiene applications, are used.. Simple to dismantle and clean. *Bürkle*

Material	Length mm	Diam. mm	PK	Cat. No.
PTFE/FEP	600	25	1	**6.255 307**
PTFE/FEP	1000	25	1	**9.303 950**
PTFE/FEP	2000	25	1	**9.303 951**
PP, transparent	600	25	1	**6.901 807**
PP, transparent	1000	25	1	**9.303 955**
PP, transparent	2000	25	1	**9.303 956**

4



Sampler ViscoSampler, PTFE/FEP or PP

Ultra-pure sampler with powerful suction for viscous substances. *Bürkle*
Choice of construction. PTFE/FEP or PP.
Specially designed for viscous substances, such as slime, slurries, wet clay and soil samples, sediments, oils, emulsions and creams.
The filter flask sucks up and discharges the material. All surfaces are non-porous and crevice-free, preventing dirt accumulation. Only round-profile threads, suitable for food hygiene applications, are used. Allow easy dismantling and cleaning.

Material	Length mm	Diam. mm	PK	Cat. No.
PTFE/FEP	60	25	1	**6.803 102**
PTFE/FEP	1000	25	1	**9.303 960**
PTFE/FEP	2000	25	1	**9.303 961**
PP	60	25	1	**6.253 163**
PP	1000	25	1	**9.303 965**
PP	2000	25	1	**9.303 966**

1 2 Sample bottles for water sampling

NEW!

Isolab

These sterile bottles are specially designed for taking , handling , transporting and storing of water samples.

Manufactured either as clear or amber colour from low density polyethylene.
Clear bottles are manufactured from glass-like transperant special grade polyethylene.
Amber bottles are manufactured from an amber colour clear polyethylene which is higly translucent but still preventing the UV light penetrating inside the bottle.
Square body form offers easy handling , and optimum space saving solutions during storage period.
Wide bottle neck (GL 50) provides easy filling and pouring.

Cap is made from high density polypropylene with self sealing lock with integral security ring.
Unique cap inner design ensures hermetical closure and qurantees an excellent leak and contamination proof bottle.

Embossed graduation (presicion of ±2%) on side wall enables volume verifications.
Each bottle is labelled specyfiying sample and source descriptions , code and lot numbers , expiry date and others info's.
Bottles with liquid sodium thiosulfate (20 mg/lt - acc to ISO/FDIS 19458:2006) are ideal to analyse water meant for human consumption, swimming pools, and any other water where clorine may modify the composition of the sample.

Empty bottles , without sodium thiosulfate ; ideal to sample water for physical and chemical analysis, as well as for other sample requirements that demands sterile bottles.

1



2



Capacity ml	Description	PK	Cat. No.
250	Sample bottles, clear, sterile R, without sodium thiosulfate	108	**9.001 075**
500	Sample bottles, clear, sterile R, without sodium thiosulfate	84	**9.001 076**
1000	Sample bottles, clear, sterile R, without sodium thiosulfate	30	**9.001 077**
250	Sample bottles, amber, sterile R, without sodium thiosulfate	108	**9.001 078**
500	Sample bottles, amber, sterile R, without sodium thiosulfate	84	**9.001 079**
1000	Sample bottles, amber, sterile R, without sodium thiosulfate	30	**9.001 080**
250	Sample bottles, clear, sterile R, with sodium thiosulfate	108	**9.001 081**
500	Sample bottles, clear, sterile R, with sodium thiosulfate	84	**9.001 082**
1000	Sample bottles, clear, sterile R, with sodium thiosulfate	30	**9.001 083**
250	Sample bottles, amber, sterile R, with sodium thiosulfate	108	**9.001 084**
500	Sample bottles, amber, sterile R, with sodium thiosulfate	84	**9.001 085**
1000	Sample bottles, amber, sterile R, with sodium thiosulfate	30	**9.001 086**

Available from January 2014 on.



1



9.303 935

2



9.303 937

3



9.303 938

4



9.303 939

5



7.623 934

6



9.303 933

(Liquid samplers, vessels and bottles) Dipping vessels

According to DIN 51750 pt. 2 — *Bürkle*

Dipping Vessel
For sampling liquids from tanks, lorry tankers, etc. Made for Ex-use or stainless steel V2A. 1L capacity, 81mm diameter, 400mm high. Without lowering cable.
Operation: Lower vessel into liquid. Bottom and cap valves open automatically. Liquid flows through the vessel. The valves close at the target depth, and the desired sample can be collected.

Dipping bottle EX
For sampling flammable liquids.
For sampling group A mineral oil products, Explosion Categories IIA, IIB and IIC. Made from brass that do not produce sparks, 89mm diameter, 385mm high, weight 3kg. Without lowering cable.
Operation: 1. Lower bottle into liquid. 2. Pull the cable when the target spot has been reached and the stopper opens. 3. Sample flows in. 4. Pull up dipping bottle and remove sample.
Use an electrically conductive, manually operated reel and lowering cable or chain.

Dipping bottle glass
For sewage disposal plants, sludge and water samples. Nickel-plated brass frame with glass sample bottle. 1000ml capacity, 148mm diameter, 330mm high, weight 3.1kg. Without lowering cable.
Operation: 1. Lower bottle into liquid. 2. Pull cable when target depth is reached and open stopper. 3. Sample flows in. 4. Pull bottle back up and remove sample.

Immersion Cylinders
For target spot and bottom samples of mineral oil products. Made of nickel-plated brass.Heavy, robust design (4.1kg). Without lowering and pull cables
Target spot sample: 1. Immersion cylinder is lowered in the tank to be sampled by the manually operated reel. 2. The separate pull cable is used to open the valve when the target spot is reached and the sample then enters the immersion cylinder.
Bottom sample: 1. Lower the immersion cylinder to the bottom. 2. The weight of the immersion cylinder opens the valve automatically when the bottom is reached and the sample then enters the immersion cylinder.

Target immersion cylinder
With the Target immersion cylinder, liquid samples can be taken from a particular point. The immersion cylinder is lowered on a strong and sealed tube. When the target has been reached, a valve at the tube end is opened. This vents the immersion cylinder and fills it with the sample. The immersion cylinder is pulled up and emptied via the screw thread. Weight 2.5kg. With 5M venting tube. Screw off top enables easy cleaning.

Mini immersion cylinder
For sampling liquids in narrow places where access is difficult. Can also be used in curved dipping tubes and barrels with narrow openings. Capacity 50ml, 32mm diameter, height 180mm, weight 280g. Without lowering cable. Upper body unscrews for easy cleaning.

Type	PK	Cat. No.	
Dipping vessel, nickel-plated brass	1	**9.303 935**	1
Dipping vessel, stainless steel V2A	1	**9.303 936**	
Dipping bottles Ex	1	**9.303 937**	2
Dipping bottle	1	**9.303 938**	3
Immersion cylinder	1	**9.303 939**	4
Target immersion cylinder	1	**7.623 934**	5
Mini immersion cylinder	1	**9.303 933**	6

7



7 Accessories for liquid samplers, vessels and bottles

Bürkle

Description	PK	Cat. No.
Manual cable reel, PP green, without cable	1	**6.200 263**
Manual cable reel, black PA, electrically conductive, without cable	1	**9.303 941**
Manual cable reel Ex, black with grounding cable, without cable	1	**6.234 815**
Cable, V2A stainless steel conductive	1	**9.303 943**
AISI 304 stainless steel lowering cable/PTFE-coated, length 10m	1	**6.087 044**
Lowering cable, length 10m	1	**7.620 817**

1 Jaw Crusher, BB 50

NEW!

Retsch

Benchtop model Jaw Crusher for the rapid and gentle, coarse and preliminary size reduction of hard, brittle and ductile materials. Continuous digital gap width adjustment with scale, enhanced ultimate fineness up to 0.5mm.
- Large fold-back hopper
- Removable crusher arm for easy cleaning
- Adjustable speed allows adaptation to sample characteristics
- Convenient operating keypad with digital display
- Memory for gap width setting
- Wear compensation with zero-point adjustment

Features:
- Feed size up to 40mm
- Throughput/charge: single items, charges to 3000ml
- Dimensions (WxDxH): 420 x 560 x 460mm
- Weight approx. 79kg
- Supply requirements: 220-240V, 50Hz

Type	Material	PK	Cat. No.
BB 50	Manganese steel	1	**9.738 770**
BB 50	Stainless steel	1	**9.738 771**
BB 50	Tungsten carbide	1	**9.738 772**
BB 50	Zirconia	1	**9.738 773**
BB 50*	Steel 1.1750	1	**9.738 774**

* for heavy metal free grinding.
Other power supply variants are available on request at the same price.

1



2



2 Jaw Crushers, BB 100, BB 200, BB 300

Retsch

For rapid and gentle coarse grinding and crushing of hard, brittle and tough materials.
Continuous gap adjustment with scale and zero-point adjustment for wear compensation. Excellent performance with enhanced ultimate fineness, robust construction, fitted with quick-release hopper, receiver with safety switch and casing.
Standard model is supplied with manganese steel breaking jaws.
Models with jaws made of stainless steel or tungsten carbide are available, details on request.

Features:
- high throughput
- continuous gap width adjustment
- braking motor with safety switch
- ultimate fineness approx. 2 to 5mm
- easy cleaning of grinding chamber
- Supply requirements 400 V 3-ph, 50 Hz

Type	Feed size up to mm	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
BB 100	50	320 x 800 x 960	137	1	**9.739 098**
BB 200	90	450 x 900 x 1160	300	1	**9.519 120**
BB 300	130	670 x 1450 x 1600	700	1	**9.739 093**



1 Jaw crushers PULVERISETTE 1 *classic line* (2 Models)

Fritsch

Ideal for fast and effective pre-crushing of hard and very hard brittle materials in the areas of mining and metallurgy, chemistry, geology and mineralogy, glass industry, ceramics industry, rocks and soils. The final fineness can be easily set from the outside (10 different stages are possible).

Equipment Model I/II:
With crushing jaws and lateral support walls made of tempered steel.
Crushers are also available in other voltages and with crushing jaws and lateral support walls made of stainless steel, chromium-free steel, hardmetal tungsten carbide, zirconium oxide and manganese steel.

	Model I/Model II
Max. feed size:	approx. 60mm/approx. 95mm
Throughput:	up to 140kg/h/up to 200kg/h
Gap widths (final fineness):	1 to 15mm/1 to 15mm
Supply requirements:	400V/3~, 50-60Hz/400V/3~, 50-60Hz
Dimensions (WxDxH):	400 x 800 x 800mm/400 x 800 x 800mm
Net weight:	177kg/202kg

Type	Rating W	PK	Cat. No.
Jaw Crusher PULVERISETTE 1 *classic line* model I	1450	1	**9.519 213**
Jaw Crusher PULVERISETTE 1 *classic line* model II	2780	1	**9.519 223**

The Jaw Crushers PULVERISETTE 1 are also available as *premium line* models with increased performance, even easier to operate and fast cleaning.



1 LLG-Mortars only, porcelain, rough inside

DIN 12906

Capacity ml	Height mm	Ext. diam. mm	DIN	PK	Cat. No.
25	32	51		1	**9.164 410**
70	41	63	12906	1	**6.227 149**
75	45	76		1	**9.164 411**
110	50	83		1	**6.232 577**
160	56	90	12906	1	**6.243 865**
220	64	105		1	**9.164 412**
400	71	125	12906	1	**9.164 413**
2250	127	224		1	**6.252 383**



2 LLG-Mortars only, porcelain, glazed

NEW!

Capacity ml	Height mm	Ext. diam. mm	PK	Cat. No.
110	50	83	1	**6.227 289**
220	64	105	1	**6.234 591**



3 LLG- Pestle only, porcelain, rough

Head diam. mm	Length mm	DIN	PK	Cat. No.
14	54		1	**6.227 150**
24	115	12906	1	**9.164 420**
30	135	12906	1	**6.232 574**
36	150	12906	1	**9.164 421**
42	175	12906	1	**9.164 422**
74	250	12906	1	**6.252 384**



4 LLG- Pestle only, porcelain, glazed

NEW!

Head diam. mm	Length mm	DIN	PK	Cat. No.
42	175	12906	1	**6.227 292**
36	150	12906	1	**6.234 592**



5 Mortars only, porcelain

To DIN 12906. With spout, pestle not supplied. Glazed externally. Inside rough. *Haldenwanger*

Capacity ml	Int. diam. mm	PK	Cat. No.
70	65	1	**9.164 206**
170	90	1	**9.164 209**
400	130	1	**9.164 212**
700	150	1	**9.164 215**
1000	180	1	**9.164 218**
2600	240	1	**9.164 225**
6000	330	1	**9.164 235**



6 Pestles only, porcelain

To DIN 12906. With glazed handle. Unglazed grinding surface. *Haldenwanger*

Nominal dia. mm	Head diam. mm	Length mm	PK	Cat. No.
63	24	115	1	**9.164 306**
90	30	135	1	**9.164 309**
125	36	150	1	**9.164 312**
150	42	175	1	**9.164 315**
180	55	210	1	**9.164 318**

Nominal size = mortar internal diameter
Special sizes available on request.





1 Mortar with pestle,Porcelain

Unglazed, with wooden handled pestle.

Ext. diam. mm	PK	Cat. No.
115	1	**9.164 373**
135	1	**9.164 374**
150	1	**9.164 375**



2 Mortars and pestles, MF

White. Melamine formaldehyde (MF). With spouted mortar. Resistant to boiling. Autoclavable at 121°C. *BRAND*

Diam. mm	Height mm	PK	Cat. No.
125	80	1	**9.164 355**
150	90	1	**9.164 357**



3 Mortars and pestles, Agate

Agate. Polished. Standard quality. Other sizes available on request.

Capacity ml	Ext. diam. mm	Int. diam. mm	PK	Cat. No.
9	50	40	1	**9.164 050**
25	75	60	1	**9.164 075**
50	100	85	1	**9.164 100**
100	125	100	1	**9.164 125**



4 Mortar, stainless steel

Mortar and pestle head are both made from stainless steel. *Bochem*

Description	Capacity ml	PK	Cat. No.
Mortar	250	1	**6.900 119**
Pestle		1	**6.079 568**



1 Laboratory blender MemoryBlender2

NEW!

ROTOR

The high performance programmable commercial silent blender.
- 12 programmable cycles for automatic processing
- 6 fixed speeds in manual mode
- very quiet, place saving, solid and elegant
- polished stainless steel
- easy cleaning

Safety features:
- By opening the plastic cover the motor stops immediately.
- A protective switch prevents the motor from overloading and overheating.
- Rugged main switch.
- The blender conforms to the international IEC standards

Specifications:
The Laboratory Memory Blender 2 is a compact programmable commercial blender, driven by a high power ventilator cooled motor. The high-quality construction and the electronically controlled speed cycles guarantee a maximum on performance. The microprocessor based controller features 6 push buttons with 12 optimized pre-programmed cycles which are suitable for most applications. Using the built-in "Memory" function, these cycles can be replaced with individual programs with different time and speed settings. Even the speed of the "Pulse" function can be changed. It's possible to disable the "Memory" function, to prevent unwanted overwriting. The blender can also be operated in a manual mode with 6 fixed speeds. The easy to understand LEDs show the state of the controller.

Please order mixing containers separately.

1



Description	PK	Cat. No.
Laboratory blender MemoryBlender2 incl. sound protection hood	1	**9.571 309**

Laboratory blender MemoryBlender2, accessories

ROTOR

Before starting each operation the durability and resistance of all blender materials, e. g. glass, CNS, PP, rubber have to be checked concerning their tolerance against the substances to process.

Description	PK	Cat. No.
2l stainless steel container HighPower, with lid and knife kit	1	**7.631 205**
2l polycarbonate container HighPower, with lid and knife kit	1	**9.571 308**
125ml glass container without baffles, without lid	1	**9.571 301**
250ml glass container without baffles, without lid	1	**9.571 302**
500ml glass container without baffles, without lid	1	**9.571 303**
1000ml glass container without baffles, without lid	1	**9.571 304**
1000ml glass container with baffles, without lid	1	**9.571 305**

2 Mixer, POLYMIX® MB 550

NEW!

Kinematica

The MICROTRON® MB 550 is designed for mixing, dispersing, homogenizing, emulsifying and crushing of pigments, foodstuffs, and other easy to cut products.

- processing glass vessel attachments and safety hood (please order separately): 125 ml
- operation is only possible with attached safety hood
- zinc die-cast motor base, chromium-plated

Specifications:

Application volume:	125ml
Motor input power:	550W
Speed range:	Stepless up to 14.000 min^{-1}
Drive Dimensions (L x W x H):	190 x 245mm
Tested to:	EN 60335-1:1988, EN 60335-2-64:1993, EN 60335-2-64:1997, EN 55014:1993, EN 55104:1995, EN 61000-3-2:1995, EN 61000-3-3:1995, CEI-Norm 335

2



Type	Description	PK	Cat. No.
MB 550	Drive unit 230V	1	**6.241 879**
MBA 125	Mixing attachment with 125ml working volume, vessel made from glass	1	**6.257 342**
MBH 125	Safety hut to MBA 125	1	**6.257 343**

1



6.241 371

Dry Mill, POLYMIX® PX - MFC 90 D

NEW!

Kinematica

The PX-MFC 90 D is suitable for dry sample grinding in the laboratory. It's possible to change the hammer and cutting Mill sets.

- The blade grinding attachment is used for processing of dried, stringy and fibrous and grease-free materials
Application: Wood, straw, dried grease-free meat, leather, paper, carbon, synthetic et cetera
- The hammer grinding attachment is used for processing of dried, brittle and grease-free materials
Application: Dried grain, dried beans, bones, rock, ceramics et cetera
- Sieves 0.2mm up to 6mm diameter
- Hopper volume 300ml
- If the door is opened during operation for any reason, the motor is stopped

Specifications

Application volume:	Hopper 300ml
Sieves:	0.2, 0.5, 0.8, 1.0, 1.5, 2.0, 3.0, 4.0, 5.0, 6.0mm
Motor input power:	1000W
Speed range:	speless up to 6000min^{-1}
Drive Dimensions (L x W x H):	251 x 325 x 480mm
Tested to:	IEC/EN 61000-6-2/EN 61000-6-3 IEC/EN 61010-2-51

Type	PK	Cat. No.	
PX - MFC 90 D drive unit 230V/EU, with hammer grinding attachment	1	**6.241 371**	1
Blade grinding attachment for PX-MFC 90 D	1	**9.571 495**	2

Sieves 0.2 to 6.0mm also available.

2



9.571 495

3



3 Cyclone Mill TWISTER

NEW!

Retsch

Application:
The Cyclone Mill TWISTER is specially designed for the processing of foods and feeds for subsequent NIR analysis. The optimized form of rotor and grinding chamber generates an air jet which carries the ground sample through the integrated cyclone into the sample bottle. The air jet prevents the material from heating up, thus preserving the moisture content.

Features:
- Ideal for grinding feeds, grains, forage and other similar products
- 3 controlled speeds
- Cyclone separator with 250 ml collecting bottle for quick extraction of sample
- No cross contamination thanks to easy cleaning
- Convenient operating panel
- Professional industrial design with long lifetime

Specifications:
- Feed size: <10mm
- Final fineness: <500µm
- Speed setting: digital, 2000 to 10.000rpm
- Dimensions (WxDxH): 449 x 283 x 427mm
- Weight: approx. 14kg
- Power supply: 230 V, 50/60 Hz

Supplied with:
Cyclone Mill TWISTER complete with rotor, grinding ring, sieve inserts (1.0mm and 2.0mm) and 10 sample bottles 250ml.

Type	PK	Cat. No.
TWISTER	1	**6.256 514**

Further inserts and accessories available on request.

E & OE.

1 Ultra Centrifugal Mill ZM 200



Application: *Retsch*
Extremely rapid and gentle size reduction of soft to medium-hard and fibrous materials.
Ideal for grinding, e.g., chemicals, foods and feeds, washing powder, plastics, fertilizers, pharmaceutical raw materials and finished products. Also suitable for cryogenic grinding.

Features:
- gentle on the material thanks to 2-step rotor/screen system
- wide speed range, adjustable from 6 000 to 18 000 min^{-1}
- patented cassette system for maximum sample recovery and easy cleaning
- defined final fineness due to ring sieves with aperture sizes from 0.08 to 10 mm
- comfortable safety housing with automatic cover closure
- motor compartment and electronics protected against dust and material penetration
- wide range of accessories with different rotors, ring sieves and cassettes

Specifications:
Feed size: up to 10mm
Final fineness: down to 40µm
Batch: up to 300/4500ml (with cyclone)
Size (WxDxH): 410 x 365 x 515 mm
Weight: approx. 38 kg
Mains connection: 230 V, 50/60 Hz

Supplied with:
ZM 200 with cassette 900 ml.
Rotors and ring sieves have to be ordered separately.

Further rotors and ring sieves on request (e.g. for grinding without heavy metal contamination).

Type	PK	Cat. No.
ZM 200	1	**9.738 970**

2 Accessories for Ultra Centrifugal Mill ZM 200



Retsch

Description	PK	Cat. No.
Rotor, stainless steel, 6 teeth	1	**9.739 064**
Rotor, stainless steel, 12 teeth	1	**9.739 065**
Rotor, stainless steel, 24 teeth	1	**9.739 066**
Ring sieve, trapezoid holes 0.08mm	1	**9.738 972**
Ring sieve, trapezoid holes 0.12mm	1	**9.738 973**
Ring sieve, trapezoid holes 0.20mm	1	**9.738 974**
Ring sieve, trapezoid holes 0.25mm	1	**9.738 975**
Ring sieve, trapezoid holes 0.50mm	1	**9.738 976**
Ring sieve, trapezoid holes 0.75mm	1	**9.738 977**
Ring sieve, trapezoid holes 1.00mm	1	**9.738 978**
Ring sieve, trapezoid holes 1.50mm	1	**9.738 979**
Ring sieve, trapezoid holes 2.00mm	1	**9.738 980**
Ring sieve, round holes 3.00mm	1	**9.738 981**
Ring sieve, round holes 4.00mm	1	**9.738 982**
Ring sieve, round holes 5.00mm	1	**9.738 983**
Ring sieve, round holes 6.00mm	1	**9.738 984**
Conversion kit for grinding small quantities, consisting of push-fit rotor with 8 teeth, labyrinth disc, cassette 50 ml	1	**9.738 987**
Feeder kit, DR 100, drive unit for 220-240V, 50Hz, with feed attachment, with 40mm push-fit feed chute, funnel and stand	1	**9.738 971**
Cyclone with 5 litres collecting receptacle and filter bag	1	**9.738 990**

Further Ring sieves and rotors available on request.



1 Rotor Beater Mills SR 200/SR 300

Retsch

For batch and continuous coarse, fine and ultra-fine grinding, as well as for the deagglomeration of dry, soft, medium-hard, organic and inorganic materials. The SR 300 achieves a larger throughput with higher product fineness due to the higher rotor speed and drive capacity than the SR 200. Grinding and sieve inserts are easily interchangeable.

Specifications:
Feed size: up to 15mm
Dimensions with base frame (WxDxH)
SR 200: 560 x 1150 x 700mm
SR 300: 560 x 1170 x 700mm
Weight approx.
SR 200: 57kg
SR 300: 95kg
Power supply: 400V, 50Hz 3-ph.

Items supplied: Mill with rotor and 5L stainless steel receiver including, filter tubing. SR 300 is also available with base frame. Sieves for sieve frames and grinding assemblies are available on request.

Type	Ult. fineness mm	PK	Cat. No.
SR 200 for 400 V 50 Hz 3-ph., grey cast iron	0.08	1	**9.739 081**
SR 300 for 400 V 50 Hz 3-ph., stainless steel	0.05	1	**9.738 905**

Accessories for Rotor Beater Mills SR 200/SR 300

Retsch

Type	PK	Cat. No.
Retaining frame for ring sieves 360°, stainless steel	1	**9.738 909**
Ring sieve, Trapezoid holes 0.25mm	1	**9.738 914**
Ring sieve, Trapezoid holes 0.50mm	1	**9.738 915**
Ring sieve, Trapezoid holes 0.75mm	1	**9.738 916**
Ring sieve, Trapezoid holes 1.00mm	1	**9.738 917**



2 Cross Beater Mill SK 100

Retsch

Application:
Simple and rapid size reduction of medium-hard and brittle substances, either batch-wise or continuous. A wide range of accessories makes it suitable for numerous applications.

Features:
- Defined final fineness due to bottom sieves with aperture sizes from 0.12 - 10 mm
- Exchangeable grinding and sieve inserts
- Available in 4 different materials, also for heavy-metal-free grinding
- Easy cleaning
- Motor brake

Specifications:
- Feed size: up to 15mm
- Ultimate fineness: approx. 0.1mm
- External dimensions (WxDxH): 560 x 700 x 1150mm (incl. base stand)
- Weight approx.: 57kg
- Supply requirements: 400V, 50Hz 3-ph.

Supplied with: Cross Beater Mill with grinding insert, cross beater, baffle plates, filter hose and 5 l collecting vessel. Bottom sieves and base frame have to be ordered separately.
Further voltages are available on request.

Type	PK	Cat. No.
SK 100, hardened steel	1	**9.739 020**
SK 100, cast iron	1	**9.739 021**
SK 100, stainless steel	1	**9.739 022**

Accessories for Cross Beater Mill SK 100

Retsch

Type	Aperture size mm	PK	Cat. No.
Base for SK 100	-	1	**9.738 811**
Bottom sieves, trapezoid holes	0.12	1	**9.738 671**
Bottom sieves, trapezoid holes	0.50	1	**9.738 912**
Bottom sieves, trapezoid holes	1.00	1	**9.738 660**
Bottom sieves, trapezoid holes	2.00	1	**9.738 662**
Bottom sieves, round holes	5.00	1	**9.738 665**
Bottom sieves, round holes	10.00	1	**9.738 670**

Further sieves for heavy metal-free applications available on request.

1 Cutting Mill SM 100/200/300

Retsch



Rapid and gentle size reduction of bulky, soft, medium-hard, fibrous, elastic and thermally sensitive materials. The most powerful model, the SM 300, is especially suitable for cutting heterogeneous mixtures such as household waste, plastic materials, computer and electronic scrap. The mills are also used for organic materials like wood, roots, bones, plants and feed pellets. They can be equipped with various rotors and hoppers. The SM 300 features a variable speed which makes it perfectly adaptable to the particular application requirements.

Features:
- powerful size reduction thanks to 3kW drive with high torque and RES technology (SM 300)
- perfect adaptation to application requirements by variable speed from 700rpm to 3000rpm (SM 300)
- optimum cutting effects thanks to double acting cutting bars (SM 200, SM 300)
- quick and easy cleaning without tools due to fold-back housing with smooth surfaces and push-fit rotor and sieves (SM 200, SM 300)
- defined final fineness due to bottom sieves with aperture sizes from 0.25mm to 20mm
- wide range of accessories including various hoppers, collection systems, rotors and sieves

Supplied with:
SM 100 with 5L collecting receptacle. Please order rotor, hopper and bottom sieve and base frame (option) separately.
SM 200/SM 300 with 5L collecting receptacle, base frame. Please order rotor, hopper and bottom sieve separately.

Specifications:	**SM 100/200/300**
Feed size:	up to 60 x 80mm
Final fineness:	0.25 to 20mm
Retractable hopper:	-/yes/yes
Push-fit rotor:	yes/ yes/yes
Speed at 50 Hz:	1500rpm
	(SM 300) variable 700 to 3000rpm
Drive power:	1.5/2.2/3kW
Mains connection:	3/N~ 400V, 50Hz
	(SM 300) 220-230V, 50/60Hz

Type	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
SM 100	582 x 700 x 1675	73	1	**9.739 069**
SM 200	576 x 760 x 1675	90	1	**9.739 067**
SM 300	795 x 765 x 1691	160	1	**9.739 083**

Further voltages and versions for heavy-metal free grinding on request.

2 Rotors and Receptacles SM 100/200/300

Retsch



Description	PK	Cat. No.
6-disc rotor stainless steel, with reversible cutting tips	1	**9.739 074**
Parallel section rotor stainless steel	1	**7.900 427**
Collecting receptacle, 30L plastic, incl. adapter and filter hose	1	**9.739 607**
Collecting unit 250/500ml incl. 2 sample bottles	1	**9.739 608**

Hoppers for Cutting Mill SM 100

Retsch

Description	PK	Cat. No.
Base frame with wheels	1	**7.900 426**
Standard funnel for cutting mill	1	**7.900 428**
Long stock hopper	1	**9.739 070**



1 Hoppers for Cutting Mill SM 200/300

Retsch

Description	PK	Cat. No.
Universal hopper with plastic plunger	1	**9.739 071**
Long stock hopper with wooden plunger	1	**9.739 072**

Cyclone-suction-combination for cutting mill SM 200/300

Retsch

Description	PK	Cat. No.
Cyclon unit incl. 1 sample bottle 500 ml*	1	**6.256 520**
Holder for use of sample bottles 1L / 2L / 5L	1	**9.739 603**
Sample bottle 1L	1	**9.739 604**
Sample bottle 2L	1	**9.739 605**
Sample bottle 5L	1	**9.739 606**

*to be used with industrial vacuum cleaner (not included in delivery)



2 Bottom sieves for cutting mill SM 100/200/300

Retsch

Description	Aperture size mm	PK	Cat. No.
Trapezoid holes	0.25	1	**9.738 854**
Trapezoid holes	0.50	1	**9.738 855**
Trapezoid holes	0.75	1	**9.738 856**
Trapezoid holes	1.00	1	**9.738 857**
Trapezoid holes	1.50	1	**9.738 858**
Square holes	2.00	1	**6.240 026**
Square holes	4.00	1	**9.738 815**
Square holes	6.00	1	**9.738 816**
Square holes	8.00	1	**9.738 817**
Square holes	10.00	1	**9.738 818**
Square holes	20.00	1	**9.739 055**

Other Bottom sieves for grinding without heavy-metal contamination are available on request.

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

Retsch Solutions in Milling & Sieving

E & OE.

1 Knife Mills GRINDOMIX GM 200/GM 300



Retsch

The Knife Mills Grindomix GM 200 and GM 300 are suitable for the rapid and reproducible size reduction and homogenisation of food and feed materials.
They can process substances with a high water, oil or fat content just as quickly and reliably as dry, soft and medium-hard products.

Features:
- Very fast and reproducible grinding and homogenisation of foodstuffs, final fineness < 300 µm
- Speed-controlled industrial motor
- Autoclavable grinding tools
- For sample volumes up to 700ml (GM 200) or 4500ml (GM 300)
- Digital display of grinding time and speed
- Interval operation possible
- Optional Gravity lid for automatic adjustment of grinding chamber volume
- 10 parameter combinations can be stored (GM 300)
- Drive power : ~ 900W (GM 200); continuous 1.1kW, short term peak 3 kW (GM 300)
- Electrical supply data: 220-240V, 50-60Hz

Supplied with:
GM 200 complete with 1L plastic container, lid and stainless steel knife.
GM 300 complete with 5L plastic container, standard lid, standard knife and scraper.

Type	Feed size up to mm	Maximum Throughput/ Charge	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
GM 200	40	700 ml	350 x 392 x 275	10.0	1	**9.739 252**
GM 300	approx. 130	4500 ml	440 x 440 x 340	30.0	1	**9.738 500**

Accessories for Knife Mill GM 200

Retsch

Description	PK	Cat. No.
Grinding container 1 litre plastic, autoclavable	1	**9.738 510**
Grinding container of PP, 1L	1	**9.739 213**
Grinding container of glass, 1L	1	**9.739 208**
Grinding container of stainless steel, 1L	1	**9.739 248**
Standard lid of PP for grinding container of autoclavable plastic, PP, glass or steel	1	**7.930 430**
Reduction lid of PP for volume reduction to 0.5L for grinding container of autoclavable plastic or PP	1	**9.739 222**
Gravity lid PP for grinding container of autoclavable plastic and PP	1	**9.739 210**
Gravity lid of PP with overflow channels for grinding container of autoclavable plastic and PP	1	**9.739 218**
Gravity lid of PP for grinding container of glass or steel	1	**9.739 211**
Gravity lid of PP with overflow channels for grinding container of glass or steel	1	**9.739 209**
Scraper	1	**9.739 212**
Knife of pure titanium for heavy-metal free grinding	1	**9.739 254**

Accessories for Knife Mill GRINDOMIX GM 300

Retsch

Description	PK	Cat. No.
Grinding container of plastic, transparent, autoclavable and scratch-resistant, 5L, including knife holder	1	**9.738 501**
Grinding container of plastic, transparent, autoclavable and scratch-resistant, 5L, without knife holder	1	**9.738 502**
Grinding container of stainless steel, autoclavable, 5L, including knife holder	1	**9.738 503**
Grinding container of stainless steel, autoclavable, 5L, without knife holder	1	**9.738 504**
Standard lid of plastic, transparent, autoclavable and scratch-resistant	1	**9.738 505**
Gravity lid of plastic, autoclavable and scratch-resistant	1	**9.738 506**
Gravity lid of plastic, with overflow channels, autoclavable and scratch-resistant	1	**9.738 507**
Standard knife made of stainless steel, autoclavable	1	**9.738 508**
Scraper	1	**9.738 509**



1 Disc Mill DM 200

Retsch

The DM 200 disc mills are mainly used for preliminary and fine grinding of medium-hard and hard-brittle substances in batches.
Grinding discs are available in 4 different materials.

Specifications:
- feed size: up to 20mm
- ultimate fineness: up to 0.1mm
- batch: up to 2.5l
- dimensions (WxDxH): 440 x 400 x 870mm
- weight: approx. 140kg
- supply requirement: 3/N~ 400 V, 50/60 Hz

Supplied with: disc mill DM 200 without grinding assembly.
Please order grinding assembly separately.

Type	PK	Cat. No.
DM 200	1	**9.739 030**

Accessories for Disc Mill DM 200

Retsch

Type	PK	Cat. No.
Grinding discs - hardened steel	1	**9.739 031**
Grinding discs - manganese steel	1	**9.739 032**
Grinding discs - tungsten carbide	1	**9.739 033**
Grinding discs -- zirconium oxide	1	**9.739 034**



2 Mortar Grinder RM 200

Retsch

Suitable for dry and wet grinding of soft, brittle, hard and paste-like samples. Depending on the sample, amounts from approx. 10ml up to 190ml can be reduced in size, triturated and homogenised. With beech wood scraper (special accessory) for pharmaceutical and homeopathic applications. The RM 200 is exceptionally easy to operate and clean. With digital time control and performance display, scale for reproducible pestle setting, built-in automatic switch-off and rapid motor-stop.
Please order mortar and pestle separately.

Specifications:

Feed size*:	max. 8mm
Batch size/Feed volume:	10 to 190ml
Ultimate fineness*:	approx. 10µm
Dimensions (WxDxH):	400 x 370 x 480mm
Weight: approx:	approx. 24 kg (without grinding set)
Supply requirements:	220 - 240V 50Hz

*depending on feed material

Type	PK	Cat. No.
RM 200	1	**9.738 170**

Accessories for Mortar Grinder RM 200

Retsch

Description	PK	Cat. No.
Mortar, hard porcelain	1	**9.738 151**
Mortar, agate	1	**9.738 172**
Pestle, hard porcelain	1	**9.738 173**
Pestle, agate	1	**9.738 174**

Mortars and pestles made from zirconium oxide, sintered corundum, steel and tungsten carbide are available on request.

Mixer Mills MM 200/400

Retsch

The mixer mills are true laboratory "all-rounders". They have been developed specially for grinding, homogenising and mixing of small amounts of sample in only a few seconds.
They are also perfectly suitable for the disruption of biological cells as well as for DNA/RNA recovery.
The MM 400 can also be used for cryogenic and wet grinding.

Features:
- 2 milling stations
- Digital setting of time and vibration intensity
- 9 separate programmes can be stored
- Wide selection of grinding jar sizes and materials
- Self-locking and self-centering, clamping device for grinding jars (MM 400)
- Screw-top grinding jars up to 50ml, especially suitable for wet and cryogenic grinding (MM 400)

Accessories for cryogenic grinding available on request.
Grinding jars and balls please order separately.

1



9.739 080

Specifications:

Feed size*	
MM 200:	up to 6mm
MM 400:	up to 8mm
Ultimate fineness*	
MM 200:	< 10µm
MM 400:	< 5µm
Charge	
MM 200:	max. 2 x 10ml
MM 400:	max. 2 x 20ml
Digital preselection of vibrational frequency	
MM 200:	3 to 25Hz (180 to 1500rpm.)
MM 400:	3 to 30Hz (180 to 1800rpm.)
Power supply:	100 - 240V 50/60Hz

*depending on feed material

Type	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
MM 200	371 x 461 x 266	25.00	1	**9.739 080** 1
MM 400	371 x 461 x 266	26.00	1	**9.739 091**

2 Grinding Jars for Mixer Mill MM 200

Retsch

2



Material	Capacity ml	PK	Cat. No.
Stainless steel	1.5	1	**9.738 823**
Stainless steel	5.0	1	**9.738 829**
Stainless steel	10.0	1	**9.738 835**
Stainless steel	25.0	1	**9.738 839**
Agate	5.0	1	**9.738 827**
Agate	10.0	1	**9.738 833**

Mixing beakers available on request.

3 Grinding Jars for Mixer Mill MM 400

With screw cap.

Retsch

3



Advantages:
- simple and safe handling
- dust and air-tight
- Suitable for wet and cryogenic grinding

Material	Capacity ml	PK	Cat. No.
Stainless steel	1.5	1	**9.738 848**
Stainless steel	5.0	1	**9.738 849**
Stainless steel	10.0	1	**9.738 960**
Stainless steel	25.0	1	**9.738 964**
Stainless steel	35.0	1	**9.738 875**
Stainless steel	50.0	1	**9.738 885**
Agate	5.0	1	**9.738 852**
Agate	10.0	1	**9.738 961**
Zirconium oxide	10.0	1	**9.738 962**
Zirconium oxide	25.0	1	**9.738 965**
Zirconium oxide	35.0	1	**9.738 880**
Tungsten carbide	10.0	1	**9.738 963**
Tungsten carbide	25.0	1	**9.738 864**
Hardened steel	25.0	1	**9.738 869**
PTFE	25.0	1	**9.738 874**
PTFE	35.0	1	**9.738 966**



1 Mixer Mill CryoMill

Retsch

The CryoMill is designed for the cryogenic size reduction of materials which cannot be ground at room temperature or whose composition would be changed by it. The grinding jar is cooled before and during the grinding process with liquid nitrogen through an integrated cooling system. Thus the sample is embrittled and its volatile components are preserved. The size reduction principle is the same as that of the well-proven Mixer Mill MM 400. The CryoMill can also be operated without the cooling system which makes it suitable for a wide range of applications.

Features:
- Powerful cryogenic grinding by impact and friction, up to 30 Hz
- Closed LN2-system (autofill) for enhanced safety, avoids any contact of the user with LN2
- Screw-top grinding jars for convenient, leak-proof operation
- Clearly structured user interface, memory for 9 SOPs
- Wide range of accessories including various LN2 feeding systems, jar and ball sizes, adapter racks, materials

Specifications:

Feed size	up to 8mm
Ultimate fineness	< 5µm
Charge	max. 1 x 20ml
Adjustable frequency range	3 to 30Hz (180 to 1800rpm.)
Dimensions (WxDxH)	385 x 675 x 370mm
Weight	40kg
Power supply:	100 - 240V, 50/60Hz

Type	PK	Cat. No.
CryoMill	1	**9.739 299**

Please order Autofill, grinding jars and grinding balls separately.



2 Grinding Jars for CryoMill

Retsch

Material	Capacity ml	PK	Cat. No.
Stainless steel (to be used with adapter)	5	1	**9.739 281**
Stainless steel	10	1	**9.739 609**
Stainless steel	25	1	**9.739 611**
Stainless steel	35	1	**9.739 612**
Stainless steel	50	1	**9.739 613**
Hardened steel (to be used with adapter)	5	1	**9.739 287**
Hardened steel	25	1	**9.739 614**
Hardened steel	35	1	**9.739 615**
Hardened steel	50	1	**9.739 616**
Zirconium oxide	25	1	**9.739 610**
PTFE	25	1	**9.739 617**



3 Accessories for Mixer Mill, CryoMill

Retsch

Type	PK	Cat. No.
Autofill with LN_2 container, 50L	1	**9.739 292**
Adapter for use of 2/4 grinding jars, 5ml stainless steel	1	**9.739 286**
Adapter for use of 2, 4 or 6 reaction tubes, 2.0ml	1	**9.739 297**
Reaction tubes, 2.0ml	1000	**9.739 298**

Ball charge table for grinding jars MM 200/MM 400/CryoMill

Grinding jars ml	Volume ml	Feed size up to mm	Ball diam. mm	Bulbs
1.5	0.2 - 0.5	1	5	1 - 2
5.0	0.5 - 2.0	2	7	1 - 2
10.0	2 - 4	4	10 / 12	1-2 / 1-2
25.0	4 - 10	6	10 / 12 / 15	5-6 / 2-4 / 1-2
35.0	6 - 15	6	10 / 12 / 15 / 20	6-9 / 4-6 / 2-3 / 1
50.0	8 - 20	8	10 / 12 / 15 / 20 / 25	12-14 / 6-8 / 3-4 / 1 / 1

E & OE.

Grinding balls for Mixer Mill MM 200/MM 400/CryoMill

Retsch

Material	Diam. mm	PK	Cat. No.
Zirconium oxide	10	1	**9.738 419**
Zirconium oxide	12	1	**9.738 846**
Zirconium oxide	15	1	**9.738 405**
Zirconium oxide	20	1	**9.738 847**
Hardened steel	10	1	**9.738 381**
Hardened steel	15	1	**9.738 407**
Hardened steel	7	1	**9.738 866**
Hardened steel	12	1	**9.738 868**
Stainless steel	5	1	**9.738 870**
Stainless steel	7	1	**9.738 871**
Stainless steel	10	1	**9.738 382**
Stainless steel	12	1	**9.738 873**
Stainless steel	15	1	**9.738 408**
Stainless steel	20	1	**9.738 387**
Stainless steel	25	1	**9.738 403**
Tungsten carbide	7	1	**9.738 877**
Tungsten carbide	10	1	**9.738 384**
Tungsten carbide	12	1	**9.738 879**
Tungsten carbide	15	1	**9.738 414**
PTFE with steel core	15	1	**9.738 420**
PTFE with steel core	20	1	**9.738 888**
Agate	5	1	**9.738 860**
Agate	7	1	**9.738 861**
Agate	10	1	**9.738 383**
Agate	12	1	**9.738 863**

Further grinding balls available on request.

1 Planetary Ball Mills PM 100/100 CM/200/400



Retsch

Planetary Ball Mills are suitable for mixing and grinding soft, medium-hard, extremely hard, brittle and fibrous materials. They are used whenever high degrees of fineness down to the submicron range are to be achieved in a very short time. In addition to dry and wet grinding, they are also suitable for colloidal grinding and mechanical alloying. Typical materials are minerals, ores, chemicals, ceramics, soils, household and industrial waste etc.

Features:
- extremely high ultimate fineness down to submicron range
- 1, 2 or 4 grinding stations
- grinding jar volumes from 12ml to 500ml
- suitable for long-term trials and continuous use
- programmable starting time
- power failure back-up ensures storage of remaining grinding time
- reproducible results due to digital parameter setting
- 10 parameter combinations can be stored
- single button operation with graphic display
- automatic grinding chamber ventilation for cooling the grinding jars
- grinding jars in 7 sizes and 6 different materials available

Supplied with: Planetary Ball Mill only. Grinding jars and grinding balls have to be ordered separately.
The PM100 CM is a Planetary Ball Mill with a speed ratio of 1:-1. Size reduction is not so much achieved by impact but by pressure and friction which is more gentle on the material.

Specifications:

Ultimate fineness:	< 1µm
Dimensions (WxDxH):	630 x 415 x 468mm
PM 400	836 x 780 x 1220mm
Supply requirements:	230V, 50-60Hz

Type	Grinding stations	Grinding jars ml	Feed size up to mm	Maximum Throughput/ Charge	Weight kg	PK	Cat. No.
PM 100	1	12 to 500	up to 10	up to 220 ml	86.00	1	**9.739 270**
PM 100 CM	1	12 to 500	up to 10	up to 220 ml	86.00	1	**9.739 275**
PM 200	2	12 to 125	up to 4	up to 2 x 50 ml	72.00	1	**9.739 271**
PM 400	4	12 to 500	up to 10	up to 4 x 220 ml	290.00	1	**9.739 274**

Please order grinding jars and grinding balls separately.

1



1 Grinding Jars for Planetary Ball Mills PM 100/100 CM/200/400

Retsch

Material	Capacity ml	PK	Cat. No.
Hardened steel	50	1	**9.738 320**
Hardened steel	125	1	**9.738 339**
Hardened steell*	250	1	**9.738 216**
Hardened steel*	500	1	**9.738 222**
Stainless steel	50	1	**9.738 321**
Stainless steel	125	1	**9.738 340**
Stainless steel*	250	1	**9.738 217**
Stainless steel*	500	1	**9.738 223**
Tungsten carbide	50	1	**9.738 311**
Tungsten carbide	125	1	**9.738 338**
Tungsten carbide*	250	1	**9.738 218**
Agate	50	1	**9.738 328**
Agate	125	1	**9.738 345**
Agate*	250	1	**9.738 219**
Agate*	500	1	**9.738 224**
Sintered aluminium oxide	50	1	**9.738 327**
Sintered aluminium oxide	125	1	**9.738 344**
Sintered aluminium oxide*	250	1	**9.738 220**
Sintered aluminium oxide*	500	1	**9.738 226**
Zirconium oxide	50	1	**9.738 325**
Zirconium oxide	125	1	**9.738 342**
Zirconium oxide*	250	1	**9.738 221**
Zirconium oxide*	500	1	**9.738 227**

*not suitable for PM 200.
Further grinding jars on request

Ball charge table for grinding jars PM 100/100 CM/200/400

Grinding jars ml	Volume ml	Feed size up to mm	Ball diam. mm	Bulbs
50.0	5 - 20	3	5 / 10 / 15 / 20	200 / 10 / 7 / 3
80.0	10 - 35	4	5 / 10 / 15 / 20	250 / 25 / 10 / 5
125.0	15 - 50	6	5 / 10 / 15 / 20	500 / 30 / 18 / 7
250.0	25 - 120	10	5 / 10 / 15 / 20 / 30	1200 / 50 / 45 / 15 / 6
500.0	75 - 220	10	5 / 10 / 15 / 20 / 30 / 40	2000 / 100 / 70 / 25 / 8 / 4

2



2 Grinding Balls for PM 100/100 CM/200/400

Retsch

Material	Diam. mm	PK	Cat. No.
Agate	10	1	**9.738 383**
Agate	20	1	**9.738 388**
Agate	30	1	**9.738 393**
Agate	40	1	**9.738 398**
Sintered aluminium oxide	10	1	**9.738 380**
Sintered aluminium oxide	20	1	**9.738 385**
Sintered aluminium oxide	30	1	**9.738 390**
Sintered aluminium oxide	40	1	**9.738 395**
Hardened steel	10	1	**9.738 381**
Hardened steel	20	1	**9.738 386**
Hardened steel	30	1	**9.738 391**
Hardened steel	40	1	**9.738 396**
Stainless steel	10	1	**9.738 382**
Stainless steel	20	1	**9.738 387**
Stainless steel	30	1	**9.738 392**
Stainless steel	40	1	**9.738 397**
Stainless steel 0.5 kg	2	1	**9.738 425**
Stainless steel 0.5 kg	3	1	**9.738 426**
Zirconium oxide	10	1	**9.738 419**
Zirconium oxide	20	1	**9.738 847**
Zirconium oxide	30	1	**9.738 417**
Zirconium oxide	40	1	**9.738 418**
Zirconium oxide, 0.5 kg	2	1	**9.738 427**
Zirconium oxide, 0.5 kg	3	1	**9.738 428**
Tungsten carbide	10	1	**9.738 384**
Tungsten carbide	20	1	**9.738 389**
Tungsten carbide	30	1	**9.738 394**
Tungsten carbide	40	1	**9.738 399**

Further Grinding balls available on request.

E & OE.

1 Disk mill PULVERISETTE 13 *classic line*



Ideal for intermittent and continuous fine grinding of hard-brittle and medium-hard solids in the areas of mining and metallurgy, glass industry, ceramics industry, soil research, rocks and soils.

Fritsch

Max. feed size:	20mm
Throughput:	up to 150kg/h
Final fineness:	0.1 to 12mm
Supply requirements:	400V/3~, 50-60Hz, 1830W
Dimensions (WxDxH):	440 x 870 x 40mm
Net weight:	140kg

Type	PK	Cat. No.
Disk Mill PULVERISETTE 13 *classic line*	1	**9.739 001**

Instrument also available in other voltages.
Fixed and movable grinding disks must be ordered additionally.
The Disk Mill is also available as *premium line* model: even more powerful, safer and easier to operate due to easy reproducible gap width setting via display.

Accessories for disk mill PULVERISETTE 13 *classic line*

Fritsch

Type	Description	PK	Cat. No.
Fixed grinding disk	hardened steel cast	1	**9.739 002**
Mobile grinding disk	hardened steel cast	1	**9.739 003**
Fixed grinding disk	zirconium oxide	1	**9.739 006**
Mobile grinding disk	zirconium oxide	1	**9.739 007**

Grinding disks are also in manganese steel and hardmetal tungsten carbide available.

2 Mortar grinder PULVERISETTE 2



Ideal for universal fine grinding of hard-brittle to soft samples, dry or in suspension, as well as for preparing and homogenising pastes and creams on a laboratory scale. The PULVERISETTE 2 is an essential instrument in the chemical/pharmaceutical as well as in food processing laboratories. The Mortar grinder is easy to clean ensures reproducible and precise grinding results, due to precise adjustment and pestle pressure readout. Also working with liquid nitrogen for cooling/embrittlement is no problem.

Fritsch

Max. feed size:	8mm
Max. sample quantity:	up to 190ml
Final fineness:	10 to 20µm
Supply requirements:	100-120/200-240V/1~, 50-60Hz, 250W
Dimensions (WxDxH):	310 x 460 x 410mm
Net weight:	24kg

Type	PK	Cat. No.
Mortar Grinder PULVERISETTE 2	1	**9.738 200**

Mortar and pestle must be ordered additionally.

Accessories for mortar grinder PULVERISETTE 2

Fritsch

Material	PK	Cat. No.
Agate	1	**9.738 211**
Stainless steel	1	**9.738 235**
Hard porcelain	1	**9.738 240**

Mortars and pestles are also available in sintered corundum, hardmetal tungsten carbide and zirconium oxide.

1



1 Planetary ball mills PULVERISETTE 5/6 *classic line*

Fritsch

Ideal for fast, loss-free fine grinding of hard, medium-hard, brittle and fibrous materials, dry or in suspension. Sample can be processed from a few milligrams to several kilograms at a wide range of fineness levels down to less than 1µm. They are especially easy to operate and fast and easy to clean. They are suitable for continuous, heavy duty usage and guarantee safe clamping of the grinding bowls. Matching grinding parts of 8 different materials are available to provide maximum protection against undesired contamination. In addition to size-reduction, Planetary Ball Mills can also be used for mixing and homogenising of emulsions and pastes or for mechanical alloying and activation.

Example areas: geology and mineralogy, sample preparation for analysis, ceramics, chemistry, biology, pharmaceuticals, metallurgy and much more.

Features:
- Extremely high rotational speeds of the main disk for particularly high final finenesses
- Very fast, uniform and reproducible size reduction
- Loss-free grinding also in suspensions, due to a seal ring in the grinding bowl
- Reproducible grinding results due to controlled drive and programmable electronic system
- Programmable interval-, break-times and reversing unit
- RS232 interface for data transfer of process parameters (validation)
- Microprocessor control electronic system and precise digital display of all functions (also of rotational speed)

FRITSCH also offers a revolutionary Planetary Mill Generation *premium line* generation, worldwide unique in operation, performance and safety, a new reference class, please have a look at Planetary Micro Mill PULVERISETTE 7 *premium line*.

Max. feed size:	10mm
Final fineness:	< 1µm
Grinding bowl sizes:	80, 250, 500ml
Supply requirements:	100-120/200-240V/1~, 50-60Hz
Dimensions (WxDxH):	370 x 530 x 500mm PULVERISETTE 6 *classic line* 580 x 670 x 570mm PULVERISETTE 5 *classic line*

Type	Grinding stations	Rotation speed rpm	Sample volume ml	Weight kg	PK	Cat. No.
Planetary Mono Mill PULVERISETTE 6 *classic line*	1	100-650	225	63	1	**9.738 300**
Planetary Mill PULVERISETTE 5 *classic line* model I	4	50-400	900	120	1	**9.738 404**
Planetary Mill PULVERISETTE 5 *classic line* model II	2	50-400	450	100	1	**9.738 402**

Grinding bowls and grinding balls must be ordered additionally.
Further models of planetary mills on request.

2



2 Grinding bowls for planetary ball mills PULVERISETTE 5/6 *classic line*

Fritsch

Material	Volume ml	PK	Cat. No.
Tempered steel	80	1	**9.738 515**
Tempered steel	250	1	**9.738 525**
Tempered steel	500	1	**9.738 535**
Stainless steel	80*	1	**9.738 516**
Stainless steel	250	1	**9.738 526**
Stainless steel	500	1	**9.738 536**
Sintered corundum	80*	1	**9.738 512**
Sintered corundum	250	1	**9.738 522**
Sintered corundum	500	1	**9.738 532**
Zirconium oxide	80*	1	**9.738 518**
Zirconium oxide	250	1	**9.738 528**
Zirconium oxide	500	1	**9.738 538**
Hardmetal tungsten carbide**	80*	1	**9.738 514**
Hardmetal tungsten carbide**	250	1	**9.738 524**
Adapter for grinding bowls	80	1	**9.738 315**

* One grinding bowl holder can hold either 2 x 80ml bowls or 1 x 80ml bowl together with a grinding bowl adapter mounted one on top of the other.
** Grinding bowl in a steel casing.
Grinding bowls are also available in agate and silicon nitride. Special gassing lids for grinding in an inert atmosphere and for mechanical alloying as well as the GTM-system (Gas pressure and temperature measuring system) for measuring gas pressure and temperature during the grinding process are available.

1 Grinding balls for grinding bowls PULVERISETTE 5/6 *classic line*



Fritsch

Material	Ball diam. mm	PK	Cat. No.
Tempered steel	10	1	**9.738 555**
Tempered steel	20	1	**9.738 565**
Tempered steel	30	1	**9.738 575**
Tempered steel	40	1	**9.738 585**
Stainless steel	10	1	**9.738 556**
Stainless steel	20	1	**9.738 566**
Stainless steel	30	1	**9.738 576**
Stainless steel	40	1	**9.738 586**
Sintered corundum	10	1	**9.738 552**
Sintered corundum	20	1	**9.738 562**
Sintered corundum	30	1	**9.738 572**
Sintered corundum	40	1	**9.738 582**
Zirconium oxide	10	1	**9.738 558**
Zirconium oxide	20	1	**9.738 568**
Zirconium oxide	30	1	**9.738 578**
Zirconium oxide	40	1	**9.738 588**
Hardmetal tungsten carbide	10	1	**9.738 554**
Hardmetal tungsten carbide	20	1	**9.738 564**
Hardmetal tungsten carbide	30	1	**9.738 574**
Hardmetal tungsten carbide	40	1	**9.738 584**

Grinding bowls are also available in agate and silicon nitride.
Grinding balls are also offered in the diameters 0.1mm to 3mm (to achieve a fineness down to the nanometer-range) as well as in 5mm and 15mm (have a look at grinding balls for grinding bowls for planetary micro mill PULVERISETTE 7 *premium line*).

Recommended number of grinding balls per grinding bowl for PULVERISETTE 5/6 *classic line*

Grinding bowl Useful capacity (sample volume) Ball diameter	500ml 80 - 225ml	250ml 30 - 125ml	80ml 10 - 30ml
5mm	2000	1200	250
10mm	100	50	25
15mm	70	45	10
20mm	25	15	5
30mm	8	6	
40mm	4		

1



1 Planetary micro mill PULVERISETTE 7 *premium line*

Fritsch

As extension of the existing *classic line* planetary mills, FRITSCH offers now a new *premium line* generation. For the first time ever, it is possible to reach rotational speeds never known before, which achieves ultrafine grinding results down to the nano range.

FASTER, SIMPLER AND SAFER THAN EVER.

Features:
- Extremely high-speed milling thanks to sunken grinding bowls with up to 1100rpm
- Sensational centrifugal accelerations of up to 95 times the force of gravity for better results in shorter times
- 150% greater energy application than conventional Planetary Ball Mills
- Extremely easy grinding bowl change with just two motions
- Highest safety due to unique SelfLock-grinding bowl-clamping
- For the first time, the bowl and lid form a single unit, no additional tensioning, no incorrect operation
- Automatic check of the grinding bowl locks in the mill
- Blockage in the event of impermissible operating state
- Automatic parameter check performed before every grinding, guarantees exact reproducibility
- Via USB all data can be easily exported to save time

Max. feed size:	5mm
Max. sample quantity:	70ml
Final fineness:	< 100nm
Rotational speed of main disk:	100 to 1100rpm
Supply requirements:	100-240V/1~, 50-60Hz, 1100W
Dimensions (WxDxH):	400 x 580 x 360mm
Net weight:	44kg

Type	PK	Cat. No.
Planetary Micro Mill PULVERISETTE 7 *premium line*	1	**6.233 706**

Grinding bowls and grinding balls must be ordered additionally.
For fast high-tech grinding of larger sample quantities down to the nano range, the Planetary Mono Mill PULVERISETTE 6 *premium line* is available.

2



2 Grinding bowls for planetary micro mill PULVERISETTE 7 *premium line*

Fritsch

Description	Capacity ml	PK	Cat. No.
Stainless steel*	20	1	**9.738 455**
Stainless steel*	45	1	**9.738 454**
Stainless steel*	80	1	**9.738 453**
Sintered corundum*	20	1	**9.738 459**
Sintered corundum*	45	1	**9.738 460**
Sintered corundum*	80	1	**9.738 461**
Zirconium oxide*	20	1	**9.738 458**
Zirconium oxide*	45	1	**9.738 457**
Zirconium oxide*	80	1	**9.738 456**
Hardmetal tungsten carbide*	20	1	**6.237 286**
Hardmetal tungsten carbide*	45	1	**9.738 231**
Hardmetal tungsten carbide*	80	1	**9.738 232**

* Grinding bowl in a steel casing.
Special gassing lids for grinding in an inert atmosphere and for mechanical alloying as well as the EASY GTM - Gas pressure and temperature measuring system, for measuring gas pressure and temperature during the grinding process and for controlling the grinding process are available.

1 Grinding balls for grinding bowls PULVERISETTE 7 *premium line*



Fritsch

Material	Ball diam. mm	PK	Cat. No.
Stainless steel	5	1	**9.738 560**
Stainless steel	15	1	**9.739 165**
Sintered corundum	15	1	**9.739 162**
Zirconium oxide	5	1	**9.739 160**
Zirconium oxide	15	1	**9.739 166**
Hardmetal tungsten carbide	5	1	**6.050 329**
Hardmetal tungsten carbide	15	1	**9.739 163**

Grinding bowls are also available in agate, tempered steel and silicon nitride.
Grinding balls are also offered in the diameters 0.1mm to 3mm (to achieve a fineness down to the nanometer-range) as well as in 10mm and 20mm (have a look at grinding balls for grinding bowls for planetary mono mill PULVERISETTE 6 *classic line* and planetary mill PULVERISETTE 5 *classic line*).

Recommended number of grinding balls per grinding bowl for PULVERISETTE 7 *premium line*

Grinding bowl Useful capacity (sample volume) Ball diameter	20ml 1 - 9ml	45ml 3 - 20ml	80ml 10 - 30ml
5mm	80	180	250
10mm	10	18	25
15mm	-	7	10
20mm	-	-	5

2 Mini mill PULVERISETTE 23



Fritsch

Ideal for fine comminution of smallest quantities for wet and dry grinding as well as for cryogenic grinding. Its special spherical grinding bowl ensures much better performance in grinding, mixing and homogenising compared with similar models for example in chemical analysis, chromatography, mass spectrometry or x-ray structural analysis, preparation of samples for genetic research, homogenising of active ingredients, preparation of extracts in the forensic analysis, grinding of pigments and precious materials.

Max. feed size:	6mm
Max. sample quantity:	up to 5ml
Final fineness:	5µm
Supply requirements:	100-240V/1~, 50-60Hz
Dimensions (WxDxH):	200 x 300 x 300mm
Net weight	7kg

Type	PK	Cat. No.
Mini Mill PULVERISETTE 23	1	**9.739 345**

Grinding bowls and grinding balls must be ordered additionally.

Recommended number of grinding balls per grinding bowl for mini mill PULVERISETTE 23

Grinding bowl Useful capacity (sample volume) Ball diameter	5ml 0.01 - 1ml	10ml 0.2 - 1ml	15ml 0.5 - 5ml
5mm	20	30	60
10mm	1	3	5
15mm	-	1	2

3 Grinding bowls and grinding balls for mini mill PULVERISETTE 23



Fritsch

Type	PK	Cat. No.
Grinding bowl, PTFE, 5ml	1	**9.739 343**
Grinding bowl, stainless steel, 10ml	1	**9.739 346**
Grinding bowl, stainless steel, 15ml	1	**9.739 347**
Grinding ball, 5mm, stainless steel	1	**9.738 560**
Grinding ball, 10mm, stainless steel	1	**9.738 556**
Grinding ball, 15mm, stainless steel	1	**9.739 165**

Grinding bowls and balls are also offered in zirconium oxide and tempered steel, as well as grinding balls in 15mm diameter (have a look at grinding balls for grinding bowls: planetary micro mill PULVERISETTE 7 *premium line*).

1



1 Variable speed rotor mill PULVERISETTE 14 *classic line*

Fritsch

Ideal for fast, effective comminution of soft to medium-hard, brittle, fibrous materials, as well as difficult-to-mill and temperature-sensitive samples.
Cryogenic grinding, dispersion and homogenisation are also one of the areas of operation.
The variable speed rotor mill is an ultra-centrifugal mill with variable speed settings between 6.000rpm and 20.000rpm and automatic speed regulation for constant milling in the areas of analytic, biology, chemistry, agriculture and forestry, foodstuffs, plastics and textiles, pharmaceuticals, environment/RoHS.

For optimal material feeding the Vibratory Feeder LABORETTE 24 (optional) is recommended.

Max. feed size:	10mm
Throughput:	0.05 to 5L/h
Sieve inserts:	0.08 to 6mm
Final fineness (d_{50}):	40µm
Rotor speed:	6.000 to 20.000rpm
Supply requirements:	100-120/200-240V/1~, 50-60Hz, 1150W
Dimensions (WxDxH):	310 x 480 x 470mm
Net weight:	23kg

Type	PK	Cat. No.
Variable speed rotor mill PULVERISETTE 14 *classic line*	1	**9.738 281**

Impact rotor and sieve ring must be ordered additionally.
The variable speed rotor mill PULVERISETTE 14 is also available as *premium line* model and can be used as impact mill, cutting mill and knife mill due to a multi-functional tool system.

2



2 Accessories for variable speed rotor mill PULVERISETTE 14 *classic line*

Fritsch

Type	PK	Cat. No.
Impact rotor with 8 ribs	1	**9.738 282**
Impact rotor with 12 ribs	1	**9.738 283**
Impact rotor with 24 ribs	1	**9.738 284**
Sieve rings, trapezoidal perforation 0.08mm	1	**9.738 286**
Sieve rings, trapezoidal perforation 0.12mm	1	**9.738 287**
Sieve rings, trapezoidal perforation 0.2mm	1	**9.738 288**
Sieve rings, trapezoidal perforation 0.5mm	1	**9.738 289**
Sieve rings, trapezoidal perforation 0.75mm	1	**9.738 285**
Sieve rings, trapezoidal perforation 1mm	1	**9.738 290**
Sieve rings, trapezoidal perforation 1.5mm	1	**9.738 278**
Sieve rings, trapezoidal perforation 2mm	1	**9.738 279**
Sieve rings, round perforation 1mm	1	**9.738 291**
Sieve rings, round perforation 2mm	1	**9.738 292**
Sieve rings, round perforation 4mm	1	**9.738 293**
Sieve rings, round perforation 6mm	1	**9.738 294**
Conversion kit for large quantities	1	**9.738 329**
Vibratory feeder LABORETTE 24 for continuous feeding	1	**9.738 299**
Stand for vibratory feeder LABORETTE 24	1	**9.738 298**

Rotors and sieve rings are also available in others designs and materials. An extensive accessory programme with impact bar, pin insert, sample exhauster with cyclone separator and much more is available for your specific application.

Cutting mill PULVERISETTE 15 and universal cutting mill PULVERISETTE 19

Fritsch

Ideal for pre and fine grinding of soft to medium-hard as well as fibrous or tough materials. They are essential for the areas of plastics, textiles, agriculture and forestry, environmental, construction materials, chemistry, foodstuffs and for sample preparation for RoHS analysis.
All grinding parts can be removed for cleaning in just a few seconds without tools, unbeatable fast, simple and efficient.
Different rotors, various knife geometries and replaceable blades ensure maximum flexibility and durability.
For controlling the abrasion properties, the grinding tools are offered in different materials.
The optimum airflow ensures fast grinding and secure protection against clogging.
The patented FRITSCH sample exhauster with cyclone separator (optional) ensures simple feeding, fast throughput and good cooling.

1



9.738 421

2



9.739 300

Max. feed size:	up to 70 x 80mm*
Throughput:	up to 60L/h*
Sieve inserts:	0.2 to 6mm
Supply requirements:	400V/3~, 50-60Hz
Dimensions (WxDxH):	420 x 480 x 690mm resp. 440 x 550 x 630mm*

* depending on the instrument type

Type	Feed size up to mm	Throughput max. l/h	Rotation speed rpm	Weight kg	PK	Cat. No.	
Cutting mill PULVERISETTE 15	70 x 70	50	2800-3400	37	1	**9.738 421**	1
Universal cutting mill PULVERISETTE 19	70 x 80	60	2800-3400	56	1	**9.739 300**	2

Instruments also available in other voltages.
Funnels, rotors, sieve inserts/sieve cassettes and collecting vessels must be ordered separately.
Further Cutting mills available on request.

3 Accessories for cutting mill PULVERISETTE 15

Fritsch

Type	PK	Cat. No.
Funnel for long and bulk solids	1	**7.900 140**
Cutting rotor with straight cutting edges and fixed knives made of tool steel	1	**9.738 424**
Sieve insert, trapezoidal perforation 0.25mm	1	**9.738 432**
Sieve insert, trapezoidal perforation 0.5mm	1	**9.738 433**
Sieve insert, trapezoidal perforation 1mm	1	**9.738 435**
Sieve insert, trapezoidal perforation 2mm	1	**9.738 437**
Sieve insert, square perforation 4mm	1	**9.738 441**
Sieve insert, square perforation 6mm	1	**9.738 442**
Collecting vessel, 3.5L	1	**6.231 269**
Collecting vessel, 60L with filter hose	1	**9.738 449**
Universal support stand	1	**9.738 429**

Alternative funnels as well as sieve inserts made of stainless steel are also available in other perforations.
Cutting rotors as well as the sieve insert are also offered in chromium-free steel.

3



4 Accessories for universal cutting mill PULVERISETTE 19

Fritsch

Type	PK	Cat. No.
Standard funnel for long and bulk solids	1	**6.510 319**
Standard rotor with V-cutting, edges and fixed knives made of tool steel	1	**9.739 321**
Sieve cassette, trapezoidal perforation 0.5mm	1	**9.739 331**
Sieve cassette, trapezoidal perforation 1mm	1	**9.739 333**
Sieve cassette, trapezoidal perforation 2mm	1	**9.739 335**
Sieve cassette square holes, 4mm	1	**9.739 340**
Sieve cassette square holes, 6mm	1	**9.739 341**
Collecting vessel, 3L	1	**9.739 350**
Large collecting vessel, 10L	1	**9.739 351**
Universal support stand	1	**9.738 429**

Alternative funnels, cutting rotors in other materials and designs, sieve cassettes in other perforations and materials as well as a sample exhauster with cyclone separator are available on request.

4



1



9.737 790

2



9.737 791

Tube Mill control

NEW!

IKA

The world's first patented Tube Mill control is a batch mill with disposable grinding chambers. Eliminates possibility of cross-contamination and the effort of cleaning.
The grinding chamber and cover are made of a transparent material so grinding tests can be observed at any time.
The mill can be used for hard (Mohs hardness up to 3), dry and brittle materials. It is especially suitable for grinding seeds, such as corn and wheat. During development of the mill, particular emphasis was placed on security. The mill will only start when the hood is closed. When the grinding chamber is not inserted properly or not closed properly, the drive unit will display an error message and the drive will not start. During operation, the grinding chamber cannot be opened. The drive and the grinding chambers are secured with a labyrinth seal. No dust can escape from the chamber or penetrate the drive.

- Clearly arranged, multilingual OLED-display
- USB interface for control and documentation of all the parameters
- Interval operation available
- Various operating modes
- Adjustable safety speed
- Adjustable safety time
- Programmable and storable test conditions
- Error Code Display
- Reproducible test results
- Easy operation with touch keypad
- Dust proof sealed housing
- Quiet operation

Specifications:

Operating principle	cutting/impact
Motor rating input/output:	175/123W
Speed:	5000 to 25000rpm
Chamber vol.:	40ml
Timer:	5s to 3min
Interval timer:	5s to 60s
Overload protection:	yes
Circumferential speed:	65m/s
Max. feed hardness:	5Mohs
Dimensions (WxDxH):	180 x 300 x 170mm
Weight:	2.7kg
Protection class according to DIN EN 60529:	IP 30
Power supply:	220-240V, 50/60Hz

Type	PK	Cat. No.	
Tube Mill control	1	**9.737 790**	1
Disposable grinding chamber MT 40	10	**9.737 791**	2

3



3 Grinding mill, A11 basic

IKA

Batch mill for 2 different grinding procedures:
Impact grinding of hard, brittle or non-elastic grinding materials with high-grade stainless steel beater. This beater can be used for a Mohs hardness up to 6 (incl. with delivery). Cutting grinding for pulverizing soft, fibrous materials with a cutting blade (not incl. with delivery).
- Moist and gluey materials can be pulverized by adding water
- Grinding chamber made of Tefcel (PTFE, glass fibre-reinforced) with stainless steel inlet (1.4571), useful volume 80ml (incl. with delivery). For embrittlement of grinding materials with liquid nitrogen in the grinding chamber
- Optionally, a 250ml grinding chamber is available

Specifications:

Motor rating input/output:	160/100W
Speed:	28000rpm (off load)
Chamber vol.:	80ml
Power-on time ON/OFF:	1/10 min
Auto power off:	yes
Tangential speed:	53m/sec.
Max. sample granule size:	10mm
Dimensions (WxDxH):	85 x 85 x 240mm
Weight:	1.5kg
Protection class DIN EN 60529:	IP 43
Supply requirements:	230V 50/60Hz
Tested to DIN EN IEC 61010-1.	

Type	PK	Cat. No.
A 11 basic	1	**9.737 801**
A 11 basic UK	1	**6.202 305**

Optional accessories: A 11.4 Grinding chamber (250ml), A 11.1 Spare beater, A 11.2 Cutting blade, A 11.6 Double beater, A 11.5 Spare grinding chamber , A 11.7 Funnel, A 11.3 Beater

E & OE.

1 Accessories for Grinding mill, A11 basic



IKA

A 11.1 Spare beater
For pulverising substances with a Mohs hardness up to 6.
A 11.2 Cutter
For pulverising soft, fibrous grinding materials.
A 11.3 Beater, hard metal
For pulverising substances with a Mohs hardness up to 9, chrome-carbide coated
A 11.4 Grinding container, 250ml
Made of polycarbonate with stainless steel inlet. Not suitable for cooling with N_2, only applicable with double beater A 11.6.
A 11.5 Spare grinding container, 80ml
Made of Tefcel (PTFE, glass faser-reinforced) with stainless steel inlet. Excellent resistance to chemicals and low temperatures (- 200°C).
A 11.6 Dubbel beater
For use up to Mohs hardness 3. Only applicable with grinding chamber A 11.4.
A 11.7 Funnel
Prevents splashing by pouring in liquid nitrogen in the grinding chamber A 11.5.

Type	Description	PK	Cat. No.
A 11.1	Spare beater*	1	**9.737 815**
A 11.2	Cutter	1	**9.737 806**
A 11.3	Beater	1	**9.737 807**
A 11.4	Grinding container, 250ml	1	**9.737 805**
A 11.5	Spare grinding container, 80 ml*	1	**9.737 816**
A 11.6	Double beater	1	**9.737 817**
A 11.7	Funnel	1	**9.737 818**

*included in delivery

2 Universal mill M20



IKA

Batch mill suitable for dry grinding of hard and brittle substances.
- Double-walled grinding chamber can be cooled with water through two hose adapters
- Removable grinding chamber, easy to clean
- Two grinding chambers can be alternately operated using one drive
- M 21 blade incl. with delivery

Specifications:

Motor rating input/output:	440/225W
Speed:	max. 20000rpm. off load
Overload protection:	current limiter
Throughput/Charge max:	250ml
Material:	stainless steel (AISI 304)
Feed size:	max. 5 to 7mm
Dimensions (WxDxH):	170 x 170 x 350mm
Weight:	6.6kg
Supply requirements:	230V 50/60Hz
Protection class DIN EN 60529:	IP21
Tested to DIN EN IEC 61010-1.	

Type	PK	Cat. No.
M 20	1	**9.737 828**
M 20 UK	1	**4.007 942**

Optional accessories: M 21 Spare cutter, stainless steel, M 20.1 Grinding chamber, M 23 Star-shaped cutter, M 22 Hard metal cutter

3 Universal mill M 20, accessories and spares



IKA

Type	Description	PK	Cat. No.
M 21	Spare cutter for M 20*	1	**9.737 829**
M 22	Hard metal cutter (tungsten carbide)	1	**9.737 830**
M 23	Star-shaped cutter (stainless steel)	1	**9.737 831**
M 20.1	Grinding chamber	1	**9.737 832**

*included in delivery

2 3 Drive unit MF 10 basic

IKA

Universal laboratory grinder, comprising powerful drive unit for use with a choice of accessory grinding heads.
The user can choose between the impact grinding head for milling hard, brittle materials (see fig.) and the cutting head for processing fibrous material.
The maximum granule size output can be set by using various insert sieves (with apertures between 0.25mm and 3mm) placed above the outlet. There is an NS29 standard ground joint at the outlet for attachment of receiving flasks.
Grinding/cutting heads not included.

Specifications:

Motor rating input/output:	1000/500W
Speed range:	3000 to 6500rpm.
Tangential speed with impact grinding head:	31.4 m/sec.
Tangential speed with cutting head:	22.5 m/sec.
Material in contact with product:	Stainless steel AISI 316 L
Power-on time ON/OFF:	120/130mins.
Auto power off:	yes
Dimensions with grinding head (WxDxH):	320 x 300 x 380mm
Weight with grinding head:	9.7kg
Protection class DIN EN 60529:	IP22
Supply requirements:	230V 50/60Hz.
Tested to DIN EN IEC 61010-1.	

Type	Description	PK	Cat. No.
MF 10 basic	Drive unit without head	1	**9.737 780** 1

Optional accessories: MF 10.1 Cutting-grinding head, MF 10.2 Impact grinding head, MF Sieves

1



9.737 780

2



3



4 5 Accessories for microfine grinder MF10 basic, for in-line processes

IKA

Type	Description	PK	Cat. No.
MF 10.1	Cutting head	1	**9.737 781**
MF 10.2	Impact grinding head	1	**9.737 782**
MF 0.25	Sieve	1	**9.737 783**
MF 0.5	Sieve	1	**9.737 784**
MF 1.0	Sieve	1	**9.737 785**
MF 2.0	Sieve	1	**9.737 787**
MF 3.0	Sieve	1	**9.737 788**
MF 4.0	Sieve	1	**9.737 789**

4



5



E & OE.

1 2 Analytical Sieve Shakers AS 200 basic/digit/control, AS 300 control, AS 450 basic/control


1


2

Sieve shakers are used in research & development, quality control of raw materials, interim and finished products as well as in production monitoring. *Retsch*

Features:
- Sieving with 3D effect
- For wet and dry sieving
- Short sieving times
- Low-noise, maintenance-free

AS 200 basic: favourably priced basic model.

AS 200 digit: powerful comfort model with touch-sensitive keypad, digital display, interval sieving.

AS 200 control: like AS 200 digit, but microprocessor-controlled, with freely selectable intervals and digital vibration amplitude setting. It can be calibrated and, for the first time, allows 100% reproducible sieving results worldwide, even if different instruments are used. The AS 200 control has an integrated interface for the evaluation software EasySieve®. At the same time it also offers all the requirements for test materials monitoring according to ISO 9000 ff.

AS 300 control: like AS 200 control; also suitable for sieves up to 315mm diameter and for higher loads.

AS 450 basic: budget-priced basic model for dry sieving up to 15kg of material.

AS 450 control: like AS 200 control but only suitable for 400mm diam. and 450mm diam. sieves. The optimized electromagnetic drive with RETSCH's CET technology allows for an amplitude up to 2.2mm even with maximum loads up to 25kg. Manual re-sieving is no longer required.

Specifications:

Max. number of fractions (depending on sieve size):	
AS 200, AS 300:	9/17
AS 450 basic:	10/7
AS 450 control:	13/9
Movement of sample:	orbital with vibration
Height of sievetower	
AS 200, AS 300:	up to approx. 450mm
AS 450 basic:	up to approx. 830mm
AS 450 control:	up to approx. 960mm
Max. charge/quantity of sample:	
AS 200:	3kg
AS 300:	5kg
AS 450 basic:	15kg
AS 450 control:	25kg
Timer:	
AS 200 digit, control, AS 300, AS 450:	digital
AS 200 basic:	analog

Type	Measuring range	Dimensions (W x D x H) mm	Weight kg	For Sieve sizes (diam.) mm	PK	Cat. No.
AS 200 basic	20µm to 25mm	400 x 350 x 230	30	100 / 150 / 200 / 203	1	**9.739 223**
AS 200 digit	20µm to 25mm	400 x 350 x 230	30	100 / 150 / 200 / 203	1	**9.739 224**
AS 200 control	20µm to 25mm	400 x 350 x 230	30	100 / 150 / 200 / 203	1	**9.739 273**
AS 300 control	20µm to 40mm	400 x 400 x 235	35	100 / 150 / 200 / 203 / 305 / 315	1	**9.739 241**
AS 450 basic	20µm to 125mm	680 x 680 x 280	140	400 / 450	1	**9.739 278**
AS 450 control	20µm to 125mm	715 x 630 x 435	200	400 / 450	1	**9.739 277**

1



9.739 242

2



6.238 947

3



6.238 239

Analytical Sieve Shakers AS 400 control, AS 200 tap/ jet

Retsch

AS 400 control:
The AS 400 control is used for the sieving of dry goods with test sieves of a diameter up to 400mm. The uniform, horizontal circular motion ensures exact separation of the product to be sieved.

Features:
- Sieving with circular sieving motion according to DIN 53477
- Free digital adjustment of all process parameters (time, speed or sieve acceleration, interval)
- Memory for up to 9 SOPs
- Integrated interface for evaluation software EasySieve®

Electrical supply data: 100-240 V, 50/60 Hz

The clamping devices of AS 200 and AS 300 are also suitable for the AS 400.

AS 200 tap:
For sieve analysis of certain products such as activated carbon, abrasives, coal, spices and diamonds, as specified in the corresponding standards.

Features:
- Horizontal, circular sieving motion with vertical taps
- Suitable for dry sieving
- Robust and maintenance-free

Electrical supply data: 230 V, 50Hz

AS 200 jet:
The air jet sieving machine AS 200 jet is particularly suitable for light materials with particle sizes in the lower micron range which tend to agglomerate.

Features:
- Open Mesh Function to reduce the number of near-mesh particles
- Operation with standard Retsch sieves, 203 mm (8") diameter, 1" or 2" high
- Adapter for 200mm sieves optional
- Free manual (standard) or automatic (accessory) pressure regulation
- High flexibility through adjustable nozzle speed
- Memory for up to 9 SOPs, additional Quick Start mode

Electrical supply data: 230 V, 50/60 Hz

Please order clamping devices (except AS 200 tap), sieves and collecting pans separately.

Specifications:

Max. number of fractions (depending on sieve size):	
AS 400 control:	7/9/17
AS 200 tap:	7/13
AS 200 jet:	1 (2 with cyclone)
Movement of sample:	
AS 400 control:	circular
AS 200 tap:	circular with taps
AS 200 jet:	dispersion by air jet
Height of sievetower	
AS 400 control:	up to approx. 450mm
AS 200 tap:	up to approx. 350mm
AS 200 jet:	up to approx. 50mm
Max. charge/quantity of sample:	
AS 400 control:	5kg
AS 200 tap:	3kg
AS 200 jet:	0.3 to 100g
Timer:	digital

Type	Measuring range	Dimensions (W x D x H) mm	Weight kg	For Sieve sizes (diam.) mm	PK	Cat. No.
AS 400 control	45 µm to 63 mm	540 x 507 x 260	70	100 /150 / 200 /203 / 305 / 315 / 400	1	**9.739 242** 1
AS 200 tap*	20 µm to 25 mm	735 x 530 x 675	92	200 / 203	1	**6.238 947** 2
AS 200 jet	10 µm to 4 mm	460 x 305 x 288	14	203	1	**6.238 239** 3

*with sound protection cabinet

E & OE.

Acessories for AS 200 jet

Retsch

Description	PK	Cat. No.
Vacuum cleaner, 230V, 50/60Hz (other electrical versions available)	1	**9.739 600**
Cyclone with collector (250ml wide-mouth bottle)	1	**9.739 601**
Automatic vacuum regulation	1	**9.739 296**
Adapter and lid for analysing sieves 200 x 50mm and 200 x 25mm	1	**9.739 253**

1 Software EasySieve® for Sieve Shakers AS control/AS 200 tap/AS jet

Software for particle size analyses. *Retsch*

Features:
- Automatic registration, evaluation and administration of measurement data
- Logical design, self-explanatory
- Measurement protocol in accordance with standards
- Easy selection and configuration of common analytical scales
- English and German
- For automatic control of sieve shakers AS 200 control, AS 300 control, AS 450 control, AS 400 control, AS 200 tap, AS 200 jet
- For Windows® 2000/XP/Vista/7/8



Type	PK	Cat. No.
EasySieve® Single-user-licence, incl. adapter RS232-USB	1	**6.238 927**
Adapter RS232-USB	1	**9.739 250**

Clamping device for Sieve Shakers AS series

Retsch

For	Description	PK	Cat. No.
AS 200 + AS 300 + AS 400	Clamping device, comfort, for 200/203mm dia. sieves	1	**9.739 226**
AS 200 + AS 300 + AS 400	Clamping device, standard, for 200/203mm dia. sieves	1	**9.739 227**
AS 200 + AS 300 + AS 400	Clamping device economy for 100/150/200/203mm dia. sieves	1	**9.739 228**
AS 300 + AS 400	Clamping device, standard, for 305/315mm dia. sieves	1	**9.739 261**
AS 300 + AS 400	Clamping device, comfort, for 305/315mm dia. sieves	1	**9.739 260**
AS 200	Universal clamping device, standard, for 100/150/200/203mm dia. sieves	1	**9.739 229**
AS 200	Universal clamping device, comfort, for 100/150/200/203mm dia. sieves	1	**9.739 230**
AS 200	Universal wet sieving clamping device, standard, for 100/150/200/203mm dia. sieves	1	**9.739 231**
AS 300	Wet sieving clamping device, standard, for 305mm dia. sieves	1	**9.739 251**
AS 300	Wet sieving clamping device, comfort, for 305mm dia. sieves	1	**6.232 828**
AS 400	Clamping device, comfort, for 400mm dia. sieves	1	**9.739 265**
AS 400	Clamping device, standard, for 400mm dia. sieves	1	**9.739 266**
AS 450 control	Clamping device, standard, for 400/450mm dia. sieves	1	**9.739 262**
AS 450 control	Clamping device, comfort, for 400/450mm dia. sieves	1	**9.739 267**
AS 450 control	Wet sieving clamping device, standard, for 400/450mm dia. sieves	1	**9.739 268**
AS 450 control	Wet sieving clamping device, comfort, for 400/450mm dia. sieves	1	**9.739 269**

Other accessories, such as sieve lids and intermediate receivers, are available on request.

Test sieve sets for Sieve Shakers AS series

Retsch

For	Diam. mm	Description	PK	Cat. No.
AS 200	200	Sieve set, mesh 45µm, 63µm, 125µm, 250µm, 500µm, 1mm, 2mm, 4mm, and collecting pan	1	**9.739 255**
AS 300	305	Sieve set, mesh 630µm, 1.25mm, 2.5mm, 5mm, 10mm, 20mm, 31.5mm, and collecting pan	1	**9.739 256**
AS 400	400	Sieve set, mesh 500µm, 1mm, 2mm, 5mm, 10mm, 20mm, and collecting pan	1	**9.739 257**
AS 450	450	Sieve set, mesh 63µm, 125µm, 250µm, 500µm, 1mm, 2mm, 4mm, and collecting pan	1	**9.739 279**

Other accessories, such as sieve lids and intermediate receivers, are available on request.

1



1 Vibratory sieve shaker ANALYSETTE 3 PRO and SPARTAN

Fritsch

For quantitative particle size analysis of dry samples and suspensions of all kind by dry and wet sieving with woven test sieves. FRITSCH Sieve Shakers satisfy all requirements for accurate and reproducible sieving analysis and perform automatic sieve analysis with the control and evaluation software AUTOSIEVE. The top model ANALYSETTE 3 PRO guarantees absolutely reproducible sieving results due to automatic amplitude control, programme selection, can be integrated as testing device into any quality management systems, has an RS232-interface, to mention only some of its innovative and practical features.

Sieving:	dry or wet
Sieve diameters:	100mm, 150mm, 200mm or 8"
Maximum number of sieves:	10 x 50mm (full) or 18 x 25mm (half) height
Sieves:	woven mesh metal sieves
Measuring range:	Dry sieving: 32µm to 63mm Wet sieving: 20µm to 10mm
Sample quantity:	Dry sieving: up to 2kg (depending on the sample material and sieve used) Wet sieving: 20 to 100g
Sieving time:	Dry sieving: 3 to 20 min Wet sieving: 5 to 10 min
Power supply:	100-240V/1~, 50-60Hz
Dimensions (WxDxH):	370 x 400 x 200mm
Net weight:	21kg

Type	PK	Cat. No.
Sieve Shaker ANALYSETTE 3 PRO	1	**9.826 402**
Sieve Shaker ANALYSETTE 3 SPARTAN	1	**9.826 403**

Clamping lid, sieve pan and sieves must be ordered separately.
Further sieve shakers available on request.

2



2 Accessories for vibratory sieve shakers, ANALYSETTE 3 PRO and SPARTAN

Fritsch

Type	For	PK	Cat. No.
Clamping lid, Plexiglas for 8" / 200mm diam. sieves	Dry sieving	1	**9.826 404**
Clamping lid, PA (without window) for all test sieves up to 200mm / 8" diam.	Dry sieving	1	**9.826 405**
Sieve tensioning system TorqueMaster (incl. clamping lid and electrical tool)	Dry sieving	1	**9.826 943**
Interposed sieve pan made of stainless steel 200mm diam., 50mm height	Dry sieving	1	**9.826 939**
Interposed sieve pan made of stainless steel 8" diam., 2" height	Dry sieving	1	**9.826 940**
Sieve pan, stainless steel 200mm diam., 50mm high	Dry sieving	1	**9.826 444**
Sieve pan, stainless steel 8" diam., 2" high	Dry sieving	1	**9.826 406**
Clamping lid, Plexiglas with 2 rotation nozzles for test sieves 8" / 200mm diam.	Wet sieving	1	**9.826 401**
Sieve pan, stainless steel with outlet 200mm diam., 50 mm high	Wet sieving	1	**9.826 446**
Interposed sieve ring with 3 nozzles for test sieves 200mm diam.	Wet sieving	1	**9.826 447**
Sieve pan, stainless steel with outlet, 8" diam., 2" high	Wet sieving	1	**9.826 449**
Interposed sieve ring with 3 nozzles for test sieves 8" diam.	Wet sieving	1	**9.826 450**

Test sieves as well as accessories for micro-precision sieving and for use of the ANALYSETTE 3 as Micro Mill (for grinding small sample quantities) on request.
Sieves, clamping lid and sieve pans with and without outlet are also available for 100 mm sieves.

Test Sieves

Retsch

Features:
- Previously unattained product quality owing to advanced manufacturing processes and continuous optical inspection.
- High quality joining technology guarantees permanently taut wire mesh.
- High level of corrosion resistance and easy to clean owing to the use of high-alloy stainless steel.
- "one-piece cast" sieve frame and seamless mesh joint prevent cross contamination.
- Maximum stability and optimum density of the sieve stack.
- 15% lighter than traditional sieves whilst at the same time having larger sieving area.
- Clear sieve marking and traceability by individual laser engraving on each sieve.

1 Test Sieves, , 200 x 50 mm.

Retsch

Mesh size µm	PK	Cat. No.
20	1	**9.226 650**
25	1	**9.226 651**
32	1	**9.226 652**
36	1	**9.226 653**
38	1	**9.226 654**
40	1	**9.226 655**
45	1	**9.226 656**
50	1	**9.226 657**
53	1	**9.226 658**
56	1	**9.226 659**
63	1	**9.226 660**
71	1	**9.226 661**
75	1	**9.226 662**
80	1	**9.226 663**
90	1	**9.226 664**
100	1	**9.226 665**
106	1	**9.226 666**
112	1	**9.226 667**
125	1	**9.226 668**
140	1	**9.226 669**
150	1	**9.226 670**
160	1	**9.226 671**
180	1	**9.226 672**
200	1	**9.226 673**
212	1	**9.226 674**
224	1	**9.226 675**
250	1	**9.226 676**
280	1	**9.226 677**
300	1	**9.226 678**
315	1	**9.226 679**
355	1	**9.226 680**
400	1	**9.226 681**
425	1	**9.226 682**
450	1	**9.226 683**
500	1	**9.226 684**
560	1	**9.226 685**
600	1	**9.226 686**
630	1	**9.226 687**
710	1	**9.226 688**
800	1	**9.226 689**
850	1	**9.226 690**
900	1	**9.226 691**

1



Ultrasonic baths with test sieve holder - please see page 1139

1



1 Test Sieves, 200 x 50mm

DIN ISO 3310-1 and BS 410-1. Dimensions (dia. x h): 200mm x 50mm. *Retsch*

Aperture size mm	PK	Cat. No.
1.00	1	**9.226 692**
1.12	1	**9.226 693**
1.18	1	**9.226 694**
1.25	1	**9.226 695**
1.40	1	**9.226 696**
1.60	1	**9.226 697**
1.70	1	**9.226 698**
1.80	1	**9.226 699**
2.00	1	**9.226 700**
2.24	1	**9.226 701**
2.36	1	**9.226 702**
2.50	1	**9.226 703**
2.80	1	**9.226 704**
3.15	1	**9.226 705**
3.35	1	**9.226 706**
3.55	1	**9.226 707**
4.00	1	**9.226 708**
4.50	1	**9.226 709**
4.75	1	**9.226 710**
5.00	1	**9.226 711**
5.60	1	**9.226 712**
6.30	1	**9.226 713**
6.70	1	**9.226 714**
7.10	1	**9.226 715**
8.00	1	**9.226 716**
9.00	1	**9.226 717**
9.50	1	**9.226 718**
10.00	1	**9.226 719**
11.20	1	**9.226 720**
12.50	1	**9.226 721**
13.20	1	**9.226 722**
14.00	1	**9.226 723**
16.00	1	**9.226 724**
18.00	1	**9.226 725**
19.00	1	**9.226 726**
20.00	1	**9.226 727**
22.40	1	**9.226 728**
25.00	1	**9.226 729**
26.50	1	**9.226 730**
28.00	1	**9.226 731**
31.50	1	**9.226 732**
35.50	1	**9.226 733**
37.50	1	**9.226 734**
40.00	1	**9.226 735**
45.00	1	**9.226 736**
50.00	1	**9.226 737**
53.00	1	**9.226 738**
56.00	1	**9.226 739**
63.00	1	**9.226 740**
71.00	1	**9.226 741**
75.00	1	**9.226 742**
80.00	1	**9.226 743**
90.00	1	**9.226 744**
100.00	1	**9.226 745**
106.00	1	**9.226 746**
112.00	1	**9.226 747**
125.00	1	**9.226 748**

1 Test Sieves, 200 x 25 mm

DIN ISO 3310-1 and BS 410-1. Dimensions (dia. x H): 200mm x 25mm. *Retsch*



Mesh size µm	PK	Cat. No.
20	1	**9.226 750**
25	1	**9.226 751**
32	1	**9.226 752**
36	1	**9.226 753**
38	1	**9.226 754**
40	1	**9.226 755**
45	1	**9.226 756**
50	1	**9.226 757**
53	1	**9.226 758**
56	1	**9.226 759**
63	1	**9.226 760**
71	1	**9.226 761**
75	1	**9.226 762**
80	1	**9.226 763**
90	1	**9.226 764**
100	1	**9.226 765**
106	1	**9.226 766**
112	1	**9.226 767**
125	1	**9.226 768**
140	1	**9.226 769**
150	1	**9.226 770**
160	1	**9.226 771**
180	1	**9.226 772**
200	1	**9.226 773**
212	1	**9.226 774**
224	1	**9.226 775**
250	1	**9.226 776**
280	1	**9.226 777**
300	1	**9.226 778**
315	1	**9.226 779**
355	1	**9.226 780**
400	1	**9.226 781**
425	1	**9.226 782**
450	1	**9.226 783**
500	1	**9.226 784**
560	1	**9.226 785**
600	1	**9.226 786**
630	1	**9.226 787**
710	1	**9.226 788**
800	1	**9.226 789**
850	1	**9.226 790**
900	1	**9.226 791**

2 Sieving aids

For difficult to separate materials which require dry sieving.
Different aids are used according to mesh size. *Retsch*



Type	PK	Cat. No.
Steatite ball, 6mm dia., 150g	1	**9.739 238**
Nylon brushes (pack of 3)	1	**9.826 131**
Vulkollan cube 12 x 12 x 12mm	10	**9.826 132**
Rubber ball, 20mm dia.	5	**9.826 133**
Agate ball, dia. 10mm	10	**9.826 134**
Test sieve rack for max. 10 sieves up to 203mm dia., 50mm height	1	**9.739 243**



1 Test Sieves, 200 x 25 mm.

DIN ISO 3310-1 and BS 410-1. Dimensions (dia. x H): 200mm x 25mm. *Retsch*

Aperture size mm	PK	Cat. No.
1.00	1	**9.226 792**
1.12	1	**9.226 793**
1.18	1	**9.226 794**
1.25	1	**9.226 795**
1.40	1	**9.226 796**
1.60	1	**9.226 797**
1.70	1	**9.226 798**
1.80	1	**9.226 799**
2.00	1	**9.226 800**
2.24	1	**9.226 801**
2.36	1	**9.226 802**
2.50	1	**9.226 803**
2.80	1	**9.226 804**
3.15	1	**9.226 805**
3.35	1	**9.226 806**
3.55	1	**9.226 807**
4.00	1	**9.226 808**
4.50	1	**9.226 809**
4.75	1	**9.226 810**
5.00	1	**9.226 811**
5.60	1	**9.226 812**
6.30	1	**9.226 813**
6.70	1	**9.226 814**
7.10	1	**9.226 815**
8.00	1	**9.226 816**
9.00	1	**9.226 817**
9.50	1	**9.226 818**
10.00	1	**9.226 819**
11.20	1	**9.226 820**
12.50	1	**9.226 821**
13.20	1	**9.226 822**
14.00	1	**9.226 823**
16.00	1	**9.226 824**
18.00	1	**9.226 825**
19.00	1	**9.226 826**
20.00	1	**9.226 827**
22.40	1	**9.226 828**
25.00	1	**9.226 829**
26.50	1	**9.226 830**
28.00	1	**9.226 831**
31.50	1	**9.226 832**
35.50	1	**9.226 833**
37.50	1	**9.226 834**
40.00	1	**9.226 835**
45.00	1	**9.226 836**
50.00	1	**9.226 837**
53.00	1	**9.226 838**
56.00	1	**9.226 839**
63.00	1	**9.226 840**
71.00	1	**9.226 841**
75.00	1	**9.226 842**
80.00	1	**9.226 843**
90.00	1	**9.226 844**
100.00	1	**9.226 845**
106.00	1	**9.226 846**
112.00	1	**9.226 847**
125.00	1	**9.226 848**



2 Analytical Sieve Test Sand

NEW!

Normensand GmbH

Test materials can be used to check analytical sieves between the schedulded calibration dates and to demonstrate the presence of the required properties, as well as the suitability of analytical sieves. A test material for analytical sieves with frequent mesh widths (2.0mm - 1.0mm - 0.5mm - 0.25mm - 0.125mm).
- Pack of 3
- Grain size 0.125mm - 2.00mm, 202g
- Data sheet for the use of traceability for analytical sieves

Description	PK	Cat. No.
Analytical Sieve Test Sand	3	**9.739 500**

E & OE.

1 Test Sieves, 203 x 50 mm

DIN ISO 3310-1 and BS 410-1. Dimensions (dia. x H): 203mm x 50mm. *Retsch*



Mesh size µm	PK	Cat. No.
20	1	**9.226 850**
25	1	**9.226 851**
32	1	**9.226 852**
36	1	**9.226 853**
38	1	**9.226 854**
40	1	**9.226 855**
45	1	**9.226 856**
50	1	**9.226 857**
53	1	**9.226 858**
56	1	**9.226 859**
63	1	**9.226 860**
71	1	**9.226 861**
75	1	**9.226 862**
80	1	**9.226 863**
90	1	**9.226 864**
100	1	**9.226 865**
106	1	**9.226 866**
112	1	**9.226 867**
125	1	**9.226 868**
140	1	**9.226 869**
150	1	**9.226 870**
160	1	**9.226 871**
180	1	**9.226 872**
200	1	**9.226 873**
212	1	**9.226 874**
224	1	**9.226 875**
250	1	**9.226 876**
280	1	**9.226 877**
300	1	**9.226 878**
315	1	**9.226 879**
355	1	**9.226 880**
400	1	**9.226 881**
425	1	**9.226 882**
450	1	**9.226 883**
500	1	**9.226 884**
560	1	**9.226 885**
600	1	**9.226 886**
630	1	**9.226 887**
710	1	**9.226 888**
800	1	**9.226 889**
850	1	**9.226 890**
900	1	**9.226 891**

Collecting pans, stainless steel

Stainless steel. In accordance to DIN ISO 3310-1 C and ASTM E 11-95. *Retsch*

Description	PK	Cat. No.
100mm dia., with outlet	1	**9.739 237**
200mm dia., without outlet	1	**9.739 235**
200mm dia., with outlet	1	**9.739 236**
203mm dia., without outlet	1	**9.739 239**
203mm dia., with outlet	1	**9.739 240**

Further collecting pans available on request.









1 2 3 Mesh, polyester

Thermo-fixed PE mesh with temperature resistance from 75°C to +150°C (short). For long term heating max. 125°C. Resistant to acids but not alkalis.
Dimensions: Minimum width 102cm, Length 100cm.

Mesh size µm	PK	Cat. No.
1	1	**9.068 210**
5	1	**9.068 211**
6	1	**9.068 212**
10	1	**9.068 213**
15	1	**9.068 214**
20	1	**9.068 215**
30	1	**9.068 216**
40	1	**9.068 217**
50	1	**9.068 218**
53	1	**9.068 219**
60	1	**9.068 220**
70	1	**9.068 221**
80	1	**9.068 222**
90	1	**9.068 223**
100	1	**9.068 224**
105	1	**9.068 225**
150	1	**9.068 226**
200	1	**9.068 227**
250	1	**9.068 228**
300	1	**9.068 229**
400	1	**9.068 230**
500	1	**9.068 231**
600	1	**9.068 232**
700	1	**9.068 233**
800	1	**9.068 234**
900	1	**9.068 235**
1000	1	**9.068 236**
1600	1	**9.068 237**
2000	1	**9.068 238**
3000	1	**9.068 239**
4000	1	**9.068 240**







4 5 6 Mesh, Polyamide

Thermo-fixed Polyamide (Nylon) mesh is temperature stable from -40°C to +115°C. Dry in water from 95°C to 100°C. Stability in acids is limited and dependant on concentration and temperature. Nylon exhibits outstanding stability in alkalis, including sodium and potassium solutions. Its chemical behaviour with respect to organic solvents is moderate to good. Minimum mesh width: 102cm, Length: 1m

Mesh size µm	PK	Cat. No.
1	1	**9.068 276**
5	1	**9.068 277**
6	1	**9.068 278**
10	1	**9.068 279**
15	1	**9.068 280**
20	1	**9.068 281**
30	1	**9.068 282**
40	1	**9.068 283**
50	1	**9.068 284**
60	1	**9.068 285**
70	1	**9.068 286**
80	1	**9.068 287**
90	1	**9.068 288**
100	1	**9.068 289**
125	1	**9.068 290**
150	1	**9.068 291**
200	1	**9.068 292**
250	1	**9.068 293**
300	1	**9.068 294**
400	1	**9.068 295**
500	1	**9.068 296**
600	1	**9.068 297**
700	1	**9.068 298**
780	1	**9.068 308**
800	1	**9.068 299**
900	1	**9.068 300**
950	1	**9.068 301**
1000	1	**9.068 302**
1150	1	**9.068 307**
1800	1	**9.068 303**
2000	1	**9.068 304**
3300	1	**9.068 305**
4000	1	**9.068 306**

1 Sample Splitters, RT series

To provide separation of pourable powders and bulk materials on site and in the laboratory. Operates independently of mains supply. Available in 6 sizes. Number of samples: 2.

Retsch



Type	Feed size up to mm	Maximum Throughput/ Charge	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
RT 6.5	6.3	5 L	300 x 270 x 250	3.50	1	**9.739 200**
RT 12.5	12.5	5 L	300 x 270 x 250	3.50	1	**9.739 201**
RT 25	25.0	16 L	620 x 420 x 260	21.50	1	**9.739 202**
RT 37.5	37.5	16 L	620 x 420 x 260	21.50	1	**9.739 203**
RT 50	50	16 L	620 x 420 x 260	21.50	1	**9.739 204**
RT 75	75	16 L	620 x 420 x 260	21.50	1	**9.739 205**

2 Vibratory Feeder DR 100

NEW!

For the continuous, automatic material conveyance to, and feeding of, sample dividers, mills, balances or analytical and measuring apparatus.

Retsch



Specifications:
- Weight: approx. 10kg
- Supply requirements: 220-240V, 50Hz.

DR 100 supplied with: sample divider attachment, with plug-in, 40mm wide chute and mounting plate.
Accessories: Further hoppers, chutes and vibrating tubes made of stainless steel available on request.

Type	PK	Cat. No.
Feeder DR 100	1	**9.739 305**

3 Sample Divider PT 100

Rotary tube divider for the representative sample division with an extremely high division accuracy. Rapid and easy handling of sample vessels thanks to quick-release clamps.

Retsch



Supplied with: PT 100 incl. deviding head with 8 quick-release sample outlets, vibratory feeder DR 100/40 and 10 sample bottles (250ml).

Specifications:

Feed size:	up to 10mm
Number of samples:	8 (6 or 10 heads also available on request)
Throughput/charge:	5000ml
Dimensions (WxDxH):	580 x 420 x 910mm
Weight: approx.:	34kg
Supply requirements:	230V, 50Hz

Type	PK	Cat. No.
Sample Divider PT 100	1	**9.739 147**



1 Rotary cone sample divider LABORETTE 27

Fritsch

Creates the optimal basis for reliable analysis of a representative sample! Representative samples division is the foundation for every precise analysis. The rotary cone sample divider LABORETTE 27 achieves due to its unique combination of three methods previously unheard of dividing precision. Variable division ratios and the design in several variants guarantee adaptation to a wide range of applications with a dividing accuracy of up to 99.9%. For optimal sample feeding the vibratory feeder LABORETTE 24 (optional) is recommended.

Division:	of solid samples and suspensions, without modification
Division ratio:	1:8, 1:10, 1:30
Number of sub-sets:	8, 10, 3
Max. particle size:	10mm, 2.5mm
Max. feed volume:	4000ml, 2500ml, 300ml
Sample bottle capacities:	15, 20, 25, 30, 250, 500ml
Power supply:	230V/1~, 50-60Hz
Dimensions (WxDxH):	270 x 450 x 460mm
Net weight:	7.7kg

Type	PK	Cat. No.
Rotary cone sample divider LABORETTE 27	1	**9.738 310**

Instrument also available in other voltages.
Dividing heads must be ordered separately.

Accessories for rotary cone sample divider LABORETTE 27

Fritsch

Division ratio	Material	Sample bottles ml	PK	Cat. No.
1:8	POM plastic	500	1	**9.738 316**
1:8	aluminium	500	1	**9.738 313**
1:10	POM plastic	250	1	**9.738 317**
1:10	aluminium	250	1	**9.738 318**
1:30	POM plastic	15	1	**9.738 319**
1:30	aluminium PTFE-coated	15	1	**9.738 314**

All dividing heads are delivered inclusive of sample bottles and funnels.



1 Homogeniser SilentCrusher S



Small model for use in microbiology *Heidolph*

- Unique and truly driveless technology allows for uncontrollable years of maintenance-free operation eliminating down times and spare parts cost
- This unique magnetic drive technology allows for operation in a reduced particle environment
- The drive unit is designed without any clutches, and therefore the level of noise is reduced to a minimum
- Operate your SilentCrusher without ear plugs and without any risk to your health
- Featuring a speed range up to 75000rpm the SilentCrusher S is by far the fastest and most silent homogenizer in the world
- To protect your sample effectively from any thermal damage the drive system switches off automatically after 90 seconds
- Superior ease of use: Simply drop the reaction vessel into the drive system and it will start automatically
- If required, you can easily cool down samples by using ice or cold water. Three discs are included in every shipment which allow for height positioning of any cooling tray
- Ideal for homogenizing sample quantities from 0.8ml to 10ml and a viscosity up to 5000mPa s
- Choose from three different sterilisable generators: 3.5mm or 7mm, these options will certainly include a generator that works best for your needs

Specifications:

Input Power:	24W
Dimensions:	
Drive (dia. x H):	125 x 197mm
Power Supply Pack (W x H x D):	106 x 30 x 65mm
Voltage:	100-240V, 47-63Hz
Protection Class:	IP30
Weight:	0.8kg

Type	PK	Cat. No.
SilentCrusher S	1	**9.570 135**

2 Generators Homogeniser SilentCrusher S



- Homogenise with high-quality generators made of corrosion-resistant stainless steel AISI 316 *Heidolph*
- SilentCrusher generators are easily disassembled for quick and convenient cleaning; ideal for multiple samples
- Generators are autoclavable up to 130°C or allow for air sterilization up to 180°C
- To ensure years of unlimited usage the ball bearings and the attachment for the generators are made of chemically-resistant PTFE
- 10 Polypropylene vessels which perfectly fit your generator of choice are included as a standard

Type	Stator diam. mm	Shaft length min. mm	Output particle size mm	Volume ml	Recommendations for use	PK	Cat. No.
3 F	3.3	26	<0.4	0.8 to 1.0	Reaction tubes	1	**9.570 136**
5 F	5.0	38	<0.4	2.0 to 4.0	Test tubes	1	**9.570 137**
7 F	7.0	55	<0.4	6.0 to 10.0	Test tubes	1	**9.570 138**

For our Life Science product range - please see page 1225

1



1 Homogeniser SilentCrusher M

Model for all standard applications *Heidolph*

- Unique and truly driveless technology allows for uncontrollable years of maintenance-free operation eliminating down times and spare parts cost
- The high speed range reduces process times significantly
- This unique magnetic drive technology allows for operation in a reduced particle environment
- The drive unit is designed without any clutches, and therefore the level of noise is reduced to a minimum
- Operate your SilentCrusher without ear plugs and without any risk to your health
- With a speed range up to 26000rpm the SilentCrusher M is the most silent homogeniser in the world
- Large digital display allows for easy setting and readout even from a distance
- Speed can be adjusted individually from 5000rpm to 26000rpm
- Your first choice for any quantities from 0.8ml to 2000ml
- Allows for any viscosity up to 5000mPa s
- Choose from 13 different sterilisable generators: From 6mm to 22mm diameter you will find options which meet your specification

Plug & Play SilentCrusher M

This package includes:
- SilentCrusher M
- Plate stand
- 2 Boss head clamps
- Vessel holding bracket

Type	PK	Cat. No.
SilentCrusher M	1	**9.570 140**
Plug & Play SilentCrusher M	1	**6.233 404**

2



2 Generator for Homogeniser SilentCrusher M

- Homogenise with high quality generators made of corrosion resistant stainless steel AISI 316 *Heidolph*
- SilentCrusher generators are easily disassembled for quick and convenient cleaning, ideal for multiple samples
- Generators are autoclavable up to 130°C or allow for air sterilisation up to 180°C
- Due to interchangeable ball bearings and chemically resistant PTFE, all bearings are designed for years of unlimited usage
- For larger samples it may be necessary to pre-crush samples. In this case we recommend generators which feature additional sprockets (except for 18G, 18DG, 22G)
- For applications under vacuum down to 20mbar or pressure up to 6 bar we recommend our sealed generators

Type	Stator diam. mm	Rotor diam. mm	Slit width mm	Length mm	Volume ml	Output particle size mm	PK	Cat. No.
6 F	5.3	3.20	0.6	60	0.8 to 30	< 0.4	1	**9.570 139**
8 F	8.2	6.60	0.6	80	3 to 50	< 0.4	1	**9.570 141**
8 DF*	8.2	6.60	0.6	75	3 to 50	< 0.4	1	**9.570 142**
12 F	12.0	9.00	0.6	120	25 to 250	< 2.0	1	**9.570 143**
12 G	12.0	9.00	2.0	120	25 to 250	< 2.0	1	**9.570 144**
12 DF*	12.0	9.00	0.6	115	25 to 250	< 2.0	1	**9.570 145**
12 DG*	12.0	9.00	2.0	115	25 to 250	< 2.0	1	**9.570 146**
18 F	18.0	12.50	1.5	180	100 to 1500	< 4.0	1	**9.570 147**
18 G	18.0	12.50	3.0	180	100 to 1500	< 4.0	1	**9.570 148**
18 DF*	18.0	12.50	1.5	175	100 to 1500	< 4.0	1	**9.570 149**
18 DG*	18.0	12.50	3.0	175	100 to 1500	< 4.0	1	**9.570 150**
22 F	22.0	16.50	1.5	180	100 to 2000	< 4.0	1	**9.570 104**
22 G	22.0	16.50	3.0	180	100 to 2000	< 4.0	1	**9.570 105**

* For applications under pressure or vacuum (max. pressure 6 bar/min. vacuum 20 mbar).

3



3 Accessories for Homogeniser SilentCrusher M

Plate stand *Heidolph*

Footprint: 180 x 245mm, Shaft: diameter 13mm, Length: 600mm, Weight: 1.8kg

Boss head

Please note, 2 clamps are required to attach the SilentCrusher M and the vessel holding bracket.

Vessel holding bracket incl. 2 retainer rings

For different vessels diameter 20mm to 105mm

Type	PK	Cat. No.
Plate stand	1	**9.570 151**
Boss head	1	**9.570 152**
Vessel holding bracket incl. 2 retainer rings	1	**9.570 153**

E & OE.

1 Homogenizer, POLYTRON® PT 1200 E

NEW!

Kinematica



1

This handheld homogenizer is ideal for quick processing of small sample quantities and volumes, for example in Life science or genetic.

Application volume: 0.05 to 250ml
- Soft start prevents splashing of homogenate from sample vessel
- Tip speed up to 12 m/s
- Ergonomic design and various models of dispersing aggregates in Easy-to-Clean design

Applications:
- General homogenization applications (dispersion and emulsification)
- Sample preparation for subsequent extraction of pharmaceutical agents (API)
- Cell disruption, RNA/DNA isolation from tissue
- Dispersion of small quantities from plants, animals or human tissue

Specifications:

Application volume:	0.05 to 250ml
Motor input power:	100W
Aggregates:	dia. 3, 5, 7 and 12mm and dia. 20mm X EC-E116 Aggregat
Speed range:	Stepless up to 25.000min^{-1}
Max. viscosity:	6000mPas
Drive Dimensions (L x W x H):	220 x 44 x 55 mm
Weight drive:	440g
Tested to:	EN/IEC 61010, 61326-1

Type	PK	Cat. No.
PT 1200 E, 230V (with EU-plug)	1	**9.571 492**

Homogenizer, POLYTRON® PT 1300 D

NEW!

Kinematica



2

9.571 493

This digital Homogenizer, is ideal for quick processing of small sample quantities and volumes, for example in Life science or genetic. Storing the desired speed ensures repetitive and reproducible homogenizations. When the unit is switched off, the last stored speed is saved. This drive can be controlled using our KIN software from a PC via USB or RS232.

- Application volume 0.05 to 250ml
- Soft start prevents splashing of homogenate from sample vessel
- Tip speed up to 14 m/s
- Speed remains constant even when viscosity changes
- PC interfaces (RS 232 and USB)
- MEMO function of the stored speed
- Ergonomic design and various models of dispersing aggregates in Easy-to-Clean design

Applications look also at PT 1200 E:
- Reproducible processes

Specifications:

Application volume:	0.05 to 250ml
Motor input power:	100W
Aggregates:	dia. 3, 5, 7 and 12mm and dia. 20mm X EC-E116 Aggregat
Speed range:	Stepless up to 30.000min^{-1}
Max. viscosity:	6000mPas
Drive Dimensions (L x W x H):	210 x 40 x 45mm Drive, 230 x 205 x 95mm Base
Weight drive:	620g
Tested to:	IEC/EN 61000-6-2/EN 61000-6-3/IEC/EN 61010-2-51

Type	PK	Cat. No.
PT 1300 D, 230V (with EU-plug)	1	**9.571 493** 2

1



1 Homogenizer, POLYTRON® PT 2500 E

NEW!

Kinematica

The PT2500 E is the ideal solution for cost-conscious laboratories.
It is able to perform a lot of applications.

- Application volume 0.05 to 2500ml
- Soft start prevents splashing of homogenate from sample vessel
- Tip speed up to 32 m/s
- Speed remains constant even when viscosity changes
- Various models of dispersing aggregates in Easy-to-Clean design

Applications:
- General homogenization applications (dispersion and emulsification)
- Formulation of lotions, creams and food
- Production of oil-water emulsions

Specifications:

Application volume:	0.05 to 2500ml
Motor input power:	500W
Aggregates:	dia. 3, 5, 7 and 12mm and dia. 20mm and 25mm
Speed range:	Stepless up to 30.000min^{-1}
Max. viscosity:	6000mPas
Drive Dimensions (L x W x H):	157 x 76 x 236mm
Tested to:	IEC/EN61326-1/IEC/EN 61000-6-2/EN 61000-6-4 IEC/EN 61010-2-51

Type	PK	Cat. No.
PT-MR 2500 E, 230V/EU package with ST-P11/600, drive holder, vessel holder, safety pos. ring	1	**9.571 494**

Dispersing aggregates for Homogenizer POLYTRON® 1200 E, 1300 D and 2500 E

NEW!

Kinematica

For model	Type	Length mm	Diam. mm	Working volume ml	PK	Cat. No.
PT 1200 E / PT 1300 D / PT 2500 E	PT-DA 03/2 EC-E050	50	3	0,05 - 2	1	**6.258 269** 2
PT 1200 E / PT 1300 D / PT 2500 E	PT-DA 05/2 EC-E085	85	5	0,1 - 5	1	**9.570 223**
PT 1200 E / PT 1300 D / PT 2500 E	PT-DA 07/2 EC-E107	107	7	0,3 - 10	1	**6.258 271**
PT 1200 E / PT 1300 D / PT 2500 E	PT-DA 07/2SYN-E082	82	7	0,3 - 10	25	**6.258 273** 3
PT 1200 E / PT 1300 D / PT 2500 E	PT-DA 12/2SYN-E123	123	12	2 - 250	10	**9.570 224**
PT 2500 E	PT-DA 12/2 EC-E157	157	12	2- 250	1	**9.570 225**
PT 2500 E	PT-DA 20/2 EC-E192	192	2	100 - 2500	1	**6.258 234**
PT 1200 E / PT 1300 D / PT 2500 E	PT-DA 20/2X EC-E116	116	20	10 - 250	1	**9.570 226**
PT 2500 E	PT-DA 25/2 EC-E192	192	25	100 - 2500	1	**9.570 227**

2



6.258 269

3



6.258 273

Dispersing aggregates for Homogenizer POLYTRON® 10-35 GT, 3100 D and 6100 D

NEW!

Kinematica

For model	Type	Length mm	Diam. mm	Working volume ml	PK	Cat. No.
PT 10-35 GT / PT 3100 D / PT 6100 D	PT-DA 20/2 EC-E192	192	2	100 - 2500	1	**6.258 234**
PT 10-35 GT / PT 3100 D / PT 6100 D	PT-DA 30/2 EC-F250	250	2	100 - 4000	1	**9.570 228**
PT 10-35 GT / PT 3100 D / PT 6100 D	PT-DA 30/4 EC-F250	250	4	100 - 4000	1	**6.258 233**
PT 10-35 GT / PT 3100 D / PT 6100 D	PT-DA 36/2 EC-F250	250	2	200 - 4500	1	**9.570 229**
PT 3100 D / PT 6100 D	PT-DA 40/2 EC-F250	250	2	200 - 5000	1	**9.570 230**
PT 3100 D / PT 6100 D	PT-DA 45/2 EC-F250	250	2	200 - 6000	1	**9.570 231**
PT 3100 D / PT 6100 D	PT-DA 45/6 EC-F250	250	6	200 - 6000	1	**9.570 232**
PT 3100 D / PT 6100 D	PT-DA 50/2 EC-F250	250	2	1000 - 10000	1	**9.570 233**

1 Homogenizer, POLYTRON® PT 10-35 GT

NEW!

Kinematica



The powerfull Motor is helpfully for sample preparation and also for formulation in scaleup matters

- Application volume 0.1 up to 10.000ml
- Soft start prevents splashing of homogenate from sample vessel
- Tip speed up to 32m/s
- Speed remains constant even when viscosity changes
- Various models of dispersing aggregates in Easy-to-Clean design

Applications:
- General homogenization applications (dispersion and emulsification)
- Formulation of lotions, creams and food
- Production of oil-water emulsions
- Dispersion of small quantities from plants, animals or human tissue

Specifications:

Application volume:	0.1 to 10.000ml
Motor input power:	1200W
Aggregates:	ø 20, 30, 36mm
Speed range:	Stepless up to 30.000min^{-1}
Max. viscosity:	6000mPas
Drive Dimensions (L x W x H):	95 x 210 x 247mm
Tested to:	IEC/EN 61000-6-2/EN 61000-6-3/IEC/EN 61010-2-51

Type	PK	Cat. No.
PT-MR 10-35 GT, 230V/EU package with ST-P10/600, drive holder, vessel holder, safety pos. ring	1	**9.571 490**

2 Homogenisierer, POLYTRON® PT 3100 D/PT 6100 D

NEW!

Kinematica



This dispersion units are a unique class. Applications with highest demands on reproducibility or requiring a scale-up step are excellently served by this unit.
The complete digitalised control and regulating system can be easily operated using the membrane keyboard.
The bright and informative display shows all parameters. Via PC interface, diverse parameters such as speed profile or times can be specified using the enclosed KIN software. Results can be recorded as an Excel file.

- Application volume 0.1 up to 30.000ml
- Soft start prevents splashing of homogenate from sample vessel
- Tip speed up to 32m/s
- Speed remains constant even when viscosity changes
- PC interfaces (RS 232 and USB)
- Digital display for showing different process parameters and messages
- Various models of dispersing aggregates in Easy-to-Clean design

Applications (see also POLYTRON® PT10-35-GT):
- reproduce of work routine
- testing for scaleup

Specifications:

Application volume:	PT 3100 D 0.1 to 10 litres PT 6100 D 0.1 to 30 litres
Motor input power:	PT 3100 D with 1200W PT 6100 D with 1700W
Aggregates:	ø 20, 30, 36, 40, 45, 50mm
Speed range:	Stepless up to 30.000min^{-1}
Max. viscosity:	6000mPas
Drive Dimensions (L x W x H):	PT 3100 D 240 x 130 x 265mm PT 6100 D 360 x 164 x 313mm
Tested to:	IEC/EN 61000-6-2/EN 61000-6-3/IEC/EN 61010-2-51

Type	PK	Cat. No.
PT-MR 3100 D, 230V/EU package with ST-F10/600	1	**6.235 534**
PT-MR 6100 D, 230V/EU package with ST-F11/855	1	**9.571 491**

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9.570 500

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9.570 506

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4.008 150

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4 Disperser System Ultra-Turrax® Tube Drive

IKA

Disperse, stir and grind using a single drive unit. Patented disposable disperser system for volumes from 2ml to 50ml with hermetically sealable, disposable sample tubes.
Provides protection and safety from: Infectious samples, toxic substances, strong-smelling materials.
- no possibility of cross-contamination
- suitable for individual or serial operations
- increased safety due to low voltage (24V) power
- chemically resistant plastic containers
- anti-locking function
- patented
- worldwide service guaranteed by Ika®

ULTRA-TURRAX® Tube Drive Workstation additionally with:
- USB interface for experiment control and documentation
- Collecting tray for protection against leaking liquids
- Simple, precise and multilingual menu navigation with OLED display
- Programmable sample conditions (library)
- Tubo button for short-term, intensive mixing, dispersing and grinding
- Adjustable reverse operation

ULTRA-TURRAX® Tube Drive Workstation supplied with:
Ultra Turrax® Tube Drive, 2 x DT-20 dispersing tubes incl. hook for removing the rotor-stator unit, 2 x ST-20 stirring tubes, 2 x BMT-20 G/S Ball-mill-tubes (with glass balls/stainless steel balls, respectively), power supply and 1 x removal hook for removal the rotor-stator unit.
Dispersing tubes (20ml and 50ml) with pierceable membrane and γ-sterilised are available on request.

ULTRA-TURRAX® Tube Drive control Workstation supplied with:
ULTRA-TURRAX® Tube Drive control , 1 x ST-20, 1 x DT-20 incl. 1 removal hook for removal the rotor-stator unit, 2 x BMT-20 G/S, power supply.

Specifications

Motor rating input/output	
ULTRA-TURRAX® Tube Drive:	20/17 W
ULTRA-TURRAX® Tube Drive control:	28/17 W
Volume:	2ml to 50ml
Viscosity max.:	5000mPas
Speed range	
ULTRA-TURRAX® Tube Drive:	300rpm to 6000rpm
ULTRA-TURRAX® Tube Drive control:	400rpm to 800rpm
Noise without element:	50dB(A)
Timer	
ULTRA-TURRAX® Tube Drive:	1 to 59sec. (300 to 6000rpm) 1 to 29min. (300 to 4000rpm)
ULTRA-TURRAX® Tube Drive control:	1 sec. up to 30min. (continuously adjustable)
Protection class according to DIN EN 60529:	IP20
Supply requirements:	100v - 240V /50/60Hz
Tested to DIN EN IEC 61010-1.	

Description	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
Ultra-Turrax® Tube Drive	100 x 160 x 40	0.75	1	**9.570 500** 1
Ultra-Turrax® Tube Drive Workstation	100 x 160 x 40		1	**9.570 506** 2
ULTRA-TURRAX® Tube Drive control	122 x 178 x 54	0.90	1	**4.008 150** 3
ULTRA-TURRAX® Tube Drive control Workstation	122 x 178 x 54		1	**4.008 135**
DT-20 Dispersing Tube			25	**9.570 507**
ST-20 Stirring Tube			25	**9.570 508**
BMT-20 G Ball-Mill-Tube (with glass balls)			25	**9.570 509**
BMT-20 S Ball-Mill-Tube (with stainless steel balls)			25	**9.570 510**

50 ml tubes available on request.

E & OE.

1 2 Dispersing instrument T 10 standard ULTRA-TURRAX® PCR Kit

NEW!

IKA

Competitively priced dispersing instrument for volumes of 0.5ml to 100ml.
A wide speed range allows you to work at high circumferential speeds.
- maintains speed with various media thanks to high performance 125W drive
- ideal for manual operation thanks to its light weight and ergonomic form
- extremely mobile thanks to direct mains operation (no transformer required)
- stainless steel dispersing elements (5mm, 8mm and 10mm diameter) can be cleaned quickly and easily as they can be dismantled without tools
- plastic disposable dispersing elements in two sizes, particularly suitable for PCR analysis
- quick-release coupling makes changing the dispersing elements easy

Supplied with: storage case to hold drive and accessory dispersing elements (to be ordered separately), spare seals and R 200 clamp

Specifications:

Motor rating input/output:	125/75W
Working volume range (H_2O):	0.5 to 100ml
maximum viscosity:	5000mPas
Speed range:	8000 to 30000rpm
Speed adjustment:	stepless
Speed display:	Scale (1 to 6)
Clamping rod diameter/length:	8 mm/100mm
Dimensions:	46 x 57 x 201mm
Weight:	0.4kg
Protection rating to DIN EN 60529:	IP30
Tested to DIN EN IEC 61010-1.	

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Type	PK	Cat. No.
T 10 standard ULTRA-TURRAX® PCR Kit	1	**9.570 959**

3 Homogeniser T 10 basic ULTRA-TURRAX®

NEW!

IKA

Small dispersing instrument for volumes from 0.5ml to 100ml (H_2O). It offers a wide speed range from 8000rpm to 30000rpm that enables users to work at high circumferential speeds even with small rotor diameters. A broad choice of dispersing elements guarantees a wide range of applications.

- Quick-connect coupling for changing dispersing elements easily
- Ideal for manual operation due to its light weight and ergonomic design
- Extremely mobile due to direct line power (no transformer required)
- Stainless steel dispersing elements can be cleaned quickly and easily as they can be dismounted without tools
- Plastic disposable dispersing elements are available in two sizes, particularly suitable for PCR analysis
- High performance drive ensures immense speed stability
- Quiet operation

Specifications:

Motor rating input/output:	125W/75W
Working volume range (H_2O):	0.5ml to 100ml
Viscosity max.:	5000mPas
Speed range:	8000rpm to 30000rpm
Speed display:	scale
Speed control:	stepless
Noise without element:	65dB(A)
Extension arm diam./length:	8mm/130mm
Dimensions (WxDxH):	56 x 66 x 178mm
Weight:	0.5kg
Power supply:	230V, 50/60Hz
Protection class DIN EN 60529:	IP 30

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Type	PK	Cat. No.
T 10 basic ULTRA-TURRAX®	1	**9.570 940**
T 10 basic S2 ULTRA-TURRAX® UK	1	**9.570 941**
T 10 basic S3 ULTRA-TURRAX® CH	1	**9.570 942**

Dispersing heads Ultra Turrax® T 10 basic

Dispersing heads, plastic: Autoclavable. Dispersing heads, stainless steel: Ultimate fineness emulsions 1 to 10µm and suspensions 5 to 25µm, sterilisable by all methods. *IKA*

Type	Material	Diam. rotor / stator mm	Max. immersion depth mm	Working volume ml	PK	Cat. No.	
S 10 D - 7G - KS - 65	PC, PSU	4.8 / 7	50	1 to 20	25	**9.570 875**	1
S 10 D - 7G - KS - 110	PC, PSU	4.8 / 7	90	1 to 40	25	**9.570 877**	2
S 10 N - 5 G	PTFE, AISI 316L	3,8 / 5	75	0.5 to 10	1	**7.631 964**	3
S 10 N - 8 G	PTFE, AISI 316L	6,1 / 8	95	1 to 50	1	**6.225 614**	4
S 10 N - 10 G	PTFE, AISI 316L	7,6 / 10	100	1 to 100	1	**6.225 477**	5

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9.570 875

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7.631 964

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6.225 614

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6.225 477

Accessories - please see page 575

6 

6 Homogeniser T 18 digital ULTRA-TURRAX®

NEW!

Competitively priced dispersing instrument for volumes from 1ml to 1500ml (H_2O) with digital speed display. It offers a wide speed range from 500rpm to 25000rpm that enables users to work at high circumferential speeds even with small rotor diameters. A broad choice of dispersing elements guarantees a wide range of applications. *IKA*

- Digital speed display
- Electronic speed control
- Electronic overload protection
- Stainless steel dispersing elements can be cleaned quickly and easily
- Plastic disposable dispersing elements are available in two sizes
- Error code display
- Quiet operation

Specifications

Motor rating input/output:	500W/300W
Working volume range (H_2O):	1ml to 1500ml
Viscosity max.:	5000mPas
Speed range:	500rpm to 25000rpm
Speed display:	LED
Speed control:	stepless
Noise without element:	75dB(A)
Extension arm diam./length:	13mm/160mm
Dimensions (WxDxH):	87 x 106 x 271mm
Weight:	2.5kg
Power supply:	200-240 V, 50/60Hz
Protection class DIN EN 60529:	IP 20

Type	PK	Cat. No.
T 18 digital ULTRA-TURRAX®	1	**9.570 943**
T 18 digital S2 ULTRA-TURRAX® UK	1	**9.570 944**
T 18 digital S3 ULTRA-TURRAX® CH	1	**9.570 945**
T 18 digital ULTRA-TURRAX® Package	1	**9.570 946**
T 18 digital S2 ULTRA-TURRAX® Package UK	1	**9.570 947**
T 18 digital S3 ULTRA-TURRAX® Package CH	1	**9.570 948**

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7 Dispersing heads for Ultra Turrax® T18 basic

Plastic dispersing heads: Autoclavable
Stainless steel dispersing heads: Ultimate fineness emulsions 1 to 10µm and suspensions 10 to 50µm, sterilisable by all methods. *IKA*

Type	Diam. rotor / stator mm	Max. immersion depth mm	Working volume ml	Material	PK	Cat. No.
S 18 D-10 G-KS	6.75 / 10	85	10 to 100	PC, PEEK	10	**9.570 855**
S 18 D-14 G-KS	9.5 / 14	85	10 to 500	PC, PEEK	10	**9.570 857**
S 18 N-10 G	7.5 / 10	70	1 to 100	PTFE, AISI 316L	1	**9.570 841**
S 18 N-19 G	12.7 /19	170	10 to 1500	PTFE, AISI 316L	1	**9.570 842**

E & OE.

1 Homogeniser T 25 digital ULTRA-TURRAX®

NEW!

IKA

High-performance dispersing instrument for volumes from 1 to 2000ml (H_2O) with digital speed display. It offers a wide speed range from 500 to 25000rpm that enables users to work at high circumferential speeds even with small rotor diameters. A broad choice of dispersing elements adds versatility. Applications ranges from homogenizing waste water samples, use in laboratory reactors, dispersion tasks under vacuum/pressure and sample preparation in medical diagnostics.

- Digital speed display
- Electronic speed control
- Electronic overload protection
- Stainless steel dispersing elements can be cleaned quickly and easily
- Plastic disposable dispersing elements are available in two sizes
- Error code display
- Quiet operation

Specifications

Motor rating input/output:	800/500W
Working volume range (H_2O):	1 to 2000ml
Viscosity max.:	5000mPas
Speed range:	500 to 25000rpm
Speed display:	LED
Speed control:	stepless
Noise without element:	75dB(A)
Extension arm diam./length:	13mm/160mm
Dimensions (WxDxH):	87 x 106 x 271mm
Weight:	2.5kg
Power supply:	200-400 V, 50/60Hz
Protection class DIN EN 60529:	IP 20

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Type	PK	Cat. No.
T 25 digital ULTRA-TURRAX®	1	**9.570 949**
T 25 digital S2 ULTRA-TURRAX® UK	1	**9.570 950**
T 25 digital S3 ULTRA-TURRAX® CH	1	**9.570 951**

Dispersing heads for T25 basic Ultra-Turrax®

IKA

Plastic dispersing heads: Autoclavable.
Stainless steel dispersing heads: Ultimate fineness: emulsions 1µm to 10µm and suspensions 5µm to 50µm, sterilisable by all methods.

Type	Diam. rotor / stator mm	Max. immersion depth mm	Working volume ml	Material	PK	Cat. No.
S 25 D-10 G-KS	6.75 / 10	85	10 - 100	PC, PEEK	10	**9.570 859** 2
S 25 D-14 G-KS	9.5 / 14	85	10 - 500	PC, PEEK	10	**9.570 861** 3
S 25 N - 8 G	6.1 / 8	85	1 - 50	PTFE, AISI 316L	1	**9.571 098**
S 25 N - 10 G	7.5 / 10	85	1 - 100	PTFE, AISI 316L	1	**9.571 207**
S 25 N - 18 G	12.7 / 18	165	10 - 1500	PTFE, AISI 316L	1	**9.571 119**
S 25 NK - 19 G	12.7 / 19	165	25 - 1500	PTFE, AISI 316L	1	**9.571 121**
S 25 KV - 25 G	17.0 / 25	225	50 - 2000	FFPM / SIC, AISI 316L	1	**9.571 198**
S 25 N - 25 G	17.0 / 25	165	50 - 2000	PTFE, AISI 316L	1	**9.571 200** 4
S 25 N - 25 F	18.0 / 25	165	100 - 2000	PTFE, AISI 316L	1	**9.571 201**
S 25 KV - 25 F	18.0 / 25	225	100 - 2000	FFPM / SIC, AISI 316L	1	**9.571 199**

Further dispersing heads are available on request.

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9.570 859

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9.570 861

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9.571 200

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1 High-power homogeniser T 50 digital ULTRA-TURRAX®

NEW!

IKA

Powerful dispersing instrument for volumes from 0.25 to 30l (H_2O) with digital speed display. It offers a wide speed range from 500 to 10000rpm that enables users to work at high circumferential speeds even with small rotor diameters. A broad choice of dispersing elements guarantees a wide range of applications. Reproducible operations due to constant speed even with changes in viscosities.

- Digital speed display
- Electronic speed control
- Electronic overload protection
- Stainless steel dispersing elements can be cleaned quickly and easily
- Smooth start
- Error code display

Specifications

Motor rating input/output:	1100W/700W
Working volume range (H_2O):	0.25 to 30l
Viscosity max.:	5000mPas
Speed range:	500 to 10000rpm
Speed display:	LED
Speed control:	stepless
Noise without element:	72dB(A)
Extension arm diam./length:	16mm/220mm
Dimensions (WxDxH):	115 x 139 x 355mm
Weight:	5.76kg
Power supply:	200-240 V, 50/60Hz
Protection class DIN EN 60529:	IP 20

Type	PK	Cat. No.
T 50 digital ULTRA-TURRAX®	1	**9.570 952**
T 50 digital S2 ULTRA-TURRAX® UK	1	**9.570 953**
T 50 digital S3 ULTRA-TURRAX® CH	1	**9.570 954**

Dispersing heads for T50 basic ULTRA-TURRAX®

Stainless steel dispersing heads *IKA*

Type	Diam. rotor / stator mm	Max. immersion depth mm	Working volume l	Ult. fineness suspensions / emulsions µm	Material	PK	Cat. No.
S 50 N - G 45 G*	36,0 / 45	250	0.5 to 20	40 to 100	PTFE, AISI 316L	1	**9.570 882** 2
S 50 N - G 45 M*	40.5 / 45	250	0.5 to 15	25 to 50	PTFE, AISI 316L	1	**9.570 886** 3
S 50 N - G 45 F*	40.0 / 45	250	0.25 to 10	10 to 30	PTFE, AISI 316L	1	**9.570 896** 4

* sterilisable by all methods

Further dispersing heads are available on request.

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9.570 882

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9.570 886

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9.570 896

We can **supply** this **manufacturer's whole product range !**

IKA®

partner of the LLG Lab Logistics Group

E & OE.

Special dispersing heads for disperser T50 basic

IKA

R 50 "high speed" stirring shaft
Using the R 50 stirring shaft, the T50 basic is quickly converted into a high speed stirrer. 700W power and 10000rpm are provided for rapid mixing, dissolving, and breaking up pigment agglomerates. The conical shaft is supported by means of ball bearings, the mixing elements have a screw connection. For operational safety a protective cage is fitted around the mixing element.

S 50 N - W 80 SMK Jet mixer head
For shortening mixing and dissolving times. The vertical flow and the high tangential speed, up to 10000rpm, ensure intensive mixing. The head is used for adding gases or liquids, for lump-free suspension of difficult to dissolve powders or for dissolving sedimented, accreted substances.

S 50 N - W 65 SK Cutting head
To crush large pieces (up to 50mm) of fibrous materials, such as plant matter, vegetables and fruit.

Type	Max. immersion depth mm	Working volume l	PK	Cat. No.	
R 50	180	0.25 to 30	1	**9.571 350**	1
S 50 N - W 80 SMK	350	1 to 50	1	**9.570 926**	2
S 50 N - W 65 SK	350	1 to 10	1	**9.570 922**	3

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9.571 350

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9.570 926

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9.570 922

Type	Volume range L	Rotor diam. mm	PK	Cat. No.	
R 1405 Propeller	0.25 to 30	45	1	**9.197 053**	4
R 1402 Dissolver	1 to 30	42	1	**9.197 055**	5

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9.197 053

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9.197 055

Stands and fittings for Dispersers T 10/T 18/T 25/T 50

IKA

Type	Description	Rod diam. mm	Height mm	For model	PK	Cat. No.	
R 104	Stand	10	370	T 10	1	**7.631 971**	6
H 44	Bosshead			T 10	1	**9.232 994**	7
R 200	Clamp			T 10	1	**6.225 158**	8
R 1825	Stand with baseplate	16	560	T 18 / T 25	1	**9.224 031**	9
RH 5	Strap clamp			T 50	1	**9.224 762**	
R 1826	Stand with baseplate	16	800	T 18 / T 25	1	**9.224 032**	
R 1827	Stand with baseplate	16	1000	T 18 / T 25	1	**9.224 033**	
R 182	Bosshead			T 18 / T 25	1	**9.224 292**	10
RH 3	Strap clamp			T 18 / T 25	1	**9.224 761**	11
R 2722	H-stand	34	1010	T 50	1	**9.224 026**	
R 2723	Telescopic stand	34	620 - 1010	T 50	1	**9.224 028**	
R 271	Bosshead			T 50	1	**9.224 266**	

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7.631 971

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9.232 994

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6.225 158

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9.224 031

10



9.224 292

11



9.224 761

SONOREX DIGIPLUS



NEW

SONOPULS HD 4000 series



NEW

BANDELIN

The Ultrasound Company



www.bandelin.com

1 Ultrasonic Homogeniser SONOPULS mini20

Bandelin



Ready-to-operate for volumes from 0.1 ml to 25ml, consisting of HF generator mini20, ultrasonic converter mini20 and microtip MS 2.5, diameter 2.5mm. Max. 12W_{eff} HF output. Automatic amplitude control.
- pulse: ON cycles 0.1 to 60 secs.; OFF cycles 0.2 to 60 secs.
- time modes, safety shut down: 59min, 59s
- energy monitoring in kJ
- remote control with PC: RS232 (infrared)
- HF power: max. 20W_{eff}
- processing frequency 30kHz
- electrical supply data: 230 V~, 50/60 Hz

HF generator	**GM mini20**
Dimensions:	250 x 256 x 154mm
Weight:	2.0kg
Converter	**UW mini20**
Dimensions, dia. x H:	Approx. 50mm x 160mm
Weight:	270g
Titanium probes:	1.5mm, 2.0mm diameter

Type	PK	Cat. No.
SONOPULS mini20	1	**9.650 160**

2 Ultrasonic homogenizers, Sonopuls HD 2070/HD 2200

Bandelin



For cell disruption, emulsification and homogenising of materials, liquid degassing, dispersion, extraction and for sonochemistry. Amplitude adjustable from 10 to 100%.
Values can be monitored on the digital display. Pulsation time and data can be stored in the integrated memory. Processing frequency: 20 kHz, which is particularly effective. Fail-safe protection against operating when sample vessel empty and during continuous operation. For 230V 50/60Hz supplies, alternatively available for 115V~, 50/60Hz supplies on request. CE-marked, also as a medical device compliant to the in-vitro diagnostics directive 98/79/EG.

On/off switch control:	Possible directly at the converter, at the ultrasonic generator or via remote control (foot switch)
Amplitude adjustment:	Electronically stabilised from 10 to 100%, ±1%
Pulsation control:	10 to 100% permits heat dissipation when processing sensitive samples
Timer:	1 sec. to 99 mins. : 59 sec. or continuous operation

3 Ultrasonic homogenizer, SONOPULS HD 2070

Bandelin



For volumes from 2ml to 50ml. Ready to operate, standard unit with GM 2070 generator, UW 2070 ultrasonic converter, SH 70 G titanium stepped horn probe with external thread and MS 73 3 mm diameter micro tip. HF-output: max. 70 W_{eff}.
Titanium probes for other volumes (1ml to 200ml) are available with probes from 2mm to 13mm diameter.

Type	PK	Cat. No.
SONOPULS HD 2070	1	**9.650 180**

HD 2070 (stand and vessel are not included in delivery).

4 Ultrasonic homogenizer, SONOPULS HD 2200

Bandelin



For volumes from 20ml to 900ml. Ready-to-operate standard unit with GM 2200 generator, UW 2200 ultrasonic converter, SH 213 G booster horn with external thread and diameter 13mm titanium tip TT 13. HF-output: max. 200 W_{eff}. Titanium probes for other volumes (2ml to 1000ml) are available with probes from diameter 2mm to 25mm.

Type	PK	Cat. No.
SONOPULS HD 2200	1	**9.650 185**

HD 2200 (stand and vessel are not included in delivery).

For our Life Science product range - please see page 1225

For noise protection - please see page 211.

Ultrasonic homogenisers, SONOPULS HD 3100/ 3200/3400

Bandelin

- Amplichron® control
- amplitude setting adjustable in % or alternatively power control in W
- Working frequency 20 kHz
- Pulsation: operation intervals from 0.2 s up to 600 secs, rest intervals from 0.3 secs up to 600 secs
- Timer 9 h: 59 min: 59 secs
- Display of energy delivered to the sample in kJ
- 9 user programmes
- Probe monitoring (of specific probes)
- Automatic amplitude limiting after preselection of the probe
- Temperature indication from 0 up to 120°C (248°F), either with unit shutdown or alarm indication when the maximum temperature is exceeded, using optional temperature sensor
- WINPULS® remote control for process organisation with PC via RS232 and IR interfaces with IR adapter
- Backlit graphics LCD readout
- 230V~, 50/60Hz or 115V~, 50/60Hz

SONOPULS ultrasonic homogenizers are CE-marked, also as a medical device compliant to the in-vitro diagnostics directive 98/79/EG.

Applications: Disruption of highly-resistant bacteria, cells or tissues - Production of fine emulsions - Homogenization - Degassing of liquids - Sample preparation for grain size analysis - Catalysis of chemical reactions

1



1 Ultrasonic homogenizer, Sonopuls HD 3100

Bandelin

High-Tech for research - using small volumes.
For samples from 2 ml to 50ml, ready-to-operate standard set
with GM 3100 generator, UW 3100 ultrasonic converter , SH 70 G standard horn and MS 73 microtip, diameter 3 mm.

Max. 100W HF-output. - Processing frequency 20kHz. - for 230V 50/60Hz or 115V 50/60Hz supplies - For volumes from 1 ml to 200ml - 5 titanium probes, 2mm to 13mm diameter, are available.

HF generator	**GM 3100**
Dimensions:	250 x 256 x 170mm
Weight:	2.0kg
Converter	**UW 3100**
Dimensions:	70 x 120mm diameter
Weight:	1kg
Titanium probes*:	2mm, 3mm, 6mm, 13mm diameter

Type	PK	Cat. No.
SONOPULS HD 3100	1	**9.650 170**

* on request
HD 3100 (stand and vessel are not included in delivery)

2



2 Ultrasonic homogeniser, SONOPULS HD 3200

Bandelin

High-Tech for research - using larger volumes
For volumes from 20ml to 900ml, ready-to-operate standard set with generator GM
3200, ultrasonic converter UW 3200, booster horn SH 213 G and flat titanium tip TT 13 diameter 13 mm.

Max. 200W HF-output. - Processing frequency 20kHz. - For 230V 50/60Hz or 115V 50/60Hz supplies - For volumes from 2ml to 1000ml - 8 titanium probes available from 2mm to 25mm diameter.

HF generator	**GM 3200**
Dimensions:	250mm x 256mm x 170mm
Weight:	2.7kg
Converter	**UW 3200**
Dimensions:	70 diameter x 120mm
Weight:	1kg
Titanium probes (diameter):	2mm, 3mm, 6mm, 13mm, 19mm, 25mm

Type	PK	Cat. No.
SONOPULS HD 3200	1	**9.650 175**

* on request
HD 3200 (stand and vessel are not included)

E & OE.

1 Ultrasonic Homogenizer Sonopuls HD 3400

High tech for research and pilot plant stations *Bandelin*

Ready-to-operate, basic unit for 100ml to 2500ml volumes consisting of generator GM 3400, ultrasonic converter UW 3400, threaded booster horn SH 3425 G and probe VS 200 T, 25mm diameter VS 190, T 19mm diameter on request. HF out put max. 400W_{eff}.

HF generator	**GM 3400**
Dimensions:	324 x 230 x 131mm
Weight:	31kg
Converter	**UW 3400**
Dimensions, dia. x H:	90 x 180mm
Weight	2.2kg
Titanium probes*:	19.25mm diameter

Type	PK	Cat. No.
SONOPULS HD 3400	1	**9.650 195**

* on request
HD 3100/HD 3200 (stand and glas not included in delivery)

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Booster horns and stepped horns for SONOPULS Ultrasonic homogenizers, titanium alloy

Booster horns, stepped horns (titanium alloy) for connection of interchangeable sonotrodes (probes). Further booster horns are available on request. *Bandelin*

Type	Diam. mm	For	PK	Cat. No.
Booster horn SH 213 G	13	HD 2200 / HD 3200	1	**9.650 208** 2
Booster horn SH 219 G	19	HD 2200 / HD 3200	1	**9.650 218** 3
Booster horn SH 225 G	25	HD 2200 / HD 3200	1	**9.650 217** 4
Stepped horn SH 70 G	13	HD 2070 / HD 3100	1	**9.650 205** 5
Booster horn SH 3419	19	HD 3400	1	**9.650 204**
Booster horn SH 3425	25	HD 3400	1	**9.650 209**

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9.650 208

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9.650 218

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9.650 217

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9.650 205

Ultrasonic homogenizers, SONOPULS, accessories

Stainless steel stands HG 5/11, with base plate. *Bandelin*
Clamping device KL 7 with rod, swivelling clamp and quick clamp for reaction vessels of 15mm to 100mm diameter.
Support table AT 7 suitable for KL 7 or in LS 8 and LS 11, for the safe stationing of ultrasonic irradiation vessels.

Type	Description	For	PK	Cat. No.
HG 5	Stainless steel stand	HD 2070/ 3100 / 2200 / 3200	1	**9.650 273** 6
HG 10	Stainless steel stand	HD 3400	1	**9.650 275**
KL 7	Clamping device	HG 5 / HG 10	1	**9.650 276** 7
AT 7	Support table	KL 7 or LS 8 / LS 11	1	**9.650 277** 8

6



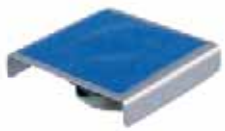
9.650 273

7



9.650 276

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9.650 277

Probes for Sonopuls Ultrasonic homogenizers, titanium

Titanium probes. *Bandelin*
For connection to stepped horns/booster horns.

Type	Diam. mm	Tip	For	For bottle ml	For	PK	Cat. No.	
MS 72	2.0	microtip	SH 70 G SH 213 G	1 - 25 2 - 30	HD 2070 / 2200 HD 3100 / 3200	1	**9.650 244**	
MS 73	3.0	microtip	SH 70 G SH 213 G	2 - 50 5 - 90	HD 2070 / 2200 HD 3100 / 3200	1	**9.650 245**	1
KE 76	6.0	tapered tip	SH 70 G SH 213 G	5 - 100 10 - 350	HD 2070 / 2200 HD 3100 / 3200	1	**9.650 246**	2
TT 13	13.0	titanium flat tip	SH 70 G SH 213 G	10 - 200 20 - 900	HD 2070 / 2200 HD 3100 / 3200	1	**9.650 250**	
TT 13 FZ	13.0	titanium flat tip with hole	FZ 5 G FZ 7 G	-	HD 2200 / 3200	1	**9.650 247**	
TT 19	19.0	titanium flat tip	SH 219 G	25 - 900	HD 2200 / 3200	1	**9.650 248**	
TT 25	25.0	titanium flat tip	SH 225 G	30 - 1000	HD 2200 / 3200	1	**9.650 249**	
VS 70 T	13.0	probe long	SH 70 G SH 213 G	10 - 200 20 - 900	HD 2070 / 2200 HD 3100 / 3200	1	**9.650 239**	3
VS 190 T	19.0	probe long	SH 219 G SH 3419	25 - 900 500 - 1500	HD 2200 / 3200 HD 3400	1	**9.650 243**	
VS 200 T	25.0	probe long	SH 225 G SH 3425	30 - 1000 500 - 2500	HD 2200 / 3200 HD 3400	1	**9.650 240**	
MS 1.5	1.5	microtip	UW mini20	0,1 - 10	Sonpuls mini20	1	**9.650 165**	
MS 2.0	2.0	microtip	UW mini 20	0,25 - 20	Sonpuls mini20	1	**6.251 521**	
MS 2.5	2.5	microtip	UW mini20	0,5 - 25	Sonpuls mini20	1	**9.650 166**	

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9.650 245

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9.650 246

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9.650 239

4



4 Flow-through standard horn for Sonopuls Ultrasonic homogenizers

- Flow-through standard horn FZ 5 G with external screwthread and titanium flat tip TT 13 FZ. *Bandelin*
- Flow-through standard horn FZ 7 G with external screwthread and titanium flat tip TT 13 FZ.

Type	For	PK	Cat. No.
FZ 5 G	HD 2070 / HD 3100	1	**9.650 241**
FZ 7 G	HD 2200 / HD 3200	1	**9.650 242**

5



5 Flow-through cell for SONOPULS Ultrasonic homogenizers, stainless steel

Flow-through cell for continuous flow-through processing. Stainless steel, sealed, vibration-free reaction vessel with cooling jacket. For connection to SH 70 G or SH 213 G with TT 13. For HD 2070, HD 2200, HD 3100 and HD 3200 homogenisers. Flow rate up to 30 L/hr. *Bandelin*

Type	PK	Cat. No.
DG 4 G (flow-through)	1	**9.650 269**

6



6 Ultrasonic processing vessels for SONOPULS Ultrasonic homogenizers, plastic

Ultrasonic processing vessels. Plastic. For indirect ultrasonic irradiation. If BB 2 G is ordered, titanium flat tip TT 13 is required. BB 6 fits directly to UW 2200/UW 3200. *Bandelin*
Microtube holder EH6. Stainless steel. For simultaneous, contact-free ultrasonic irradiation of up to 6 samples using the ultrasonic homogeniser HD 2200/HD 3200 and ultrasonic processing vessel BB 6.

Type	For	PK	Cat. No.
BB 2 G	HD 2070 / HD 3100	1	**9.650 253**
BB 6	HD 2200 / HD 3200	1	**9.650 254**
EH 6	BB6	1	**9.650 258**

E & OE.

1 Sleeve adapters for Sonopuls Ultrasonic homogenizers, PTFE

PTFE sleeve adapters for mounting probes into standard ground joint vessels. For use with HD 2070/2200/3100/3200 homogenisers
- NA 29 G: for vessels with standard ground joint 29/32 and for SH 70/213 G horns
- NA 45 G: for vessels with standard ground joint 45/40 and for SH 70/213/219/225 G horns

Bandelin

Type	PK	Cat. No.
NA 29 G	1	**9.650 228**
NA 45 G	1	**9.650 229**

1



Ultrasonic homogenizer cup booster BR 30 for SONOPULS HD 2070/ 2200/ 3100/ 3200

For Sonopuls HD 2070, HD 2200, HD 3100 and HD 3200.
- BR 30 cup booster enables highly intensive sonication of small samples, disruption of cells or sonification of pathogenic or toxic substances.
- EH 3: Microtube holder for BR 30 for simultaneous sonification of up to 3 samples.

Bandelin

Specifications:

Beaker capacity:	12ml
Int. height:	15mm
Int. diameter:	32mm
Max. ultrasound intensity:	3100 W/L (HD 2200/3200)
Material:	Titanium alloy

Type	PK	Cat. No.
BR 30	1	**9.650 190** 2
EH 3	1	**9.877 745** 3

Converter and stand are not included.

2



9.650 190

3



9.877 745

Accessories for SONOPULS Ultrasonic homogenizers HD 2200, glass

Glass sample vessels for direct ultrasonic irradiation. *Bandelin*

Type	For probes up to Ø mm	Capacity ml	For	PK	Cat. No.
KG 3 cooling vessel	13	15	HD 2070/2200/3100/3200	1	**9.650 235** 4
KG 5 cooling vessel	25	70	HD 2200/3200	1	**9.650 223**
DG 3 flow-through vessel with cooling jacket	13	15	HD 2070/2200/3100/3200	1	**9.650 236** 5
DG 5 flow vessel with cooling jacket	25	70	HD 2200/3200	1	**9.650 224**
RZ 1 rosett cell	13	25	HD 2070/2200/3100/3200	1	**9.650 267**
RZ 2 rosett cell	13	40	HD 2070/2200/3100/3200	1	**9.650 268**
RZ 3 rosett cell	13	110	HD 2070/2200/3100/3200	1	**9.650 261** 6
RZ 4 rosett cell	25	390	HD 2200/3200/3400	1	**9.650 260**
RZ 5 rosett cell	25	660	HD 2200/3200/3400	1	**9.650 264**
SZ 3 Suslick cell	13	20	HD 2070/2200/3100/3200	1	**9.650 262**
SZ 5 Suslick cell	25	110	HD 2200/3200	1	**9.650 265**

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9.650 235

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9.650 236

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9.650 261

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1 Sound proof boxes LS series

Provides considerable noise level reduction. *Bandelin*

LS 4: Made of plastic-coated walls. 10dB(A) damping.
LS 8/11: Made of stainless steel, with damping plates. 20dB(A) damping. With rod, swivelling clamp and bosshead for height adjustment of sample vessels.

Type	For	PK	Cat. No.
LS 4	HD 2070 / 2200 / 3100 / 3200	1	**9.650 271**
LS 8	HD 2070 / 2200 / 3100 / 3200	1	**9.650 281**
LS 11	HD 3400	1	**9.650 282**

2



9.650 238

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9.650 225

Accessories for sound proof box LS 8

For sonification using the BR 30 cup booster, support frame UG 6 allows BB 6 or BB 2G acoustic irradiation cups to rotate through 180° within the LS 8 noise protection box (not included with main instrument). Material: PTFE-coated, lacquered aluminium support with PTFE feet. Ultrasonic converter UW 2070/2200/3100/3200 can be securely attached using the rapid snap fastener. *Bandelin*

Description	PK	Cat. No.
Support UG 6 for LS 8	1	**9.650 238** 2
Spacer AH 6 for LS 8*	1	**9.650 225** 3

* Required for direct sonification using long probes.

6 Ultrasonic Processor UP50H/UP100H

For manual operation or for stand use, frequency 30kHz, automatic frequency tuning system, amplitude adjustable 20% to 100%, pulse 0 to 100%, dry running protected, in portable case, with mounting for stand STH-16 and mounting tools, 230V a.c. *Hielscher Ultrasonics*

Type	Rating W	PK	Cat. No.
UP50H	50	1	**9.106 600** 4
UP100H	100	1	**6.235 231** 5

4



9.106 600

5



6.235 231

6



Accessories for Ultrasonic Processor UP50H/UP100H

Sonotrode MS1, made of titanium, approx. length 80mm *Hielscher Ultrasonics*
Sonotrode MS3, made of titanium, approx. length 80mm
Sonotrode MS7, made of titanium, approx. length 80mm
Sonotrode MS10, made of titanium, approx. lenght 80mm (only for UP100H)

Stand ST1-16, pole diameter 16mm, made of stainless steel, base (L x W x H) 300 x 150 x 600mm
Sound Protection Box SB2-16, with adjustable table and 16mm stand pole
Timer T1, from 00:00 to 99:59 (min:sec)

Type	Tip	For bottle ml	PK	Cat. No.
MS1	dia. 1mm	0,1 - 5,0	1	**9.106 602**
MS3	dia. 3mm	5,0 - 100	1	**4.005 989**
MS7	dia. 7mm	10,0 - 250	1	**9.106 604**
MS10	dia. 10mm	20,0 - 500	1	**4.005 990**
ST1-16			1	**6.226 573**
SB2-16			1	**6.235 330**
T1			1	**6.235 003**

For noise protection - please see page 211.

1 Compact ultrasonic processor UP200S

Hielscher Ultrasonics

Stand mounting, compact, robust unit, 200W, frequency 24kHz. With automatic frequency scanning system, amplitude adjustable 20% to 100%, pulse adjustable 0 to 100% and dry-running protected. Supplied in carrying case with mounting tools but without sonotrodes (probes). A wide range of accessories are available on request (sonotrodes, sound protection, PC control, etc.).

Type	PK	Cat. No.
UP200S	1	**9.106 606**

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2 Sonotrode for compact ultrasonic processor UP200S

Hielscher Ultrasonics

Type	Tip	For bottle ml	PK	Cat. No.
S1	dia. 1mm	0.1 to 5ml	1	**9.106 607**
S3	dia. 3mm	5 to 200ml	1	**9.106 608**
S7	dia. 7mm	20 to 500ml	1	**9.106 609**
S14	dia. 14mm	50 to 1000ml	1	**9.106 610**
S14D*		5 to 25L/h	1	**9.106 611**

* with glass flow vessel GD14K.

2



3 Ultrasonic Processor UP200H

Hielscher Ultrasonics

For manual operation or for stand use, 200W, frequency 24kHz, automatic frequency tuning system, amplitude adjustable 20% to 100%, pulse 0 to 100%, dry running protected, in portable case, with mounting tools, 230V a.c.

Type	PK	Cat. No.
UP200H	1	**4.005 991**

3



4 Accessories for Ultrasonic Processor UP200H

Hielscher Ultrasonics

Sonotrode S3, titanium, approx. length 100mm
Sonotrode S7, titanium, approx. length 100mm
Sonotrode S14, titanium, approx. length 100mm
Sonotrode S40, titanium, approx. lenghth 100mm

Stand ST1-16, rod diameter 16mm, stainless steel, base (L x W x H) 300 x 150 x 600mm
Sound Protection Box SB3-16, with adjustable table and 16mm stand pole
Timer T1, from 00:00 - 99:59 (min:sec)

Type	Tip	For bottle ml	PK	Cat. No.
S3	dia. 3mm	5.0 - 200	1	**9.106 608**
S7	dia. 7mm	20 - 500	1	**9.106 609**
S14	dia. 14mm	50 - 1000	1	**9.106 610**
S40	dia. 40mm	100 - 2000	1	**4.005 992**
ST1-16			1	**6.226 573**
SB3-16			1	**6.227 896**
T1			1	**6.235 003**

4



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1 Ultrasonic Processor UIS250v for Eppendorf tubes

For handheld operation or for stand use, 250W. Ultrasonic frequency 24kHz, automatic frequency tuning system, amplitude adjustable from 20% to 100%, pulse adjustable from 0 to 100%, dry running protected, transducer protected to IP40 level, 230V a.c.

Hielscher Ultrasonics

Type	PK	Cat. No.
UIS250v	1	**4.005 993**

2



3



2 3 Accessories for Ultrasonic Processor UIS250v

Sonotrode LS24d3, titanium, approx. length 100mm
Sonotrode LS24d5, titanium, approx. length 100mm
Sonotrode LS24d10, titanium, approx. length 100mm
Sonotrode VT24d10, titanium, with 1 bore hole diameter 10mm for sonication of one vial (outer diameter 10mm)
Sonotrode VialTweeter, titanium, with bores and clamping fixture for the sonication of up to 8 x 1.5ml Eppendorf tubes

Hielscher Ultrasonics

Stand ST1-16clamp, rod diameter 16mm, made of stainless steel, base (L x W x H): 300 x 150 x 600mm
Timer T1, from 00:00 to 99:59 (min:sec)

Type	Tip	For bottle ml	PK	Cat. No.
LS24d3	dia. 3mm	5.0 - 200	1	**4.005 994**
LS24d5	dia. 5mm	20 - 300	1	**4.005 995**
LS24d10	dia. 10mm	50 - 1000	1	**4.005 996**
VT24d10	dia. 10mm		1	**4.005 997**
VialTweeter			1	**4.005 998**
ST1-16Clamp			1	**4.005 999**
T1			1	**6.235 003**

4



4 Ultrasonic Processor UIS250L for sieving

250W, ultrasonic frequency 24kHz, automatic frequency tuning system, amplitude adjustable from 20% to 100%, pulse adjustable from 0 to 100%, dry running protected, IP40 grade transducer, 230V a.c.

Hielscher Ultrasonics

Type	PK	Cat. No.
UIS250L	1	**4.006 001**

5



5 Accessories for Ultrasonic Processor UIS250L

Ring sonotrode RIS200, H = 35mm, for the use of standard laboratory test sieves (DIN ISO 3310/1)
Ring sonotrode RIS203, H = 35mm, for the use of standard laboratory test sieves (ASTM E 11-95)

Hielscher Ultrasonics

Accessories set SZS200 for screens and ring sonotrode, Set: base plate, support rods with quick chuck, catch pan, cover clamping

Type	Diam. mm	PK	Cat. No.
RIS 200	200	1	**4.006 002**
RIS 203,5	203.5	1	**4.006 003**
SZS 200	200/203.5	1	**4.006 004**

For our Life Science product range - please see page 1225

E & OE.

Laboratory paddle blender BagMixer® 100 MiniMix®

MiniMix® 100 paddle blenders, from the BagMixer® range, guarantees a quick and accurate blending of small samples. Thanks to the adjustable paddle system, blending is at its best. MiniMix® 100 is ideal for medical, veterinary and microbiological analysis.

interscience

Type	Volume ml	PK	Cat. No.
MiniMix® 100 P CC®	80-100	1	**6.240 509** 1
MiniMix® 100 W CC®	80-100	1	**6.241 090** 2

1



6.240 509

2



6.241 090

3



3 Laboratory mixer, BagMixer®

interscience

For sample preparation with easily adjustable paddle system. The BagMixer® is available in 3 sizes and blends all sample types prior to their microbial analysis. Thanks to their unique adjustable paddle system the blending chamber can be adjusted to the sample volume. Combined with the variable speed, a higher bacterial recovery rate is achieved. All BagMixer® units are fitted with a timer. Constructed in stainless steel. The fully opening door enables easy cleaning.

BagMixer® 400 P with stainless steel door.
BagMixer® 400 W and 400 CC with see through glass door.

Click & clean® System (only BagMixer® 400 CC): removable and autoclavable paddles.

All units have a 3-year warranty and life guarantee for shock absorbers and window door.

Type	Volume ml	Length mm	Width mm	Height mm	PK	Cat. No.
BagMixer® 400 P	50 to 400	390	260	290	1	**6.204 551**
BagMixer® 400 W	50 to 400	390	260	290	1	**6.224 287**
BagMixer® 400 VW	50 to 400	390	260	290	1	**9.570 073**
BagMixer® 400 CC	50 to 400	420	260	265	1	**9.570 098**
JumboMix® 3500 VW	400 to 3500	470	520	470	1	**9.570 074**

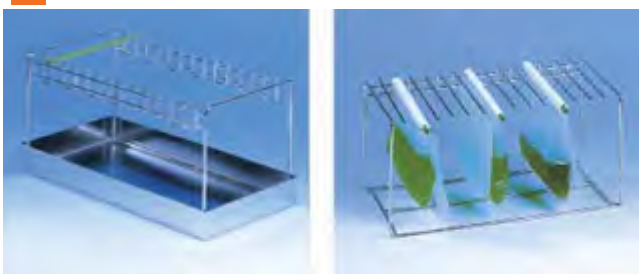
Scan 500 colony counter available on request!

4 5 Rack form u for 14 stomacher bags, Stainless steel, seal bag clipsac, clips

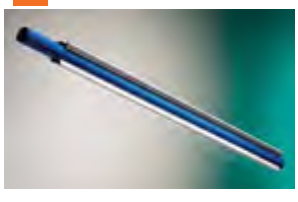
NEW!

Description	PK	Cat. No.
Rack for 14 Stomacherbag	1	**9.570 018**
Seal bag, stomacher clipsac green	50	**9.570 017**
Clips, blue for stomacher bag	10	**9.570 016**

4



5



Blender bags, BagSystem®

interscience

These highly resistant bags provide increased safety. The filter bags automatically filter the sample during the blending process, withholding particles behind the filter.

The BagPage® has a full-width membrane filter.

The BagFilter® P is a non-woven lateral filter and it is sterile.

Sample bags, RollBag®
Sterile bags with seal reinforced with metal wire for BagMixer® lab blender and for collecting samples in the food, dairy, water, sewage, medical, veterinary, environmental, soil and industrial fields. By whirling, the RollBag® becomes a leakproof bag. RollBag® is also thick and robust in order to resist bursting when handling a variety of samples.

Specifications Blender bags, BagSystem®

Capacity:	450ml
Blended volume:	5 to 50ml
Capacity:	1300ml
Blended volume:	50 to 300ml

Type	Description	Width mm	Height mm	PK	Cat. No.	
BagLight® 100	plain bag, sleeve 25	110	185	500	**9.570 075**	1
BagLight® 400	plain bag, sleeve 25	175	300	1000	**9.570 097**	
BagLight® 3500	plain bag, sleeve 25	380	510	500	**9.570 077**	
BagFilter® 400 P	side filter bag, sleeve 25	190	300	500	**9.570 078**	2
BagFilter® 3500 P	side filter bag, sleeve 10	380	510	100	**9.570 079**	
BagPage® 100	full-size filter bag, sleeve 25	180	95	500	**9.570 080**	
BagPage® Plus 400	full-size filter bag, sleeve 25	190	300	500	**9.570 081**	
BagPage® 3500	full-size filter bag, sleeve 10	380	510	100	**9.570 082**	
RollBag® 450 ml		110	230	1000	**9.570 099**	
RollBag® 1300 ml		175	290	500	**9.570 096**	3

1



9.570 075

2



9.570 078

3



9.570 096

4 5 6 7 Accessories for blender BagSystem®

interscience

Type	Description	PK	Cat. No.
BagOpen® 80/100	bag opener	1	**9.570 083**
BagOpen® 400	bag opener	1	**9.570 084**
BagOpen® 3500	bag opener	1	**9.570 085**
BagRack® 80/100	bag storage for 11 bags	1	**9.570 086**
BagRack® 400	bag storage for 10 bags	1	**9.570 087**
BagClip® 80/100	bag closure clip	50	**9.570 088**
BagClip® 400	bag closure clip	50	**9.570 089**
BagClip® 3500	bag closure clip	50	**9.570 090**
BagPipet®	pipette with 3 fixed graduations: 0.1, 0.9, 1.0ml	1	**9.570 091**
BagTips® Regular	straws for BagPipet®, 19cm, sterile	1000	**9.570 092**
BagTips® Jumbo	straws for BagPipet®, 24cm, sterile	1000	**9.570 093**

4



5



6



7



For adhesive labels - please see page 155

Distillation, synthesis 588
Flasks with NS joint neck 588
Components for reaction and distillation 600
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KPG stirrer and bearings 613
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Syringe filters 700
Filtration apparatus 713

1



6.243 668

Receiving flasks, with spherical ground glass joint, borosilicate glass 3.3

NEW!

Manufactured from borosilicate glass 3.3 and meeting quality standards according to DIN 12383 standards.

Isolab

Capacity ml	socket NS	Flask dia. mm	PK	Cat. No.
100	KS 35	64	1	**6.243 665**
250	KS 35	85	1	**6.243 666**
500	KS 35	105	1	**6.243 667**
1000	KS 35	131	1	**6.243 668** 1

2



9.196 244

Receiving flasks, DURAN®

With with or without highly transparent PUR coating, autoclavable

Lenz

Capacity ml	socket NS	Flask dia. mm	PK	Cat. No.
100	spherical, S35	64	1	**9.196 224**
250	spherical, S35	85	1	**9.196 236**
500	spherical, S35	105	1	**9.196 244** 2
500	spherical, S35, plastic coated	105	1	**7.653 714**
1000	spherical, S35	131	1	**9.196 254**
1000	spherical, S35, plastic coated	131	1	**9.812 217**
2000	spherical, S35	166	1	**9.196 263**
2000	spherical, S35, plastic coated	166	1	**6.200 782**

3



6.236 112

Evaporator flask pear shape, borosilicate glass 3.3

NEW!

Manufactured from borosilicate glass 3.3, according to DIN 12383

Isolab

Capacity ml	Centre neck NS	PK	Cat. No.
100	29/32	1	**6.237 167**
250	29/32	1	**6.237 711**
500	29/32	1	**6.243 664**
1000	29/32	1	**6.236 112** 3

4



9.196 044

Evaporating flasks with conical ground joint, DURAN®

Especially for rotary evaporators, with center neck and conical joint, autoclavable, pear-shaped, material: DURAN®

Lenz

Capacity ml	Socket NS	Flask dia. mm	PK	Cat. No.
50	29/32	56	1	**9.196 020**
100	29/32	60	1	**9.196 024**
250	29/32	81	1	**9.196 036**
500	29/32	101	1	**9.196 044** 4
1000	29/32	126	1	**9.196 054**
2000	29/32	158	1	**9.196 063**

Evaporating flasks with conical ground joint, DURAN®, with PUR coating

NEW!

Especially for rotary evaporators, with center neck and conical joint, with highly transparent PUR coating, autoclavable, pear-shaped, material: DURAN®

Lenz

Capacity	Socket	Flask dia.	PK	Cat. No.
ml	NS	mm		
50	29/32	56	1	**6.246 006**
100	29/32	60	1	**6.246 007**
250	29/32	81	1	**6.246 008**
500	29/32	101	1	**6.246 009**
1000	29/32	126	1	**6.246 010** 1
2000	29/32	158	1	**6.242 495**
3000	29/32	175	1	**6.246 011**

1



6.246 010

Lenz laboratory glass instruments are also available with PU coating, autoclavable.

PUR Coating, autoclavable

Lenz

Physical Properties	
Autoclavable	121°C/2.05 bar/20 minutes - max. 100 cycles
Transmission	absorption up to 380nm
Long-term heat resistance	up to 140°C
Max. heat resistance	up to 190°C for a short time
Suitable for freezing	-30°C
Suitable for microwave use	
Chemical Properties (Resistance)	
Water	up to 100°C/5 min. constant exposure
Organic solvents	room temperature/5 min. constant exposure
- alcohol	
- acetone	
- tetra	
Inorganic acids, bases	room temperature/5 min. constant exposure
- hydrochloric acid (up to 20%)	
- nitric acid (up to 20%)	
- sulphuric acid (up to 20%)	
- caustic soda (up to 20%)	
Cleaning resistance	Standard disinfectants and detergents
- industrial washers/clinic	up to 50 cycles/ max. 95°C
- household dishwashers	up to 50 cycles/ max. 65°C

Powder Flasks jointed, Duran®

NEW!

Specially for rotary evaporators. For the drying of powder-like substances . With centre neck and conical joint, with inscription label.

Lenz

Capacity	Socket	Flask dia.	PK	Cat. No.
ml	NS	mm		
100	29/32	60	1	**6.205 965**
250	29/32	81	1	**6.205 966**
500	29/32	101	1	**6.205 512** 2
1000	29/32	126	1	**6.206 195**
2000	29/32	158	1	**6.205 692**

2



6.205 512

1



6.237 702

Round bottom flasks, borosilicate glass 3.3

Manufactured from borosilicate glass 3.3. Resistant to heat and almost all chemicals. According to DIN 12394. Reinforced rims are used to prevent breaking during washing and transportation.

Isolab

Capacity ml	Socket NS	Flask dia. mm	Height mm	Neck diam. approx. mm	PK	Cat. No.
50	14/23	51	105	22	1	**6.236 508**
50	19/26	51	100	22	1	**4.008 379**
50	24/29	51	100	30	1	**4.008 380**
50	29/32	51	105	34	1	**6.238 345**
100	14/23	64	115	22	1	**6.236 346**
100	19/26	64	110	22	1	**4.008 381**
100	24/29	64	110	30	1	**4.008 382**
100	29/32	64	115	34	1	**6.236 774**
250	14/23	85	145	22	1	**6.252 403**
250	19/26	85	140	22	1	**4.008 383**
250	24/29	85	140	30	1	**4.008 384**
250	29/32	85	145	34	1	**6.236 303**
500	24/29	105	170	30	1	**4.008 385**
500	29/32	105	175	34	1	**6.240 426**
1000	24/29	131	210	42	1	**6.237 702** 1
1000	29/32	131	200	42	1	**6.242 240**
2000	29/32	166	260	34	1	**6.238 472**

2



9.011 850

Round bottom flasks, standard ground, DURAN®

To DIN 4797.

Lenz

Capacity ml	Socket NS	Flask dia. mm	PK	Cat. No.
5	14/23	30	1	**6.201 199**
10	14/23	35	1	**9.011 801**
25	14/23	41	1	**9.011 802**
25	19/26	41	1	**7.021 797**
50	14/23	51	1	**9.011 805**
50	19/26	51	1	**6.302 116**
50	24/29	51	1	**7.019 181**
50	29/32	51	1	**9.011 835**
100	14/23	64	1	**9.011 810**
100	19/26	64	1	**6.200 675**
100	24/29	64	1	**7.019 182**
100	29/32	64	1	**9.011 840**
250	14/23	85	1	**9.011 815**
250	19/26	85	1	**6.800 202**
250	24/29	85	1	**6.800 214**
250	29/32	85	1	**9.011 845**
250	45/40	85	1	**9.011 867**
500	24/29	105	1	**6.800 215**
500	29/32	105	1	**9.011 850** 2
500	45/40	105	1	**9.011 868**
1000	24/29	131	1	**6.800 235**
1000	29/32	131	1	**9.011 855**
1000	45/40	131	1	**9.011 869**
2000	29/32	166	1	**9.011 860**
2000	45/40	166	1	**9.011 870**
3000	29/32	185	1	**6.077 738**
3000	45/40	185	1	**6.901 617**
4000	29/32	207	1	**9.011 865**
4000	45/40	207	1	**9.011 875**
5000	29/32	223	1	**9.011 864**
5000	45/40	223	1	**9.011 877**
6000	29/32	236	1	**9.011 866**
6000	45/40	236	1	**9.011 880**
10000	45/40	279	1	**9.011 885**

Round bottom flasks, borosilicate glass 3.3, amber

NEW!

Manufactured from borosilicate glass 3.3., amber. Resistant to heat and almost all chemicals. According to DIN 12394. Reinforced rims are used to prevent breaking during washing and transportation.

Isolab

Capacity	Socket	Flask dia.	Height	PK	Cat. No.
ml	NS	mm	mm		
50	29/32	51	105	1	**9.141 091**
100	29/32	64	115	1	**7.980 357**
250	29/32	85	145	1	**7.980 358**
500	29/32	105	175	1	**9.141 092** 1
1000	29/32	131	200	1	**9.141 093**

1



9.141 092

Round bottom flasks, DURAN®, amber

To DIN EN ISO 4797.

Lenz

Capacity	Socket	Flask dia.	PK	Cat. No.
ml	NS	mm		
50	29/32	51	1	**6.242 163**
100	29/32	64	1	**9.011 827**
250	29/32	85	1	**9.011 828**
500	29/32	105	1	**9.011 829** 2
2000	29/32	166	1	**6.253 256**

2



9.011 829

Kjeldahl flasks with ground neck

NEW!

Manufactured from borosilicate glass 3.3. NS necks are in compliance with DIN 12242 standards.

Isolab

Capacity	Socket	PK	Cat. No.
ml	NS		
100	19/26	1	**9.140 385**
250	29/32	1	**9.140 386**
500	29/32	1	**9.140 387** 3
750	29/32	1	**9.140 388**
1000	29/32	1	**9.140 389**

3



9.140 387

4 Kjeldahl flasks with ground neck, DURAN®

NEW!

For the determination of nitrogen in organic compounds, with center neck, with conical joint and inscription label, material: DURAN®

Lenz

Capacity	Socket	Flask dia.	PK	Cat. No.
ml	NS	mm		
50	19/26	51	1	**9.141 860**
100	19/26	60	1	**9.141 861**

4



1



1 Flask, ground glass joint, Engler, DURAN®

Due to the wall thickness distribution, it is suitable for use as a heating vessel and for distillation. Glass Type I/neutral glass as per USP, EP and JP. 19/26 socket. With 7mm diameter side arm, length 100mm. Autoclavable.

DURAN Group

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
125	68	215	1	**9.030 128**

2



2 Pear shape flasks, borosilicate glass 3.3

NEW!

Manufactured from borosilicate glass 3.3 which is resistant to heat and almost all chemicals. They meet the highest quality standards according to DIN 12383 standards. NS neck is in compliance with DIN 12242 standards.

Isolab

Capacity ml	Socket NS	PK	Cat. No.
5	14/23	1	**9.140 301**
10	14/23	1	**6.236 347**
25	14/23	1	**6.237 164**
50	14/23	1	**6.237 165**
100	14/23	1	**6.237 166**
250	14/23	1	**9.140 302**
25	19/26	1	**9.140 303**
50	19/26	1	**9.140 304**
100	19/26	1	**9.140 305**
250	19/26	1	**9.140 306**
50	24/29	1	**9.140 307**
100	24/29	1	**9.140 308**
250	24/29	1	**9.140 309**
50	29/32	1	**9.140 310**
100	29/32	1	**6.257 941**
250	29/32	1	**9.140 311**

4



4 Pear shape flasks, ground glass joint, DURAN®

DIN 12383. With conical joint and inscription label.

Lenz

Capacity ml	Socket NS	Flask dia. mm	PK	Cat. No.
10	14/23	33	1	**9.012 021**
25	14/23	42	1	**9.012 022**
50	14/23	51	1	**9.012 023**
100	14/23	64	1	**9.012 024**

3



3 Pear shape flasks with side neck, borosilicate glass 3.3

NEW!

Manufactured from borosilicate glass 3.3 which is resistant to heat and almost all chemicals. They meet the highest quality standards according to DIN 12383 standards. NS necks are in compliance with DIN 12242 standards and side neck has an angle of 25° with the center neck.

Isolab

Capacity ml	Socket NS	Side necks NS	PK	Cat. No.
25	14/23	14/23	1	**9.140 312**
50	14/23	14/23	1	**9.140 313**
100	14/23	14/23	1	**9.140 314**
250	14/23	14/23	1	**9.140 315**
25	19/26	14/23	1	**9.140 316**
50	19/26	14/23	1	**9.140 317**
100	19/26	14/23	1	**9.140 318**
250	19/26	14/23	1	**9.140 319**

E & OE.

Round bottom flasks with two necks, parallel, borosilicate glass 3.3

Side arms are parallel to each other. NS necks are in compliance with DIN 12242 standards. *Isolab*

Capacity ml	Socket NS	Parallel side necks NS	PK	Cat. No.
50	14/23	14/23	1	**9.140 340**
100	14/23	14/23	1	**9.140 341**
250	14/23	14/23	1	**9.140 342**
100	24/29	14/23	1	**9.140 343**
250	24/29	14/23	1	**9.140 344**
500	24/29	14/23	1	**9.140 345**
1000	24/29	14/23	1	**9.140 346**
100	24/29	19/26	1	**9.140 347**
250	24/29	19/26	1	**9.140 348**
500	24/29	19/26	1	**9.140 349**
1000	24/29	19/26	1	**9.140 350**
100	29/32	14/23	1	**6.243 621**
250	29/32	14/23	1	**6.243 622**
500	29/32	14/23	1	**6.243 623**
1000	29/32	14/23	1	**6.243 624**
2000	29/32	14/23	1	**9.140 351**
100	29/32	19/26	1	**9.140 352**
250	29/32	19/26	1	**9.140 353**
500	29/32	19/26	1	**9.140 354**
1000	29/32	19/26	1	**9.140 355**
2000	29/32	19/26	1	**9.140 356**
100	29/32	29/32	1	**9.140 357**
250	29/32	29/32	1	**6.240 973**
500	29/32	29/32	1	**6.240 974**
1000	29/32	29/32	1	**6.240 975** 1
2000	29/32	29/32	1	**6.243 625**
4000	29/32	29/32	1	**9.140 358**
6000	29/32	29/32	1	**9.140 359**

1



6.240 975

Round bottom flasks with two necks, parallel, DURAN®

DIN 12394. Two-neck, side neck parallel. *Lenz*
Central socket (NS): 29/32
Side necks (NS): 14/23 or 29/32

Capacity ml	Centre neck NS	Side necks NS	Flask dia. mm	PK	Cat. No.
100	29/32	14/23	64	1	**9.011 924**
250	29/32	14/23	85	1	**9.011 926**
250	29/32	29/32	85	1	**9.011 927**
500	29/32	14/23	105	1	**9.011 928** 2
500	29/32	29/32	105	1	**9.011 930**
1000	29/32	14/23	131	1	**9.011 931**
1000	29/32	29/32	131	1	**9.011 932**
2000	29/32	14/23	166	1	**7.019 207**
2000	29/32	29/32	166	1	**6.306 990**

2



9.011 928



1



4.008 388

Round bottom flasks with two necks, angled, borosilicate glass 3.3

They meet the highest quality standards according to DIN 12394. Side arms are 45 degree angled with each other. NS necks are in compliance with DIN 12242 standards.

Isolab

Capacity ml	Centre neck NS	Parallel side necks NS	PK	Cat. No.
50	14/23	14/23	1	**9.140 320**
100	14/23	14/23	1	**9.140 321**
250	14/23	14/23	1	**9.140 322**
100	24/29	14/23	1	**9.140 323**
250	24/29	14/23	1	**9.140 324**
500	24/29	14/23	1	**9.140 325**
1000	24/29	19/26	1	**9.140 326**
100	24/29	19/26	1	**9.140 327**
250	24/29	19/26	1	**9.140 328**
500	24/29	19/26	1	**9.140 329**
100	29/32	14/23	1	**6.243 616**
1000	24/29	14/23	1	**9.140 330**
250	29/32	14/23	1	**4.008 386**
500	29/32	14/23	1	**4.008 387**
1000	29/32	14/23	1	**4.008 388** 1
1000	29/32	14/23	1	**9.140 331**
100	29/32	19/26	1	**9.140 332**
250	29/32	19/26	1	**9.140 333**
500	29/32	19/26	1	**9.140 334**
1000	29/32	19/26	1	**9.140 335**
2000	29/32	19/26	1	**9.140 336**
100	29/32	29/32	1	**9.140 337**
250	29/32	29/32	1	**6.243 617**
500	29/32	29/32	1	**6.243 618**
1000	29/32	29/32	1	**6.243 619**
2000	29/32	29/32	1	**6.243 620**
4000	29/32	29/32	1	**9.140 338**
6000	29/32	29/32	1	**9.140 339**

2



9.011 908

Round bottom flasks with two necks, with angled neck, DURAN®

DIN 12394. With one central and one 20° side angled ground joint necks as outlined below.

Lenz

Capacity ml	Centre neck NS	Side necks NS	Flask dia. mm	PK	Cat. No.
25	14/23	14/23	41	1	**9.011 901**
50	14/23	14/23	51	1	**9.011 902**
100	14/23	14/23	64	1	**9.011 903**
100	29/32	14/23	64	1	**9.011 904**
100	29/32	19/26	64	1	**6.233 114**
100	29/32	29/32	64	1	**6.204 819**
250	14/23	14/23	85	1	**9.011 905**
250	24/29	19/26	85	1	**6.206 139**
250	29/32	14/23	85	1	**9.011 906**
250	29/32	19/26	85	1	**6.225 989**
250	29/32	29/32	85	1	**9.011 907**
500	29/32	14/23	105	1	**9.011 908** 2
500	29/32	19/26	105	1	**6.233 091**
500	29/32	29/32	105	1	**9.011 910**
1000	29/32	14/23	131	1	**9.011 915**
1000	29/32	19/26	131	1	**6.231 953**
1000	29/32	29/32	131	1	**9.011 920**
2000	29/32	14/23	166	1	**6.072 288**
2000	29/32	29/32	166	1	**6.056 856**
4000	29/32	29/32	207	1	**6.201 298**

Round bottom flasks with three necks, NS joints, parallel, borosilicate glass 3.3

NEW!

Manufactured from borosilicate glass 3.3 which is resistant to heat and almost all chemicals. The flasks have thick walls, heavy bases and reinforced rims which prevent breaking. They meet the highest quality standards according to DIN 12394. Side arms are parallel with the centre neck. NS necks are in compliance with DIN 12242 standards. *Isolab*

Capacity ml	Centre neck NS	Angled side necks NS	PK	Cat. No.
50	14/23	14/23	1	**9.140 360**
100	14/23	14/23	1	**9.140 361**
250	14/23	14/23	1	**9.140 362**
100	14/23	24/29	1	**9.140 363**
250	14/23	24/29	1	**9.140 364**
500	14/23	24/29	1	**9.140 365**
1000	14/23	24/29	1	**9.140 366**
100	19/26	24/29	1	**9.140 367**
250	19/26	24/29	1	**9.140 368**
500	19/26	24/29	1	**9.140 369**
1000	19/26	24/29	1	**9.140 370**
2000	19/26	24/29	1	**9.140 371**
100	14/23	29/32	1	**9.140 372**
250	14/23	29/32	1	**6.243 654**
500	14/23	29/32	1	**6.243 655**
1000	14/23	29/32	1	**6.243 656**
2000	14/23	29/32	1	**9.140 373**
100	19/26	29/32	1	**9.140 374**
250	19/26	29/32	1	**6.243 657**
500	19/26	29/32	1	**6.243 658**
1000	19/26	29/32	1	**6.243 659**
2000	19/26	29/32	1	**9.140 375**
100	29/32	29/32	1	**9.140 376**
250	29/32	29/32	1	**6.243 660**
500	29/32	29/32	1	**6.243 661**
1000	29/32	29/32	1	**6.243 662** 1
2000	29/32	29/32	1	**6.243 663**
4000	29/32	29/32	1	**9.140 377**
6000	29/32	29/32	1	**9.140 378**

1



6.243 662

Round bottom flasks, ground glass joint, three neck, parallel, DURAN®

DIN 12392. All necks are parallel. *Lenz*

Capacity ml	Centre neck NS	Side necks NS	Flask dia. mm	PK	Cat. No.
100	24/29	19/26	64	1	**6.205 694**
100	29/32	14/23	64	1	**9.011 933**
100	29/32	19/26	64	1	**6.306 275**
250	24/29	19/26	85	1	**7.021 838**
250	29/32	14/23	85	1	**9.011 935**
250	29/32	29/32	85	1	**9.011 936**
500	24/29	19/26	105	1	**7.021 840**
500	29/32	14/23	105	1	**9.011 938** 2
500	29/32	19/26	105	1	**7.019 244**
500	29/32	29/32	105	1	**9.011 939**
1000	29/32	14/23	131	1	**9.011 941**
1000	29/32	19/26	131	1	**6.203 572**
1000	29/32	29/32	131	1	**9.011 942**
1000	45/40	29/32	131	1	**9.011 943**
2000	29/32	14/23	166	1	**9.011 945**
2000	29/32	19/26	166	1	**6.203 571**
2000	29/32	29/32	166	1	**9.011 946**
2000	45/40	29/32	166	1	**9.011 947**
3000	29/32	29/32	185	1	**6.203 569**
4000	29/32	14/23	207	1	**6.238 532**
4000	29/32	29/32	207	1	**7.200 347**
4000	45/40	29/32	207	1	**9.011 950**
5000	29/32	29/32	223	1	**6.306 286**
5000	45/40	29/32	223	1	**9.011 949**
6000	29/32	14/23	236	1	**6.803 543**
6000	29/32	29/32	236	1	**6.072 558**
6000	45/40	29/32	236	1	**9.011 951**
10000	45/40	29/32	279	1	**9.011 952**

2



9.011 938

1



1 Round bottom flasks with three necks, NS joints, angled, borosilicate glass 3.3

Manufactured from borosilicate glass 3.3. They meet the highest quality standards according to DIN 12394. Side arms are at 45 degree angles with the centre neck. NS necks are in compliance with DIN 12242 standards.

Isolab

Capacity ml	Centre neck NS	Angled side necks NS	Flask dia. mm	PK	Cat. No.
250	29/32	14/23	85	1	**4.008 390**
250	29/32	19/26	85	1	**4.008 393**
250	29/32	29/32	85	1	**6.240 976**
500	29/32	14/23	105	1	**4.008 391**
500	29/32	19/26	105	1	**4.008 394**
500	29/32	29/32	105	1	**6.240 977**
1000	29/32	14/23	131	1	**4.008 392**
1000	29/32	19/26	131	1	**4.008 395**
1000	29/32	29/32	131	1	**6.240 978**
2000	29/32	29/32	166	1	**4.008 396**

2



9.011 958

Round bottom flasks, ground glass joint, three neck, angled, DURAN®

DIN 12394. Central neck with 2 x 20° angled side necks.

Lenz

Capacity ml	Centre neck NS	Side necks NS	Flask dia. mm	PK	Cat. No.
50	19/26	14/23	51	1	**6.202 804**
100	24/29	19/26	64	1	**6.204 321**
100	29/32	14/23	64	1	**9.011 953**
100	29/32	19/26	64	1	**6.204 852**
100	29/32	29/32	64	1	**7.019 272**
250	24/29	19/26	85	1	**6.204 322**
250	29/32	14/23	85	1	**9.011 955**
250	29/32	19/26	85	1	**9.011 957**
250	29/32	29/32	85	1	**9.011 956**
500	29/32	14/23	105	1	**9.011 958** 2
500	29/32	19/26	105	1	**9.011 960**
500	29/32	29/32	105	1	**9.011 959**
1000	29/23	14/23	131	1	**9.011 961**
1000	29/32	19/26	131	1	**9.011 964**
1000	29/32	29/32	131	1	**9.011 962**
1000	45/40	29/32	131	1	**9.011 963**
2000	29/32	14/23	166	1	**9.011 965**
2000	29/32	29/32	166	1	**9.011 966**
2000	45/40	29/32	166	1	**9.011 967**
3000	29/32	29/32	185	1	**6.203 014**
4000	45/40	29/32	207	1	**9.011 968**
5000	45/40	29/32	223	1	**9.011 971**
6000	45/40	29/32	236	1	**9.011 969**
10000	45/40	29/32	279	1	**9.011 970**

3



9.140 381

Round bottom flasks, ground glass joint, four neck

NEW!

Borosilicate glass 3.3 with four angled side arms.

Isolab

Capacity ml	Centre neck NS	Side necks NS	PK	Cat. No.
500	29/32	on request	1	**9.140 380**
1000	29/32	on request	1	**9.140 381** 3
2000	29/32	on request	1	**9.140 382**
4000	29/32	on request	1	**9.140 383**
6000	29/32	on request	1	**9.140 384**

Nitrogen flasks with stopcock, borosilicate glass 3.3

NEW!

Manufactured from borosilicate glass 3.3. NS necks are in compliance with DIN 12242 standards. With angled side neck with PTFE stopcock (2.5 mm hole). *Isolab*

Capacity ml	Socket NS	PK	Cat. No.
25	14/23	1	**9.140 390**
50	14/23	1	**9.140 391**
100	14/23	1	**9.140 392**
250	14/23	1	**9.140 393**
50	29/32	1	**9.140 394**
100	29/32	1	**9.140 395**
250	29/32	1	**9.140 396**
500	29/32	1	**9.140 397** 1
1000	29/32	1	**9.140 398**

1



9.140 397

Nitrogen Round-bottom Flasks (Schlenk-Flasks), DURAN®

With an angled side arm with 2.5 mm glass stopcock. *Lenz*

Capacity ml	Socket NS	PK	Cat. No.
25	14/23	1	**6.800 337**
50	14/23	1	**6.307 820**
50	29/32	1	**6.802 978**
100	14/23	1	**6.307 327** 2
100	29/32	1	**6.307 821**
250	14/23	1	**6.206 524**
250	29/32	1	**6.073 481**
500	29/32	1	**6.307 822**
1000	29/32	1	**6.307 823**

2



6.307 327

Nitrogen Tubes (Schlenk-Tubes)

NEW!

Made of DURAN® tubing. With conical joint and NS glass stopcock. *Lenz*

Capacity ml	Centre neck NS	Bore mm	PK	Cat. No.
10	14/23 Socket	2.5	1	**7.610 673** 3
25	14/23 Socket	2.5	1	**7.610 674**
50	14/23 Socket	2.5	1	**6.901 799**
100	14/23 Socket	2.5	1	**6.401 203**
250	14/23 Socket	2.5	1	**7.200 160**
10	14/23 Cone	2.5	1	**7.610 677** 4
25	14/23 Cone	2.5	1	**6.235 110**
250	14/23 Cone	2.5	1	**6.235 111**
100	14/23 Cone	2.5	1	**6.258 680**
250	14/23 Cone	2.5	1	**6.258 681**

3



7.610 673

4



7.610 677

Flat bottom flasks, NS joint neck, borosilicate glass 3.3

Borosilicate glass 3.3. Resistant to heat and almost all chemicals. According to DIN 12394. *Isolab*

Capacity ml	Socket NS	Height mm	PK	Cat. No.
50	19/26	100	1	**6.243 607**
50	24/29	100	1	**6.243 608**
50	29/32	100	1	**4.008 377**
100	14/23	110	1	**6.243 609**
100	19/26	110	1	**6.243 610**
100	24/29	110	1	**6.243 611**
100	29/32	110	1	**6.236 773**
250	19/26	140	1	**6.243 612**
250	24/29	140	1	**6.243 613**
250	29/32	140	1	**6.238 346**
500	24/29	170	1	**6.243 614**
500	29/32	170	1	**6.240 425** 5
1000	24/29	200	1	**6.243 615**
1000	29/32	200	1	**4.008 378**
2000	29/32	250	1	**6.237 704**

5



6.240 425

1



9.011 985

Flat bottom flasks, ground glass joint, DURAN®

DIN EN ISO 4797. With standard ground sockets to DIN 12242. *Lenz*

Capacity	Socket	Flask external diam.	Flask dia.	PK	Cat. No.
ml	NS	mm	mm		
50	29/32	90	51	1	**9.011 982**
100	29/32	100	64	1	**9.011 983**
250	29/32	130	85	1	**9.011 984**
500	29/32	155	105	1	**9.011 985** 1
1000	29/32	190	131	1	**9.011 986**

Up to 100ml made of DURAN® tubing.

2



9.141 113

Erlenmeyer flasks, NS neck, borosilicate glass 3.3

Borosilicate glass 3.3. Resistant to heat and almost all chemicals. They meet the highest quality standards according to DIN 12387. NS necks are in compliance with DIN 12242 standards. Inscriptions are in white enamel which is specially designed for glass use. *Isolab*

Capacity	Socket	Height	PK	Cat. No.
ml	NS	mm		
50	14/23	85	1	**9.141 105**
50	19/26	85	1	**9.141 106**
50	29/32	85	1	**9.141 107**
100	14/23	100	1	**9.141 108**
100	29/32	100	1	**9.141 109**
250	29/32	140	1	**9.141 110**
300	29/32	156	1	**9.141 111**
500	29/32	175	1	**9.141 112**
1000	29/32	220	1	**9.141 113** 2

3



9.012 015

Erlenmeyer flasks, ground glass joint, DURAN®

DIN EN ISO 4797. With standard ground sockets. *Lenz*

Capacity	Socket	Flask dia.	PK	Cat. No.
ml	NS	mm		
10	14/23	42	1	**6.200 447**
25	14/23	42	1	**9.012 001**
25	19/26	42	1	**7.019 150**
50	14/23	51	1	**9.012 002**
50	19/26	51	1	**6.900 839**
50	24/29	51	1	**7.019 155**
50	29/32	51	1	**9.012 012**
100	14/23	64	1	**9.012 003**
100	19/26	64	1	**6.200 676**
100	24/29	64	1	**7.019 156**
100	29/32	64	1	**9.012 013**
200	24/29	79	1	**7.019 164**
200	29/32	79	1	**9.012 017**
250	19/26	85	1	**6.900 834**
250	24/29	85	1	**6.200 677**
250	29/32	85	1	**9.012 014**
250	45/40	85	1	**9.012 006**
300	19/26	87	1	**7.019 163**
300	24/29	87	1	**7.070 022**
300	29/32	87	1	**9.012 018**
300	45/40	87	1	**9.012 007**
500	19/26	105	1	**6.900 835**
500	24/29	105	1	**7.400 404**
500	29/32	105	1	**9.012 015** 3
500	45/40	105	1	**9.012 008**
1000	29/32	131	1	**9.012 016**
1000	45/40	131	1	**9.012 009**
2000	29/32	166	1	**9.012 019**
2000	45/40	166	1	**9.012 010**
3000	45/40	185	1	**6.900 828**
5000	45/40	223	1	**7.607 913**

Erlenmeyer flasks, NS neck, borosilicate glass 3.3, amber

NEW!

Borosilicate glass 3.3, amber. Resistant to heat and almost all chemicals. They meet the highest quality standards according to DIN 12387. NS necks are in compliance with DIN 12242 standards.

Isolab

Capacity ml	Socket NS	Height mm	PK	Cat. No.
50	29/32	85	1	**9.140 400**
100	29/32	100	1	**6.258 244**
250	29/32	140	1	**6.258 150**
500	29/32	175	1	**6.255 806** 1
1000	29/32	220	1	**9.140 401**
2000	29/32	270	1	**9.140 402**

1



6.255 806

Erlenmeyer flasks without NS neck please see page 21.

Iodine determination Flasks, Duran®

Two types available:
- With overflow collar and NS29/32 iodine stopper.
- Without overflow collar, with NS29/32 hollow hexagonal stopper.

Lenz

Capacity ml	Flask external diam. mm	PK	Cat. No.
100	64	1	**6.258 682**
250	85	1	**6.230 826** 2
500	105	1	**7.980 791**

2



6.230 826

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

Lenz Laborglas GmbH & Co. KG

1



1 Distilling Adapters

NEW!

Manufactured from borosilicate glass 3.3. Suitable to be used in distillation assemblies for connecting flasks to condenser. Upper socket designed to accept thermometer either by screw thread adapter or by thermometer socket.
With side cone at 75° angled to the center socket.

Isolab

Cone vertical NS	Cone obliquely NS	Socket NS	PK	Cat. No.
14/23	14/23	14/23	1	**9.043 301**
19/26	19/26	14/23	1	**9.043 302**
29/32	29/32	14/23	1	**9.043 305**

2



9.012 173

Stillheads, plain, ground cone joints

Made of DURAN® tubing. DIN 12594. Medium neck. Inlet (flask) cone with thermometer socket and 75° angled outlet (condenser) cone.

Lenz

Cone vertical NS	Cone obliquely NS	Socket NS	PK	Cat. No.
29/32	29/32	14/23	1	**9.012 173** 2

3



9.043 311

Distilling Adapters, Claisen heads

NEW!

Manufactured from borosilicate glass 3.3. Suitable to be used in distillation assemblies for connecting flasks to condenser. Upper socket designed to accept thermometer either by screw thread adapter or by thermometer socket. Claisen type has a similar use as standard still head adapter but it is supplied with extra socket to accept dropping funnels, stirrers and so on.

Isolab

Cone NS	Cone obliquely NS	Socket NS	PK	Cat. No.
14/23	14/23	14/23	1	**9.043 306**
19/26	19/26	14/23	1	**9.043 307**
29/32	14/23	14/23	1	**9.043 310**
29/32	29/32	14/23	1	**9.043 311** 3

4



9.012 183

Stillheads, ground glass joint, Claisen type, sloping

Made of DURAN® tubing. DIN 12594. Claisen type, sloping. Stillhead with central and parallel side necks and vapour outlet cone at 75°. 2 x sockets NS 14/23, 2 x cones, for distillation thermometers of 55mm built-in length.

Lenz

Cone obliquely NS	Cone vertical NS	Socket NS	PK	Cat. No.
14/23	29/32	14/23	1	**9.012 182**
29/32	29/32	14/23	1	**9.012 183** 4

5



5 Distilling links without condenser

NEW!

Manufactured from borosilicate glass 3.3 which is resistant to heat and almost all chemicals.

Isolab

Effective length mm	Cone NS	Description	PK	Cat. No.
150	14/23	Standard	1	**9.012 287**
350	29/32	Standard	1	**9.012 288**
150	14/23	with socket for thermometers	1	**9.012 289**
350	29/32	with socket for thermometers	1	**9.012 290**

E & OE.

Distilling Links

Made of DURAN® tubing. Distilling links without condenser, with two vertical NS-cones. With, or without socket NS14/23 for distillation thermometers of 55mm built-in length. *Lenz*

Cone NS	Socket NS	Length mm	PK	Cat. No.
29/32	-	350	1	**9.012 203** 1
29/32	14/23	350	1	**9.012 213** 2

1



9.012 203

2



9.012 213

3 Stillheads, ground glass joint, with integral Liebig condenser

NEW!

Manufactured from borosilicate glass 3.3 which is resistant to heat and almost all chemicals. With liebig condenser and socket NS 14/23 for distillation thermometers. Available with or without vacuum receiver adapter. *Isolab*

Cone NS	Effective length mm	Description	PK	Cat. No.
14/23	160	without vacuum receiver adapter	1	**9.012 291**
14/23	250	without vacuum receiver adapter	1	**9.012 292**
29/32	250	without vacuum receiver adapter	1	**9.012 293**
29/32	400	without vacuum receiver adapter	1	**9.012 294**
14/23	160	with vacuum receiver adapter	1	**9.012 295**
14/23	250	with vacuum receiver adapter	1	**9.012 296**
29/32	250	with vacuum receiver adapter	1	**4.008 375**
29/32	400	with vacuum receiver adapter	1	**9.012 297**

3

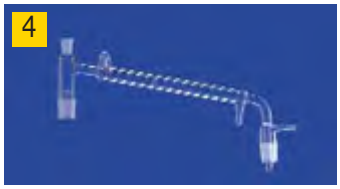


Stillheads, ground glass joint, with Liebig condenser

Made of DURAN® tubing. DIN 12596. With Liebig condenser at 75° and vertical outlet with NS cone and vacuum connection with glass olives. With socket NS 14/23 for distillation thermometers of 55mm built-in length. *Lenz*

Cone NS	Socket NS	Effective length mm	PK	Cat. No.
14/23	14/23	160	1	**6.203 415**
29/32	14/23	250	1	**6.203 416**
14/23	14/23	250	1	**9.012 264**
29/32	14/23	250	1	**9.012 266** 4
29/32	14/23	400	1	**9.012 268**

4



9.012 266

5 Distilling links with Liebig condenser and GL thread

NEW!

Distilling links with Liebig condenser, outlet with NS cone, water connection with thread GL14, with socket NS 14/23 for distillation thermometers of 55 mm built-in length, made of DURAN® tubing. *Lenz*

Cone NS	Length mm	PK	Cat. No.
14/23	160	1	**6.202 281**
14/23	250	1	**6.243 055**
29/32	250	1	**6.230 719**
29/32	400	1	**6.243 056**

5



Distillation assemblies Claisen-type

Made of DURAN® tubing. DIN 12596. With Liebig condenser and NS cone outlet. With two sockets NS 14/23 for destillation thermometer, 55mm built-in length. *Lenz*

Socket NS	Cone NS	Effective length mm	PK	Cat. No.
14/23	14/23	250	1	**9.012 282**
14/23	29/32	250	1	**9.012 285** 6

6



9.012 285

1



1 Distilling links with Liebig condenser and Claisen head

NEW!

With Liebig condenser and Claisen head and socket NS 14/23 for distillation thermometers, 55 mm fitting length. Available with or without vacuum receiver adapter.

Isolab

Description	Cone NS	Effective length mm	PK	Cat. No.
distilling link standard	14/23	160	1	**9.012 247**
distilling link standard	14/23	250	1	**9.012 248**
distilling link standard	29/32	250	1	**9.012 249**
distilling link standard	29/32	400	1	**9.012 250**
distilling link with vakuum adapter	14/23	160	1	**9.012 216**
distilling link with vakuum adapter	14/23	250	1	**9.012 217**
distilling link with vakuum adapter	29/32	250	1	**9.012 218**
distilling link with vakuum adapter	29/32	400	1	**9.012 219**

2



9.012 276

Distilling links, Claisen-type

Made of DURAN® tubing. According to DIN 12594. With Liebig condenser (angled 75°) and vertical head to Claisen, water and vacuum connection with olives. With two sockets NS 14/23 for distillation thermometers of 55mm built-in length.

Lenz

Cone NS	Socket NS	Effective length mm	PK	Cat. No.
14/23	14/23	160	1	**9.012 271**
29/32	14/23	250	1	**9.012 276** 2

3



3 Distilling links acc. to Claisen, with vacuum receiver adapter & GL thread

NEW!

Distilling links acc. to DIN 12594, with Liebig condenser and head to Claisen, thread connections: GL 14 (water) and GL 18 (vacuum), with two sockets NS 14/23 for distillation thermometers of 55 mm built-in length, made of DURAN® tubing

Lenz

Cone NS	Effective length mm	PK	Cat. No.
14/23	160	1	**9.012 272**
14/23	250	1	**9.012 274**
29/32	250	1	**9.012 275**
29/32	400	1	**9.012 279**

4



4 Distillation adapters

NEW!

Manufactured from borosilicate glass 3.3. Suitable for feeding distillate from condensers into receiving flasks. Stem length is either 65 mm or 200 mm. Socket inclined 105° with outer tube of 12 mm diameter.

Isolab

Description	Socket NS	PK	Cat. No.
adapters 65 mm, bend	14/23	1	**6.244 591**
adapters 65 mm, bend	29/32	1	**6.244 592**
adapters 200 mm, bend	14/23	1	**6.244 593**
adapters 200 mm, bend	29/32	1	**6.244 594**

5



9.012 603

6



9.012 606

Distillation adapters (plain bends), ground glass joint

Made of DURAN® tubing.
With socket and outlet tube angled at 105°, 12mm diameter.

Lenz

Socket NS	Length*	PK	Cat. No.
29/32	65	1	**9.012 603** 5
29/32	200	1	**9.012 606** 6

* Outlet tube length (mm)

1 Bends

NEW!

Manufactured from borosilicate glass 3.3 which is resistant to heat and almost all chemicals. Suitable for the usage of assembling various reactor systems. Available in two shapes: bend with angle 75° or 90°.

Isolab

Description	Cone NS	PK	Cat. No.
adapter bend-75°	14/23	1	**9.012 653**
adapter bend-75°	29/32	1	**9.012 654**
adapter bend-90°	14/23	1	**9.012 655**
adapter bend-90°	29/32	1	**9.012 656**

1



Bends

NEW!

Made of DURAN® - tubing. Bent 75° or 90°. With two cones.

Lenz

Angle	NS	PK	Cat. No.
75	14/23	1	**9.012 141**
75	29/32	1	**9.012 143** 2
90	14/23	1	**6.306 285**
90	19/26	1	**7.018 680**
90	24/29	1	**7.018 681**
90	29/32	1	**9.012 153** 3

2



9.012 143

3



9.012 153

4 Adapters bend or straight, borosilicate glass 3.3

NEW!

Manufactured from borosilicate glass 3.3. Bend adapters are available as plain bend or bend with vent with105° angled body shape.

Isolab

Description	Socket NS	Cone NS	PK	Cat. No.
adapters with ventilation	14/23	14/23	1	**9.012 657**
adapters with ventilation	29/32	29/32	1	**9.012 658**
adapters straight	14/23	14/23	1	**9.012 659**
adapters straight	29/32	29/32	1	**9.012 660**

4



Delivery Adapters, Angled

Made of Duran® tubing.

Lenz

Socket NS	Cone NS	PK	Cat. No.
14/23	14/23	1	**9.012 625**
29/32	29/32	1	**9.012 626** 5

5



9.012 626

1



1 Distillation adapters

NEW!

Manufactured from borosilicate glass 3.3. Suitable for the usage of assembling with vacuum connections. Available in two shapes: straight or angled 105°.

Isolab

Description	Socket NS	Cone NS	PK	Cat. No.
adapters straight	14/23	14/23	1	**6.243 604**
adapters straight	29/32	29/32	1	**4.008 370**
adapters bend	14/23	14/23	1	**4.008 371**
adapters bend	29/32	29/32	1	**4.008 372**

2



9.012 621

3



9.012 623

Vacuum Distillation core and sleeve

Made of DURAN® tubing. With vent/vacuum connection. Straight or angled (105°),with nozzle.

Lenz

Socket NS	Cone NS	Form	PK	Cat. No.
14/23	14/23	straight	1	**9.012 611**
14/23	14/23	angled	1	**9.012 613**
29/32	29/32	straight	1	**9.012 621** 2
29/32	29/32	angled	1	**9.012 623** 3

4



4 Receiver adapters, straight or bent, with GL thread

NEW!

Receiver adapters acc. to DIN 12594, straight or bent (angle: 105°), with NS socket and NS cone, with drain tip, vacuum connection:
thread GL18, made of DURAN® tubing

Lenz

NS	DIN	Description	PK	Cat. No.
14/23	12594	straight	1	**7.930 030**
29/32	12594	straight	1	**6.900 523**
14/23	12594	bent	1	**9.012 607**
29/32	12594	bent	1	**9.012 608**

5



5 Distilling adapters, Bredt type

NEW!

Manufactured from borosilicate glass 3.3. Suitable to be used in distillation assemblies to be connected to distilling distributor. Straight or bend 105° shape with vacuum connection.

Isolab

Description	PK	Cat. No.
adapter straight, upper socket NS size 14/23, down socket NS size 19/26	1	**9.012 634**
adapter straight, upper socket NS size 29/32, down socket NS size 29/32	1	**9.012 635**
adapter bend, upper socket NS size 14/23, down socket NS size 19/26	1	**9.012 636**
adapter bend, upper socket NS size 29/32, down socket NS size 29/32	1	**9.012 637**

6



6 Distilling distributor, Bredt type

NEW!

Manufactured from borosilicate glass 3.3. To be used with maximum 250 ml flasks with NS 14/23.

Isolab

Description	PK	Cat. No.
center cone 19/26, side cone 14/23	1	**9.012 638**
center cone 29/32, side cone 14/23	1	**9.012 639**

1 Distilling Receivers

NEW!

Distilling Receivers to Bernauer, with 3 cones NS 14/23,vacuum connection with glass olive. Made of DURAN® tubing.

Lenz

Type	Socket NS	PK	Cat. No.
Distilling Receivers, without flask	14/23	1	**6.210 168**
Distilling Receivers, without flask	29/32	1	**6.236 954**

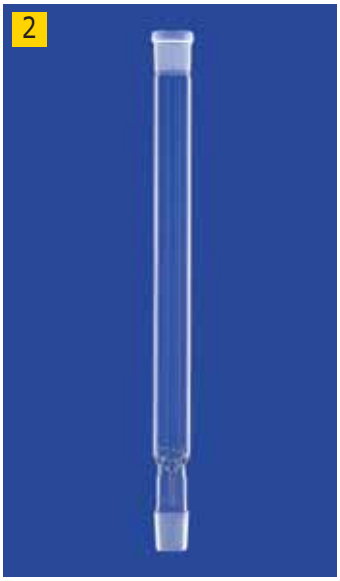


Columns, ground glass joint, Hempel

Made of DURAN® tubing. With packing material support, ground glass cone and socket

Lenz

Socket NS	Cone NS	Fill height mm	PK	Cat. No.
14/23	14/23	300	1	**9.012 321**
29/32	29/32	300	1	**9.012 322** 2
29/32	29/32	800	1	**9.012 326**



9.012 322

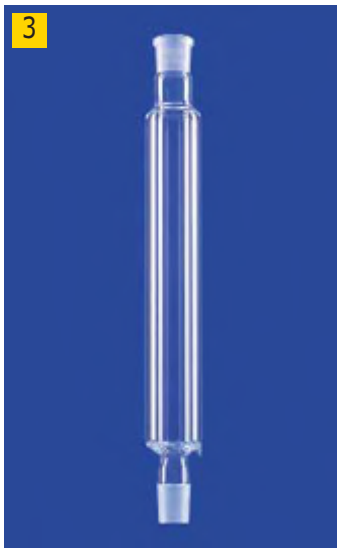
3 Columns acc. to Hempel with fixed vacuum jacket

NEW!

For packings like Raschig rings or glass beads, with NS socket and NS cone, with fixed vacuum jacket, made of DURAN® tubing

Lenz

Fill height mm	NS	PK	Cat. No.
200	14/23	1	**6.241 715**
300	29/32	1	**9.012 327**
500	29/32	1	**9.012 328**
800	29/32	1	**9.012 329**



4 Raschig rings, glass

NEW!

Pack of 1 kg.

Hecht

Type	PK	Cat. No.
3x3	1	**9.012 413**
4x4	1	**9.012 414**
5x5	1	**9.012 415**
6x6	1	**9.012 416**
8x8	1	**9.012 417**



Glass wool please see page 1443.



1 Glass beads

Type AR soda lime glass. Supplied in packs of approx. 1kg. *Lindner*

Ø mm	PK	Cat. No.
0,09 - 0,15	1	**6.079 803**
0,40 - 0,60	1	**6.074 805**
0,50 - 0,75	1	**6.901 962**
1,00 - 1,30	1	**6.239 547**
1,5 - 2	1	**9.012 402**
3	1	**9.012 403**
4	1	**9.012 404**
4,5	1	**6.254 325**
5	1	**9.012 405**
6	1	**9.012 406**
7	1	**6.254 523**
8	1	**9.012 407**
10	1	**9.012 408**
14	1	**9.012 410**



9.012 336



9.012 330

Columns acc. to Vigreux, with or without vacuum jacket

Made of DURAN® tubing. *Lenz*

Type	NS	Effective length mm	PK	Cat. No.
without jacket	14/23	200	1	**6.304 939**
without jacket	14/23	300	1	**6.900 157**
without jacket	29/32	300	1	**9.012 336** 2
without jacket	29/32	600	1	**9.012 337**
with jacket	14/23	200	1	**6.070 046**
with jacket	14/23	300	1	**6.079 073**
with jacket	29/32	300	1	**9.012 330** 3
with jacket	29/32	600	1	**7.628 209**

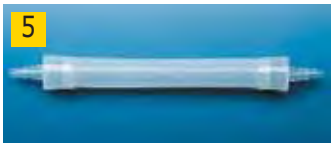


4 Columns acc. to Vigreux with fixed vacuum jacket

NEW!

With NS socket and NS cone, with fixed vacuum jacket, made of DURAN® tubing. *Lenz*

Fill height mm	NS	PK	Cat. No.
200	14/23	1	**7.613 796**
300	14/23	1	**9.012 333**
300	29/32	1	**6.073 183**
600	29/32	1	**6.226 643**



5 Drying tubes, PE-LD

Removable stoppers at both tube ends. With tubing nozzles, 4mm to 9mm o.d. *Kartell*

Length mm	PK	Cat. No.
100	1	**9.253 131**
150	1	**9.253 135**
200	1	**9.253 140**



6 Drying tubes, U-pattern

NEW!

Made of borosilicate glass 3.3. DIN 12610. With or without interchangeable ground joint stopcocks. U-shape. Hose connectors 6mm in diameter. *Isolab*

Length mm	NS	Diam. mm	Description	PK	Cat. No.
100	14/23	13	without stopcock	1	**9.140 515**
130	14/23	13	without stopcock	1	**9.140 516**
180	19/26	18	without stopcock	1	**9.140 517**
100	14/23	13	with stopcock	1	**9.140 518**
130	14/23	13	with stopcock	1	**9.140 519**
180	19/26	18	with stopcock	1	**9.140 520**

1 Drying tubes

NEW!

Made of borosilicate glass 3.3. Angled to 90°. *Isolab*

Length mm	Diam. mm	PK	Cat. No.
100	13	1	**9.140 513**
150	13	1	**9.140 514**



Desiccant please see page 1044.

Drying tubes

Made of DURAN® tubing. Angled to 75°. *Lenz*

Cone NS	PK	Cat. No.
14/23	1	**9.012 701**
29/32	1	**9.012 703** 2



9.012 703

Multiple Adapters, 2 Necks

NEW!

Made from borosilicate glass 3.3. With two sockets and one cone. *Isolab*
One neck 105° upwards.

Cone NS	Socket NS	Socket lateral NS	PK	Cat. No.
14/23	14/23	14/23	1	**6.243 740** 3
19/26	19/26	19/26	1	**6.243 741**
29/32	29/32	14/23	1	**9.140 502**
29/32	29/32	29/32	1	**9.140 503**



6.243 740

4 Multiple Adapters, 2 Necks

NEW!

Made from Duran® tubing. With two sockets and one cone. *Lenz*
One neck 105° upwards.

Cone NS	Socket NS	Socket lateral NS	PK	Cat. No.
14/23	14/23	14/23	1	**9.012 101**
19/26	19/26	19/26	1	**6.232 027**
29/32	29/32	14/23	1	**7.610 631**
29/32	29/32	29/32	1	**9.012 103**



1



6.243 739

Multiple Adapters, 2 Necks

NEW!

Made of borosilicate glass 3.3. Side neck parallel with centre neck. 2 x sockets 1 x cone. *Isolab*

Cone NS	Socket NS	Socket lateral NS	PK	Cat. No.
14/23	14/23	14/23	1	**6.243 738**
19/26	19/26	19/26	1	**9.140 504**
14/23	29/32	14/23	1	**9.140 507**
29/32	29/32	29/32	1	**6.243 739** 1

2



9.012 123

Adapters, ground glass joint, multiple, 2 neck

Made of DURAN® tubing. Side neck parallel with centre neck. 2 x sockets 1 x cone. *Lenz*

Cone NS	Socket NS	Socket lateral NS	PK	Cat. No.
29/32	14/23	14/23	1	**6.232 074**
14/23	14/23	14/23	1	**9.012 121**
29/32	29/32	29/32	1	**9.012 123** 2

3



4.008 373

4



9.140 508

Splash head adapter, ground glass joint, borosilicate glass 3.3

Borosilicate glass 3.3. Suitable to be used in distillation assemblies to prevent raw liquid step over from flask to condenser. *Isolab*

Socket NS	Cone NS	Description	PK	Cat. No.
14/23	14/23	straight	1	**4.008 373** 3
29/32	29/32	straight	1	**6.255 503**
14/23	14/23	bend	1	**9.140 508** 4
29/32	29/32	bend	1	**9.140 511**

5



9.012 193

6



9.012 138

Splash head adapter, ground glass joint, Duran® tubing

Made of DURAN® tubing. *Lenz*
Two versions available:
- straight, with cone and socket
- bent with two cones at 75°.

Splash heads are directly placed onto distillation flasks for separation of drops.

NS	Description	PK	Cat. No.
29/32	29/32	1	**9.012 193** 5
29/32	29/32	1	**9.012 138** 6

7



7 Bellows, PTFE

NEW!

Strainless connection of ground joint equipment; for compensating vibra-tions from vacuum pumps; for length compensation of heated columns; angular misalignment.
Made of PTFE, with sharp folds and sealing rings on the outside; maximum deflection: 120°. *BOLA*

Socket NS	Cone NS	Overall length mm	PK	Cat. No.
14/23	14/23	90	1	**9.012 161**
29/32	29/32	120	1	**9.012 163**

E & OE.

1 Vacuum sublimation apparatus

Enables effective cleaning of chemicals and substances that turn from solids to vapours directly without liquidifying first and solidifying again on cooling. The cleaned sublimate can be fully recovered from the conical cooler without difficulty once the sublimation process is complete.

Type	PK	Cat. No.
Micro apparatus, complete, sublimate quantity 1g to 2g	1	**9.305 367**
Semi-micro apparatus, complete, sublimate quantity 5g to 7g	1	**9.305 368**
Macro apparatus, complete, sublimate quantity 10g to 25g	1	**9.305 369**



2 Reaction flasks, flat flange, DURAN®

Flanged neck with groove for vacuum use. 500ml and 1000ml vessels are completely cylindrical. Capacities indicated are brim-full volumes. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable.

DURAN Group

Capacity ml	DN	Capacity ml	Flange diam. mm	Body diam. mm	Height mm	Pressure bar	PK	Cat. No.
100	60	195	100	70	85	2,5*	1	**9.142 024**
250	60	315	100	70	125	2,5*	1	**9.142 036**
500	100	740	138	106	120	1,5*	1	**9.142 044**
1000	100	1395	138	106	205	1,5*	1	**9.142 054**
2000	100	2620	138	140	270	1,5*	1	**9.142 063**
4000	150	5765	184	200	290	1,0*	1	**9.142 071**
6000	150	7320	184	215	320	1,0*	1	**9.142 076**

* Maximum permissable operating pressure measured at 250°C.



3 Flat flange beakers, DURAN®

Flanged neck with groove for vacuum use. Maximum 0.5bar working pressure at 250°C. Capacities indicated are brim-full volumes. We recommend that these beakers are heated in water or oil baths. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable.

DURAN Group

Flange diameter: 158mm
Beaker diameter: 130mm

Capacity ml	DN	Capacity ml	Height mm	PK	Cat. No.
1000	120	1360	125	1	**9.142 271**
2000	120	2200	200	1	**9.142 272**
3000	120	3220	290	1	**9.142 273**



4 Flat ground flange lids, DURAN®

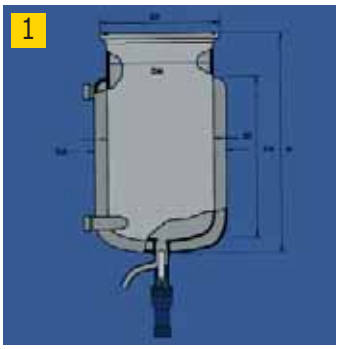
With four ground joint necks as outlined below. Centre neck NS 29/32. 1bar max. operating pressure at 250°C. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable.

DURAN Group

DN	Flange diam. mm	Height mm	Side necks NS	PK	Cat. No.
100	138	125	3 x 29/32 angled	1	**9.142 246**
100	138	105	2 x 29/32 angled, 1 x 14/23 parallel	1	**9.142 476**
120	158	130	2 x 29/32 angled, 1 x 14/23 parallel	1	**9.142 251**
150	184	130	3 x 29/32 parallel	1	**9.142 257**
150	184	130	2 x 29/32 angled, 1 x 14/23 parallel	1	**9.142 259**



1



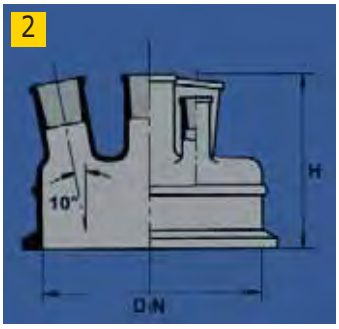
1 Flat ground flange reaction vessels, jacketed

Flange with groove in accordance with DIN 12214.
Flask with thermostatic jacket and type "T" 10mm bore PTFE drain valve.
Form
A = cylindrical form
B = short form

Capacity ml	DN mm	Form	Widest A.-Ø mm	Flange diam. mm	Height mm	Fill height mm	PK	Cat. No.
250	100	A	140	138	140	50	1	**9.142 037**
500	100	A	140	138	165	75	1	**9.142 038**
1000	100	A	140	138	230	140	1	**9.142 039**
1000	120	A	160	158	210	110	1	**9.142 040**
2000	120	A	160	158	300	200	1	**9.142 041**
3000	120	A	160	158	390	290	1	**9.142 042**
2000	150	A	200	184	230	130	1	**9.142 043**
3000	150	A	200	184	295	190	1	**9.142 045**
4000	150	A	200	184	355	250	1	**9.142 046**
5000	150	A	200	184	400	300	1	**9.142 047**
6000	150	A	200	184	450	350	1	**9.142 048**
6000	150	B	250	184	360	260	1	**9.142 049**
10000	150	A	200	184	675	575	1	**9.142 050**
10000	150	B	300	184	450	290	1	**9.142 051**

Further accessories and spare parts available on request.

2

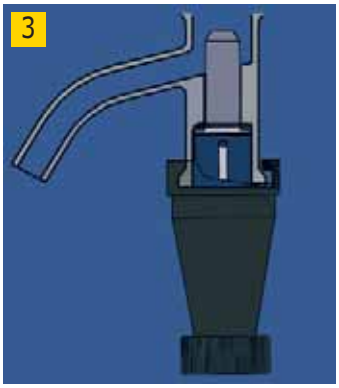


2 Flat flange lids

Flange in accordance with DIN 12214.

Flange diam. mm	Centre neck NS	Angled side necks NS	Parallel side necks NS	Height mm	PK	Cat. No.
100	29	2 x 29	-	125	1	**9.142 120**
100	29	-	2 x 29	125	1	**9.142 121**
100	29	2 x 29	1 x 14	125	1	**9.142 122**
100	29	2 x 29	2 x 29	125	1	**9.142 123**
100	45	2 x 29	-	150	1	**9.142 124**
100	45	2 x 29	1 x 14	150	1	**9.142 126**
100	45	2 x 29	2 x 29	150	1	**9.142 127**
120	29	2 x 29	-	125	1	**9.142 128**
120	29	-	2 x 29	125	1	**9.142 129**
120	29	2 x 29	1 x 14	125	1	**9.142 130**
120	29	2 x 29	2 x 29	125	1	**9.142 131**
120	45	2 x 29	-	150	1	**9.142 132**
120	45	-	2 x 29	150	1	**9.142 133**
120	45	2 x 29	1 x 14	150	1	**9.142 134**
120	45	2 x 29	2 x 29	150	1	**9.142 135**
150	29	2 x 29	-	125	1	**9.142 136**
150	29	-	2 x 29	125	1	**9.142 137**
150	29	2 x 29	1 x 14	125	1	**9.142 138**
150	29	2 x 29	2 x 29	125	1	**9.142 139**
150	45	2 x 29	-	150	1	**9.142 140**
150	45	-	2 x 29	150	1	**9.142 141**
150	45	2 x 29	1 x 14	150	1	**9.142 142**
150	45	2 x 29	2 x 29	150	1	**9.142 143**

3



3 Reaction vessel accessories

PTFE drain valves, complete:
Model "T" (Standard for vessels with NW 100 to NW 200 flanges):
PTFE, 10mm bore drain valve with no dead volume, key plug that seals on the base of the vessel, with maximum opening 35mm, self-adjusting, centring hub, visible wear indication and integral glass angled outlet. For standard applications with liquids of different viscosity.
Model "H"
generally as Model "T", but with 20mm bore and max. opening 70mm.
Model "H/PT 100"
generally as Model "H", but with integral Pt100 sensor to enable easy measurement of sump temperature.

Type	PK	Cat. No.
Model "T"	1	**9.142 001**
Model "H"	1	**9.142 002**
Model "H/Pt 100"	1	**9.142 003**

Further accessories and spare parts available on request.

E & OE.

1 Tubing adapters for heating and cooling connection

For metal or standard tubing connectors with secure, quick attachment/release, using spring insert technology.

Type	PK	Cat. No.
For DN 15, M 16 x 1 thread	1	**9.142 004**
For DN 15, M 24 x 1.5 thread	1	**9.142 005**
For DN 15, M 16 with integral Pt100	1	**9.142 006**
For DN 15, D11 olive-shaped connection	1	**9.142 007**
For DN 15, D13 olive-shaped connection	1	**9.142 008**
PTFE comb seal DN 15	1	**9.142 009**
Graphited flat seal for temperatures above +150°C	1	**9.142 010**
Pin spanner for DN 15 metal adapter to ensure secure mounting	1	**9.142 011**



2 O-rings

VMQ silicone. With, or without, FEP coating. *Lenz*

Type	For flange DN	Diam. mm	Thickness mm	PK	Cat. No.
VMQ	60	75	4	1	**9.142 834**
VMQ	100	110	4	1	**9.142 846**
VMQ	150	150	5	1	**9.142 857**
VMQ + FEP	60	75	4	1	**9.142 866**
VMQ + FEP	100	110	4	1	**9.142 867**
VMQ + FEP	150	150	5	1	**9.142 868**
VMQ + FEP	200	215	5	1	**9.142 869**



Seal for flat flange vessel

NEW!

H.W.S.

Description	PK	Cat. No.
Seal for flat flange vessel DN 50 consist of: PTFE supporting ring and seal O-Ring, Viton	1	**9.142 170**
Seal for flat flange vessel DN 50 consist of: PTFE supporting ring and seal O-Ring, Silicone	1	**9.142 171**
Seal for flat flange vessel DN 50 consist of: PTFE supporting ring and seal O-Ring, Silicone/FEP	1	**9.142 172**
Seal for flat flange vessel DN 60 consist of: PTFE supporting ring and seal O-Ring, Viton	1	**9.142 173**
Seal for flat flange vessel DN 60 consist of: PTFE supporting ring and seal O-Ring, Silicone	1	**9.142 174**
Seal for flat flange vessel DN 60 consist of: PTFE supporting ring and seal O-Ring, Silicone/FEP	1	**9.142 175**
Seal for flat flange vessel DN 100 consist of: PTFE supporting ring and seal O-Ring, Viton	1	**9.142 176**
Seal for flat flange vessel DN 100 consist of: PTFE supporting ring and seal O-Ring, Silicone	1	**9.142 177**
Seal for flat flange vessel DN 100 consist of: PTFE supporting ring and seal O-Ring, Silicone/FEP	1	**9.142 178**
Seal for flat flange vessel DN 120 consist of: PTFE supporting ring and seal O-Ring, Viton	1	**9.142 179**
Seal for flat flange vessel DN 120 consist of: PTFE supporting ring and seal O-Ring, Silicone	1	**9.142 180**
Seal for flat flange vessel DN 120 consist of: PTFE supporting ring and seal O-Ring, Silicone/FEP	1	**9.142 181**
Seal for flat flange vessel DN 150 consist of: PTFE supporting ring and seal O-Ring, Viton	1	**9.142 182**
Seal for flat flange vessel DN 150 consist of: PTFE supporting ring and seal O-Ring, Silicone	1	**9.142 183**
Seal for flat flange vessel DN 150 consist of: PTFE supporting ring and seal O-Ring, Silicone/FEP	1	**9.142 184**
Seal for flat flange vessel DN 200 consist of: PTFE supporting ring and seal O-Ring, Viton	1	**9.142 185**
Seal for flat flange vessel DN 200 consist of: PTFE supporting ring and seal O-Ring, Silicone	1	**9.142 186**
Seal for flat flange vessel DN 200 consist of: PTFE supporting ring and seal O-Ring, Silicone/FEP	1	**9.142 187**

Quick-acting closures

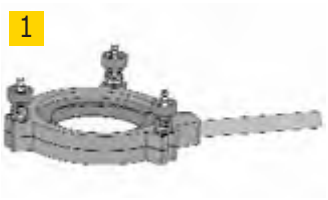
Stainless steel. With three-part caliper clamps. *Lenz*

For flange DN	PK	Cat. No.
60	1	**9.142 934**
100	1	**9.142 946** 3
120	1	**9.142 951**
150	1	**9.142 957**
200	1	**9.142 964**



9.142 946

1



1 Supporting ring

NEW!

H.W.S.

Description	PK	Cat. No.
Supporting ring DN 60 Polyester, with support	1	**9.011 732**
Supporting ring DN 100 Polyester, with support	1	**9.011 733**
Supporting ring DN 120 Polyester, with support	1	**9.011 734**
Supporting ring DN 150 Polyester, with support	1	**9.011 735**
Supporting ring DN 60 Polyester, with support DIN	1	**6.229 692**
Supporting ring DN 100 Polyester, with support DIN	1	**6.229 695**
Supporting ring DN 120 Polyester, with support DIN	1	**9.011 736**

2



2 PF - laboratory-flange triple clamp

Bochem

Holder for all PF- laboratory flasks for the alternating removal of vessel and lid. This special quick-release fastener ensures that the two laboratory flat flanges of reaction tube and flat flange lid are connected and, in addition, that the reaction tube and/or flat flange lid are held individually.(optimal flange angle 45°). Without accessories. Rod 15/26.9mm diameter.

Jaw opening mm	Diam. mm	PK	Cat. No.
100	15.0	1	**9.224 851**
120	15.0	1	**9.224 852**
150	15.0	1	**9.224 853**
200	26.9	1	**9.224 854**



E & OE.

1 2 KPG stirrer shafts, DURAN®

DURAN®. Interchangeable. Bearing surface ground and polished. *DURAN Group*
WG: 4 fixed blades
WS: 2 movable blade
KPG diameter: 10mm
KPG length: 160mm.

Type	Length mm	For neck dia. mm	PK	Cat. No.
WG 10	320	60	1	**9.197 321**
WG 10	370	60	1	**9.197 322**
WG 10	410	60	1	**9.197 323**
WG 10	440	60	1	**9.197 324**
WS 10	320	25	1	**9.197 311**
WS 10	370	25	1	**9.197 312**
WS 10	410	25	1	**9.197 313**
WS 10	440	25	1	**9.197 314**


1


2

3 KPG stirrer bearings, DURAN®

Interchangeable. Bearing surface ground, polished. *DURAN Group*
With or without standard ground cone NS 29/32.

Type	Cone NS	Diam. mm	Height mm	PK	Cat. No.
HA 10	no	10	65	1	**9.197 251**
HB 10	no	10	75	1	**9.197 252**
HB 16	no	16	90	1	**9.197 257**
HQ 10	yes	10	75	1	**9.197 253**
HT 10	yes	10	65	1	**9.197 256**
HT 16	yes	16	85	1	**9.197 258**


3

Stirrer with stirrer adapter

Made of DURAN® tubing. *Lenz*
For round bottom flasks 250 to 2000ml. Stirrer shaft, with PTFE stirrer blade and fixing screw. Seals vacuum stirring apparatus gas-tight to 10^{-2} mbar up to a permanent load of 800rpm.

Type	PK	Cat. No.
Stirrer with Stirrer Bearing, complete	1	**9.198 050** 4
Shaft, Dia. 10 x L 400mm	1	**6.802 957**
Blade, PTFE, 70x24x3mm	1	**6.204 794**
Screw, PTFE	1	**6.204 795**
Sealing, PTFE	1	**7.616 277**
Closure, thread GL 25, cone NS 29/32	1	**6.258 683**
Pressure spring, stainless steel	1	**6.258 684**
Screw cap GL 25, PP	1	**6.258 685**


4

9.198 050

5 Stirrer bearings with cooling jacket

NEW!

Stirrer bearings with NS cone and cooling water connections (thread GL 14), bearing surface ground and polished, made of DURAN® tubing. *Lenz*

Cone NS	For diam. stirring rod mm	PK	Cat. No.
29/32	10	1	**6.234 956**
45/40	16	1	**6.234 957**


5

1



9.197 355

Stirrer glands with GL male thread, DURAN®

Made of DURAN® tubing. Other materials used: PTFE (bearing), silicone (gasket) and Stirrer guides, GL male thread. Cone size 29/32. Guide bore 10mm i.d.

Lenz

Type	Neck thread GL	Cone NS	Ø agitator shaft mm	Overall length mm	PK	Cat. No.
Stirrer bearing with male thread	25	29/32	10	90	1	**9.197 355** 1
Stirrer bearing with male thread	25	45/40	10	110	1	**6.223 283**
Stirrer bearing with male thread	32	45/40	16	118	1	**9.197 356**

2



2 Stirrer Bearings, PTFE

The sealing rings on these bearings ensure a perfect sealing. The ground joint no longer sticks, the danger of breaking is reduced and the cone can be removed easily from the socket. A special gasket made of PTFE and an FPM o-ring which is compressed by a GL screw cap provide a good sealing of the stirrer shaft. This gasket can be exchanged after wearing. Suitable for vacuum, perfect bearing for stainless steel, glass and BOLA Stirrer Shafts.

BOLA

Cone NS	For diam. stirring rod mm	Overall length mm	Neck thread GL	PK	Cat. No.
29/32	6	72	18	1	**6.087 538**
29/32	8	74	25	1	**6.076 532**
29/32	10	72	25	1	**6.088 058**

3



3 Stirrer bearings with dynamic double seal

NEW!

Stirrer bearings for applications under vacuum or under slight overpressure. With extended guidance for reduced vibrations and a longer lifetime. Material: borosilicate glass 3.3 (closure), PTFE (sealings)

Lenz

For diam. stirring rod mm	NS	PK	Cat. No.
10	29/32	1	**7.629 417**
10	45/40	1	**9.197 359**
16	29/32	1	**9.197 363**
16	45/40	1	**9.197 364**

E & OE.

1 Dropping funnels, borosilicate glass 3.3

NEW!

Conical dropping funnels, without relief tube supplied with PTFE stopcock. *Isolab*

Capacity ml	NS	PK	Cat. No.
50	19/26	1	**9.140 420**
100	19/26	1	**9.140 421**
250	29/32	1	**9.140 422**
500	29/32	1	**9.140 423**
1000	29/32	1	**9.140 424**

1



Dropping funnels, cylindrical, with or without pressure equalizing tube

Borosilicate glass 3.3, cylindrical shape, with or without pressure equalising tube. DIN 12451 and DIN 12567. *Isolab*

Capacity ml	NS	Type	PK	Cat. No.
50	19/26	with relief tube	1	**9.140 415**
100	19/26	with relief tube	1	**4.008 428** 2
250	29/32	with relief tube	1	**6.240 982**
500	29/32	with relief tube	1	**6.240 983**
1000	29/32	with relief tube	1	**9.140 416**
50	19/26	without with relief tube	1	**9.140 410**
100	19/26	without with relief tube	1	**9.140 411**
250	29/32	without with relief tube	1	**9.140 412**
500	29/32	without with relief tube	1	**9.140 413**
1000	29/32	without with relief tube	1	**9.140 414**

2



4.008 428

Cylindrical dropping funnels, with pressure equalising tube, borosilicate glass 3.3

Borosilicate glass 3.3. Cylindrical shape, with pressure equalising tube. With NS socket and interchangeable PE stopper, plug with retaining device. With graduations for reading of the approx. volume. *Lenz*

Two types available:
- With solid glass key
- With PTFE key

Capacity ml	NS	Bore mm	Grad. ml	Keys	PK	Cat. No.
25	14/23	2.5	1	solid	1	**6.072 172**
50	14/23	2.5	1	solid	1	**9.012 755**
50	29/32	2.5	1	solid	1	**9.012 767**
100	14/23	2.5	2	solid	1	**9.012 756**
100	29/32	2.5	2	solid	1	**9.012 768**
250	14/23	4.0	5	solid	1	**9.012 757**
250	29/32	4.0	5	solid	1	**9.012 769** 3
500	29/32	4.0	10	solid	1	**9.012 770**
1000	29/32	6.0	20	solid	1	**7.601 147**
25	14/23	2.5	1	PTFE	1	**9.012 751**
50	14/23	2.5	1	PTFE	1	**9.012 752**
50	29/32	2.5	1	PTFE	1	**6.223 427**
100	14/23	2.5	2	PTFE	1	**9.012 753**
100	29/32	2.5	2	PTFE	1	**6.900 312**
250	29/32	4.0	5	PTFE	1	**9.012 764** 4
500	29/32	4.0	10	PTFE	1	**9.012 765**
1000	29/32	6.0	20	PTFE	1	**9.012 766**

3



9.012 769

4



9.012 764

1



9.012 471

Air condensers, ground glass joint

Made of DURAN® tubing. For easily condensable vapours. With NS cone and drain ring. *Lenz*

Cone NS	Length mm	PK	Cat. No.
14/23	700	1	**9.012 470**
29/32	1000	1	**9.012 471** 1

2



2 Condensers, ground glass joint, Dimroth, PP-olive

Made of borosilicate glass 3.3. Resistant to heat and almost all chemicals. According to DIN 12591. Supplied with polypropylene side arm, which has a screw thread connector for easy and safe fitting of the tubing. The side arms accept tubing with 8/9mm bore size. *Isolab*

Description	NS	Effective length mm	PK	Cat. No.
with PP side arm	29/32	250	1	**9.012 547**
with PP side arm	29/32	400	1	**9.012 545**

3



3 Condensers, ground glass joint, Dimroth, borosilicate glass 3.3.

NEW!

Made of borosilicate glass 3.3. Resistant to heat and almost all chemicals. According to DIN 12591. Supplied with glass side arm, which has a screw thread connector for easy and safe fitting of the tubing. The side arms accept tubing with 8/9mm bore size. *Isolab*

Effective length mm	Socket NS	Cone NS	PK	Cat. No.
160	14/23	14/23	1	**9.012 525**
160	29/32	29/32	1	**9.012 526**
250	14/23	14/23	1	**9.012 527**
250	29/32	29/32	1	**6.258 228**
400	14/23	14/23	1	**9.012 528**
400	29/32	29/32	1	**6.243 670**

4



9.012 533

Condensers, ground glass joint, Dimroth, PP-olive

DURAN® tubing. DIN 12591. Socket and cone NS. Water connection by nozzles or GL14 threads with two threaded plastic nozzles. *Lenz*

Socket NS	Cone NS	Effective length mm	PK	Cat. No.
14/23	14/23	160	1	**9.012 530**
29/32	29/32	250	1	**9.012 533** 4
29/32	29/32	400	1	**9.012 534**

5



5 Condensers, ground glass joint, Allihn

NEW!

Manufactured from borosilicate glass 3.3 according to DIN 12581 standard. Supplied with glass side arm.The side arms accept tubings with 8/9 mm bore size. *Isolab*

Effective length mm	Cone NS	Socket NS	PK	Cat. No.
160	14/23	14/23	1	**9.012 507**
160	29/32	29/32	1	**9.012 508**
250	14/23	14/23	1	**9.012 509**
250	29/32	29/32	1	**6.253 331**
400	14/23	14/23	1	**9.012 510**
400	29/32	29/32	1	**6.243 669**

Extraction apparatus - please see page 623.

E & OE.

1 Condensers, ground glass joint, Allihn

Borosilicate glass 3.3 which is resistant to heat and almost all chemicals. They meet the highest quality standards according to DIN 12581. Polypropylene side arm has a screw thread connector for easy and safe fitting of the tubing. The side arms accept tubings with 8/9mm bore size. *Isolab*

Description	NS	Effective length mm	PK	Cat. No.
with PP side arm	29/32	160	1	**4.008 406**
with PP side arm	29/32	400	1	**4.008 408**

1



Condensers, ground glass joint, Allihn, Duran® tubing

Made of DURAN® tubing. DIN 12581. For condensing vapours. With cone and socket, GL14 threaded water connections with two threaded, plastic, tubing nozzles. *Lenz*

Socket NS	Cone NS	Bulbs	Effective length mm	PK	Cat. No.
14/23	14/23	4	160	1	**9.012 511**
19/26	19/26	4	160	1	**9.012 516**
29/32	29/32	5	250	1	**9.012 517** 2
29/32	29/32	8	400	1	**9.012 515**
19/26	19/26	5	250	1	**6.236 022**
14/23	14/23	5	250	1	**6.251 366**
29/32	29/32	4	160	1	**9.012 518**

2



9.012 517

3 Spiral condensers, borosilicate glass 3.3

Made of borosilicate glass 3.3 which is resistant to heat and almost all chemicals. They meet the highest quality standards according to DIN 12592. Supplied with either glass side arm or polypropylene side arm. Polypropylene side arm has a screw thread connector for easy and safe fitting of the tubing. The side arms accept tubings with 8/9mm bore size. *Isolab*

Description	NS	Effective length mm	PK	Cat. No.
with glass side arm	14/23	160	1	**9.012 548**
with glass side arm	29/32	250	1	**6.257 821**
with glass side arm	29/32	400	1	**4.008 411**
with PP side arm	14/23	160	1	**4.008 412**
with PP side arm	29/32	250	1	**6.257 820**
with PP side arm	29/32	400	1	**4.008 414**

3



Spiral condensers, Duran® tubing

Made of DURAN® tubing. For cooled distillate. Water connections, complete with two GL14 threaded plastic nozzles. *Lenz*

Socket NS	Cone NS	Effective length mm	PK	Cat. No.
14/23	14/23	160	1	**9.012 522**
29/32	29/32	400	1	**6.225 557**
29/32	29/32	250	1	**9.012 523** 4
29/32	29/32	500	1	**9.012 524**

4



9.012 523

For all condensers are other sizes available on request.

1



9.012 543

Intensive condensers, jacketed coil, ground glass joint, Duran® tubing

Made of DURAN® tubing. DIN 12593. With jacketed cooling coil. Water connection with nozzle or GL14 thread, with two threaded, plastic, tubing nozzles. *Lenz*

Socket NS	Cone NS	Effective length mm	PK	Cat. No.
29/32	29/32	250	1	**6.227 832**
29/32	29/32	400	1	**6.240 342**
14/23	14/23	160	1	**6.900 522**
29/32	29/32	160	1	**7.635 816**
29/32	29/32	500	1	**7.970 241**
29/32	29/32	160	1	**9.012 542**
29/32	29/32	250	1	**9.012 543** 1
29/32	29/32	400	1	**9.012 544**

2



2 Condensers, ground glass joint, Liebig, borosilicate glass 3.3

Made of borosilicate glass 3.3 which is resistant to heat and almost all chemicals. They meet the highest quality standards according to DIN 12576. Polypropylene side arm has a screw thread connector for easy and safe fitting of the tubing. The side arms accept tubings with 8/9mm bore size. *Isolab*

Description	NS	Effective length mm	PK	Cat. No.
with PP side arm	29/32	250	1	**9.012 546**
with PP side arm	29/32	400	1	**4.008 405**
with glass side arm	29/32	250	1	**7.970 278**
with glass side arm	29/32	400	1	**6.236 239**
with glass side arm	14/23	160	1	**9.012 535**
with glass side arm	14/23	250	1	**9.012 536**
with glass side arm	14/23	400	1	**9.012 537**

3



9.012 505

Condensers, ground glass joint, Liebig, DURAN® tubing

Made of DURAN® tubing. DIN 12576 with nozzle or GL14 thread. Water connection, tubing nozzle or GL14 thread, with two threaded, plastic, tubing nozzles. *Lenz*

Socket NS	Cone NS	Ext. diam. mm	Int. diam. mm	Effective length mm	PK	Cat. No.
14/23	14/23	20	12	160	1	**9.012 502**
19/26	19/26	24	16	160	1	**9.012 501**
29/32	29/32	24	16	250	1	**9.012 505** 3
29/32	29/32	24	16	400	1	**9.012 506**

We can **supply** this **manufacturer's whole product range !**

partner of the LLG Lab Logistics Group

ISOLAB Laborgeräte GmbH

1 Air leak rod, DURAN®

With bulb.

Width mm	Length mm	PK	Cat. No.
4	180	1	**9.012 302**



Air leak capillary tubes, ground glass joint

DURAN® tubing. DIN 12404. For cutting off, or drawing out, to required length. Cone size: 14/23. *Lenz*

Cone NS	Diam. mm	Length mm	PK	Cat. No.
29/32	6	200	1	**6.239 812**
14/23	6	200	1	**9.012 301** 2

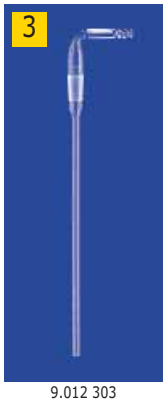


9.012 301

Insertion tubes

DURAN® tubing. With cone, enclosing a bent insertion tube with tubing connection. *Lenz*
Insertion tube diameter x length: 6mm x 250mm.

Cone NS	PK	Cat. No.
14/23	1	**9.012 303** 3
29/32	1	**9.012 305**



9.012 303

4 Air regulator Type HM-2

For tubes:
8mm to 15mm diameter, 6mm to 12.5mm diameter
For air-leak capillary tubes. Acts as a fine regulation valve (needle valve). Plastic body. Brass needle with fine thread.

Type	PK	Cat. No.
HM-2	1	**9.194 011**





1



1 Boiling stones, Type A

Developed for use in preparatory work. For distillation and reflux in aqueous, neutral and alkaline solvents, even under a vacuum. Effective in even the smallest volumes of liquid and after multiple interruptions. Prevents any bumping. Natural product.

Type	Capacity g	PK	Cat. No.
A	250	1	**9.012 306**

2



2 Boiling stones, Type B

Specifically for analytical work. Can be used for distillation in a clean, neutral and basic environment. Not suitable for vacuum distillation. Effective in the smallest amounts of liquid, also after multiple distillations. Prevents " bumping". Ceramic product with relatively high level of purity and abrasion resistance.

Type	Capacity g	PK	Cat. No.
B	200	1	**9.012 307**

3



3 Boiling stones, PTFE

Protects against overheating. Minimises bubbling during reflux. Speeds up the distillation process. Remains inert when boiling acids, hydrocarbons, ketones, esters, alcohol or alcohol solutions in any concentation. Unlimited life span. Easy to clean. Does not scratch glass or leave any powdery residue.

Capacity g	PK	Cat. No.
450	1	**9.012 310**

4



4 Boiling stones

behrotest® boiling stones are made from a ceramic material. Compared to conventional boiling stones made of glass, they provide optimum protection against defervescence due to their porosity and their shape, even with badly blended samples. *Behr*
behrotest® boiling stones are chemically pure and guarantee unadulterated results when determining the COD, the Kjeldahl nitrogen etc.

Type	Description	PK	Cat. No.
SIST 100	Boiling stones, contens 100g	1	**9.920 710**

5



5 Boiling chips, type Resistent

Developed for preparatory and analytical purposes. Suitable for biochemistry, biotechnology, microbiology, microanalysis. Can even be used in strong acids and alkalis, and in all solvents and oxidants. Suitable for vacuum and high-vacuum distillation. Reduces distillation times in rotary evaporators. No abrasion, absorption of substances or solvents. Softening (evaporation) occurs at 2500°C. Can be sterilised by dry heating. Effective in even the smallest volumes of liquid, even after multiple interruptions. Prevents any bumping. Highly resistant.

Type	Capacity g	PK	Cat. No.
Resistent	50	1	**9.012 308**

Hotplates - please see page 858.

E & OE.

1 Separating funnels, Squibb-pattern, borosilicate glass 3.3

Supplied with PTFE stopcock, graduated or ungraduated. According to DIN 12452. With PP conical stopper. *Isolab*

Capacity	NS	Description	Bore	PK	Cat. No.
ml			mm		
50	19/26	ungraduated	10.0	1	**4.008 422**
100	19/26	ungraduated	10.0	1	**6.241 670**
250	29/32	ungraduated	10.0	1	**6.238 526**
500	29/32	ungraduated	10.0	1	**6.238 527**
1000	29/32	ungraduated	12.0	1	**6.241 669**
2000	29/32	ungraduated	12.0	1	**6.241 668**
50	19/26	graduated	10.0	1	**6.236 317**
100	19/26	graduated	10.0	1	**6.236 318**
250	29/32	graduated	10.0	1	**6.236 319**
500	29/32	graduated	10.0	1	**6.236 320**
1000	29/32	graduated	12.0	1	**6.236 321**
2000	29/32	graduated	12.0	1	**6.240 412**

1



Separating funnels, Squibb-pattern, borosilicate glass 3.3

Squibb-pattern. With glass stopcock, PTFE key and retaining device. Available with, or without, graduations to read the approximate volume. With PP conical stopper. *Lenz*

Capacity	Socket	Description	Bore	PK	Cat. No.
ml	NS		mm		
50	19/26	ungraduated	2.5	1	**9.203 322**
100	19/26	ungraduated	2.5	1	**9.203 323**
250	29/32	ungraduated	4.0	1	**9.203 325**
500	29/32	ungraduated	4.0	1	**9.203 328**
1000	29/32	ungraduated	6.0	1	**9.203 330**
2000	29/32	ungraduated	6.0	1	**9.203 332**
50	19/26	graduated	2.5	1	**9.203 372**
100	19/26	graduated	2.5	1	**9.203 373**
250	29/32	graduated	4.0	1	**9.203 375** 2
500	29/32	graduated	4.0	1	**9.203 376**
1000	29/32	graduated	6.0	1	**9.203 377**
2000	29/32	v	6.0	1	**9.203 378**

2



9.203 375

Separating funnels, conical, borosilicate glass 3.3

Supplied with PTFE stopcock, graduated or ungraduated. According to DIN 12451. With PP conical stopper. *Isolab*

Capacity	NS	Description	PK	Cat. No.
ml				
50	19/26	ungraduated	1	**4.008 423**
100	19/26	ungraduated	1	**4.008 424**
250	29/32	ungraduated	1	**6.242 395**
500	29/32	ungraduated	1	**4.008 425**
1000	29/32	ungraduated	1	**6.242 694**
2000	29/32	ungraduated	1	**4.008 426**
50	19/26	graduated	1	**4.008 427**
100	19/26	graduated	1	**6.241 980**
250	29/32	graduated	1	**6.241 671**
500	29/32	graduated	1	**6.241 981**
1000	29/32	graduated	1	**6.244 011** 3
2000	29/32	graduated	1	**6.242 394**

3



6.244 011

1



9.203 486

Separating funnels, conical, borosilicate glass 3.3

Conical pattern. With glass stopcock, PTFE key and retaining device. Available with, or without, graduations to read the approximate volume. With PP conical stopper.

Lenz

Capacity ml	NS	Description	Bore mm	PK	Cat. No.
50	19/26	ungraduated	2.5	1	**9.203 462**
100	19/26	ungraduated	2.5	1	**9.203 463**
250	29/32	ungraduated	4.0	1	**9.203 465**
500	29/32	ungraduated	4.0	1	**9.203 466**
1000	29/32	ungraduated	6.0	1	**9.203 467**
2000	29/32	ungraduated	6.0	1	**9.203 468**
50	19/26	graduated	2.5	1	**9.203 482**
100	19/26	graduated	2.5	1	**9.203 483**
250	29/32	graduated	4.0	1	**9.203 485**
500	29/32	graduated	4.0	1	**9.203 486** 1
1000	29/32	graduated	6.0	1	**9.203 487**
2000	29/32	graduated	6.0	1	**9.203 488**

2



2 Separating funnels with screw cap, Type 4301, FEP

Transparent. Teflon® FEP, Tefzel® ETFE stopcock and ETFE screw cap. Impact resistant. Non-wetting surfaces ensure no liquid residue adhesion. Chemically stable. Length of stem under stopcock 65mm. Autoclavable.

Thermo Scientific

Type	Capacity ml	Screw cap diam. mm	PK	Cat. No.
4301	125	28	1	**9.203 531**
4301	250	33	1	**9.203 532**
4301	500	43	1	**9.203 533**
4301	1000	53	1	**9.203 534**
4301	2000	53	1	**9.203 535**

Teflon® and Tefzel® are registered trademark of DuPont.

3



3 Separating funnel holder PP

Manufactured from best quality polypropylene. Suitable to hold all types of laboratory funnels and also separatory funnels with diameter up to 150mm. Two tapered wedges are provided to ensure firm grip.

Isolab

Type	PK	Cat. No.
Separating funnel holder	1	**9.251 559**

Support ring please see page 167.

4



4 Apparatus water estimator

NEW!

Manufactured from borosilicate glass 3.3 according to DIN 12420. Suitable for xylol method. System completed with 500 ml (NS 29/32) flask + Liebig condenser with jacket length 400 mm + measuring tube (10:0.1 ml) with PTFE stopcock.

Isolab

Description	PK	Cat. No.
Apparatus water estimator	1	**9.303 005**

E & OE.

1 Extractors acc. to Knöfler-Böhm

NEW!

Lenz

The condensate passes the extraction sample and flows back into the flask continuously without interrupting the extraction process, i.e. the solvent is recirculated continuously.
The complete apparatuses are consisting of:
Jacketed extractor head made of DURAN® tubing, Dimroth condenser, with thread GL 14, made of DURAN® tubing,
Round bottom flask material: DURAN®

Extractor ml	Condenser NS	Round bottom flasks Capacity ml	PK	Cat. No.
150	45/40	250	1	**6.237 313**
30	29/32	100	1	**6.237 312**
250	45/40	500	1	**9.043 010**
500	60/46	1000	1	**9.043 020**

1



2 soxhlet extractors, without stopcock

Isolab

Borosilicate glass 3.3 which is resistant to heat and almost all chemicals. They meet the highest quality standards according to DIN 12602. The side arms accept tubings with 8/9mm bore size.

Capacity ml	Cone NS	Socket NS	PK	Cat. No.
30	29/32	29/32	1	**4.008 417**
70	29/32	34/35	1	**4.008 418**
100	29/32	45/40	1	**4.008 419**
150	29/32	45/40	1	**4.008 420**
250	29/32	45/40	1	**4.008 421**
500	29/32	45/40	1	**6.243 673**

2



Extraction apparatus, Soxhlet, DURAN® tubing

Lenz

Made of DURAN® tubing, flask DURAN®. Soxhlet-pattern. The siphon is protected by the vapour tube. Compact design: with NS 29/32 flask connections. Please order separately: condenser, extractor top pipe and round-bottom flask.

Soxhlet Extraction stillheads, made of DURAN® tubing

For Extractor ml	Cone NS	Socket NS	PK	Cat. No.
30	29/32	29/32	1	**9.043 011**
70	29/32	34/35	1	**9.043 012**
100	29/32	45/40	1	**9.043 013** 3
150	29/32	45/40	1	**9.043 014**
200	29/32	45/40	1	**9.043 018**
250	29/32	45/40	1	**9.043 015**
300	29/32	60/46	1	**9.043 019**
500	29/32	60/46	1	**9.043 016**
1000	29/32	71/51	1	**9.043 017**

3



9.043 013

Accessories for Extractor

NEW!

Lenz

Extractor heads for the extraction of liquids with specific light solvents, with insert filter (porosity: 0), made of DURAN® tubing.
Distribution tubes with frit (porosity: 0), for specific light solvents, made of DURAN® tubing.

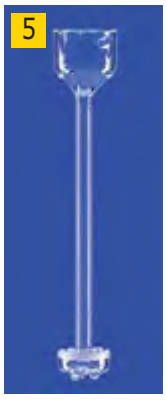
Type	Extractor ml	Condenser NS	PK	Cat. No.
Extractor Head	100	45/40	1	**6.801 962** 4
Extractor Head	250	45/40	1	**6.258 695**
Extractor Head	500	60/46	1	**6.902 445**
Distribution Tube	100		1	**6.258 692**
Distribution Tube	250		1	**6.258 693**
Distribution Tube	500		1	**6.902 444** 5

4



6.801 962

5



6.801 962

Extraction thimbles please see page 1199.

1



1 Extractor heads for specific heavy solvents

NEW!

For the extraction of liquids with specific heavy solvents, with insert filter (porosity: 0), made of DURAN® tubing

Lenz

Extractor ml	Condenser NS	PK	Cat. No.
100	45/40	1	**6.258 697**
250	45/40	1	**6.258 698**
500	60/46	1	**6.258 699**

2



2 Distribution tubes with frit

NEW!

Distribution tubes with frit (porosity: 0), for specific heavy solvents, made of DURAN® tubing

Lenz

Extractor ml	PK	Cat. No.
100	1	**6.235 019**
250	1	**6.235 065**
500	1	**6.258 696**

3



3 Dimroth condensers for Soxhlet

NEW!

Manufactured from borosilicate glass 3.3 with glass side arm. The side arms accept tubings with 8/9 mm bore size.

Isolab

For bottle ml	Cone NS	PK	Cat. No.
30	29/32	1	**9.012 538**
70	34/35	1	**9.012 539**
100/250	45/40	1	**6.254 108**

4



4 Condensers, ground glass joint, Dimroth, for soxhlet

Borosilicate glass 3.3. Resistant to heat and almost all chemicals. According to DIN 12591. Supplied with polypropylene side arm. Polypropylene side arm has a screw thread connector for easy and safe fitting of the tubing. The side arms accept tubings with 8/9mm bore size.

Isolab

Volume ml	NS	PK	Cat. No.
100 - 250	45/40	1	**7.629 955**

5



9.043 023

Condenser Dimroth

Condensers, ground glass joint, Dimroth, made of DURAN® tubing.

Lenz

Volume ml	Cone NS	PK	Cat. No.
30	29/32	1	**9.043 021**
70	34/35	1	**9.043 022**
100, 150, 200, 250	45/40	1	**9.043 023** 5
300, 500	60/46	1	**9.043 026**
1000	71/51	1	**9.043 027**

Condensers, ground glass joint, Dimroth

Made of DURAN® tubing. For extractors and for condensing vapours. With cone. Water connection with thread GL 14, with two threaded plastic nozzles. *Lenz*

Volume ml	Cone NS	PK	Cat. No.
100 - 250	45/40	1	**9.043 023** 1
300 - 500	60/46	1	**9.043 026**
1000	71/51	1	**9.043 027**



9.043 023

2 Allihn condensers for Soxhlet

NEW!

Manufactured from borosilicate glass 3.3 with glass side arm. The side arms accept tubings with 8/9 mm bore size. *Isolab*

For bottle ml	Cone NS	PK	Cat. No.
30	29/32	1	**9.012 540**
70	34/35	1	**9.012 541**
100/250	45/40	1	**6.254 106**



Condensers, Allihn for Extractors

Made of DURAN® tubing. DIN 12581. For condensing vapours. With cone, water connection with nozzle or GL 14 thread and two threaded plastic tubing nozzles. *Lenz*

Extractor ml	Cone NS	Effective length mm	Connection	PK	Cat. No.
30	29/32	160	Olive	1	**6.204 890**
100-250	45/40	250	Olive	1	**7.200 489** 3
30	29/32	160	GL 14	1	**6.242 774**
100-250	45/40	250	GL 14	1	**6.224 397** 4



7.200 489



6.224 397

For all condensers are other sizes available on request.

5 Gas washing bottle, PP

Graduated 250ml polypropylene cylinder with a stable extended base for use in precipitating elements from gas. *Bel-Art Products*

- Gas is dispersed through a removable fitting that has a coarse grade porosity, polyethylene dispersion disc
- Silicone stopper holds 6.3mm (¼") O.D. tubes for entrance and exit of gas
- 0.5 psi maximum pressure

Type	PK	Cat. No.
Gas washing bottle	1	**9.110 290**





1 Gas wash bottle reservoirs

In accordance with Drechsel. Ground joint 29/32. DIN 12463. Overall height 200mm. *Rettberg*

Description	PK	Cat. No.
Gas wash bottle reservoirs 100 ml	1	**9.110 473**
Gas wash bottle reservoirs 250 ml	1	**9.110 474**
Gas wash bottle reservoirs 500 ml	1	**6.240 962**
Without frit	1	**6.240 963**
With frit	1	**9.110 472**



2 Gas wash bottle reservoirs

NEW!

Isolab

Manufactured from borosilicate glass 3.3 according to DIN 12596. Manufactured from borosilicate glass 3.3 which is resistant to heat and almost all chemicals. Bottle heads are supplied with or without sintered glass support (of porosity 0) which enables efficent gas dispensing. Bottle and selected head should be ordered seperately.

Capacity ml	NS	Description	PK	Cat. No.
125	29/32	Gas wash bottle	1	**9.140 530**
250	29/32	Gas wash bottle	1	**9.140 531**
500	29/32	Gas wash bottle	1	**9.140 532**
		Gas wash bottle head, without frit disk, with glass-olive	1	**4.008 376**
		Gas wash bottle head, without frit disk, with PP side-olive	1	**9.140 533**
		Gas wash bottle head, with frit disk, with glass side-olive	1	**9.140 534**
		Gas wash bottle head, with frit disk, with PP side-olive	1	**9.140 535**

Gas Washing bottles to Drechsel, DURAN® tubing

NEW!

Lenz

Bottle, DURAN®. Head made from DURAN® - tubing, with screw connections. Head available with, or without, porosity 1 filter disc, insert height adjustable, capacity: 500ml, central screw cap: GL 45, lateral screw caps: GL 14.

Description	PK	Cat. No.
Gas Washbottle without filter disc	1	**6.073 489** 3
Gas Washbottle with filter disc	1	**7.635 908** 4



6.073 489



7.635 908

1 Gas washing bottles, Borosilcate glass 3.3

Head with fritted disc, standard taper joint.

Capacity ml	Porosity	NS	Int. diam. mm	Height mm	PK	Cat. No.
100	1	29/32	25	250	1	**6.228 324**
250	1	29/32	25	250	1	**9.110 452**



Caps for gas washing bottles

Acc. to DIN 12596. DURAN® tubing. Ground joint 29/32. With or without filter disc. *Lenz*

Type	Porosity	Description	PK	Cat. No.
Without filter disc		nozzle	1	**9.110 380** 2
With filter disc	0	nozzle	1	**9.110 390** 3
With filter disc	1	nozzle	1	**9.110 391**



9.110 380



9.110 390

4 Gas collecting tube, borosilicate glass 3.3

NEW!

Manufactured from borosilicate glass 3.3 according to DIN 12473-1. Available with or without distributor tube with GL14 thread. *Isolab*

Capacity ml	NS	Type	PK	Cat. No.
150	14	without distributor	1	**9.140 521**
350	14	without distributor	1	**9.140 522**
500	14	without distributor	1	**9.140 523**
1000	18	without distributor	1	**9.140 524**
150	14	with distributor	1	**9.140 525**
350	14	with distributor	1	**9.140 526**
500	14	with distributor	1	**9.140 527**
1000	18	with distributor	1	**9.140 528**



Gas sampling tubes, glass

Made of DURAN® tubing. To DIN 12473. With 2.5mm bore stopcocks . Stopcocks are provided with elastic key retainers. With, or without, sampling connections.
PU protective coating available on request. *Lenz*

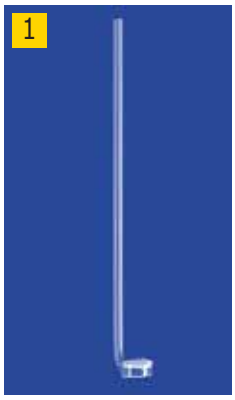
Capacity ml	Length*	External body diam. mm	Type	PK	Cat. No.
150	155	42	Without sampling connections	1	**9.110 215**
350	200	54	Without sampling connections	1	**9.110 220**
500	220	65	Without sampling connections	1	**9.110 225**
1000	260	85	Without sampling connections	1	**9.110 230**
150	155	42	With sampling connections, GL 14	1	**6.243 069**
350	200	54	With sampling connections, GL 14	1	**9.110 236** 5
500	220	65	With sampling connections, GL 14	1	**9.110 237**
1000	260	85	With sampling connections, GL 14	1	**7.623 930**

* Body length (mm)



9.110 236

1



1 Gas distribution tubes, lateral ring or central ring, borosilicate glass 3.3

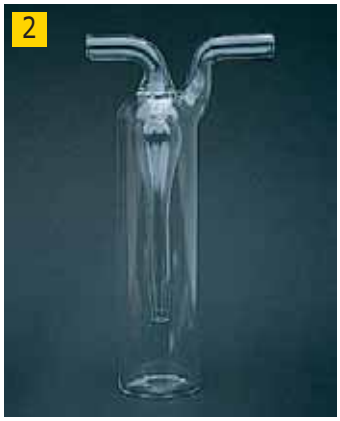
NEW!

Lenz

Porosity	Tube diam. mm	Diam.	Height mm	PK	Cat. No.
0	6.0	ring diam. 22 mm	250	1	**6.253 537**
1	6.0	ring diam. 22 mm	250	1	**6.254 890**
2	6.0	ring diam. 22 mm	250	1	**9.052 625**
0*	9.0	ring diam. 25 mm	250	1	**6.253 538**
1*	9.0	ring diam. 25 mm	250	1	**7.652 008**
2*	9.0	ring diam. 25 mm	250	1	**7.651 831**

* central ring

2



2 Bubble counter

DURAN®.

Height mm	PK	Cat. No.
100	1	**9.014 100**

3



9.140 539

Connectors with stopcock

NEW!

Isolab

Manufactured from borosilicate glass 3.3. Supplied with PTFE stopcock with different key bore diameters.

Socket NS	Cone NS	PK	Cat. No.
14/23	14/23	1	**9.140 536**
19/26	19/26	1	**9.140 537**
24/29	24/29	1	**9.140 538**
29/32	29/32	1	**9.140 539** 3

4



4 Connectors with NS stopcock

NEW!

Lenz

Connectors with NS stopcock, with solid glass plug, with NS socket and NS cone, made of DURAN® tubing

Socket NS	Cone NS	Bore mm	PK	Cat. No.
14/23	14/23	2.5	1	**7.622 815**
29/32	29/32	8.0	1	**7.626 118**

1 2 Expansion and reduction adapters, borosilicate glass 3.3

Manufactured from borosilicate glass 3.3 which is resistant to heat and almost all chemicals. They meet the highest quality standards according to DIN 12257. They have excellent grinding to prevent airleaks. The bottom part of the ground joints are fire polished. *Isolab*

Socket NS	Cone NS	PK	Cat. No.
14/23	19/26	1	**6.243 581**
14/23	24/29	1	**6.243 582**
14/23	29/32	1	**9.011 740**
19/26	14/23	1	**4.008 341**
19/26	24/29	1	**4.008 342**
19/26	29/32	1	**4.008 343**
19/26	34/35	1	**6.243 583**
24/29	29/32	1	**6.241 533**
24/29	34/35	1	**6.243 584**
24/29	45/40	1	**6.243 585**
29/32	14/23	1	**6.235 966**
29/32	19/26	1	**4.008 344**
29/32	24/29	1	**4.008 345**
29/32	34/35	1	**6.243 586**

1



2



Expansion and reduction adapters

Made of DURAN® tubing. DIN 12257. Reduction and Expansion Adapters with Ground joint. *Lenz*

Socket NS	Cone NS	PK	Cat. No.
14/23	29/32	1	**9.011 755** 3
19/26	14/23	1	**9.011 766**
29/32	14/23	1	**9.011 750** 4
29/32	19/26	1	**9.011 767**
29/32	45/40	1	**9.011 765**
45/40	29/32	1	**9.011 760**

3



9.011 755

4



9.011 750

5 Adapter for thermometer, borosilicate glass 3.3

Manufactured from borosilicate glass 3.3 according to DIN 12257 standard, ideal to use for thermometers with Ø 6 - 8 mm. Screw joint provides easy depth adjustment of thermometer. Seal material: NBR *Isolab*

Neck thread GL	Cone NS	Adapter bore diam. mm	PK	Cat. No.
14	14/23	6 - 8	1	**4.008 360**
14	29/32	6 - 8	1	**6.244 589**

5



Thermometers please see page 363.

6 Threaded tube connectors, borosilicate glass 3.3

Borosilicate glass 3.3 according to DIN 12257 standard. *Isolab*

Neck thread GL	Cone NS	PK	Cat. No.
14	14/23	1	**4.008 355**
14	29/32	1	**4.008 358**
18	14/23	1	**4.008 356**
18	29/32	1	**4.008 357**
25	29/32	1	**6.241 693**

6



1



1 Tubing adapters

NEW!

Manufactured from borosilicate glass 3.3 with two different shapes: straight or 90° angled. Tubing adapter is suitable for up to 10 mm tubings. *Isolab*

Description	Socket NS	Diam.	PK	Cat. No.
straight	14/23	Olive 8 mm	1	**9.012 184**
straight	29/32	Olive 10 mm	1	**9.012 185**
bend	14/32	Olive 8 mm	1	**9.012 186**
bend	29/32	Olive 10 mm	1	**9.012 187**
straight with PTFE stopcock	14/32	Olive 8 mm	1	**9.012 188**
straight with PTFE stopcock	29/32	Olive 10 mm	1	**9.012 189**
bend with PTFE stopcock	14/32	Olive 8 mm	1	**9.012 190**
bend with PTFE stopcock	29/32	Olive 10 mm	1	**9.012 191**

2



9.012 319

3



9.012 313

Cone: flexible tubing adapter

Made of DURAN® tubing. Adapter, NS cone to 10mm bore tubing connector. Straight or angled (90°). Available with, or without, size 3 NS stopcock, with 2.5mm bore key. *Lenz*

Cone NS	Form	Stopcock	PK	Cat. No.
14/23	straight	with	1	**9.012 316**
14/23	straight	without	1	**9.012 312**
14/23	bent	with	1	**9.012 315**
14/23	bent	without	1	**9.012 311**
29/32	straight	with	1	**9.012 319** 2
29/32	straight	without	1	**9.012 314**
29/32	bent	with	1	**9.012 317**
29/32	bent	without	1	**9.012 313** 3

4



9.209 517

Threaded tube connectors

Made of DURAN® tubing. DIN 12257. Double ended.
With GL thread at one end and ground glass at the other. NS cone at the other, as outlined below. *Lenz*

Neck thread GL	Cone NS	PK	Cat. No.
14	14/23	1	**9.209 514**
14	29/32	1	**9.209 517** 4
18	14/23	1	**9.209 518**
18	29/32	1	**9.209 529**
25	14/23	1	**6.300 168**
25	29/32	1	**9.209 559**
32	24/29	1	**9.209 581**
32	29/32	1	**9.209 582**

5



5 Adapters NS cone to spherical joint socket

NEW!

Adapters from ground joint cone to spherical joint socket, made of DURAN® tubing *Lenz*

Cone NS	socket NS	PK	Cat. No.
14/23	19	1	**9.011 768**
29/32	19	1	**9.011 769**
29/32	29	1	**6.900 648**

6



9.011 771

Adapters NS socket to spherical joint ball

NEW!

Adapters from spherical joint ball to ground joint socket, made of DURAN® tubing *Lenz*

Socket NS	socket/ball	PK	Cat. No.
14/23	19	1	**9.011 770**
29/32	29	1	**9.011 771** 6

E & OE.

1 Ground Joint Reducing Sets



This set consists of PTFE reducing rings graduated in ground joint sizes 14.5/18.8/24/29.2/34.5/45 and 60. With these rings, different cone and socket sizes can be connected. For example, it is possible to fit a 14.5 cone into a socket of 45. Also other combinations are possible. With this set you can practically cover all requirements within the lab. *BOLA*

Size	Height / Ground Joint Length	PK	Cat. No.
NS 14,5 - NS 60	20 mm	1	**9.207 162**

2 Ground Joint GL Adapters, PTFE



Black, PPS screw cap with GL45 thread or blue PP, screw cap with GLS80 thread, movable insert with ground joint made of PTFE. Transition from a ground joint to a glass thread. The body can be turned independently from the screw cap. The complete, assembled adapter can be removed and fixed onto another bottle without the risk of disarranging the tubing. Very good chemical resistance, for working temperatures up to max. +250°C. *BOLA*

Joint size NS	Thread	PK	Cat. No.
29/32	GL 45	1	**6.224 507**
29/32	GLS 80	1	**9.209 926**
45/40	GLS 80	1	**9.209 927**

3 Screw connector caps



Red. PBT. With central hole (diameter outlined below). Temperature resistance to max. 180°C. *DURAN Group*

Neck thread GL	Bore mm	PK	Cat. No.
14	9.5	1	**9.209 114**
18	11.0	1	**9.209 118**
25	15.0	1	**9.209 125**
32	20.0	1	**9.209 132**
45	34.0	1	**9.209 135**

4 Screwthread couplings, PBT



DIN screwthread. For flexible connection of two glass screwthreads. With integral PTFE-faced silicone (VMQ) seals. Temperature resistant to max. 180°C. *DURAN Group*

Neck thread GL	PK	Cat. No.
14	1	**9.209 004**
18	1	**9.209 005**
25	1	**9.209 006**
32	1	**9.209 007**
45	1	**9.209 008**

5 Silicone cap wads/septa, VMQ



For GL-screwthread caps. Overall diameter and wad thickness as outlined below. Thermical resistance: 130°C (steam)/200°C (heat). Autoclavable. *DURAN Group*

For thread size GL	Diam. mm	Thickness mm	PK	Cat. No.
14	12	2	1	**9.209 414**
18	16	2	1	**9.209 418**
25	22	2	1	**9.209 425**
32	29	2	1	**9.209 432**
45	42	3	1	**9.209 435**

1



1 Silicone sealing rings, VMQ

With vulcanized PTFE sleeve. For screwthread caps.
Thermical resistance: 130°C (steam), 200°C (heat). Autoclavable.

DURAN Group

For thread size GL	Int. diam. mm	Ext. diam. mm	For tubes diam. mm	PK	Cat. No.
14	6	12	5.5 to 6.5	1	**9.209 146**
18	6	16	5.5 to 6.5	1	**9.209 186**
18	8	16	7.5 to 9.0	1	**9.209 188**
18	10	16	9.0 to 11.0	1	**9.209 190**
25	8	22	7.5 to 9.0	1	**9.209 258**
25	10	22	9.0 to 11.0	1	**9.209 260**
25	12	22	11.0 to 13.0	1	**9.209 262**
32	10	29	9.0 to 11.0	1	**9.209 320**
32	12	29	11.0 to 13.0	1	**9.209 322**
32	14	29	13.0 to 15.0	1	**9.209 324**
32	16	29	15.0 to 17.0	1	**9.209 326**
32	18	29	17.0 to 19.0	1	**9.209 327**
45	26	42	25.0 to 27.0	1	**9.209 329**
45	32	42	31.0 to 33.0	1	**9.209 331**

2



2 Plastic ferrule, angled, PP

PP. For screw connector caps GL 14. With silicone seal (VMQ).
Temperature resistant up to max. +140°C. Autoclavable.

DURAN Group

Diam. mm	Neck diam. mm	PK	Cat. No.
8.6	4	1	**9.051 308**

3



3 GL screwthread ferrules

Fluoroplastics, for tubing connection. Straight and curved models available, screw connector caps made of PPS reinforced with glass fibre (max. +250°C), ferrules made of PFA, with flexible PFA sealing rim and FPM O-ring. When in use, the contents only comes into contact with PFA (or PTFE - GL25 and GL32).

BOLA

Type	Neck thread GL	Ext. diam. mm	Int. diam. mm	PK	Cat. No.
Straight 35 mm	14	8.7	6.00	1	**9.051 320**
Straight 39 mm	18	10.5	7.00	1	**9.051 321**
Angled 40 mm	14	8.7	6.00	1	**9.051 324**
Angled 54 mm	18	10.5	7.00	1	**9.051 325**

4



4 Screw caps, high temperature, PBT

Red. DIN thread. With PTFE-coated silicone seal. Withstands temperatures up to 180°C. Autoclavable.

DURAN Group

Neck thread GL	PK	Cat. No.
14	1	**9.209 014**
18	1	**9.209 018**
25	1	**9.209 025**
32	1	**9.209 032**
45	1	**9.209 045**

5



9.209 440

6



9.209 086

Gaskets, silicone/PTFE and pouring rings, ETFE

Pouring rings, ETFE.
For screw caps made from PBT. Autoclavable.
Thermical resistance: max. 180°C

DURAN Group

Silicone gasket (VMQ), PTFE coated.
For screw caps made from PBT. Autoclavable.
Thermical resistance: max. 130°C (steam), 200°C (heat)

Type	Neck thread GL	Material	PK	Cat. No.	
Gasket	14	silicone, PTFE coated	1	**9.209 440**	5
Gasket	18	silicone, PTFE coated	1	**9.209 441**	
Gasket	25	silicone, PTFE coated	1	**9.209 442**	
Gasket	32	silicone, PTFE coated	1	**9.209 443**	
Gasket	45	silicone, PTFE coated	1	**9.209 444**	
Pouring ring	32	ETFE	1	**9.209 086**	6
Pouring ring	45	ETFE	1	**9.209 088**	

E & OE.

1 NS stoppers, PE-HD

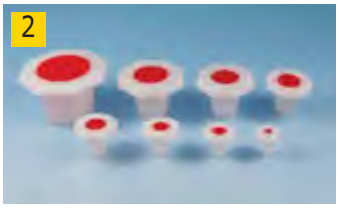
Isolab



NS	PK	Cat. No.
10/19	1	**4.008 495**
12/21	1	**4.008 496**
14/23	1	**4.008 497**
19/26	1	**4.008 498**
24/29	1	**4.008 499**
29/32	1	**4.008 500**

2 Stoppers

PE. Fits standard conical joints. Supplied singly.



NS	PK	Cat. No.
7/16	1	**9.230 107**
10/19	1	**9.230 110**
12/21	1	**9.230 112**
14/23	1	**9.230 114**
19/26	1	**9.230 119**
24/29	1	**9.230 124**
29/32	1	**9.230 129**
45/40	1	**9.230 145**
60/46	1	**9.230 160**

3 Conical stoppers

Polyethylene. Stoppers manufactured to DIN standard 12242 ensuring an effective seal, even on non-standard surfaces.



NS	Bottom diam. mm	Colour	PK	Cat. No.
7/16	5.9	violet	1	**9.230 161**
10/19	8.1	blue	1	**9.230 162**
12/21	10.4	green	1	**9.230 163**
14/23	12.2	brown	1	**9.230 164**
19/26	16.4	yellow	1	**9.230 165**
24/29	21.1	red	1	**9.230 166**
29/32	25.8	black	1	**9.230 167**
34/35	30.9	white	1	**9.230 168**

4 NS-Glass stoppers, hollow borosilicate glass 3.3

Isolab

Manufactured from borosilicate glass 3.3 which is resistant to heat and almost all chemicals. They meet the highest quality standards according to DIN 12252. Lower closed end of stopper features a "drip-tip" to ensure adhered liquid is returned to the flask. Hexagonal flat head prevents the stopper from rolling and allows stopper to be stood on end preventing contamination of the ground surface.



NS	Description	PK	Cat. No.
10/19	clear	1	**7.900 483**
12/21	clear	1	**6.242 396**
14/23	clear	1	**9.229 990**
19/26	clear	1	**9.229 991**
24/29	clear	1	**6.240 333**
29/32	clear	1	**9.229 992**
34/35	clear	1	**6.240 060**
10/19	amber	1	**7.900 484**
12/21	amber	1	**6.258 416**
14/23	amber	1	**7.900 486**
19/26	amber	1	**7.970 573**
24/29	amber	1	**6.258 415**
29/32	amber	1	**7.629 440**
34/35	amber	1	**6.258 417**





1 2 NS-Glass stoppers, DURAN® and Borosilicate glass

DIN 12252. Hollow stoppers, hexagonal plate, pointed or flat bottom and stopper, octagonal plate, glass

NS	Material	Stopper NS	Form	Figure	PK	Cat. No.
7/16	Borosilicate glass 3.3	hollow	hexagonal	a	1	**9.230 002**
10/19	Borosilicate glass 3.3	hollow	hexagonal	a	1	**9.230 003**
12/21	Borosilicate glass 3.3	hollow	hexagonal	a	1	**9.230 004**
14/23	Borosilicate glass 3.3	hollow	hexagonal	a	1	**9.230 006**
19/26	Borosilicate glass 3.3	hollow	hexagonal	a	1	**9.230 007**
29/32	Borosilicate glass 3.3	hollow	hexagonal	a	1	**9.230 009**
45/40	Borosilicate glass 3.3	hollow	hexagonal	a	1	**9.230 012**
10/19	DURAN®	solid	octagonal	b	1	**9.230 053**
12/21	DURAN®	solid	octagonal	b	1	**9.230 054**
14/23	SBW	solid	octagonal	b	1	**9.230 056**
19/26	SBW	solid	octagonal	b	1	**9.230 057**
24/29	SBW	solid	octagonal	b	1	**9.230 058**
29/32	SBW	semi solid	octagonal	b	1	**9.230 059**
34/35	DURAN®	semi solid	octagonal	b	1	**9.230 061**
45/40	DURAN®	semi solid	octagonal	b	1	**9.230 062**

3



4.008 335

4



4.008 340

Socket/Connectors with NS joint, borosilicate glass 3.3

Manufactured from borosilicate glass 3.3. Resistant to heat and almost all chemicals. According to DIN 12242. They have excellent grinding to prevent airleaks. The bottom part of the ground joints are fire polished.

Isolab

Description	NS	Length mm	PK	Cat. No.
Socket	10/19	120	1	**4.008 330**
Socket	12/21	120	1	**4.008 331**
Socket	14/23	120	1	**4.008 332**
Socket	19/26	120	1	**4.008 333**
Socket	24/29	120	1	**4.008 334**
Socket	29/32	120	1	**4.008 335** 3
Socket	45/40	120	1	**4.008 336**
Cone	14/23	120	1	**4.008 337**
Cone	19/26	120	1	**4.008 338**
Cone	24/29	120	1	**4.008 339**
Cone	29/32	120	1	**4.008 340** 4



E & OE.

4 Socket/Connectors with NS joint, DURAN® tubing

Made of DURAN® tubing. DIN 12249. Annealed edges. Joint rims slightly rounded. *Lenz*

Description	NS	Ext. diam. mm	Length mm	PK	Cat. No.
Socket	10/19	13	130	1	**9.011 523**
Socket	12/21	15	130	1	**9.011 524**
Socket	14/23	17	130	1	**9.011 525**
Socket	19/26	22	130	1	**9.011 526**
Socket	24/29	28	130	1	**9.011 527**
Socket	29/32	33	130	1	**9.011 528** 2
Socket	45/40	50	145	1	**9.011 530**
Cone	10/19	8	115	1	**9.011 503**
Cone	12/21	11	130	1	**9.011 504**
Cone	14/23	13	130	1	**9.011 505**
Cone	19/26	17	130	1	**9.011 506**
Cone	24/29	22	130	1	**9.011 507**
Cone	29/32	26	130	1	**9.011 508** 1
Cone	45/40	40	145	1	**9.011 510**
Cone with outlet	14/23	13	130	1	**9.011 545**
Cone with outlet	19/26	17	130	1	**9.011 546**
Cone with outlet	24/29	22	130	1	**9.011 547**
Cone with outlet	29/32	26	130	1	**9.011 548** 3
Cone with outlet	45/40	40	145	1	**9.011 550**

1



9.011 508

2



9.011 528

3



9.011 548

4



Spherical ground glass joints

Made of DURAN® tubing. DIN 12224. With ground glass ball (male) and cup (female) joints. Cup joints have a beaded reinforcement rim. *Lenz*

Type	socket/ball	Tube diam. mm	Overall length mm	PK	Cat. No.
Cup	S 13/2	8.0	100	1	**9.011 602**
Cup	S 13/5	8.0	100	1	**9.011 603**
Cup	S 19	13.0	120	1	**9.011 605**
Cup	S 29	19.0	120	1	**9.011 609**
Cup	S 35	28.0	120	1	**9.011 613** 5
Cup	S 40	30.0	120	1	**9.011 610**
Cup	S 65	48.0	170	1	**9.011 615**
Ball	S 13/2	8.0	100	1	**9.011 622**
Ball	S 13/5	8.0	100	1	**9.011 623**
Ball	S 19	13.0	120	1	**9.011 625**
Ball	S 29	19.0	120	1	**9.011 629**
Ball	S 35	28.0	120	1	**9.011 630** 6
Ball	S 40	30.0	120	1	**9.011 632**
Ball	S 65	48.0	170	1	**9.011 635**

5



9.011 613

6



9.011 613

Threaded tubes, DURAN®

DIN 12216. For tubing extension and connection. With DIN screwthread. *Lenz*

Neck thread GL	Diam. mm	Length mm	PK	Cat. No.
14	12	100	1	**9.209 714** 7
18	16	100	1	**9.209 718**
25	22	100	1	**9.209 725**
32	28	140	1	**9.209 732**
45	40	180	1	**9.209 735**

7



9.209 714



1 Clips for joints, POM

Manufactured from POM and has excellent chemical resistance as well as a very good mechanical strength. They are perfect tools to join two ground joints. *Isolab*

Joint size NS	Colour	PK	Cat. No.
10/19	black	1	**4.008 347**
12/21	purple	1	**4.008 348**
14/23	yellow	1	**4.008 349**
19/26	blue	1	**4.008 350**
24/29	green	1	**4.008 351**
29/32	red	1	**4.008 352**
34/35	orange	1	**4.008 353**
45/40	brown	1	**4.008 354**



2 Conical joint clips for sleeve connections, plastic

POM. Melting point 175°C. For conical ground joints.
Excellent chemical resistance. Rigid.

NS	Colour	PK	Cat. No.
10	green	1	**9.011 773**
12	violet	1	**9.011 774**
14	yellow	1	**9.011 775**
19	blue	1	**9.011 776**
24	green	1	**9.011 777**
29	red	1	**9.011 778**
34	orange	1	**9.011 779**
40	yellow	1	**9.011 780**
45	brown	1	**9.011 781**



3 Spherical joint clips, plastic

POM. Melting point 175°C. For spherical ground joints.
Excellent chemical resistance. Rigid.

NS	PK	Cat. No.
13	1	**9.011 793**
19	1	**9.011 794**
29	1	**9.011 795**
35	1	**9.011 796**



4 Ground joint clips for sleeve connections, wire

Chrome-nickel steel.

NS	PK	Cat. No.
10/19	1	**9.011 703**
12/21	1	**9.011 704**
14/23	1	**9.011 705**
19/26	1	**9.011 706**
24/29	1	**9.011 707**
29/32	1	**9.011 708**
45/40	1	**9.011 710**

1 2 Clipox® Clips for NS ground glass joints

Clipox

Clipox® Clips are safe, universal clips for NS conical ground glass joints. Available to secure NS conical ground glass joints including stopcocks, vacuum-stopcocks and reagent bottles with glass stoppers.

Clipox® simplifies the daily laboratory work and increases the safety of glassware.
- Easy to mount and to remove due to two-sided handles
- To be used with stand clamps
- Secures horizontal and vertical in case of pressure overload
- Longevity of suspension and shape due to spring steel wire
- Outstanding thermal, chemical and acid resistance
- Material: high grade stainless steel, V4A (1.4568)
- Made in Germany, production certified according to ISO 9001

Pack of 5 pieces.





Joint size NS	PK	Cat. No.
10	5	**9.011 400**
12	5	**9.011 401**
14	5	**9.011 402**
19	5	**9.011 403**
24	5	**9.011 404**
29	5	**9.011 405**
34	5	**9.011 406**
40	5	**9.011 407**
45	5	**9.011 408**
60	5	**9.011 409**

3 Joint clips for conical joint sleeve connections

Axel von Gunten

Chrome-nickel steel. For tapered ground joints as outlined below. With, or without, locking screw.



NS	Type	PK	Cat. No.
14/23	with locking screw	1	**9.011 675**
19/26	with locking screw	1	**9.011 676**
24/29	with locking screw	1	**9.011 677**
29/32	with locking screw	1	**9.011 678**
45/40	with locking screw	1	**9.011 680**
14/23	without locking screw	1	**9.011 685**
19/26	without locking screw	1	**9.011 686**
24/29	without locking screw	1	**9.011 687**
29/32	without locking screw	1	**9.011 688**
45/40	without locking screw	1	**9.011 690**

4 PTFE sealing rings for jointed glassware

An effective alternative to common PTFE joint sleeves and PTFE stoppers.
- Air leakage $<10^{-8}$ to 10^{-6} mBar l/s (vacuum and pressure).
- Solvent leakage from containers < 0.1 to 0.03mg/day.
- Temperature range: -196 to 300°C



NS	PK	Cat. No.
10	50	**9.011 663**
12	50	**7.622 596**
14	50	**9.011 664**
19	50	**9.011 665**
24	50	**9.011 666**
29	50	**9.011 667**
34	50	**7.700 004**
45	50	**9.011 668**



1 Sleeves, PTFE, disposable

BRAND

Seals without grease - no grease residues are left in the analysis. Excellent chemical resistance. Can be used in temperatures from -200 to +260°C. Wall thickness only 0.05mm. Wide range of applications, also suitable for vacuums down to 0.1mbar, e.g. for rotary evaporators.

NS	PK	Cat. No.
7/16	1	**9.011 316**
10/19	1	**9.011 317**
12/21	1	**9.011 318**
14/23	1	**9.011 319**
19/26	1	**9.011 320**
24/29	1	**9.011 321**
29/32	1	**9.011 322**
34/35	1	**9.011 323**
40/38	1	**9.011 330**
45/40	1	**9.011 324**
50/42	1	**9.011 325**
55/44	1	**9.011 326**
60/46	1	**9.011 327**



2 Sleeves with ribs, PTFE

BOLA

For use with ground glass joints. Suitable for vacuums up to 0.1mbar. Reusable and long lasting. The sealing ribs grip on the inside wall of the glass socket, sealing without the need for grease and enabling the cone to be freed easily when required.

NS	PK	Cat. No.
12/21	1	**9.011 653**
14/23	1	**9.011 655**
19/26	1	**9.011 656**
24/29	1	**9.011 657**
29/32	1	**9.011 658**
45/40	1	**9.011 660**



3 Sleeves, cone joint, PTFE

BOLA

With knurled gripping ring at the top of the cone for easy removal. For gas, liquid and vacuum-tight cone joint connections with sizes as outlined below. Reusable. With reinforced external ribs for a high-vacuum tight seal (leakage rate: < $1x10^{-4}$ mbar x I x s^{-1}). No joint sealant or grease required.

NS	PK	Cat. No.
14/23	1	**9.011 642**
19/26	1	**9.011 643**
24/29	1	**9.011 644**
29/32	1	**9.011 645**
45/40	1	**9.011 647**



4 Baysilone® silicone high vacuum grease

For use up to 10^{-6} mbar. -50 to +200°C. Supplied in 35g tube.

Type	PK	Cat. No.
Low viscosity	1	**9.116 902**
Medium viscosity	1	**9.116 903**
High viscosity	1	**9.116 904**



5 BUDDE - joint grease

Buddeberg

For all glass joints. Transparent, vacuum tight, water washable and water soluble. Maintains practically the consistency between -30°C and +200°C, non-solidifying. Compatible with most elastomers. Biodegradable. Tube of 80g.

Weight g	PK	Cat. No.
80	1	**9.116 950**

E & OE.

1 Silicone high vacuum grease

Silicone high vacuum grease are used for ground joints and taps at low ultimate pressure. Like vacuum grease LOSOID is very stable during temperature changes, though its lubricating properties at high and low temperature are not as good. At temperures above 200°C the silicone grease continue to be polymerized and begins to outgas.
100g tube.

Type	PK	Cat. No.
Silicone high vacuum grease	1	**9.116 901**



2 Silicone high vacuum grease

For use up to 10^{-6} mbar. Temperature range from -40 to +150°C. 100g tube.

Type	PK	Cat. No.
Silicone high vacuum grease	1	**9.116 911**



Silicone grease OKS 1112 100 gr.tube

NEW!

Kahmann & Ellerbrock

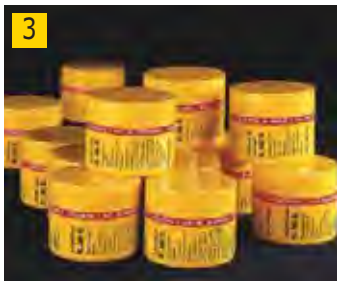
Description	PK	Cat. No.
Silicone grease, 100 gr.tube	1	**9.116 909**

3 Joint grease, K.W.S

Without silicone. Designed as vacuum and high vacuum grease. No silicone derivatives, polymerisation or gumming. Excellent adhesion and viscosity. Acid/alkaline resistant. Locked joints can be loosened by brief, gentle heating. Can be used to make temporary glassware repairs. Biodegradable. Non-toxic in normal use.

Working temperature range: -40 to +200°C
Vapour pressure: 0.00001 mbar.

Capacity ml	PK	Cat. No.
30	1	**9.116 924**



4 Rotating joint grease, silicone-free, Alsirol

Silicone-free stopcock grease. No silicone derivatives, polymerisation or gumming. Excellent adhesion and viscosity. Stable grease film enables safe, long term use. Low heat-up occurs during rotation even if operation is continuous. When sealing glassware systems with glass and metal stirrers and shafts Alsirol protects rotating, precision-ground sockets and stirring shafts against glass abrasion. Also suitable for lubricating rotating metal and glass components. Acid and alkali resistant. For use under vacuum and high vacuum. Biodegradable. Non-toxic in normal use.

Working temperature range: -40 to +200°C
Vapour pressure: 0.00001 mbar

Capacity ml	PK	Cat. No.
50	1	**9.116 925**



Laboratory greases glisseal® N and glisseal® HV

Laboratory grease without silicone. For sealing and greasing ground and spherical glass joints, plastic and metal connections, as well as for solving the most demanding lubricating problems, e.g. in precision engineering and in the optical industry. Apply only a very thin layer. Glisseal® can be easily removed with Deconex® cleaners. 60g tube.

Normal quality, with red cap:
Colour: translucent
Dripping point: without
Working temperature ranges:
In air: -40°C to 200°C
Under vacuum: -40°C to 300°C
For short periods, up to: 350°C
High vacuum quality, with blue cap:
Colour: dark brown
Dripping point: without
Working temperature range:
In air: -40°C to 220°C
Under vacuum: -40°C to 320°C
For short periods, up to: 400°C

Type	PK	Cat. No.
Normal quality GLISSEAL	1	**9.116 934** 5
High vacuum quality GLISSEAL	1	**9.116 935** 6



9.116 934



9.116 935

1



9.115 611

Stopcocks, straight bore with solid glass key stopcock, borosilicate glass 3.3

DIN 12541-1. With solid glass key stopcock and retaining device. Straight bore. Leakage rate acc. to DIN 12540-1. *Lenz*

Description	NS	Bore mm	DIN	Material	PK	Cat. No.
With solid glass key	12.5	1.5	12541-1		1	**9.115 611** 1
With solid glass key	12.5	2.5			1	**9.115 642**
With solid glass key	14.5	2.5	12541-1		1	**6.079 648**
With solid glass key	14.5	4.0			1	**9.115 614**
With solid glass key	18.8	4.0	12541-1		1	**9.115 644**
With solid glass key	18.8	6.0			1	**9.115 615**
With solid glass key	21.5**	6.0	12541-1		1	**9.115 617**
With solid glass key	24**	8.0			1	**9.115 618**
With solid glass key	29.2**	10.0	12541-1		1	**9.115 619**
With solid glass key	12.5*	1.5	12541-1		1	**9.115 612**
With solid glass key	14.5*	2.5	12541-1		1	**9.115 613**
Spare key, solid glass	12.5	1.5		SBW	1	**7.018 947**
Spare key, solid glass	12.5	2.5		SBW	1	**7.018 936**
Spare key, solid glass	14.5	2.5		SBW	1	**7.018 948**
Spare key, solid glass	14.5	4.0		SBW	1	**6.093 232**
Spare key, solid glass	18.8	4.0		SBW	1	**6.800 209**
Spare key, solid glass	21.5**	6.0		DURAN®	1	**7.510 838**

* with capillary side arms
**with rubber retaining device

2



2 Vacuum stopcocks, glass, Vendura-Nova

Vendura-Nova DURAN®. With PP safety device. Adjustable seal. Comprises of glass stopcock body, PTFE needle with sealing ring and FKM O-rings. Fine control gives precise flow metering. *DURAN Group*
Available in straight or 90° angle patterns.
Leak rate: <1 x 10^{-6} mbar x l/s

Temperature resistant to
with safety device: 140°C
without safety device: 180°C

Type	Tube diam. mm	Flow rate ml / min.	PK	Cat. No.
straight	9.0	0 to 2.5	1	**9.117 002**
straight	10.0	0 to 4.0	1	**9.117 003**
straight	10.0	0 to 6.0	1	**9.117 004**
90° angle	9.0	0 to 2.5	1	**9.117 012**
90° angle	10.0	0 to 4.0	1	**9.117 013**
90° angle	10.0	0 to 6.0	1	**9.117 014**

3



9.116 011

3-way stopcocks, T-bore, borosilicate glass 3.3

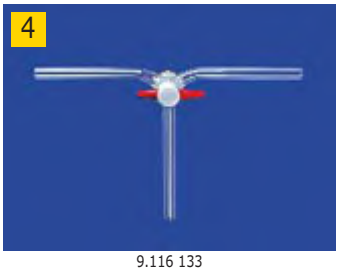
NEW!

Acc. to DIN 12554 and in addition to DIN standard, T-bore, with solid glass plug or PTFE plug and screw thread retaining device. Material: borosilicate glass 3.3, leakage rate to DIN 12540-1. *Lenz*

Description	Stopcock type NS	Bore mm	PK	Cat. No.
Solid Glass Key	14,5	1.5	1	**9.116 011** 3
Solid Glass Key	14,5	2.5	1	**9.116 012**
Solid Glass Key	18,8	2.5	1	**9.116 013**
Solid Glass Key	18,8	4.0	1	**9.116 014**
Solid Glass Key*	24,0	4.0	1	**9.116 015**
Solid Glass Key*	29,2	6.0	1	**9.116 017**

* with rubber ring retaining device

4



9.116 133

Three-way stopcocks, angled bore, borosilicate glass 3.3

NEW!

3-way stopcocks (Czako), angled bore, with solid glass or PTFE plug. Leakage rate to DIN 12540-1.

Description	NS	Bore mm	PK	Cat. No.
Glass	14,5	2.5	1	**9.116 113**
PTFE	14,5	2.5	1	**9.116 133** 4
PTFE	18,8	4.0	1	**9.116 135**

E & OE.

Laboratory reactor, LR 1000 basic/control Package

NEW!

IKA

LR 1000 basic Package The LR 1000 basic is a cost efficient, modular laboratory reactor designed for optimizing chemical reaction processes as well as for mixing, dispersing and homogenization applications at the laboratory scale. The reactor is especially designed for the unique applications requirements that define the cosmetic and pharmaceutical industries. The temperature of the medium can be as high as 120 °C. The temperature of the heating source, which is located at the bottom of the vessel, is controlled accordingly to reach the set temperature inside the medium. A PT 100.5 temperature sensor and the corresponding receptacle LR 1000.61 for the lid are included with this package.

- Digital display for monitoring the speed and temperature
- Expandable for use with the ULTRA TURRAX® T 25 digital (Accessory)
- Standard joint fittings on the lid: 1x NS 29, 3x NS 14 for flexible adaptation of further equipment
- Vacuum valve included with delivery
- Anchor stirrer with PTFE-scrapers available (Accessory)
- Connections to attach a cooling source to the back of the unit
- Manual adjustable safety circuit
- Integrated safety shutdown when vessel or lid is removed from the base

Expanding on the features of the LR 1000 basic, the control model is equipped with a number of additional features that allow even further enhancement of your application requirements. The LR 1000 control can be connected to a PC running with labworldsoft®. All measurement data can be monitored and stored conveniently on a PC. The LR 1000 control package also includes the PT 100.5 temperature sensor and the sensor receptacle. A USB cable is also supplied with this package.

Specifications	**LR 1000 basic/control**
Usable volume:	300 - 1000ml
Max. working temperature:	120°C
Nominal torque:	3Nm
Attainable vacuum:	25mbar
Max. viscosity:	100.000mPas
Speed range:	10 - 150rpm
Display:	LED
Material in contact with medium:	AISI 316L, borosilicate glass 3.3, PTFE, FKM
Heat output:	1000W
Heat control accuracy:	±1K
Connection for ext. temperature sensor:	yes
Temperature measurement resolution:	0.1K
Temperature control accuracy with PT 100:	±0.2K
Min. cooling medium temperature:	3°C
pH sensor interface:	no
Timer/counter function:	yes
Support rod diameter:	16mm
Dimensions (WxDxH):	443 x 295 x 360mm
Weight:	16kg
Permissible ambient temperature:	5 - 40°C
Permissible relative moisture:	80%
Protection class according to DIN EN 60529:	IP 21
USB and RS 232 interface:	no
Voltage:	230V
Frequency:	50/60Hz
Power input:	1200W

Type	PK	Cat. No.	
LR 1000 basic	1	**9.813 100**	1
LR 1000 control	1	**9.813 101**	2

1



9.813 100

2



9.813 101

Rotary Evaporators Hei-VAP Series

Intelligent Evaporation *Heidolph*

Leading Safety Standards
- Two independent safety circuits avoid an overheat situation of your heating bath: If bath temperature overshoots by 5°C and if your water bath runs dry, heating will be switched off automatically
- To avoid an overtemperature situation and potential thermal damage to your sample, you can individually pre-program a maximum temperature on the Precision model, at which the bath shuts off
- In case of a power cut, all motor lift models will remove the flask from the heating bath preventing safety hazards and potential thermal damage to your sample
- To protect you from splashes and scalding, the Hei-VAP heating bath features a pour spout to remove bath fluid safely
- Heating bath is constructed with a double wall for your protection against burns and scalding
- The guard hood covers the entire bath completely even if the heating bath is adjusted horizontally to its most extreme limit
- A metal support between the heating bath and the base unit prevents bath instability
- To protect your heating bath against short-circuits and systematic corrosion, the cable coupling complies with the high protection class IP 67
- For your protection, the operating panel is located near the base so as to keep your hands out of the dangerous zone of rotating flasks, steam and slashing bath fluids
- All heating baths feature non-slip handles with safety grip to protect you from scalding bath liquids and allow for easy installation/removal of the bath
- A separate on/off switch for heating prevents an unintenional heat-up. If heating is switched on the on/off button is illuminated for visual control
- In case of an overshoot of any parameter setting, all models will show a warning on the operating panel
- Glassware assemblies are optionally available with transparent plastic safety coating ensuring ultimate protection while allowing visual control at all times

Superior Ease of Use
- The detachable operating panel can be attached via velcro or with a special suspension at eye level for your convenience from outside closed fume hoods
- The evaporating flask clamp cannot be lost due to a connection to the vapor tube coupling ring
- The integrated coupling ring and the patented clamping sleeve system allows you to remove sticking evaporating flasks from the vapor tube just in seconds in a safe manner
- The universal heating bath can be adjusted horizontally up to 200 mm and offers efficient space to accommodate even 5-liter flasks
- For your convenience, the height of 160 mm and the angle of the evaporating flask can be adjusted easily from 20° to 80°
- The optional automatic module Hei-VAP Distimatic allows for continuous and unattended automatic operations

Reduced Cost of Ownership
- Reduce your process times up to 30 %
- The chemical-resistant vacuum seal reduces your spare parts budget up to 75 % with prolonged operational lifespan
- Savings at the same high level are possible due to the long vapor tube service-life
- Increase your range of applications by using 5-liter flasks in the universal bath at no added costs
- Reduce your maintenance costs. The sealed housing protects your rotary evaporator from aggressive fumes, liquids and vapors to prevent internal corrosion. This results in an increased lifespan of 10 years on average at a reduced maintenance and repair cost
- The flange on the condenser side of the drive is made of PPS (Polyphenylene sulfide), a robust industrial-designed resin with superior chemical resistance which provides more chemical resistance than stainless steel or welded aluminum. - This reduces corrosion to a minimum which results in additional savings on maintenance and replacement components
- Only Hei-VAP heating baths reach a temperature of 210°C which is 30°C higher than other evaporators on the market and allow for a broader range of applications which previously could not be performed on any rotary evaporator (for example bitumen distillation). Thus, increasing the range of applications eliminates the need for investment in other equipment
- Spend your working hours more effectively on other challenges which require your attention and evaporate large quantities continuously with the automatic module Hei-VAP Distimatic
- Maximize your initial investment significantly: the automatic module Hei-VAP Distimatic is an affordable and more flexible alternative to large-scale rotary evaporators

Specifications

Hei-VAP's	
Size for hand lift models (WxDxH):	393 x 427 x 449mm
Size for motor lift models (WxDxH):	
Weight (without glass assembly):	approx. 17kg
Hei-VAP Water bath	
Temperature range:	from +20°C to +210°C
Temperature accuracy:	393 x 427 x 411mm
Heating capacity:	1300W
Volume heating bath:	4.5L
Sample size/Use of glassware:	flasks up to 5L
	< ±1K

E & OE.

1 Hei-VAP Value

Intelligent Evaporation *Heidolph*

Affordable model with hand lift for all standard applications
- Includes leading safety standards and features for superior ease of use and reduced cost of ownership, plus:
- The convenience of large dial controls for adjustment of rotation speed and bath temperature
- For limited budgets we recommend the optional manual vacuum controller
- Hei-VAP Value models have no digital display

1



Description	Glassware set	PK	Cat. No.
G1 Angled condenser	standard	1	**9.812 410**
G1 Angled condenser UK	standard	1	**9.812 751**
G1 Angled condenser	coated	1	**9.812 411**
G3 Vertical condenser	standard	1	**9.812 412**
G3 Vertical condenser UK	standard	1	**9.812 753**
G3 Vertical condenser	coated	1	**9.812 413**
G3 Vertical condenser UK	coated	1	**9.812 755**
G5 Condensate trap	standard	1	**9.812 414**
G5 Condensate trap	coated	1	**9.812 415**
G6 Vertical condenser for reflux distillation	standard	1	**9.812 416**
G6 Vertical condenser for reflux distillation	coated	1	**9.812 417**

2 Hei-VAP Advantage

Intelligent Evaporation *Heidolph*

For your routine distillation applications and reproducible results
- Includes leading safety standards and features for superior ease of use and reduced cost of ownership, plus:
- Available in hand lift or motor lift configurations
- Experience the advantages of our large digital 3.5" LCD display which indicates rotation speed, heating bath and vapor temperature
- We recommend the optional manual vacuum controller
- Experience the advantages of the automatic process timer which turns off your evaporator at a pre-programmed time and removes evaporator flasks from bath on motor lift models
- Upgrade your Hei-VAP Advantage to a Hei-VAP Precision: Upgrade-KIT Advantage Precision - ML; Upgrade-KIT Advantage Precision - HL

2



Description	Glassware set	PK	Cat. No.
G1 Angled condenser, Manual lift	standard	1	**9.812 420**
G1 Angled condenser, Manual lift	coated	1	**9.812 421**
G3 Vertical condenser, Manual lift	standard	1	**9.812 422**
G3 Vertical condenser, Manual lift	coated	1	**9.812 423**
G5 Condensate trap, Manual lift	standard	1	**9.812 424**
G5 Condensate trap, Manual lift	coated	1	**9.812 425**
G6 Vertical condenser for reflux distillation, Manual lift	standard	1	**9.812 426**
G6 Vertical condenser for reflux distillation, Manual lift	coated	1	**9.812 427**
G1 Angled condenser, Motor lift	standard	1	**9.812 430**
G1 Angled condenser, Motor lift	coated	1	**9.812 431**
G3 Vertical condenser, Motor lift	standard	1	**9.812 432**
G3 Vertical condenser, Motor lift	coated	1	**9.812 433**
G5 Condensate trap, Motor lift	standard	1	**9.812 434**
G5 Condensate trap, Motor lift	coated	1	**9.812 435**
G6 Vertical condenser for reflux distillation, Motor lift	standard	1	**9.812 436**
G6 Vertical condenser for reflux distillation, Motor lift	coated	1	**9.812 437**

Vacuum pumps please see page 647.

Heating bath liquid please see page 813.

1



1 Hei-VAP Precision

Intelligent Evaporation *Heidolph*

Most demanding applications and the finest integrated vacuum control capabilities
- Includes leading safety standards and features for superior ease of use and reduced cost of ownership, plus:
- Available in hand lift or motor lift configurations
- Experience the advantages of our large 4.3" color graphic display which features all parameters, integrated vacuum controller and includes programs for automated distillations
- Make your life easier by utilizing the integrated software support which leads you through the capabilities of the evaporator
- For data management Hei-VAP Precision models feature a USB interface
- Save time by configurating the unit; all connected devices will be recognized by the evaporator, which eliminates the need to configure the unit manually
- Now you can manage even the most demanding applications easily and prevent foaming, excessive bubbling or bumping
- Save time with your individualized pre-programmed parameter settings for your 30 most common applications used on a daily basis by saving them in a "Favorites" section.
- Each ramp offers 20 separate steps for demanding applications
- Apply an individual name to those ramps to avoid a mix-up
- Experience the advantages of the automatic process timer which turns off your evaporator at a pre-programmed time by raising the flask on motor lift models and releasing vacuum
- Control your process individually by pre-programming vacuum gradients
- Hei-VAP Precision models feature a built-in vacuum controller as a standard

Programs facilitate process control
Reduce your process times significantly by using these three programs for automated distillation.

SETpressure Program for solvent separations. This program holds a pre-set vacuum constant. During the evacuation you have the full flexibility to choose any other level of vacuum by the press of a button.

AUTOeasy Supports the automatic pressure control for solvent separations. The pressure level for the first boiling point is found automatically. This program can be used with all Heidolph glassware assemblies and does not require any accessories.

AUTOaccurate Supports very precise automatic pressure control for solvent separations. This program works similar to AUTOeasy but in addition is able to identify multiple boiling points automatically by reducing vacuum accordingly. Also the AUTOaccurate program delivers the finest and most precise vacuum control. To take advantage of this program the optional AUTOaccurate-sensor is required. Also, this program cannot be used on Heidolph G1 and G5 glassware assemblies. Leading parameter of this program is the vapor temperature

Reduce your process times via automated distillation programs.

Description	Glassware set	PK	Cat. No.
G1 Diagonal condenser, Hand lift	standard	1	**9.812 450**
G1 Diagonal condenser, Hand lift	coated	1	**9.812 451**
G3 Vertical condenser, Hand lift	standard	1	**9.812 452**
G3 Vertical condenser, Hand lift	coated	1	**9.812 453**
G5 Condensate trap, Hand lift	standard	1	**9.812 454**
G5 Condensate trap, Hand lift	coated	1	**9.812 455**
G6 Vertical condenser for reflux distillation, Hand lift	standard	1	**9.812 456**
G6 Vertical condenser for reflux distillation, Hand lift	coated	1	**9.812 457**
G1 Diagonal condenser, Motor lift	standard	1	**9.812 458**
G1 Diagonal condenser, Motor lift	coated	1	**9.812 459**
G3 Vertical condenser, Motor lift	standard	1	**9.812 460**
G3 Vertical condenser, Motor lift	coated	1	**9.812 461**
G5 Condensate trap, Motor lift	standard	1	**9.812 462**
G5 Condensate trap, Motor lift	coated	1	**9.812 463**
G6 Vertical condenser for reflux distillation, Motor lift	standard	1	**9.812 464**
G6 Vertical condenser for reflux distillation, Motor lift	coated	1	**9.812 465**

E & OE.

1 Automatic Module - Hei-VAP Distimatic

NEW!

For unattended and continuous use - including automatic drainage of residue

Heidolph

Save time by evaporating large volumes in a continuous and unattended way overnight and during the weekend
- Automatic refill of the evaporation flask with the solvent mixture set according to your settings. Continuous automatic discharge of condensate
- The worldwide unique automatic residue drainage offers a wide range of new possibilities for automatic distillation
- All parameters can be set individually
- The automatic module is compatible with all Hei-VAP and Laborota 4000 models and also with other comparable bench-top evaporators
- The storage and the collecting tank can be replaced during the process

Automatic solvent supply of the evaporating flask
- Filling level in the evaporating flask is measured by a sensor
- Required filling level can be set individually
- The recharge of the product under vacuum is valve-controlled
- A sensor measures the filling level of the storage tank and stops the evaporation process as soon as the liquid is completely evaporated

Automatic discharge of condensate
- A valve matrix controls the continuous discharge of the condensate from the system into a temporary storage flask. Afterwards the collected condensate will be discharged into the collecting tank by a diaphragm pump

Automatic drainage of residue
- The residue in the evaporating flask will be drained into a collecting tank. Afterwards the process starts again automatically by refilling the evaporating flask

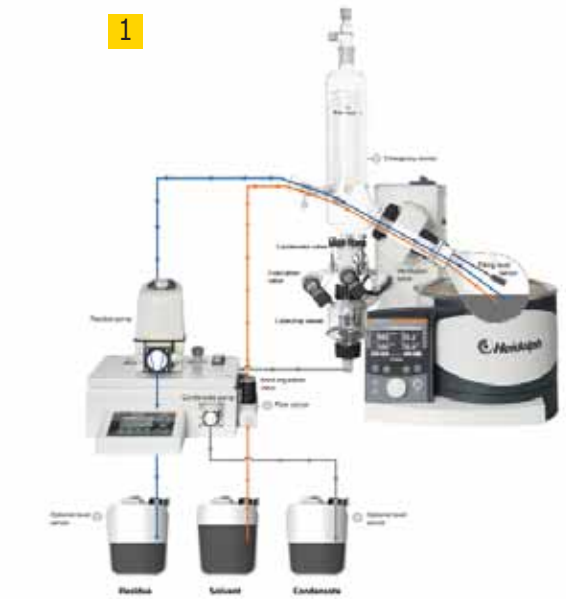
End of distillation process
- The process can be terminated automatically after evaporation is completed or manually at any time by the operator

Your Advantages
- Affordable alternative to common large-scale evaporators
- For your safety - the complete system is sensor-controlled and turns off the automatic module and the connected equipment completely in case of an emergency
- Take advantage of the wide range of possibilities to adjust the settings according to your individual needs
- Save energy costs - the automatic module as well as the connected devices turn off completely after finishing the evaporation process
- The system can be placed under a common fume hood which ensures the highest safety level for the operator

Rate of evaporation (continuous operation)
Hei-VAP Distimatic Delta T 40°C
L/h Water 1.2
L/h Ethanol 3.5
L/h Acetone 4.4
L/h Toluene 6.3

Description	PK	Cat. No.
without automatic discharge of residue	1	**6.258 421**
including automatic discharge of residue	1	**6.257 823**

1



Heating bath liquid please see page 813.

Accessories for Rotary Evaporators Hei-VAP Series

Heidolph

Description	PK	Cat. No.	
Guard hood for evaporating flasks	1	**6.236 805**	1
Guard shield for attaching to bath	1	**9.812 476**	2
Boiling temperature sensor	1	**7.651 893**	3
Temperature sensor for controller function AUTOaccurate	1	**9.812 479**	
Vacuum valve	1	**6.237 305**	4
Heating bath fluid, 5L	1	**9.906 200**	
Tube set, 5m vacuum tube and 6m water tube	1	**7.078 667**	
Upgrade-Kit advantage precision motor lift	1	**9.812 395**	
Upgrade-Kit advantage precision manual lift	1	**9.812 398**	
Spare PTFE vacuum seal	1	**7.055 667**	
Spare clamping sleeve	1	**7.076 245**	
Switchbox, connects up to 3 rotary evaporators to one pump and control vacuum individually	1	**9.812 480**	
AquaStop - security mechanism for water disconnection	1	**6.256 590**	

1



6.236 805

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9.812 476

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7.651 893

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6.237 305

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9.812 399

6



6.230 365

7



9.812 400

Chiller

Heidolph

Rotacool

High cooling capacity at minimal bench space
- The only chiller designed specifically for rotary evaporators
- Minimal bench space due to unique L-shape design
- Footprint of chiller (L x W x H): 470 x 580 x 443mm
- Provides space of (L x W): 470 x 405mm for evaporator
- Temperature range from -10°C to +40°C
- Temperature control of ±0.5°C
- Display for setting temperature and reading out actual temperature
- Maximum cooling capacity of 420 W

Rotacool Mini

Ideal for standard applications
- Chiller for all standards applications
- Small footprint of chiller (L x W x H): 225 x 450 x 400mm
- Cooling temperature: 7°C (not adjustable)
- Cooling capacity at: 7°C, 370W
- No digital display
- Temperature control of ±1°C

RotaChill

The affordable model
- Temperature range from 0°C to +100°C
- Precise temperature control of ±0.2°C
- Footprint of chiller: 210 x 450 x 570mm
- The RotaChill should be placed directly besides the evaporator to ensure a sufficient pump performance

Type	PK	Cat. No.	
RotaChill	1	**9.812 400**	7
Rotacool mini	1	**6.230 365**	6
Rotacool	1	**9.812 399**	5

Other chillers - please see page 787.

E & OE.

Vacuum Pumps Rotavac Valve/Vario

Heidolph

Rotavac Valve Control - For all Hei-VAP models
- Two-stage diaphragm pump made from chemical-resistant material
- High suction capacity of 2.0m³/h for fastest evacuation
- Suction capacity for up to 3 rotary evaporators at the same time
- Achieves an ultimate vacuum of 7mbar
- Can be combined with a condenser
- Power input: 180W; Weight: 12.8kg
- Dimensions (L x W x H): 195 x 245 x 310mm
- Vacuum can be controlled manually or via valve operated vacuum controllers
- Depending on your application you can switch on and off the vacuum pump via switchbox

Rotavac Vario Control - For Hei-VAP Precision
- Three-stage diaphragm pump is made from chemical-resistant material
- High suction capacity of 1.7m³/h for fastest evacuation
- Achieves an ultimate vacuum of 2mbar
- Can be combined with a condenser
- Power input: 160W; Weight: 5.4kg
- Dimensions (L x W x H): 236 x 167 x 196mm
- Even if the gas ballast valve is open an excellent ultimate vacuum is reached when working with easily condensable vapors. This makes distilling high boiling point solvents such as DMF or DMSO possible at low bath temperatures

Rotavac Valve Tec - For all Hei-VAP models
- Two-stage diaphragm pump made from chemical-resistant material
- Suction capacity of 0.75m³/h
- Achieves an ultimate vacuum of 12mbar
- Can be combined with a condenser
- Power input: 80W; Weight: 6kg
- Dimensions (L x W x H): 315 x 145 x 169mm
- Recommended for solvents with low or medium boiling points
- Vacuum can be controlled manually or via valve operated vacuum controllers

Rotavac Vario Tec - For Hei-VAP Precision
- Two-stage diaphragm pump is made from chemical-resistant material
- Suction capacity of 1.0m³/h
- Achieves an ultimate vacuum of 12mbar
- Can be combined with a condenser
- Power input: 160W; Weight: 4.3kg
- Dimensions (L x W x H): 236 x 156 x 196mm
- Recommended for solvents with low or medium boiling points

Fully controllable stand-alone pumping unit including vacuum controller - For Hei-VAP Value and Hei-VAP Advantage
- Three-stage diaphragm pump is made from chemical-resistant material
- High suction capacity of 1.7 ³m/h for fastest evacuation
- Achieves an ultimate vacuum of 5mbar
- Can be combined with a condenser (order nr. 9.812 377)
- Power input: 160W, Weight: 6kg
- Dimensions (L x W x H): 193 x 263 x 299mm
- Precise vacuum control avoids bumping and eliminates foaming of your evaporation solution
- Due to automatic vacuum supply to the process parameters you have more time for important laboratory activities

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9.812 385

2



6.231 964

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9.812 478

4



9.812 365

Type	PK	Cat. No.	
Rotavac Valve Control	1	**9.812 385**	1
Cooler for Rotavac Valve Control Hei-VAP	1	**6.401 205**	
Rotavac Vario Control for Hei-VAP	1	**9.812 477**	
Rotavac Valve Tec for Hei-VAP	1	**6.231 964**	2
Cooler for Rotavac Valve Tec for Hei-VAP	1	**9.812 378**	
Rotavac Vario Tec for Hei-VAP	1	**9.812 478**	3
Vacuum Valve	1	**9.812 405**	
Woulff Bottle	1	**9.812 406**	
Manual vacuum controller for Hei-VAP Valve and Advantage	1	**6.238 796**	
Rotavac Vario stand-alone pumping	1	**9.812 365**	4
Condenser for Rotavac Vario Pumping unit	1	**9.812 377**	
Switchbox, connects up to 3 rotary evaporators to one pump and control vacuum individually	1	**6.223 990**	

Heidolph Rotary evaporators - please see page 642.

1



1 Valve-regulated vacuum pump Rotavac 20

NEW!

Heidolph

Includes secondary condenser and air intake separation vessel.
This vacuum system can be applied in many different fields in order to evacuate, evaparate and pump out gases and vapors. Thanks to the emission condenser it is possible to achieve a chemical recovery of almos 100%.

- Excellent compatibility with chemicals and condensate
- Excellent ultimate vacuum of 2 mbar
- Very quiet and very low Vibration
- Very high suction capacity of 3.0 m³/h
- Size (w x d x h): 350 x 275 x 495 mm
- Weight: 19.9 kg

Type	PK	Cat. No.
Rotavac 20	1	**6.257 926**

2



2 Rotary Evaporator RV 8

NEW!

IKA

The IKA Rotary Evaporator range gets a new family member - the RV 8. This new distilling system completes the existing series by adding a functional basic model. The manual lift, with ambidextrous design, allows for precise positioning of the glassware. Digital displays for rotation speed and heating bath temperature allow for optimal control of all distilling processes. New clamp mechanism to simplify the changing of evaporation flasks.

- Manual lift with integrated safety "lift-out-function"
- Water/oil heating bath with integrated ergonomic carrying handles
- Key-button with locking function for the heating bath temperature
- Adjustable immersion angle
- Digital displays for rotation speed and heating bath temperature
- Single-hand operation; ambidextrous design
- Speed range 5 - 300 rpm
- Additional user safety through reduced 24 V power requirements within the unit
- Compatible with the complete range of IKA RV 10 glassware
- New clamp mechanism

Specifications

Drive	
Motor rating input	50W
Speed:	5 to 300rpm
Speed display:	digital
Adjustable head angle:	0 to 45°
Stroke displacement:	130mm, manual
Heating bath	
Bath volume:	3l
Temperature range:	RT to +180°C
Heating power:	1300W
General data	
Dimensions (WxDxH):	510 x 345 x 490mm
Protection class according to DIN EN 60529:	IP 20
Power supply	220-240V, 50/60Hz

Type	Description	PK	Cat. No.
RV 8 Flex	with heating bath HB 10 and Woulff bottle	1	**9.813 001**
RV 8 V	with heating bath HB 10 and vertical glassware, RV 10.1	1	**9.813 002**
RV 8 V-C	with heating bath HB 10 and vertical glassware, coated RV 10.10	1	**9.813 003**



Rotary evaporators RV 10 basic

IKA

The RV 10 basic is the entry level model into the IKA RV 10 Rotary Evaporator line. It comes equipped with a new universal heating bath, space-saving vertical glassware as well as state-of-the-art safety features. The RV 10 basic is a robust and reliable lab companion. Its optimized bath volume allows for fast heat-up times. The condenser unit has specially designed glass tubes that utilize the 1500 cm² surface extremely efficient. That's why the RV 10 basic delivers reliable and reproducible process results usually seen on much more costly systems. Additional features such as smooth start, left-right interval or timer function capability support the user in their daily lab work. Another important aspect of the RV 10 basic are the sophisticated safety features. The motorized lift has an automated lift-out function in case of power outage to prevent superheating of the solvent. Safety temperature circuits can be set individually. Dry-run protection, adjustable lower end stop and lock function of bath setting complete the line of safety features. Furthermore, IKA offers a choice of coated glassware for increased safety needs.

In summary, the entry level RV 10 basic has all the features for smart, safe and affordable distillation.

- Universal (water/oil) heating bath
- Vertical Glassware as standard
- Motorized lift with "safety-stop" function
- Optimized heating bath volume for fast heat-up
- Highly efficient 1500 cm² condenser unit
- Rugged design
- Ergonomically placed handles on Heating bath
- Smooth start
- Left-right interval
- Timer function
- Dry-run protection
- Safety temperature circuits
- Lower-end stop
- Choice of coated glassware
- Push-off mechanism to loosen tight fitted glassware
- Easy and safe operation due to ergonomically designed user interface

Specifications:

Drive:	
Motor rating input:	50W
Speed range:	20 to 280 rpm
Speed display:	digital
Head angle adjustable:	0 to 45°
Stroke displacement:	140mm, motorised
Setting of lower end stop:	60mm, contact-free
Heating bath:	
Temperature range:	Ambient up to 180°C
Heating power:	1.300W

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9.813 011

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6.237 535

3



4.008 136

Type	Description	PK	Cat. No.
RV 10 basic V	with heating bath HB 10 and vertical glassware, RV 10.1	1	**9.813 011** 1
RV 10 basic V-C	with heating bath HB 10 and vertical glassware, coated RV 10.10	1	**9.813 013**
RV 10.70	Vapor tube made of borosilicate glass, NS 29/32	1	**6.237 535** 2
RV 10.8001	Lip-seal from a PTFE compound with a built-in stainless steel spring	1	**4.008 136** 3

Heating bath liquid please see page 813.



1



1 Rotary evaporator RV 10 control

NEW!

IKA

The RV 10 control is the flagship of the new rotary evaporator series by IKA®. It offers all the functions of the RV 10 digital. But the IKA® RV 10 control goes one step further.
Like the RV 10 digital, it can be precisely controlled via the RS 232 interface for remote PC operation with IKA®s labworldsoft® and is thus ideal for automatic operation, but thats not all; the control functions also enable completely automatic distillation both for volumebased processes and full drying depending on the area of application. The expandable solvent library also allows you to incorporate new processes.

Same properties as RV 10 digital, with the following additional functions:

Integrated vacuum controller with central display for automatic distilling and ramp programming
- Integrated solvent library, which can be extended by the user
- Distillation specific parameters stored for standard distillations
- Automatic transfer of measurements and distillation type with one key press
- Programmable volume controlled distillation
- Colour graphic display for safe and comfortable operation
- Display of distillation curves
- Multiple languages
- Automatic ventilation at the end of each test
- Cooling water switched off automatically at the end of the test
- Integrated cooling water monitoring
- Heating bath safety management; automatic heating bath monitoring with distillation stop in case of temperature errors
- Heating bath switched off automatically at the end of the test
- USB interface
- 5 years warranty after registration
- New: Now RV 10.4002 Magnetic valve included in delivery

Type	Description	PK	Cat. No.
RV 10 contol V	with heating bath HB 10, vertical glassware RV 10.1 and RV 10.4002 Magnetic valve laboratory vacuum	1	**9.813 004**
RV 10 contol V-C	with heating bath HB 10, vertical glassware, coated RV 10.10 and RV 10.4002 Magnetic valve laboratory vacuum	1	**9.813 005**
RV 10 contol FLEX	with heating bath HB 10, incl. Woulff bottle and RV 10.4002 Magnetic valve laboratory vacuum, glassware - please order separately	1	**9.813 006**
RV 10 contol V auto	with heating bath HB 10, speed-controlled pump N 920, vertical glassware RV 10.1	1	**9.813 007**
RV 10 contol V-C auto	with heating bath HB 10, speed-controlled pump N 920, vertical glassware, coated RV 10.1	1	**9.813 008**

Accessories for Rotary evaporators RV8/RV 10 basic/RV 10 contol

NEW!

IKA

Type	Description	PK	Cat. No.
N 920 KT.29.18	Vacuum pump	1	**6.229 964**
MPC 105 T	Vacuum pump	1	**6.242 434**
LVS105T-10 ef	Vacuum pump	1	**4.008 149**
VCV 1	Vacuum control valve	1	**6.251 448**
RV 10.4001	Magnetic valve in-house vacuum	1	**6.237 539**
RV 10.4002	Magnetic valve ilaboratoy vacuum	1	**6.237 538**
RV 10.4003	Pump control incl. magnetic valve	1	**6.237 330**
RV 10.5001	Choke water valve	1	**6.237 540**
RV 10.5002	Filter	1	**6.237 541**
RV 10.5003	Pressure regulating valve	1	**6.237 542**

E & OE.

Large-Scale Evaporator Laborota 20 series

Intelligent Evaporation *Heidolph*

Your advantages

- A guard hood consisting of a metal frame and safety glass, covers the bath completely while providing clear visible monitoring
- Features water-level regulation system to prevent water from spilling over and potential floods in your lab
- Unique integrated evaporating flask support system allows for "one-person operation" to remove the flask in just moments
- A temperature sensor powers off the bath in case of any uncontrolled heat-up event. In case of overpressure or glassware breakage, the unit powers off entirely
- No hassle or safety concerns due to low bath fluid levels the self-filling water bath takes the worry out of running dry
- Continuous unattended evaporation without limits-the automatic module Laborota 20 Distimatic with automatic release of condensate is an affordable and more flexible alternative to common 50 or 100-liter evaporators
- Receiver cassettes guard against glassware breakage while providing a self-standing support
- Excellent user safety: condenser and receiving flasks are protected by high-impact transparent PMMA doors

1



9.812 520

Type	i	ii	iii	iv	PK	Cat. No.
Laborota 20 compact R	1			1	1	**9.812 520** 1
Laborota 20 compact RC	1			2	1	**9.812 521**
Laborota 20 compact A		1	1	1	1	**9.812 522**
Laborota 20 compact AC		1	1	2	1	**9.812 523**
Laborota 20 compact A2	1	1	1	1	1	**9.812 524**
Laborota 20 compact A2C	1	1	1	2	1	**9.812 525**
Laborota 20 safety R	1			1	1	**9.812 526**
Laborota 20 safety RC	1			2	1	**9.812 527**
Laborota 20 safety A		1	1	1	1	**9.812 528**
Laborota 20 safety AC		1	1	2	1	**9.812 529**
Laborota 20 safety A2	1	1	1	1	1	**9.812 530**
Laborota 20 safety A2C	1	1	1	2	1	**9.812 531**
Laborota 20 compact R shorty					1	**9.812 539**
Laborota 20 compact RC shorty					1	**9.812 553**
Laborota 20 compact R shorty*					1	**9.812 555**
Laborota 20 safety R shorty*					1	**9.812 556**
Laborota 20 safety RC shorty*					1	**9.812 558**

i = upward condenser, ii = downward condenser, iii = expansion vessel, iv = receiving flask
All variants, upon request, are available with an oil bath instead of a water bath.
* Oil bath

2 Bladder for rotary evaporators for venting with inert gas

Football bladder

2



Type	PK	Cat. No.
Bladder for rotary evaporators	1	**9.115 515**

Evaporator flask pear shape, borosilicate glass 3.3

NEW!

Manufactured from borosilicate glass 3.3, according to DIN 12383 *Isolab*

3



6.236 112

Capacity ml	Centre neck NS	PK	Cat. No.
100	29/32	1	**6.237 167**
250	29/32	1	**6.237 711**
500	29/32	1	**6.243 664**
1000	29/32	1	**6.236 112** 3

1



9.196 044

Evaporating flasks with conical ground joint, DURAN®

Especially for rotary evaporators, with center neck and conical joint, autoclavable, pear-shaped, material: DURAN®

Lenz

Capacity	Socket	Flask dia.	PK	Cat. No.
ml	NS	mm		
50	29/32	56	1	**9.196 020**
100	29/32	60	1	**9.196 024**
250	29/32	81	1	**9.196 036**
500	29/32	101	1	**9.196 044** 1
1000	29/32	126	1	**9.196 054**
2000	29/32	158	1	**9.196 063**

2



6.246 010

Evaporating flasks with conical ground joint, DURAN®, with PUR coating

NEW!

Especially for rotary evaporators, with center neck and conical joint, with highly transparent PUR coating, autoclavable, pear-shaped, material: DURAN®

Lenz

Capacity	Socket	Flask dia.	PK	Cat. No.
ml	NS	mm		
50	29/32	56	1	**6.246 006**
100	29/32	60	1	**6.246 007**
250	29/32	81	1	**6.246 008**
500	29/32	101	1	**6.246 009**
1000	29/32	126	1	**6.246 010** 2
2000	29/32	158	1	**6.242 495**
3000	29/32	175	1	**6.246 011**

Lenz laboratory glass instruments are also available with PU coating, autoclavable.

PUR Coating, autoclavable

Lenz

Physical Properties	
Autoclavable	121°C/2.05 bar/20 minutes - max. 100 cycles
Transmission	absorption up to 380nm
Long-term heat resistance	up to 140°C
Max. heat resistance	up to 190°C for a short time
Suitable for freezing	-30°C
Suitable for microwave use	
Chemical Properties (Resistance)	
Water	up to 100°C/5 min. constant exposure
Organic solvents	room temperature/5 min. constant exposure
- alcohol	
- acetone	
- tetra	
Inorganic acids, bases	room temperature/5 min. constant exposure
- hydrochloric acid (up to 20%)	
- nitric acid (up to 20%)	
- sulphuric acid (up to 20%)	
- caustic soda (up to 20%)	
Cleaning resistance	Standard disinfectants and detergents
- industrial washers/clinic	up to 50 cycles/ max. 95°C
- household dishwashers	up to 50 cycles/ max. 65°C

Powder Flasks jointed, Duran®

NEW!

Specially for rotary evaporators. For the drying of powder-like substances . With centre neck and conical joint, with inscription label.

Lenz

Capacity	Socket	Flask dia.	PK	Cat. No.
ml	NS	mm		
100	29/32	60	1	**6.205 965**
250	29/32	81	1	**6.205 966**
500	29/32	101	1	**6.205 512** 1
1000	29/32	126	1	**6.206 195**
2000	29/32	158	1	**6.205 692**

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6.205 512

Receiving flasks, with spherical ground glass joint, borosilicate glass 3.3

NEW!

Manufactured from borosilicate glass 3.3 and meeting quality standards according to DIN 12383 standards.

Isolab

Capacity	Socket	Flask dia.	PK	Cat. No.
ml	NS	mm		
100	KS 35	64	1	**6.243 665**
250	KS 35	85	1	**6.243 666**
500	KS 35	105	1	**6.243 667**
1000	KS 35	131	1	**6.243 668** 2

2



6.243 668

Receiving flasks, DURAN®

With with or without highly transparent PUR coating, autoclavable

Lenz

Capacity	Socket	Flask dia.	PK	Cat. No.
ml	NS	mm		
100	spherical, S35	64	1	**9.196 224**
250	spherical, S35	85	1	**9.196 236**
500	spherical, S35	105	1	**9.196 244** 3
500	spherical, S35, plastic coated	105	1	**7.653 714**
1000	spherical, S35	131	1	**9.196 254**
1000	spherical, S35, plastic coated	131	1	**9.812 217**
2000	spherical, S35	166	1	**9.196 263**
2000	spherical, S35, plastic coated	166	1	**6.200 782**

3



9.196 244

Lenz laboratory glass instruments are also available with PU coating, autoclavable.

Ground joint clips, metal

Stainless steel. For spherical ground joint connections. With locking screw.

Lenz

Size	PK	Cat. No.
13	1	**9.011 693**
19	1	**9.011 694**
29	1	**9.011 695**
35	1	**9.011 698** 4
40	1	**9.011 696**
65	1	**9.011 697**

4



9.011 698

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2



3



1 2 3 Mini-Centrifuge Sprout®

NEW!

Heathrow Scientific

New SnapSpin™ rotors - a new approach to compact centrifuge use!
Introducing the next generation of the Sprout® mini-centrifuge loaded with new features for increased efficiency in the lab. Two new SnapSpin rotors (a six-place standard rotor and an eight-place strip rotor) snap-in and out for fast and easy changes! Plus, two sets of adapters accommodate all major microtube and PCR® tube styles (2.0, 1.5, 0.5, 0.2 mL) for customized use. The Sprout is ideal for microfilter cell separations and HPLC samples. With most spins lasting around 20 seconds, the ergonomically designed lid was specifically designed to fit in the palm of the hand for easy repeat opening and use. Made with UV resistant plastic.
Operation is now faster and easier: Snap in rotor, load and close. For repeated spins, simply close the lid to reactivate. An internal safety switch ensures the Sprout will not operate with the lid open.
Small footprint offers minimal benchtop space and removable cord for compact storage.

- Low noise and vibration
- Small footprint
- Quick Spin feature for short spins.
- Numbered tube positions
- Unit will not operate without lid in place

Sprout includes:

- Two easy change, tool-free rotors:
- Six-place standard rotor for 1.5/2 mL tubes
- Eight-place strip rotor for two 0.2 mL tube strips or 16 single tubes
- Six 0.2 mL and six 0.5 mL adapters for customized use
- Storage Case - Keeps rotors and adapters contained and dust-free
- Tube Rack - Convenient for handling samples before and after quick spins

Specifications

Maximum RCF:	2000xg
Maximum Speed:	6000rpm
Tubes Accommodated	
Circular, one-size rotor:	six 1.5- and 2.0ml tubes or use with adapters to spin six 0.4- and 0.5ml tubes
Strip rotor:	two 8 x 0.2ml PCR tube strips or 16 x individual 0.2ml PCR tubes
Dimensions:	153 x 128 x 104mm

Description	PK	Cat. No.
Sprout®	1	**6.254 604**

4



5



4 5 High-Speed Mini-Centrifuge Gusto™

NEW!

Heathrow Scientific

Maximum speed with minimal space. This compact centrifuge is ideal for most protocols calling for fast spins (up to 12500 rpm/9100 rcf) and quick spindowns. Useful for PCR®, microfilter cell separation, clinical applications, and HPLC protocols. Operation is extremely simple for this high-level of sophistication: Insert tubes, close lid, adjust speed/time, and press Start. For duplicate spins, simply reload rotor and push Start. Designed with quick-spin option for commonly used 20-second spins. Also includes a tool-free, quick-change rotor system.
Safety features ensure the unit will not operate with an open lid, a jammed rotor or when out of balance. Gusto™ provides the option of setting and displaying in rpm or rcf. Efficiently designed for minimum bench top space. Included features typically found on more expensive units.

Supplied with:

- 12 place standard rotor with lid for 1.5/2ml tubes
- 8-place strip rotor for four 0.2ml tube strips or 32 single tubes
- Twelve 0.2ml and twelve 0.5ml adapters for customized use
- Power Adapter with power cords for e.g. EU, UK, CH, USA

Specifications

RCF:	15 to 9800 x g
Speed:	500 to 12500 rpm
Dimensions:	203mm x 171mm x 114mm
Supply requirements:	100 - 240 VAC, 50 - 60 Hz

Type	PK	Cat. No.
Gusto™	1	**6.254 597**

E & OE.

Accessories for Mini-Centrifuge Gusto™

NEW!

Heathrow Scientific

Description	PK	Cat. No.
Power adapter	1	**6.254 598**
Universal power cord set for e.g EU, UK, CH, USA	1	**6.254 599**
Standard rotor for 12 x 1.5 / 2.0 ml tubes, with lid and knob	1	**6.254 600**
PCR® rotor for 4 x 8 Strips 0.2 ml or 32 single tubes, with knob	1	**6.254 601**
Rotor knob for Standard and PCR® rotor	1	**6.254 602**
Standard rotor cover	1	**6.254 603**

1 Mini Centrifuge Microspin 12

NEW!

Grant

Compact high-speed benchtop mini centrifuge with a built-in rotor for 12 x 1.5/2ml microtubes. Ideal for biomedical laboratories.

- Fixed angular aluminium rotor accommodates 12 x 1.5/2 ml microtubes, supplied with adapters for 0.2ml and 0.5ml tubes and fixing lid
- Timed operation (1 to 30 minutes), with automatic switch-off
- Suitable to use in cold rooms, operating temperature ambient +4°C to +25°C
- Metal protective inserts inside the lid and casing, automatic imbalance switch-off and locking of a lid provide safe operation
- Constant airflow around the rotor reduces risk of samples overheating during centrifugation
- Simple push-buttons and a clear 2-line LCD status display shows actual and set values of time, set and actual speed and relative centrifugal force (g-force)
- Low voltage cord easily fits through refrigerator door gaskets
- Compact design and quiet in operation
- Fits neatly and unobtrusively into the workspace

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Specifications

RCF:	12400xg
Speed:	14500rpm
Capacity:	12 x 0.2/0.5/1.5/2ml microtubes
Dimensions (WxDxH):	200 x 240 x 125mm
Weight:	3.5kg
Power supply:	230V, 50-60Hz

Type	PK	Cat. No.
Microspin 12	1	**9.721 003**

2 Centrifuge/vortexer, Combi-spin PCV-2400

Grant

Combined centrifuge/vortex mixer for microtubes and 0.2ml strips. For independent centrifuge and vortex mixing, or mixing of an individual tube concurrently with spinning of multiple tubes. The vortex cup, located at the top of the central shaft, emerges through an opening in the closed lid. In spin-mix-spin applications, the Combi-spin can be used with reagent volumes down to approximately 50µl.
- max RCF(bottom of tubes) g-force 700xg
- interchangeable rotors for 2.0ml, 1.5ml, 0.5ml, 0.2ml microtube combinations and 0.2ml stripes.
- fixed speed: 2800rpm
- continuous operation or short spin

2



Type	PK	Cat. No.
PCV-2400	1	**9.721 001**

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9.721 005

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9.721 004

Centrifuge Multi-spin PCV-3000/PCV-6000

Grant

Combined centrifuge/vortex mixer for microtubes and 0.2ml strips. For independent centrifuge and vortex mixing operations, or a programmable sequence of spin and mix phases of multiple tubes.

- Vortex mixing speed: three stage adjustment
- Interchangeable rotors for 2.0ml, 1.5ml, 0.5ml, 0.2ml microtube combinations and 0.2ml strips
- Timed vortex mixing: 1sec to 20sec

Specifications

Max. RCF(bottom of tubes)	
PCV-3000:	800xg
PCV-6000:	2350xg
Max. speed	
PCV-3000:	1000rpm to 3500rpm (at 60Hz)
PCV-6000:	1000rpm to 6000rpm
Max. capacity:	12 x 1.5ml microtubes or 12 x 0.5ml plus 12 x 0.2ml microtubes
Spin timer	
PCV-3000:	1sec to 99min
PCV-6000:	1sec to 30min

Type	PK	Cat. No.	
PCV-3000	1	**9.721 005**	1
PCV-6000	1	**9.721 004**	2

Accessories for Centrifuges Combi-spin PCV- 2400/Multi-spin PCV-3000 and PCV-6000

Grant

Type	Description	PK	Cat. No.
PR2-05	Rotor for 8 x 1.5/2.0ml plus 8 x 0.5ml tubes	1	**9.721 006**
PR2-05-02	Rotor for 6 x 1.5/2.0ml plus 6 x 0.5ml plus 6 x 0.2ml tubes	1	**9.721 007**
PSR-16	Rotor for 2 x 8-well 0.2ml microtube strips	1	**9.721 008**

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3 4 Mini Centrifuge Prism™ Mini

NEW!

Labnet

The Prism Mini can be used for a wide range of molecular biology separations and quick spins. The centrifuge was designed to be extremely compact with an exceptionally small footprint. It includes 2 quick release interchangeable rotors, which spin up to 6000rpm's. The electronic brake and self opening lid allow for quick deceleration to reduce handling time. The Prism Mini's maintenance-free drive is remarkably quiet and the unique design allows for excellent airflow, to protect temperature sensitive samples.

- Quick release rotor exchange
- Increased sample capacity
- Rapid sample processing
- One-step sample retrieval

Supplied with: Mini Centrifuge incl. 8 place tube rotor for 1.5/2.0ml microcentrifuge tubes, incl. adapters for 0.5ml and 0.4ml tubes and PCR strip rotor for 4 strips with 8 x 0.2ml tubes or 32 x 0.2ml single tubes.

Further adapters available on request.

Specifications

Max. RCF:	2000 x g
Max. speed:	6000rpm
Dimensions (WxDxH):	132mm x 132mm x 112mm
Weight:	550g
Supply requirements:	230V, 50-60Hz
Rotor capacity microcentrifuge tubes:	8 x 1.5/2.0ml or 8 x 0.5ml and 8 x 0.4ml with adapters (included)
Strip rotor capacity:	4 strips with 8 x 0.2ml or 32 single tubes with 0.2ml

Description	PK	Cat. No.
Prism™ Mini	1	**9.945 789**

E & OE.

Adapters for Mini Centrifuge Prism™ Mini

NEW!

Labnet

Type	Description	PK	Cat. No.
C1205-8	Individual adapters for 0.5/0.6ml tubes	8	**9.945 781**
C1206-8	Individual adapters for 0.4/0.25ml tubes	8	**9.945 782**
C1222-8	Individual adapters for 0.2ml thermal cycling tubes	8	**9.945 783**

1 Mini Plate Spinner MPS 1000

Labnet



- quickly spin down droplets and condensation
- use before and after thermal cycling to increase PCR yield
- accepts skirted, non-skirted and all standard PCR plates
- less than ¼ x the size of most plate centrifuges

Specifications

Centifugal force:	500xg
Rotor Speed:	2500rpm
Capacity:	2 PCR Plates
Rotor:	Fixed vertically
Dimensions (WxDxH):	483 x 534 x 465mm
Weight:	3kg
Supply requirements:	230V 50/60Hz

Type	PK	Cat. No.
MPS 1000	1	**9.945 790**

2 MiniSpin® and MiniSpin® Plus personal centrifuges

Eppendorf AG



Features:

- Extremely compact and small footprint
- Especially quiet due to its carefully balanced drive
- Maintenance-free motor
- Clear digital display
- Minimal sample heating (after 20min. at max. speed only 12°C max.)
- Separate short-spin button
- Automatic lid opening
- Integral power supply unit
- Capacity: 12 x 1.5/2ml containers
- Autoclaveable rotor (121°C, 20min.)
- Start-up/slow-down time less than 13 secs. (to/from max. speed).

Additional features of MiniSpin®

- Includes standard anodised aluminium rotor
- Max. rcf: 12400 xg, max. speed: 13400rpm
- Timer can be set for up to 30 mins.

Additional features of MiniSpin® Plus

- Includes premium "Black Line" aluminium rotor
- Max. rcf: 14100 xg, max. speed: 14500rpm
- Speed/rcf display switch
- Timer can be set for up to 99 mins.
- Permanent centrifuging option

Type	Dimensions (W x D x H) mm	Weight kg	Power W	PK	Cat. No.
MiniSpin®	225 x 240 x 120	4.3	70	1	**9.776 500**
MiniSpin® plus	225 x 240 x 120	4.3	85	1	**9.776 501**

3 Accessories for MiniSpin® and MiniSpin® Plus personal centrifuges

Eppendorf AG



Type	PK	Cat. No.
Rotor F-55-16-5-PCR incl. lid	1	**9.776 521**
Lid, stainless steel for F-55-16-5-PCR	1	**9.776 522**
Adapter for 0.5ml microcentrifuge tubes and 0.6ml microtainers	6	**9.776 488**
Adapter for 0.4ml microcentrifuge tubes	6	**9.776 487**
Adapter for 0.2ml PCR-vessels	6	**9.776 504**

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1 Microlitre centrifuges Espresso

Thermo Scientific

Introducing Espresso - the personal microcentrifuge that takes productivity and ease-of-use to a whole new level. Compact and stylishly designed, the Espresso microcentrifuge lets you perform all your standard runs with a minimum of adjustments, and offers outstanding performance to handle a wide range of applications across pharmaceutical, biotechnology and academic research.

User friendly:
- Rotors and tubes are inserted and removed with minimal effort.
- A large LED display simplifies viewing of parameters
- Setting parameters is also fast and simple using a single knob-no need to bother with toggling arrow keys or imprecise analog controls
- Espresso is a snap to clean: its plastic rotor is fully autoclavable and non-corroding, and the unit features a brushless motor that offers years of maintenance-free operation

Maximum productivity:
- Espresso offers outstanding performance in a small, versatile package. Operating at 14.500 x g, it can hold 12 micro tubes from 0.5 to 2.0 mL and supports smaller volumes with adapters
- Espresso excels in a wide range of applications including nucleic acid purification, PCR cleanup, plasmid mini-prep, protein processing and forensics
- Its fast spin-up/spindown offers significant time savings that increases productivity

Compact and quiet:
- With its 76.5 square-inch footprint, Espresso delivers consistent results without taking center stage on your benchtop
- it's exceptionally quiet so you can conduct your research all day long without distraction

Type	Max. rcf x g	Max. speed rpm	Dimensions (W x D x H) mm	PK	Cat. No.
Espresso	14500	14600	250 x 200 x 150	1	**9.945 115**

Accessories for microcentrifuge Espresso

Thermo Scientific

Description	PK	Cat. No.
Adapter 0.5mm (D= 8mm)	12	**4.009 275**
Adapter 0.4mm (D= 6mm)	12	**4.009 276**

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2 Mini-centrifuge mini G

NEW!

IKA

Mini-centrifuge for all applications which do not require high speeds, e.g. micro-filtrations and cell separation. Transparent cover allows constant observation of centrifuge. The mini-centrifuge can be used for both PCR-vessels and PCR-strips. As a safety feature, the centrifuge will run only when the lid is closed. Lid opens easily with the press of a button.

- Fixed speed of 6000rpm
- Digital timer adjustable from 1 to 99min
- Integrated quick stop
- Fast start-up of speed
- Compact design and quiet operation
- Rotor exchangeable without tools
- Easy operation with touch keypad

Specifications

Max. RCF:	2000xg
Speed:	6000rpm
Capacity:	8 x 2.0ml
Dimensions (WxDxH):	155 x 175 x 105mm
Weight:	1.4kg
Power supply:	24V DC voltage

Type	PK	Cat. No.
mini G	1	**9.570 480**
mini G UK	1	**9.570 481**
mini G CH	1	**9.570 482**

E & OE.

1 Microlitre centrifuge, Spectrafuge®



Microlitre centrifuge for microtubes up to 2.0ml. *Labnet*

Features:
- Brushless, induction motor
- Steplessly adjustable speed range: 1000rpm to 14000rpm rpm
- Timer pre-selection from 1 min. to 30 min. with "continuous run" facility
- "quick" pulse button for short time runs
- CE-marked
- Constructed to IEC 1010 requirements

Specifications

Max. rcf.:	15996×g
Max. speed:	14000rpm
Max. capacity:	18 × 1.5/2.0ml
Dimensions (W x H xD):	200 × 180 × 220mm
Weight:	4.5kg

Description	PK	Cat. No.
Microlitre centrifuge, Spectrafuge® complete with accessories	1	**9.945 721**

2 Microcentrifuge Spectrafuge™ 24D



The Spectrafuge™ 24D combines innovations such as a unique, easy access rotor, exclusive multi-flow air cooling system and high performance drive with a digital microprocessor that precisely regulates operation. Parameters are selected with two "smart" knobs and values are shown on large, easy to read, LED displays. Speed can be set and displayed in rpm or g-force while runs may be timed, continuous or momentary. *Labnet*

The unique design of the 24-place rotor allows easy access to the tops of the tubes. An optional StripSpin™ adapter fits onto the rotor for spinning 0.2ml tubes and strips. A powerful, brushless motor quickly accelerates the rotor to set speed. Air enters the centrifuge through vents on the back of the housing and it is circulated in multiple directions to maximize cooling. The result is a cool running microcentrifuge that keeps samples close to ambient temperature, even during extended runs at maximum speed. For samples that require below ambient temperatures, the Spectrafuge 24D may be used in a cold room.

Specifications:

RCF/Maximum speed:	16.300xg/13.300rpm
Maximum capacity:	24 x 1.5ml/2.0ml
Timer:	1 to 30min or continuos "Quick" button for momentary operation
Ambient operating range:	4°C to 35°C
Dimensions (WxDxH):	235 x 293 x 216mm
Weight:	8.1kg
Supply requirements:	230V 50Hz or 120V 60Hz

Type	PK	Cat. No.
Spectrafuge™ 24D	1	**9.945 799**

We can **supply** this
manufacturer's
whole
product range !

partner of the LLG Lab Logistics Group

Labnet
Labnet International, Inc.

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9.945 795

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9.945 793

Microcentrifuge Prism/Prism R

Labnet

Operation can be timed, continuous or momentary, using the "quick" button. Vibration free operation is ensured by an isolation system. In the event of a significant imbalance, operation of the centrifuge is automatically stopped. Deceleration at the end of a run is very quick, but will not disrupt samples. Supplied with a uniquely designed 24 x 1.5ml/2.0ml rotor that allows easy access to the tops of the sample tubes. Individual tube slots in the solid aluminum rotor support tubes along their length and contain the sample in the event of tube failure. The rotor is seated on a tapered shaft which facilitates easy removal for cleaning and autoclaving.

Adapters for smaller tubes and PCR strips -please oder separately.

Specifications	**Prism/Prism R**
Max. RCF:	21.200xg/17.135xg
Speed range:	500 to 15.000rpm/500 to 13.500rpm
Max. capacity:	24 x 1.5/2.0ml
Timer:	0.5 to 99 minutes or continuous "Quick" button for momentary operation
Tempearatur range:	---/-10 to 40°C
Dimensions (WxDxH):	24 x 35 x 19cm/27.7 x 45 x 24.75cm
Weight:	9.6kg/20kg
Power supply:	230V, 50Hz or 120V, 60Hz

Description	PK	Cat. No.	
Prism ambient microcentrifuge with 24 place rotor	1	**9.945 795**	1
Prism R ambient microcentrifuge with 24 place rotor and cooling	1	**9.945 793**	2
StripSpin adapter for 0.2ml tubes and strips	1	**9.945 794**	
Individual adapter for 0.5/0.6ml tubes	6	**9.945 796**	
Individual adapter for 0.4/0.25ml tubes	6	**9.945 797**	
Individual adapter for 0.2ml thermal cycling tubes	6	**9.945 798**	

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3 Microcentrifuge 5418/5418 R

Eppendorf AG

Microcentrifuge 5418
- 18 place rotor for 1.5/2.0ml tubes
- Lid opens automatically after spinning
- Very small profile, minimal bench space required
- Remarkably silent, even without rotor lid
- Standard, certified aerosol-tight rotor
- Convenient Eppendorf two-dial operation
- rpm/rcf converter
- Short-spin

Microcentrifuge 5418 R, with additional features:
- The patented compressor technology reduces vibration to a minimum
- Temperature range: 0°C to +40°C
- Low access height of 26cm
- Keeps a constant 4°C at max. speed
- Fast Temp for rapid pre-cooling of the centrifuge

Specifications	**5418/5418 R**
Max. rcf:	16 873xg
Max. speed:	14 000rpm
Capacity:	18 x 1.5/2.0ml
Warm-up time to max. speed:	16s/11s
Slow-down from max. speed:	18s/12s
Noise level:	<51dB(A)/<56dB(A)
Supply requirements:	230V, 50/60Hz

Type	Description	Dimensions (W x D x H) mm	Weight kg	Power W	PK	Cat. No.
5418		210 x 300 x 210	7.7	170	1	**9.776 700**
5418 R	with cooling	300 x 460 x 250	22.0	320	1	**9.776 702**

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4 Rotor for microcentrifuge 5418/5418 R

Includes aerosol-tight rotor cover. 18-place rotor.

Eppendorf AG

Type	PK	Cat. No.
Rotor F-45-18-11 incl. aerosol-tight rotor lid	1	**9.776 705**

1 Microcentrifuge 5424/5424 R


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Microcentrifuge 5424 *Eppendorf AG*
- 24-place-centrifuge
- aerosol tight rotors
- 4 different rotors
- very quiet in operation, even without rotor lid
- Choice of analogue dial or membrane keypad control
- adjustable soft ramp acceleration

Microcentrifuge R 5424, additional features:
- The patented compressor technology reduces vibration to a minimum
- Temperature range: -9°C to +40°C
- Small footprint and low access height of 26cm
- Keeps a constant 4°C at max. speed
- Fast Temp for rapid pre-cooling of the centrifuge, for example, from about 21°C to 4°C in 8 mins.

Specifications	**5424/5424 R**
Max. rcf:	20238 x g/21130 x g
Max. speed:	14.680rpm/15.000rpm
Capacity:	24 x 1.5/2ml
Warm-up time to max. speed:	15 sec.
Slow-down from max. speed:	16 sec.
Noise level:	51 dB(A)/54 dB(A)
Supply requirements:	230V 50/60Hz

Type	Description	Dimensions (W x D x H) mm	Weight kg	Power W	PK	Cat. No.
5424	with control knobs, with rotor	236 x 320 x 227	13.4	250	1	**9.776 710**
5424	with foil keypad, with rotor	236 x 320 x 227	13.4	250	1	**9.776 711**
5424	with control knobs, without rotor	236 x 320 x 227	13.4	250	1	**9.776 712**
5424	with foil keypad, without rotor	236 x 320 x 227	13.4	250	1	**9.776 713**
5424 R	with control knobs, with rotor, aerosol-tight	290 x 480 x 260	21.0	350	1	**9.776 762**
5424 R	with foil keypad, with rotor, aerosol-tight	290 x 480 x 260	21.0	350	1	**9.776 760**
5424 R	with control knobs, without rotor	290 x 480 x 260	21.0	350	1	**9.776 763**
5424 R	with foil keypad, without rotor	290 x 480 x 260	21.0	350	1	**9.776 761**

Rotors for Microcentrifuge 5424/5424 R

Including Rotor lid.

FA-45-24-11
Certified aerosol-tight rotor for 24 x 1.5ml /2.0ml microcentrifuge tubes comes standard (max. 20.238xg). Perfect for standard applications and centrifugation of biohazardous or radioactive samples. Aerosol-tight rotors are easily identified by a red lid screw.
FA-45-24-11-Special
Certified aerosol-tight rotor for 24 x 1.5ml /2.0ml tubes with special PTFE-coating for improved chemical resistance (e.g., when working with phenol or chloroform) and easy cleaning (max. 20.238xg). Aerosol-tight rotors are easily identified by a red lid screw.
F-45-18-11-Kit
Innovative 18-place rotor for miniprep spin columns and 1.5/2.0 ml tubes. Designed with an extra high rim to support open tube lids during centrifugation, no more torn off lids (max. 18.111xg).
F-45-32-5-PCR
Rotor for 4 x 8-tube PCR strips or 32 x 0.2ml PCR tubes quickly knocks down liquids and properly supports thin-walled PCR tubes (max. 18.615 xg).

Type	PK	Cat. No.
FA 45-24-11*	1	**9.776 724** 2
FA 45-24-11-Special**	1	**9.776 721** 3
F 45-18-11-Kit	1	**9.776 722** 4
F 45-32-5-PCR	1	**9.776 723** 5
Adapter for 0.2ml PCR tubes in fixed angle rotor	6	**9.776 504**
Adapter for 0.4ml PCR tubes in fixed angle rotor	6	**9.776 487**
Adapter for 0.5ml PCR tubes in fixed angle rotor/B-D-Microtainer	6	**9.776 488**

* aerosol-tight
**aerosol-tight, PTFE-coated

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9.776 724

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1 Microcentrifuge 5430/5430 R

Eppendorf AG

Microcentrifuge 5430
- Choice of 8 different rotors, e.g. MTP rotor, Falcon rotor for max. versatility
- 30 place centrifuge for 1.5ml/2.0ml micro test tubes, 15ml/50ml Falcon® tubes or MTP plates
- Unique 30.130xg
- Automatic rotor recognition
- Stores up to 50 routine programs
- Menu guided operation in 4 different languages
- Automatic lid opening following application sequence (only 5430)

Microcentrifuge 5430 R, additional features:
- Temp. range: -11°C to +40°C
- +4°C at max. speed with all rotors
- Continues cooling after the centrifugation process
- Fast Temp for achieving required temperature in shortest possible time
- Fast Temp pro for having the centrifuge refrigerated and ready-for-use at your desired pre-set time

Specifications	**5430/5430 R**
Max. rcf:	30130 xg
Max. speed:	17500rpm
Capacity:	30 x 1.5/2.0ml or 6 x 50ml
Acceleration time to max. speed:	<25 sec.
Braking period from max. speed:	<25 sec.
Noise level:	<67 dB(A)/<63 dB(A)
Supply requirements:	230V, 50/60Hz

Type	Description	Dimensions (W x D x H) mm	Weight kg	Power W	PK	Cat. No.
5430	without rotor, with membrane keypad	330 x 420 x 250	29.0	475	1	**9.776 731**
5430	without rotor, with dial setting	330 x 420 x 250	29.0	475	1	**9.776 732**
5430	with rotor FA-45-30-11	330 x 420 x 250	29.0	475	1	**9.776 730**
5430	with rotor FA-45-30-11, with dial setting	330 x 420 x 250	29.0	475	1	**9.776 733**
5430 R	without rotor, with membrane keypad	380 x 640 x 300	56.0	1050	1	**9.776 734**
5430 R	without rotor, with dial setting	380 x 640 x 300	56.0	1050	1	**9.776 735**
5430 R	with rotor FA-45-30-11, with membrane keypad	380 x 640 x 300	56.0	1050	1	**9.776 736**
5430 R	with rotor FA-45-30-11, with dial setting	380 x 640 x 300	56.0	1050	1	**9.776 737**

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9.776 740

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9.776 747

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9.776 751

Rotors for microcentrifuge 5430/5430 R

Include rotor cover.

Eppendorf AG

FA-45-30-11
Standard rotor, 30 x tubes 1.5/2.0ml, max. 20817xg, speed 14000rpm

F-45-30-11
Fixed angle rotor, 30 x tubes 1.5/2.0ml, max. 20817xg, speed 14000rpm

FA-45-24-11-HS
High speed rotor, 24 x Eppendorf 1.5ml Safe-Lock tubes and 3810X tubes, max. 30130xg, speed 17500rpm

FA-45-24-11-Kit
Kit rotor 24 x spin columns, nucleic acid cleaning kits, tubes up to 2.0ml, max. 19090xg, speed 13200rpm

F-45-64-5-PCR
PCR strip rotor, 8 x 5/8 PCR strips or 64 x 0.2ml PCR tubes, max. 13543xg, speed 11800rpm

F-45-18-17-Cryo
CryoTube® rotor, 18 x CryoTubes® 1.0/2.0ml, max. 8320xg, speed 8900rpm

F-35-6-30
Falcon® rotor, 6 x 50ml or 6 x 15ml Falcon® tubes, max. 7197xg, speed 7830rpm

A-2-MTP
MTP rotor for PCR plates, CombiSlide adapter, max. loading height 29mm, max. 2204xg, speed 4680rpm

Type	PK	Cat. No.
F-45-30-11*	1	**9.776 740** 2
FA-45-24-11-HS**	1	**9.776 742** 3
FA-45-24-11-Kit**	1	**9.776 743**
F-45-18-17-Cryo, incl. Adapter	1	**9.776 744** 4
F-45-64-5-PCR, incl. Adapter	1	**9.776 745** 5
F-35-6-30, incl. Adapter	1	**9.776 747** 6
A-2-MTP***	1	**9.776 751** 7

* PTFE-coated
**aerosol-tight, PTFE-coated
***incl. 2 MPT-supports

1 Microcentrifuge 5430/5430 R rotor accessories



Eppendorf AG

Description	PK	Cat. No.
Adapter for F-45-64-5-PCR	4	**9.776 746**
Adapter for 1 x 15ml Falcon-type tubes	10	**9.776 750**
MPT spare supports	2	**9.776 752**

2 3 Zentrifuge Centrifuge 5427 R

NEW!



Eppendorf AG

Performance never felt better

If there is a demand for high sample throughput, many centrifuges call it a day in regards to capacity. This does not apply to the Centrifuge 5427 R. With a new double-row 48-place rotor it lives up to the increased efficiency requirements with fast running times in a safe and reliable manner. This is supported by an intuitive human interface and design concept which makes for a compelling user comfort. For these reasons, the Centrifuge 5427 R becomes the ideal solution for high-end research applications.
In addition, this microcentrifuge satisfies with an innovative compressor technology which-by taking ecological aspects into account-tempers sensible samples precisely to guarantee a proper preparation of your analysis.

Features and benefits
- New 48-place rotor reduces time expenditure of daily routine works significantly
- Short-Spin function allows for quick short centrifugation with pre-selectable rotation speed
- Eppendorf QuickLock®-system for quick rotor lid opening and closing
- Very quiet operation due to further improved sound insulation
- FastTemp™ for rapid pre-cooling of the centrifuge, e. g. from 23°C to 4°C in in aprox. 11 minutes
- Continuous cooling keeps the temperature after the run constant-Your samples stay safe
- Alternatively to continuous cooling: ECO-shut off of the compressor (adjustable after 1, 2, 4 or 8 hours of non-use) for a lower energy consumption

Specifications:

Max. rcf:	25.000 × g
Max. rpm:	16.220 rpm
Acceleration time to max. speed:	18 s (with Rotor FA-45-24-11)
Braking time from max. speed:	18 s (with Rotor FA-45-24-11)
Temperature settings:	-11°C to 40°C
Time settings:	10 s bis 9:59 h
Max. noise level:	< 54 dB(A)
Dimensions (W × D × H):	319 × 540 × 254mm
Weight without rotor:	30 kg
Power requirement:	550 W
Max. capacity:	48 × 1.5/2.0 mL



Type	Description	PK	Cat. No.
Centrifuge 5427 R	230V/50-60Hz, with rotary knobs	1	**9.776 764**
Centrifuge 5427 R	with rotor FA-45-48-11	1	**9.776 765**
Centrifuge 5427 R	with rotor FA-45-30-11	1	**9.776 766**

Accessories for Centrifuge 5427 R

NEW!

Eppendorf AG

Type	Description	PK	Cat. No.
Rotor FA-45-24-11	incl. rotor lid, aerosol tight*	1	**9.776 785**
Rotor FA-45-30-11	incl. rotor lid, aerosol tight*	1	**9.776 786**
Rotor FA-45-48-11	incl. rotor lid, aerosol tight*	1	**9.776 787**
Rotor FA-45-24-11-Kit	incl. rotor lid, aerosol tight*	1	**9.776 788**
Rotor F-45-30-11	incl. rotor lid	1	**9.776 789**
Rotor F-45-48-11	incl. rotor lid	1	**9.776 790**
Fixed angle rotor F-45-48-5-PCR		1	**9.776 791**
Swing out rotor S-24-11-AT	incl. air vessel and rotor lid, aerosol tight*	1	**9.776 792**
Adapter for fixed angle rotor	0.2mL PCR tubes	6	**9.776 504**
Adapter for fixed angle rotor	0.4mL tubes	6	**9.776 487**
Adapter for in fixed angle rotor	0.5mL tubes and 0.6mL Microtainer®	6	**9.776 488**

* certified aerosol tight

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9.943 110

Benchtop centrifuges EBA 20/EBA 20 S

Hettich

The practical and handy EBA 20 and EBA 20S are supplied with an 8-place angle rotor. Designed for small sample throughput, they are ideal for use in doctors' surgeries or in large laboratories as auxiliary equipment. With microprocessor control, impulse key for short centrifuging, one-hand lid locking and lid holding. Easy entry of the parameters time and speed (rpm) via foil keypad. Actual values are displayed during centrifugation. Various tubes (incl. glass tubes) can be centrifuged without an adapter. Adapters for additional blood collection tubes are available on request. Model EBA 20 S is supplied with adapters for 13 x 75mm Vacutainers (1.6ml to 5ml).

Specifications

Max. rcf:	
EBA 20:	3461xg
EBA 20 S:	6153xg
Max. speed:	
EBA 20:	6000rpm
EBA 20 S:	8000rpm
Max. capacity:	8 x 15ml

Type	Description	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
EBA 20	with angle rotor	231 x 292 x 216	approx. 4	1	**9.943 110** 1
EBA 20 S	with angle rotor	231 x 292 x 216	approx. 6	1	**9.943 463** 2

Accessories available on request.

2



9.943 463

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6.242 287

Benchtop centrifuge EBA 270

NEW!

Hettich

The EBA 270 is a small centrifuge with a swing-out rotor. It accepts common blood or urine tubes up to a volume of 15 ml and accelerates them to a maximum speed of 4.000 min^{-1}.

Specifications

Max. rcf:	2254xg
Max. speed:	4000rpm
Max. capacity:	6 x 15ml

Type	Description	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
EBA 270	Benchtop centrifuge	326 x 389 x 239	13	1	**6.242 287** 3

Accessories available on request.

4



4 Benchtop centrifuge ROTOFIX 32 A

Hettich

Microprocessor-controlled benchtop centrifuge with a comprehensive and versatile range of accessories. 11 exchangeable rotors enable a multitude of applications. With frequency drive, impulse key for short period centrifuging, lid locking and holding. An "rcf" key allows display of the rcf during operation, while the key is pressed. Easy entry of rpm (speed) and time via foil keypad. Actual values are displayed during centrifugation.

Specifications

Max. rcf:	4226xg
Max. speed:	6000rpm
Max. capacity:	4 x 100ml/32 x 15ml

Type	Description	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
ROTOFIX 32 A	without rotor	366 x 430 x 257	approx. 23	1	**9.943 119**

Accessories available on request.

E & OE.

Microlitre centrifuges MIKRO 200/200 R

Hettich

Refrigerated and non-refrigerated, high-performance microlitre centrifuges. Five exchangeable rotors are available. With frequency drive, microprocessor control with 4 programmable memories, impulse key for short centrifuging, powered lid locking and "open lid" key. Easy entry of the parameters via select keys and a twist knob. A switch key enables entry/display of rpm (speed) or rcf, as required. Actual values are displayed during centrifugation. The refrigerated MIKRO 200 R allows chamber temperature control between -10 to +40°C. With the Fast Cool function it refrigerates to +4°C in 10 to 15 minutes. The "stand-by" mode maintains the set temperature between runs.

Specifications

Max. rcf: 21382xg
Max. speed: 15000rpm
Max. capacity: 30 x 0.2 to 2ml

Type	Description	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
MIKRO 200	without rotor	275 x 344 x 260	approx. 11.5	1	**9.943 117** 1
MIKRO 200 R	refrigerated, without rotor	281 x 547 x 260	approx. 28	1	**9.943 118** 2

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9.943 117

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9.943 118

3 Accessories for microlitre centrifuges MIKRO 200/200 R

Hettich

Type	Description	PK	Cat. No.
2427-A	Angle rotor for 30 x 0.2 to 2ml microtubes with standard lid	1	**9.943 464**

Additional accessories on request.

3



Microlitre centrifuges MIKRO 220/220 R

Hettich

Microlitre centrifuges with outstanding performance characteristics. Model MIKRO 220 accommodates 9 alternative rotors, the refrigerated version MIKRO 220 R takes 13 alternative rotors. The MIKRO 220/220 R feature frequency drive, microprocessor control and impulse key for short period centrifuging. Extremely short acceleration and deceleration times, easy entry of the parameters via a foil keypad and digital display. As necessary, a switch key enables entry/display of rpm (speed) or rcf. 10 complete running programmes can be stored and recalled. The refrigerated MIKRO 220 R can control chamber temperature between -20 and +40°C.

Specifications

Max. rcf: 31514xg
Max. speed: 18000rpm
Max. capacity: 60 x 0.2 to 2ml
or 6 x 50ml

Type	Description	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
MIKRO 220	without rotor	330 x 420 x 313	approx. 21	1	**9.943 250** 4
MIKRO 220 R	refrigerated, without rotor	330 x 650 x 313	approx. 42	1	**9.943 251** 5

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9.943 250

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9.943 251

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1 Accessories for microlitre centrifuges MIKRO 220/220 R

Hettich

Type	Description	PK	Cat. No.
1195-A	Angle rotor for 24 x 0.2 to 2ml microtubes with bio-containment lid	1	**9.943 327**
1158-L	Angle rotor, 2-row for 48 x 0.2 to 2ml microtubes with bio-containment lid	1	**9.943 329**

Additional accessories on request.

2



2 Benchtop centrifuges UNIVERSAL 320/320 R

Hettich

The UNIVERSAL 320/320 R impress with excellent performance in both the high and low speed ranges, and versatile, easily exchangeable accessories. At low speeds, they process standard tubes up to a volume of 100ml, microtitre plates, conical tubes with screw cap, blood collection tubes and cyto accessories. Microlitre tubes can be accelerated to an rcf of 21382. A selection of 19 rotors is available for the UNIVERSAL 320/320 R centrifuges. With frequency drive, microprocessor control, impulse key for short centrifuging, quick-entry foil keypad and digital display. As necessary, a switch key enables entry/display of rpm (speed) or rcf. Ten complete running programmes can be stored and recalled. Temperature in the refrigerated UNIVERSAL 320 R is adjustable within a range of -20 to +40°C.

Specifications

Max. rcf:	21382xg
Max. speed:	15000rpm
Max. capacity:	4 x 100ml/32 x 15ml

Type	Description	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
UNIVERSAL 320	without rotor	395 x 520 x 346	approx. 31	1	**9.943 120**
UNIVERSAL 320 R	without rotor, with refrigeration	401 x 695 x 346	approx. 53	1	**9.943 121**

Accessories available on request.

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9.943 129

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9.943 130

Benchtop centrifuges ROTINA 380/380 R

Hettich

High-performance, benchtop centrifuges with a comprehensive range of accessories especially for applications in the fields of diagnostics, genetics and microbiology. Both models offer a choice of 11 rotors. With frequency drive, microprocessor control, impulse key for short centrifuging and powered lid locking. The advanced C control panel significantly facilitates daily laboratory routine. Parameter selection is done via the use of symbol keys. Values are set with the control knob, and recorded by pressing the Start key. Digital display. As necessary, a switch key enables entry/display of rpm (speed) or rcf. With 98 programmable memories. Temperature within the chamber of the refrigerated ROTINA 380 R is controllable within a range of -20 to +40°C. The temperature can also be set in degrees Fahrenheit.

Specifications:

Max. rcf:	24400xg
Max. speed:	15000rpm
Max. capacity:	4 x 290ml

Type	Description	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
ROTINA 380	without rotor	457 x 600 x 418	approx. 51	1	**9.943 129** 3
ROTINA 380 R	without rotor, with refrigeration	457 x 750 x 418	approx. 81	1	**9.943 130** 4

Accessories available on request.

E & OE.

Benchtop centrifuges ROTINA 420/420 R

Hettich

The compact benchtop centrifuges are designed both for high sample throughput and high sample volumes. With a max. capacity of 4 x 600ml, 140 blood collection tubes or 16 microtitre plates they are ideal for applications in clinical chemistry, in biotechnology and in life science research facilities. With frequency drive, microprocessor control and impulse key for short centrifuging and motorised lid locking. The advanced C control panel is ideal for daily routine tasks in the laboratory. Parameter selection is achieved via the use of symbol keys. Values are set with the control knob, and recorded by pressing the Start key. Digital display. 98 programmable memories. Temperature in the refrigerated ROTINA 420 R is adjustable within a range of -20 to +40°C. The temperature can also be set in degrees Fahrenheit.

Specifications

Max. rcf: 24400xg
Max. speed: 15000rpm
Max. capacity: 4 x 600ml

Type	Description	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.	
ROTINA 420	without rotor	506 x 650 x 423	approx. 75	1	**9.943 125**	1
ROTINA 420 R	without rotor, with refrigeration	713 x 654 x 423	approx. 108	1	**9.943 126**	2

Accessories available on request.

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9.943 125

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9.943 126

3 4 Centrifuges ROTANTA 460 series

Hettich

For sample processing in clinical chemistry, biotechnology, molecular biology and the pharmaceutical industry a wide selection of adapters is available to accommodate the most varied types of tubes. Developed for large volumes, the model offers frequency drive, microprocessor control, impulse key for short centrifuging, and powered lid locking. As necessary, a switch key enables entry/display of RPM (speed) or RCF. All ROTANTA 460 models feature the extended C control panel, which provides up to 98 programmable memories. Temperature in the refrigerated ROTANTA 460 R is controllable within a range of -20°C to +40°C. The temperature can also be set in degrees Fahrenheit. The refrigerated ROTANTA 460 R can also be supplied in an underbench version or as a floorstanding model.

Without rotors. Please order separately.

Specifications

Max. rcf: 24400xg
Max. speed range: 15000rpm
Max. capacity: 4 x 750ml
Running time: 1sec - 99h : 59min : 59sec, ∞ continuous run, short cycle mode

3



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Type	Description	Dimensions (W x D x H) mm	Weight kg	Voltage 50/60 Hz	PK	Cat. No.
ROTANTA 460	Benchtop centrifuge, classic	554 x 706 x 456	approx. 101	200-240 V	1	**9.943 150**
ROTANTA 460	Benchtop centrifuge, classic	554 x 715 x 456	approx. 111	100-127 V	1	**9.943 151**
ROTANTA 460 R	Benchtop centrifuge, cooled	770 x 706 x 456	approx. 141	200-240 V	1	**9.943 152**
ROTANTA 460 R	Benchtop centrifuge, cooled	770 x 715 x 456	approx. 151	100-127 V	1	**9.943 153**
ROTANTA 460 RC	Underbench centrifuge, cooled	554 x 697 x 683	approx. 140	200-240 V	1	**9.943 154**
ROTANTA 460 RF	Floorstanding centrifuge, cooled	554 x 697 x 961	approx. 164	200-240 V	1	**9.943 155**

Accessories available on request.

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2



1 2 Refrigerated microlitre centrifuge Z 216 MK

Hermle

The Z 216 MK refrigerated microcentrifuge sets a new standard in this centrifuge class. Capable of centrifuging up to 44 x 1.5/2.0ml, it features a versatile control panel allowing for storage of up to 99 runs. The powerful refrigeration system keeps samples at temperatures as low as 4°C during a continious run at 20000xg.

Specifications:
- Maintenance-free induction drive
- Microprocessor with large LCD Display
- Motor driven lid lock
- Active imbalance-identification and -cut off
- Standstill cooling
- Audible signal at the end of each run
- Rapid acceleration and deceleration (see rotor data)
- Lowest sample temperature 4°C at 20000xg
- Noise level < 56 dBA at 20000xg
- Extremely compact with a space saving footprint
- Quick access to samples with a snap on lid
- Aerosol tight rotor option
- Manufactured according to international safety regulations, i.e. IEC 61010
- Distinct control panel

Technical data

Max. RCF:	21380xg
Max. speed:	15000rpm
Max. Volume:	44 x 1.5/2.0ml
Speed range:	200 to 15000rpm
Running time:	59 min 50 sec/10 sec increments 99 h 59 min/1 min increments

Description	Dimensions (W x D x H) mm	Weight kg	Rating W	PK	Cat. No.
Refrigerated microlitre centrifuge Z 216 MK	280 x 550 x 290	35	500	1	**6.231 520**
Refrigerated microlitre centrifuge Z 216 MK incl. angle rotor	280 x 550 x 290	35	500	1	**6.230 074**

3



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3 4 Accessories for refrigerated Microlitre centrifuge Z 216 MK

Hermle

Description	PK	Cat. No.
Angle rotor 24 x 1.5/2.0ml	1	**9.945 715**
Angle rotor 24 x 1.5/2.0ml, hermetically sealed	1	**9.945 716**
Angle rotor 30 x 1.5/2.0ml, hermetically sealed	1	**9.945 717**
Adapter sets for 0.2 and 0.4ml reaction vessels	6	**6.225 371**
Adapter sets for 0.5ml reaction vessels	6	**6.225 372**
Angle rotor for 4 x 8 PCR Stripes	1	**9.945 718**

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

HERMLE LABORTECHNIK

E & OE.

1 2 Refrigerated high speed centrifuge Z 32 HK

Hermle

With a wide range of accessories, the Z 32 HK high speed centrifuge is applicable in a wide variety of research settings. In spite of the remarkably small footprint, the Z 32 HK features a powerful refrigeration system capable of maintaining cool sample temperatures even at maximum speed.

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Specifications:
- Maintenance-free induction drive
- Microprocessor with large LCD display
- Motor driven lid lock
- Automatic rotor identifi cation system with over speed protection immediately upon rotor installation
- Active imbalance identification and cut off rotor specific
- Imbalance tolerant drive
- CFC-free refrigeration system
- A large variety of rotors and accessories
- Manufactured according to international safety regulations, i.e. IEC 61010
- Audible signal at the end of each run with several melody options
- Quick and easy rotor exchange
- Noise level under 60dBA at max. speed
- Distinct control panel

Technical data

Max. RCF:	38012 xg
Max. speed:	20000rpm
Max. Volume:	4 x 100ml
Speed range:	200 to 20000rpm
Running time:	59 min 50 sec./10 sec. increments 99 h 59 min/1 min increments

Description	Dimensions (W x D x H) mm	Weight kg	Rating W	PK	Cat. No.
Refrigerated High Speed Centrifuge Z 32 HK	400 x 700 x 360	71	1200	1	**6.240 037**

Accessories for refrigerated High Speed Centrifuge Z 32 HK

Hermle

Description	PK	Cat. No.
Angle rotor for max. 6 x 85ml	1	**9.945 915**
Angle rotor for max. 20 x 10ml	1	**9.945 916**

For further accessories see Z 326/Z326K.

3 Compact centrifuge Z 206 A

Hermle

Compact centrifuge for physicians and clinical laboratories.

3



The Z 206 A accepts up to 12 x 15ml conical and round bottom tubes. For tubes with smaller dimensions we offer several adapters. For larger volumes we offer an angle rotor for 6 x 50ml conical and round bottom tubes.

Specifications:
- Microprocessor with LCD display
- Electrical lid lock
- Pre-selection of the rotor type
- Active imbalance-identification and -cut off
- Manufactured according to international safety regulations, i.e. IEC 61010
- Noise level under 60dBA at max. speed
- A large variety of rotors and accessoires
- Easy change of rotors
- Distinct control panel

Technical Data

Max. RCF:	4180xg
Max. speed:	6000rpm
Max. volume:	12 x 15ml/6 x 50ml
Dimensions (W x H x D):	28 x 26 x 37cm
Weight:	13/15kg

Description	Dimensions (W x D x H) mm	Weight kg	Rating W	PK	Cat. No.
Compact centrifuge Z 206 A	280 x 370 x 260	13	100	1	**9.945 737**
Compact centrifuge Z 206 A incl. angle rotor 12x15ml	280 x 370 x 260	15	100	1	**9.945 738**

Accessories for compact centrifuge Z 206 A

Hermle

Description	PK	Cat. No.	
Angle rotor 12 x 15ml	1	**9.945 728**	1
Angle rotor 6 x 50ml	1	**9.945 729**	2
Angle rotor 18 x 1.5/2.0ml	1	**9.945 739**	3
Swing out rotor 6 x 5ml	1	**9.945 740**	4

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9.945 728

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9.945 729

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9.945 739

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9.945 740

Universal centrifuges Z 326/Z 326 K

Universal laboratory centrifuge for medical laboratory, from the large volume (4 x 100ml) to reaction vessels.

Hermle

Both the table top centrifuge Z 326 and the refrigerated table top centrifuge Z 326 K offer a wide assortment of rotor options, making them ideal for a wide variety of research applications. Rotor exchange between swing out, micro, or high volume angled rotors is very simple and can take place in a matter of seconds. The Z 326 K includes the refrigeration system on the back side of the unit, optimised for the lab bench at only 40cm wide.

Specifications:
- Maintenance-free induction drive
- Microprocessor with large LCD display
- Motor driven lid lock
- Automatic rotor identification system with over speed protection, immediately upon rotor insertion
- Active imbalance-identification and -cut off (rotor specific)
- Imbalance tolerant drive
- CFC free refrigeration system (Z 326 K)
- A large variety of rotors and accessories
- Manufactured according to international safety regulations, i.e. IEC 61010
- Audible signal at the end of each run with several melody options
- Rotor exchange is easy to handle
- Noise level under 60dBA at max. speed
- Optimized airfl ow system keeps the samples cool (Z 326)
- Distinct control panel

Technical data

Max. RCF:	23545xg
Max. speed:	18000rpm
Max. volume:	4 x 100ml
Speed range:	200 to 18000rpm
Running time:	59 min 50 sec/10 sec increments
	99 h 59 min/1 min increments

Description	Dimensions (W x D x H) mm	Weight kg	Rating W	PK	Cat. No.	
Universal centrifuges Z 326	400 x 480 x 360	43	230	1	**6.241 114**	5
Universal centrifuges Z 326 K	400 x 700 x 360	60	230	1	**6.238 613**	6

5



6.241 114

6



6.238 613

Accessories for Universal Centrifuges Z 326/Z 326 K

Hermle

Description	PK	Cat. No.	
Swing out Rotor, 4 place	1	**6.238 614**	1
Bucket 1 x 100ml	2	**9.945 750**	
Bucket 1 x 50ml Falcon	2	**9.945 752**	
Bucket 2 x 15ml Falcon	2	**9.945 753**	
Bucket 10 x 1.5ml	2	**9.945 771**	
Swing out Rotor, 4 place	1	**6.241 887**	2
Bucket 2 x 50ml Falcon	2	**9.945 772**	
Bucket 3 x 15ml Falcon	2	**9.945 773**	
Bucket hermetic for tube racks	2	**6.241 888**	
Tube racks 1 x 100ml	2	**6.240 595**	
Tube racks 1 x 50ml Falcon	2	**6.902 309**	
Tube racks 2 x 15ml Falcon	2	**6.902 310**	
Tube racks 7 x 5 to 7ml	2	**9.945 903**	
Tube racks 5 x 1.5ml	2	**6.902 308**	
Swing out rotor 2 x 3 Microtiterplates	1	**9.945 910**	3
Angle rotor for max. 12 x 15ml	1	**9.945 912**	
Angle rotor for max. 6 x 50ml	1	**9.945 913**	
Angle rotor for max. 6 x 85ml	1	**6.240 038**	
Angle rotor for max. 24 x 1.5/2.0ml	1	**6.238 615**	4
Angle rotor for 4 x 8 PCR Stripes	1	**9.945 919**	

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6.238 614

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6.241 887

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9.945 910

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6.238 615

5 Centrifuge tubes, round bottom, DURAN®

To DIN 58970 part 2. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable. Maximum loading: 4000xg rcf.

DURAN Group

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
6	12	100	1	**9.315 010**
12	16	100	1	**9.315 011**
25	24	100	1	**9.315 014**
50	34	100	1	**9.315 017**
80*	40	115	1	**9.315 024**
80	44	100	1	**9.315 026**
250*	56	147	1	**9.315 036**

* Not to DIN.

5



6 Centrifuge tubes, conical, DURAN®

Rimless, with conical base. Maximum loading: 4000xg rcf.

DURAN Group

Capacity ml	Diam. mm	Height mm	Angle	PK	Cat. No.
12	16	100	30	1	**9.315 509**
25	24	100	60	1	**9.315 514**
50	34	100	60	1	**9.315 517**

6



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6.803 323

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7.920 120

3



6.803 325

High speed centrifuge tube, borosilicate glass

NEW!

Borosilicate glass. The tubes have been chemically strengthened to achieve a greater mechanical strength than standard borosilicate centrifuge tubes. These tubes can be centrifuged up to 13.100 RCF when used with an accessory rubber adapter sleeve in a 50ml rotor cavity. They can withstand temperatures up to 300ºC. Autoclavable.

Type	Capacity ml	Diam. mm	Length mm	PK	Cat. No.
without rim	15	18	102	6	**6.803 323** 1
without rim	30	24	106	6	**6.093 022**
screw thread	15	18	102	6	**7.920 120** 2
screw thread	30	24	106	6	**6.234 247**
Rubber adapter, 15ml				2	**6.803 324**
Rubber adapter, 30ml				2	**6.803 325** 3

4

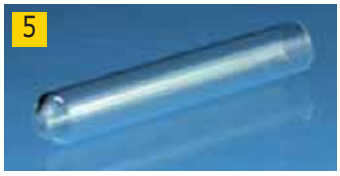


4 Centrifuge tubes, glass, round bottom, graduated, DURAN®

In white enamel, rimless. Maximum loading: 3500xg rcf.

Capacity ml	Diam. mm	Length mm	PK	Cat. No.
10 to 15	17	98	1	**9.315 237**
10 to 15	17	107	1	**9.315 240**
25	25	100	1	**9.315 245**

5



6



5 6 Centrifuge tubes, round bottom, AR glass®

Round bottom. Graduated or ungraduated. Maximum loading: 3500xg rcf.

Capacity ml	Diam. mm	Length mm	Grad. ml	PK	Cat. No.
10 to 15	17	98	no	1	**9.315 201**
10 to 15	17	107	no	1	**9.315 203**
50 to 55	35	98	no	1	**9.315 207**
70 to 100	40	115	no	1	**9.315 210**
10 to 15	17	98	yes	1	**9.315 217**
10 to 15	17	107	yes	1	**9.315 220**
25	25	100	yes	1	**9.315 225**

7



7 Centrifuge tubes, AR glass®, ungraduated

Capacity approx. 15ml. Wall thickness approx. 1mm.
Maximum loading: 3500xg rcf.

BRAND

Base	Neck	Capacity ml	Diam. mm	Length mm	PK	Cat. No.
conical, long taper	beaded rim	15	17	113	100	**9.315 412**
conical, short taper	rimless	11	17	98	1	**9.315 420**
round bottom	rimless	13	17	98	100	**9.315 421**

8



8 Centrifuge tubes, AR glass®, conical bottom, graduated

Graduated, with rim and conical bottom. Capacity approx. 15ml. Graduation of approx. volume and labelling in high-contrast white enamel. Graduated from 0 to 15ml x 0.1ml divisions. Wall thickness, approx. 1mm. For use with loads up to 3500xg rcf.

BRAND

Diam. mm	Height mm	PK	Cat. No.
17	113	1	**9.315 416**

E & OE.

1 ASTM centrifuge tube, cylindrical, with conical base, borosilicate glass 3.3

BLAUBRAND®. Cylindrical, with conical base. Complies with ASTM D 91. Capacity 100ml. Graduations and labelling in high-contrast blue enamel. Maximum loading 700 xg rcf. Supplied singly. *BRAND*

Graduated, ml:	In subdivisions, ml:
0 to 0.5	0.05
0.5 to 2	0.10
2 to 3	0.20
3 to 5	0.50
5 to 10	1.00
10 to 25	5.00
25 to 100	25.0

Capacity ml	PK	Cat. No.
100	1	**9.315 810**



2 ASTM centrifuge tube, pear-shaped with cylindricaal base, borosilicate glass 3.3

BLAUBRAND®. Pear-shaped with cylindrical base. Former standard ASTM D 96. Capacity 100ml. Graduations and labelling in high-contrast blue enamel. Maximum loading 700xg rcf. Supplied singly. *BRAND*

Graduated, ml:	In subdivisions, ml:
0 to 1.5	0.10
1.5 to 3	0.50
3 to 5	0.50
5 to 10	1.00
10 to 25	5.00
25 to 100	25.0

Capacity ml	PK	Cat. No.
100	1	**9.315 815**



We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

BRAND



1 LLG-Centrifuge tubes, PP

Polypropylene tubes with very good thermal, mechanical and chemical stability. Fitted with screw-on closure. Packed in boxes or bags. With graduations and labelling area. Cytotoxicity-free, DNase/RNase- and human DNA-free.

Centrifugation capacitiy (RCF): 6000 x g

Diam. mm	Height mm	Capacity ml	Form	Description	PK	Cat. No.
17.0	120	15	conical	sterile, single packed	50	**9.316 062**
17.0	120	15	conical	non-sterile, 8x50 in rack	400	**4.008 507**
17.0	120	15	conical	non-sterile	500	**9.316 063**
30.0	120	50	conical	sterile, single packed	50	**9.316 064**
30.0	120	50	conical	non-sterile	500	**9.316 065**
30.0	120	50	conical	non-sterile, in rack	50	**9.316 066**
30.0	120	50	with rim	sterile, single packed	50	**9.316 067**
30.0	120	50	with rim	sterile	50	**6.238 728**
30.0	120	50	with rim	non-sterile	50	**4.008 506**
30.0	120	50	with rim	non-sterile,4x50 in rack	200	**4.008 508**



2 Centrifuge tubes, PP

Polypropylene tubes with very good thermal, mechanical and chemical stability. Fitted with screw-on closure. Packed in boxes or bags. With graduations and labelling area. Tubes are sterile, cytotoxicity-free, DNase/RNase- and human DNA-free.

Specifications:

Centrifugation capacitiy (15 - 50 ml): 3215 x g/4500 rpm in swing out rotors
8965 x g/9000 rpm in fixed angle rotors

Diam. mm	Height mm	Capacity ml	Form	PK	Cat. No.
17.0	120	15	conical	50	**9.380 423**
17.0	120	15	conical	500	**7.380 423**
17.0	120	15	conical	1000	**7.053 718**
30.0	115	50	conical	20	**9.380 421**
30.0	115	50	conical	500	**7.380 421**
30.0	115	50	conical	300	**6.049 748**
30.0	115	50	conical, with rim	25	**9.380 422**
30.0	115	50	conical, with rim	450	**7.380 422**
30.0	115	50	conical, with rim	300	**6.054 664**





3 4 Centrifuge tubes, conical tubes, PP/PE-HD

New and improved conical tubes with the largest writing area on the market for increased traceability with additional space for labeling information. Recyclable plastic rack reduces waste in the lab. New conical tubes have higher RCF ratings, which enable more applications from low speed to super speed centrifugation. They meet USP class VI requirements and are non-cytotoxic, non-pyrogenic and RNase/DNase free. Graduated, leak proof and sterile (SAL 10^{-6})

Thermo Scientific

Material tubes: PP
Material caps: PE-HD

Specifications:

Centrifugation capacitiy (15 - 50 ml): 3500 x g in swing out rotors
3500 x g in fixed angle rotors

Capacity ml	Description	Max. rcf	PK	Cat. No.
15	Bulk	10500 x g*	500	**9.401 430**
15	Racked	10500 x g*	500	**9.401 431**
50	Bulk	17000 x g*	500	**9.401 432**
50	Racked	17000 x g*	300	**9.401 433**

* When fully supported by conical rotor cavity or conical adaptor. Note the maximum speeds listed are guidelines only. These speeds have been achieved in reliability tests based on sedimentation of 1.2 specific gravity fluid at 18°C.



5 Centrifuge tubes, conical, PP

PP. High chemical resistance. Autoclavable. Can withstand temperatures up to +120°C. Cannot be used with naked flame.

Kartell

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
10	16	108	500	**9.315 832**
15	18	120	500	**9.315 833**

E & OE.

1 Graduated centrifuge tubes, PP, conical

PP. Autoclavable. Can withstand temperatures up to +120°C. Rimmed. High chemical resistance. Good transparency, especially when in contact with liquids. Cannot be used with naked flame. Can be used as conventional test tubes. *Kartell*

Capacity ml	Grad. ml	Diam. mm	Height mm	PK	Cat. No.
10	0.10	16	107	100	**6.233 811**
15	0.20	18	118	100	**9.315 834**



2 Graduated centrifuge tubes, PMP (TPX®), conical

PMP (TPX®). Autoclavable. Can withstand temperatures up to +170°C. Rimmed. High chemical resistance. Crystal clear. Cannot be used with naked flame. Can be used as conventional test tubes. *Kartell*

Capacity ml	Grad. ml	Diam. mm	Height mm	PK	Cat. No.
10	0.10	16	107	50	**6.075 746**
15	0.20	18	118	50	**6.231 946**



3 Centrifuge tubes, cylindrical, PP

Translucent. PP. Autoclavable. Can withstand temperatures up to +120°C. Rimmed. High chemical resistance. Cannot be used with naked flame. Can also be used as conventional test tubes. *Kartell*

Capacity ml	Diam. mm	Height mm	PK	Cat. No.
7	12	100.0	100	**9.315 830**
16	17	101.0	500	**6.204 878**
31	24	93.0	50	**6.205 839**
48	30	104.0	25	**6.205 674**
70	35	99.5	20	**9.315 831**
110	40	119.0	25	**6.205 169**



4 Test tubes and centrifuge tubes, PS

Round or conical bottom.

Capacity ml	Length mm	Diam. mm	Description	PK	Cat. No.
2.0	40	10.5	round bottom	3000	**9.400 505**
3.5	63	11.0	round bottom	3000	**9.400 520**
4.0	70	11.0	round bottom	2880	**9.400 530**
4.0	55	12.0	round bottom	3600	**6.510 405**
5.0	75	12.0	round bottom	2000	**9.400 532**
10.0	100	14.0	round bottom	1400	**9.400 562**
12.0	100	16.0	round bottom	1600	**9.400 564**
14.0	100	17.0	round bottom	1500	**9.400 565**
20.0	152	16.0	round bottom	1500	**9.400 590**
4.5	75	12.0	conical bottom	3600	**9.400 901**
13.0	103	16.5	conical bottom	1500	**9.400 908**



5 Test tubes and centrifuge tubes, PP

Round bottom. *Greiner Bio-One*

Capacity ml	Length mm	Diam. mm	PK	Cat. No.
4.0	55	12.0	3600	**9.400 615**
5.0	75	12.0	2000	**9.400 632**
12.0	100	16.0	1600	**9.400 664**
14.0	100	17.0	1500	**9.400 665**





1 Centrifuge tubes, plastic, round bottom, PC, graduated

Transparent. PC. Rimless, with moulded graduations. *BRAND*
Slightly yellowish in colour. Round bottom. For use with loads up to 20000xg rcf.

Note: the strength of Polycarbonate is reduced when it is autoclaved or cleaned using alkaline detergents.

Capacity ml	Grad. ml	Diam. mm	Height mm	PK	Cat. No.
50	1	35	99	1	**9.315 329**
100		41	115	1	**9.315 339**
100	2	45	98	1	**9.315 340**



2 Centrifuge tubes Oak Ridge Typ 3114, FEP

Teflon® FEP with Tefzel® ETFE screw cap. Resistant to all acids, bases and solvents. *Thermo Scientific*
Autoclavable. Operating temperature range -100 to +150°C. Can be used brim-full in refrigerated centrifuges at up to 50000xg rcf. Leak-proof. Accessory sealing cap assemblies are available for all sizes.

Type	Capacity ml	Diam. mm	Height mm	PK	Cat. No.
3114	10	16.0	81.5	1	**9.315 701**
3114	30	25.5	93.7	1	**9.315 702**
3114	50*	28.5	107.7	1	**9.315 703**

* Capacity: 46ml to the brim.
Teflon® and Tefzel® are a registered trademark of DuPont.



3 Centrifuge tubes Oak Ridge Typ 3115, PSU

Transparent. Polysulphone (PSU) with PP screw cap. As stable and robust as PC test-tubes, but considerably more resistant to acids and alkalis. Autoclavable. Can be used in refrigerated or ambient centrifuges at up to 50000xg rcf. Accessory sealing cap assemblies are available for all sizes. Notes: If autoclaving, the tubes must be filled to 80% of their total capacity. Polysulphone must not be used with Tween, as this causes hairline cracks to form. *Thermo Scientific*

Type	Capacity ml	Diam. mm	Height mm	PK	Cat. No.
3115	30	25.7	94.5	1	**9.315 708**
3115	50*	29.0	107.7	1	**9.315 709**

* Capacity: 43ml to the brim.



4 Centrifuge tubes Oak Ridge Typ 3118, PC

Transparent. PC with PP screw cap. Can be used in suitable refrigerated or ambient centrifuges at up to 50000xg rcf. Autoclavable. Accessory sealing cap assemblies are available for 10ml, 30ml and 50ml sizes. *Thermo Scientific*

Type	Capacity ml	Diam. mm	Height mm	PK	Cat. No.
3118	10	16.1	81.7	1	**9.315 691**
3118	28	25.4	101.8	1	**9.315 692**
3118	30	25.7	94.5	1	**9.315 693**
3118	50*	28.8	107.0	1	**9.315 694**
3118	85**	38.2	105.7	1	**9.315 695**

* Capacity: 43ml to the brim.
**Capacity: 81ml to the brim.

1 Centrifuge tubes Oak Ridge Typ 3119, PP-copolymer

PP-copolymer with PP screw cap. PPCO is more resistant to chemicals than PC. *Thermo Scientific*
Autoclavable. When wet, the translucent test-tube enables observation of the contents.
Can be used in refrigerated and unrefrigerated centrifuges at up to 50000xg rcf. Accessory sealing cap assemblies are available for all sizes.

Type	Capacity ml	Diam. mm	Height mm	PK	Cat. No.
3119	10	16.0	81.4	1	**9.315 711**
3119	28	25.4	101.9	1	**9.315 712**
3119	30	25.5	94.3	1	**9.315 713**
3119	50*	28.8	106.7	1	**9.315 714**

* Capacity: 42ml to the brim.



2 Centrifuge bottles Typ 3120, PP-copolymer

PP-copolymer with PP screw cap. Autoclavable. *Thermo Scientific*

Type	Capacity ml	Diam. mm	Height mm	Max. rcf	PK	Cat. No.
3120	250	61.8	127.7	13.200*	1	**9.315 716**
3120	500	69.5	170.2	4.800	1	**9.315 717**
3120	500	73.8	170.0	4.800	1	**9.315 720**
3120	1000	97.5	184.5	7.100	1	**9.315 718**
3120	1000	97.7	179.0	7.100	1	**9.315 719**

* Up to 27500xg if using the sealing screw cap 9.315 734.



3 Centrifuge bottles Typ 3122, PC

PC with PP screw cap. Crystal clear. Good mechanical strength. Autoclavable. Leak-proof even at low speeds. In order to ensure that the system is leak-proof even at high speeds and when centrifuging dangerous substances, the 250ml and 1000ml sizes must be used in conjunction with sealing screw cap sets. *Thermo Scientific*

Type	Capacity ml	Diam. mm	Height mm	Max. rcf	PK	Cat. No.
3122	250	61.8	127.6	27.500	1	**9.315 721**
3122	500	69.5	169.6	13.700	1	**9.315 723**
3122	1000	97.6	188.4	7.100	1	**9.315 724**
3122	1000	98.1	180.2	7.100	1	**9.315 725**



4 Sealing cap assemblies Typ DS 3131, PP

PP screw cap with Tefzel® ETFE plug liner and viton O-ring. Leak-proof at recommended maximum speed and rcf for tubes. Suitable for working with aggressive chemicals. The 38mm assembly has a PP shoulder reinforcement ring to prevent collapsing of the 250ml bottles. *Thermo Scientific*

Type	For tubes ml	Screw cap diam. mm	PK	Cat. No.
DS3131	30	20	1	**9.315 732**
DS3131	50	24	1	**9.315 733**
DS3131	250	38	1	**9.315 734**

Tefzel® is registered trademark of DuPont.



5 Sealing cap assemblies with silicone seal Typ DS 3132, PP

For Oak Ridge centrifuge test tubes made of PP, PC and polysulphone. *Thermo Scientific*

Type	For tubes ml	Screw cap diam. mm	PK	Cat. No.
DS3132	28 / 30	20	2	**9.315 738**
DS3132	50	24	2	**9.315 739**
DS3132	250	58	2	**9.315 740**
DS3132	500 / 1000	63	2	**9.315 741**





1 Wide-mouth centrifuge bottles Typ 3141, PP-copolymer

PP-copolymer with sealing screw cap. Autoclavable. *Thermo Scientific*

Type	Capacity ml	Diam. mm	Height mm	Max. rcf x g	PK	Cat. No.
3141	250	60.7	133.4	27500	1	**9.315 763**
3141	450	69.5	160.0	13700	1	**9.315 764**



2 Centrifuge Bottles with Sealing Cap , SuperSpeed, Types 3140, 3141

Thermo Scientific

Designed to boost productivity and pellet recovery in super speed, large volume gross separation applications. Process one full Litre in each window-clear bottle at speeds up to 15810xg. Graduated, wide-mouth bottle simplifies decanting, re-suspensions and pellet removal. Smooth inner walls are less likely to shear delicate cells. Ideal for bacterial, yeast and tissue isolations. Improve viral harvesting in vaccine production. Reduce shearing in mammalian culture separations. PC offers excellent clarity. Ergonomic design facilitates loading, recovery and storage of samples. Recommended operating temperature range is from 4°C to 22°C; storage to -70°C. Brim capacity is 1.055ml. Nominal Dimensions (Diam. x H): 96.52 x 195.58mm. Before autoclaving, just set closure on top of bottles without engaging the threads. For proper performance these bottles must be filled to at least 80% of the total capacity.

Type	Capacity ml	Material	PK	Cat. No.
3140	1000	PC	1	**9.315 729**
3141	1000	PPCO	1	**6.236 915**



3 Centrifuge bottles Type 3120, BioBottle

Thermo Scientific

Centrifuge bottle with 2L capacity.
- Separating large volumes up to 12L
- Centrifugation up to 7333xg, at temperatures from 4°C to 22°C
- Bottle meets the requirements of USP VI
- Non-cytotoxic, not hemolytic
- PPCO bottle, PP seal screw cap with silicone seal
- Graduated, total volume of 2380ml
- Excellent chemical resistance
- Before autoclaving, unscrew the cap and place it on the bottle neck
- Bottles must always be at least 80% filled

The closure design features a two-piece plug and sealing cap to support aseptic handling techniques. Use of the two-piece closure system protects the bottle contents from contamination when the support bridge is applied and removed from the bottle. The plug includes a retaining ring to ensure and maintain the placement of the gasket during use.

Type	Capacity ml	Material	PK	Cat. No.
3120	2000	PPCO	1	**9.315 727**
3120	2000	PPCO, sterile	1	**9.315 728**

1 Centrifugal concentrators, Vivaspin 500

Sartorius

Vivaspin 500µl unit with 2.2ml sample carrier tube can be used in a fixed angle rotor. The vertical, built-in membrane guarantees minimal membrane fouling and provides rapid sample concentration. Low protein adsorption gives minimal sample loss.

Membrane surface:	0.5cm²
Max. rcf.:	15000 x g
Hold-up volume:	< 5µl



2 Centrifugal concentrators, Vivaspin 500

Membrane: polyethersulphone

Sartorius

MWCO	PK	Cat. No.
3000	25	**9.049 863**
5000	25	**9.049 755**
10000	25	**9.049 756**
30000	25	**9.049 757**
50000	25	**9.049 758**
100000	25	**9.049 759**
Starter kit (5 ea. 5K to 100K)	25	**9.049 750**
3000	100	**9.049 864**
5000	100	**9.049 850**
10000	100	**9.049 851**
30000	100	**9.049 852**
50000	100	**9.049 853**
100000	100	**9.049 854**



3 Centrifugal concentrators, Vivaspin 2

Sartorius

This 2 ml volume unit combines the rapidity of the classic Vivaspin products with reduced internal surface and membrane areas for superior recoveries from very dilute solutions.
With a choice of suitable membranes (PES, CTA, Hydrosart) Vivaspin 2 provides the highest flexibility for process optimisation.
Vivaspin 2 guarantees maximum sample recovery either by reverse centrifuging into the concentrate recovery cap or by directly pipetting the concentrate from the deadstop pocket built into the bottom of the concentrator.

Membrane surface:	1.2cm²
Max. rcf.:	8000 x g
Hold-up volume:	< 10µl



4 Centrifugal concentrators, Vivaspin 2

Membrane: polyethersulphone

Sartorius

MWCO	PK	Cat. No.
3000	25	**9.049 861**
5000	25	**9.049 760**
10000	25	**9.049 761**
30000	25	**9.049 762**
50000	25	**9.049 763**
100000	25	**9.049 764**
3000	100	**9.049 862**
5000	100	**9.049 777**
10000	100	**9.049 778**
30000	100	**9.049 779**
50000	100	**9.049 780**
100000	100	**9.049 781**





1 Vivaspin 6

Vivaspin 6ml concentrators have been developed to offer increased volume flexibility and performance. Vivaspin 6 can process an impressive 6ml in either swing-out buckets or fixed angle rotors accepting standard 15ml conical bottom test tubes. The Vivaspin 6 features twin vertical membranes for unparalleled filtration speeds and 100x plus concentrations. *Sartorius*

Membrane area:	2.5cm²
Max. centrifugal force:	10000 x g
Dead volume:	< 10µl



2 Centrifugal concentrators, Vivaspin 6

Membrane: polyethersulphone *Sartorius*

MWCO	PK	Cat. No.
5000	25	**9.049 765**
10000	25	**9.049 766**
30000	25	**9.049 767**
50000	25	**9.049 768**
100000	25	**9.049 769**
0.2 µm	25	**9.049 770**
5000	100	**9.049 782**
10000	100	**9.049 783**
30000	100	**9.049 784**
50000	100	**9.049 785**
100000	100	**9.049 786**
0.2 µm	100	**9.049 787**
Starter kit (5 ea. 5K to 100K)	25	**9.049 753**



3 Vivaspin 20

Vivaspin 20ml centrifugal concentrators have been developed to offer increased volume flexibility and performance. *Sartorius*
Vivaspin 20 handles up to 20ml in swing bucket centrifuges and 14ml in 25° fixed angle rotors accepting 50ml centrifuge tubes. Featuring twin vertical membranes for unparalleled filtration speeds the Vivaspin 20 can achieve 100x plus concentrations. Remaining volume is easy to read off the printed scale on the side of the concentrator and the modified dead stop pocket further simplifies direct pipette recovery of the final concentrate.

Membrane area:	6.0cm²
Max. centrifugal force:	8000xg
Dead volume:	< 20µl



4 Centrifugal concentrators, Vivaspin 20

Membrane: polyethersulphone *Sartorius*

MWCO	PK	Cat. No.
3000	12	**9.049 855**
5000	12	**9.049 771**
10000	12	**9.049 772**
30000	12	**9.049 773**
50000	12	**9.049 774**
100000	12	**9.049 775**
300000	12	**9.049 857**
1000000	12	**9.049 858**
0.2 µm	12	**9.049 776**
3000	48	**9.049 856**
5000	48	**9.049 788**
10000	48	**9.049 789**
30000	48	**9.049 790**
50000	48	**9.049 791**
100000	48	**9.049 792**
300000	48	**9.049 859**
1000000	48	**9.049 860**
0.2 µm	48	**9.049 793**
Starter kit (2 ea. 5K to 0.2 µm)	12	**9.049 754**

Further concentrators please see page1248.

E & OE.

1 Centrifugal filtration units, Centrisart I

Centrisart I is a ready to use unit for small volume centrifugal ultrafiltration to separate proteins from low molecular weight substances in biological samples. *Sartorius*

Typical applications include:
- Drug binding studies
- Determination of metabolites in serum
- Protein removal from blood samples
- Cleaning of liposomes (virus removal)



Type	PK	Cat. No.
Centrisart 5,000 MWCO CTA	12	**9.054 671**
Centrisart 10,000 MWCO CTA	12	**9.054 672**
Centrisart 20,000 MWCO CTA	12	**9.054 673**
Centrisart 100,000 MWCO PES	12	**9.054 674**
Starter pack (3 units each of 5K, 10K, 20K, 100K)	12	**9.054 675**

CTA = Cellulose tri-acetate
PES = Polyethersulphone

Centrifugal and Pressure Unit Vivacell 70

Vivacell 70 is a disposable ultrafiltration unit for the concentration of samples between 10 ml and 70 ml and can be used either in a centrifuge or for pressure filtration. Vivacell 70 thus combines the ease of use of centrifugal devices with the flexibility and control provided by pressurized ultrafiltration cells. Vivacell 70 is easy to assemble, requires no tubing connections or stirring mechanisms and can be adapted to equipment availability or to specific user preferences. For convenience, the units are simply spun in a large capacity centrifuge (carriers accepting 250ml bottles). The concentrator features a vertical membrane that minimizes fouling, while the built-in deadstop of 150 µl will prevent concentration to dryness. *Sartorius*

MWCO	Description	PK	Cat. No.
5000	with 2 x filtrate bottles to fit 250ml centrifuge rotors	2	**9.049 730**
10000	with 2 x filtrate bottles to fit 250ml centrifuge rotors	2	**9.049 731**
30000	with 2 x filtrate bottles to fit 250ml centrifuge rotors	2	**9.049 732**
50000	with 2 x filtrate bottles to fit 250ml centrifuge rotors	2	**9.049 733**
100000	with 2 x filtrate bottles to fit 250ml centrifuge rotors	2	**9.049 734**
0.2 µm	with 2 x filtrate bottles to fit 250ml centrifuge rotors	2	**9.049 735**
5000	without filtrate bottles	10	**9.049 736**
10000	without filtrate bottles	10	**9.049 737**
30000	without filtrate bottles	10	**9.049 738**
50000	without filtrate bottles	10	**9.049 739**
100000	without filtrate bottles	10	**9.049 740**
0.2 µm	without filtrate bottles	10	**9.049 741**

2 3 Crossflow filter units Vivaflow 50 and Vivaflow 200

NEW!

Thin channel, crossflow filter units with 50cm²/200cm² filter areas for capacities between 100ml/500ml and 5L. This system provides high crossflow rates at minimum pumping pressure and does not require additional fittings for scale-up. *Sartorius*
VivaFlow 50 is easy to operate with a flow restrictor and, optionally, a pressure indicator. Modular construction with luer connections allows interlocking of units in series for easy scale-up. Recovery rates are maximised due to optimised recirculation volume and by use of low adsorption materials. Disposable.
For greater volumes, VivaFlow 200 is available with a filter area of 200cm² and includes pressure indicator, flow restrictor, filtrate tubing and connectors.
Membrane: polyethersulphone





MWCO	Description	PK	Cat. No.
3.000	Vivaflow 50	2	**6.240 542**
5.000	Vivaflow 50	2	**9.049 742**
10.000	Vivaflow 50	2	**9.049 743**
30.000	Vivaflow 50	2	**9.049 744**
50.000	Vivaflow 50	2	**9.049 745**
100.000	Vivaflow 50	2	**9.049 746**
0,2 µm	Vivaflow 50	2	**9.049 747**

Accessories available on request.

LLG-Filter paper, qualitative grades

Made from 100% cellulose.
Ash content 0.06%.
Filtration speed according to DIN 53137.
Capacity of separation according to DIN 53135.



1 LLG-Qualitative filter paper, circles

Fast

Diam. mm	Filtration time secs.	PK	Cat. No.
90	10	100	**9.045 830**
110	10	100	**9.045 831**
125	10	100	**9.045 832**
150	10	100	**9.045 833**
185	10	100	**9.045 834**



2 LLG-Qualitative filter paper, circles

Medium speed

Diam. mm	Filtration time secs.	PK	Cat. No.
42.5	50	100	**9.045 820**
90.0	50	100	**9.045 821**
110.0	50	100	**9.045 822**



3 LLG-Qualitative filter paper, circles

Medium speed

Diam. mm	Filtration time secs.	PK	Cat. No.
42.5	88	100	**9.045 800**
47.0	88	100	**9.045 801**
55.0	88	100	**9.045 802**
70.0	88	100	**9.045 803**
90.0	88	100	**9.045 804**
110.0	88	100	**9.045 805**
125.0	88	100	**9.045 806**
150.0	88	100	**9.045 807**
185.0	88	100	**9.045 808**
240.0	88	100	**9.045 809**



4 LLG-Qualitative filter paper, folded filters

Medium speed

Diam. mm	Filtration time secs.	PK	Cat. No.
125.0	50	100	**9.045 825**
150.0	50	100	**9.045 826**
185.0	50	100	**9.045 827**



5 LLG-Qualitative filter paper, sheets

Medium speed

Dimensions mm	Filtration time secs.	PK	Cat. No.
460 x 570	88	100	**9.045 810**

Extraction thimbles - please see page 1199.

E & OE.

1 Filter paper, Grade number 4

Circles. Qualitative. Fast flowrate. Excellent retention of coarse and gelatinous precipitants. Creped. Supplied in packs of circles as outlined below. *GE Healthcare*

Flowrate: Fast
Retention: Medium
Wet strength: Low
Thickness: 0.21mm
Ash: 0.06%



Diam. mm	PK	Cat. No.
42	100	**9.056 231**
55	100	**9.056 233**
70	100	**9.056 235**
90	100	**9.056 196**
110	100	**9.056 230**
125	100	**9.056 232**
150	100	**9.056 234**
185	100	**9.056 236**
240	100	**9.056 237**
320	100	**9.056 239**
460	100	**9.056 334**

2 Filter paper, grade 113

Circles. Qualitative. Fast flow. Excellent retention of coarse and gelatinous precipitates, creped. *GE Healthcare*

Flow rate: Fast
Retention: Medium
Wet strength: High
Thickness: 0.42mm
Ash: 0.06%



Diam. mm	PK	Cat. No.
90	100	**9.049 015**
125	100	**9.049 016**
150	100	**9.049 017**
185	100	**9.049 018**
240	100	**9.049 019**

3 Filter paper, grade 114

Circles. Qualitative. Thin and very strong. Smooth surface. *GE Healthcare*

Flow rate: Fast
Retention: Medium
Wet strength: High
Thickness: 0.19mm
Ash: 0.06%



Diam. mm	PK	Cat. No.
150	100	**9.049 027**

4 Filter paper, Grade 542

Circles. Qualitative. Hardened. Ashless. Highly retentive for fine precipitates. *GE Healthcare*

Flow rate: Fast
Retention: Medium
Wet strength: High
Thickness: 0.16mm
Ash: 0.08%



Diam. mm	PK	Cat. No.
55	100	**9.056 500**
70	100	**9.056 461**
90	100	**9.056 502**
110	100	**9.056 503**
125	100	**9.056 504**
150	100	**9.056 505**
185	100	**9.056 506**
240	100	**9.056 507**

1



1 Filter paper, Grade number 1

Circles and sheets. Qualitative. The most widely used grade of filter paper. *GE Healthcare*

Flowrate:	Medium/Fast
Retention:	Medium
Wet strength:	Low
Thickness:	0.18mm
Ash:	0.06%

Diam. mm	PK	Cat. No.
20	400	**9.048 942**
25	400	**9.048 943**
30	400	**9.048 944**
32	100	**9.048 937**
42.5	100	**9.056 199**
47	100	**9.048 945**
55	100	**9.056 200**
70	100	**9.056 201**
85	100	**9.048 946**
90	100	**9.056 202**
110	100	**9.056 203**
125	100	**9.056 204**
150	100	**9.056 205**
185	100	**9.056 206**
240	100	**9.056 207**
270	100	**9.056 208**
320	100	**9.056 209**
400	100	**9.056 278**
500	100	**9.056 279**
26 x 31	1000	**9.056 337**
460 x 570	100	**9.056 331**
460 x 570	500	**9.056 340**
580 x 680	100	**9.056 341**
75 x 100	500	**9.056 338**

2



2 Filter paper, Grade number 2

Circles and sheets. Qualitative. Slightly thicker and more retentive than number 1. *GE Healthcare*

Flowrate:	Medium/Fast
Retention:	Medium
Wet strength:	Low
Thickness:	0.19mm
Ash:	0.06%

Diam. mm	PK	Cat. No.
42.5	100	**9.056 198**
55	100	**9.056 210**
70	100	**9.056 211**
90	100	**9.056 212**
110	100	**9.056 213**
125	100	**9.056 214**
150	100	**9.056 215**
185	100	**9.056 216**
240	100	**9.056 217**
320	100	**9.056 219**
460 x 570	100	**9.056 332**

3



3 Filter paper, Grade 91

Circles and sheets. Qualitative. General purpose schools grade, creped. *GE Healthcare*

Flowrate:	Medium/Fast
Retention:	Medium
Wet strength:	High
Thickness:	0.23mm

Diam. mm	PK	Cat. No.
110	100	**9.048 938**
125	100	**9.048 933**
150	100	**9.048 939**
185	100	**9.048 934**
240	100	**9.048 940**

E & OE.

1 Filter paper, Grade number 3

Circles and sheets. Qualitative. Very thick. Double the thickness of number 1. *GE Healthcare*



Flowrate:	Medium
Retention:	High
Wet strength:	Medium
Thickness:	0.39mm
Ash:	0.06%

Diam. mm	PK	Cat. No.
55	100	**9.056 220**
70	100	**9.056 221**
90	100	**9.056 222**
110	100	**9.056 223**
125	100	**9.056 224**
150	100	**9.056 225**
185	100	**9.056 226**
240	100	**9.056 227**
460 x 570	100	**9.056 333**

2 Qualitative filter paper, Grade 595, circles and sheets

Medium fast 4 to 7µm *GE Healthcare*

- thin filter paper
- for medium to fine precipitates and general laboratory work
- Weight: 68g/m²
- Thickness: 0.16mm



Diam. mm	PK	Cat. No.
110	100	**9.062 303**
125	100	**9.062 304**
150	100	**9.062 305**

3 Qualitative filter paper, Grade 597, circles and sheets

Medium fast, 4 to 7µm *GE Healthcare*

- thicker and faster than 595
- for medium to fine precipitates
- Weight: 82g/m²

Thickness: 0.19mm



Diam. mm	PK	Cat. No.
55	100	**9.062 400**
90	100	**9.062 402**
110	100	**9.062 403**
150	100	**9.062 405**
185	100	**9.062 406**
240	100	**9.062 407**
580 x 580	100	**9.066 597**

4 Filter paper, Grade number 5

Circles. Qualitative. Slow flowrate. Retains fine precipitates, grained surface. Supplied in packs of circles as outlined below. *GE Healthcare*



Flowrate:	Slow
Retention:	High
Wet strength:	Low
Thickness:	0.20mm
Ash:	0.06%

Diam. mm	PK	Cat. No.
55	100	**9.056 240**
70	100	**9.056 241**
90	100	**9.056 242**
110	100	**9.056 243**
125	100	**9.056 244**
150	100	**9.056 245**
185	100	**9.056 246**
240	100	**9.056 247**

1



1 Filter paper, Grade number 6

Circles. Qualitative. Slow. Supplied in packs of circles as outlined below. *GE Healthcare*

Flowrate:	Slow
Retention:	High
Wet strength:	Low
Thickness:	0.18mm
Ash:	0.20%

Diam. mm	PK	Cat. No.
70	100	**9.056 251**
90	100	**9.056 252**
110	100	**9.056 253**
125	100	**9.056 254**
150	100	**9.056 255**
185	100	**9.056 256**
240	100	**9.056 257**

Qualitative filter paper, Grade 602 h, circles

Slow < 2µm *GE Healthcare*

- thick filter paper
- for fine precipitates
- Weight: 85g/m²
- Thickness: 0.15mm

Diam. mm	PK	Cat. No.
125	100	**9.062 704**
185	100	**9.062 706**

Qualitative filter paper, Grade 604½, folded filters

Fast, 12 to 25µm *GE Healthcare*

- time saving, because folded filters have a larger surface area
- filter faster than comparable circular filters
- for coarse precipitates (e.g. hydroxide and sulphide)
- Weight: 80g/m²
- Thickness: 0.19mm

Diam. mm	PK	Cat. No.
150	100	**9.063 905**
185	100	**9.063 906**
240	100	**9.063 907**
320	100	**9.063 909**

2



2 Qualitative filter paper, Grade 1573½, folded filters

Fast, 12 to 25µm *GE Healthcare*

- wet-strength
- time saving, because folded filters have a larger surface area than circular filters of the same diameter
- Weight: 90g/m²
- Thickness: 0.18mm

Diam. mm	PK	Cat. No.
125	100	**9.065 104**
150	100	**9.065 105**
185	100	**9.065 106**
240	100	**9.065 107**
270	100	**9.065 108**
320	100	**9.065 109**

Qualitative filter paper, Grade 598½, folded filters

Medium to fast, 7 to 12µm *GE Healthcare*

- thick filter paper
- for fast filtration of coarse precipitates
- Weight: 80g/m²

Thickness: 0.32mm

Diam. mm	PK	Cat. No.
125	50	**9.063 604**
185	50	**9.063 606**
240	50	**9.063 607**
500	50	**9.063 611**
580 x 580	250	**9.066 598**

E & OE.

1 Qualitative filter paper, Grade 595½, folded filters



Medium fast, 4 to 7µm *GE Healthcare*

- time saving, because folded filters have a larger surface area
- filter faster than comparable circular filters
- for medium to fine precipitates and general laboratory work
- Weight: 68g/m²
- Thickness: 0.16mm

Diam. mm	PK	Cat. No.
70	100	**9.063 301**
110	100	**9.063 303**
125	100	**9.063 304**
150	100	**9.063 305**
185	100	**9.063 306**
240	100	**9.063 307**
270	100	**9.063 308**
320	100	**9.063 309**
385	100	**9.063 310**

2 Qualitative filter paper, Grade 597½, folded filters



Medium fast, 4 to 7µm *GE Healthcare*

- time saving, because folded filters have a larger surface area
- for medium to fine precipitates
- Weight: 82g/m²

Thickness: 0.19mm

Diam. mm	PK	Cat. No.
90	100	**9.063 402**
110	100	**9.063 403**
125	100	**9.063 404**
150	100	**9.063 405**
185	100	**9.063 406**
240	100	**9.063 407**
270	100	**9.063 408**
320	100	**9.063 409**
385	100	**9.063 410**
500	100	**9.063 411**

3 Filter paper, Grade number 2 V



Qualitative. Folded (pre-pleated) version of Number 2. *GE Healthcare*

Flowrate:	Medium/Fast
Retention:	Medium
Wet strength:	Low
Thickness:	0.19mm
Ash:	0.06%

Diam. mm	PK	Cat. No.
125	100	**9.056 304**
150	100	**9.056 305**
185	100	**9.056 306**
240	100	**9.056 307**
270	100	**9.056 308**
320	100	**9.056 309**

4 Qualitative filter paper, Grade 593 ½, folded filters



Medium to slow 2 to 5µm *GE Healthcare*

- time saving, because folded filters have a larger surface area than comparable circular filters
- for medium to fine precipitates and general laboratory work
- Weight: 85g/m²
- Thickness: 0.17mm

Diam. mm	PK	Cat. No.
185	100	**9.063 106**
240	100	**9.063 107**

Qualitative filter paper, Grade 594½, folded filters

Slow 2 to 4µm *GE Healthcare*
- for fine precipitates
- Weight: 85g/m²
- Thickness: 0.17mm

Diam. mm	PK	Cat. No.
185	100	**9.063 206**

Qualitative filter paper, thick, Grade 602eh½, folded filters

Very slow, <2 µm *GE Healthcare*
- thick filter paper
- for fine precipitates
- Weight: 85g/m²
- Thickness: 0.15mm

Diam. mm	PK	Cat. No.
125	100	**9.063 804**
150	100	**9.063 805**



1 Filter paper, grade 113 V

Circles. Prepleated. Qualitative. Excellent retention of coarse and gelatinous precipitates, creped. *GE Healthcare*

Diam. mm	PK	Cat. No.
125	100	**9.056 294**
150	100	**9.056 295**
185	100	**9.056 296**
240	100	**9.056 297**
270	100	**9.056 298**
320	100	**9.056 299**
500	100	**9.056 301**



2 Filter paper, grade 114 V

Circles. Prepleated. Qualitative. Thin and very strong. Smooth surface. *GE Healthcare*

Diam. mm	PK	Cat. No.
125	100	**9.056 324**
150	100	**9.056 325**
185	100	**9.056 326**
240	100	**9.056 327**

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

Distributor
GE Healthcare

E & OE.

LLG-Filter papers for quantitative analysis

Made from 100% cellulose.
Ash content 0.007%.
Filtration speed according to DIN 53137.
Capacity of separation according to DIN 53135.

1 LLG-Quantitative filter paper, circles



Fast 12 to 25µm
- for coarse, high volume precipitates
- for determinations according to the German Standard Methods for the examination of water, waste water and sludge.
- most frequently used quantitative filter
- ashless, equivalent black tape

Diam. mm	Filtration time secs.	PK	Cat. No.
70	10	100	**9.045 840**
90	10	100	**9.045 841**
110	10	100	**9.045 842**
125	10	100	**9.045 843**
150	10	100	**9.045 844**
185	10	100	**9.045 845**

2 LLG-Quantitative filter paper, circles



Slow < 2µm.
- for very fine precipitates and small particles
- for soil analysis
- for $BaSO_4$ (hot precipitate), $PbSO_4$, Cu_2O, ZnS, NiS
- ashless, equivalent blue tape

Diam. mm	Filtration time secs.	PK	Cat. No.
70	180	100	**7.970 271**
90	180	100	**9.045 850**
110	180	100	**6.242 670**
125	180	100	**9.045 851**
150	180	100	**9.045 852**
185	180	100	**6.242 669**
320	180	100	**7.970 611**

3 Quantitative filter paper, Grade 589/1, circles



GE Healthcare

Fast 12 to 25µm
Black ribbon
- for coarse, high volume precipitates
- for determinations according to the German Standard Methods for the examination of water, waste water and sludge.
- most frequently used quantitative filter
- Weight: 80g/m²
- Thickness: 0.19mm

Diam. mm	PK	Cat. No.
90	100	**9.060 102**
110	100	**9.060 103**
125	100	**9.060 104**
150	100	**9.060 105**
185	100	**9.060 106**

4 Quantitative filter paper, grade 41



GE Healthcare

Circles. Quantitative. Ashless. For filtration of coarse and gelatinous precipitates.
Supplied in box of 100.

Flow rate:	Fast
Retention:	Medium
Wet strength:	Low
Thickness:	0.22mm
Ash:	0.007%

Diam. mm	PK	Cat. No.
55	100	**9.056 410**
60	100	**9.049 045**
70	100	**9.056 411**
90	100	**9.056 412**
110	100	**9.056 413**
125	100	**9.056 414**
150	100	**9.056 415**
185	100	**9.056 416**
240	100	**9.056 417**



1 Quantitative filter paper, Grade 589/2

Medium fast, 4 to 12µm. White ribbon. *GE Healthcare*

- for the analysis of foodstuffs
- for carbonates of alkaline earth metals, $(NH_4)_3[P(Mo_3O_{10})_4]$ x aq., $Mg(NH_4)PO_4$, CaC_2O_4 (hot precipitates)
- Weight: 85g/m²
- Thickness: 0.18mm

Diam. mm	PK	Cat. No.
55	100	**9.060 200**
70	100	**9.060 201**
90	100	**9.060 202**
110	100	**9.060 203**
125	100	**9.060 204**
150	100	**9.060 205**
185	100	**9.060 206**
240	100	**9.060 207**



2 Quantitative filter paper, grade 40

Circles. Quantitative. Ashless. *GE Healthcare*

Flow rate:	Medium
Retention:	Medium
Wet strength:	Low
Thickness:	0.21mm
Ash:	0.007%

Diam. mm	PK	Cat. No.
32.0	100	**9.049 035**
42.5	100	**9.056 399**
55.0	100	**9.056 400**
70.0	100	**9.056 401**
90.0	100	**9.056 402**
110.0	100	**9.056 403**
125.0	100	**9.056 404**
150.0	100	**9.056 405**
185.0	100	**9.056 406**
240.0	100	**9.056 407**



3 Quantitative filter paper, Grade 589/3, circles

Slow < 2µm. Blue ribbon. *GE Healthcare*

- for very fine precipitates and small particles
- for soil analysis
- for $BaSO_4$ (hot precipitate), $PbSO_4$, Cu_2O, ZnS, NiS
- Weight: 84g/m²
- Thickness: 0.16mm

Diam. mm	PK	Cat. No.
110	100	**9.060 303**
125	100	**9.060 304**
150	100	**9.060 305**
185	100	**9.060 306**



4 Filter paper, grade 42

Circles. Quantitative. Ashless. For filtration of fine precipitates. *GE Healthcare*

Flow rate:	Slow
Retention:	Medium
Wet strength:	Low
Thickness:	0.20mm
Ash:	0.007%

Diam. mm	PK	Cat. No.
42.5	100	**9.056 419**
55.0	100	**9.056 420**
70.0	100	**9.056 421**
90.0	100	**9.056 422**
110.0	100	**9.056 423**
125.0	100	**9.056 424**
150.0	100	**9.056 425**
185.0	100	**9.056 426**
240.0	100	**9.056 427**

E & OE.

1 Phase separators, 1PS



A silicone impregnated, water repellent paper which can be used to separate aqueous solutions from immiscible solvents. The aqueous phase is retained and the organic phase passes through. Will retain solid particles. Can be used either flat under suction not exceeding 70mm Hg or quadrant folded in a conical glass funnel. Supplied in box of 100 circles. *GE Healthcare*
Note: This paper contains a small quantity of tin complex catalyst. It is therefore not recommended for use when this complex may cause interference, e.g. with the use of dithizone (diphenylthiocarbazone) reagent.

Flow rate:	Fast
Retention:	Medium
Wet strength:	High
Thickness:	0.16mm
Ash:	0.008%

Diam. mm	PK	Cat. No.
70	100	**9.056 891**
90	100	**9.056 892**
110	100	**9.056 893**
125	100	**9.056 894**
150	100	**9.056 895**
185	100	**9.056 896**

Glass microfibre filters

Glass microfibre filters have a fast filtration and a high loading capacity and particle retention rate. Manufactured without chemical binder from high grade borosilicate glass. (Exception: GF6, GF9). They are suitable for gravity or low suction filtration. Filtration speeds generally very much higher than conventional cellulose papers. Efficient retention of micron size particles. Must be used flat. Ideal for use in flat perforated plate Buchner type funnels (not sintered glass models). Can be used up to 550°C
Wide range of applications including:
- retention of fine analytical precipitates
- retention of biochemical gelatinous precipitates
- water/air pollution analyses
- as prefilters for membranes
- scintillation counting
- radioimmunoassay.

2 LLG-Glass microfibre filters, filter circles



Diam. mm	Filtration time secs.	PK	Cat. No.
25	60	100	**9.045 860**
47	60	100	**9.045 861**
150	60	100	**9.045 862**
25	100	100	**9.045 865**
70	100	100	**9.045 866**
90	100	100	**9.045 867**
110	100	100	**9.045 868**

Glass microfibre filters, grade GF 9, circles

Glass fibre filters are made of 100% borosilicate glass fibres with an inorganic binder. *GE Healthcare*
They are mechanically stable, this makes them easy to use. Temperature resistant up to 500°C.
Glass fibre filters are chemically resistant except against hydrofluoric acids and highly concentrated alkalis. They are known for their fast filtration times (compared to other medias) with excellent retention rates, even of very fine particles from aqueous solutions and gases.

Application:
- Gas-/air-monitoring
- Water and waste water determination

Retention rate:	99.97%
Filtration time according to Herzberg:	120s
Filtration time according to Gurley:	20s
Weight:	70g/m²
Thickness:	350µm

Diam. mm	PK	Cat. No.
50	200	**9.068 699**
90	100	**9.068 702**
110	100	**9.068 703**

1



1 Glass microfibre filters, grade GF 6, circles

GE Healthcare

Retention rate:	99.97%
Filtration time according to Herzberg:	200s
Filtration time according to Gurley:	40s
Weight:	80g/m²
Thickness:	350µm

Diam. mm	PK	Cat. No.
55	100	**9.068 500**
70	100	**9.068 501**
90	100	**9.068 502**
110	100	**9.068 503**
125	100	**9.068 504**
150	100	**9.068 505**
185	100	**9.068 506**
240	100	**9.068 507**

2



2 Glass microfibre filters, grade GF/F

This ultra-fine filter has a 98% retention efficiency for particles as small as 0.7µm in liquids. Particle retention to 0.7µm.

GE Healthcare

Diam. mm	PK	Cat. No.
24	100	**9.056 666**
25	100	**9.056 676**
42.5	100	**9.056 716**
47	100	**9.056 726**
55	100	**9.056 780**
70	100	**9.056 781**
90	25	**9.056 782**
110	25	**9.056 783**
125	25	**9.056 784**
150	25	**9.056 785**
257	25	**9.056 787**
570 x 460	25	**9.056 805**

3



3 Glass microfibre filters, grade GF/B

Three times thicker and with greater wet strength than GF/A. Particle retention to 1µm. Supplied in pack quantities as outlined below.

GE Healthcare

Diam. mm	PK	Cat. No.
24	100	**9.056 662**
25	100	**9.056 672**
37	100	**9.056 692**
42.5	100	**9.056 712**
47	100	**9.056 722**
55	100	**9.056 750**
70	100	**9.056 751**
90	25	**9.056 752**
110	25	**9.056 753**
125	25	**9.056 754**
150	25	**9.056 755**
185	25	**9.056 756**
570 x 460	25	**9.056 802**

4



4 Glass microfibre filters, grade GF/C

Extremely efficient filter made to retain fine particles and micro organisms. Particle retention to 1.2µm.

GE Healthcare

Diam. mm	PK	Cat. No.
21	100	**9.056 643**
24	100	**9.056 663**
25	100	**9.056 673**
42.5	100	**9.056 713**
47	100	**9.056 723**
50	100	**9.056 759**
55	100	**9.056 760**
70	100	**9.056 761**
90	100	**9.056 762**
110	100	**9.056 763**
125	100	**9.056 764**
150	100	**9.056 765**
254 x 102	50	**9.056 816**
570 x 460	25	**9.056 803**

E & OE.

1 Glass microfibre filters, grade 934-AH

Circles. High retention at high flow rates. Widely used in water pollution monitoring techniques for suspended solids, and is specified in US Method 934-AH. Particle retention to 1.5µm. *GE Healthcare*



Diam. mm	PK	Cat. No.
24	100	**9.056 667**
47	100	**9.056 727**
55	100	**9.056 730**
70	100	**9.056 731**
90	100	**9.056 732**
110	100	**9.056 733**
125	100	**9.056 734**

2 Glass microfibre filters, grade GF/A

The general purpose high efficiency glass microfibre filter. Particle retention to 1.6µm. Supplied in pack quantities as indicated. *GE Healthcare*



Diam. mm	PK	Cat. No.
21	100	**9.056 641**
24	100	**9.056 661**
25	100	**9.056 671**
37	100	**9.056 691**
42.5	100	**9.056 711**
47	100	**9.056 721**
50	100	**9.056 725**
55	100	**9.056 740**
60	100	**9.056 739**
70	100	**9.056 741**
90	100	**9.056 742**
110	100	**9.056 743**
125	100	**9.056 744**
150	100	**9.056 745**
254 x 203	100	**9.056 811**
570 x 460	25	**9.056 801**

Glass microfibre filters, grade EPM 2000

For use in high volume air sampling apparatus. Particle retention to 2µm. *GE Healthcare*

Diam. mm	PK	Cat. No.
203 x 254	100	**9.049 672**

3 Glass microfibre filters, grade GF/D

Thick filter made from less fibres and retaining around 3µm particles with a very high loading capacity. Extremely high speed. Particle retention to 2.7µm. *GE Healthcare*



Diam. mm	PK	Cat. No.
25	100	**9.056 674**
47	100	**9.056 724**
70	100	**9.056 771**
90	25	**9.056 772**
110	25	**9.056 773**
125	25	**9.056 774**
150	25	**9.056 775**
257	25	**9.056 777**

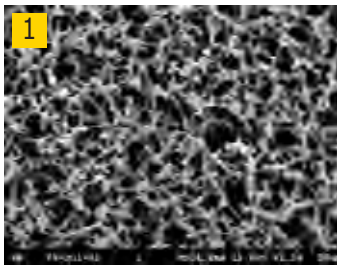
4 Quartz microfibre filters, grade QM-A

Manufactured from quartz microfibre to withstand high temperatures. Can be used up to 500°C. *GE Healthcare*

Flow rate:	Fast
Retention:	Medium
Wet strength:	High
Thickness:	0.16mm
Ash:	0.008%



Diam. mm	PK	Cat. No.
25	100	**9.056 679**
37	100	**9.056 699**
47	100	**9.056 729**
203 x 254	25	**9.056 814**



1 Membrane filters, Grade NC, made from cellulose nitrate

Grade NC *GE Healthcare*

Applications:
- For prefiltration and dust measurement, clarification and sterile filtration
- For aqueous solutions

Properties:
- Very easily wetted
- Hydrophilic
- Can be used up to 125°C
- Autoclavable up to 121°C

Type	Pore size µm	Diam. mm	PK	Cat. No.
NC 10	0.10	47	100	**9.057 341**
NC 10	0.10	50	100	**9.057 342**
NC 20	0.20	25	100	**9.058 326**
NC 20	0.20	47	100	**9.058 327**
NC 20	0.20	50	100	**9.058 328**
NC 45	0.45	25	100	**9.057 219**
NC 45	0.45	47	100	**9.057 220**
NC 45	0.45	50	100	**9.057 222**
NC 45	0.45	100	50	**9.057 225**
NC 45	0.45	110	50	**9.057 226**
NC 45	0.45	142	25	**9.057 228**



2 Membrane filters, Cellulose nitrate, WCN

Plain white. Circles. *GE Healthcare*

Pore size µm	Diam. mm	PK	Cat. No.
0.10	25	100	**9.950 979**
0.10	47	100	**9.950 980**
0.20	13	100	**9.950 981**
0.20	25	100	**9.950 982**
0.20	47	100	**9.950 983**
0.20	90	25	**9.950 984**
0.20	142	25	**9.950 985**
0.45	13	100	**9.950 988**
0.45	25	100	**9.950 989**
0.45	47	100	**9.950 991**
0.45	50	100	**9.950 992**
0.45	90	25	**9.950 994**
0.45	142	25	**9.950 995**
0.65	47	100	**9.950 998**
0.80	25	100	**9.951 001**
0.80	37	100	**9.951 002**
0.80	47	100	**9.951 003**
0.80	90	25	**9.951 004**
1.00	25	100	**9.951 005**
1.00	47	100	**9.951 006**
1.20	50	100	**9.951 008**
1.20	142	25	**9.951 009**
3.00	25	100	**9.951 010**
3.00	47	100	**9.951 011**
5.00	25	100	**9.951 012**
5.00	47	100	**9.951 013**
5.00	90	25	**9.951 014**

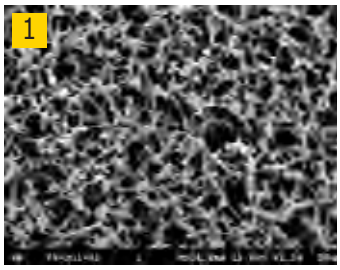


1 Membrane filters, Grade AE, made from pure cellulose nitrate

GE Healthcare

Applications:
For prefiltration and dust measurement, clarification and sterile filtration.

Properties:
- Very easily wetted
- For aqueous solutions
- Hydrophilic
- Can be used up to 125°C
- Autoclavable up to 121°C



Type	Pore size µm	Diam. mm	PK	Cat. No.
AE 98	5.00	47	100	**9.057 041**
AE 98	5.00	50	100	**9.057 042**
AE 99	8.00	25	100	**9.057 005**
AE 99	8.00	47	100	**9.057 011**
AE 99	8.00	50	100	**9.057 012**
AE 100	12.00	47	100	**9.057 191**
AE 100	12.00	50	100	**9.057 193**

2 Membrane filters, Cellulose mixed ester

Composed of cellulose acetate (~20%) and cellulose nitrate (~80%).

GE Healthcare



Type	Pore size µm	Diam. mm	PK	Cat. No.
Gridded white	0.45	25	100	**9.951 015**
Gridded white	0.45	47	100	**9.951 016**
Gridded white	0.80	25	100	**9.951 018**

3 Membrane filters, Grade ME, made from mixed cellulose esters

GE Healthcare

Applications:
- Excellent for gravimetrical analysis
- Especially for aqueous solutions
- Ideally suitable for contamination test

Properties:
- Economical
- Constant weight
- Hydrophilic
- Not sterile
- Can be used up to 125°C
- Autoclavable up to 121°C



Type	Pore size µm	Diam. mm	PK	Cat. No.
ME24	0.20	25	100	**9.058 965**
ME24	0.20	47	100	**9.058 969**
ME24	0.20	50	100	**9.058 987**
ME24	0.20	142	25	**9.058 981**
ME25	0.45	25	100	**9.058 935**
ME25	0.45	47	100	**9.058 939**
ME25	0.45	50	100	**9.058 942**
ME25	0.45	100	50	**9.058 946**
ME25	0.45	110	50	**9.057 812**
ME25	0.45	142	25	**9.058 951**
ME27	0.80	25	100	**9.058 865**
ME27	0.80	47	100	**9.058 869**
ME27	0.80	50	100	**9.058 872**
ME28	1.20	47	100	**9.058 839**
ME28	1.20	50	100	**9.058 842**
ME29	3.00	25	100	**9.057 800**
ME29	3.00	47	100	**9.058 809**
ME29	3.00	50	100	**9.058 812**



1 Membrane filters, Grade OE, made from cellulose acetate

GE Healthcare

Very high wet strength and very low ability for protein binding. For filtration of aqueous, alcohol and oil-based solutions at temperatures up to 180°C.

Description	Pore size µm	Diam. mm	PK	Cat. No.
OE 67	0.45	25	100	**9.057 565**
OE 67	0.45	47	100	**9.057 571**
OE 67	0.45	50	100	**9.057 572**
OE 67	0.45	142	25	**9.057 578**
OE 66	0.20	25	100	**9.057 605**
OE 66	0.20	47	100	**9.057 611**
OE 66	0.20	50	100	**9.057 612**
OE 66	0.20	142	25	**9.057 618**

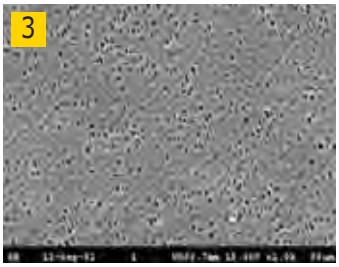


2 Membrane Filters, Grade RC, Regenerated cellulose

GE Healthcare

Application:
For the sterilisation and particle filtration of aqueous and organic solutions
Properties
- spontaneously wetted, very good wet-strength
- high chemical resistance, useful for aqueous and organic media
- hydrophilic
- can be used up to 180°C
- sterilisable by all methods
- suitable for use as sterile filter to ASTM-D 3862-80

Type	Pore size µm	Diam. mm	PK	Cat. No.
RC 58	0.20	47	100	**9.057 771**
RC 55	0.45	47	100	**9.057 791**
RC 55	0.45	50	100	**9.057 792**
RC 55	0.45	100	25	**9.057 795**
RC 55	0.45	142	25	**9.057 798**
RC 60	1.00	50	100	**9.057 712**
RC 58	0,25	50	100	**9.057 772**



3 Membrane filters, Grade NL, made from pure polyamide

GE Healthcare

Application:
- Universal filter, especially in the pharmaceutical section

Properties:
- Mechanically very strong
- For aqueous and organic solutions
- Hydrophilic
- Can be used up to 135°C
- Autoclavable up to 134°C

Type	Pore size µm	Diam. mm	PK	Cat. No.
NL 16	0.20	47	100	**9.057 433**
NL 17	0.45	25	100	**9.057 452**
NL 17	0.45	47	100	**9.057 453**
NL 17	0.45	50	100	**9.057 454**

E & OE.

1 Membrane filters, Nylon



Hydrophilic, durable and compatible with a wide range of aqueous solutions, organic solvents and for the filtration of biological preparations and media. Autoclavable at 121°C.

GE Healthcare

Pore size µm	Diam. mm	PK	Cat. No.
0.20	13	100	**9.951 042**
0.20	47	100	**9.951 043**
0.20	90	50	**9.951 044**
0.45	13	100	**9.951 045**
0.45	25	100	**9.951 046**
0.45	47	100	**9.951 047**
0.45	90	50	**9.951 048**
0.80	47	100	**9.951 049**

2 Membrane filters, Grade TE, PTFE with support



GE Healthcare

Applications:
- Ideal venting filter for all applications
- For aggressive media and cryogenic liquids
- Separation of free water from organic solutions
- Outstanding as gas/liquid barrier
- Filtration of air and (hot) gases

Properties:
- Chemically inert to aqueous and organic solutions as well as concentrated acids and bases
- Hydrophobic - for aqueous filtration the pressure must be higher than the water breakthrough pressure
- Can be used up to 145°C
- Can be sterilised by all methods except gamma radiation

Type	Pore size µm	Diam. mm	PK	Cat. No.
TE 35	0.20	25	50	**9.058 682**
TE 35	0.20	47	50	**9.058 683**
TE 35	0.20	50	50	**9.058 684**
TE 36	0.45	47	50	**9.058 663**
TE 36	0.45	50	50	**9.058 664**
TE 37	1.00	25	50	**9.058 642**
TE 37	1.00	47	50	**9.058 643**
TE 37	1.00	50	50	**9.058 644**
TE 38	5.00	47	50	**9.058 623**
TE 38	5.00	50	50	**9.058 624**

3 Membrane filters, PTFE, WTP



With PP backing.

GE Healthcare

Pore size µm	Diam. mm	PK	Cat. No.
0.20	25	100	**9.951 029**
0.20	47	100	**9.951 030**
0.50	47	100	**9.951 031**
1.00	47	100	**9.951 033**

4 Membrane filters, inorganic, Anodisc®



Material: Anopore®. White.

GE Healthcare

The inorganic membrane Anopore® consists of high-purity aluminium oxide and can be used for a wide range of applications. The unique material has a precise, non-deformable honeycomb structure with a narrow pore size distribution range that guarantees very efficient particle retention. In addition, the membrane has a low protein binding capacity, minimal autofluorescence, is non-toxic and supports cellular growth.

Pore size µm	Diam. mm	PK	Cat. No.
0.02	13	100	**9.951 034**
0.02	25	50	**9.951 035**
0.02	47	50	**7.604 787**
0.10	13	100	**9.951 036**
0.10	25	50	**6.235 017**
0.10	47	50	**9.951 038**
0.20	13	100	**9.951 039**
0.20	25	50	**9.951 040**
0.20	47	50	**9.951 041**

1



1 Membrane filters, cellulose nitrate

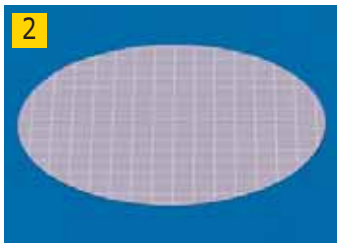
Sartorius

Type 113. White. Very low content of extractable materials. Weight constant after 60 minutes of drying at 105°C. Suitable for residue analysis, microscopic viewing in incident or transmitted light, chemotaxis, x-ray fluorescence, spectrometry and gravimetric analysis. Autoclavable at 121°C. Other pore sizes and formats are available on request.

Type	Pore size µm	Diam. mm	PK	Cat. No.
11301	8.00	25	100	**9.053 304**
11301	8.00	47	100	**9.053 308**
11301	8.00	50	100	**9.053 309**
11302	3.00	50	100	**9.053 349**
11303	1.20	25	100	**9.053 364**
11303	1.20	47	100	**9.053 368**
11303	1.20	50	100	**9.053 369**
11304	0.80	25	100	**9.053 384**
11304	0.80	47	100	**9.053 388**
11304	0.80	50	100	**9.053 389**
11306	0.45	25	100	**9.053 424**
11306	0.45	47	100	**9.053 428**
11306	0.45	50	100	**9.053 429**
11306	0.45	142	25	**9.053 432**

Other patterns are available on request.

2



2 Membrane filters Type 13005/13006, series

Sartorius

Cellulose nitrate. Grey membranes (black after wetting) with white grid. For detection of yeasts and moulds, particle analysis and microscopy.

Type	Pore size µm	Diam. mm	Description	PK	Cat. No.
13005	0.65	47	sterile	100	**9.054 122**
13006	0.45	47	sterile	100	**9.054 132**
13006	0.45	50	sterile	100	**9.054 133**
13006	0.45	50	non-sterile	100	**9.054 139**

Other types available on request.

3



3 Membrane filters, gridded Type 13806

Sartorius

Cellulose nitrate. Sterile, individually packed. Green with dark green grid. Optimal contrast to light or white bacteria colonies when colony counting.

Type	Pore size µm	Diam. mm	PK	Cat. No.
13806	0.45	47	100	**9.054 202**
13806	0.45	50	100	**9.054 203**

4



4 Membrane filters, gridded Type 13906 and 139H6

Sartorius

Cellulose nitrate. Sterile and individually packed. White with green grid. For the evaluation of microbiological and particle samples.

Type	Pore size µm	Diam. mm	Description	PK	Cat. No.
13906	0.45	47	Standard	100	**9.054 460**
13906	0.45	50	Standard	100	**9.054 462**
139H6	0.45	47	High flow	100	**9.054 464**
139H6	0.45	50	High flow	100	**9.054 465**

5



5 Membrane filters, cellulose acetate

Sartorius

Type 111. Resistant to steam sterilisation up to 134°C, or in dry heat up to 180°C. Very low adsorption (important when filtering proteinaceous solutions). Suitable for particle removal and ultracleaning of aqueous solutions, methanol, ethanol, high-grade alcohols and residue analysis of fuels and oils. The extractable content of these filters make up <1% of their weight. Other pore sizes and formats available on request.

Type	Pore size µm	Diam. mm	PK	Cat. No.
11106	0.45	25	100	**9.053 044**
11106	0.45	47	100	**9.053 048**
11106	0.45	50	100	**9.053 049**
11106	0.45	142	25	**9.053 055**
11107	0.20	25	100	**9.053 064**
11107	0.20	47	100	**9.053 068**
11107	0.20	50	100	**9.053 069**
11107	0.20	142	25	**9.053 075**

Other patterns are available on request.

1 Membrane filters, Polyamide

Type 250. Polyamide, white. For filtration of alkaline solutions and organic solvents. *Sartorius*


1

Type	Pore size µm	Diam. mm	PK	Cat. No.
2506	0.45	25	100	**9.053 227**
2506	0.45	47	100	**9.053 242**
2506	0.45	50	100	**9.053 243**
2507	0.20	25	100	**9.053 222**
2507	0.20	47	100	**9.053 223**
2507	0.20	50	100	**9.053 224**

Other patterns are available on request.

2 Membrane filters, blotting, Polycarbonate

Type 230. Polycarbonate (PC), white, non-sterile. Ultrapure, polycarbonate membrane with especially smooth surface and fine pore distribution. Applications include COD/TOC testing, particle analysis or epifluorescence microscopy. *Sartorius*



2

Type	Pore size µm	Diam. mm	PK	Cat. No.
23006	0.40	25	100	**9.049 182**
23006	0.40	47	100	**9.049 183**
23007	0.20	25	100	**9.049 180**
23007	0.20	47	100	**9.049 181**

Other patterns are available on request.

3 Nutrient pads

Sterile, dehydrated culture media pads in petri dishes. Once they are moistened with 3.0ml to 3.5ml of sterile and demineralised (or distilled) water they are ready-to-use immediately. All Nutrient Pad sets are supplied with the appropriate membrane filters, which are also individually sterile packed. Shelf life of the NPS 18 to 24 months at room temperature. Alternative nutrient media are available on request. *Sartorius*


3

Type	For	Colour	Pore size µm	PK	Cat. No.
Azide	Enterococci	Green / green	0.45	100	**9.055 006**
Endo	E. coli + Coliforms	White / green	0.45	100	**9.055 008**
Caso	Colony count	Green / green	0.45	100	**9.055 017**
Standard TTC	Colony count	Green / green	0.45	100	**9.055 010**
Tergitol TTC	E. coli + Coliforms	White / green	0.45	100	**9.055 011**
Chapman	Staphylococci	White / green	0.45	100	**9.055 032**
Wort	Yeasts and moulds	Grey / white	0.65	100	**9.055 013**
ECD	E. coli	White / green	0.45	100	**9.055 025**
VLB S7-S	Pediococci and Lactobacilli	White / green	0.45	100	**9.055 014**
Caso	Colony count	Green / green	0.45	100	**9.055 018**
Glucose-Tryptone	thermophilic spore formers, mesophilic bacteria	White / green	0.45	100	**9.055 020**
M-FC	E. coli + Coliforms	White / green	0.45	100	**9.055 022**
Tomato juice	Leuconostocoenos	Green / green	0.45	100	**9.055 026**
Lysin	wild yeasts	Grey / white	0.65	100	**9.055 015**
Sabouraud	Yeast + mould	Grey / green	0.65	100	**9.055 023**
Mac Conkey	Enterobacteria	White / green	0.45	100	**9.055 027**
Cetrimide	Pseudomonas	White / green	0.45	100	**9.055 031**
Schaufus Pottinger	Yeast + mould	White / green	0.65	100	**9.055 034**
Yeast extract	Colony count	Green / green	0.45	100	**9.055 037**
*Schaufus Pottinger	Yeasts and moulds	White / green	1.20	100	**9.055 028**
Weman	Mesophilic slime-forming bacteria	Green / green	0.45	100	**9.055 019**
Bismuth sulphite	Salmonellae	Green / green	0.45	100	**9.055 012**

* also available in 1.2µm (white/green), 0.8µm (grey/white) and 0.65µm (white/green) versions.

Transfer membranes please see page 1263.

LLG-Syringe Filters

We offer a line of syringe filters especially designed to provide efficient filtration of a broad variety of fluids, solvents, aqueous or inorganic solutions. Our syringe filters cover most applications in HPLC, pharmaceutical, environmental, biotechnology and food and beverage testing laboratories.

- Housing injected in Polypropylene or MABS
- Multifunctional Syringe filters equipped with Female Luer-Lock/Male Luer Lock or Male Luer Slip connections for different applications
- Pre-sterilised or non-sterile
- Sterile products in individual hard blister
- Superior pressure stability
- Easy to identify because of colour code and printed description

1



9.055 500

2



9.055 503

3



9.055 520

4



9.055 530

5



9.055 541

LLG-Syringe Filters, non sterile

Membrane	Pore size µm	Housing	Diam. mm	PK	Cat. No.	
CA	0.20	Acrylic, blue	13	500	**9.055 500**	1
CA	0.20	Acrylic, blue	25	500	**9.055 501**	
CA	0.45	Acrylic, yellow	13	500	**9.055 502**	
CA	0.45	Acrylic, yellow	25	500	**9.055 503**	2
CA	0.80	Acrylic, green	13	500	**9.055 504**	
CA	0.80	Acrylic, green	25	500	**7.970 389**	
Nylon	0.20	PP	13	500	**9.055 520**	3
Nylon	0.20	PP	25	500	**9.055 521**	
Nylon	0.45	PP	13	500	**9.055 522**	
Nylon	0.45	PP	25	500	**9.055 523**	
RC	0.20	PP	13	500	**9.055 530**	4
RC	0.20	PP	25	500	**9.055 531**	
RC	0.45	PP	13	500	**9.055 532**	
RC	0.45	PP	25	500	**9.055 533**	
PE	0.20	PP	13	500	**9.055 540**	
PE	0.20	PP	25	500	**9.055 541**	5
PE	0.50	PP	13	500	**9.055 542**	
PE	0.50	PP	25	500	**9.055 543**	
PTFE	0.20	PP	13	500	**7.970 402**	
PTFE	0.20	PP	25	500	**9.055 535**	
PTFE	0.45	PP	13	500	**7.970 385**	
PTFE	0.45	PP	25	500	**6.255 331**	
PES	0.20	Acrylic	13	500	**9.055 524**	
PES	0.20	Acrylic	25	500	**9.055 525**	
PES	0.45	Acrylic	13	500	**9.055 526**	
PES	0.45	Acrylic	25	500	**7.970 213**	
PVDF	0.20	PP	13	500	**7.970 258**	
PVDF	0.20	PP	25	500	**7.970 387**	
PVDF	0.45	PP	13	500	**9.055 534**	
PVDF	0.45	PP	25	500	**7.970 286**	
GF	0.70	PP	25	500	**9.055 550**	
GF	1.00	PP	25	500	**9.055 551**	
GF	1.20	PP	25	500	**9.055 552**	
GF	3.10	PP	25	500	**9.055 553**	

6



7



6 7 LLG-Syringe Filters, CA, sterile

Membrane	Pore size µm	Diam. mm	Colour	PK	Cat. No.
CA	0.20	13	blue	50	**9.055 510**
CA	0.20	25	blue	50	**9.055 511**
CA	0.45	13	yellow	50	**9.055 512**
CA	0.45	25	yellow	50	**9.055 513**

Disposable syringes please see page 1406.

E & OE.

Ready-to-use filter units, Specifications

For the ready-to-use filter units only virgin raw material is used. This ensures that there is no interaction with the sample to be filtered, provided that the units are used properly. The filter units are intended for laboratory use only and at temperatures up to 60°C.
Note: If syringes with a volume <10 ml are used, a pressure could be created which exceeds the max. operating pressure (700 kPa/7 bar) of the filter unit.
Filters with integral pre-filter have a higher hold-up volume.
EtO-sterilized = endotoxin free according to LAL-Test (USPXXIII),
Sensitivity: 0.25EU/ml.

1 2 Syringe filters Puradisc 4™

GE Healthcare

For the filtration of sample volumes below 2ml. High sample recovery is achieved because of the extremely low residual volume, which is very important when dealing with expensive samples. Available with a wide variety of membranes, both sterile and non-sterile.
- Housing PP
- Filtration area 0.2cm²
- Max. pressure 5 bar
- Residual volume <10µl
- Inlet female luer-lock
- Outlet luer cone or extended tip
- Autoclavable at 121°C


1



2

Media type	Pore size µm	Type	PK	Cat. No.
PVDF	0,2	non sterile	100	**9.951 222**
PVDF	0,2	sterile	50	**9.951 221**
PVDF	0,45	non sterile	100	**9.951 224**
PVDF w/t	0,2	non sterile	50	**9.951 213**
PVDF w/t	0,45	non sterile	50	**9.951 215**
PTFE	0,2	non sterile	100	**9.951 252**
PTFE	0,45	non sterile	100	**9.951 253**
Nylon	0,2	sterile	50	**9.951 264**
Nylon	0,2	non sterile	100	**9.951 265**

3 Syringe filters Puradisc 13™

Membrane with 13mm diameter.

GE Healthcare



3

Media type	Pore size µm	Type	PK	Cat. No.
PVDF	0.2	sterile	50	**9.951 226**
PVDF	0.2	non-sterile	100	**9.951 227**
PVDF	0.45	sterile	50	**9.951 228**
PVDF	0.45	non-sterile	100	**9.951 229**
PVDF w/t	0.2	non-sterile	50	**9.951 218**
PVDF w/t	0.45	non-sterile	50	**9.951 220**
PTFE	0.1	non-sterile	100	**9.951 255**
PTFE	0.2	non-sterile	100	**9.951 256**
PTFE	0.45	non-sterile	100	**9.951 257**
PTFE	1.0	non-sterile	100	**9.951 258**
PTFE w/t	0.2	non-sterile	50	**9.951 249**
PTFE w/t	0.45	non-sterile	50	**9.951 250**
Polysulphone	0.2	sterile	50	**9.951 238**
Polysulphone	0.2	non-sterile	100	**9.951 239**
Polysulphone	0.45	sterile	50	**9.951 240**
Polysulphone	0.45	non-sterile	100	**9.951 241**
Polypropylene	0.2	non-sterile	100	**9.951 245**
Polypropylene	0.45	non-sterile	100	**9.951 246**
Nylon	0.2	sterile	50	**9.951 267**
Nylon	0.2	non-sterile	100	**9.951 268**
Nylon	0.45	sterile	100	**9.951 269**
Glass microfibre media GF/A	1.6*	non-sterile	100	**9.951 275**
Glass microfibre media GF/C	1.2*	non-sterile	100	**9.951 276**
Glass microfibre media GF/D	2.7*	non-sterile	100	**9.951 277**
Glass microfibre media GF/F	0.7*	non-sterile	100	**9.951 278**

* Particle retention rating

4 Puradisc™ 25 NYL series syringe filters

Nylon membrane in polypropylene casing. For water and solvent-based HPLC sample filtration.

GE Healthcare


4

Type	Pore size µm	PK	Cat. No.
Non-sterile	0.20	50	**9.951 065**
Non-sterile	0.20	200	**9.951 066**
Non-sterile	0.45	50	**9.951 067**
Non-sterile	0.45	200	**9.951 068**



1 Puradisc™ 25 TF series syringe filters

PTFE membrane in polypropylene casing. Suitable for HPLC sample filtration (solvent-based). Ultra-cleaning of organic solvents and aggressive solutions, including acids and alkalis.

GE Healthcare

Type	Pore size µm	PK	Cat. No.
Non-sterile	0.20	50	**9.951 069**
Non-sterile	0.20	200	**9.951 070**
Non-sterile	0.45	50	**9.951 071**
Non-sterile	0.45	200	**9.951 072**
Non-sterile	1.00	50	**9.951 073**



2 Puradisc™ 25 PP series syringe filters

Polypropylene membrane and casing. Suitable for HPLC sample filtration (water-based). Purification of reagents and buffers. Filtration of aggressive water solutions, such as acids and alkalis.

GE Healthcare

Type	Pore size µm	PK	Cat. No.
Non-sterile	0.20	50	**9.951 074**
Non-sterile	0.20	200	**9.951 075**
Non-sterile	0.45	50	**9.951 076**
Non-sterile	0.45	200	**9.951 077**



3 Puradisc™ 25 series syringe filters

Polysulphone membrane in acrylic housing. Suitable for sterilisation and filtration of tissue culture media, antibody and enzyme solutions and aqueous protein solutions. Sterile filters are individually wrapped.
With 25mm filter syringe which has a low hold-up volume to provide maximum sample recovery. Connections: female luer lock, male slip luer connector. Filtration capacity up to 100ml.

GE Healthcare

Pore size µm	Membrane	Type	PK	Cat. No.
0.20	PES	Sterile	50	**9.951 061**
0.45	PES	Sterile	50	**9.951 062**
0.20	PS	Non-sterile	200	**9.951 063**
0.45	PS	Non-sterile	200	**9.951 064**



4 Disposable vacuum filter units FP

GE Healthcare

Housing type A + B:

Type:	30mm
Effective filter area:	5.7cm²
Hold-up volume after air cleaning:	≤ 50µl
Inlet:	Luer-Lock Inner cone (female)
Outlet A:	Luer slip cone (male)
Outlet B:	Luer-Lock outer cone (male)

Description	Housing	PK	Cat. No.
FP 30/5.0 CN-S	A	50	**9.049 911**
FP 030/0.45 CA-S	A	50	**9.049 912**
FP 030/0.2 CA-S	A	50	**9.049 913**
FP 30/0.8 CA-S	A	50	**9.049 915**
FP 030/0.8 CA	A	50	**9.049 936**
FP 030/1.2 CA-S	A	50	**9.049 916**
FP 30/1.2 CA	A	50	**9.049 937**
FP 030/0.2 PTFE-S	A	50	**9.049 918**
FP 30/5.0 CN	A	500	**9.603 581**
FP 030/5.0 CN	A	50	**9.049 931**
FP 030/0.45 CA	A	500	**9.049 933**
FP 030/0.45 CA	A	50	**9.049 932**
FP 030/0.8 CA	A	100	**9.049 927**
FP 30/0.2 CA	A	500	**9.603 584**
FP 030/0.2 CA	A	50	**9.049 934**
FP 30/0.2 CA	A	100	**9.603 585**
FP 030/0.2 CA-S	B	50	**9.049 917**

E & OE.

1 Inorganic membrane syringe filters, Anotop®

GE Healthcare

The Anopore® inorganic membrane consists of high-purity aluminium oxide and can be used for a wide range of applications. This unique material has a precise, non-deformable, honeycomb structure with a relatively consistent pore size that guarantees very efficient particle retention. In addition, the membrane has a low protein binding capacity, minimal autofluorescence, is non-toxic and supports cellular growth.
- Anotop® 10 Plus/25 Plus contains a glass microfiber prefilter
- Housing: PP
- Extractable materials: low
- Inlet connection: Female luer lock
- Outlet connection: Male slip luer

Housing diameter:	10mm
Extractable substances:	low
Retained volume:	< 20µl

1



Type	Pore size µm	Description	Membrane diam. mm	Residual volume ml	PK	Cat. No.
Anotop® 10	0.02	non-sterile	10	0.02	50	**9.951 186**
Anotop® 10	0.1	non-sterile	10	0.02	50	**9.951 187**
Anotop® 10	0.2	non-sterile	10	0.02	50	**9.951 188**
Anotop® 10	0.02	sterile	10	0.02	50	**9.951 189**
Anotop® 10	0.1	sterile	10	0.02	50	**9.951 190**
Anotop® 10	0.2	sterile	10	0.02	50	**9.951 191**
Anotop® 10 Plus	0.02	with prefilter	10	0.03	50	**9.951 192**
Anotop® 10 Plus	0.1	with prefilter	10	0.03	50	**9.951 193**
Anotop® 10 Plus	0.2	with prefilter	10	0.03	50	**9.951 194**
Anotop® 10 Plus	0.02	with prefilter, sterile	10	0.03	50	**9.951 195**
Anotop® 10 Plus	0.1	with prefilter, sterile	10	0.03	50	**9.951 196**
Anotop® 10 Plus	0.2	with prefilter, sterile	10	0.03	50	**9.951 197**
Anotop® 25	0.02	non-sterile	25	0.15	50	**9.951 198**
Anotop® 25	0.1	non-sterile	25	0.15	50	**9.951 199**
Anotop® 25	0.2	non-sterile	25	0.15	50	**9.951 200**
Anotop® 25	0.2	non-sterile	25	0.15	200	**9.951 201**
Anotop® 25	0.02	sterile	25	0.15	50	**9.951 202**
Anotop® 25	0.1	sterile	25	0.15	50	**9.951 203**
Anotop® 25	0.2	sterile	25	0.15	50	**9.951 204**
Anotop® 25 Plus	0.02	with prefilter	25	0.20	50	**9.951 205**
Anotop® 25 Plus	0.1	with prefilter	25	0.20	50	**9.951 206**
Anotop® 25 Plus	0.2	with prefilter	25	0.20	50	**9.951 207**
Anotop® 25 Plus	0.2	with prefilter	25	0.20	200	**9.951 208**
Anotop® 25 Plus	0.02	with prefilter, sterile	25	0.20	50	**9.951 209**
Anotop® 25 Plus	0.1	with prefilter, sterile	25	0.20	50	**9.951 210**
Anotop® 25 Plus	0.2	with prefilter, sterile	25	0.20	50	**9.951 211**

2 3 4 Syringe filters GD/X®

GE Healthcare

Whatman GD/X syringe filters are the perfect solution for samples with high viscosity or samples that contain particles. Four filter layers decrease clogging and therefore filter exchange during processing is avoided.
These filters allow 3 to 7 times higher throughput than traditional types. 25mm diameter. Non-sterile.

Pore size µm	Membrane	PK	Cat. No.
0.20	Nylon	150	**9.056 820**
0.45	Nylon	150	**9.056 821**
0.20	PVDF	150	**9.056 822**
0.45	PVDF	150	**9.056 823**
0.20	RC	150	**9.056 807**
0.45	RC	150	**9.056 809**
0.45	RC	1500	**9.056 810**

2



3



4



Disposable syringes please see page 1406.

1



1 Syringe filters, disposable, Spartan® range

GE Healthcare

Versatile use - ready-to-use filter units with a hydrophilic, low protein-binding membrane made of regenerated cellulose.
First class chemical resistance against the usual aqueous and organic HPLC solvents
- Spartan® 13 and 30 are tested and certified for UV adsorbance substances at wavelengths of 210nm and 254nm with water, methanol and acetonitrile;
- Spartan® 13 has an extremely low hold up volume; <10µl, for optimal filtration

Applications:
Ideal for HPLC sample preparation to achieve reproducible results. Carefully controlled manufacture guarantees lowest traces of UV- absorbing, extractable components.

Type	Diam. mm	Pore size µm	Connection in / out	PK	Cat. No.
13 RC	13	0.20	LLF/LM	100	**9.049 948**
13 RC	13	0.20	LLF/LM	500	**9.049 980**
13 RC	13	0.20	LLF/Mini-Tip	100	**9.049 943**
13 RC	13	0.20	LLF/Mini-Tip	500	**9.049 951**
13 RC	13	0.45	LLF/LM	100	**9.049 949**
13 RC	13	0.45	LLF/Mini-Tip	100	**9.049 944**
13 RC	13	0.45	LLF/Mini-Tip	500	**9.049 950**
30 RC	30	0.20	LLF/LM	100	**9.049 941**
30 RC	30	0.20	LLF/LM	500	**9.049 965**
30 RC	30	0.45	LLF/LM	50	**9.049 960**
30 RC	30	0.45	LLF/LM	100	**9.049 942**
30 RC	30	0.45	LLF/LM	500	**9.049 959**

LLF = luer-lock female
LM = luer male

2



2 Syringe filters, Minisart NML

Sartorius

For sterile, particle free, ultrapure filtration of small volumes of liquid up to approx. 100ml. Colour coded pore sizes for ease of identification. With hydrophilic cellulose acetate membrane for minimum adsorption. Ready-to-use immediately. With female luer-lock inlet, male luer slip outlet.

Application:

Sterile filtration	0.2 µm pore size
High purification	0.45 µm pore size
Ultrafiltration	1.2 µm pore size
Pre-filtration	5 µm pore size

Pore size µm	Diam. mm	Colour	PK	Cat. No.
0.20	26	blue	50	**9.049 101**
0.20	26	blue	500	**9.049 107**
0.45	26	yellow	50	**9.049 102**
0.45	26	yellow	500	**9.049 108**
0.80	26	green	50	**9.049 103**
0.80	26	green	500	**9.049 109**
1.20	26	red	50	**9.049 104**
1.20	26	red	500	**9.049 122**
5.00	26	brown	50	**9.049 105**
5.00	26	brown	500	**9.049 123**

3



3 Syringe filters, Minisart High-Flow

Sartorius

Sartorius Minisart high-flow syringe attachment for sterile filtration of solutions across a wide pH range. With asymmetric polyethersulfone (PES) membrane for optimum flow performance, high throughput, low adsorption and excellent chemical resistance.

Pore size µm	Diam. mm	Colour	PK	Cat. No.
0.10	25	aubergine	50	**9.049 866**
0.20	26	blue	50	**9.049 129**
0.20	26	blue	500	**9.049 130**
0.45	26	yellow	50	**9.049 865**

E & OE.

1 Syringe filters, Minisart-plus

Sartorius

The only difference between the Sartorius Minisart-plus and the standard Minisart NML is an additional glass fibre pre-filter which enables a greater filtration volume for liquids which are difficult to filter. Available sterile, single-wrapped or non-sterile, bulk-wrapped, in outer packs as indicated.



Pore size µm	Diam. mm	Colour	Description	PK	Cat. No.
0.20	26	blue	sterile	50	**9.049 118**
0.20	26	blue	non sterile	500	**9.049 126**
0.45	26	yellow	sterile	50	**9.049 127**
0.45	26	yellow	non sterile	500	**9.049 128**

2 Syringe filters, Minisart GF

Sartorius

Sartorius Minisart-GF contains a single, binding agent-free, glass fibre pre-filter for ultrafiltration. Available sterile, single-wrapped or non-sterile, bulk-wrapped, in outer packs as indicated with a support achievement of 99% for 40µm spherical particles.



Diam. mm	Colour	PK	Cat. No.
26	white	50	**9.049 119**
26	white	500	**9.049 120**

3 Syringe filters, Minisart RC

Sartorius

Ready-to-use units with a hydrophilic, solvent-resistant membranes made of regenerated cellulose, making sample preparation quick and easy. Suitable for aqueous/organic solutions. With female luer-lock inlet, male luer slip outlet. Non-sterile.



Type	Pore size µm	Diam. mm	PK	Cat. No.
Minisart RC 4	0.20	4	50	**9.049 081**
Minisart RC 4	0.20	4	500	**9.049 082**
Minisart RC 4	0.45	4	50	**9.049 084**
Minisart RC 4	0.45	4	500	**9.049 085**
Minisart RC 15	0.20	15	50	**9.049 087**
Minisart RC 15	0.20	15	500	**9.049 088**
Minisart RC 15	0.45	15	50	**9.049 091**
Minisart RC 15	0.45	15	500	**9.049 092**
Minisart RC 25	0.20	25	50	**9.049 094**
Minisart RC 25	0.20	25	500	**9.049 095**
Minisart RC 25	0.45	25	50	**9.049 097**
Minisart RC 25	0.45	25	500	**9.049 098**

4 Syringe filters, Minisart SRP

Sartorius

With a chemical-resistant, hydrophobic PTFE membrane for high purification of solvents or aggressive liquids in HPLC or GC analysis. Low adsorption. With female luer-lock inlet, male luer slip outlet. Non-sterile.



Type	Pore size µm	Diam. mm	PK	Cat. No.
Minisart SRP 4	0.45	4	50	**9.049 146**
Minisart SRP 4	0.45	4	500	**9.049 147**
Minisart SRP 15	0.45	15	50	**9.604 024**
Minisart SRP 15	0.45	15	500	**9.049 073**
Minisart SRP 25	0.45	25	50	**9.049 116**
Minisart SRP 25	0.45	25	500	**9.049 117**

Minisart SRP 15 and SRP 25 are also available in 0.2µm pore sizes (and sterile).

Disposable syringes please see page 1406.

Syringe filters CHROMAFIL®

MACHEREY-NAGEL

CHROMAFIL® filters are available with pore sizes of 0.2µm and 0.45µm (exceptions: PET filters have 1.2µm, glass fibre filters have 1µm) and filter sizes of 25mm, 15mm and 3mm diameter. The small diameter filters are especially recommended for very small samples, which require extremely low dead volumes.

Specifications
The membrane housing consists of polypropylene (PP). This material is very resistant towards most solvents and has a very low extractable substances content. Thus it can be used with almost all solvents, acids and bases (see table). The especially thick rim of the housing is ideal for use with laboratory robots (e.g. Benchmate™). Filter inlet and filter outlet can be fitted to the CHROMABOND® columns for selective sample preparation with the aid of a special adaptor. All filters can be autoclaved at 121°C and 1.1bar for 30min.

Applications
A choice of filter membranes made from different materials are available for solving most filtration problems:

- Cellulose mixed esters
- Cellulose acetate
- Regenerated cellulose
- Polyamide
- PTFE
- Polyester
- Glass-fibre

Syringe filters CHROMAFIL®

MACHEREY-NAGEL

General
CHROMAFIL® syringe filters are used for filtration of suspended matter from liquid samples.
Advantages:
HPLC-Certification
available on the internet
Polypropylene housing
better solvent stability compared to acrylate and polystyrene filters
Shells ultrasonically sealed, not glued
no extractable components from glues
Filtration in both directions possible, the liquid cannot bypass the membranes
Luer lock on side of entry
safe connection on the "high pressure" side
Luer exit
standard luer for 3mm and 25mm filters, minispike luer with low dead volume and small OD for 15mm filters
Deflector
the stream of liquid is broken and distributed, and does not directly hit the membrane: this prevents rupture of the membrane
Star-shaped distribution device
the liquid is evenly distributed to the whole membrane surface: this results in a better utilisation of the total area; the filter is not rapidly clogged up; high flow efficiency
Colour coded
filters with 0.2µm pores have a yellow upper housing, for filters with 0.45µm pores this is colourless; the different membrane types are distinguished by different colours
Low dead volume
~80µl for 25mm, 12µl for 15mm, 5µl for 3mm.

Further CHROMAFIL® filters - please see chapter Chromatography.

1



1 Syringe filters CHROMAFIL® CA, , Cellulose acetat

MACHEREY-NAGEL

Cellulose acetate
This membrane features excellent shape stability in aqueous solutions and a very low binding capacity for proteins.

Type	Pore size µm	Membrane dia. mm	Housing colour top	Housing colour base	PK	Cat. No.
CA-20 / 25	0.20	25	yellow	red	100	**9.049 038**
CA-20 / 25	0.20	25	yellow	red	400	**9.049 039**
CA-45 / 25	0.45	25	natural	red	100	**9.049 040**
CA-45 / 25	0.45	25	natural	red	400	**9.049 041**

BIG-BOX: 9.049 039/9.049 041

E & OE.

1 Syringe filters CHROMAFIL® MV, Cellulose mixed ester



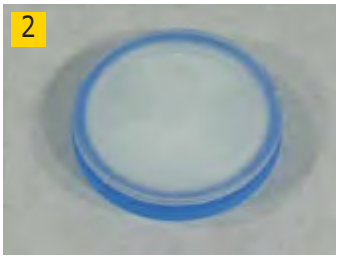
Cellulose mixed ester *MACHEREY-NAGEL*

This membrane is recommended for all filtrations in aqueous or polar organic samples.

Pore size µm	Membrane dia. mm	Housing colour top	Housing colour base	PK	Cat. No.
0.20	25	yellow	yellow	100	**9.049 030**
0.20	25	yellow	yellow	400	**9.049 031**
0.45	25	colourless	yellow	100	**9.049 032**
0.45	25	colourless	yellow	400	**9.049 033**

BIG-BOX: 9.049 031/9.049 033

2 Syringe filters CHROMAFIL® RC, regenerated cellulose



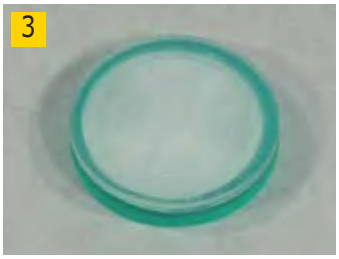
Regenerated cellulose *MACHEREY-NAGEL*

This hydrophilic membrane features very low adsorption. It is recommended for filtration of aqueous and organic/aqueous liquids.

Type	Membrane dia. mm	Pore size µm	Housing colour top	Housing colour base	PK	Cat. No.
RC-20 / 25	25	0.20	yellow	blue	100	**9.049 042**
RC-20 / 25	25	0.20	yellow	blue	400	**9.049 043**
RC-45 / 25	25	0.45	natural	blue	100	**9.049 044**
RC-45 / 25	25	0.45	natural	blue	400	**9.049 046**

BIG-BOX: 9.049 043/9.049 046

3 Syringe filters CHROMAFIL® PA, Polyamide



Polyamide *MACHEREY-NAGEL*

Nylon - this is a rather hydrophilic membrane; it is recommended for filtration of aqueous and organic/aqueous medium polar liquids.

Type	Pore size µm	Membrane dia. mm	Housing colour top	Housing colour base	PK	Cat. No.
AO- 20 / 25	0.20	25	yellow	green	100	**9.049 049**
AO- 20 / 25	0.20	25	yellow	green	400	**9.049 050**
AO- 45 / 25	0.45	25	natural	green	100	**9.049 051**
AO- 45 / 25	0.45	25	natural	green	400	**9.049 052**

BIG-BOX: 9.049 050/9.049 052

4 Syringe filters CHROMAFIL® PTFE, Polytetrafluoroethylene



Polytetrafluoroethylene *MACHEREY-NAGEL*

A hydrophobic membrane. Ideal for filtration of non-polar liquids and gases. It is very resistant to varous solvents as well as acids and bases. By flushing with alcohol, followed by water, the originally hydrophobic membrane can be made more hydrophilic.

Type	Pore size µm	Membrane dia. mm	Housing colour top	Housing colour base	PK	Cat. No.
O-20 / 25	0.20	25	yellow	natural	100	**9.049 057**
O-20 / 25	0.20	25	yellow	natural	400	**9.049 058**

BIG-BOX: 9.049 058

Disposable syringes please see page 1406.

1



1 Syringe filters CHROMAFIL®, PET, Polyester

Polyester *MACHEREY-NAGEL*

This membrane features outstanding chemical resistance and is suited for polar as well as non-polar solvents. This all-purpose membrane is recommended for filtration of aggressive media, for dust and aerosol analyses, ultrapurification of solvents etc. It is very well suited for TOC/DOC determination. The membrane is not cytotoxic and does not inhibit the growth of microorganisms and cells.
Polyester filters with integrated glass fibre prefilters (GF/PET): recommended for solutions with a high load of particulate matter or for highly viscous solutions.

MS: Mini tip on the outlet

Type	Pore size µm	Membrane dia. mm	Housing colour top	Housing colour base	PK	Cat. No.
PET- 20 / 15 MS	0,20	15	yellow	orange	100	**9.049 065**
PET- 45 / 15 MS	0,45	15	natural	orange	100	**9.049 066**
PET- 20 / 25	0,20	25	yellow	orange	100	**9.049 067**
PET- 20 / 25	0,20	25	yellow	orange	400	**9.049 068**
PET- 45 / 25	0,45	25	natural	orange	100	**9.049 069**
PET- 45 / 25	0,45	25	natural	orange	400	**9.049 070**
GF / PET- 20 / 25	1,0/0,20	25	blue	orange	100	**9.049 079**
GF / PET- 45 / 25	1,0/0,45	25	black	orange	100	**9.049 080**

BIG-BOX: 9.049 068/9.049 070

2



2 Syringe filters CHROMAFIL® PES, Polyethersulphone

Polyethersulphone *MACHEREY-NAGEL*

Hydrophilic membrane for aqueous and light organic solutions with a low binding capacity for proteins. This membrane has extremely low extractable levels and is ideal for ionic chromatography and organic solutions.

3



3 Syringe filters CHROMAFIL® GF, glass-fibre

Glass-fibre *MACHEREY-NAGEL*

The nominal pore size of these filters is 1µm. They can be used for solutions with high particulate loads or for highly viscous solutions (e.g. soil samples, fermentation broths) either alone or in combination with other CHROMAFIL® filters. When membrane filters are combined with glass-fibre filters, they prevent clogging of the membrane. Used alone, glass-fibre filters allow higher flow rates than a 0.45µm filter for instance.

Type	Pore size µm	Membrane dia. mm	Housing colour top	Housing colour base	PK	Cat. No.
GF-100 / 25	1.00	25	yellow	black	100	**9.049 078**

4



4 Syringe filters for cleaning, non-sterile, CA/PP

Autoclavable. Cellulose acetate membrane (CA). *Thermo Scientific*

Applications: Cleaning of small volumes of immunological reagents, enzymes and antibodies.

Sample volume ml	Membrane / housing	Pore size µm	Membrane diam. mm	PK	Cat. No.
1 to 2	C.A. / PP	0.20	4	100	**9.046 191**

5



5 Syringe filters, non-sterile, Type 176, Nylon/PP

Autoclavable. *Thermo Scientific*
Applications: Pre-filtration and ultrafiltration of aqueous solutions, HPLC and GC solvents and DMSO.

Type	Sample volume ml	Membrane / housing	Pore size µm	Membrane diam. mm	PK	Cat. No.
176	0.5 to 1	Nylon / PP	0.20	4	100	**9.046 196**
176	0.5 to 1	Nylon / PP	0.45	4	100	**9.046 197**

E & OE.

1 Syringe filters, sterile, SFCA/Acrylic

Individually blister-packed, colour-coded blue. *Thermo Scientific*
Applications: Sterile filtration of microbiological media, proteinaceous solutions and tissue culture reagents.

Sample volume ml	Membrane / housing	Pore size µm	Membrane diam. mm	PK	Cat. No.
10 to 50	SFCA / Acrylic	0.20	25	50	**9.046 166**

1



2 Syringe filters, sterile, SFCA/Acrylic

Individually blister-packed, colour-coded blue. *Thermo Scientific*
Applications: Pre-filtration and ultrafiltration of aqueous solutions and alcohols, pre-filtration of serum and other samples containing protein. Note: do not autoclave.

Sample volume ml	Membrane / housing	Pore size µm	Membrane diam. mm	PK	Cat. No.
10 to 50	SFCA / Acrylic	0.45	25	50	**9.046 167**

2



3 Syringe filters to series filtration, sterile, CA/Acrylic

Individually blister-packed, colour-coded blue. *Thermo Scientific*
Areas of application: Pre-filtration, series filtration and ultrafiltration of aqueous solutions, serum and alcohols. Separation of cell residues. Note: do not autoclave.

Sample volume ml	Membrane / housing	Pore size µm	Membrane diam. mm	PK	Cat. No.
10 to 50	C.A. / Acrylic	0.80	25	50	**9.046 168**

3



4 Syringe filters, Type 195, sterile, Nylon/PP

Individually blister-packed. *Thermo Scientific*
Applications: Sterilization of tissue culture media, ultrafiltration of aqueous solutions, HPLC solvents, alcohols and DMSO. Hydrophilic.

Type	Sample volume ml	Membrane / housing	Pore size µm	Membrane diam. mm	PK	Cat. No.
195	10 to 50	Nylon / PP	0.45	25	50	**7.047 850**
195	10 to 50	Nylon / PP	0.20	25	50	**9.046 176**

4



5 Syringe filters, Type 191, non-sterile, SFCA/Acrylic

Colour-coded blue. *Thermo Scientific*
Applications: Pre-filtration, serial filtration and ultrafiltration of aqueous solutions, serum and alcohols. Removal of cell residues.

Type	Sample volume ml	Membrane / housing	Pore size µm	Membrane diam. mm	PK	Cat. No.
191	10 to 50	SFCA / Acrylic	0.20	25	50	**9.046 171**
191	10 to 50	SFCA / Acrylic	0.45	25	50	**9.046 172**
191	10 to 50	C.A. / Acrylic	0.80	25	50	**9.046 173**

5



6 Syringe filters, non-sterile, Nylon/PP

Autoclavable, colour-coded red. *Thermo Scientific*

Applications: Cleaning of aqueous solutions, HPLC solutions, alcohols and DMSO. Hydrophilic.

Sample volume ml	Membrane / housing	Pore size µm	Membrane diam. mm	PK	Cat. No.
10 to 50	Nylon / PP	0.20	25	50	**9.046 181**

6



Disposable syringes please see page 1406.

1



1 Syringe filters, non-sterile, Nylon/PP

Autoclavable, colour-coded black. *Thermo Scientific*
Applications: Pre-filtration and ultrafiltration of aqueous solutions, HPLC solutions, alcohols and DMSO. Hydrophilic.

Sample volume ml	Membrane / housing	Pore size µm	Membrane diam. mm	PK	Cat. No.
10 to 50	Nylon / PP	0.45	25	50	**9.046 182**

2



2 Syringe filters, Type 199, non-sterile, PTFE/PP

Autoclavable, colour-coded black. *Thermo Scientific*
Applications: Pre-filtration and ultrafiltration of organic solutions and alcohols, sterile filtration of air or other gases.

Type	Sample volume ml	Membrane / housing	Pore size µm	Membrane diam. mm	PK	Cat. No.
199	10 to 50	PTFE / PP	0.20	25	50	**9.046 187**
199	10 to 50	PTFE / PP	0.45	25	50	**9.046 188**

3



3 Syringe filters, disposable, ReZist®

- Hydrophobic PTFE-membrane, laminated with polypropylene *GE Healthcare*
- first class chemical resistance opposite to common organic HPLC solvents

Application:
Filtration of aggressive solutions.
GF9 membrane to the prefiltration of loaded solutions.

Type	Pore size µm	Diam. mm	Connection in / out	PK	Cat. No.
13 PTFE	0.20	13	LLF/Mini-Tip	100	**9.049 981**
13 PTFE	0.45	13	LLF/Mini-Tip	100	**9.049 982**
30 PTFE-S	0.20	30	LLF/LLM	50	**9.049 955**
30 PTFE	0.20	30	LLF/LLM	100	**9.049 961**
30 PTFE	0.20	30	LLF/LLM	500	**9.049 990**
30 PTFE	0.45	30	LLF/LLM	100	**9.049 962**
30 PTFE	0.45	30	LLF/LLM	500	**9.049 991**
30 PTFE	1.00	30	LLF/LLM	100	**9.049 963**
30 PTFE	1.00	30	LLF/LLM	500	**9.049 992**
30 PTFE	5.00	30	LLF/LLM	100	**9.049 964**
30 PTFE	5.00	30	LLF/LLM	500	**9.049 993**
30/GF92		30	LLF/LLM	100	**9.049 996**
30/GF92		30	LLF/LLM	500	**9.049 997**

LLF = luer-lock female
LLM = luer-lock male

4



4 Syringeless filters, Autovial™

Provides a single disposable, manual pressure filtration system which is fast and easy to use in sample preparation. *GE Healthcare*
- Built-in pre-filter for 'difficult' samples
- Minimal waste

Comprise a graduated, medical grade PP barrel, maximum capacity 12ml with 3cm² filter at the base, luer slip outlet and plunger. Non-sterile

Membrane	Pore size µm	PK	Cat. No.
PVDF	0.2	50	**9.951 174**
PVDF	0.45	50	**9.951 175**
Nylon	0.45	50	**9.951 176**
PTFE	0.2	50	**9.951 177**
PTFE	0.45	50	**9.951 178**

E & OE.

1 Syringeless filters, UniPrep™

GE Healthcare

Comprise a 5ml capacity, medical grade polypropylene test tube which initially holds the sample, and hollow plunger incorporating a filter at the tip. In use the sample is manually pressure filtered into the plunger which then acts as a storage vial for the filtered sample. The plunger has a removable cap. Non-sterile.



Membrane	Pore size µm	PK	Cat. No.
Nylon	0.45	50	**9.951 180**
PTFE	0.45	50	**9.951 181**
Glass microfibre	0.45	50	**9.951 179**

2 3 Syringeless filters Mini-UniPrep™

GE Healthcare

The Whatman Mini-UniPrep™ filter provides a quick and easy means of removing particles from HPLC samples. In comparison to other methods the amount of time required for sample preparation is reduced to one third. Mini-Uni-Prep™ is a ready-to-use filter unit consisting of a 0.4ml chamber and a plunger. The plunger contains a filtration membrane at one end and a cap with septum at the other. The plunger is pressed through the sample in the chamber. The pressure generated forces the filtrate into the plunger reservoir, with air escaping through the vent hole until the locking mechanism engages to form an airtight seal. The unit can now be placed in any autosampler and the sample analysed. Alternatively the sample can also be removed manually with a suitable syringe and injected into the HPLC instrument.





Membrane	Pore size µm	PK	Cat. No.
PTFE	0.2	100	**9.056 824**
RC	0.2	100	**9.056 825**
RC	0.45	100	**9.056 826**
PVDF	0.45	100	**9.056 827**
DpPP	0.45	100	**9.056 828**
GMF	0.45	100	**9.056 829**
Nylon	0.45	100	**9.056 830**
PTFE	0.45	100	**9.056 831**
PP	0.45	100	**9.056 832**
RC	0.2	1000	**9.056 833**
RC	0.45	1000	**9.056 834**
PVDF	0.45	1000	**9.056 835**
Nylon	0.45	1000	**9.056 836**
PTFE	0.45	1000	**9.056 837**
PP	0.45	1000	**9.056 838**

Syringeless filters, slit septa Mini-UniPrep™

GE Healthcare

Slit septum cap enables Mini-UniPrep use with current robotics on HPLC instruments for high throughput automation
Durable yet flexible slit septum cap has been specially designed for instruments with sensitive sampling needs. Sample evaporation is minimal.

Membrane	Pore size µm	PK	Cat. No.
PVDF	0.2	100	**9.056 840**
Nylon	0.2	100	**9.056 841**
PTFE	0.2	100	**9.056 842**
Nylon	0.45	100	**9.056 843**
PTFE	0.45	100	**9.056 844**

Syringeless filters, amber Mini-UniPrep™

GE Healthcare

Amber colorant prevents photo degradation of light sensitive samples. Same colorant used in pharmaceutical containers designed to meet USP specifications for light resistance. Translucent amber chamber and plunger enable easy visual inspection

Membrane	Pore size µm	PK	Cat. No.
Nylon	0.2	100	**9.056 845**
PVDF	0.45	100	**9.056 846**
PTFE	0.45	100	**9.056 847**



1 Compressor for Mini-UniPrep™ syringeless filters

The compressor can process up to 6 samples at any one time, further improving sample processing time.

GE Healthcare

Type	PK	Cat. No.
Compressor Mini-UniPrep™	1	**9.056 839**



2 Disposable filtration capsules, Polycap TF™

Hydrophobic PTFE membrane.
- 1µm capsules incorporate a PP prefilter
- Autoclavable up to 132°C maximum

For applications involving organic solvents and chemically aggressive solutions.

GE Healthcare

Type	Description	Porosity µm	PK	Cat. No.
Polycap 36 TF	non-sterile	0.2	1	**9.951 126**
Polycap 36 TF	non-sterile	1.0	1	**9.951 127**
Polycap 75 TF	non-sterile	0.2	1	**9.951 128**
Polycap 75 TF	non-sterile	1.0	1	**9.951 129**



3 Selectron® filter holder FP 025/1

Selectron filter holder FP 025/1 in polysulphone for use with syringes for analytical and preparative use.
Filtration-media must be selected separately.

GE Healthcare

Applications:
Clarification and sterile filtration of aqueous liquids and gases.

Specifications:

Max. pressure:	7 bar
Max. temperature:	180°C
Filter dia.:	25mm

Type	PK	Cat. No.
FP 025/1	10	**9.603 181**



9.603 205

Selectron® filter holder FP 050/1

Application:
Selectron filter holders FP 050/1 are for sampling and for flow rate applications.
Ideal for filtrations using peristaltic pumps and for gas sterilisation.

GE Healthcare

Specifications:

Max. pressure:	7 bar
Max. temperature:	180°C
Filter diameter:	50mm

Type	Description	PK	Cat. No.
FP 050/1	with 2 olive connection	1	**9.603 205** 4



5 Membrane filter holders, syringe, Type 165

Type 165. PC. Reusable filter holder, without filter. Filter has to be selected separately. For particle removal, sterile filtration of aqueous solutions or for venting of sterile vessels. Autoclavable. With Luer connection.

Sartorius

Diam. mm	PK	Cat. No.
13	12	**9.049 241**
25	12	**9.049 242**

1 In-line filters, Midisart 2000

Sartorius

Midisart 2000 in-line filters. For sterile ventilation of fermenters, culture vessels, etc. or to act as a water barrier between the suction flask and the vacuum pump in filtration applications. The supported PTFE membrane within a PP housing gives excellent chemical resistance. Filter in either direction (3 bar max. pressure). Sterile versions are individually wrapped, and can be autoclaved repeatedly.



Pore size µm	Diam. mm	PK	Cat. No.
0.20	62	12	**9.049 151**
0.20	62	25	**9.049 152**

2 Syringe filters, disposable, Polydisc TF™

GE Healthcare

Mounted in a robust PP housing. All have a low hold-up volume. Dimensions: (diameter x length) 53 x 46mm.
Connections: For 6mm to 10mm diameter bore tubing. Also accept male luer slip.
- Hydrophobic PTFE membrane
- Pore sizes 0.1µm, 0.2µm, 0.45µm, 1.0µm
- 1µm pore size unit has a PP prefilter
- Autoclavable at 131°C for 20 minutes
- Maximum operating pressure 4.0 bar

Suitable for chemically aggressive solutions, reagents and organic solvents. Ideal for protective venting, in-line filtration and isolation applications. Non-sterile.



Pore size µm	PK	Cat. No.
0.10	10	**9.951 096**
0.20	10	**9.951 097**
0.45	10	**9.951 098**
1.00	10	**9.951 099**

3 Pressure filtration equipment, MD 142/5, stainless steel

GE Healthcare

For membrane filters 142mm diameter, prefilters 134mm diameter. For In-line filtration/sterilisation of up to several litres of liquid. Pressure-resistant up to 10 bar (using PTFE O-ring up to 4 bar only).



Type	PK	Cat. No.
without sample cylinder	1	**9.603 212**
with 2200 ml sample cylinder	1	**9.603 224**

4 Pressure filter holder, stainless steel

Sartorius

For 47mm diameter membrane filters. With reservoir barrel allowing up to 200ml of liquid to be filtered by connection to a suitable direct pressure source. Can also be used for filtering larger volumes in conjunction with a 5L pressurising container. Complete with silicone O-rings and 10mm diameter tubing ferrules on the inlet and outlets. For sterile filtration of tissue cultures, ultrafiltration of buffer solutions, cell count solutions and for pressing soil samples.



Type	Volume ml	Filter size mm	PK	Cat. No.
Pressure filter holder	200	Ø 47 mm	1	**9.604 345**



1 Pressure filtration units

Sartorius

Sartolab P 20. For sterile filtration of cell culture media. Ready-to-use, disposable filtration units. Surfactant-free, 0.2µm cellulose acetate membrane with minimal protein adsorption. With Luer lock inlet and filling bell on the outlet.

Sartolab P 20 plus. With additional, binding agent-free, glass-fibre pre-filter for media which are difficult to filter.

Type	PK	Cat. No.
Sartolab P 20	10	**9.054 681**
Sartolab P 20 plus	10	**9.054 686**

Accessories for Sartorius pressure filtration equipment Sartolab P20

Sartorius

Description	PK	Cat. No.
Coupling M12 x 1 with G$^{3}/_{8}$ male thread	1	**9.604 383**
Diaphragm pump, pressurizing, G$^{3}/_{8}$ male screwthread connection, for 220V, 50Hz supplies	1	**9.604 389**
Tripod for pressure filtration apparatus 9.604 345	1	**9.604 394**
Double-ended box spanner for tripod 9.604 394	1	**9.604 395**
Stainless steel forceps	1	**9.604 061**

Further designs available on request.



2 Vacuum or pressure filtration apparatus, Typ 16510, PC

Sartorius

For vacuum or pressure filtration up to 2 bar.
For ultra or sterile filtration.
With collecting bottle 250 ml.
For filter 47mm diameter filters.

Type	Volume ml	Filter size mm	PK	Cat. No.
PC filtration apparatus	250	Ø 47mm	1	**9.049 243**



3 Filter holders, glass, Type 163

Sartorius

Two compact, glass vacuum filter holders for simple particle testing and clarification of solutions. With glass frit membrane filter support and anodised aluminium clamp.

Type	Volume ml	For Filter size	PK	Cat. No.
glass frit	30	25 mm dia.	1	**9.604 204**
glass frit	250	47/50 mm dia.	1	**9.604 307**

1 Filter holders, Type 16309

Sartorius

For vacuum filtration of particles from solutions. Comprises 250ml, dismountable, top manifold with filter holder and clamp. For 47mm and 50mm diameter filters. Supplied complete with 1L capacity filter flask with ground joint to fit manifold and PP side-arm for safe connection of flexible vacuum tubing.

Type	Capacity ml	Filter size mm	PK	Cat. No.
All-glass unit	250	Ø 47 - 50mm	1	**9.604 076**



2 Vacuum filtration equipment, GV 025 series

GE Healthcare

- funnel volume 60ml
- for filter 25mm diameter

Type	Filter media	Connection	PK	Cat. No.
GV 025/0	glass frit	rubber stopper	1	**9.603 250**
GV 025/2	glass frit	TC*, EF* 250ml (NS 29)	1	**9.603 252**

*TC = tubing connection
**EF = Erlenmeyer flask



3 Filtering apparatus DURAN®

NEW!

DURAN Group

The DURAN® filtering apparatus is made of high-quality borosilicate glass. Aside from glass, the medium only comes into chemical contact with PTFE. This means that the filtering apparatus can be used to filter virtually any chemical.
Thanks to the PTFE disc holder, fritted glass discs of different porosities can be used in addition to the slit-sieve disc. This creates a wide application scope for filtration using filter paper, membrane filters (47mm) or simply using glass filters. Different porosities are available between 10µm and 160µm, which makes it possible to perform coarse and fine filtration in addition to analytical filtration. Furthermore, the filtering apparatus is suitable for the filtration of HPLC media, testing for bacterial contamination, residue analysis and the filtration of other media.

Properties:
- Removable filter discs ensure easy cleaning
- Slit-sieve disc for mounting filter paper/membrane filter
- Only glass and PTFE come into contact with the medium
- Funnel with scale
- Secure plastic hose connection
- Tried-and-tested DURAN® filtering flask
- All components are available as spare parts

Description	PK	Cat. No.
Filtering apparatus DURAN®	1	**9.052 744**



Filtering apparatus DURAN®, Spare parts

NEW!

DURAN Group

Description	PK	Cat. No.
PTFE adapter disc	1	**9.052 745**
Clamp (anodised aluminium)	1	**9.052 746**
Funnel with 250ml scale	1	**9.052 747**
Head NS 45 / 40	1	**9.052 748**
Filtering flask with NS 45 /40, 1000ml	1	**9.052 749**
Plastic hose connection with silicone seal, straight, GL 14	1	**7.023 754**
Screw connection caps, red, made of PBT, GL 14, aperture bore 9.5mm	1	**9.209 114**
DURAN® glass filter disc, 50mm in diameter, por. 2	1	**9.052 952**
DURAN® slit-sieve disc, diameter 48mm	1	**9.052 901**

1



1 Vacuum Filtration Equipment GV 050 Series

GE Healthcare

- Funnel Volume 250 ml
- to be used with Ø 47/50 mm membranes and Ø 40 mm pre-filter
- silicone cap and venting nozzle included in scope of supply
- GV 050A-Types equipped with rapid closure clamp

Type	Filter media	Connection	PK	Cat. No.
GV 050/0	glass frit	rubber stopper	1	**9.603 500**
GV 050/1	sieve	rubber stopper	1	**9.603 501**
GV 050/2	glass frit	TC*, EF** 1000 ml (NS 45)	1	**9.603 502**
GV 050/3	sieve	TC*, EF** 1000 ml (NS 45)	1	**9.603 503**

*TC = tubing connection
**EF = Erlenmeyer flask

2



2 Vacuum filtration Equipment Grade MV 050/0

GE Healthcare

Stainless steel construction, chemically resistant to most aqueous and organic solutions.
- funnel volume 50ml
- for filters with 47mm /50mm diameter and 40mm diameter prefilter

Self sealing, ideal for quick, repeated filtrations

Type	PK	Cat. No.
MV 050A/0*	1	**9.603 520**
MV 050/0	1	**9.603 510**

*With rapid closure clamp

3



4



3 4 Microbiological monitoring of water: MBS I system and membranes

GE Healthcare

The MBS I filtration system is designed for laboratories that handle high numbers of samples for microbiological quality control. It consists of a membrane dispenser, a funnel dispenser, and a 2-place filter AS220 manifold.
AS220 Filtration Manifold and Filtration funnels AS220 is a two-place stainless-steel filtration manifold, which can be joined together (maximum of 3 manifolds).This simple manifold can be used with 47mm or 50mm filtration membranes. AS220 Filtration Manifold and Filtration funnels deliver:- Waste reduction-because PP funnels can be autoclaved up to 20 times

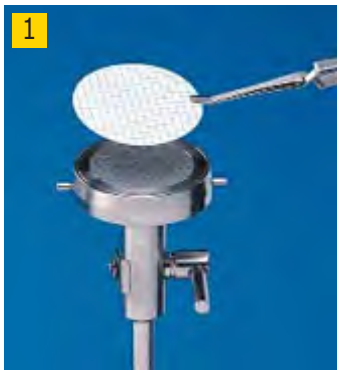
- Time saving-No need to flame in between filtrations
- Easy handing
- Cost saving-20 PP funnels are enough for 1000 analyses
- Reduces cross-contamination

Description	PK	Cat. No.
2-place vacuum manifold AS 220	1	**6.231 788**
Automatic dispenser for funnels	1	**6.231 860**
Funnels 100 ml, PP, autoclavable	20	**7.616 566**
Funnels 100 ml, ABS, not autoclavable	20	**9.603 290**
Funnels 350 ml, PP, autoclavable	20	**6.801 571**
Autoclaving bags	20	**7.608 012**
Mountig for two Membrane-Butler ES	1	**6.234 184**
Membran-Butler manual	1	**6.225 967**

E & OE.

1 Filter holders, vacuum, Type 162. Stainless steel

Specially designed for residue analysis. The stainless steel filter support produces homogeneous distribution of the residues on the membrane filter surface. Easy to use. For 47mm or 50mm diameter filters. *Sartorius*



Type	PK	Cat. No.
Vacuum filter holder, 500ml	1	**9.604 201**
Vacuum filter holder, 100ml	1	**9.604 202**

2 Biosart®100 monitors

Filtration unit for use with a Sartorius vacuum manifold or direct attachment to a special vacuum pump. Biosart® 100 Monitors have been specifically designed for the microbiological testing of pharmaceuticals, food, beverages, water and other liquids. These sterile disposable units with built-in membrane filter and cellulose pad are ready to use. After filtration, just remove the 100ml funnel to convert the Monitor into a petri dish. Culture media for wetting the pad are available in individually sterilised, convenient plastic ampoules. Biosart® 100 Monitors are ready to use filter units designed to fitted onto the receivers of a vacuum manifold. For use with Biosart® 100 culture media. *Sartorius*



Type	Diam. mm	Pore size µm	Colour	PK	Cat. No.
K	47	0.45	White / Black	48	**9.049 300**
K	47	0.45	Grey / White	48	**9.049 315**
ACK Sterile, individually packed	47	0.20	White / Black	48	**9.049 311**
ACK Sterile, individually packed	47	0.45	White / Black	48	**9.049 312**
ACK Sterile, individually packed	47	0.45	Green / Dark green	48	**9.049 313**
ACK Sterile, individually packed	47	0.45	Grey / White	48	**9.049 304**
Adapter for BioSart	55		-	1	**9.049 320**

ACK= individually sterile packed. K= sterile.

3 Filter funnel, Biosart®250

For microbiological and analytical quality assurance in industry. 250ml sterile plastic funnels reduce process time in colony and particle analysis. For use with Sartorius membrane filters and Sartorius cardboard culture plates.
Note: BioSart 250 funnels can also be adapted to fit single filter holders or filtration manifolds. *Sartorius*



Type	PK	Cat. No.
BioSart 250 disposable funnel, sterile	50	**9.049 340**
BioSart 250 disposable funnel, sterile, individually packed	50	**9.049 341**

4 Filter manifold systems, 3- and 6-place

For colony counting when using large number of samples. Available with either 100ml or 500ml funnels. *Sartorius*

Note:
Stainless steel manifolds only (Combisart) without funnels, for use with suitable adapters, are also available for attachment to all Sartorius vacuum funnels.



Type	Diam. mm	Capacity ml	PK	Cat. No.
3-way stainless steel manifold	50	3 x 100	1	**9.604 222**
6-way stainless steel manifold	50	6 x 100	1	**9.604 223**
3-way stainless steel manifold	50	3 x 500	1	**9.604 226**
6-way stainless steel manifold	50	6 x 500	1	**9.604 224**



1 Stainless steel filter manifold system

Combisart® Multibranch System with modular structure: For microbiological analysis. Basic system without outlet for holding all dismountable Sartorius vacuum funnels either completely or by using appropriate adapters

Sartorius

Description	PK	Cat. No.
3-place s/s manifold with sterile venting	1	**9.604 227**
6-place s/s manifold with sterile venting	1	**9.604 228**
Funnel, 100 ml	1	**9.604 210**
Funnel, 500 ml	1	**9.604 211**
Lid, stainless steel for 100ml funnel	1	**9.604 212**
Lid, stainless steel for 500ml funnel	1	**9.604 213**
Silicone lid seal for 100ml funnel	1	**9.604 214**
Silicone lid seal for 500ml funnel	1	**9.604 215**
Base support, stainless steel for mounting a single funnel onto a manifold	1	**9.604 216**



2 Filter units with Supor® machV PES Membrane, MF75 ™ Series, Type 565, sterile

Ideal for biological and pharmaceutical sterile filtration. PES membrane features low protein binding, low level of extractables and a high flow rate. Now available in three pore sizes: The best filter units with 0.20µm and 0.45µm pore size and new to the protection of valuable cell cultures from mycoplasma with 0.10µm pore size. Filter top and filtrate bottle are graduated. Vacuum tubing to be connected onto tubing adapter of side arm. Leakproof, sterile screw closure included for storage of sterile filtrate. Sterile, single packed. Certificate of Quality included in each full case. Lot number, catalogue number, membrane type, pore size and expiration date are printed on filter units, bottle tops and receivers for easy identification and lot traceability.

Thermo Scientific

Type	Capacity ml	Pore size µm	Membrane diam. mm	PK	Cat. No.
565	150	0.10	50	1	**9.046 022**
565	250	0.10	50	1	**9.046 024**
565	500	0.10	75	1	**9.046 023**
565	150	0.20	50	1	**6.302 336**
565	250	0.20	50	1	**6.228 218**
565	500	0.20	75	1	**6.227 381**
565	500	0.20	90	1	**6.225 298**
565	1000	0.20	90	1	**6.229 041**
565	150	0.45	50	1	**7.047 785**
565	250	0.45	50	1	**7.047 791**
565	500	0.45	75	1	**7.047 787**
565	500	0.45	90	1	**7.047 793**
565	1000	0.45	90	1	**7.047 789**



3 Filter Unit with PES-Membrane, Low Profile, sterile

Polyethersulfone-membrane (PES) The ultimate cell and tissue culture media membrane.

Thermo Scientific

- Graduated
- Lot number, catalogue number, membrane type, pore size and expiration date are printed on filter units, bottle tops and receivers for easy identification and lot traceability
- Ideal for sterilisation of biological and pharmaceutical sterile solutions
- Low protein binding, low extractables, no external wetting agents, fast flow

Capacity ml	Pore size µm	Membrane diam. mm	PK	Cat. No.
115	0.20	50	1	**6.234 424**
115	0.45	50	1	**9.046 020**



4 Nalgene™ Rapid-Flow™ Bottle-Top-Filter

Filters securely screw onto glass media bottles with 33mm or 45mm neck sizes. Allows direct filtration of liquid into sterile glass media bottles. Tight and secure thread connection for vacuum filtration, vacuum tubing to be connected onto tubing adapter of side-arm. Graduated. Sterile, single packed. Certificate of Quality included in each full case. Lot number, catalogue number, membrane type, pore size and expiration date are printed on filter units, bottle tops and receivers for easy identification and lot traceability

Thermo Scientific

Type	Capacity ml	Pore size µm	Neck thread GL	Membrane diam. mm	PK	Cat. No.
296	150	0.45	33	50	1	**7.048 393**
295	500	0.45	33	75	1	**7.048 389**
296	150	0.45	45	50	1	**7.048 395**
295	500	0.45	45	75	1	**7.048 391**

E & OE.

1 Filter unit bodies, Type 300

Graduated reusable filtration unit bodies with upper manifolds and lower receivers made of unbreakable polysulphone (PSF). Nominal filtration surface 11cm². With membrane support plate. Without membrane. For filter membrane from 47mm to 50mm.

Thermo Scientific



Type	Manifold capacity ml	Receiver capacity ml	Diam. mm	Height mm	PK	Cat. No.
300	250	250	83	180	1	**9.046 151**
300	500	500	117	230	1	**9.046 152**
300	500	1000	114	293	1	**9.046 153**

2 Vacuum filtration devices bottle-top filters, Type DS0320, PSU

Reusable, PSU filter manifolds for fitting onto bottles with 33mm or 45mm screw neck diameters. Non-toxic. Robust body with removable membrane support plate. Suitable for pressure filtration up to 600mbar and vacuum filtration. With seal, cap and tubing adapter on lower half of the assembly. Autoclavable. Without membrane (47mm or 50mm diameter can be fitted).

Thermo Scientific



Type	Capacity ml	Neck thread GL	PK	Cat. No.
DS0320	250	33	1	**9.059 506**
DS0320	500	33	1	**9.059 508**
DS0320	250	45	1	**9.059 507**
DS0320	500	45	1	**9.059 509**

3 Nalgene™ Rapid-Flow™ Bottle-Top-Filter, sterile, Type 595, 596, 597

Filters securely screw onto glass media bottles with 33mm or 45mm neck sizes. Allows direct filtration of liquid into sterile glass media bottles.
Tight and secure thread connection for vacuum filtration, vacuum tubing to be connected onto tubing adapter of side-arm. Graduated. Certificate of quality included in each full case. Lot number, catalogue number, membrane type, pore size and expiration date are printed on filter units, bottle tops and receivers for easy identification and lot traceability.

Thermo Scientific



Type	Capacity ml	Neck thread GL	Pore size µm	Membrane diam. mm	PK	Cat. No.
596	150	33	0.20	50	1	**7.048 392**
595	500	33	0.20	75	1	**7.048 388**
597	1000	33	0.20	90	1	**7.048 396**
596	150	45	0.20	50	1	**6.224 312**
595	500	45	0.20	75	1	**7.048 390**
597	1000	45	0.20	90	1	**7.048 397**

4 Filter units, disposable, SFCA-membrane

Single-use, disposable filter units for sterile filtration of media and other reagents, and for other highly sensitive cell culture lines. With polystyrene (PS) upper and lower chambers and surfactant-free, cellulose acetate membranes. Colour code: yellow collar. For cell culture. Gamma-irradiated sterile. Low protein binding, with high throughput rate for proteinaceous solutions and minimal extractables content. Lot number, catalogue number, membrane type, pore size and expiration date are printed on filter units, bottle tops and receivers for easy identification and lot traceability.

Thermo Scientific



Capacity ml	Pore size µm	Membrane diam. mm	PK	Cat. No.
150	0.20	50	1	**9.046 034**
150	0.45	50	1	**9.046 035**
250	0.20	50	1	**9.046 037**
250	0.45	50	1	**9.046 038**
500	0.20	75	1	**9.046 041**
500	0.45	75	1	**9.046 042**
1000	0.20	75	1	**9.046 044**
1000	0.45	75	1	**9.046 045**
500	0.20	90	1	**9.045 975**
500	0.45	90	1	**9.045 976**
1000	0.20	90	1	**9.045 971**
1000	0.45	90	1	**9.045 972**

1



1 Filter units, disposable, cellulose nitrate membrane

Thermo Scientific

White, cellulose nitrate membrane. Colour code: green. Highest throughput rate for water and aqueous solutions, low extractables content. Surfactant-free. Lot number, catalogue number, membrane type, pore size and expiration date are printed on filter units, bottle tops and receivers for easy identification and lot traceability.

Capacity ml	Pore size µm	Membrane diam. mm	Grid	PK	Cat. No.
150	0.20	50	without	1	**9.046 109**
150	0.45	50	green	1	**9.046 110**
150	0.80	50	black	1	**9.046 111**
250	0.20	50	without	1	**9.046 121**
250	0.45	50	green	1	**9.046 122**
250	0.80	50	black	1	**9.046 123**
500	0.20	75	without	1	**9.046 131**
500	0.45	75	green	1	**9.046 132**
500	0.80	75	black	1	**9.046 133**
1000	0.20	75	without	1	**9.046 141**
1000	0.45	75	green	1	**9.046 142**
1000	0.80	75	black	1	**9.046 143**

2



2 Filter units, PS, disposable, Type 150, 153, 151, 154, 163, 164, nylon membrane

Thermo Scientific

Single-use, disposable filter units for sterile filtration of media and other reagents, and for other highly sensitive cell culture lines. With polystyrene (PS) upper and lower chambers and nylon membrane. Colour code: red. For cell culture. Gamma-irradiated sterile. Extremely low in extractable substances, no wetting agents. Lot number, catalogue number, membrane type, pore size and expiration date are printed on filter units, bottle tops and receivers for easy identification and lot traceability.

Type	Capacity ml	Pore size µm	Membrane dia. mm	PK	Cat. No.
150	150	0.20	50	1	**9.046 055**
150	150	0.45	50	1	**9.046 056**
153	250	0.20	50	1	**9.046 061**
153	250	0.45	50	1	**9.046 062**
151	500	0.20	75	1	**9.046 064**
151	500	0.45	75	1	**9.046 065**
163	500	0.20	90	1	**9.045 978**
154	1000	0.20	75	1	**9.046 067**
154	1000	0.45	75	1	**9.046 068**
164	1000	0.20	90	1	**9.045 979**

3



3 Bottle-top filters, SFCA membrane, Nalgene®

Thermo Scientific

Tissue culture filters for screw fitting onto bottles with 33mm or 45mm neck diameters. With surfactant-free, cellulose acetate membrane (SFCA) and polystyrene (PS) housing. Gamma-irradiated sterile. Pyrogen free. Non cytotoxic. Low-pressure filtration can be carried out directly into a suitable sterile bottle. Caution: Only use sterile bottles authorised for use in low pressure applications. Always wear protective equipment for low pressure procedures. The membrane is characterised by its low protein binding, good throughput rates and minimal clogging with negligible protein loss. Permanent, moulded graduations. Quick-disconnection tubing adaptor with cellulosic vent plug for tubing with an internal diameter of 6mm to 9mm. Lot number, catalogue number, membrane type, pore size and expiration date are printed on filter units, bottle tops and receivers for easy identification and lot traceability.

Capacity ml	Neck thread GL	Pore size µm	Membrane diam. mm	PK	Cat. No.
150	33	0.20	50	1	**9.045 951**
150	33	0.45	50	1	**9.045 952**
150	45	0.20	50	1	**9.045 953**
150	45	0.45	50	1	**9.045 954**
500	33	0.20	75	1	**9.045 956**
500	33	0.45	75	1	**9.045 957**
500	45	0.20	75	1	**9.045 958**
500	45	0.45	75	1	**9.045 959**
1000	33	0.20	90	1	**9.045 961**
1000	45	0.20	90	1	**9.045 963**

E & OE.

1 Conical Filter Unit with PES-Membrane, sterile

Thermo Scientific

Polystyrene housing, 0.2µm Supor® machV PES membrane. The optimal choice for small volume tissue culture work. Offers clean, fast filtration of 20ml to 50ml of media or buffers using the Pall Supor® machV PES membrane. This low protein binding unit is non-cytotoxic and non-pyrogenic. Comes assembled with 50ml conical tube and a separate closure. Includes 2 reusable stands in each case. Certified and graduated. Lot number, catalogue number, membrane type, pore size and expiration date are printed on it.



Capacity ml	Pore size µm	Diam. mm	PK	Cat. No.
50	0.20	50	1	**9.046 021**

2 Filter Unit Receivers MF75™ series Type 455, PS, sterile

Thermo Scientific

Easy-to-use ergonomic design. Can be used to store sterilised filtrate. Radiation-sterilised to save you time and minimize contamination. Also handy as presterilised, single-use storage containers. 1-1/2-turn threaded screw closure guarantees a leakproof seal and eliminates pH shift in receivers. Certified. Non pyrogenic, non cytotoxic. Sterile, graduated and leakproof.



Type	Capacity ml	PK	Cat. No.
455	150	1	**7.048 731**
455	250	1	**7.048 732**
455	500	1	**7.048 733**
455	1000	1	**7.048 734**

3 Filter crucibles, borosilicate glass 3.3

Borosilicate glass 3.3. With sintered disc filter as outlined below.



Capacity ml	Porosity	Diam. mm	PK	Cat. No.
15	1	23	1	**9.052 060**
15	2	23	1	**9.052 061**
15	3	23	1	**9.052 062**
15	4	23	1	**9.052 063**
15	5	23	1	**9.052 064**
30	1	30	1	**9.052 036**
30	2	30	1	**9.052 037**
30	3	30	1	**9.052 038**
30	4	30	1	**9.052 039**
30	5	30	1	**9.052 040**
50	1	40	1	**9.052 041**
50	2	40	1	**9.052 042**
50	3	40	1	**9.052 043**
50	4	40	1	**9.052 044**
50	5	40	1	**9.052 065**

4 Filter crucibles, DURAN®

DURAN Group

With sintered glass filter disc at base, as outlined below.
Glass Type I/neutral glass as per USP, EP and JP. Autoclavable.



Capacity ml	Porosity	Diam. mm	PK	Cat. No.
30	1	28	1	**9.052 021**
30	2	28	1	**9.052 022**
30	3	28	1	**9.052 023**
30	4	28	1	**9.052 024**
30	5	28	1	**9.052 025**
50	1	36	1	**9.052 031**
50	2	36	1	**9.052 032**
50	3	36	1	**9.052 033**
50	4	36	1	**9.052 034**

1



1 Adapters for filter crucibles, borosilicate glass 3.3.

Borosilicate glass 3.3. Autoclavable.

Diam. mm	Stem diam. mm	PK	Cat. No.
34	10	1	**9.052 213**
40	10	1	**9.052 214**
50	10	1	**9.052 215**

2



2 Adapters for filter crucibles, Duran®

Glass Type I/neutral glass as per USP, EP and JP. Autoclavable. *DURAN Group*

Diam. mm	Height mm	PK	Cat. No.
27	108	1	**9.052 216**
34	110	1	**9.052 222**
41	125	1	**9.052 226**
50	132	1	**9.052 232**

3



3 Filter holders, DURAN®

DURAN®. Dismountable, modular filter holders with screwthreaded top manifold, PP funnel outlet and two FKM seals. Accessory sintered filter discs (9.052 941 to 9.052 954) are screwed in between two FKM seals. The filter discs are easy to replace. Membrane or paper filters can be stretched across the disc. Filter plates must be ordered separately. *DURAN Group*

Capacity ml	Plate diam. mm	Thread diam. mm	PK	Cat. No.
30	24	28	1	**9.052 903**
250	50	54	1	**9.052 905**
1000	90	95	1	**9.052 910**

4



4 Filter holders, glass, top manifold only, DURAN®

DURAN®. For use in dismountable filter holders. With screwthread, without PP outlet funnel, filter disc or FKM rubber seals. *DURAN Group*

Capacity ml	Thread diam. mm	PK	Cat. No.
30	28	1	**9.052 913**
250	54	1	**9.052 915**
1000	95	1	**9.052 920**

5



5 Filter holders, outlet funnels, PP

PP. For use with dismountable filter holders. With screwthread to fit respective top manifold. Without manifold, sintered filter disc or FKM rubber seals. *DURAN Group*

Neck thread GL	Thread diam. mm	PK	Cat. No.
28	10	1	**9.052 973**
54	12	1	**9.052 975**
95	18	1	**9.052 980**

Exhaust Device please see page 1200.

E & OE.

1 FKM seals

For use in dismountable filter holders. Without PP outlet funnel, filter disc or top manifold.

DURAN Group

For dia. mm	PK	Cat. No.
24	1	**9.052 923**
50	1	**9.052 925**



2 Filter discs, DURAN®

With glass rim. For use in dismountable filter holders. Patented design. Filter discs must always be screwed in between two FKM rubber seals. Without top manifold, PP outlet funnel or seals.

DURAN Group

Plate diam. mm	Porosity	PK	Cat. No.
24	1	1	**9.052 941**
24	2	1	**9.052 942**
24	3	1	**9.052 943**
24	4	1	**9.052 944**
50	1	1	**9.052 951**
50	2	1	**9.052 952**
50	3	1	**9.052 953**
50	4	1	**9.052 954**



3 Slotted sieve disc (perforated plate) DURAN®

Can be used in the 250ml capacity dismountable filter holder as a carrier for membrane and paper filters.

DURAN Group

Plate diam. mm	PK	Cat. No.
48	1	**9.052 901**



4 Filter funnels, Borosilicate glass 3.3

Borosilicate glass 3.3, with sintered disc filter as outlined below. Autoclavable.

Capacity ml	Porosity	Diam. mm	Stem diam. mm	PK	Cat. No.
50	1	36	10	1	**9.052 367**
50	2	36	10	1	**9.052 368**
50	3	36	10	1	**9.052 369**
50	4	36	10	1	**9.052 370**
75	1	48	10	1	**9.052 371**
75	2	48	10	1	**9.052 372**
75	3	48	10	1	**9.052 373**
75	4	48	10	1	**9.052 374**
125	1	60	10	1	**9.052 375**
125	2	60	10	1	**9.052 376**
125	3	60	10	1	**9.052 377**
125	4	60	10	1	**9.052 378**
250	1	80	18	1	**9.052 066**
250	2	80	18	1	**9.052 067**
250	3	80	18	1	**9.052 068**
250	4	80	18	1	**9.052 069**
500	1	95	22	1	**9.052 379**
500	2	95	22	1	**9.052 380**
500	3	95	22	1	**9.052 381**
500	4	95	22	1	**9.052 382**
1000	1	124	22	1	**9.052 383**
1000	2	124	22	1	**9.052 384**
1000	3	124	22	1	**9.052 385**
1000	4	124	22	1	**9.052 386**
4000	1	180	30	1	**9.052 387**
4000	2	180	30	1	**9.052 388**
4000	3	180	30	1	**9.052 389**
4000	4	180	30	1	**9.052 390**



1



1 Filter funnels, glass DURAN®

Glass Type I/neutral glass as per USP, EP and JP. Autoclavable. *DURAN Group*

Capacity ml	Porosity	Diam. mm	Stem diam. mm	Height mm	PK	Cat. No.
50	1	35	10	130	1	**9.052 301**
50	2	35	10	130	1	**9.052 302**
50	3	35	10	130	1	**9.052 303**
50	4	35	10	130	1	**9.052 304**
50	5	35	10	130	1	**9.052 305**
75	1	45	10	132	1	**9.052 311**
75	2	45	10	132	1	**9.052 312**
75	3	45	10	132	1	**9.052 313**
75	4	45	10	132	1	**9.052 314**
75	5	45	10	132	1	**9.052 315**
125	1	60	10	140	1	**9.052 321**
125	2	60	10	140	1	**9.052 322**
125	3	60	10	140	1	**9.052 323**
125	4	60	10	140	1	**9.052 324**
125	5	60	10	140	1	**9.052 325**
500	1	95	22	240	1	**9.052 331**
500	2	95	22	240	1	**9.052 332**
500	3	95	22	240	1	**9.052 333**
500	4	95	22	240	1	**9.052 334**
500	5	95	22	240	1	**9.052 335**
1000	1	120	22	270	1	**9.052 341**
1000	2	120	22	270	1	**9.052 342**
1000	3	120	22	270	1	**9.052 343**
1000	4	120	22	270	1	**9.052 344**
1000	5	120	22	270	1	**9.052 345**
4000	1	175	30	425	1	**9.052 361**
4000	2	175	30	425	1	**9.052 362**
4000	3	175	30	425	1	**9.052 363**
4000	4	175	30	425	1	**9.052 364**

2



2 Filter funnels, conical, borosilicate glass 3.3

Capacity ml	Porosity	Diam. mm	Int. diam. mm	Stem diam. mm	PK	Cat. No.
25	3	55	25	8	1	**9.052 365**
25	4	55	25	8	1	**9.052 366**

3



3 Filter funnels, glass DURAN®, conical

Conical. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable. *DURAN Group*

Capacity: 25mm
Diameter: 55mm
Plate diameter: 25mm
Stem diameter: 8mm
Height: 100mm

Type	Porosity	PK	Cat. No.
39D	3	1	**9.052 453**
39D	4	1	**9.052 454**

4



4 Slotted sieve filter funnels (Buchner funnels), DURAN®

Buchner pattern funnel with slotted sieve (perforated) filter plate. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable. *DURAN Group*

Capacity ml	Diam. mm	Height mm	Stem diam. mm	PK	Cat. No.
70	48	132	10	1	**9.252 022**
125	60	140	10	1	**9.252 028**
220	73	190	18	1	**9.252 034**
500	95	240	22	1	**9.252 044**
1000	120	270	22	1	**9.252 054**

E & OE.

1 LLG Buchner funnels, porcelain

NEW!



For filterpaper diam. mm	Capacity ml	PK	Cat. No.
45	35	1	**6.239 903**
55	70	1	**6.237 328**
70	120	1	**6.231 541**
90	240	1	**9.252 500**
110	400	1	**9.252 501**
125	600	1	**9.252 502**
150	1000	1	**9.252 503**
185	2000	1	**9.252 504**
240	4000	1	**9.252 505**
295	7000	1	**9.252 506**
325	10000	1	**9.252 507**

2 Buchner funnels, porcelain



To DIN 12905. *Haldenwanger*

For filter diam. mm	Capacity ml	PK	Cat. No.
27*	10	1	**9.252 027**
45	50	1	**9.252 045**
50	75	1	**9.252 055**
70	135	1	**9.252 070**
90	290	1	**9.252 090**
110	580	1	**9.252 110**
125	795	1	**9.252 125**
150	1250	1	**9.252 150**
185	1900	1	**9.252 185**
240	4300	1	**9.252 240**
270	5800	1	**9.252 270**
320	10600	1	**9.252 320**

* supplementary to DIN 12905

3 Filter funnels, PP, Buchner



PP. Two-piece construction. Top and bottom sections can be separated. Easy to clean. *Kartell*

For filter diam. mm	Capacity ml	PK	Cat. No.
42,5	40	1	**9.252 330**
55	70	1	**9.252 331**
70	180	1	**9.252 332**
80	285	1	**9.252 333**
90	390	1	**9.252 334**
110	810	1	**9.252 335**
160	2100	1	**9.252 338**
240	6000	1	**9.252 339**

4 Discs for filter funnels, Buchner, PE-HD



Useful interface layer between filter paper and perforated Buchner plate. Avoids clogging of filter holes. *Kartell*

Diam. mm	PK	Cat. No.
45	1	**9.252 340**
55	1	**9.252 341**
70	1	**9.252 342**
80	1	**9.252 343**
90	1	**9.252 344**
110	1	**9.252 345**
160	1	**9.252 348**
240	1	**9.252 349**

1

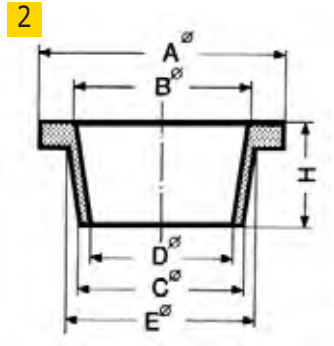


1 Rubber sleeves, EPDM

For filter crucibles. Temperature resistant up to 150°C. Autoclavable. *DURAN Group*

Diam. mm	PK	Cat. No.
26	1	**9.052 114**
33	1	**9.052 121**
41	1	**9.052 126**
49	1	**9.052 131**

2



2 Filter rings, rubber

Natural rubber (NR). To hold filter funnels or crucibles.

Ø A mm	Ø B mm	Ø C mm	Ø D mm	Ø E mm	Height mm	PK	Cat. No.
41	25	24	18	30	20	1	**9.052 449**
48	35	32	28	36	20	1	**9.052 450**
56	40	42	35	44	20	1	**9.052 451**

3



3 Protective collars, EPDM.

For filter flasks.
Special design centres the funnel and flask and provides stable support for funnels, filters and manifolds placed on them. A clean seal is made between the flask rim and container placed on it. Application of the vacuum provides a tight seal. Also provides all-round protection for glass filter flask rims, significantly reducing impact damage and extending working life.

Diam. mm	Height mm	For bottles ml	PK	Cat. No.
23	11	100	1	**9.052 391**
33	15	250, 500	1	**9.052 392**
44	25	1000	1	**9.052 393**
58	25	2000, 3000	1	**9.052 394**
68	25	5000, 10000	1	**9.052 395**

4



4 Gaskets, Guko

Grey, filter gaskets made of natural rubber (NR). Conical, to fit filter funnels or crucibles into suction flasks.

Top diam. mm	Bottom diam. mm	Height mm	Wall thickness mm	PK	Cat. No.
21	12.0	18	2.5	1	**9.052 412**
27	17.0	20	3.0	1	**9.052 417**
33	21.0	24	3.0	1	**9.052 423**
41	27.5	27	4.0	1	**9.052 427**
53	33.0	34	5.0	1	**9.052 432**
68	48.0	35	5.5	1	**9.052 436**
78	58.0	35	6.0	1	**9.052 439**
89	66.0	40	6.5	1	**9.052 443**

5



5 Set of filter crucible cones, Guko

Comprises of 8 Gukos with an external lower diameter of 12mm, 17mm, 21mm, 27.5mm, 33mm, 48mm, 58mm and 66mm each.

Type	PK	Cat. No.
Guko set	1	**9.052 400**

Filter flasks, Erlenmeyer shape, borosilicate glass 3.3

Borosilicate glass 3.3 with thick walls according to ISO 6556 and DIN 12476 standards. *Isolab*
The glass side arm and the Polypropylene side arm is suitable to work with 6mm to 10mm hose diameters. The Polypropylene side arm has a screw thread connector for easy and safe fitting of the tubing.

Capacity ml	lateral connection	PK	Cat. No.
100	glass	1	**4.008 437** 1
250	glass	1	**6.241 652**
500	glass	1	**6.241 291**
1000	glass	1	**6.239 008**
2000	glass	1	**4.008 438**
100	PP	1	**4.008 439** 2
250	PP	1	**6.237 706**
500	PP	1	**6.237 707**
1000	PP	1	**6.237 708**
2000	PP	1	**6.242 170**

1



4.008 437

2



4.008 439

3 Filter flasks, glass DURAN®

DIN 12476. ISO 6556. With PBT tubing connection and silicone (VMQ) seal. Heavy wall for vacuum use. These filtering flasks fulfil the regulations of the "equipment and product safety regulations". *DURAN Group*

Capacity, 100ml to 2000ml: Erlenmeyer shape
Capacity, 3000 to 20000 ml: Bottle shape

Capacity ml	Diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
100	64	24	105	1	**9.051 424**
250	85	34	155	1	**9.051 436**
500	105	34	185	1	**9.051 444**
1000	135	45	230	1	**9.051 454**
2000	166	60	255	1	**9.051 455**
3000	170	58	295	1	**9.051 456**
5000	185	68	360	1	**9.051 457**
10000	240	70	420	1	**9.051 458**
15000	257	70	500	1	**9.051 459**
20000	290	70	535	1	**9.051 460**

3



4 Assembly set, KECK® and Replacement seal

For attaching flexible vacuum tubing to filter flasks. Consists of straight PP tubing connection, PP tubulature made of silicone (VMQ) rubber seal. PP components can withstand temperatures up to 140°C for short periods without mechanical load. *DURAN Group*

Type	PK	Cat. No.
Assembly set, Keck®	1	**9.051 471**
Replacement seal	1	**9.051 474**

4



Flasks, Büchner, plain side-arm, Pyrex®

NEW!

- Büchner type flasks for vacuum filtration *Scilabware*
- Heavy walls provide increased mechanical strength
- "Studded" base to minimise surface abrasion
- With integral glass side-arm to accept 9mm bore flexible tubing

Capacity ml	Neck diam. mm	External flask diam. mm	Height mm	PK	Cat. No.
250	35	85	155	10	**9.014 035**
500	35	105	185	10	**9.014 036** 5
1000	45	135	230	5	**9.014 037**
3000	68	187	335	5	**9.014 038**
5000	68	220	385	1	**9.014 039**

5



9.014 036

1



1 Filter flasks, glass DURAN®

DIN 12476. ISO 6556. Erlenmeyer shape. Heavy wall, for vacuum use. With ground 17.5/26 socket for vacuum tubing with 15mm to 18mm external diameter. These filtering flasks fulfil the regulations of the "equipment and product safety regulations".

DURAN Group

Capacity ml	Diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
250	85	34	155	1	**9.051 236**
500	105	34	185	1	**9.051 244**
1000	135	45	230	1	**9.051 254**
2000	166	60	255	1	**9.051 263**

2



2 Filter flasks with side-arm socket, glass DURAN®

Bottle shape. Heavy wall, for vacuum use. With ground 17.5/26 socket for vacuum tubing with 15mm to 18mm external diameter. These filtering flasks fulfil the regulations of the "equipment and product safety regulations".

DURAN Group

Capacity ml	Diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
3000	170	58	295	1	**9.051 268**
5000	185	68	360	1	**9.051 273**
10000	240	70	420	1	**9.051 286**
15000	255	70	500	1	**9.051 288**
20000	290	70	535	1	**9.051 291**

3



3 Filter flask DURAN®

Witt-pattern. Complete with interchangeable, flat-ground jointed, tube lid with cone, and plastic flexible tubing connection on one side. Vacuum resistant.

DURAN Group

DN	Height mm	Lid	PK	Cat. No.
100	160	29/32	1	**9.051 519**
150	200	29/32	1	**9.051 531**
100	160	45/40	1	**9.051 619**
150	200	45/40	1	**9.051 631**

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

DURAN GROUP magic of precision

Cooling 730
Refrigerators and Freezers ex protected 730
Refrigerators and Freezers 733
Low and Ultra low temperature freezers 737
Ice machines 744
Cryogenic tubes 746
Cryogenic boxes 749
Cryogenic racks 756
Cryogenic accessories 757
Transport boxes 759
Dewar flasks 760
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Incubators 821
Cooling incubators 825
CO2-Incubators 829
Shaking incubators 833
Test incubators 847
Ovens, Furnaces 854
Hotplates 858
Incubation hoods 863
Temperature controllers, thermostats 868

1 Spark-free laboratory refrigerators

AQUALYTIC

The BGR 120 laboratory guidelines state that interiors of refrigerators in which dangerous, explosive atmospheres can develop, must be spark-free. Such explosive atmospheres can be created by stored flammable liquids, for example.
The laboratory refrigerators by Aqualytic® meet these requirements. The interiors are free from sparking sources and are therefore explosion-proof. With glass shelves.
Variable temperature control from +2°C to +10°C. Temperature is continuously controlled by thermostat.

Capacity L	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	Weight kg	Power W	Temp. range °C	PK	Cat. No.
150	602 x 600 x 885	515 x 443 x 700	37.00	120	+2 ... +10	1	**9.699 001**
210	602 x 600 x 1215	515 x 415 x 1045	46.50	140	+2 ... +10	1	**9.699 002**
295	602 x 600 x 1589	515 x 415 x 1450	62.00	150	+2 ... +10	1	**9.699 003**
425	755 x 715 x 1515	652 x 515 x 1300	77.00	150	+2 ... +10	1	**9.699 004**

1



2



2 Spark-free laboratory refrigerators FKEX

Liebherr

Laboratory refrigerators with static cooling and spark-free interior. Designed especially for storing explosive and highly flammable substances. The interiors of the FKEX models meet all the safety requirements of the EU Directive 94/9EC (ATEX 95). The appliances excel with a large capacity and rugged design. The cooling temperature is continuously adjustable from +2°C to +10°C with the aid of the thermostat integrated in the control panel.

Features:
- Flexible, hygienic interior
- Glass shelves
- Water tray
- Lock
- Reversible door hinges
- Certified according to ATEX 95

Type	Capacity Litres	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	Energy consumption kWh (24h)	PK	Cat. No.
FKEX 1800	180	600 x 600 x 886	513 x 441 x 734	0.7	1	**9.698 653**
FKEX 2600	260	600 x 600 x 1216	513 x 441 x 1047	0.8	1	**9.698 654**
FKEX 3600	360	600 x 600 x 1590	513 x 441 x 1418	0.9	1	**9.698 655**
FKEX 5000	500	752 x 710 x 1516	652 x 537 x 1338	0.9	1	**9.698 656**

3



3 LLG-Laboratory Power Failure Detector

NEW!

- Alarm is reported immediately visually and acoustically
- Reports alarm even for short power outages or for a period of at least 12 hours (can be switched off manually)
- Plug safety cover offers protection against accidental pulling the plug
- Maximum total power of connected devices. 3500W power supply 230V 50Hz
- Max. Rating 16 A
- With built-in battery

Scope of supply:
1 x power failure detector
2 x plug safety caps
2 x screws

Type	PK	Cat. No.
LLG-Laboratory Power Failure Detector	1	**6.255 819**

E & OE.

Precision and innovation for professional laboratory applications



- Menu-guided Profi electronic controller with user-friendly text display for precise temperature setting
- Visual and audible temperature-, door open- and power-failure alarms
- Integrated data-logger records alarm events and internal temperatures
- Integrated 12 Volt battery maintains data-logger and alarm functions of the electronic controller in case of mains power failure
- Infrared data transfer, RS 485 serial interface and volt-free contact for external temperature and alarm documentation
- 3-point calibration for high-precision temperature control



LIEBHERR

Quality, Design and Innovation

Spark-free laboratory refrigerators and freezers LKexv/LKUexv/LGex/LGUex/LCexv with Comfort electronic controller

The range of laboratory appliances with Comfort electronic controllers comprises two refrigerators, two freezers and one frigde-freezer combination with spark-free interior, especially for storing explosive and highly flammable substances - for instance in the chemical industry or in special laboratories. The interiors of the appliances are in compliance with the safety requirements of the EU Directive 94/9/EC (ATEX 95) and have been tested by electro-suisse - SEV, the ATEX conformity evaluation organisation. *Liebherr*

Features:
- Dynamic cooling system (refrigerators), static cooling system (freezers)
- Precision electronic controller with digital temperature display
- Flexible, height-adjustable glass-shelves
- Convenient, clear view drawers (freezers)
- Self-closing door with integrated lock

Security package:
- Visual and audible temperature and door alarm
- Visual power failure alarm when mains power returns
- Integrated data memory with min/max temperatures
- Volt-free contact for alarm forwarding to an external remote warning system
- RS 485 interface enabling external documentation
- Access port for an external temperature sensor
- Maximum temperature stability and consistency according to NF X15-140

Type	Capacity l	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	Energy consumption kWh (24h)	Temp. range °C	PK	Cat. No.	
LKexv 3910	360	600 x 615 x 1840	440 x 435 x 1635	0.9	+3 ... +8	1	**9.698 685**	1
LKUexv 1610	441	600 x 615 x 820	440 x 435 x 670	0.9	+3 ... + 8	1	**9.698 682**	2
LGex 3410	310	600 x 615 x 1840	420 x 400 x 1587	1.3	-9 ... -30	1	**9.698 691**	3
LGUex 1500	139	600 x 615 x 820	454 x 450 x 663	0.9	-9 ... -26	1	**9.698 690**	4
LCexv 4010 fridge freezer	254 / 107	600 x 615 x 2000	440 x 435 x 1105 / 431 x 435 x 597	1.8	+3 ... +8 / -9 ... -30	1	**9.698 677**	5

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9.698 685

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9.698 682

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9.698 691

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9.698 690

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9.698 677

E & OE.

Laboratory refrigerators and freezers LKPv/LGPv with Profi electronic controller

Liebherr

The laboratory appliances incorporating Profi electronic controllers offer many advantages. High-grade materials, high-performance components and accurate workmanship right down to the last detail ensure the high quality of the Liebherr appliances. Wherever huge storing capacity is required the large-scale laboratory appliances with Profi electronic controller are the ideal solution.

Features:
- Dynamic cooling system
- Profi electronic controller with integrated real-time clock
- Castors, thereof two with brake
- Integrated, ergonomic handle
- Plastic-coated grid shelves and CNS inner liner
- Glass door (..22) with ceiling light (seperately switchable)
- Hot-gas defrost system for very short defrost cycles

Security package:
- Integrated data memory (Alarm events and temperature profile)
- Visual and audible temperature and door alarm
- Mains-independent power supply of the electronic controller
- Infrared and RS 485 interface enabling external documentation
- Volt-free contact for alarm forwarding to an external remote warning system
- Maximum temperature stability and consistency according to NF X15-140
- 3-point calibration
- Access port for an external temperature sensor
- Lock

Type	Capacity Litres	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	Energy consumption kWh (24h)	Temp. range °C	PK	Cat. No.	
LKPv 1422	1427	1430 x 830 x 2150	1263 x 650 x 1550	3.9	0 ... +16	1	**9.698 689**	1
LKPv 6522	601	700 x 830 x 2150	533 x 650 x 1550	2.7	0 ... +16	1	**9.698 687**	2
LKPv 1420	1427	1430 x 830 x 2150	1263 x 650 x 1550	2.3	-2 ... +16	1	**9.698 688**	3
LKPv 6520	601	700 x 830 x 2150	533 x 650 x 1550	1.8	-2 ... +16	1	**9.698 686**	4
LGPv 1420	1427	1430 x 830 x 2150	1263 x 650 x 1550	8.9	-10 ... -26	1	**9.698 693**	5
LGPv 6520	601	700 x 830 x 2150	533 x 650 x 1550	4.7	-10 ... -35	1	**9.698 692**	6
LKPv 8420	856	790 x 980 x 2150	623 x 800 x 1550	2.4	-2 ... +16	1	**9.698 697**	
LGPv 8420	856	790 x 980 x 2150	623 x 800 x 1550	5.5	-10 ... -35	1	**9.698 698**	

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9.698 689

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9.698 687

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9.698 688

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9.698 686

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9.698 693

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9.698 692

Laboratory refrigerators LKv/LKUv and laboratory fridge-freezer LCv

Liebherr

Wherever floor space is limited or under-worktop installation is planned, the laboratory refrigerators with Comfort electronic controllers are the ideal solution. The range comprises two freestanding (LKv) and two underworktop (LKUv) laboratory refrigerators, in each case with glass door and solid door versions. The temperature can be set from +3°C to +8°C. The forced-air cooling system in conjunction with the precision electronic controller ensures temperature consistency and uniform temperature distribution in the interior. The LCv 4010 laboratory fridge-freezer, which has two separately cooling circuits, further extends the range of compact laboratory appliances.

Features:
- Dynamic cooling system
- Precision electronic controller with digital temperature display
- Glass door (..12) with ceiling light (separately switchable)
- Convenient, clear view drawers (LCv 4010)
- Self-closing door with integrated lock

Security package:
- Visual and audible temperature and door alarm
- Visual power failure alarm when mains power returns
- Integrated data memory with min/max temperatures
- Volt-free contact for alarm forwarding to an external remote warning system
- RS 485 interface enabling external documentation
- Access port for an external temperature sensor
- Maximum temperature stability and consistency according to NF X15-140

Type	Capacity l	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	Energy consumption kWh (24h)	Temp. range °C	PK	Cat. No.	
LKv 3912*	360	600 x 615 x 1840	440 x 435 x 1635	1.3	+3 ... +8	1	**9.698 684**	1
LKv 3910	360	600 x 615 x 1840	440 x 435 x 1635	0.8	+3 ... +8	1	**9.698 683**	2
LKUv 1612*	141	600 x 615 x 820	440 x 435 x 670	1.0	+3 ... +8	1	**9.698 681**	3
LKUv 1610	141	600 x 615 x 820	440 x 435 x 670	0.7	+3 ... +8	1	**9.698 680**	4
LCv 4010 fridge	254/	600 x 615 x 2000	440 x 435 x 1105	1.8	+3 ... +8	1	**7.627 795**	5
freezer	107		431 x 435 x 597		-9 ... -30			

*Glass door

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9.698 684

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9.698 683

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9.698 681

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9.698 680

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7.627 795

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6 Refrigerator drawers AluCool® including dividers

NEW!

H+H System GmbH

High quality aluminium drawers including frame on smooth-running wheels with pull-out stop. Includes flexible dividing system with card pockets. The flexible drawer dividers are pushed directly to the product, saving up to 30% space. With a few simple steps, the flexible dividers are taken out and the drawer can be cleaned easily and hygienically.

Typ A:
FKS 1800/1802/2600 /2602/3600/3602; FKU 1800/1805; UKS 1800/1801/2600/2602/3600/3602/3650; FKEx 1800/2600/3600

Typ B:
FKUv 1610/1612/1660/1662; LKexv 3910; LKv 3910/3912; LKUexv 1610; LKUv 1610/1612

The AluCool® drawers can be retrofitted at any refrigerator - to save and optimise valuable space.

Division: 3 channels with 12 universal dividers. Width of the channels can be changed in 1cm steps.

Refrigerator internal dimensions (W x D) mm	Type	PK	Cat. No.
441 x 513	A	1	**9.698 980**
435 x 440	B	1	**9.698 981**

E & OE.

1 Laboratory refrigerators and freezers ES series

NEW!

Thermo Scientific

Designed for routine sample protection where laboratory space is limited.
Our new ES Series lab refrigerators, freezers and combination refrigerator/freezer are the ideal choice when there is limited space in the laboratory.
All ES Series models deliver the sample protection, performance, security and quality you have come to depend on from us:

- Integrated controller
- Digital temperature display
- High and low temperature alarms
- Standard door locks, lockable
- Low energy consumption
- Access ports
- CE marked
- Defrost type automatic for temperature range +1 ... +11°C and manual for temperature range -10 ... -30°C

Equipment

151R-AEV-TS/151R-AEW-TS:	3 shelves, 1 basket
288R-AEV-TS/288R-AEW-TS:	5 shelves, 1 basket
151F-AEV-TS/151F-AEW-TS:	3 shelves
232F-AEV-TS/232F-AEW-TS:	2 shelves, 3 baskets
263C-AEV-TS/263C-AEW-TS:	3 shelves, 2 half baskets (R) / 1 shelf 2 baskets (F)

Type	Capacity l	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	Energy consumption kWh (24h)	Temp. range °C	PK	Cat. No.
151R-AEV-TS*	151	595 x 610 x 845	500 x 450 x 705	0.6	+1 ... +11	1	**9.536 211**
151R-AEW-TS**	151	595 x 610 x 845	500 x 450 x 705	0.6	+1 ... +11	1	**9.536 212**
288R-AEV-TS*	288	595 x 640 x 1565	480 x 445 x 1382	0.5	+1 ... +11	1	**9.536 213**
288R-AEW-TS**	288	595 x 640 x 1565	480 x 445 x 1382	0.5	+1 ... +11	1	**9.536 214**
151F-AEV-TS*	151	595 x 610 x 845	500 x 450 x 705	1.5	-10 ... -30	1	**9.536 215**
151F-AEW-TS**	151	595 x 610 x 845	500 x 450 x 705	1.5	-10 ... -30	1	**9.536 216**
232F-AEV-TS*	232	595 x 640 x 1565	437 x 430 x 1300	1.0	-10 ... -30	1	**9.536 217**
232F-AEW-TS**	232	595 x 640 x 1565	437 x 430 x 1300	1.0	-10 ... -30	1	**9.536 218**
263C-AEV-TS*	159 (R) / 109 (F)	545 x 610 x 1675	457 x 450 x 725 (R) / 408 x 415 x 670 (F)	0.9	+1 ... +11 (R) / -10 ... -30 (F)	1	**9.536 219**
263C-AEW-TS**	159 (R) / 109 (F)	545 x 610 x 1675	457 x 450 x 725 (R) / 408 x 415 x 670 (F)	0.9	+1 ... +11 (R) / -10 ... -30 (F)	1	**9.536 220**

*EU plug, **UK plug
(R) refrigerated area, (F) freeze area

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Laboratory refrigerators and freezers GPS series up to +1°C/-25°C

NEW!

Thermo Scientific

Medium and large capacities designed for routine sample protection.
With capacities ranging from space-saving 400L to spacious 1400L, our new GPS Series lab refrigerators and freezers meet the demands of today's laboratory requirements. All models contain sample protection features designed for the rigorous demands of the laboratory environment.
All GPS Series models deliver the sample protection performance, security and quality you have come to depend on from us:

- Integrated controller
- Digital temperature display
- High and low temperature alarms
- Standard door locks, lockable
- Standard casters
- Choice of glass or solid door (refrigerators only)
- Automatic defrost
- Access ports
- CE marked

Equipment

R400-/R700-/F400-/F700-: 3 shelves
R14X-/F14X-: 6 shelves

Type	Capacity Litres	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	Energy consumption kWh (24h)	Temp. range °C	doors	PK	Cat. No.
R400-SAEV-TS*	400	600 x 600 x 1900	480 x 500 x 1150	3.1	+1 ... +11	solid	1	**9.536 221**
R400-SAEW-TS**	400	600 x 600 x 1900	480 x 500 x 1150	3.1	+1 ... +11	solid	1	**9.536 222**
R400-GAEV-TS*	400	600 x 600 x 1900	480 x 500 x 1150	3.6	+1 ... +11	glass	1	**9.536 223**
R400-GAEW-TS**	400	600 x 600 x 1900	480 x 500 x 1150	3.6	+1 ... +11	glass	1	**9.536 224**
R700-SAEV-TS*	700	790 x 860 x 1980	600 x 660 x 1300	3.4	+1 ... +11	solid	1	**9.536 225**
R700-SAEW-TS**	700	790 x 860 x 1980	600 x 660 x 1300	3.4	+1 ... +11	solid	1	**9.536 226**
R700-GAEV-TS*	700	790 x 860 x 1980	600 x 660 x 1300	5.3	+1 ... +11	glass	1	**9.536 227**
R700-GAEW-TS**	700	790 x 860 x 1980	600 x 660 x 1300	5.3	+1 ... +11	glass	1	**9.536 228**
R14X-SAEV-TS*	1400	1400 x 800 x 1980	1300 x 660 x 1300	2.6	+1 ... +11	solid	1	**9.536 229**
R14X-SAEW-TS**	1400	1400 x 800 x 1980	1300 x 660 x 1300	2.6	+1 ... +11	solid	1	**9.536 230**
R14X-GAEV-TS*	1400	1400 x 800 x 1980	1300 x 660 x 1300	7.7	+1 ... +11	glass	1	**9.536 231**
R14X-GAEW-TS**	1400	1400 x 800 x 1980	1300 x 660 x 1300	7.7	+1 ... +11	glass	1	**9.536 232**
F400-SAEV-TS*	400	600 x 600 x 1900	480 x 500 x 1150	10.1	-12 ... -25	solid	1	**9.536 233**
F400-SAEW-TS**	400	600 x 600 x 1900	480 x 500 x 1150	10.1	-12 ... -25	solid	1	**9.536 234**
F700-SAEV-TS*	700	790 x 860 x 1980	600 x 660 x 1300	10.6	-12 ... -25	solid	1	**9.536 235**
F700-SAEW-TS**	700	790 x 860 x 1980	600 x 660 x 1300	10.6	-12 ... -25	solid	1	**9.536 236**
F14X-SAEV-TS*	1400	1400 x 800 x 1980	1300 x 660 x 1300	12.0	-12 ... -25	solid	1	**9.536 237**
F14X-SAEW-TS**	1400	1400 x 800 x 1980	1300 x 660 x 1300	12.0	-12 ... -25	solid	1	**9.536 238**

*EU plug, **UK plug

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E & OE.

Laboratory chest freezers up to -45°C

NEW!

Liebherr

Liebherr's low temperature -45°C chest freezers are designed to meet the specific requirements of an array of research, industrial or clinical applications. Where there is a need to store products or samples at lower than usual freezing temperatures freezers are the ideal solution. Offering supreme temperature stability as well as temperature uniformity within the units, they ensure the safe, cold storage of specimens, biological samples and other substances. The low temperature chest freezers are available in three sizes and are equipped with a precision digital controller, which guarantees maximum temperature accuracy. Having a volt-free contact and an RS 485 serial interface, Liebherr's low temperature chest freezers can also be connected to a central alarm and documentation system, which provides additional safety for the samples within the unit.

Features:
- Precision electronic controller with digital temperature display
- Interior light integrated in the lid
- Hygenic, easy-to-clean inner liner
- Profiled aluminium handle
- Reinforced lid hinges

Security package:
- Visual and audible temperature and lid-open alarm
- Visual power failure alarm when mains power returns
- Integrated data memory with min/max temperatures
- 1-point-calibration
- Volt-free contact for alarm forwarding to an external remote warning system
- RS 485 interface enabling external documentation
- Access port for an external temperature sensor
- Stop-frost-system to prevent the freezer from steaming up and easy opening
- Maximum temperature stability and consistency according to NF X15-140

Type	Capacity Litres	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	Energy consumption kWh (24h)	Temp. range °C	PK	Cat. No.
LGT 2325	215	1132 x 760 x 919	889 x 410 x 630	2.256	-10°C ... -45°C	1	**9.698 694** 1
LGT 3725	365	1373 x 808 x 919	1170 x 500 x 650	2.928	-10°C ... -45°C	1	**9.698 695** 2
LGT 4725	459	1648 x 808 x 919	1445 x 500 x 650	4.352	-10°C ... -45°C	1	**9.698 696** 3

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9.698 694

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9.698 695

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9.698 696

Ultra low temperature freezer, ULUF series up to -90°C

NEW!

Arctiko A/S

Reliable and powerful upright freezer with extra storage capacity and an user friendly controller. Features as non-manipulative data logger and USB readout are just some of the features that come as standard in the ULUF series.

Features on ULUF series
- Single compressor
- Low energy consumption
- Low noise level
- Low heat dissipation
- Insulated inner doors
- Castors
- Lock on door
- Ergonomic loading
- Heated door frame
- Heated vacuum valve
- 100% HCFC/CFC free
- Porthole for external temperature probes

Controller features
- Micro processor controller with digital display
- Approx. 72 hours battery back up for alarms, loggings and temperature display in case of power cut
- Visual and acoustic alarm
- Adjustable high/low temperature alarm
- Power failure alarm
- Probe failure alarm
- Instrument failure alarm
- Open door alarm
- Contact for remote alarm
- Prepared for GSM alarm
- Integrated data logger (software included)
- RS485/232 Interface
- Computer USB data read out
- Auto cycle if probe failure
- Ambient temperature display
- Shows all alarms
- Direct download/upload on/from USB memory stick
- 3-level password protected
- Battery level indication
- Integrated memory

Type	Capacity Litres	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Weight kg	Temp. range °C	PK	Cat. No.	
ULUF 65*	55	360 x 468 x 320	600 x 700 x 810	80	-40...-86°C	1	**9.699 310**	
ULUF 125*	155	360 x 493 x 530	950 x 725 x 810	100	-40...-86°C	1	**9.699 311**	1
ULUF 450*	413	480 x 608 x 1415	720 x 885 x 2089	183	-40...-86°C	1	**9.699 312**	
ULUF 750**	680	790 x 608 x 1415	1030 x 885 x 2089	354	-40...-86°C	1	**9.699 314**	2
ULUF 850***	826	2 deparment each 480 x 608 x 1415	1492 x 885 x 2089	376	-40...-86°C	1	**9.699 315**	3
ULUF 490***	393	480 x 608 x 1415	720 x 885 x 2089	208	-40...-90°C	1	**9.699 318**	
ULUF 890***	786	2 deparment each 480 x 608 x 1415	1492 x 885 x 2089	426	-40...-90°C	1	**9.699 319**	

* single compressor
**insulated inner doors
***dual refrigeration system

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9.699 311

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9.699 314

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9.699 315

E & OE.

Ultra low temperature freezer, UPUL series up to -86°C

NEW!

Arctiko A/S

Low energy consumption combined with ergonomic usage and many alarm features. With direct cooling in each compartment, the UPUL series ensures better temperature uniformity from top to bottom.

Features on UPUL series
- Single compressor
- Low energy consumption
- Low noise level
- Low heat dissipation
- Inner doors
- Castors and door key lock
- Ergonomic loading
- Heated door frame
- Heated vacuum valve
- 100% HCFC/CFC free
- Porthole for external temperature probes

Controller features
- Micro processor controller with digital display
- Approx. 72 hours battery back up for alarms, loggings and temperature display in case of power cut
- Visual and acoustic alarm
- Adjustable high/low temperature alarm
- Power failure alarm
- Probe failure alarm
- Instrument failure alarm
- Open door alarm
- Contact for remote alarm
- Prepared for GSM alarm
- Integrated data logger (software included)
- RS485/232 Interface
- Computer USB data read out
- Auto cycle if probe failure
- Ambient temperature display
- Shows all alarms
- Direct download/upload on/ from USB memory stick
- 3-level password protected
- Battery level indication
- Integrated memory

1



9.699 313

Type	Capacity Litres	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Weight kg	Temp. range °C	PK	Cat. No.
UPUL 580*	450	480 x 586 x 1470	680 x 805 x 2182	154	-40 to -86°C	1	**9.699 313** 1

* single compressor

Ultra low temperature freezer, ULTRA.GUARD™ up to -86°C

2

BINDER

The new BINDER ULTRA.GUARD™ Ultra low temperature freezer from BINDER secures a long-term storage of samples at -86°C. ULTRA.GUARD™ is based on a multi-stage security concept, which offers everything that laboratory staff want from reliable operation to ease of use and system integration to the emergency exchange service. Voltage 230V 1N, ~50Hz.

Advantages:
- GUARD.CONTROL opens the freezer by pressing a button
- GUARD.CONTROL RFID technology personalizes access and records user traffic
- DATA.SECURE Data logger with USB connection
- SERVICE.PRO™ provides 24/7/365 exchange service and an extended 4 year guarantee

Areas of application:
- Biotechnology
- Clinics/University Hospitals
- Pharmaceuticals Industry

Shelves are included. Racks and boxes must be ordered separately.



9.883 664

Type	Capacity Litres	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	Weight kg	Temp. range °C	PK	Cat. No.
UF V 500	465	900 x 890 x 1970	619 x 635 x 1300	320	-40 to -86°C	1	**9.883 663**
UF V 700	725	1200 x 890 x 1970	911 x 635 x 1300	360	-40 to -86°C	1	**9.883 664** 2

Accessories for ultra low temperature freezer, ULTRA.GUARD™

BINDER

For	Description	PK	Cat. No.
all UF V models	Access port 30 mm, back side	1	**9.883 670**
all UF V models	Ethernet interface	1	**9.883 673**
all UF V models	Additional PT 100 sensor with lemo socket, back side	1	**9.883 674**
all UF V models	Remote alarm box GSM	1	**9.883 675**
all UF V models	Advanced voltage booster	1	**9.883 676**
all UF V models	Read-out box RFID system	1	**9.883 677**
UF V 500	PDF Data logger with USP port	1	**9.883 682**
UF V 500	Chart recorder UF V 500 (internal)	1	**9.883 683**
UF V 500	Deicing kit including deicing tray, wiper and scratch	1	**9.883 684**
UF V 500	Water cooling	1	**9.883 685**
UF V 700	PDF Data logger with USP port	1	**9.883 686**
UF V 700	Chart recorder UF V 700	1	**9.883 687**
UF V 700	Deicing kit including deicing tray, wiper and scratch	1	**9.883 688**
UF V 700	Water cooling	1	**9.883 689**

Ultra low temperature freezer, ULTF serie, -86/-40°C

NEW!

Arctiko A/S

Powerful high performance freezing combined with low energy consumption. The integrated cooling system gives maximum use on limited space, and we pride ourselves with the lowest noise level available.

Features on ULTF serie
- Single compressor
- Low energy consumption
- Low noise level (50 dBa)
- Low heat dissipation
- 100% HCFC/CFC free
- Sub lids
- Castors and key lock
- Porthole for external temperature probes

Controller features
- Digital display
- Visual and acoustic alarm
- Adjustable high/low temperature alarm
- Power failure alarm
- Instrument (Eprom) failure alarm
- Probe failure alarm
- Contact for remote alarm
- Approx. 48 hours battery back up for alarms and temperature display in case of power cut
- 3 pin PT100 specially designed for ultra low temperatures

Type	Capacity	Internal dimensions (W x D x H)	External dimensions (W x D x H)	Weight	Temp. range	PK	Cat. No.	
	Litres	mm	mm	kg	°C			
ULTF 80*	71	390 x 390 x 450	552 x 648 x 850	53	-40...-86°C	1	**9.699 320**	
ULTF 220*	189	760 x 440 x 635	920 x 695 x 885	64	-40...-86°C	1	**9.699 321**	
ULTF 320*	284	1100 x 440 x 630	1262 x 698 x 885	76	-40...-86°C	1	**9.699 322**	1
ULTF 420*	368	1400 x 440 x 630	1562 x 698 x 885	88	-40...-86°C	1	**9.699 323**	2

* single compressor

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9.699 322

2



9.699 323

E & OE.

1 Chest and Upright Freezers

1



GFL

Microprocessor controlled temperature regulation
The microprocessor controlled temperature regulator, with digital display of actual and set temperature values operates without maintenance and is shock-resistant. The regulator is battery-backed by constantly charged NiCd battery that maintains the display of the actual temperature and the alarm functions for 60 hours in the event of mains failure. During operation on the mains, the battery level and the set temperature can be checked by touch control. With RS-232 interface, compatible e.g. to the PC software labworldsoft®. Alternative data transfer formats, RS-422 and RS-485, are also available.

Energy-saving cooling unit
The maintenance-free cooling unit, equipped with hermetically sealed, high-performance compressors, ensures short cooling times. The refrigerant is non-flammable. The all around insulation comprises an up to 150mm thick, seamless and diffusion-protected foamed-in polyurethane layer.

Ex-proof inside cabinets
The inside cabinets are manufactured entirely out of stainless steel (material no 1.4301), are corrosion resistant and easy to clean. They are free from ignition sources, an extremely important aspect when storing low flash-point media and are ex-proof in accordance with BG-I 850-0, version 02/2009. The cooling air outlet is located at the front of the unit, meaning that explosive gases can not be drawn in. The magnetic sealing system reliably prevents freezing of the lid or door seals.

Controlled access
The lids and doors of the freezer units can be locked, a control panel provides controlled access through the use of a key-operated security switch.

Multiple alarm messages
All deep freezers include a potential-free, changeover contact for connection to an internal alarm system or to the central I&C system as standard. They are also provided with a connection for a piezoelectric buzzer. In the event of a fault an optical and audible alarm is issued. The cause for the fault is shown in the display as a defined code number. The limit values for alarms (1-20 K) for excess and under temperature can be set individually by the user. Optional suppressions of alarm messages can also be set by the user.

Powder-coated housing
The housings are made of powder-coated, electrolytically galvanized sheet steel. As standard, GFL deep freezers are mounted on double wheel, swivel castors, two of which can be locked, for transport to the place of use and for mobile applications (castors for the sub-counter Deep Freezers 6441 and 6481).

Accessories appropriate for the task at hand and storage system avaialble on request. Customised equipment available on request, for tasks that demand special solutions for storage.

2 Chest Freezers up to -40°C/-85°C

2



GFL

All chest lids are balanced and easy to operate. Chest freezers with capacities of 220 to 500 litres are also equipped with additional insulating cover panels on the cabinet.

Type	Capacity Litres	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	Weight kg	Rating kW	Temp. range °C	PK	Cat. No.
6340	70	836 x 685 x 1055	600 x 350 x 340	100	0.60	0 to -40	1	**9.699 340**
6341	30	700 x 600 x 905	500 x 305 x 200	70	0.60	0 to -40	1	**9.699 341**
6342	100	960 x 790 x 1080	710 x 440 x 340	180	0.60	0 to -40	1	**9.699 342**
6343	220	1450 x 870 x 1040	840 x 460 x 580	210	0.60	0 to -40	1	**9.699 343**
6344	300	1610 x 910 x 1060	1000 x 500 x 600	240	0.60	0 to -40	1	**9.699 344**
6345	500	2060 x 1000 x 1060	1440 x 580 x 600	310	1.20	-50 to -85	1	**9.699 345**
6380	70	836 x 685 x 1055	600 x 350 x 340	120	1.20	-50 to -85	1	**9.699 380**
6381	30	700 x 600 x 905	500 x 305 x 200	90	1.20	-50 to -85	1	**9.699 381**
6382	100	960 x 790 x 1080	710 x 440 x 340	200	1.20	-50 to -85	1	**9.699 382**
6383	220	1450 x 870 x 1040	840 x 460 x 580	230	1.20	-50 to -85	1	**9.699 383**
6384	300	1610 x 910 x 1060	1000 x 500 x 600	260	1.20	-50 to -85	1	**9.699 384**
6385	500	2060 x 1000 x 1060	1440 x 580 x 600	330	1.20	-50 to -85	1	**9.699 385**

1 2 Upright Freezers up to -40°C/-85°C

Upright freezers of 300 litres and 500 litres are equipped with three inner compartments (H 353mm), each provided with an insulating door. Optional shelves can also be installed in the compartments. On request, the cabinet can also be equipped with a set of drawers instead of the inside compartments. *GFL*

After removing the cover plate, the sub-counter Deep Freezers 6441 and 6481 can be built into a laboratory bench.

Type	Capacity Litres	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	Weight kg	Rating kW	Temp. range °C	PK	Cat. No.
6441	96	900 x 770 x 890	430 x 430 x 510	140	0.45	0 to -40	1	**9.699 501**
6443	300	990 x 865 x 1940	600 x 450 x 1100	240	0.60	0 to -40	1	**9.699 503**
6445	500	990 x 1175 x 1940	600 x 760 x 1100	310	0.60	0 to -40	1	**9.699 504**
6481	96	900 x 770 x 890	430 x 430 x 510	150	0.90	-50 to -85	1	**9.699 502**
6483	300	990 x 865 x 1940	600 x 450 x 1100	270	1.20	-50 to -85	1	**9.699 495**
6485	500	990 x 1175 x 1940	600 x 760 x 1100	340	1.20	-50 to -85	1	**9.699 497**

1



2



3



3 Safety Cooling Systems

Accessories for Chest and Upright Freezers. *GFL*

CO_2/LN_2 safety cooling systems for connection to a 230V emergency power system or for battery-powered operation (supplied with power from a battery provided with the system, approx. 60 h). Temperature of the cabinet is kept constant at a freely selectable value (0 to -70°C) by controlled injection of CO_2 or LN_2. For chest freezers with a volume of 70 litres or above and upright freezers from 300 litres capacity upwards. Refrigerant vessel not included.

Type	For	PK	Cat. No.
6946a LN_2 safety cooling	230V	1	**9.699 452**
6946b LN_2 safety cooling	Battery	1	**9.699 453**
6947a CO_2 safety cooling	230V	1	**9.699 447**
6947b CO_2 safety cooling	Battery	1	**9.699 451**

4



4 Distribution Lines for Safety Cooling System with CO_2

For CO_2 safety cooling systems 6947a and 6947b (CO_2 bottles not included in scope of supply). For simultaneous connection of two or three CO_2 bottles distribution lines are required. The CO_2 bottles must be provided with a rising pipe and must not be connected to a pressure limiter. The distribution line can be ordered complete with all requisite connectors, tubes and materials for wall mounting. *GFL*

Type	For	PK	Cat. No.
6948	2 CO_2 bottles	1	**9.699 448**
6949	3 CO_2 bottles	1	**9.699 449**

E & OE.

Water cooling 6960

Accessory for Chest and Upright Freezers. *GFL*
A heat exchanger is installed in place of the air-cooled liquefier. The heat exchanger considerably reduces the heat given off by the unit to the environment, at the same time, expanding the permissible ambient temperature range in which the unit can be operated. Water supply is regulated by the freezer. The heat exchanger can be connected to a recirculation system or to the internal water supply system. (Connecting points on unit: outside thread connector for pressure hose ½ inch *with lock nut.) For freezers with a volume of at least 220 litres.

Type		PK	Cat. No.
6960		1	**9.699 454**

* not in scope of supply

Qualification data record

For detailed documentation of the spatial and temporal temperature constancy in the deep freezers, when users must, for example, comply with the special approval guidelines defined by the Federal Drug Administration of the USA (FDA). All requested test and measurement data are established at our factory using a calibrated test section and archived at GFL for one decade. *GFL*

Type	Description	PK	Cat. No.
6965	Measurement report	1	**9.699 565**

1 Drawer Sets for Upright Freezers (300/500 l volume)

To equip the cabinet of upright freezers with a set of four drawers in place of the three insulated compartments. Made of stainless steel with front panels made of 10mm thick polystyrene insulating plates. Ball bearings and slide rails ensure easy and level motion. *GFL*

Type	For	PK	Cat. No.
6952	Upright freezer, 300L	4	**9.699 456**
6953	Upright freezer, 500L	4	**9.699 457**

1



2 Additional Shelves for Upright Freezers (300/500l volume)

Upright Freezers having a storage volume of 300 and 500 litres come with three compartments as standard equipment. As an option, each compartment can be sectioned with one additional shelf for optimal utilisation of the internal volume of the unit. *GFL*

Type	For	PK	Cat. No.
6954	300 litre freezers	1	**9.699 458**
6955	500 litre freezers	1	**9.699 459**

Storage system for Chest and Upright Freezers (racks to accept boxes, inner dividers for boxes and racks for Microtiter and DeepWell plates) available on request.

2



We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

GFL

Ice Flaker RF/RFS series

Due to its specific properties and large surface for rapid cooling, flake ice can be used in different areas of food production or laboratories and could be applied directly to the products to be cooled Important for the users is the consistently high quality of compact granular and flakes with excellent cooling performance. The flake ice is compliant with HACCP and will be manufactured in a vertical stainless steel evaporator. A worm gear promotes the flake ice in a closed system to the head of the cylinder, where it is compressed and broken into the desired size. In this particularly hygienic and economical method almost the total amount of used water is converted into ice. Manitowoc offers a variety of different ice flakers. Beside mountable devices with reservoir, there are modular ice machines with separate magazine and split units with external condenser. Flake ice in three different grain sizes (fine, hard and crude) could be produced which all are HACCP compliant. The ice flaker can be used with deionized water without any technical change.

Manitowoc

1



9.580 203

Flake ice maker with reservoir, air cooled, RF Series

NEW!

Manitowoc

- Vertical condenser cylinder with internal worm gear system
- HACCP compliant
- Energy-saving production
- Convenient door for easy access
- Separate power switch
- Ready to plug in
- Stainless Steel
- Deionized water suitable

Included: Adjustable stainless steel feet 110 to 150mm, water supply kit, drain kit, ice scoop.

Specifications

Cooling:	Air (A)
Refrigerant:	R 404 A
Power supply *:	230V, 50Hz

* Other voltages on request

Type	Output kg/24 hrs.	Rating	Capacity	Dimensions (W x D x H)	Weight	PK	Cat. No.
	up to kg	W	kg	mm	kg		
RF 0244 A	82	703	18	500 x 660 x 842	71	1	**9.580 201**
RF 0266 A	82	703	27	500 x 660 x 952	76	1	**9.580 202**
RF 0385 A	151	1026	40	738 x 690 x 1003	102	1	**9.580 203** 1
RF 0399 A	151	1026	54	738 x 690 x 1172	109	1	**9.580 204**
RF 0644 A	312	3004	54	741 x 678 x 1167	117	1	**9.580 205**

Dry ice machines please see page 760.

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

Manitowoc

E & OE.

Flake ice maker without reservoir, RFS series

NEW!

Manitowoc

- HACCP compliant
- Robust and low-maintenance
- Improved energy efficiency by 5% (RFS models)
- Stainless steel (inside/outside)
- Separate power switch
- Air-or water-cooled
- Vertical condenser cylinder with internal worm gear system
- Deionized water suitable

Included: Water supply kit, drain kit, adapter kit for memory.

Specifications

Cooling:	Air (A)
Refrigerant:	R 404 A
Power supply *:	230V, 50Hz

* Other voltages on request

Type	Output kg/24 hrs. up to kg	Rating W	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
RFS 0300 A	174	1465	559 x 600 x 660	79	1	**9.580 211** 1
RFS 0650 A	322	3004	559 x 600 x 660	104	1	**9.580 212**
RFS 1200 A	546	4103	760 x 600 x 696	119	1	**9.580 213**
RFS 2300 A	1093	8646	944 x 684 x 700	210	1	**9.580 214** 2

1



9.580 211

2



9.580 214

Reservoir and adapters for RFS series

NEW!

Manitowoc

Type	Description	For model	PK	Cat. No.
B 320	Reservoir 95kg	RFS 0300 A/W und RFS 0650 A/W	1	**9.580 221** 3
B 420	Reservoir 141kg	RFS 0300 A/W und RFS 0650 A/W	1	**9.580 222**
B 570	Reservoir 195kg	RFS 01200 A/W	1	**9.580 223**
B 970 + K-00368	Reservoir 323kg includes adapter	RFS 01200 A/W	1	**9.580 224**
F 1300	Reservoir 599kg	RFS 02300 A/W	1	**9.580 225**

3



9.580 221



1 LLG-Cryotubes, PP, sterile

External screw thread or internal screw thread. Temperature resistant down to -196°C. **Not appropriate for operations in liquid nitrogen.** With marking area, fill line and graduations printed on the vial. Safe and precise handling of biotechnology materials. Bar-code printed on each tube. DNase/RNase free. Vials and caps are autoclavable at 121°C.

Homogeneous conception:
- all made from polypropylene
- single-body, single-turn screw cap

Printed graduations for accurate measurements. Large white area for writing specimen identification. Sterile.

Packed in 2 bags of 50 tubes.

Capacity ml	Ext. diam. mm	Height mm	Description	PK	Cat. No.
1.2	14.2	41.5	external thread, self-standing	100	**9.401 060**
1.2	12.3	42.4	internal thread, self-standing	100	**9.401 061**
2.0	14.2	48.0	external thread, self-standing	100	**9.401 062**
2.0	12.3	49.0	internal thread, self-standing	100	**9.401 063**
2.0	14.2	46.5	external thread	100	**9.401 064**
2.0	12.3	48.0	internal thread	100	**9.401 065**
5.0	14.2	88.9	external thread, self-standing	100	**9.401 066**
5.0	12.3	91.9	internal thread	100	**9.401 067**
5.0	12.3	91.0	internal thread, self-standing	100	**9.401 068**

Fits in 10 x 10 Cryobox System 100™ 5026, Order No: 9.400 927



2 LLG-Insert cap disks for cryotubes, PP

Colour-coded cryovial cap inserts

Colour	PK	Cat. No.
blue	1000	**9.401 070**
white	1000	**9.401 071**
yellow	1000	**9.401 072**
pink	1000	**9.401 073**
red	1000	**9.401 074**
green	1000	**9.401 075**





3 4 Cryogenic tubes, PP

NEW!

BRAND

Designed for storage of biological material, such as microorganisms, human and animal cells, etc. in the gas phase of liquid nitrogen.
Graduated, 12.5 mm o.d. Large frosted marking area and coloured cap inserts for easy sample identification.
Temperature stability to -196°C. y-ray sterile (SAL 10^{-6}) and autoclavable at 121°C (2 bar), according to DIN EN 285.
Marked with the CE symbol according to the IVD Directive 98/79 EC. Cryogenic vials are sterile, RNase-, DNase-, DNA- and endotoxin-free.

Capacity ml	Grad. up to ml	Description	Thread	Height mm	PK	Cat. No.
1.2	1.00	self-standing	external	41	1000	**6.801 655**
2.0	1.80	round-bottom	external	47	1000	**6.206 393**
2.0	1.80	self-standing	external	49	1000	**7.079 366**
3.0	3.00	self-standing	external	70	1000	**6.802 266**
4.0	3.60	self-standing	external	76	1000	**7.059 827**
5.0	4.50	self-standing	external	90	1000	**7.300 349**
1.2	1.00	self-standing	internal	41	1000	**7.300 557**
2.0	1.80	self-standing	internal	49	1000	**7.053 349**
2.0	1.80	round-bottom	internal	48	1000	**7.604 109**
4.0	3.60	round-bottom	internal	70	1000	**9.401 223**
4.0	3.60	self-standing	internal	71	1000	**9.401 224**
5.0	4.60	round-bottom	internal	90	1000	**7.610 567**



5 Cap coders, PP for Brand® cryogenic tubes

NEW!

Fit for all sizes

BRAND

Colour	PK	Cat. No.
white	500	**7.200 575**
blue	500	**7.077 849**
red	500	**7.053 350**
green	500	**7.079 679**
yellow	500	**7.600 162**

1 Cryovials System 100, with external screw thread, PP

Thermo Scientific

With PE-HD screw cap and silicone gasket. External screw thread. Self-standing. Increase storage capacity in mechanical and gaseous phase liquid nitrogen freezers. The gasket prevents leakage in microcentrifuges (up to 8000xg), or during transport. With writing area and graduations in white. Gamma radiation sterilized. One-handed operation possible. In compliance to CE. DNAse/RNAse free. Pyrogen-free and non-cytotoxic. Supplied in packs as indicated. Bar coded version available on request.



Capacity ml	Ext. diam. mm	Height mm	PK	Cat. No.
1.0	12	38	25	**9.400 912**
1.5	12	48	25	**9.400 913**

2 Cryovials with external screw thread, PP, sterile

Thermo Scientific

PP with PE-HD screw cap. External screw thread. Self-standing. Temperature resistant down to -196°C. Gamma radiation sterilised. Non-cytotoxic and pyrogen-free. Compliance to Derective CE. DNAse/RNAse free. With marking area, fill line and graduations printed on the vial. Bar coded version available on request.



Type	Capacity ml	Ext. diam. mm	Height mm	Description	PK	Cat. No.
5000	1.2	13.5	38	conical, sterile	25	**9.400 941**
5000	2.0	13.5	48	conical, sterile	25	**9.400 942**
5000	5.0	13.5	92	conical, sterile	10	**9.400 943**
5005	15.0	33.0	47	flat, sterile	75	**9.400 950**

Also available in a larger pack size (1000 pc.).

3 Cap coders for cryovials, PS

Thermo Scientific

Coloured PS cap inserts.



Colour	PK	Cat. No.
white	100	**9.400 967**
yellow	100	**9.400 968**
blue	100	**9.400 969**
green	100	**9.400 970**
red	100	**9.400 971**

Cryovial racks, PC

Thermo Scientific

Autoclavable. Space-saving. Choice of sizes to hold 25 or 50 cryovials of 1.2, 2.0 or 5ml capacities. With moulded identification numbers and letters. One-handed operation possible.



9.400 958

Aperture array qty.	Width mm	Length mm	Height mm	PK	Cat. No.
5 x 10	102	197	28	1	**9.400 944**
5 x 5, staggered	102	197	22	1	**9.400 958** 4

Further Racks - please see page 35.





1 2 Nunc Cryotubes with External Thread, PP/PE

Thermo Scientific

Intended for cryogenic transportation and storage of biological material. Available in three different tube types: Round or conical bottom shape with starfoot or round without foot (= non free standing). Conform to the IATA requirements for the transport of diagnostic specimens and to the US pharmacopoeia USP Class VI. Packed in resealable zip lock bags with printed catalog no. and lot. no. Non-pyrogenic. Non-toxic. Sterile (SAL 10^{-6}). CE marked. Certified RNase- and DNase-free.
Material tubes: PP
Material screw caps: PE

Warning:
Do not use CryoTubes in the liquid phase of liquid nitrogen unless correctly sealed in Nunc CryoFlex™ Tubing (Cat. No. 4.009 142). Improper use may cause liquefied nitrogen to be trapped inside the vial and lead to pressure build-up, resulting in possible explosion or biohazard release.

Capacity ml	Height mm	Ext. diam. mm	Description	PK	Cat. No.
1.0	41	12.5	Conical, starfoot and writing area	500	**6.078 305**
1.8	48	12.5	Round, starfoot and writing area	450	**6.054 658**
4.5	91	12.5	Round, starfoot and writing area	300	**6.302 247**
1.0	41	12.5	Conical, starfoot	2000	**4.009 087**
1.8	48	12.5	Round, starfoot	450	**6.803 016**
4.5	91	12.5	Round, starfoot	1200	**4.008 952**
1.0	30	12.4	Round, writing area*	500	**6.800 399**
1.8	44	12.4	Round, writing area*	500	**6.088 774**
			CryoFlex™ Tubing, 500 x 14mm	300	**4.009 142**

* Closure design does not permit the use of Cryo Color Coders.





3 4 Nunc Cryotubes with Internal Thread, PP, sterile

Thermo Scientific

Intended for cryogenic transportation and storage of biological material. Internal thread with a silicone gasket provides the best possible seal. Available in four different bottom shapes: Round with or without free standing and round or conical with starfoot. Conform to the IATA requirements for the transport of diagnostic specimens and to the US pharmacopoeia USP Class VI. Packed in resealable zip lock bags with printed catalog no. and lot. no. Non-pyrogenic. Non-toxic. Sterile (SAL 10^{-6}). CE marked. Certified RNase- and DNase-free.
Material tube and screw cap: PP

Warning:
Do not use CryoTubes in the liquid phase of liquid nitrogen unless correctly sealed in Nunc CryoFlex™ Tubing (Cat. No. 4.009 142). Improper use may cause liquefied nitrogen to be trapped inside the vial and lead to pressure build-up, resulting in possible explosion or biohazard release.

Capacity ml	Height mm	Ext. diam. mm	Description	PK	Cat. No.
1.8	48	12.5	Round and writing area	500	**6.052 729**
3.6	70	12.5	Round and writing area	400	**7.607 431**
4.5	92	12.5	Round and writing area	300	**7.607 632**
1.0	42	12.5	Conical, free standing and writing area	500	**7.600 059**
1.8	49	12.5	Round, free standing and writing area	450	**6.800 228**
1.0	42	12.5	Conical, starfoot and writing area	500	**6.054 193**
1.8	49	12.5	Round, starfoot and writing area	450	**6.302 598**
3.6	72	12.5	Round, starfoot and writing area	400	**6.200 843**
4.5	92	12.5	Round, starfoot and writing area	300	**6.302 596**
			CryoFlex™ Tubing, 500 x 14mm	300	**4.009 142**

1 Cryo Color Coders for Nunc Cryotubes

Use Nunc Cryo Color Coders as part of a versatile and comprehensive filing system. Fit all CryoTubes™ and are available in 10 different colours.

Thermo Scientific



Colour	PK	Cat. No.
Red	500	**7.079 568**
Orange	2000	**9.401 272**
Brown	500	**7.630 646**
White	2000	**9.401 274**
Blue	2000	**9.401 275**
Green	2000	**9.401 276**
Magenta	500	**6.204 811**
Yellow	2000	**9.401 278**
Purple	500	**6.901 208**
Grey	500	**6.901 244**
Assorted colours	500	**7.200 519**

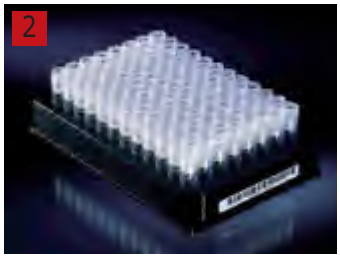
2 Cryobank Vials, black racks with 96 tubes

NEW!

Nunc CryoTube™ with unique low binding surface

Thermo Scientific

- High sample recovery with low concentration samples
- CE marked for diagnostic use
- DNAse/RNAse free
- Non-pyrogenic (LAL-test)
- Non-toxic (USP class VI test)
- Conform to IATA requirements for the transport of diagnostic specimens



Capacity ml	Description	PK	Cat. No.
0.5	sterile	10	**4.008 838**
1.0	sterile	10	**4.008 843**

3 Miniboxes for CryoTubes™, PS

Miniboxes made from High Impact Polystyrene (HIPS) are ideal for the transport of CryoTubes™. Available in two sizes.

Thermo Scientific



For	PK	Cat. No.
5 CryoTubes™ 1.0-1.8ml	350	**9.390 600**
10 CryoTubes™ 1.0-1.8ml	200	**9.390 601**

4 LLG-Cryogenic storage boxes, standard, 136 x 136

Freezer and cryogenic storage boxes (CryoBoxes).
136 x 136mm square.
For the storage of samples. Made of freezing-resistant, water-repellent, coated cardboard. With lid. Colours as indicated.



Int. height mm	Colour	PK	Cat. No.
32	white	1	**6.088 950**
32	yellow	1	**6.802 292**
32	blue	1	**6.802 293**
32	red	1	**6.260 000**
32	green	1	**6.260 001**
50	white	1	**9.401 000**
50	yellow	1	**9.401 002**
50	blue	1	**9.401 004**
50	green	1	**9.401 013**
50	red	1	**9.401 015**
75	white	1	**9.401 030**
75	yellow	1	**9.401 032**
75	blue	1	**9.401 034**
75	green	1	**9.401 036**
75	red	1	**9.401 038**
100	white	1	**9.401 040**
100	yellow	1	**9.401 042**
100	blue	1	**9.401 044**
100	green	1	**9.401 046**
100	red	1	**9.401 048**
130	white	1	**6.057 279**
130	red	1	**6.201 070**
130	green	1	**6.260 002**
130	yellow	1	**6.260 003**
130	blue	1	**6.228 311**

1



1 LLG-Cryogenic storage boxes, plastic coated, 136 x 136

Freezer and cryogenic storage boxes (CryoBoxes). Made of cardboard, **plastic coated** without divider. Dimensions: 136 x 136mm square. For the storage of samples. With lid.

Int. height mm	Colour	PK	Cat. No.
32	white	1	**6.802 214**
32	yellow	1	**6.231 450**
32	red	1	**6.231 451**
32	blue	1	**6.260 004**
32	green	1	**6.260 005**
50	white	1	**6.080 130**
50	yellow	1	**6.077 876**
50	blue	1	**6.077 875**
50	green	1	**6.081 021**
50	red	1	**6.081 022**
75	white	1	**6.802 726**
75	blue	1	**6.260 006**
75	red	1	**6.260 007**
75	green	1	**6.260 008**
75	yellow	1	**6.260 009**
100	white	1	**6.090 388**
100	blue	1	**6.260 010**
100	red	1	**6.260 011**
100	green	1	**6.260 012**
100	yellow	1	**6.260 013**
130	blue	1	**6.260 014**
130	red	1	**6.801 788**
130	white	1	**6.083 519**
130	green	1	**6.801 787**

2



2 LLG-Partition inserts for Cryoboxes,136 x 136 mm

For cryoboxes 136 x 136mm. With compartment heights and formats as indicated.

Height mm	Array	PK	Cat. No.
25	6 x 6	1	**6.260 015**
25	7 x 7	1	**6.089 965**
25	8 x 8	1	**6.202 838**
25	9 x 9	1	**6.802 057**
25	10 x 10	1	**6.054 191**
25	12 x 12	1	**6.050 586**
25	13 x 13	1	**6.050 585**
25	14 x 14	1	**6.050 333**
30	4 x 4	1	**6.305 840**
30	5 x 5	1	**9.401 055**
30	6 x 6	1	**6.090 419**
30	7 x 7	1	**9.401 054**
30	8 x 8	1	**9.401 053**
30	9 x 9	1	**9.401 052**
30	10 x 10	1	**9.401 051**
30	12 x 12	1	**9.401 050**
30	13 x 13	1	**6.260 017**
30	14 x 14	1	**6.260 016**
40	4 x 4	1	**6.401 505**
40	5 x 5	1	**6.260 020**
40	6 x 6	1	**6.202 839**
40	7 x 7	1	**6.802 215**
40	8 x 8	1	**6.900 361**
40	9 x 9	1	**7.510 691**
40	10 x 10	1	**6.077 877**
65	4 x 4	1	**6.510 301**
65	5 x 5	1	**6.079 677**
65	6 x 6	1	**6.201 071**
65	8 x 8	1	**6.801 789**
65	9 x 9	1	**6.072 218**
65	10 x 10	1	**6.802 727**
65	12 x 12	1	**6.803 270**
40	13 x 13	1	**6.260 018**
40	12 x 12	1	**6.260 019**

1 Cryogenic storage boxes, 1/1

Colour: white. Other colours are available on request. Freezer and cryogenic storage boxes (CryoBoxes). Made of freeze-resistant, water-repellent, coated cardboard. Dimensions: 136 x 136mm square. For the storage of samples. With lid.

Ratiolab

1



Int. height mm	PK	Cat. No.
32	1	**9.405 860**
50	1	**9.405 861**
75	1	**9.405 862**
100	1	**9.405 863**
130	1	**9.405 864**

Special sizes available on request!

2 Partition inserts for Cryoboxes

For cryoboxes 136 x 136mm. With compartment heights and formats as indicated.

Ratiolab

2



Height mm	Array	PK	Cat. No.
25	10 x 10	1	**9.405 874**
25	12 x 12	1	**9.405 878**
25	16 x 16	1	**9.405 882**
30	9 x 9	1	**9.405 871**
30	10 x 10	1	**9.405 875**
30	12 x 12	1	**9.405 879**
30	16 x 16	1	**9.405 883**
40	9 x 9	1	**9.405 872**
40	10 x 10	1	**9.405 876**
40	12 x 12	1	**9.405 880**
65	4 x 4	1	**9.405 870**
65	9 x 9	1	**9.405 873**
65	10 x 10	1	**9.405 877**
65	12 x 12	1	**9.405 881**

3 LLG-Cryogenic storage boxes, standard, 133 x 133

Freezer and cryogenic storage boxes (CryoBoxes). Cardboard. Without internal dividers. Colour-coded, with lid. Dimensions: 133 x 133mm. For the storage of samples.

3



Int. height mm	Colour	PK	Cat. No.
32	white	1	**6.235 243**
50	yellow	1	**6.079 785**
50	blue	1	**6.079 786**
50	green	1	**6.079 787**
50	red	1	**6.079 788**
50	white	1	**6.090 495**
75	white	1	**6.087 345**
75	blue	1	**6.260 021**
75	red	1	**6.260 022**
75	green	1	**6.260 023**
75	yellow	1	**6.260 024**
100	blue	1	**6.260 025**
100	red	1	**6.260 026**
100	green	1	**6.260 027**
100	yellow	1	**6.260 028**
100	white	1	**6.082 970**
130	white	1	**6.803 050**
130	red	1	**6.206 128**

Special sizes and colours available on request!

1



1 LLG-Cryogenic storage boxes, plastic coated, 133 x 133

Freezer and cryogenic storage boxes (CryoBoxes). Made of cardboard, **plastic coated**. Without divider. Dimensions: 133 x 133mm square. For the storage of samples. With lid.

Int. height mm	Colour	PK	Cat. No.
32	white	1	**6.260 029**
32	red	1	**6.234 735**
32	yellow	1	**6.234 736**
32	green	1	**6.801 699**
32	blue	1	**6.802 431**
50	red	1	**6.081 654**
50	white	1	**6.082 701**
50	green	1	**6.084 538**
50	blue	1	**6.700 568**
75	red	1	**6.260 030**
75	yellow	1	**6.260 031**
75	white	1	**6.801 707**
75	green	1	**6.803 056**
100	white	1	**6.260 032**
130	white	1	**6.260 033**

Special sizes and colours available on request!

LLG-Partition inserts for Cryoboxes, 133 x 133

For cryoboxes 133 x 133mm. With compartment heights and formats as indicated.

Height mm	Array	PK	Cat. No.
25	7 x 7	1	**7.072 367**
25	8 x 8	1	**6.260 034**
25	9 x 9	1	**6.078 412**
25	10 x 10	1	**6.081 029**
25	12 x 12	1	**7.610 545**
30	4 x 4	1	**6.260 038**
30	5 x 5	1	**7.606 811**
30	6 x 6	1	**6.260 037**
30	7 x 7	1	**6.260 036**
30	8 x 8	1	**6.082 702**
30	9 x 9	1	**6.081 879**
30	10 x 10	1	**6.075 820**
30	12 x 12	1	**6.260 035**
40	4 x 4	1	**7.610 014**
40	5 x 5	1	**6.260 044**
40	6 x 6	1	**6.260 043**
40	7 x 7	1	**6.260 042**
40	8 x 8	1	**6.803 043**
40	9 x 9	1	**6.260 041**
40	10 x 10	1	**6.260 040**
40	14 x 14	1	**6.260 039**
65	4 x 4	1	**6.079 079**
65	5 x 5	1	**6.260 046**
65	6 x 6	1	**6.206 129**
65	7 x 7	1	**6.260 045**
65	8 x 8	1	**6.206 130**
65	9 x 9	1	**6.206 131**

2



2 LLG-Cryogenic storage boxes, PP, autoclavable

With 100 places, 10x10 grid and numerical coded. Robust hinge with safe snap-on lid, stackable for safe transport. Minimised liquid retention. Guaranteed metal free. Temperature resistant from -130°C to +90°C, autoclavable at 121°C, 20 minutes. Dimensions: 140mm x 140mm x 60mm

Colour	PK	Cat. No.
Magenta/clear	1	**9.405 800**
Black	1	**9.405 801**

E & OE.

1 Cryogenic storage boxes Arctic Square®, PC, autoclavable

Heathrow Scientific

Safely store vials from -196 to +121°C for repeated use in mechanical freezers as well as liquid nitrogen. Boxes are designed with unique features to help the user orient, identify, and access vials with ease. The forward-sloped base and high-contrast, imprinted indexing on the transparent lid ensure quick visual orientation. Hinged lid allows easy one-handed access to samples. A built-in stop prevents the lid from swinging too far when the box is picked up by the lid, helping to prevent accidental spills. The 5 x 5 array box does not have hinged lid. All boxes include vent and drainage holes. Stackable. Autoclavable.

1



Colour	For tubes	Array	Dimensions (W x D x H) mm	Figure	PK	Cat. No.
red	up to 2.0 ml	5 x 5	76 x 76 x 53	A	1	**9.405 911**
purple	up to 5.0 ml	9 x 9	133 x 133 x 96	C	1	**9.405 912**
red, blue ,	up to 2.0 ml	9 x 9	133 x 133 x 53	B	4	**9.405 913**
green, purple, blue	up to 2.0 ml	10 x 10	133 x 133 x 53	D	1	**9.405 910**

2 3 Cryogenic box Work2Store™, PP

NEW!

Heathrow Scientific

Reduce sample handling time and the need for several racks when working with samples for cold temperature storage. Patent-pending opening and closing mechanism allows the rack to expand, creating needed room for sample manipulation. Then simply collapse the rack back to its compact form and it is ready for the freezer. Temperature range -80 to 121°C.

- Clear lid locks the rack together for safe handling and transportation
- Wells have a center depression to stabilize conical tubes and a cryogenic vial lock for one handed cap removal
- Stackable, autoclavable and with alphanumeric well identification
- Will fit into standard 2" (52mm) freezer racking

2



3



Type	For tubes	Array	Dimensions open (W x D x H) mm	Dimensions closed (W x D x H) mm	PK	Cat. No.
Work2Store™	1.5/2.0 ml	64	310 x 128 x 33,5	133 x 133 x 53	1	**9.194 001**
Work2Store™ Rack Mini	0.2/0.5 ml	96/64	310 x 128 x 20	133 x 133 x 29	1	**9.194 009**

4 Cryogenic boxes, PP, autoclavable

Ratiolab

Polypropylene. 9 x 9 array. Resists ultra-low storage temperatures from -90°C up to +121°C. With grid numbers on the lid for reliable identification of individual samples. Box fits most stainless steel racks. Autoclavable

Type A: 133mm x 133mm x 52mm

Type B: 133mm x 133mm x 75mm

4



Type	Colour	PK	Cat. No.
A	natural	1	**9.405 890**
A	yellow	1	**9.405 892**
A	red	1	**9.405 894**
A	green	1	**9.405 896**
A	blue	1	**9.405 898**
A	black	1	**9.405 900**
B	natural	1	**9.405 891**
B	yellow	1	**9.405 893**
B	red	1	**9.405 895**
B	green	1	**9.405 897**
B	blue	1	**9.405 899**
B	black	1	**9.405 901**

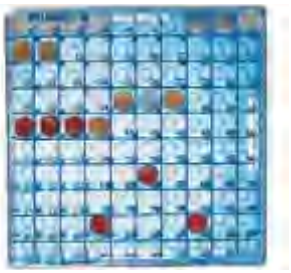
Cryogenic boxes, Type 5025, 5026, 5027, 5050, PC, autoclavable

Stable, autoclavable PC. With printed grid on lid for cryovials and similar tubes up to 13.5mm diameter. Temperature resistant from -196 to +121°C. With grid numbers for reliable identification of individual samples.

*Type 5050 is a plain box with transparent PC lid, without grid, used for storing tubes of various sizes. Supplied in packs as outlined below.

Type	For tubes ml	Width mm	Length mm	Height mm	Array	PK	Cat. No.
SYSTEM 100™ 5026	1/1.5	133	133	52	10 x 10	1	**9.400 927** 1
CryoBoxes™ 5025	1.2/2.0	76	76	52	5 x 5	1	**9.400 946**
CryoBoxes™ 5026	1.2/2.0	133	133	52	9 x 9	1	**9.400 947**
CryoBoxes™ 5027	5.0	133	133	95	9 x 9	1	**9.400 948**
Storage Box 5050*		133	133	52	1	1	**9.400 949** 2

1



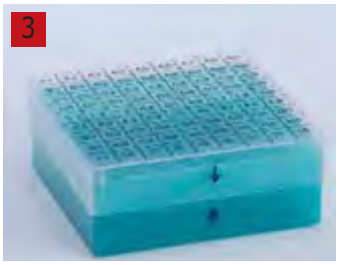
9.400 927

2



9.400 949

3

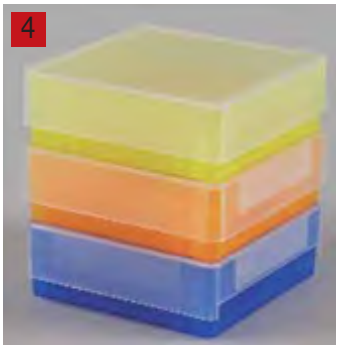


3 Cryogenic boxes, PP, 81 well, autoclavable

No. of cells 9 x 9 = 81 cryovials. *Tenak*

Type	Width mm	Depth mm	Height mm	PK	Cat. No.
Blue	130	130	50	1	**9.698 708**
Green	130	130	50	1	**9.698 709**
Natural	130	130	50	1	**9.698 710**
Red	130	130	50	1	**9.698 711**
Yellow	130	130	50	1	**9.698 712**

4



4 Cryogenic boxes, PP, 81 well, autoclavable

Polypropylene box fits in standard freezer racks. Locate tubes is easily with moulded grid lines and a moulded reference point on the lid. Stores 1.5ml to 2.0ml microtubes under easy-open, friction-fit lid. Dimensions: 130mm x 130mm x 47mm. Autoclavable. *Heathrow Scientific*

Colour	PK	Cat. No.
natural	1	**9.193 983**
blue	1	**7.078 821**
green	1	**7.058 103**
pink	1	**7.058 102**
yellow	1	**7.078 822**
orange	1	**7.083 522**
blue, green, pink, yellow, orange	5	**9.193 984**

5



6



5 6 Cryogenic boxes, slip lid with adaptable height, PP

NEW!

Ratiolab

- Made from polypropylene
- Height adaptable from 50mm to 75mm
- Dimensions (W x D): 133mm x 133mm
- 9 x 9 array, 10 x 10 array
- Numerical coded places (except black box)
- Drain bores at the bottom for dew liquids
- Autoclavable, temperature resistant from -90°C to +121°C

Colour	Array	PK	Cat. No.
natural	9 x 9	5	**9.405 840**
yellow	9 x 9	5	**9.405 843**
red	9 x 9	5	**9.405 845**
green	9 x 9	5	**9.405 844**
blue	9 x 9	5	**9.405 842**
black	9 x 9	5	**9.405 846**
natural, yellow, red, green, blue	9 x 9	5	**9.405 841**
natural	10 x 10	5	**9.405 847**
yellow	10 x 10	5	**9.405 848**
red	10 x 10	5	**9.405 849**
green	10 x 10	5	**9.405 850**
blue	10 x 10	5	**9.405 851**
black	10 x 10	5	**9.405 852**
natural, yellow, red, green, blue	10 x 10	5	**9.405 855**

E & OE.

1 Microtube Storage Boxes, 50-/100-Well, PP

Heathrow Scientific

Autoclavable. Compact storage box has angled front slot for easy access to tubes. Rugged, polypropylene box has durable three-point hinges, snapping clasp for secure closure, moulded grid lines on lid, imprinted coordinates on bottom of base and imprinted and raised coordinates on tube wells. Ideal for sample or case study storage.Holds 1.5ml to 2.0ml microtubes. Resist storage temperatures from -80°C up to +121°C.



no. of wells	Dimensions (L x W x H) mm	Colour	PK	Cat. No.
50	141 x 92 x 56	blue, green, purple, yellow, orange	5	**9.193 985**
50	141 x 92 x 56	natural	1	**6.243 162**
100	141 x 151 x 57	blue, green, purple, yellow, orange	5	**9.193 981**
100	141 x 151 x 57	natural	1	**6.206 710**

2 Microtube racks, 96-Well, PP

Heathrow Scientific

Autoclavable. Polypropylene rack has 96 wells for 0.5ml microcentrifuge tubes on one side and 96 wells for 1.5ml to 2.0ml microcentrifuge tubes on the other side. Wells are arranged in standard 8 x 12 array. Handy lid snaps into place via tabs on each end of rack. Dimensions (L x W x H): 246mm x 121mm x 50mm.



Colour	PK	Cat. No.
Blue, green, pink, yellow and orange	5	**9.193 982**
Natural	1	**6.237 620**
Blue	1	**6.237 267**
Green	1	**6.237 268**
Pink	1	**6.237 621**
Yellow	1	**6.237 622**
Orange	1	**6.237 623**

Cryo-Safe™ Mini Cooler

NEW!

Bel-Art Products

Polycarbonate. A non-toxic freezing gel is isolated within the walls of the cooler, guaranteeing that any labels or marks on the vials or tube are not damaged.

- The indexed and transparent (9.401 090, 9.401 091, 9.401 092) or gel-filled (9.401 093, 9.401 094) polycarbonate lid shows tube location and matches locations printed on the cooler
- side handles (9.401 090, 9.401 091) or a wire handle for easy carrying
- Coolers can be stacked to save space and maximize freezer volume
- rubber feet to prevent slipping.
- Adapters change well size for 0.5 ml tubes (all models except 9.401 092)
- All polycarbonate cooler body cleans easily
- Use to protect samples in freezers with defrost cycle and fluctuating temperatures

Dimensions (L x W x H) mm	Colour	Temp. range °C	PK	Cat. No.
151 x 108 x 125	red	≤ 0°C for 2.5 h	1	**9.401 090** 3
151 x 108 x 125	yellow	≤ -15°C for 1 h	1	**9.401 091** 4
197 x 140 x 190	red	≤ 0°C for 3 h	1	**9.401 092** 5
243 x 157 x 146	red	≤ 0°C for 3 h	1	**9.401 093** 6
243 x 157 x 146	yellow	≤ -15°C for 1.5 h	1	**9.401 094** 7



9.401 090



9.401 091



9.401 092



9.401 093



9.401 094

1



1 Labtop Cooler, Type 5115, DS5116

Thermo Scientific

The economical alternative for keeping samples and biochemical reagents cool at the workbench or for protecting against temperature fluctuations and power failure in refrigeration apparatus. With write-on, gridded lid. Lids fit one way to maintain the correct grid orientation. The lid of the Labtop Cooler jr. is transparent (12-position for tubes 1.5 to 2.0ml).The Labtop Cooler lid (32-position for tubes 1.5 to 2.0ml) is white and filled with a non-toxic insulation gel. Adapters are also supplied for 0.5ml microtubes. Robust, space-saving and stackable. With non-slip rubber feet. Can be used down to -135°C.

Type	Description	Aperture array qty.	Description	Temperature-maintained on lab bench	PK	Cat. No.
5115	Laptop-Cooler jr.	12	without gel	≤-15°C up to 1 hr.	1	**9.400 929**
DS5116	Labtop-Cooler jr.	12	without gel	≤ 1°C up to 3.5 hrs.	1	**9.400 930**
5115	Labtop-Cooler	32	with gel	≤-15°C up to 2 hrs.	1	**9.400 932**
DS5116	Labtop-Cooler	32	with gel	≤ 1°C up to 5 hrs.	1	**9.400 933**

2



2 50-/100-Well cryogenic boxes, EPS, not autoclavable

Heathrow Scientific

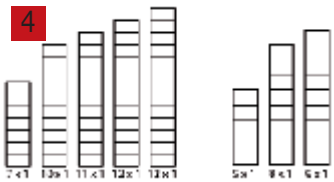
Inexpensive freezer storage. Lightweight 1.5ml to 2.0ml microtube racks are ideal for long-term studies or tube storage. Two-piece racks are constructed of expanded polystyrene (EPS) foam. Extra spacing between wells allows easy gripping with fingertips. Racks stack securely with nesting features on lid and base.
Resist storage temperatures from -80°C up to +70°C.

no. of wells	Dimensions (L x W x H) mm	PK	Cat. No.
50	210 x 100 x 71	1	**9.193 987**
100	336 x 95 x 73	1	**9.193 986**

3



4



3 4 Chest Freezers Racks, vertical

Heathrow Scientific

Stainless steel racks, suitable for all brands of chest freezer.
For boxes up to 135 x 135mm.

Type	Height Box mm	Width mm	Depth mm	Height mm	PK	Cat. No.
7x1	approx. 53	140	141	390	1	**9.698 962**
10x1	approx. 53	140	141	557	1	**9.698 746**
11x1	approx. 53	140	141	613	1	**9.698 963**
12x1	approx. 53	140	141	669	1	**9.698 964**
13x1	approx. 53	140	141	724	1	**9.698 965**
5x1	approx. 78	140	141	406	1	**9.698 967**
8x1	approx. 78	140	141	649	1	**9.698 966**
9x1	approx. 78	140	141	730	1	**9.698 968**

5



5 Vertical cryobox racks, Type 5036

Thermo Scientific

Stainless steel. With individual retainers to secure each box safely.

Type	Height Box mm	Shelves	Width mm	Depth mm	Height mm	PK	Cat. No.
5036	approx. 52	4	140	143	225	1	**9.400 953**
5036	approx. 52	9	140	143	502	1	**9.400 954**

1 2 Upright Freezer Racks

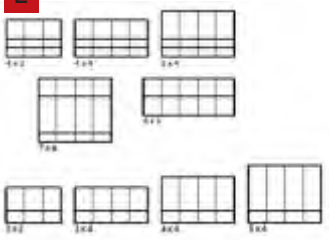
Stainless steel racks, suitable for all brands of upright freezers. *Heathrow Scientific*
For boxes up to 135mm x 135mm.

Type	Height Box mm	Width mm	Depth mm	Height mm	PK	Cat. No.
4x3	approx. 53	418	140	225	1	**9.698 970**
4x4	approx. 53	556	140	225	1	**9.698 969**
5x3	approx. 53	418	140	280	1	**9.698 974**
5x4	approx. 53	556	140	280	1	**9.698 971**
7x4	approx. 53	556	140	392	1	**9.698 972**
4x5	approx. 53	695	140	225	1	**9.698 973**
3x3	approx. 78	418	140	245	1	**9.698 976**
3x4	approx. 78	556	140	245	1	**9.698 975**
4x4	approx. 78	556	140	326	1	**9.698 960**
5x4	approx. 78	556	140	407	1	**9.698 961**

1



2



3 4 Racks for upright freezers Arctic Squares®

Stainless steel. Fits most standard upright freezers. Overall rack size (H x W x D): *Heathrow Scientific*
238 x 139 x 571mm. With four drawers to hold 16 boxes of 133 x 133 x 53mm.
Drawers feature a unique stop that when fully extended pivot down allowing for easy box access. Freezer rack also includes a pull-out wire handle for easy removal off the shelf. Polycarbonate drawer handles provide a user-friendly grip. Includes a slot and label for drawer/sample identification.

Type	PK	Cat. No.
Arctic Squares®	1	**9.193 980**

3



4



5 Cryoware marker set, Type 6313

For durable labelling of cardboard, plastic and cloth material for use at ultra-low temperatures. Non-smudge and non-running. Removable with alcohol. Extra fine point. *Thermo Scientific*
Two packs available - 1 pack conatins one each red, green, black and blue marker while the other pack contains black markers only.

Type	Description	PK	Cat. No.
6313	Assorted	4	**9.400 978**
6313	Black	4	**9.400 979**

5



6 Floating cryovial racks, Type 5974, PP

For 0.5 to 2.0ml test tubes and cryovials. Racks will float with a full load of filled tubes. *Thermo Scientific*
With moulded identification numbers and letters.

6



Type	Description	For tubes ml	Array	Colour	Dimensions (W x D x H) mm	PK	Cat. No.
5974	Square	0.5	4 x 4	black	103 x 103 x 65	1	**9.400 981**
5974	Square	1.0/1.2/1.5/2.0	4 x 4	white	103 x 103 x 65	1	**9.400 982**
5974	Circular	1.0/1.2/1.5/2.0	8	white	66 dia.	4	**9.400 983**
5974	Circular	1.0/1.2/1.5/2.0	20	white	96 dia.	4	**9.400 984**

1 2 Floating Tube Racks, PE

Polyethylene foam. Resist water absorption so racks can be washed and reused. Ideal for floating tubes in water baths, tubs, or beakers. Racks include detachable carrying handles, to easily lift samples out of baths.

Heathrow Scientific

Type	For tubes ml	Array	Colour	PK	Cat. No.
Diamond	50	4	green	5	**6.238 546**
Parallelogram	15	8	blue	5	**6.238 547**
Rectangle	1.5 to 2.0	24	yellow	5	**6.238 545**
Round	0.2/0.5/1.5 to 2	18	blue	5	**6.240 378**

1



2



3



4



3 4 Floating racks PrepSafe™ for microcentrifuge tubes, PP

NEW!

Bel-Art Products

Unique tabs protect your samples from loss and contamination. Place tubes in slots and slide under tabs to keep tubes in place and caps closed when under pressure, floating or submerged. Use in water baths, ice baths or on the benchtop

- Holds up to twelve 1.5ml or 2.0ml microcentrifuge tubes in numbered locations
- Raised handle for easy lifting without agitating samples; stable feet keep racks upright on the bench
- 95mm outer diameter fits most 1000ml beakers
- With removable vortexing attachment, this allows samples to be vortexed simultaneously
- Polypropylene construction. Steam autoclavable at 121°C (250°F)

Colour	PK	Cat. No.
Natural	1	**9.400 995**
Turquoise	1	**9.400 996**
Pink	1	**9.400 997**
Neon Yellow	1	**9.400 998**

5



5 Nalgene Freezing container Mr. Frosty, PC

Thermo Scientific

With 120mm diameter screw cap in blue PE-HD, vial holder made of white PE-HD. Suitable for 18 x 1.2/2.0ml cryovials. Foam interior. Cooling rate 1°C/min. Tubes can be easily removed. Each aperture has a moulded number for identification. Stackable.

Diam. mm	Height mm	For tubes ml	Qty.	PK	Cat. No.
117	86	1.0-2.0	18	1	**9.400 945**
117	151	3.6	12	1	**9.400 990**
117	151	4.5-5.0	12	1	**9.400 991**

E & OE.

1 Chilling Jar True North®

Heathrow Scientific

Quickly freeze samples at -1ºC per minute rate in freezer. Increase freezing rate by using isopropyl alcohol. Samples are not in contact with liquid.
When samples are removed from the freezer, the insulating foam holder decreases warming rate and extends working time.
Holds eight 1.2 to 2.0ml cryogenic vials. Dimensions (dia. x H): 123 x 105mm.

Supplied with:
Polycarbonate jar, polyethylene lid and insert and polyurethane foam holder.


1

Type	PK	Cat. No.
Chilling Jar True North®	1	**9.010 690**

Cool packs Icecatch®

Icecatch

Icecatch® cool packs for temperature sensitive products used in the pharmaceutical, biotech, medical and food industries. Icecatch® cool packs distinguish themselves through the following specific features:
- Reliable cold storage through the use of immobilised coolant
- For repeat usage due to the use of robust PA/PE film
- Disposal with the domestic trash due to the use of non-poisonous ingredients
- Unobjectionable use in the pharmaceutical and food industries
- Phase transition 0°C

Icecatch®-Gel
- Spreading of heat absorption around the 0°C range through the use of immobilised cooling gel
- Optimal price/heat absorption capacity relationship
- Filled with cooling gel

Icecatch®-Solid
- Maximum dimensional stability during the freezing process through the use of hard foam
- Filled with hard foam

Icecatch®-Solid Isolated 2 - 8°C
- A perfect cool pack in combination with our System packaging for the +2°C up to +8°C transport
- Maximum dimensional stability during the freezing process through the use of hard foam, coolant and integrated isolation layer
- Filled with hard foam and isolation layer



2
9.695 000


3
9.695 007

Type	Description	Weight g	Dimensions (W x D x H) mm	PK	Cat. No.
Icecatch®-Gel	with cooling gel	90	90 x 110 x 20	120	**9.695 000** 2
Icecatch®-Gel	with cooling gel	170	90 x 150 x 20	80	**9.695 001**
Icecatch®-Gel	with cooling gel	230	90 x 180 x 20	60	**9.695 002**
Icecatch®-Gel	with cooling gel	460	140 x 190 x 30	32	**9.695 003**
Icecatch®-Gel	with cooling gel	690	140 x 240 x 40	24	**9.695 004**
Icecatch®-Solid	with hard foam/cool medium	850	105 x 230 x 38	15	**9.695 005**
Icecatch®-Solid	with hard foam/cool medium	1100	280 x 190 x 25	10	**9.695 006**
Icecatch®-Solid Isolated	with hard foam/cool medium / and isolation layer	1100	280 x 190 x 30	10	**9.695 007** 3

System packaging Icecatch® made of EPS

Icecatch

This system solution, is a combination of a specific EPS Box and the cooling element Icecatch®-Solid Isolated (Cat-No. 9.695 007). It is the perfect medium for the transport of temperature sensitive products in the spectrum of +2°C up to +8°C.
In this solution there is no need of a combination of variably precondition cooling elements. By the use of an easily convertible packaging instruction the packaging process is simplified and wrong assembly is excluded.

- Easy handling, no "thawing", no additional isolation material
- Modular system in terms of temperature an run time requirements
- Prequalified system solution consisting of the EPS Box and Icecatch®-Solid Isolated 2°C - 8°C
- Immediate availability


4
9.695 020


5
9.695 021

Description	Dimensions (W x D x H) mm	Int. dimensions (W x D x H) mm	PK	Cat. No.
System packaging 15l/22l	670 x 390 x 385	380 x 230 x 175 / 550 x 230 x 175	1	**9.695 020** 4
System packaging 12.8l	365 x 270 x 250	305 x 210 x 200	1	**9.695 021** 5

1



1 Cool Containers True North®, PU

Heathrow Scientific

Rigid polyurethane container provides durability for chilling your temperature sensitive samples. Excellent insulation properties for ultra cold. Use with ice, dry ice and ice-salt slurries, etc. For low temperature use down to -196°C. Minimize evaporation loss with close fit lid. Easily remove with comfortable recessed knobs. Keyed lid and base fit together to conveniently store lid under base. With spout and ergonomic handles for safe handling. Stackable.

Capacity litres	Dimensions (L x W x H) mm	Colour	PK	Cat. No.
4	234 x 181*	black	1	**9.010 691**
1	267 x 195.5 x 114	green	1	**9.010 692**
4	381 x 254 x 182	blue	1	**9.010 693**
9	521 x 292 x 163	red	1	**9.010 694**

*(dia. x H)

2



2 Isolating box with lid, Neopor®

NEW!

Storopack Deutschland

Neopor® is characterised by its outstanding hot and cold thermal insulation properties (a further 20% over Styropor), its high compressive strength, shock absorbing properties, low weight and insensitivity to moisture. It also contains infrared absorbers and reflectors. Compared to conventional insulating materials, they diminish heat conductivity and lend the material its characteristic silver-grey color.

Description	Capacity	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	PK	Cat. No.
Isolating box with lid	12,5 l	350 x 350 x 300 mm	250 x 250 x 200 mm	1	**7.656 680**
Isolating baffle ring	6,2 l	350 x 350 x 100 mm	250 x 250 x 100 mm	1	**7.656 681**

3



3 Dry ice machines SnowPack®

Bürkle

Suitable for all European siphon carbon dioxide cylinders with valve (W 21.80 x 1¼" acc. to DIN 477, no. 6).

Applications: hospitals, universities, schools, laboratories, chemical industry, materials testing.
Examples of use: lowering the temperature in cooling baths or cold traps, pre-cooling tissue samples, ensuring safe transport or embedding biological substances, freezing blood and tissue samples, studies in chemistry, physics and materials technology, etc.

- Produces dry ice tablets at -79°C
- operates without power
- taint and odour free

Gassing period (per tablet): either 0.5min. or 2.5min approx.
Tablets per 22kg bottle (dependent on ambient temperature and pressure): either 90 or 16 pieces approx.

Tablet weight g	Diam. mm	Height mm	PK	Cat. No.
50	50	30	1	**9.253 006**
250	80	60	1	**9.253 008**

Further Ice machines - please see page 744.

4



4 Dewar flasks, Type 4150, PE-HD

Thermo Scientific

With vented, insulating PE-HD lid. PE covered handle. Unbreakable and completely safe for short term storage of ice water, dry ice solvents and liquid nitrogen. Also suitable for use as warming baths. Chemical-resistant, reinforced walls, filled with urethane foam, are temperature resistant from -196 to +100°C. 1, 2 and 4 litre flasks have a carrying handle.

Type	Capacity Litres	Top diam. mm	Int. height mm	PK	Cat. No.
4150	1	95	194	1	**9.031 961**
4150	2	121	225	1	**9.031 962**
4150	4	146	287	1	**9.031 964**
4150	10	197	394	1	**9.031 970**

E & OE.

1 2 3 Dewar vessels, cylindrcal, for CO_2 and LN_2

DURAN®. DIN 12492. Cylindrical. With blue coated protective casing out of metal or structured aluminium casing. With lid. Carrying handles as indicated. *KGW*

Capacity l	Int. diam. mm	Int. height mm	Figure	With	PK	Cat. No.
10	200	350	a	Handle	1	**9.032 131**
10	200	350	b	Side grips	1	**9.032 742**
14	200	500	a	Handle	1	**9.032 132**
21	250	480	c	Side grips	1	**9.032 133**
21	250	480	b	Side grips	1	**9.032 743**
28*	250	620	c	Side grips	1	**9.032 134**
40*	280	780	c	Side grips	1	**9.032 135**

*Linen bag included.







4 Dewar carrying flasks, cylindrical, for CO_2 and LN_2

DURAN®. DIN 12492. Cylindrical. With blue coated protective casing out of metal. With lid and aluminium carrying handle. *KGW*

Type	Capacity Litres	Int. diam. mm	Int. height mm	PK	Cat. No.
26 B	1	100	150	1	**9.032 726**
27 B	2	138	170	1	**9.032 727**
28 B	3	138	230	1	**9.032 728**
29 B	4	138	310	1	**9.032 729**

BE Type: Stainless steel casings, type 26 BE to 29 BE are available on request.



5 Dewar flasks, shallow form, for CO_2 and LN_2

DURAN®. DIN 12492. Dish-shaped. Generally for thermostatting round bottom flasks to a constant temperature as hot or cold baths. With structured aluminium casing and edge protection. Suitable for use with magnetic stirrers. *KGW*

Capacity ml	Int. diam. mm	Height mm	PK	Cat. No.
120	77	90	1	**9.032 422**
260	100	65	1	**9.032 423**
400	110	70	1	**9.032 425**
680	138	80	1	**9.032 426**
1600	170	110	1	**9.032 427**
3000	200	160	1	**6.075 807**





1 Dewar flasks, cylindrical, for CO_2 and LN_2

DURAN®. DIN 12492. Cylindrical. With blue coated protective casing out of metal. All vessels can also be supplied without casing, unsilvered or silvered with opposite viewing strips. *KGW*

Capacity ml	Int. diam. mm	Ext. diam. mm	Int. height mm	PK	Cat. No.
100	40	56	90	1	**9.032 011**
200	40	56	170	1	**9.032 012**
300	47	60	190	1	**9.032 013**
500	57	70	210	1	**9.032 015**
800	67	80	240	1	**9.032 018**
1200	67	80	350	1	**9.032 019**
1000	77	95	235	1	**9.032 021**
1500	77	95	345	1	**9.032 022**
1500	90	115	245	1	**9.032 024**
2000	90	115	340	1	**9.032 025**
1500	100	120	240	1	**9.032 027**
2000	100	120	290	1	**9.032 028**
2500	110	130	290	1	**9.032 030**
4000	138	160	310	1	**9.032 033**



2 Chrome steel Dewar flasks

Nickel chromium steel, unbreakable, open top. With high-vacuum, permanent insulation. Temperature range -269 to +300°C. 5 year insulation guarantee.

Capacity Litres	Int. diam. mm	Ext. diam. mm	Int. height mm	PK	Cat. No.
1	85	107	206	1	**9.031 982**
1	100	122	157	1	**9.031 983**
2	100	122	285	1	**9.031 984**



9.031 973

Lid in cork for chrome steel Dewar flasks

Cork.

For	PK	Cat. No.
9.031 982	1	**9.031 972**
9.031 983 and 9.031 984	1	**9.031 973** 3



4 Dewar flasks, spherical, for LN_2

DURAN®. DIN 12492. Spherical. Brushed aluminium casing with insulating lid and carrying handle. *KGW*

Capacity Litres	Neck diam. mm	Ext. diam. mm	PK	Cat. No.
1	30	175	1	**9.032 740**
3	60	225	1	**9.032 741**
5	60	260	1	**9.032 115**
10	65	330	1	**9.032 127**

E & OE.

Cryogenic storage tanks, B 2000 series

Cryo Diffusion

The B 2000 series is especially developed for storing of straws and cryo vials in ampoule holders.
The B 2000 series offers capacities of 216 to 1332 cryo ampoules with 2ml and 474 to 16400 x 0.25ml straws.
The B 2000 series long term storage tanks are especially suited to hold small amounts of samples. Thanks to the small neck openings these storage tanks have holding times reaching 365 days. Supplied with canisters.
Accessories on request include: Canes for cryovials, rolling castors base, liquid level measuring rod, low filling level alarm.

1 Long term cryogenic storage tanks, B 2000 series

Cryo Diffusion



Type	Capacity	No. of vials	No. of straws	No. of canisters	Static holding time	Chamber dimensions (Dia. x H)	PK	Cat. No.
	L	2ml	0.25ml		Days	mm		
B 2002M	2.00		474	3	25	26x110	1	**9.524 506**
B 2003M	4.10		1560	6	42	37x110	1	**9.524 507**
B 2009M	10.50		1560	6	93	37x110	1	**9.524 508**
B 2011M	12.00	216	2700	6	133	37x270	1	**9.524 509**
B 2020M	21.70	216	2700	6	238	37x270	1	**9.524 510**
B 2020M	21.70	216	1560	6	238	37x110	1	**9.524 511**
B 2036M	35.90	216	2700	6	365	37x270	1	**9.524 512**
B 2036M	35.90	216	1560	6	365	37x110	1	**9.524 513**

2 Large capacity cryogenic storage tanks, B 2000 series

Cryo Diffusion



Type	Capacity	No. of vials	No. of straws	No. of canisters	Static holding time	Chamber dimensions - outside (Dia. x H)	PK	Cat. No.
	L	2ml	0.25ml		Days	mm		
B 2013-6	13.00		4920	6	59	66x110	1	**9.524 514**
B 2013-10	13.00		4920	10	59	44x110	1	**9.524 515**
B 2026	26.00		8200	10	104	66x110	1	**9.524 516**
B 2035	35.90	684	9840	6	211	66x270	1	**9.524 517**
B 2048-6	48.50	1332		6	180	94x270	1	**9.524 518**
B 2048-10	48.50	1332	16400	10	180	73x270	1	**9.524 519**



1 Cryogenic storage tanks, BR 2000 series with drawers

Cryo Diffusion

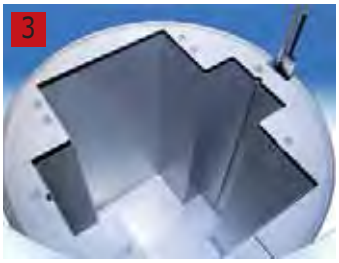
The BR 2000 series is especially developed for storing 750, 3600, 4500 and 6600 cryogenic vials (max. 2ml vials, 5ml vials on request) in cryo boxes. Low vaporization thanks to their 215mm dia. neck (BR 2048: only 120mm). The lightweight, aluminium design and low space requirements of these containers make them the most economical units in their class. Supplied with drawer fastener.

Features:
- large neck openings
- easy access to stored samples
- long Nitrogen retention times
- lightweight aluminium design
- 2 Year warranty

Available accessories on request: cryogenic boxes, castors, liquid level measuring rod, low filling level alarm, electronic filling level regulation.

Type	Capacity Litres	No. of vials 2ml	No. of boxes	No. of racks	Static holding time Days	PK	Cat. No.
BR 2048	48	750	5	6	179	1	**9.524 520**
BR 2100	100	3600	6	6	153	1	**9.524 521**
BR 2150	148	5400	9	6	227	1	**9.524 522**
BR 2200	197	6600	11	6	303	1	**9.524 523**





2 3 Cryogenic storage tanks, LO 2000 series with drawers

Cryo Diffusion

The LO 2000 series is specially developed for the storing of 4000(*), 8000(*) and 10400(*) cryo vials (*in liquid phase) (max. 2ml vials, 5ml vials on request) in cryo boxes. The large opening of 410mm (LO 2075) resp. 590mm gives easy access to the samples. The lightweight aluminium design and low space requirements of these containers make them the most economical units in their class. Supplied with drawer fastener.

Features:
- large neck openings
- easy access to stored samples
- long Nitrogen retention times
- 2 Year warranty

The storage tanks LO 2000 series are also available for gas phase and dry storage (please see detailed image).

Accessories avaialble on request: cryo boxes, liquid level measuring rod, low filling level alarm, electronic filling level regulation and storage inserts for dry storage.

Type	Capacity Litres	No. of vials 2ml	No. of boxes	No. of racks	Static holding time Days	Description	PK	Cat. No.
LO 2075 M	75	4000	10	4	30	without electronics	1	**9.524 500**
LO 2200 M	198	8000	10	8	40	without electronics	1	**9.524 501**
LO 2250 M	236	10400	12	8	47	without electronics	1	**9.524 502**
LO 2075 M	75	4000	10	4	30	with S170 electronics	1	**9.524 559**
LO 2200 M	198	8000	10	8	40	with S170 electronics	1	**9.524 560**
LO 2250 M	236	10400	12	8	47	with S170 electronics	1	**9.524 561**

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

E & OE.

1 Vapour Shipper containers BS 2000 series


1

Cryo Diffusion

Vapour Shipper containers BS 2000 series are designed for the safe transportation of biological samples at cryogenic (-150°C or colder) temperatures.
Fabricated from durable, lightweight aluminum, they employ a hydrophobic absorbent that contains the liquid nitrogen for "spill free" shipping. The absorbent also repels moisture and humidity, assuring the maximum holding time. This eliminates the necessity to dry units between uses.
A protective shipping case is available for all models. These containers may be used to ship your samples with a "non-hazardous" classification e.g. straws, cryo ampoules, bloodbags, thus reducing costs and helping to assure sample viability.

Availlable accessories on request: protective shipping case, temperature logger, holders for ampoules and blood bags.

Vapour Shipper containers BS 2000 series are in accordance with the IATA requirements.

Type	Capacity L	No. of vials 2ml	No. of straws 0.25ml	Static holding time Days	Neck diam. mm	Weight empty / full kg	PK	Cat. No.
BS 2002	2.00		190	23	35	3.3/4.8	1	**9.524 503**
BS 2004	5.20	114	1640	19	70	6.9/9.6	1	**9.524 504**
BS 2024	24.00	798	17220	11	215	15.6/22.6	1	**9.524 505**

2 Transportable stainless steel tank CRYOROLL 230 R


2

Cryo Diffusion

For Liquid Nitrogen. Cryo Diffusion proposes a new vertical LN2 tank, built out of non magnetic stainless steel. The CRYOROLL 230 R tank is particularly designed to be used in laboratories. This tank is in conformity with the European directive TPED 10/35/EU.

Specifications

Total capacity	234L
Useful capacity	222L
Maximum working pressure	3.9bar
Dimensions (H x O. dia.):	1354 x 670mm
Tare:	146kg
Gross weight LN2; LO2; LAr:	326kg; 400kg; 457kg
Loss rate (% per day) LN2; LO2; LAr:	1.6; 1.2; 1.2
Handling:	4 castors and handle

Type	PK	Cat. No.
CRYOROLL 230 R	1	**9.524 592**

3 Cryogenic liquid dewars L 2000 series


3

Cryo Diffusion

The L 2000 Series of cryogenic liquid dewars are so-called because of their universal acceptance in laboratories and medical facilities worldwide. These high-efficiency, super-insulated dewars are the most convenient, economical way to store and dispense liquid nitrogen. Types L 2025, L 2035, L 2050 and L 2100 can be fitted with pressurized dispensing devices to aid in the transfer of liquid nitrogen.
Accessories on request include: Transfer hose, phase separator, spare corks, pressurized dispensing device, liqiud level measuring rod, rolling castor base

Type	Capacity L	Evaporation rate L/ day	Neck diam. mm	Weight empty / full kg	Height mm	PK	Cat. No.
L 2002	2.0	0.08	35	2.7/4.3	402	1	**9.524 524**
L 2005	5.5	0.13	50	4.4/8.8	494	1	**9.524 525**
L 2012	12.4	0.14	50	8.1/18.1	600	1	**9.524 526**
L 2025	25.0	0.2	50	10/31	684	1	**9.524 527**
L 2035	35.0	0.25	50	13/41.5	591	1	**9.524 528**
L 2050	50.0	0.3	50	17/57.5	675	1	**9.524 529**
L 2100	100.0	0.8	50	32/113	1035	1	**9.524 530**

Castors for cryogenic liquid dewars


4

9.524 532

Cryo Diffusion

With 5 castors and 2 brakes.

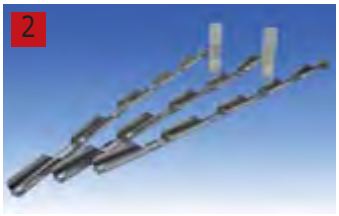
For	PK	Cat. No.
B 2048, BR 2048, L 2035, L 2050, L 2100	1	**9.524 531**
BR 2100, BR 2150	1	**9.524 532**



1 Plastic goblets for cryogenic dewars

Cryo Diffusion

Description	PK	Cat. No.
dia. 35mm, height 118mm	1	**9.524 533**
dia. 65mm, height 118mm	1	**9.524 534**
Cup "Marguerite"	1	**9.524 535**



2 Ampoule holders for cryogenic liquid dewars

Cryo Diffusion

For vials	Diam. mm	Height mm	PK	Cat. No.
6	11	45	1	**9.524 536**
6	12	45	1	**9.524 537**
5	12	55	1	**9.524 538**
2	12	75	1	**9.524 539**



3 Canisters, stainless steel for cryogenic dewars

Cryo Diffusion

Diam. mm	Height mm	For	PK	Cat. No.
30	120	BS 2002	1	**9.524 540**
66	270	BS 2004	1	**9.524 541**
26	110	B 2002	1	**9.524 542**
37	110	B 2003	1	**9.524 543**
37	110	B 2009	1	**9.524 544**
37	110	B 2011	1	**9.524 547**
66	110	B 2013/6	1	**9.524 548**
44	110	B 2013/10	1	**9.524 549**
37	270	B 2020**	1	**9.524 550**
37	110	B 2020*	1	**9.524 551**
66	110	B 2026	1	**9.524 552**
66	270	B 2035	1	**9.524 553**
94	270	B 2048/6	1	**9.524 554**
73	270	B 2048/10	1	**9.524 555**

* one level
**two levels



4 Auminum holder KryoCane™, Type 5015

For frozen storage of cryovials 1.2, 1.5 or 2.0ml. *Thermo Scientific*

Type	For	Length mm	PK	Cat. No.
5015	5 cryovials	290	1	**9.400 956**
5015	6 cryovials	300	12	**9.400 935**



5 Sleeve KryoSleeve™., Type 5016

Made of transparent PVC. For KryoCane™ aluminium vial holder. *Thermo Scientific*

Type	Length mm	PK	Cat. No.
5016	273	100	**9.400 957**

E & OE.

1 Thermostatic controllers Optima™ T100/TC120

NEW!

Grant



Combine with a plastic or stainless steel tank or with an accessory T-clamp for independent use.
The two general purpose heating circulators offer excellent temperature stability and uniformity with a cooling/heating range of 0°C to +100°C (T100) and -15°C to +120°C (TC120).

Features:
T100: visual alarm, 2 point recalibration, fixed overtemperture cutout
TC120: visual and audible alarm, timer, 2 point recalibration, adjustable overtemperture cutout, pump for external circulation

Specifications

Temperature range with stainless steel tank	
T100:	0°C to +100°C
TC120:	-15°C to +120°C
Stability/Uniformity (DIN 12876) at 70°C:	±0.05°C/±0.1°C
Setting resolution:	0.1°C
Display:	4 digit LED
No. of pre-set temperatures:	3
Recalibration points:	2
Heating power (230V):	1.3kW
Power supply (230V/50-60Hz):	1.4kW
TC120 only:	
Timer:	1 to 9999 mins
Pump max. pressure:	210mbar
Flow rate max.:	16l/min

Type	Description	PK	Cat. No.
T100	without pump	1	**9.699 630**
TC120	with pump	1	**9.699 631**

Models with clamps available on request.

2 Thermostatic controllers Optima™ TX150/TXF200

NEW!

Grant



Combine with a plastic or stainless steel tank or with an accessory T-clamp for independent use.
The two advanced heating circulators feature a modern, icon driven programming interface and full colour display.
Cooling/heating range: -15°C to +150°C (TX150) and -15°C to +200°C (TXF200).

Features:
Visual and audible alarm, timer, 5 point recalibration, adjustable overtemperture cutout, pump, external probe, progammable, relay, menu system, program storage, USB port

Specifications

Temperature range with stainless steel tank	
TX150:	-15°C to 150°C
TXF200:	-15°C to 200°C
Stability/Uniformity (DIN 12876) at 70°C:	±0.01°C/±0.05°C
Setting resolution:	0.1°C (0.01°C with Labwise)
Display:	QVGA TFT
Timer:	1 min to 99 hrs 59 mins
No. of pre-set temperatures:	3
Recalibration points:	5
Heating power (230V):	1.9kW
Power supply (230V/50-60Hz):	2.0kW
Interface:	USB and RS232
Pump max. pressure	
TX150:	310 mbar
TXF200:	530 mbar
Flow rate max.	
TX150:	18l/min
TXF200:	22l/min (adjustable)

Type	Programmable	PK	Cat. No.
TX150	remote via PC/labtop, 1 program / 30 segments	1	**9.699 632**
TXF200	direct via user interface or remote via PC/labtop, 10 programs / 100 segments	1	**9.699 633**

Models with clamps available on request.

1



1 Stirred thermostatic water baths Optima™ series

NEW!

Grant

Complete units including plastic or stainless steel bath, bridge mounting plate and thermostatic controller. For 220-240V, 50/60Hz.

- The two general purpose heating circulators offer excellent temperature stability and uniformity with a cooling/heating range of 0 to 100°C (T100) and -15°C to +120°C (TC120).
- The two advanced heating circulators feature a modern, icon driven programming interface and full color display. Cooling/heating range: -15°C to +150°C (TX150) and -15°C to +200°C (TXF200).
- Grant stirred baths and circulators provide a source of precision heating and cooling. Complete range of 32 models covers basic to more sophisticated needs, each model representing excellent value for money and featuring intuitive programming and accurate, safe temperature control.
- An accessory gabled hinged lid is available to reduce evaporation, avoid heat loss and avoid sample contamination.
- High efficiency stainless steel (ST) tanks (range -15°C to +200°C)
- A drain trap is included on the ST12, ST18, ST 26 and ST38

Accessory polypropylene spheres or a lid must be used at temperatures between 60°C and 100°C. Above 100°C only a lid must be used. Accessory cooling is required for temperatures below ambient.

Please see article table for usable working space.

Please order spheres and lids separately.

Type	Capacity	Temp. range	External dimensions (W x D x H)	Working space W x D x H	Material	PK	Cat. No.
	litres	°C	mm	mm			
T100-P5	5	Amb. +15 to +99	200 x 390 x 380	150 x 120 x 150	plastic	1	**9.699 640**
T100-P12	12	Amb. +5 to +99	350 x 415 x 380	280 x 210 x 150	plastic	1	**9.699 641**
T100-P18	18	Amb. +5 to +99	350 x 600 x 380	325 x 280 x 150	plastic	1	**9.699 642**
T100-ST5	5	Amb. +15 to +100	180 x 330 x 395	150 x 150 x 150	stainless steel	1	**9.699 643**
T100-ST12	12	Amb. +5 to +100(1)	330 x 360 x 395	300 x 205 x 150	stainless steel	1	**9.699 644**
T100-ST18	18	Amb. +5 to +100(1)	330 x 540 x 395	300 x 385 x 150	stainless steel	1	**9.699 645**
T100-ST26	26	Amb. +5 to +100(1)	330 x 540 x 405	300 x 385 x 200	stainless steel	1	**9.699 646**
T100-ST38	38	Amb. +5 to +100(1)	333 x 730 x 450	300 x 575 x 200	stainless steel	1	**9.699 647**
TC120-P5	5	Amb. +15 to +99	200 x 390 x 380	150 x 120 x 150	plastic	1	**9.699 648**
TC120-P12	12	Amb. +5 to +99	350 x 415 x 380	280 x 210 x 150	plastic	1	**9.699 649**
TC120-P18	18	Amb. +5 to +99	350 x 600 x 380	325 x 280 x 150	plastic	1	**9.699 650**
TC120-ST5	5	Amb. +15 to +120(1)	180 x 330 x 395	150 x 150 x 150	stainless steel	1	**9.699 651**
TC120-ST12	12	Amb. +5 to +120(1)	330 x 360 x 395	300 x 205 x 150	stainless steel	1	**9.699 652**
TC120-ST18	18	Amb. +5 to +120(1)	330 x 540 x 395	300 x 385 x 150	stainless steel	1	**9.699 653**
TC120-ST26	26	Amb. +5 to +120(1,2)	330 x 540 x 405	300 x 385 x 200	stainless steel	1	**9.699 654**
TC120-ST38	38	Amb. +5 to +120(1,2)	333 x 730 x 450	300 x 575 x 200	stainless steel	1	**9.699 655**
TX150-P5	5	Amb. +15 to +99	200 x 390 x 380	150 x 120 x 150	plastic	1	**9.699 656**
TX150-P12	12	Amb. +5 to +99	350 x 415 x 380	280 x 210 x 150	plastic	1	**9.699 657**
TX150-P18	18	Amb. +5 to +99	350 x 600 x 380	325 x 280 x 150	plastic	1	**9.699 658**
TX150-ST5	5	Amb. +15 to +150(1)	180 x 330 x 395	150 x 150 x 150	stainless steel	1	**9.699 659**
TX150-ST12	12	Amb. +5 to +150(1)	330 x 360 x 395	300 x 205 x 150	stainless steel	1	**9.699 660**
TX150-ST18	18	Amb. +5 to +150(1)	330 x 540 x 395	300 x 385 x 150	stainless steel	1	**9.699 661**
TX150-ST26	26	Amb. +5 to +150(1,2)	330 x 540 x 405	300 x 385 x 200	stainless steel	1	**9.699 662**
TX150-ST38	38	Amb. +5 to +150(1,2)	333 x 730 x 450	300 x 575 x 200	stainless steel	1	**9.699 663**
TXF200-P5	5	Amb. +15 to +99	200 x 390 x 380	150 x 120 x 150	plastic	1	**9.699 664**
TXF200-P12	12	Amb. +5 to +99	350 x 415 x 380	280 x 210 x 150	plastic	1	**9.699 665**
TXF200-P18	18	Amb. +5 to +99	350 x 600 x 380	325 x 280 x 150	plastic	1	**9.699 666**
TXF200-ST5	5	Amb. +15 to +200(1)	180 x 330 x 395	150 x 150 x 150	stainless steel	1	**9.699 667**
TXF200-ST12	12	Amb. +5 to +200(1)	330 x 360 x 395	300 x 205 x 150	stainless steel	1	**9.699 668**
TXF200-ST18	18	Amb. +5 to +200(1)	330 x 540 x 395	300 x 385 x 150	stainless steel	1	**9.699 669**
TXF200-ST26	26	Amb. +5 to +200(1,2)	330 x 540 x 405	300 x 385 x 200	stainless steel	1	**9.699 670**
TXF200-ST38	38	Amb. +5 to +200(1,2)	333 x 730 x 450	300 x 575 x 200	stainless steel	1	**9.699 671**

(1) Temperature range can be extended to 0°C with accessory cooling of flow cooler 9.920 765.
(2) Temperature range can be extended to -15°C with accessory cooling of flow cooler 9.920 766.
External dimensions incl. controller.

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

Grant

Tanks Optima™ series, plastic

Robust plastic baths for use at temperatures from ambient +5°C to +99°C. Supplied with bridge mounting plate for Optima series controllers without clamps and built-in lifting handles at casing ends. Liquid depth for all models min./max.: 80/140mm. Accessory polypropylene spheres or a lid must be used at temperatures between +60 and +100°C. Above +100°C only a lid must be used. **Please order lid and PP spheres separately.** *Grant*

Type	Capacity Litres	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	PK	Cat. No.
P5	5	330 x 240 x 180	160 x 240 x 150	1	**9.905 710** 1
P12	12	350 x 415 x 180	280 x 325 x 150	1	**9.905 711** 2
P18	18	365 x 600 x 180	290 x 510 x 150	1	**9.905 712** 3

1



9.905 710

2



9.905 711

3



9.905 712

Tanks Optima™ series, stainless steel

NEW!

High efficiency stainless steel (ST) tanks (range -15°C to +200°C). Drain tap included on ST12, ST18, ST26, ST38. Raised feet for carrying repositioning and retort access. Accessory polypropylene spheres or a lid must be used at temperatures between +60°C and +100°C. Above +100°C only a lid must be used. Accessory cooling is required for temperatures below ambient. **Please order lid and PP spheres separately.** *Grant*

Type	Capacity litres	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	PK	Cat. No.
ST5	5	180 x 330 x 200	150 x 300 x 150	1	**9.905 718** 4
ST12	12	330 x 360 x 200	300 x 325 x 150	1	**9.905 719**
ST18	18	330 x 540 x 200	300 x 505 x 150	1	**9.905 720** 5
ST26	26	330 x 540 x 255	300 x 505 x 200	1	**9.905 721**
ST38	38	330 x 730 x 255	300 x 690 x 200	1	**9.905 722** 6

4



9.905 718

5



9.905 720

6



9.905 722

Thermostatic controllers please see page 767.

1



9.699 086

Lids for water baths Optima™ series

To help reduce evaporation, avoid heating loss and avoid sample contamination. *Grant*
Available in moulded plastic or stainless steel, flat or gabled with hinge as indicated (*).

Type	Description	Material	For	PK	Cat. No.	
PL 5	Flat	Stainless steel	bath P 5	1	**9.699 085**	
PL 12	Flat	Plastic	bath P 12	1	**9.699 086**	1
PL 18	Flat	Plastic	bath P 18	1	**9.699 087**	
STL5	Flat	Stainless steel	bath ST5	1	**9.905 723**	
STL12	Gabled*	Stainless steel	bath ST12	1	**9.905 724**	2
STL26	Gabled*	Stainless steel	bath ST26	1	**9.905 725**	
STL38	Gabled*	Stainless steel	bath ST38	1	**9.905 726**	

2



9.905 724

5 Accessories for water baths Optima™ series

Drain syphon SY1: For the rapid draining of baths. *Grant*

Heat exchange coil CW5: For use with precision and general purpose stirred baths. Temperature range 2°C above coolant temperature. Coil diameter/l mm 77/55, pipe bore inlet/outlet 7mm.

PP spheres PS20: Between operating temperatures 60°C and 100°C and below room temperature a lid or layers of polypropylene spheres should be used. Above 100°C a lid must be used.

Type	PK	Cat. No.	
PP spheres PS20	300	**6.239 419**	
Drain syphon SY1	1	**9.699 096**	3
Heat exchange coil CW5	1	**9.920 764**	4

3



9.699 096

4



9.920 764

5



6



6 Accessories for Thermostatic controllers Optima™ series

Labwise software: Permits the remote set-up and programming of thermostats with interface from a PC. Real-time temperature/time profile and graphic representation of processes. Profile documentation and programme memory on disk. Minimum requirements: Microsoft Windows XP, Vista (32/64bit), or Windows 7 (32/64bit). Pentium III/Celeron 866MHz or equivalent. *Grant*

T Clamp: For attaching the thermostats to any vertical sided tank with a maximum wall thickness of 35mm for rectangular tanks, 30mm for circular tanks (300mm diameter), and a capacity of up to 50L.

Type	PK	Cat. No.
Labwise software	1	**9.699 165**
T clamp	1	**9.699 634**

E & OE.

1 Raised shelves for water baths Optima™ series

The effective liquid depth is reduced in order to place small or shallow containers in the bath.

Grant



Type	For bath capacity litres	PK	Cat. No.
RS14	12	1	**9.699 092**
RS22	18	1	**9.699 093**
RS28	26	1	**9.699 094**
RS38	38	1	**9.699 095**

2 Test tube racks for water baths Optima™ series

Manufactured in stainless steel, with lifting handles. Available for test tubes with an external diameter of 10 to 13mm, 16 to 19mm or 30mm as well as for 0.5ml or 1.5ml microcentrifuge tubes.

Grant



QR racks can only be used with 5 litre baths.
VR racks can only be used with 12, 18, 26 and 38 litre baths.

Max. number of racks per bath:

5 litres: S5, ST5, P5	1 x QR
12 litres: S12, ST12, P12	2 x VR
18 litres: S18, ST18, P18	4 x VR
26 litres: S26, ST26	4 x VR
38 litres: S38, ST38	6 x VR

Type	For tubes	Array	PK	Cat. No.
QR-13	30 x 10/13mm	30	1	**9.699 130**
QR-19	16 x 16/19mm	16	1	**9.699 131**
QR-24	10 x 24mm	10	1	**9.699 132**
QR-30	5 x 30mm	5	1	**9.699 133**
QR-SE	44 x 0.5ml	44	1	**9.699 134**
QR-LE	35 x 1.5ml	55	1	**9.699 135**
VR-13	65 x 10/13mm	65	1	**9.699 136**
VR-19	36 x 16/19mm	36	1	**9.699 137**
VR-24	23 x 24mm	23	1	**9.699 138**
VR-30	14 x 30mm	14	1	**9.699 139**
VR-SE	102 x 0.5ml	102	1	**9.699 140**
VR-LE	75 x 1.5ml	75	1	**9.699 141**



1



1 2 Baths and Circulators

Huber

The Huber circulators are split into two product lines, the Compatible Control models and the simpler MPC models. Both model lines represent classically constructed laboratory circulators with open baths. Baths and circulators for heating applications up to +300°C are available, as well as models for heating and cooling applications from -90°C to +200°C. Immersion or bridge circulators are suitable for thermal control of existing baths. The Ministat, the smallest cooling and heating circulator in the world, is the first choice for operation in fume-hoods or integrating into systems.

Circulators with Pilot ONE Controller
Models with Pilot ONE Controller convincing in practice with their highly precise temperature control and a professional range of functions even in the basic version. The electronic upgrade function "E-grade" allows a simple and low cost expansion of functions at any time. Operation is simple using large colour displays, an easily understandable menu and an individually customisable display. Models with the Pilot ONE have powerful pressure and suction pumps with continuously variable speed control for adjusting circulation to the bath in use. Further connections are available via the optional Com.G@te, e.g. RS232 and RS485, analogue interface 4 to 20mA or 0 to 10V, standby signal and programmable alarm.

2



Circulators using the MPC Controller
The functions of models with the low price MPC controller concentrate on the essentials. MPC models are suitable for numerous typical laboratory applications, such as temperature control of samples, analysis, materials testing, as well as the external temperature control of test equipment or experimental constructions. The machine achieves a temperature stability of ±0.05°C and are fitted with an over temperature and low fluid level protection. The safety systems are according to class III/FL (DIN 12876) for use with flammable fluids. All MPC machines are also available as "plus" versions with RS232 interface.

Advantages and Functions (model dependent):
- Working Temperatures from -90°C to +300°C
- Models for internal and external temperature control
- High heating and cooling powers up to 7kW
- Powerful controllable circulation pumps
- Function expansion with the E-grade system is available at any time
- High precision cascade temperature control
- Large and full colour 5.7" TFT touchscreen
- Programmer with calendar/clock function
- Extended range of languages including a selection of European and Asian
- Comprehensive warning and safety functions

:

3



3 Immersion circulators MPC®-E and CC®-E

Huber

Immersion circulators are the basis of many combinations of polycarbonate and stainless steel baths. Together with a cooling bath it is possible to get exact and reproducable temperatures down to -30°C.

Temp. control range °C:	(-30) 25 to 200°C
Safety class:	FL, III
Heating capacity kW:	2kW
suction max. (CC®-E):	25L/min/0.4bar
suction max. (CC®-E xd):	22L/min/0.4bar
suction max. (MPC®-E):	17L/min/0.18bar
Immersion depth	
(CC®-E, MPC®-E):	150mm
(CC®-E xd):	195mm

Type	Temp. Stability	Pump max.	Dimensions (W x D x H)	PK	Cat. No.
	K	L/min / bar	mm		
MPC®-E	0.05*	20 / 0.2	132 x 153 x 312	1	**9.699 110**
CC®-E	0.01*	27 / 0.7	132 x 159 x 315	1	**9.859 201**
CC®-E xd	0.01*	22 / 0.4	132 x 159 x 360	1	**9.859 202**

*according to DIN 12876, measured in 12-litre stainless steel bath.

E & OE.

TOP 100 2012 top innovator

- 5.7" TFT touchscreen
- USB & LAN interfaces
- User friendly operation
- Plug & Play technology
- Favourites menu

The new multi-touch controller Pilot ONE allows you to carry out your temperature control tasks easier and faster than ever before.

The Pilot ONE is now standard on all temperature control systems, chillers, baths and circulators – at no extra charge!

For more information please visit www.huber-online.com/pilot-one or ask for the temperature control catalogue.



Pilot ONE® – Touch me!

The new Multi-Touch Controller for Huber Temperature Control Units.

We are the technology leader for high precision thermoregulation in research and industry. Our products ensure precise temperature control in laboratories, pilot plants and production processes. The product range offers solutions for all thermoregulation tasks from -120 to +425°C. 2012 we were awarded with the prize ‚**Innovator of the Year**' in the category for companies with up to 250 employees.

huber
high precision thermoregulation

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1



1 Thermostatic baths with polycarbonate tanks

Huber

The transparent polycarbonate baths are suitable for use up to 100°C. An immersion thermostat is mounted on the bath bridge for all models. With a pump adapter, this combination can also be used with external, closed applications. Models with the Pilot ONE controller have a variable speed pressure/suction pump and are therefore also suitable for external open applications.

Temperature max.:	100°C
Temp. Stability at 70°C to DIN12876	
MPC®-E:	0.05K
CC®-E:	0.02K
Safety class:	FL, III
Bath depth:	150mm

Type	Bath capacity L	Bath opening mm	Pressure pump max. L/min bar	Dimensions (W x D x H) mm	PK	Cat. No.
CC®-106A	6	130 x 110	27 / 0.7	147 x 307 x 330	1	**9.859 203**
MPC®-106A	6	130 x 110	20 / 0.2	147 x 307 x 330	1	**9.857 474**
CC®-108A	8	130 x 210	27 / 0.7	147 x 407 x 330	1	**9.859 204**
MPC®-108A	8	130 x 210	20 / 0.2	147 x 407 x 330	1	**9.857 476**
CC®-110A	10	130 x 310	27 / 0.7	147 x 507 x 330	1	**9.859 205**
MPC®-110A	10	130 x 310	20 / 0.2	147 x 507 x 330	1	**9.857 477**
CC®-112A	12	303 x 161	27 / 0.7	333 x 360 x 335	1	**9.859 206**
MPC®-112A	12	303 x 161	20 / 0.2	333 x 360 x 335	1	**9.857 478**
CC®-118A	18	303 x 321	27 / 0.7	333 x 520 x 335	1	**9.859 207**
MPC®-118A	18	303 x 321	20 / 0.2	333 x 520 x 335	1	**9.857 479**

2



2 Heating circulators with stainless steel baths

Huber

The insulated stainless steel baths are suitable for use up to 200°C. All models have a bridge-mounted CC-E and MPC-E immersion circulator. With a pump adapter, this combination can also be used with externally closed and externally open(*) applications. Models with the Pilot ONE controller have a variable speed pressure/suction pump and are therefore also suitable for external open applications.

Stability to DIN 12876:	
CC® models:	0.02K
MPC® models:	0.05K
Max. temp.:	200°C
Safety class:	FL, III

Type	Bath capacity L	Bath opening mm	Bath tank depth mm	Pressure pump max. L/min bar	Dimensions (W x D x H) mm	PK	Cat. No.
CC®-208B	8.5	230 x 127	150	27 / 0.7	290 x 350 x 375	1	**9.859 212**
MPC®-208B	8.5	230 x 127	150	20 / 0.2	290 x 350 x 375	1	**9.857 425**
CC®-212B	12	290 x 152	150	27 / 0.7	350 x 375 x 375	1	**9.859 208**
MPC®-212B	12	290 x 152	150	20 / 0.2	350 x 375 x 375	1	**9.857 426**
CC®-215B	15	290 x 152	200	27 / 0.7	350 x 375 x 425	1	**9.859 209**
MPC®-215B	15	290 x 152	200	20 / 0.2	350 x 375 x 425	1	**9.857 427**
CC®-220B	20	290 x 329	150	27 / 0.7	350 x 555 x 375	1	**9.859 210**
MPC®-220B	20	290 x 329	150	20 / 0.2	350 x 555 x 375	1	**9.857 428**
CC®-225B	25	290 x 329	200	27 / 0.7	350 x 555 x 425	1	**9.859 211**
MPC®-225B	25	290 x 329	200	20 / 0.2	350 x 555 x 425	1	**9.857 429**

*with option level control

3



3 Function upgrade for Huber circulators

Huber

E-grade - innovative activation keys for the functionality to suit your budget and process requirements

Every application requires particular functions. If the circulator is to be used in a range of applications it will generally require greater functionality. The required functionality grows with the complexity of the application. The innovative „E-grade" has the answer. Models with the Pilot ONE Controller have a comprehensive range of functions suited to the classical temperature control applications. The E-grade allows the functionality to be extended at any time to suit new process requirements and budget. E-grade stands for electronic upgrade and it is simple to do: To extend the functionality a unit specific code is entered via the controller. This code is specific to the serial number of the unit and is either already entered at the factory for new units or it can be activated at a later date. The code is sent by email. There is no requirement for a hardware or software update.

Type	PK	Cat. No.
E-grade® "Exclusive"	1	**9.699 100**
E-grade® "Professional"	1	**9.699 101**

E & OE.

1 Heating circulators

NEW!

Huber



Good things come in small packages! Thanks to their low bath volumes the models CC-104A und MPC-104A (with polycarbonate bath) as well as the CC-202C and MPC-202C (with stainless steel bath) are especially suitable for controlling the temperature of small external applications. All models are fitted with rear mounted M16x1 pump connections as standard. Models with the Pilot ONE have a speed regulated pressure/suction pump. The temperature constancy, in accordance with DIN12876, is 0.02 K with the Compatible Control models and 0.05 K for the MPC models.
Models CC-202C and MPC-202C are fitted with an integrated cooling coil as standard. With the models CC-104A and MPC-104A the cooling coil is an optional extra.

Temperature range
CC®-104A/MPC®-104A: (15)25 to 100°C
CC®-202C/MPC®-202C: (-30)45 to 200°C
Temp. Stability to DIN 12876
CC® models: 0.02K
MPC® models: 0.05K
Safety class: FL, III
Bath depth: 150mm
Heating capacity: 2kW

Type	Bath opening	Dimensions (W x D x H)	Suction pump cap.	Pressure pump max.	PK	Cat. No.
	mm	mm	L/min bar	L/min bar		
CC®-104A	Ø 25	147 x 235 x 330	25/0.4	27/0.7	1	**9.859 213**
MPC®-104A	Ø 25	147 x 235 x 330	17/0.18	20/0.2	1	**7.638 719**
CC®-202C	Ø 25	178 x 260 x 355	25/0.4	27/0.7	1	**9.859 220**
MPC®-202C	Ø 25	178 x 260 x 355	17/0.18	20/0.2	1	**6.244 120**

2 Heating bath circulators

NEW!

Huber

Heating bath circulators are suitable for temperatures up to 200°C or 300°C depending on model. The Compatible Control models have a continuously variable pressure and suction pump. The pump pressure can be controlled with an optional pressure sensor, and so can protect your valuable glass-ware from breakage. The machines are preferred and used for temperature control of externally connected applications. Additionally there is the possibility to control the temperature of objects placed directly in the open bath.

Specifications
Temp. control range
CC®-205B/MPC®-205B: (-30)45 ... 200°C
CC®-304B/CC®-308B/CC®-315B: (-20)28 ... 300°C
Safety class: FL, III
Stability to DIN 12876
CC®-205B/CC®-304B/CC®-308B/CC®-315B: 0.02K
MPC®-205B: 0.05K

Type	Bath capacity	Heating capacity	Supply req., 50 Hz	Dimensions (W x D x H)	Suction pump cap.	Pressure pump max.	PK	Cat. No.
	L	kW	V	mm	L/min bar	L/min bar		
CC®-205B	5.0	2.0	230	178 x 337 x 355	25 / 0.4	27 / 0.7	1	**9.859 221**
MPC®-205B	5.0	2.0	230	178 x 337 x 355	17 / 0.18	20 / 0.2	1	**6.244 121**
CC®-304B	5.0	2.0	230	210 x 335 x 392	22 / 0.4	33 / 0.7	1	**9.859 222**
CC®-308B	8.5 / 5.2*	3.0	230	242 x 404 x 392	22 / 0.4	33 / 0.7	1	**9.859 223**
CC®-315B	15 / 8.5*	3.0 / 4.0	230 / 400	335 x 382 x 433	22 / 0.4	33 / 0.7	1	**9.859 224**

*using displacement insert



1



1 Thermoregulators Economy ED, EH, TopTech MB, MA and ME

JULABO

For thermoregulation of bath tanks up to 50 litres. With bath attachment clamp for wall thicknesses up to 26mm or retort stand mounting using accessory rod.

Economy ED series
- Bright LED temperature display for actual and setpoint values, resolution 0.1°C
- Keypad for setpoint, switches automatically to the actual value
- PID1 temperature control
- Adjustable high temperature cut-out/dry-running protection (protection class 1 for non-flammable liquids, DIN 12876-1)

Economy EH series
- Enhanced temperature range up to 150°C
- Adjustable high temperature cut-out/dry-running protection (protection class 3 for flamable liquids, DIN 12876-1)

TopTech MB series
- Multi-Display (LED) for actual and setpoint values, warning/safety functions and pump stage
- PID2 temperature control with drift compensation
- ATC3 3-Point-Calibration
- Early warning system for low liquid level
- RS232 interface
- Adjustable high temperature cut-out/dry-running protection (protection class 1 for non-flammable liquids, DIN 12876-1)

TopTech MA series - as TopTech MB, but additionally with:
- PPC (Pump Pressure Control), electronically adjustable pump capacity
- Adjustable high temperature cut-out/dry-running protection (protection class 3 for flamable liquids, DIN 12876-1)

TopTech ME series - as TopTech MA, but additionally with:
- VFD Comfort Display, resolution 0.01°C
- Pt100 External sensor connection
- Programmer for 10 programme steps

Delivery without bath please order separately.

Type	Working Temp. range °C	Temp. stability ± °C	Pump max. L/min / bar	PK	Cat. No.
Economy ED	20 to 100	0.03	15 / 0.35	1	**9.858 003**
Economy EH	20 to 150	0.03	15 / 0.35	1	**9.858 000**
TopTech MB	20 to 100	0.02	10 / 0.12	1	**9.858 001**
TopTech MA	20 to 200	0.01	11-16 / 0.23-0.45	1	**9.858 110**
TopTech ME	20 to 200	0.01	11-16 / 0.23-0.45	1	**9.858 004**

We can supply this manufacturer's whole product range !
partner of the LLG Lab Logistics Group
Julabo

E & OE.

Remote control WirelessTEMP for temperature control instruments

Wireless monitoring and control of Julabo temperature control instruments via PC or remote control. *JULABO*

The 'WirelessTEMP' series of products gives you a variety of ways to communicate with up to eight Julabo temperature control instruments using a PC or Julabo 'Remote Control'. 'WirelessTEMP' works with virtually all Julabo instruments equipped with an RS232 interface. Intelligent technology makes it easy to get started. Just switch on the system and connections will be established automatically. With 'WirelessTEMP Configurator' software, users can even set up complex networks with several separate, independent groups of instruments (PAN's). This enables disturbance-free operation in neighbouring laboratories.
- wireless monitoring and control of Julabo temperature control instruments
- wireless transmission and display of parameters, such as set points, actual values, output, warning messages and error messages from large distances
- communication with up to eight Julabo temperature control instruments

Benefits:
- a convenient way to operate Julabo instruments from your workstation
- spend less time and resources monitoring the instruments
- greater flexibility in choosing location for the instrument
- cost reduction, as the hassle of running cables is eliminated
- ideal solution as "Remote Display" for your application
- works with virtually all Julabo temperature control instruments with RS232 interface

Remote Control	Handy remote control unit for display and control of up to eight Julabo instruments
Transmitter	Send/receive module for JULABO temperature control instruments with RS232 interface
Wireless PC USB Stick	Send/receive module for PC´s with USB interface
Router	Extends wireless range

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9.858 105

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9.858 107

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9.858 109

Type	PK	Cat. No.
Remote Control	1	**9.858 105** 1
Remote Control (ATEX Version)	1	**9.858 106**
Transmitter	1	**9.858 107** 2
Wireless PC USB Stick	1	**9.858 108**
Router	1	**9.858 109** 3

ATEX version may be operated with batteries only, so a power supply unit is not included.

4 Circulator Baths, Economy ED and TopTech MB series

Open bath circulators only for lower temperature range tasks performed internally, directly in the bath. *JULABO*
Working temperature ranges:
- with stainless steel bath tank : up to 100°C (without suffix)
- with Plexiglas bath tank up to 60°C (Suffix 'A')
- with Makrolon bath tank up to 100°C (Suffix 'M')

Economy ED series
- Bright LED temperature display for actual and setpoint values, resolution 0.1°C
- Keypad for setpoint, switches automatically to the actual value
- PID1 temperature control
- Adjustable high temperature cut-out/dry-running protection

TopTech MB series
- Multi-Display (LED) for actual and setpoint values, warning/safety functions and pump status
- PID2 temperature control with drift compensation
- ATC3 3-Point-Calibration
- Early warning system for low liquid level
- RS232 interface

4



Type	Working Temp. range °C	Temp. stability ± °C	Pump max. L/min / bar	Capacity L	PK	Cat. No.
Economy ED-5A/B *	20 to 60	0.03	15 / 0.35	5	1	**9.857 804**
Economy ED-7A/B *	20 to 60	0.03	15 / 0.35	7	1	**9.857 805**
Economy ED-5M/B *	20 to 100	0.03	15 / 0.35	5	1	**9.857 806**
Economy ED-13A	20 to 60	0.03	15 / 0.35	13	1	**9.858 028**
Economy ED-19A	20 to 60	0.03	15 / 0.35	19	1	**9.858 029**
Economy ED-13M	20 to 100	0.03	15 / 0.35	13	1	**9.857 807**
Economy ED-19M	20 to 100	0.03	15 / 0.35	19	1	**9.857 808**
Economy ED-13	20 to 100	0.03	15 / 0.35	13	1	**9.858 016**
Economy ED-19	20 to 100	0.03	15 / 0.35	19	1	**9.858 017**
Economy ED-27	20 to 100	0.03	15 / 0.35	27	1	**9.858 010**
Economy ED-33	20 to 100	0.03	15 / 0.35	33	1	**9.857 810**
TopTech MB-13A	20 to 60	0.02	10 / 0.12	13	1	**9.858 025**
TopTech MB-19A	20 to 60	0.02	10 / 0.12	19	1	**9.858 030**
TopTech MB-13	20 to 100	0.02	10 / 0.12	13	1	**9.858 011**
TopTech MB-19	20 to 100	0.02	10 / 0.12	19	1	**9.858 012**

* Cooling coil option not possible

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1 Circulator baths, Economy ED, EH series and TopTech MB series

JULABO

Open bath circulator for internal and external temperature tasks directly in the bath. Additional pump connections for external temperature tasks. Working temperature ranges:
- with stainless steel bath tank: up to 100°C (without suffix)
- with Plexiglas bath tank up to 60°C (Suffix 'A')
- with Makrolon bath tank up to 100°C (Suffix 'M')

Economy ED series
- Bright LED temperature display for actual and setpoint values, resolution 0.1°C
- Keypad for setpoint, switches automatically to the actual value
- PID1 temperature control
- Adjustable high temperature cut-out/dry-running protection (protection class 1)

Economy EH series
- Extended temperature range up to +150°C
- Adjustable high temperature cut-out/dry-running protection (protection class 3)

TopTech MB series
- Multi-Display (LED) for actual and set-point values, warning/safety functions and pump status
- PID2 temperature control with drift compensation
- ATC3 3-Point-Calibration
- Early warning system for low liquid level
- RS232 interface

Type	Working Temp. range °C	Temp. stability ± °C	Pump max. L/min / bar	Capacity L	PK	Cat. No.
Economy ED-5A	20 to 60	0.03	15 / 0.35	5	1	**9.858 037**
Economy ED-5M	20 to 100	0.03	15 / 0.35	5	1	**9.857 812**
Economy ED-5	20 to 100	0.03	15 / 0.35	4.5	1	**9.858 032**
Economy EH-5	20 to 150	0.03	15 / 0.35	4.5	1	**9.858 036**
Economy EH-13	20 to 150	0.03	15 / 0.35	13	1	**9.858 056**
Economy EH-19	20 to 150	0.03	15 / 0.35	19	1	**9.858 057**
Economy EH-27	20 to 150	0.03	15 / 0.35	27	1	**9.858 058**
Economy EH-33	20 to 150	0.03	15 / 0.35	33	1	**9.858 059**
Economy EH-39	20 to 150	0.03	15 / 0.35	39	1	**9.858 060**
TopTech MB-5A	20 to 60	0.02	10 / 0.12	5	1	**9.858 034**
TopTech MB-7A	20 to 60	0.02	10 / 0.12	7	1	**9.858 035**
TopTech MB-5M	20 to 100	0.02	10 / 0.12	5	1	**9.857 820**
TopTech MB-5	20 to 100	0.02	10 / 0.12	4.5	1	**9.858 031**

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9.857 831

Heating circulator baths, TopTech MA, ME series

JULABO

Principally for temperature control of external closed circuit systems. Smaller vessels can be thermoregulated directly in the bath tank. For working at lower temperature ranges the cooling coil is integrated. With stainless steel bathes.
For temperatures up to 200°C.

TopTech MA series
- Multi-Display (LED) for actual and setpoint values, warning/safety functions and pump status
- PID2, temperature control with drift compensation
- ATC3, 3-point calibration
- early warning system for low liquid level
- RS232 interface
- PPC (Pump Pressure Control), electronically adjustable pump capacity

TopTech ME series - as TopTech MA, but with additional:
- VFD Comfort Display, resolution 0.01°C
- Pt100 external sensor connection

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9.857 833

Type	Working Temp. range °C	Temp. stability ± °C	Pump max. L/min / bar	Capacity L	PK	Cat. No.
TopTech MA-4	20 to 200	0.01	11-16 / 0.23-0.45	4.5	1	**9.858 111**
TopTech MA-6	20 to 200	0.01	11-16 / 0.23-0.45	6	1	**9.858 112**
TopTech MA-12	20 to 200	0.01	11-16 / 0.23-0.45	12	1	**9.858 113**
TopTech MA-26	20 to 200	0.01	11-16 / 0.23-0.45	26	1	**9.858 114**
TopTech ME-4	20 to 200	0.01	11-16 / 0.23-0.45	4.5	1	**9.857 831** 2
TopTech ME-6	20 to 200	0.01	11-16 / 0.23-0.45	6	1	**9.857 824**
TopTech ME-12	20 to 200	0.01	11-16 / 0.23-0.45	12	1	**9.857 832**
TopTech ME-26	20 to 200	0.01	11-16 / 0.23-0.45	26	1	**9.857 833** 3

E & OE.

1 Heating circulator baths HighTech HE, HL, SE, SL series

JULABO

Principally for temperature control of external systems. Models with pressure and suction pump generally have a higher capacity and can be used for larger and open circuit systems. Smaller vessels can be thermoregulated directly in the bath tank. For working at lower temperature ranges the cooling coil is integrated. With stainless steel bathes.
For temperatures up to 250/300°C.

HighTech HE, SE series
- Multi-Display (LED) for actual and setpoint values, warning/safety functions and pump status
- PID2, temperature control with drift compensation
- ATC3, 3-point calibration
- early warning system for low liquid level
- RS232 interface
- PPC (Pump Pressure Control), electronically adjustable pump capacity
- VFD Comfort Display, resolution 0.01°C
- Pt100 external sensor connection
- ICC (Intelligent Cascade Control), self-optimising temperature control
- powerful pressure and suction pump. Pressure 0.4 to 0.7 bar, Suction 0.2 to 0.4 bar

HighTech HL, SL series - as HighTech HE, SE, but with additional:
- LCD Dialogue Display for convenient interactive operation
- TCF Temperature Control Features to optimise control behaviour
- integral programmer for 6 x 60 programme steps
- connections for solenoid valve and HSP booster pump

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Type	Working Temp. range °C	Temp. stability ± °C	Pump max. L/min / bar	Suction bar	Capacity L	PK	Cat. No.
HighTech HE-4	20 to 250	0.01	22-26 / 0.4- 0.7	0.2-0.4	4.5	1	**9.858 044**
HighTech SE-6	20 to 300	0.01	22-26 / 0.4- 0.7	0.2-0.4	6	1	**9.858 049**
HighTech SE-12	20 to 300	0.01	22-26 / 0.4- 0.7	0.2-0.4	12	1	**9.858 047**
HighTech SE-26	20 to 300	0.01	22-26 / 0.4- 0.7	0.2-0.4	26	1	**9.858 048**
HighTech HL-4	20 to 250	0.01	22-26 / 0.4- 0.7	0.2-0.4	4.5	1	**9.858 050**
HighTech SL-6	20 to 300	0.01	22-26 / 0.4- 0.7	0.2-0.4	6	1	**9.858 054**
HighTech SL-12	20 to 300	0.01	22-26 / 0.4- 0.7	0.2-0.4	12	1	**9.858 051**
HighTech SL-26	20 to 300	0.01	22-26 / 0.4- 0.7	0.2-0.4	26	1	**9.858 052**

Refrigerated circulators LTC 2/LTC 4

NEW!

Grant

Versatile system for the laboratory, with a comprehensive specification to suit most low temperature applications.
- Optima™ digital thermostat for precise temperature control: LTC 2 assembled with TC 120, LTC 4 assembled with TX 150
- Cooling/heating range for - 20 to 100°C for LTC 2 and -30 to +100°C for LTC 4
- Stability ±0.1°C
- Powerful integral pump; allows temperature-controlled fluid to be circulated to external devices (16L/min, 210mbar for LTC 2 and 18L/min, 310mbar for LTC 4)
- Easy to use rotary dial and two function keys

- Clear 4 digit display - easy to read from a distance for instant reassurance
- Visual alarm and countdown timer; alerts you when your attention is required
- User calibration facility for optimum accuracy at the required operating temperature
- Operating setpoint plus 3 adjustable preset temperatures for convenience
- Liquid protection and over-temperature cut-out
- Easy access to coolant reservoir for local cooling of tubes, bottles etc.
- Powerful efficient cooling, ozone-friendly refrigerant
- Dual-position bridge plate, ensures visibility/accessibility of the thermostat whilst optimising bench space
- Robust construction, corrosion resistant materials, stainless steel tank; durable in demanding environments
- 5°C thermostat on/off switch; stops tank freezing when operating with water

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6.255 692

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9.721 067

Type	Capacity litres	Temp. range °C	Heating power W	Cooling capacity kW at 20/0/-20°C	Dimensions (W x D x H) mm	PK	Cat. No.
LTC 2	5	-20 to +100	1300	0.25/0.14/0.035	230 x 410 x 610	1	**6.255 692** 2
LTC 4	20	-30 to +100	1900	0.90/0.50/0.18	390 x 490 x 732	1	**9.721 067** 3

1 Cooling circulators

Huber

Combinations of immersion circulators and insulated refrigeration baths are low-cost solutions for direct thermoregulation within the temperature range -20/-30°C to 200°C.
The refrigeration baths operate with natural refrigerants. A pump adapter (optional) can be fitted for thermoregulation of externally closed applications. Models with the Pilot ONE controller have a variable speed pressure/suction pump and are therefore suitable for external open thermoregulation applications. The temperature stability is 0.02K for the Compatible Control models and 0.05K for the MPC models.

Type	Working Temp. range °C	Cooling capacity kW at 0/-10/-20°C	Bath capacity L	Bath opening mm	Dimensions (W x D x H) mm	Pump max. L/min / bar	PK	Cat. No.
CC®-K12	-20 ... +200	0.2/0.12/0.05	12	290 x 152	350 x 560 x 430	27 / 0.7	1	**9.859 227**
MPC®-K12	-20 ... +200	0.2/0.12/0.05	12	290 x 152	350 x 560 x 430	20 / 0.2	1	**9.857 407**
CC®-K15	-20 ... +200	0.2/0.12/0.05	15	290 x 152	350 x 560 x 430	27 / 0.7	1	**9.859 228**
MPC®-K15	-20 ... +200	0.2/0.12/0.05	15	290 x 152	350 x 560 x 430	20 / 0.2	1	**9.857 408**
CC®-K20	-30 ... +200	0.35/0.27/0.16	20	290 x 329	350 x 555 x 615	27 / 0.7	1	**9.859 229**
MPC®-K20	-30 ... +200	0.35/0.27/0.16	20	290 x 329	350 x 555 x 615	20 / 0.2	1	**9.857 409**
CC®-K25	-30 ... +200	0.35/0.27/0.16	25	290 x 329	350 x 555 x 615	27 / 0.7	1	**9.859 230**
MPC®-K25	-30 ... +200	0.35/0.27/0.16	25	290 x 329	350 x 555 x 615	20 / 0.2	1	**9.857 404**

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2 Compatible Control Refrigeration Circulators K6

Huber

The K6 models are compact refrigeration bath circulators for temperatures from -25 to 200°C. These units are a combination of a refrigerated bath and immersion circulator, in combination with an integrated pump they are suitable for external open (with level control) and closed applications.
The CC-E immersion circulator with its suction/pressure pump is suitable to externally open and closed applications. The temperature stability is 0.02K for the Compatible Control models and 0.05K for the MPC models.

Specifications

Safety class:	FL, III
Heating capacity:	2kW
Pressure pump	
CC®-K6/CC®-K6s:	27L/min/0.7 bar
MPC®-K6/MPC®-K6s:	20L/min/0.2 bar

Type	Temp. range °C	Bath capacity L	Bath opening mm	Cooling capacity kW at 0/-10/-20°C	Dimensions (W x D x H) mm	PK	Cat. No.
CC®-K6	-25 ... +200	4.5	140 x 120	0.15/0.1/0.05	210 x 400 x 546	1	**9.859 226**
MPC®-K6	-25 ... +200	4.5	140 x 120	0.15/0.1/0.05	210 x 400 x 546	1	**9.857 405**
CC®-K6s	-25 ... +200	4.5	140 x 120	0.21/0.15/0.05	210 x 400 x 546	1	**9.859 225**
MPC®-K6s	-25 ... +200	4.5	140 x 120	0.21/0.15/0.05	210 x 400 x 546	1	**9.857 406**

All units use natural refrigerant as standard.

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3 Cooling circulator Variostat® for a variety of baths

Huber

This unique immersion circulator can thermoregulate a wide range of baths between -30°C and 150°C. This innovative construction allows the user ultimate flexibility. The circulation can be adjusted to suit the bath size using the stepless, variable speed suction/pressure pump. The pump can also be controlled with an optional pressure sensor for external applications.

Temperature stability to DIN 12876:	0.02K
Heating capacity:	1kW
Pump pressure max.:	27L/min/0.7bar
Max. suction:	20L/min/0.4bar

Type	Working Temp. range max. °C	Bath capacity L	Cooling capacity kW at 100/20/0/-20/-30°C	PK	Cat. No.
Variostat®	-30 ... +150	variable	0.3 / 0.3 / 0.2 / 0.12 / 0.03	1	**9.859 231**

E & OE.

1 Compact refrigerated circulators - Ministat®

Exceptionally compact and powerful, Ministats have been the smallest cooling circulators in the world since 1976. Their compact form allows them to be placed in small spaces, e.g. in a laboratory extraction hood. Compliance with DIN 12876, class 3 allows them to be used unsupervised in continual operation. The maximum ambient temperature is 40°C. *Huber*

The powerful variable speed pressure/suction pump can thermoregulate objects in the bath or external applications. The maximum pressure can be controlled using an optional pressure sensor - VPC (Variable Pressure Control) - which protects delicate glassware. The small volume and high power of the Ministats means exceptionally rapid heating and cooling rates are achieved. Optional displacement inserts reduce the bath volume by approximately 50 % amplifying this effect and reducing moisture absorption in the thermal fluid. All models have Active Cooling Control for cooling power control at the maximum working temperature and an automatic cooling power regulation for energy saving operation and reduced heat dissipation into the lab.The bath opening is large enough to allow small objects to be thermoregulated within. All parts in contact with the thermal fluid are made of stainless steel or Polycarbonate.

Ministats have the Pilot ONE with Plug & Play technology (proven since 1980). In the event of service the controller can be simply swapped. Using a data cable the Ministat can be remotely controlled. The Pilot ONE has a state of the art microprocessor controller and a high precision temperature measurement system for exact and reproducible temperature control. The functionality and TFT-display are supported by Easy Control. Ministats can be fitted with a Com.G@te (NAMUR Standard) allowing them to be integrated into a process control system.

Typical applications for the smallest cooling circulator in the world are external closed systems e.g. photometer, refractometer and viscosimeter.

Pump pressure max.: 27L/min/0.7bar
Max. suction: 20L/min/0.4bar

Type	Working Temp. range max. °C	Bath capacity L	Bath tank depth mm	Heating power W	Cooling capacity kW at 0/-20/-30°C	Dimensions (W x D x H) mm	PK	Cat. No.
Ministat® 125	-25 ... +150	2.75/1.3*	120	1000	0.21/0.05/--	225 x 370 x 429	1	**6.257 173**
Ministat® 125w	-25 ... +150	2.75/1.3*	120	1000	0.20/0.10/--	225 x 370 x 429	1	**9.859 232**
Ministat® 230	-40 ... +200	3.2/1.7*	135	2000	0.38/0.25/0.14	255 x 450 x 476	1	**9.859 233**
Ministat® 230w	-40 ... +200	3.2/1.7*	135	2000	0.38/0.25/0.14	255 x 450 x 476	1	**9.859 234**
Ministat® 240	-45 ... +200	4.9/2.8*	157	2000	0.55/0.35/0.125	300 x 465 x 516	1	**9.859 235**
Ministat® 240w	-45 ... +200	4.9/2.8*	157	2000	0.55/0.35/0.125	300 x 465 x 516	1	**9.859 236**

Temperature Stability to DIN 12876: 0.02 K
All units use natural refrigerant as standard.
*with displacement insert

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We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

huber

1 Refrigeration Bath Circulators to -45°C

Huber

HUBER refrigerated bath circulators perform safe and repeatable heating and cooling tasks in the lab. 22 models covering the range -90 to 200°C with a selection of heating and cooling powers are available with air or water cooling (w). Natural refrigerants for environmentally friendly operation are available on request. A powerful variable speed pressure/suction pump allows the thermoregulation of objects directly in the bath or can be used to control external applications. The pump speed is stepless and when used in combination with an optional pressure sensor the maximum pressure can be controlled. VPC (Variable Pressure Control) ensures the best circulation and protects delicate glass apparatus from breakage caused by overpressure.
Small volume and high heating and cooling powers result in the shortest heating and cooling rates. Optional displacement inserts reduce the bath volume by half increasing this effect. Additionally the bath surface area is reduced, lowering moisture absorption. The optional calibration insert allows all HUBER refrigeration circulators to be used as calibration baths. The calibration insert ensures an even temperature distribution with a temperature stability of ±0.01K. All models have Active Cooling Control for cooling power control at the maximum working temperature and an automatic cooling power regulation for energy saving operation and reduced heat dissipation into the lab. Depending on the model carry handles or castors are fitted for easy transportation. The drain is located on the front of the unit to enable simple drainage of the bath. The cover plate is thermoregulated to avoid condensation. All models have the Pilot ONE with Plug & Play technology which can be simply swapped in the event of a service. The Pilot ONE can be used as a remote control (with data cable). The Pilot ONE is a high tech microprocessor based controller with a high precision measurement system for exact and reproducible results. The wide ranging functionality is supported by a large TFT display and simple operation. HUBER refrigeration circulators can be equipped with a Com.G@te to the NAMUR standard to enable integration in a process control system. Depending on the bath dimensions objects can be thermoregulated within the bath. Typical applications for these classics are the thermoregulation of externally closed systems, e.g. photometer, refractometer, viscosimeter, double-jacketed reactors and autoclaves. They are used in miniplants, kilo labs, for stock point measurement, for low temperature calibration, for petroleum tests and many more applications.

Option: Natural refrigerant available on request

Specifications

Pump data

Max. pressure:	33L/min/0.7bar
Max. suction:	22L/min/0.4bar
Temp. stability acc. to DIN 12876:	0.02K

Type	Working Temp. range °C	Bath capacity L	Bath tank depth mm	Heating power W	Cooling capacity KW at 100/20/0/-20/-30/-40°C	PK	Cat. No.
CC®-405	-40 ... +200	5	150	1500	0.7 / 0.7 / 0.7 / 0.45 / 0.18 / 0.03	1	**9.859 237**
CC®-405w	-40 ... +200	5	150	1500	0.7 / 0.7 / 0.7 / 0.45 / 0.18 / 0.03	1	**9.859 238**
CC®-410	-45 ... +200	22 /8.5*	200	3000	0.8 / 0.8 / 0.8 / 0.5 / 0.15 / 0.1	1	**9.857 403**
CC®-410wl	-45 ... +200	22 /8.5*	200	3000	0.8 / 0.8 / 0.8 / 0.5 / 0.15 / 0.1	1	**9.859 243**
CC®-415	-40 ... +200	5	150	1500	1.2 / 1.2 / 1.0 / 0.6 / 0.2 / 0.05	1	**9.859 239**
CC®-415wl	-40 ... +200	5	150	1500	1.2 / 1.2 / 1.0 / 0.6 / 0.2 / 0.05	1	**9.859 240**

*with displacement insert

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1 Refrigeration Bath circulators to -55°C

Compact design and high cooling capacity at low temperatures. *Huber*
Option: Natural refrigerant available on request

Heating capacity	
CC®-505/CC®-505wl:	1.5kW
CC®-508 to CC®-525w:	3.0kW
Pump data CC®-505 to CC®-508w	
Max. pressure:	33L/min/0.7bar
Max. suction:	22L/min/0.4bar
Pump data CC®-510 to CC®-525w	
Max. pressure:	31L/min/0.6bar
Max. suction:	24L/min/0.35bar
Supply requirement	
CC®-505 to CC®-508w:	230V/50Hz
CC®-510 to CC®-525w:	400V/50Hz
Temp. stability acc. to DIN 12876:	±0.02K

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Type	Working Temp. range °C	Bath capacity L	Bath tank depth mm	Cooling capacity KW at 100/20/0/-20/-40°C	PK	Cat. No.
CC®-505	-50 ... +200	5	150	1.2 / 1.2/ 1.0 / 0.6 / 0.15	1	**9.859 241**
CC®-505wl	-50 ... +200	5	150	1.2 / 1.2/ 1.0 / 0.6 / 0.15	1	**9.859 242**
CC®-508	-55 ... +200	5	160	1.5 / 1.5 / 1.5 / 1.0 / 0.3	1	**9.857 402**
CC®-508w	-55 ... +200	5	160	1.5 / 1.5 / 1.5 / 1.0 / 0.3	1	**9.857 401**
CC®-510	-50 ... +200	18/11*	200	2.1 / 2.1 / 2.1 / 1.0 / 0.4	1	**9.859 244**
CC®-510w	-50 ... +200	18/11*	200	2.4 / 2.4 / 2.4 / 1.0 / 0.4	1	**9.859 245**
CC®-515	-55 ... +200	26/15*	200	3.3 / 3.3 / 3.3 / 1.6 / 0.6	1	**9.859 247**
CC®-515w	-55 ... +200	18/11*	200	3.3 / 3.3 / 3.3 / 1.6 / 0.6	1	**9.859 246**
CC®-520w	-55 ... +200	17/10*	200	5.0 / 5.0 / 5.0 / 3.0 / 1.5	1	**9.859 248**
CC®-525w	-55 ... +200	17/10*	200	7.0 / 7.0 / 5.0 / 3.0 / 1.5	1	**9.859 249**

*with displacement insert
Function version available by E-grade.

2 Refrigerated Bath Circulators to -90°C

The CC-805 is a low cost alternative for low temperature applications when low power is required. *Huber*
Option: Natural refrigerant available on request

Pump data CC®-805/ CC®-902:	
Max. pressure:	33L/min/0.7bar
Max. suction:	22L/min/0.4bar
Pump data CC®-820 to CC®-906w:	
Max. pressure:	31L/min/0.6bar
Max. suction:	24L/min/0.35bar
Supply requirement:	400V 50Hz
CC®-805/CC®-902:	230V 50Hz
Temp. stability acc. to DIN 12876:	0.02K

2



Type	Working Temp. range °C	Bath capacity L	Bath tank depth mm	Cooling capacity KW at 100/20/0/-20/-40/-60°C	Heating power W	PK	Cat. No.
CC®-805	-80 ... +100	5	150	0.5 / 0.5 / 0.5 / 0.4 / 0.3 / 0.3	1500	1	**9.859 250**
CC®-820	-80 ... +100	17 / 10*	200	1.2 / 1.2 / 1.2 / 1.1 / 0.9 / 0.6	3000	1	**9.859 251**
CC®-820w	-80 ... +100	17 / 10*	200	1.2 / 1.2 / 1.2 / 1.1 / 0.9 / 0.6	3000	1	**9.859 252**
CC®-902	-90 ... +200	5	150	1.2 / 1.2 / 1.2 / 1.1 / 0.9 / 0.6	1500	1	**9.857 400**
CC®-905	-90 ... +200	26 / 15*	200	2.0 / 2.0 / 2.0 / 1.9 / 1.7 / 1.0	3000	1	**9.859 253**
CC®-905w	-90 ... +200	26 / 15*	200	2.0 / 2.0 / 2.0 / 1.9 / 1.7 / 1.0	3000	1	**9.859 254**
CC®-906w	-90 ... +200	30 / 19*	200	3.0 / 3.0 / 3.0 / 2.8 / 2.4 / 1.6	3000	1	**9.859 255**

*with displacement insert
Function version available by E-grade

1



1 Refrigerated circulator baths, Economy ED, EH series

JULABO

For temperature control of external closed circuit systems, such as photometers, refractometers, viscometers etc. Smaller objects can be thermoregulated directly in the bath tank.

Economy ED series
- bright LED temperature display for actual and setpoint values, resolution 0.1°C
- keypad for setpoint, switches automatically to the actual value
- PID1 temperature control
- adjustable high temperature cut-out/dry-running protection (protection class 1 for non-flammable liquids, DIN 12876-1)

Economy EH series
- extended temperature range up to +150°C
- adjustable high temperature cut-out/dry-running protection (protection class 3 for flamable liquids, DIN 12876-1)

Type	Working Temp. range °C	Temp. stability ± °C	Cooling capacity kW at 20/0/-20°C	Pump max. L/min / bar	Capacity L	PK	Cat. No.
Economy F12-ED	-20 to 100	0.03	0.16/0.1/0.02	15 / 0.35	4.5	1	**9.857 841**
Economy F25-ED*	-28 to 100	0.03	0.26/0.2/0.06	15 / 0.35	4.5	1	**9.858 062**
Economy F26-ED**	-28 to 100	0.03	0.26/0.2/0.06	15 / 0.35	4.5	1	**9.857 844**
Economy F34-ED	-30 to 100	0.03	0.45/0.32/0.14	15 / 0.35	20	1	**9.858 075**
Economy F12-EH	-20 to 150	0.03	0.16/0.1/0.02	15 / 0.35	4.5	1	**9.857 843**
Economy F25-EH	-28 to 150	0.03	0.26/0.2/0.06	15 / 0.35	4.5	1	**9.857 842**
Economy F32-EH	-35 to 150	0.03	0.45/0.39/0.15	15 / 0.35	8	1	**9.857 846**
Economy F33-EH	-30 to 150	0.03	0,5/0,32/0,12	15 / 0.35	16	1	**6.230 445**
Economy F34-EH	-30 to 150	0.03	0.45/0.32/0.14	15 / 0.35	20	1	**9.857 847**
Economy F38-EH	-35 to 80	0.05	0.92/0.66/0.32	15 / 0.35	45	1	**9.857 848**

* Compact units. **Low-profile design.

2



2 Refrigerated circulator baths TopTech MA, ME series

JULABO

For temperature control of external closed circuit systems, such as photometers, refractometers, viscometers etc. Smaller objects can be thermoregulated directly in the bath tank.

TopTech MA series - as TopTech MB, but additionally with:
- PPC (Pump Pressure Control), electronically adjustable pump capacity
- adjustable high temperature cut-out/dry-running protection (protection class 3 for flamable liquids, DIN 12876-1)

TopTech ME series - as TopTech MA, but additionally with:
- VFD Comfort Display, resolution 0.01°C
- Pt100 external sensor connection
- Programmer for 10 programme steps

Type	Working Temp. range °C	Temp. stability ± °C	Cooling capacity kW at 20/0/-20°C	Pump max. L/min / bar	PK	Cat. No.
TopTech F12-MA	-20 to 200	0.02	0.16/0.1/0.02	11-16 / 0.23-0.45	1	**9.858 115**
TopTech F25-MA	-28 to 200	0.02	0.26/0.2/0.06	11-16 / 0.23-0.45	1	**9.858 117**
TopTech FP40-MA	-40 to 200	0.02	0.68/0.5/0.32/0.004	11-16 / 0.23-0.45	1	**9.858 121**
TopTech FP50-MA	-50 to 200	0.02	0.9/0.8/0.5/0.16	11-16 / 0.23-0.45	1	**9.858 122**
TopTech F25-ME*	-28 to 200	0.01	0.26/0.2/0.06	11-16 / 0.23-0.45	1	**9.857 849**
TopTech F26-ME**	-28 to 200	0.01	0.26/0.2/0.06	11-16 / 0.23-0.45	1	**9.858 066**
TopTech F32-ME	-35 to 200	0.01	0.45/0.39/0.15	11-16 / 0.23-0.45	1	**9.857 857**
TopTech F33-ME	-30 to 200	0.01	0.50/0.32/0.12	11-16 / 0.23-0.45	1	**9.857 858**
TopTech F34-ME	-30 to 150	0.01	0.45/0.32/0.14	11-16 / 0.23-0.45	1	**9.857 859**
TopTech FP40-ME	-40 to 200	0.01	0.68/0.5/0.32/0.04	11-16 / 0.23-0.45	1	**9.857 862**
TopTech FP50-ME	-50 to 200	0.01	0.9/0.8/0.5/0.16	11-16 / 0.23-0.45	1	**9.857 863**

* Compact units.
**Low-profile design.





1 Refrigerated circulator baths, HighTech HE, HL series

JULABO

For temperature control of externally open and closed circuit systems. Smaller objects can be thermoregulated directly in the bath tank.



HighTech HE series - as TopTech ME, but additionally with:
- ICC (Intelligent Cascade Control), self-optimizing temperature control
- powerful pressure and suction pump, capacity max. 1.1 bar, electronically adjustable

HighTech HL series - as HighTech HE, but additionally with:
- LCD Dialogue Display, backlit for convenient interactive operation
- TCF Temperature Control Features to optimise control behaviour
- programmer for 6 x 60 programme steps
- connections for solenoid valve and HSP booster pump

Type	Working Temp. range °C	Temp. stability ± °C	Cooling capacity KW at 20/0/-20/-30°C	Pump max. L/min / bar	PK	Cat. No.
HighTech F25-HE	-28 to 200	0.01	0.26/0.20/0.06	22-26 / 0.4-0.7	1	**9.858 063**
HighTech F32-HE	-35 to 200	0.01	0.45/0.39/0.15	22-26 / 0.4-0.7	1	**9.858 071**
HighTech F34-HE	-30 to 150	0.01	0.45/0.32/0.14	22-26 / 0.4-0.7	1	**9.857 867**
HighTech FP40-HE	-40 to 200	0.01	0.68/0.5/0.32/0.04	22-26 / 0.4-0.7	1	**9.858 455**
HighTech FP45-HE	-42 to 200	0.01	0.85/0.7/0.42/0.08	22-26 / 0.4-0.7	1	**9.858 458**
HighTech FP50-HE	-50 to 200	0.01	0.9/0.8/0.5/0.16	22-26 / 0.4-0.7	1	**9.858 456**
HighTech F32-HL	-35 to 200	0.01	0.45/0.39/0.15	22-26 / 0.4-0.7	1	**9.858 072**
HighTech FP35-HL	-35 to 150	0.01	0.45/0.39/0.15	22-26 / 0.4-0.7	1	**9.857 872**
HighTech F25-HL	-28 to 200	0.01	0.26/0.20/0.06	22-26 / 0.4-0.7	1	**9.858 064**
HighTech F33-HL	-30 to 200	0.01	0.50/0.32/0.12	22-26 / 0.4-0.7	1	**9.857 870**
HighTech FP40-HL	-40 to 200	0.01	0.68/0.5/0.32/0.04	22-26 / 0.4-0.7	1	**9.857 878**
HighTech FP45-HL	-42 to 200	0.01	0.85/0.7/0.42/0.08	22-26 / 0.4-0.7	1	**9.858 459**
HighTech FP50-HL	-50 to 200	0.01	0.9/0.8/0.5/0.16	22-26 / 0.4-0.7	1	**9.858 460**

2 Refrigerated circulator baths series Economy and HighTech

JULABO

The new CF series offers compact refrigerated/heating circulators. With small overall dimensions the units can even be placed on a very small surface or within a complex installation. All models offer a heating capacity of 2kW and safety class 3 according to DIN12876-1. The maximum ambient temperature of +40°C as well as ventilated air cooling allow the units to be positioned very closely together, with other units or directly under a fume hood. Furthermore all the models feature pump connections for external temperature applications and a bath opening for temperature control of small objects directly in the circulator bath. Wetted parts are made of high quality stainless steel or plastic. The instruments incorporate reliable Microprocessor electronics offering high temperature stability as well as warning and safety functions.



Economy line CF30, CF40
- Ergonomic design and easy operation
- Compact dimensions require minimal space
- Splash-proof keypad
- Large, bright LED temperature display
- Precise PID temperature control
- RS232 interface for PC connection
- Adjustable high temperature cut-out
- Pump connections for external temperature applications
- Bath opening for temperature control of small objects in the bath

HighTech line CF31, CF41

Generally as Economy line but additionally with:
- Bright VFD display and interactive LCD dialogue display
- Highly precise ICC cascade temperature control
- RS232/RS485 interface for PC connection
- Electronically adjustable pump output
- External Pt100 sensor connection
- Integrated programmer with 6x60 program steps
- Early warning system for low liquid level
- 3-point calibration
- TCF Temperature Control Features

Type	Working Temp. range °C	Temp. stability ± °C	Cooling capacity kW at 20/0/-20°C	Pump max. L/min / bar	Suction bar	PK	Cat. No.
CF30	-30 to 150	0.03	0.32/0.25/0.15	15 / 0.35	-	1	**9.858 086**
CF40	-40 to 150	0.03	0.47/0.4/0.28	15 / 0.35	-	1	**9.858 087**
CF31	-30 to 200	0.02	0.32/0.25/0.15	22-26 / 0.4-0.7	0.2-0.4	1	**9.858 088**
CF41	-40 to 200	0.02	0.47/0.4/0.28	22-26 / 0.4-0.7	0.2-0.4	1	**9.858 089**

1



1 Ultra-low refrigerated Circulator Baths TopTech ME series and HighTech HL, SL series

JULABO

Ultra-low refrigerated, circulators suitable for external heating and cooling tasks.
Powerful circulating pump systems and high heating and cooling capacities guarantee short heat-up and cooling times. The inevitable dust accumulation that occurs in refrigeration systems is solved by means of an easily removed, vent grille. The units are equipped with handles or castors for easy manoeuvring. All models have a drain tap on the front, allowing the fluid to be emptied easily. Additionally the instruments are equipped with improved insulation to help avoid ice-formation, and have a visual liquid level display.

TopTech ME series
- VFD Comfort Display, resolution 0.01°C
- keypad for setpoints, warning/safety values and menu functions
- PID3 cascade temperature control
- ATC3, 3-point calibration
- Pt100 external sensor connection for measurement and control
- PPC (Pump Pressure Control), electronically adjustable pump capacity
- early warning system for low liquid level (DBGM 203 06 059.8)
- adjustable high temperature cut-out, visible via display
- RS232 interface
- integral programmer for 10 programme steps
- Active Cooling Control

HighTech HL, SL series - as TopTech ME series, but with additional
- LCD Dialogue Display, backlit for convenient interactive operation
- ICC (Intelligent Cascade Control), self-optimising temperature control
- TCF Temperature Control Features to optimise control behaviour
- RS232/RS485 interface
- integral programmer for 6 x 60 programme steps
- connections for solenoid valve and HSP booster pump

Type	Working Temp. range °C	Temp. stability ± °C	Cooling capacity kW at 20/0/-20/-40/-60/-80°C	Pump max. L/min / bar	Suction bar	PK	Cat. No.
FP51-SL	-51 to 200	0.05	2.0/1.5/1.0/0.26/-	22-26 / 0.4-0.7	0.2-0.4	1	**9.858 464**
F70-ME	-70 to 100	0.02	0.34/0.22/0.17/0.13/0.07/--	11-16 / 0.23-0.45	-	1	**9.858 462**
F81-ME	-81 to 100	0.02	0.45/0.38/0.36/0.32/0.27/0.07	11-16 / 0.23-0.45	-	1	**9.858 463**
F81-HL	-81 to 100	0.02	0.45/0.38/0.36/0.32/0.27/0.07	22-26 / 0.4-0.7	0.2-0.4	1	**9.858 476**
F95-SL	-95 to 0	0.05	--/1.7/1.5/1.3/1.1/0.36	22-26 / 0.4-0.7	0.2-0.4	1	**9.857 888**
FW95-SL	-95 to 0	0.05	--/1.7/1.5/1.3/1.1/0.36	22-26 / 0.4-0.7	0.2-0.4	1	**9.857 889**
FP52-SL	-60 to 100	0.05	3.0/2.8/1.6/0.65/0.1/--	22-26 / 0.4-0.7	0.2-0.4	1	**9.858 466**
FPW52-SL	-60 to 100	0.05	3.0/2.8/1.6/0.65/0.1/--	22-26 / 0.4-0.7	0.2-0.4	1	**9.858 467**
FP55-SL	-60 to 100	0.05	5.2/4.1/2.2/0.7/0.13/--	22-26 / 0.4-0.7	0.2-0.4	1	**9.858 479**
FPW55-SL	-60 to 100	0.05	5.5/4.1/2.2/1.0/0.13/--	22-26 / 0.4-0.7	0.2-0.4	1	**9.858 465**
FP90-SL	-90 to 100	0.05	1.8/1.7/1.6/1.35/0.75/0.15	22-26 / 0.4-0.7	0.2-0.4	1	**9.858 473**
FPW90-SL	-90 to 100	0.05	1.8/1.7/1.6/1.35/0.75/0.15	22-26 / 0.4-0.7	0.2-0.4	1	**9.858 474**
FPW91-SL	-91 to 100	0.20	5.2/4.7/4.0/3.5/2.3/0.8	22-26 / 0.4-0.7	0.2-0.4	1	**9.857 898**

FP-models: air-cooled
FPW-models: water-cooled

2



2 Ultra-low refrigerated circulator baths with extended temperature range

JULABO

Type	Working Temp. range °C	Temp. stability ± °C	Cooling capacity kW at 20/0/-20/-40/-60/-80°C	Pump max. L/min / bar	Suction bar	PK	Cat. No.
FP52-SL 150	-60 to 150	0.05	3.0/2.8/1.6/0.65 /0.1/--	22-26 / 0.4-0.7	0.2-0.4	1	**9.857 899**
FPW52-SL 150	-60 to 150	0.05	3.0/2.8/1.6/0.65 /0.1/--	22-26 / 0.4-0.7	0.2-0.4	1	**9.857 900**
FP55-SL 150	-55 to 150	0.05	5.2/4.1/2.2/0.7/0.13/--	22-26 / 0.4-0.7	0.2-0.4	1	**9.857 901**
FPW55-SL 150	-60 to 150	0.05	5.5/4.1/2.2/1.0 / 0.13/--	22-26 / 0.4-0.7	0.2-0.4	1	**9.857 902**
FP90-SL 150	-90 to 150	0.05	1.8/1.7/1.6/1.35/0.75 /0.15	22-26 / 0.4-0.7	0.2-0.4	1	**9.857 903**
FPW90-SL 150	-90 to 150	0.05	1.8/1.7/1.6/1.35/0.75 /0.15	22-26 / 0.4-0.7	0.2-0.4	1	**9.857 904**

FP-models: air-cooled
FPW-models: water-cooled

E & OE.

1 Unichiller® in alternative bench-top or tower housing formats



Huber

Unichillers are intelligent chillers which are used mainly as an environmentally friendly and economic alternative to tap water for process cooling. Low temperatures increase efficiency and recovery rates in condensation processes. In contrast to tap water a set-point can be selected between -10/-20°C to 40°C and controlled with a temperature stability of ±0.5°C. The product range includes 27 air cooled and 26 water cooled models, with cooling powers from 0.3kW to 50kW. Most models can be factory fitted with a heater if required. Housings are made of stainless steel to ensure long life. Compact, value-for-money units are available in classic look with cooling powers up to 2.5kW for cooling applications in the lab. Models from Minichiller to Unichiller 025w are suitable for on or under the lab bench. The proven Huber tower housing models offer power with small footprints. These models are now fitted with the new exchangeable Pilot ONE controller and are used in both research and production. The range of cooling powers available is from 0.3kW to 50kW. Unichillers with an optional heating become powerful process ciculators (additional charge on request).

2 Chillers, Minichiller®



Huber

Small, robust and cost effective with its stainless steel casing. The Minichiller is the smallest Unichiller in the world. Minichillers are available with air or water-cooled refrigeration systems, illuminated level indicator, overflow and drain on the front. The filling port is on the top of the unit. All models use natural refrigerants.

Supply req.: 230V 50/60Hz
Dimensions (WxDxH): 225mm x 360mm x 380mm

Type	Working Temp. range °C	Pump max. L/min / bar	Cooling capacity kW at 15/0/-10°C	PK	Cat. No.
Minichiller®*	-20 to 40	20 / 0.2	0.3/0.2/0.14	1	**9.857 717**
Minichiller® w*	-20 to 40	20 / 0.2	0.3/0.2/0.14	1	**9.857 592**

*Also available as "plus" version.
(plus=RS232/serial with the LAI commands G,v,L; (SpyLight compatible)

3 Unichiller®, bench-top



Huber

Unichillers are intelligent chillers which can be used as an environmentally friendly and economic alternative to tap water for process cooling. Low temperatures increase efficiency and recovery rates in gas condensation processes. In contrast to tap water a desired setpoint can be selected between -10/-20°C to 40°C and controlled with a temperature stability of ±0.5°C. The product range includes 27 air cooled and 26 water cooled models, with cooling powers from 0.3kW to 50kW. Most models can be factory fitted with a heater. The casings are made of high quality stainless steel to ensure long life.

With the exception of the two models Unichiller 006Tw-MPC and Unichiller 009Tw-MPC all units can be factory fitted with optional heating and independent over-temperature protection. Increasing the maximum working temperature to 100°C and the temperature stability to ±0.2K. The new construction allows constant operation in ambient temperatures up to 40°C. The water-cooled models are especially quiet and require little cooling water even at full cooling power. Despite the increasing costs of water the ROI is exceptionally short. All models with maximum pump pressure of 2.5bar have an adjustable bypass and a pressure gauge.

All Unichillers are also available as "plus" version (plus=RS232/serial with the LAI commands G,v,L; (SpyLight compatible). Unichiller 006-MPC uses natural refrigerant as standard, for all other models available on request.

Type	Working Temp. range °C	Supply req., 50 Hz V	Pump max. L/min / bar	Cooling capacity kW at 15/0/-10°C	PK	Cat. No.
Unichiller® 006-MPC®	-20 ... +40	230	30 / 0.7	0.6/0.5/0.35	1	**7.656 640**
Unichiller® 007-MPC®	-20 ... +40	230	25 / 2.5	0.7/0.55/0.4	1	**9.857 659**
Unichiller® 010-MPC®	-20 ... +40	230	25 / 2.5	1.0/0.8/0.5	1	**9.857 361**
Unichiller® 012-MPC®	-20 ... +40	230	25 / 2.5	1.2/1.0/0.7	1	**9.857 362**
Unichiller® 012w-MPC®	-20 ... +40	230	25 / 2.5	1.2/1.0/0.7	1	**9.857 363**
Unichiller® 015-MPC®	-20 ... +40	230	25 / 2.5	1.5/1.0/0.7	1	**9.857 364**
Unichiller® 015w-MPC®	-20 ... +40	230	25 / 2.5	1.5/1.0/0.7	1	**9.857 365**
Unichiller® 022-MPC®	-10 ... +40	230	25 / 2.5	2.2/1.6/1.0	1	**9.857 366**
Unichiller® 022w-MPC®	-10 ... +40	230	25 / 2.5	2.2/1.6/1.0	1	**9.857 367**
Unichiller® 025-MPC®	-10 ... +40	230	25 / 2.5	2.5/2.0/1.2	1	**9.857 369**
Unichiller® 025w-MPC®	-10 ... +40	230	25 / 2.5	2.5/2.0/1.2	1	**9.857 370**

1



1 Unichiller® (bench top) with water cooled refrigeration

Huber

The models Unichiller 006Tw and Unichiller 009Tw have a footprint of only 230 x 280mm and are therefore suitable for installation in laboratory furniture or in extract hoods. The water-cooled chillers emit almost no heat and require minimal amounts of cooling water. All models use natural refrigerant as standard.

Pump capacity max. 30L/min, pressure max. 0.7bar
Supply requirements: 230V/50Hz

Type	Working Temp. range °C	Cooling capacity kW at 15 °C	Cooling capacity kW at 0/-10/-20°C	Dimensions (W x D x H) mm	PK	Cat. No.
Unichiller® 006Tw-MPC®	-20 ... +40	0.6	0.45/0.4/0.25	230 x 280 x 540	1	**9.857 050**
Unichiller® 006Tw-MPC® plus*	-20 ... +40	0.6	0.45/0.4/0.25	230 x 280 x 540	1	**9.857 317**
Unichiller® 009Tw-MPC®	-25 ... +40	0.9	0.7/0.4/0.2	230 x 280 x 540	1	**9.857 053**
Unichiller® 009Tw-MPC® plus*	-25 ... +40	0.9	0.7/0.4/0.2	230 x 280 x 540	1	**9.857 318**

*with RS232 interface

2



2 Unichiller® (tower housing) with air cooled refrigeration

NEW!

Huber

All models require 400V/50Hz supplies, except Unichiller 017T, Unichiller 020T and Unichiller 025T which require 230V/50Hz.
Optional: Natural refrigerant available on request

Type	Working Temp. range °C	Pump max. L/min / bar	Cooling capacity kW at 15/0/-10/-20°C	Dimensions (W x D x H) mm	PK	Cat. No.
Unichiller® 017T	-10 ... +40	25 / 3.0	1.7 / 0.9 / 0.4 / --	450 x 510 x 1231	1	**9.859 301**
Unichiller® 020T	-20 ... +40	25 / 3.0	2.0 / 2.0 / 1.5 / 0.8	450 x 510 x 1231	1	**9.859 302**
Unichiller® 025T	-10 ... +40	25 / 3,0	2.5 / 1.2 / 0.6 / --	450 x 510 x 1231	1	**9.859 303**
Unichiller® 040T	-10 ... +40	26 / 3.0	4.0 / 2.5 / 1.5 / --	500 x 552 x 1451	1	**9.859 304**
Unichiller® 045T	-20 ... +40	26 / 3.0	4.5 / 4.5 / 2.9 / 1.5	500 x 552 x 1451	1	**9.859 305**
Unichiller® 055T	-10 ... +40	57/ 5.6	5.5 / 3.0 / 1.3 / --	600 x 632 x 1610	1	**9.859 306**
Unichiller® 060T	-20 ... +40	80 / 5.6	6.0 / 6.0 / 3.9 /2.0	600 x 632 x 1610	1	**9.859 307**
Unichiller® 080T	-10 ... +40	84 / 5.6	8.0 / 4.8 / 2.5 / --	600 x 790 x 1614	1	**9.859 308**

3



3 Unichiller® (tower housing) with water cooled refrigeration

NEW!

Huber

All models require 400V/50Hz supplies, except Unichiller 017Tw, Unichiller 020Tw and Unichiller 025Tw which require 230V/50Hz.
Option: Natural refrigerant available on request

Type	Working Temp. range °C	Pump max. L/min / bar	Cooling capacity kW at 15/0/-10/-20°C	Dimensions (W x D x H) mm	PK	Cat. No.
Unichiller® 017Tw	-10 ... +40	25 / 3.0	1.7 / 0.9 / 0.4 / --	400 x 440 x 1100	1	**9.859 309**
Unichiller® 020Tw	-20 ... +40	25 / 3.0	2.0 / 2.0 / 1.5 / 0.8	400 x 440 x 1100	1	**9.859 310**
Unichiller® 025Tw	-10 ... +40	25 / 3.0	2.5 / 1.2 / 0.6 / --	400 x 440 x 1100	1	**9.859 311**
Unichiller® 030Tw	-20 ... +40	26 / 3.0	3.0 / 3.0 / 2.0 / 1.0	400 x 440 x 1100	1	**9.859 312**
Unichiller® 040Tw	-10 ... +40	26 / 3.0	4.0 / 2.5 / 1.5 / --	400 x 440 x 1100	1	**9.859 313**
Unichiller® 055Tw	-10 ... +40	57/ 5.6	5.5 / 4.0 /2.0 / --	500 x 552 x 1261	1	**9.859 314**
Unichiller® 060Tw	-20 ... +40	80 / 5.6	6.0 /6.0 / 3.8 / 2.1	500 x 552 x 1261	1	**9.859 315**
Unichiller® 080Tw	-10 ... +40	84 / 5.6	8.0 / 4.65 / 2.35 / --	500 x 552 x 1261	1	**9.859 316**

1 Beer Force-Ageing-Test Bath BFT®5

Huber

We offer special air cooled circulator for the Beer Force-Ageing-Test. It is equipped with a programmer for the change between 0°C/40°C and 0°C/60°C in a 24 hour cycle.
Casings and bath parts are made of stainless steel.

Dimensions (WxDxH): 460 x 700 x 980mm

Type	Working Temp. range °C	Bath opening mm	Bath tank depth mm	Heating power W	Cooling capacity kW at 20 °C	PK	Cat. No.
BFT®5	-40 ... +80	350 x 410	270	2000	1.2	1	**9.857 399**



2 Compact Recirculating Cooler F250 EcoChiller

JULABO

- Environmentally friendly operation with low energy consumption
- No side vents, instruments can be placed right next to other equipment
- All wetted parts made of stainless steel or high grade plastic
- Large, bright LED display
- Compact design and small foot print
- Splash-proof keypad
- Drain tap
- Easy filling

Due to its high efficiency the F250 is an economic and environmentally friendly alternative to conventional tap water cooling.

Type	Working Temp. range °C	Temp. stability ± °C	Cooling capacity kW at 20/0/-10°C	Pressure bar	Flow rate L / min.	PK	Cat. No.
EcoChiller F250	-10 to +40	0.50	0.25/0.18/0.09	0.35	15	1	**9.698 525**



3 Flow coolers, FL series

JULABO

- Working temperature range covers -20°C to +40°C, the temperature stability of the PID control is ±0.5°C
- splash-proof keypad with integral mains switch
- large, bright LED display
- reliable Microprocessor PID temperature control
- filling level indicator
- powerful immersion pumps, suitable for continuous operation
- permissible temperature within return line: +80°C max.
- easy filling from the top with hinged protective lid
- low liquid level protection with visual and audible alarm signal
- stainless steel bath tanks
- removable venting grille for cleaning of the condenser
- front drain
- no side vents
- RS232 interface for PC connection
- Ingress protection class acc. to IEC 529: IP21
- pressure indicator
- adjustable bypass for pump pressure

Type	Working Temp. range °C	Temp. stability ± °C	Cooling capacity kW at 20/0/-10°C	Pressure bar	Flow rate L / min.	PK	Cat. No.
FL300	-20 to 40	0.50	0.3/0.2/0.15	0,35	15	1	**9.698 530**
FL601	-20 to 40	0.50	0.6/0.4/0.33	1,0	23	1	**9.698 531**
FL1201	-20 to 40	0.50	1.2/0.9/0.6	1,0	23	1	**9.698 532**
FL1203	-20 to 40	0.50	1.2/0.8/0.5	0,5-3,0	40	1	**9.698 533**
FL1701	-20 to 40	0.50	1.7/1.1/0.85	1,0	23	1	**9.698 534**
FL1703	-20 to 40	0.50	1.7/1.0/0.75	0,5-3,0	40	1	**9.698 535**
FL2503	-20 to 40	0.50	2.5/1.5/1.2	0,5-3,0	40	1	**9.698 536**
FL2506	-15 to 40	0.50	2.5/1.0/0.3	0,5-6,0	60	1	**9.698 537**
FL4003	-20 to 40	0.50	4.0/2.4/1.5	0,5-3,0	40	1	**9.698 538**
FL4006	-20 to 40	0.50	4.0/1.9/0.9	0,5-6,0	60	1	**9.698 539**
FL7006	-20 to 40	0.50	7.0/5.1/3.0	0,5-6,0	60	1	**9.698 540**
FL11006	-20 to 40	0.50	11.0/7.5/5.0	0,5-6,0	60	1	**9.698 541**
FL20006	-20 to 40	0.50	20.0/10/6	0,8-6,0	80	1	**9.698 550**



1 Flow coolers, FL series watercooled

JULABO

Type	Working Temp. range °C	Temp. stability ± °C	Cooling capacity kW at 20/0/-10°C	Pressure bar	Flow rate L / min.	PK	Cat. No.
FLW1701	-20 to 40	0.50	1.7/1.1/0.85	1,0	23	1	**9.698 542**
FLW1703	-20 to 40	0.50	1.7/1.0/0.75	0,5-3,0	40	1	**9.698 543**
FLW2503	-20 to 40	0.50	2.7/1.7/1.0	0,5-3,0	40	1	**9.698 544**
FLW2506	-15 to 40	0.50	2.5/1.0/0.3	0,5-6,0	60	1	**9.698 545**
FLW4003	-20 to 40	0.50	4.3/2.2/1.3	0,5-3,0	40	1	**9.698 546**
FLW4006	-20 to 40	0.50	4.0/1.7/0.7	0,5-6,0	60	1	**9.698 547**
FLW7006	-20 to 40	0.50	7.4/5.5/3.1	0,5-6,0	60	1	**9.698 548**
FLW11006	-20 to 40	0.50	11.5/7.3/4.8	0,5-6,0	60	1	**9.698 549**
FLW20006	-20 to 40	0.50	20.0/11.0/6.0	0,8-6,0	80	1	**9.698 551**

1



We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

Julabo

E & OE.

1 Petite Fleur®- the baby Tango®

1



Huber

The Tango was the original and smallest circulator of the Unistat range and had been the benchmark for many years. The Petite Fleur in comparison with the Tango, is 2/3 the size, 2/3 the power and 2/3 the price.
As with the large Unistats, the Petite Fleur, comes with full controller functionality. The powerful variable speed pump combined with the VPC pressure control and the TAC adaptive internal and cascade control ensure the best possible results. The „Professional" E-grade is factory installed as standard.

Specifications

Temperature stability at -10°C:	0.01K
Temperature adjustment and indication:	digital
Internal temperature sensor:	Pt100
Interface digital:	Ethernet, USB (Host und Device), RS232
Alarm message:	optic, acoustic, relay
Heating power:	1.5kW
Refrigeration machine:	
Petite Fleur®/Petite Fleur®-eo:	air cooled, natural refrigerant
Petite Fleur® w:	water cooled, natural refrigerant
Circulation pump:	
Max. delivery	33L/min
Max. delivery pressure	0.9bar
Net weight:	45kg
Power supply:	230V 1~ 50Hz
Protection class:	IP20
Min./max. ambient temperature:	5°C/40°C

Type	Working Temp. range max. °C	Cooling capacity kW at 200/20/0/-20/-40°C	Dimensions (W x D x H) mm	PK	Cat. No.
Petite Fleur®	-40 ... +200	0.48/0.48/0.45/0.27/0.04	260 x 450 x 504	1	**9.859 170**
Petite Fleur® w	-40 ... +200	0.48/0.48/0.45/0.27/0.04	260 x 450 x 504	1	**9.859 171**
Petite Fleur® eo*	-40 ... +200	0.48/0.48/0.45/0.27/0.04	260 x 450 x 504	1	**6.258 888**

*for external open applications

2 Dynamic Temperature Control Systems Unistat®

2



Huber

The dynamic thermoregulation of the Unistat line introduced a revolution in fluid temperature control. Unistats are the ideal solution for fast and highly exact thermal control of external applications, e.g. reactors, autoclaves, miniplants, pilot systems, reaction calorimeters or distillation systems. In comparison to classical circulators Unistats are convincing in their unique thermodynamics for highly exact and reproducible results. The Unistat technology thereby guarantees to always have the shortest heating and cooling times as well as a large temperature range without bothersome fluid changes. There are over 60 models to choose from with cooling powers from 0.7kW to 130kW. What ever the application, Unistats provide professional scale-up offering the same stable process conditions from the development lab to production systems. Unistat temperature control systems make use of a professional range of functions for all requirements. The facilities encompass a colour touchscreen display, with comfortable menu guidance and a real-time graphics display of temperature progress, as well as an intelligent cascade temperature control and high performance speed controlled circulation pump. This is rounded off with a programmer, a ramp function, calendar start, customisable user menus, sensor calibration as well as analogue and digital interfaces.

Advantages and Functions:
- Working temperatures from -120°C to +425°C
- Previously unachievable performance
- Highly acurate, intelligent temperature control
- Maximum process stability and reproducability
- The fastest heating and cooling rates
- High Cooling Power from 0.7 to 130kW
- Large temperature range without fluid change
- Increased thermal fluid life
- Incredibly compact
- Brilliant 5.7" TFT-touchscreen with graphic display
- 2x USB (Host and Device), Ethernet and RS232 interface

Software upgrades for Huber Circulators - please see page 774.

1



1 Temperature control systems, Unistat® to -55°C

NEW!

Huber

Heating capacity

Unistat® tango®/ tango® wl/405/405w/410w:	1.5/3.0kW
Unistat® 425/425w:	2.0kW
Unistat® 430/430w:	4.0kW
Unistat® 510/510w:	6.0kW

Type	Working Temp. range °C	Pump max. L/min / bar	Cooling capacity kW at 250/200/100/0/-20/-40°C	PK	Cat. No.
Unistat® tango®	-45 ... +250	55 / 0.9*	0.7 / 0.7 / 0.7 / 0.7 / 0.4 / 0.06	1	**9.859 101**
Unistat® tango® wl	-45 ... +250	55 / 0.9*	0.7 / 0.7 / 0.7 / 0.7 / 0.4 / 0.06	1	**9.859 102**
Unistat® 405	-45 ... +250	55 / 0.9*	1.0 / 1.0 / 1.0 / 1.0 / 0.6 / 0.15	1	**9.859 108**
Unistat® 405w	-45 ... +250	55 / 0.9*	1.3 / 1.3 / 1.3 / 1.3 / 0.7 / 0.15	1	**9.859 107**
Unistat® 410w	-45 ... +250	55 / 0.9*	1.7 / 2.5 / 2.5 / 1.5 / 0.8 / 0.2	1	**9.859 126**
Unistat® 425	-40 ... +250	105 / 1.5**	2.0 / 2.0 / 2.0 / 2.5 / 1.8 / 0.2	1	**9.859 116**
Unistat® 425w	-40 ... +250	105 / 1.5**	2.8 / 2.8 / 2.8 / 2.5 / 1.9 / 0.2	1	**9.859 117**
Unistat® 430	-40 ... +250	90 / 1.7**	3.5 / 3.5 / 3.5 / 3.5 / 2.2 / 0.3	1	**9.859 118**
Unistat® 430w	-40 ... +250	90 / 1.7**	3.5 / 3.5 / 3.5 / 3.5 / 2.2 / 0.3	1	**9.859 119**
Unistat® 510	-50 ... +250	105 / 1.5**	5.3 / 5.3 / 5.3 / 5.3 / 2.8 / 0.9	1	**9.857 299**
Unistat® 510w	-50 ... +250	105 / 1.5**	5.3 / 5.3 / 5.3 / 5.3 / 2.8 / 0.9	1	**9.859 120**

*Integrated pressure control VPC
**VPC pressure control via optional bypass

2 Temperature control systems, Unistat® to -85°C

NEW!

Huber

Heating capacity

Unistat® 705/705w:	1.5/3.0kW
Unistat® 815/815w:	2.0kW
Safety class:	FL, III
Supply requirements:	230/400V 50Hz (705/705w)
	400V 50Hz (815/815w)
Dimensions (WxDxH)	
Unistat® 705/705w:	425 x 400 x 720mm
Unistat® 815/815w:	460 x 604 x 1465mm

Type	Working Temp. range °C	Pump max. L/min / bar	Cooling capacity kW at 250/200/100°C	Cooling capacity kW at 0/-20/-40/-60/-80°C	PK	Cat. No.
Unistat® 705	-75 ... +250	55 / 0.9	0.6 / 0.6 / 0.6	0.65 / 0.6 / 0.6 / 0.3 / --	1	**9.859 105**
Unistat® 705w	-75 ... +250	55 / 0.9	0.6 / 0.6 / 0.6	0.65 / 0.6 / 0.6 / 0.3 / --	1	**9.859 106**
Unistat® 815	-85 ... +250	40 / 0.9	1.3 / 1.3 / 1.3	1.5 / 1.5 / 1.4 / 1.2 / 0.2	1	**9.859 121**
Unistat® 815w	-85 ... +250	40 / 0.9	1.5 / 1.5 / 1.5	1.5 / 1.5 / 1.4 / 1.2 / 0.2	1	**9.859 122**

Integraded VPC pressure control.

2



1 High temperature circulators Unistat® up to 425°C

NEW!

Huber

Safety class: FL, III



Type	Temp. range	Heating capacity	Dimensions (W x D x H)	Supply req., 50 Hz	Cooling capacity kW at 400/300/200/100°C	PK	Cat. No.
	max. °C	kW	mm	V			
Unistat® TR401	+50 ... +400	3.0/9.0	288 x 379 x 890	230/400	-- / -- / -- / --	1	**6.258 173**
Unistat® TR401w HT	+50 ... +400	3.0/9.0	288 x 379 x 890	230/400	10.0 / 10.0 / 10.0 / 10.0	1	**9.857 315**
Unistat® TR402	+80 ... +425	3.0/9.0	288 x 332 x 870	230/400	-- / -- / -- / --	1	**9.859 125**
Unistat® T305	+65 ... +300	3.0/6.0	425 x 250 x 635	230/400	-- / -- / -- / --	1	**9.859 109**
Unistat® T305 HT	+65 ... +300*	3.0/6.0	425 x 250 x 635	230/400	--/ 3.2 / 2.3 / 0.6	1	**9.859 110**
Unistat® T305w HT	+65 ... +300	3.0/6.0	425 x 250 x 635	230/400	-- / 10.0 / 10.0 / 10.0	1	**9.859 111**
Unistat® T320w HT	+65 ... +300	12.0	460 x 554 x 1332	400	-- / 10.0 / 10.0 / 6.0	1	**9.859 113**
Unistat® T330w HT	+65 ... +300	24.0	460 x 554 x 1332	400	-- / 10.0 / 10.0 / 6.0	1	**9.859 115**
Unistat® T340w HT	+65 ... +300	48.0	600 x 704 x 1517	400	-- / 10.0 / 10.0 / 6.0	1	**9.859 124**
Unistat® T402	+80 ... +425	3.0/6.0	505 x 400 x 765	230/400	-- / -- / -- / --	1	**9.857 316**

* Lowest working temperature 15K above ambient temperature.

Highly Dynamic Temperature Control Systems Presto A30/A40/W40

JULABO

The models of JULABO's new Presto generation set new standards for highly dynamic temperature control systems. They represent the optimal solution for highly precise external temperature control applications. The instruments feature extremely short heat-up and cool-down times, wide working temperature ranges and maximum performance with minimum dimensions. All models have an interactive touch screen for easy, menu-guided operation. The pump pressure is adjustable and displayed on the screen. Analog and a number of digital interfaces permit laboratory automation. Typical applications are temperature control of jacketed reactor vessels, reactor systems, autoclaves, distillations, pilot plants, semiconductor industries.

The advantages of PRESTO models:
- Extremely short heat-up and cool-down times
- Powerful circulating pump with adjustable pump pressure
- Wide working temperature ranges without change of thermal fluid
- Large TFT touch screen for interactive operation
- Digital and analog interfaces
- Handles and castors allow for easy set-up
- Low filling volume
- Small dimensions

Specifications

Temperature stability: ±0.01...0.05°C
Pump capacity
Flow rate:
A30 25L/min
A40/W40/A80/W80 16-40L/min
Pressure:
A30 0.5bar
A40/W40/A80/W80 0.3 to 1.7bar

Type	Working Temp. range	Cooling capacity kW at 20 °C	Heating capacity, kW	Dimensions (W x D x H)	PK	Cat. No.
	°C			mm		
A 30	-30 ... + 250	0,5	2.7	242 x 583 x 612	1	**9.857 915**
A 40	-40 ... + 250	1,2	2.7	323 x 583 x 662	1	**9.857 916** 2
W 40	-40 ... + 250	1,2	2.7	323 x 583 x 662	1	**9.857 917** 3
A 80	-80 ... + 250	1,2	1.8	430 x 650 1258	1	**9.857 918**
W 80	-80 ... + 250	1,2	1.8	430 x 650 1258	1	**9.857 919**

2



9.857 916

3



9.857 917

Remote control Wireless TEMP - please see page 777.

High Temperature Circulators

Forte HT30-M1 and Forte HT60-M2 *JULABO*

Julabo High Temperature Circulators have a compact, closed design and are ideally suited for wide working temperature ranges.
- rapid heating
- high pump capacity, reducible via adapter
- small footprint
- minimal filling volume
- cooling water connections for applications at particularly high temperatures (cooling zone in unit)
- wide working temperature range without changing bath fluids
- avoids oxidation and cracking of the bath fluid. This ensures a prolonged lifetime of the bath fluids recommended by Julabo
- can be easily integrated into a miniplant installation
- time-saving filling process for the entire system with permanent air purge

Forte HT30-M1 and Forte HT60-M2 with C.U. cooling unit

Using the optional C.U. cooling unit, the working temperature range can be further extended downwards. Additionally a high cooling capacity is available if constant tap water cooling is carried out.

- temperature applications from +40°C with controlled tap water cooling
- rapid cooling to low temperature values
- dynamic control characteristics: Automatic control of exothermic reactions in the connected system

Type	Working Temp. range °C	Temp. stability ± °C	Heating capacity, kW	Pump max. L/min / bar	PK	Cat. No.	
Forte HT30-M1	+70 to +400	±0.01 to ± 0.1	3	14-18 / 0.8-1.2	1	**9.858 400**	1
Forte HT60-M2	+70 to +400	±0.01 to ± 0.1	7	14-18 / 0.8-1.2	1	**6.300 656**	2
Forte HT30-M1-C.U.	+40 to +400	±0.01 to ± 0.1	3	14-18 / 0.8-1.2	1	**6.222 575**	3
Forte HT60-M2-C.U.	+40 to +400	±0.01 to ± 0.1	7	14-18 / 0.8-1.2	1	**9.858 404**	4

1



9.858 400

2



6.300 656

3



6.222 575

4



9.858 404

5



5 Beakers, glass, jacketed, type T

DURAN®. For heating and cooling liquids. Thermostatting liquid is circulating between the double walls of the beaker jacket. With glass olives (O.D. 12mm) for thermostat hoses. Coolant ram pressure: 0.5bar at maximum, operating temperature: +300°C at maximum. Special sizes available on request. *KGW*

Capacity ml	Int. diam. mm	Ext. diam. mm	Int. height mm	PK	Cat. No.
250	55	70	115	1	**9.032 371**
600	77	95	135	1	**9.032 373**
2000	112	135	200	1	**9.032 376**

6



6 Beakers, glass, jacketed wiht PTFE-Olive, type T-GL

DURAN®. For heating and cooling liquids. Thermostatting liquid is circulating between the double walls of the beaker jacket. With glass-screw connections GL14 with PTFE olives (O.D. 9mm, T-GL2000 with GL18 and O.D. 10mm) for thermostat hoses. Coolant ram pressure: 0.5bar at maximum, operating temperature: +120°C at maximum. Special sizes available on request. *KGW*

Capacity ml	Neck thread GL	Int. diam. mm	Ext. diam. mm	Int. height mm	PK	Cat. No.
250	14	55	70	115	1	**9.032 372**
600	14	77	95	135	1	**9.032 374**
2000	18	112	135	200	1	**9.032 377**

E & OE.

1 Water bath protection agent for water baths and shaking water baths

ProAquaTop prevents the formation of algae, bacteria, and mould. Biodegradable. Only 1ml per litre of water required. Replacement of the bath water is indicated by fading of the blue colouration. *GFL*

Type	Volume ml	PK	Cat. No.
1910	200	1	**9.905 957**
1911	3 x 200	3	**9.905 958**
1912	6 x 200	6	**9.905 959**



2 Water bath preservative liquid Aqua Stabil

- Prevents build-up of algae and bacteria in bath tanks providing hygienic operation *JULABO*
- No contamination of the tank or immersion thermostat components
- Economical - only 2 ml of Aqua Stabil is required for every 1 litres of water
- Remains effective for weeks, as shown by colour indicator.

Capacity ml	PK	Cat. No.
100 ml bottle	1	**9.858 040**



3 Hoses, metal

Insulated hoses of metal ensure the highest operational safety of your temperature control circuit. The high quality hoses offer the best heat transfer with optimum flow characteristics, hence reducing the power loss in external temperature control applications. The hoses are firmly screwed to the temperature control machine and the external application. *Huber*

Type	Ext. diam. mm	Temp.-working range °C	Length cm	PK	Cat. No.
NW 12 M16 x 1	33	-50 to 200	100	1	**9.857 214**
NW 12 M16 x 1	33	-50 to 200	150	1	**9.857 215**
NW 12 M16 x 1	33	-50 to 200	200	1	**9.857 216**
NW 12 M16 x 1	33	-50 to 200	300	1	**9.857 217**
NW 12 M16 x 1	44	-100 to 350	100	1	**9.857 121**
NW 12 M16 x 1	44	-100 to 350	150	1	**9.857 122**
NW 12 M16 x 1	44	-100 to 350	200	1	**9.857 045**
NW 12 M16 x 1	44	-100 to 350	300	1	**9.857 124**
NW 12 M24 x 1.5	44	-100 to 350	100	1	**9.857 218**
NW 12 M24 x 1.5	44	-100 to 350	150	1	**6.229 781**
NW 12 M24 x 1.5	44	-100 to 350	200	1	**9.857 219**
NW 12 M24 x 1.5	44	-100 to 350	300	1	**9.857 220**
NW 12 M24 x 1.5	56	-120 to 400	100	1	**9.857 046**
NW 12 M24 x 1.5	56	-120 to 400	150	1	**9.857 047**
NW 12 M24 x 1.5	56	-120 to 400	200	1	**9.857 048**
NW 12 M24 x 1.5	56	-120 to 400	300	1	**9.857 049**
NW 20 M30 x 1.5	56	-100 to 350	100	1	**9.857 125**
NW 20 M30 x 1.5	56	-100 to 350	150	1	**9.857 126**
NW 20 M30 x 1.5	56	-100 to 350	200	1	**9.857 127**
NW 20 M30 x 1.5	56	-100 to 350	300	1	**9.857 128**
NW 25 M38 x 1.5	63	-100 to 350	100	1	**9.857 129**
NW 25 M38 x 1.5	63	-100 to 350	150	1	**9.857 130**
NW 25 M38 x 1.5	63	-100 to 350	200	1	**9.857 131**
NW 25 M38 x 1.5	63	-100 to 350	300	1	**9.857 132**



1



1 Thread adapters

Huber

Type	PK	Cat. No.
M16x1 male - M16x1 male	1	**9.857 176**
M16x1 female - M16x1 female	1	**9.857 177**
M16x1 male - G½ male	1	**9.857 178**
M16x1 male - G½ female	1	**9.857 179**
M16x1 female - R½ male	1	**9.857 180**
M16x1 female - G½ female	1	**9.857 181**
M16x1 male - G¾ female	1	**9.857 182**
M16x1 female - G¾ female	1	**9.857 183**
M16x1 female - M30x1.5 male	1	**9.857 184**
M16x1 male - M30x1.5 male	1	**9.857 185**
M16x1 male - M30x1.5 female	1	**9.857 186**
M24x1.5 female - M16x1 male	1	**6.227 404**
M24x1.5 female - ¾ NPT female	1	**9.857 209**
M24x1.5 male - M16x1 female	1	**9.857 210**
M24x1.5 male - R½ female	1	**9.857 211**
M24x1.5 female - R½ male	1	**9.857 212**
M24x1.5 male - M24x1.5 male	1	**9.857 213**
M30x1.5 male - M30x1.5 male	1	**9.857 187**
M30x1.5 female - G3/8 male	1	**9.857 188**
M30x1.5 male - G½ male	1	**9.857 189**
M30x1.5 male - R½ female	1	**9.857 190**
M30x1.5 female - G½ male	1	**9.857 191**
M30x1.5 female - G½ female	1	**9.857 192**
M30x1.5 male - G¾ male	1	**9.857 193**
M30x1.5 male - R¾ female	1	**9.857 194**
M30x1.5 female - ¾ NPT male	1	**9.857 208**
M30x1.5 female - G¾ female	1	**9.857 195**
M30x1.5 male - G1 male	1	**9.857 196**
M30x1.5 female - G1 female	1	**9.857 197**
M30x1.5 male - M38x1.5 female	1	**9.857 201**
R½ female - R½ female	1	**9.857 198**
R½ female - ¾ NTP female	1	**9.857 199**
M38x1.5 female - 1 NPT male	1	**9.857 200**
M38x1.5 female - R¾ male	1	**9.857 202**

Further thread adapters available on request

2



2 Accessories M16x1

Huber

Accessories	PK	Cat. No.
Hose connector NW 8	1	**9.857 145**
Hose connector NW 12	1	**9.857 146**
Blank Plug	1	**9.857 147**
Nut	1	**9.857 148**
Micro hose connector NW 3.2	1	**9.857 149**
Connector 90°	1	**9.857 150**
Ball valve*	1	**9.857 151**
2-way Header	1	**9.857 152**
3-way Header	1	**9.857 153**
4-way Header	1	**9.857 154**
5-way Header	1	**9.857 206**
2-way Valve System*	1	**9.857 155**
3-way Valve System*	1	**9.857 156**
4-way Valve System*	1	**9.857 157**
5-way Valve System*	1	**9.857 207**

*Temperature range: -20 to +140°C (max. 6 bar at +140°C)

E & OE.

1 Thermal fluids

Huber thermal fluids are recommended because they have the best possible thermodynamic and environmental characteristics. Safe reliable operation relies on compliance with safety standards to ensure optimal results.

Huber



Description	Type	Capacity litres	Temp. range °C	PK	Cat. No.
Thermal fluid MinOil	P20.190.40	5	+20 to +190	1	**6.201 643**
Thermal fluid MinOil	P20.190.40	20	+20 to +190	1	**6.239 618**
Thermal fluid SilOil	P20.275.50	5	+20 to +275	1	**6.201 670**
Thermal fluid SilOil	P20.275.50	10	+20 to +275	1	**6.203 535**
Thermal fluid SilOil	M20.195/235.20	5	-20 to +195/235	1	**6.306 078**
Thermal fluid SilOil	M20.195/235.20	10	-20 to +195/235	1	**6.250 420**
Thermal fluid SilOil	M40.165.10	5	-40 to +165	1	**6.250 278**
Thermal fluid SilOil	M40.165.10	10	-40 to +165	1	**6.304 378**
Thermal fluid SilOil	M60.115.05	5	-60 to +115	1	**6.201 255**
Thermal fluid SilOil	M60.115.05	10	-60 to +115	1	**6.225 263**
Thermal fluid SilOil	M90.055.03	5	-90 to +55	1	**7.615 661**
Thermal fluid SilOil	M90.055.03	10	-90 to +55	1	**6.202 172**

Further thermal fluids available on request

2 Thermal fluid DW-Therm

DW-Therm is a mixture of isometric triethoxysilanes and has been developed for hydraulically sealed systems.

Huber



- temperature range from -90°C to +200°C (hydraulically sealed systems)
- excellent stability at high temperatures
- low viscosity at low temperatures
- low volatility and pleasant odour
- easy handling (no creeping like silicone oils)
- good compatibility with silicone oils
- insoluble in water and environmentally friendly
- not classified as dangerous goods, no known toxicity

Specifications

Appearance and odour:	transparent, colourless or yellow liquid with characteristic odour
Silane content:	99%
Viscosity:	2.0 - 2.2 mm² /sec at 20°C
Density:	0.88g/cm³ at 15°C
Boiling range	228 - 235°C
Solidification at:	-137°C
Flash point:	101°C
Ignition temperature:	265°C
Usage:	closed systems

Description	Type	Capacity Litres	Temp. range °C	PK	Cat. No.
Thermal fluid DW-Therm	M90.200.02	10	-90 to +200°C	1	**6.201 320**

Thermal fluid DW-Therm HT

DW-Therm HT is a mixture of partially hydrogenated terphenyls. It is for use exclusively in high temperature Unistats.

Huber



- temperature range from +20°C to +340°C (hydraulically sealed systems)
- long lifetime at high temperatures under inert atmosphere: 3-4 years
- good thermal properties for heat transfer
- high thermal oxidation stability
- nontoxic

Specifications

Appearance:	clear, orange coloured liquid
Silane content:	99.5% partially hydrogenated terphenyls
Viscosity:	32 mm²/sec at 25°C
Density:	1.004 g/cm³ at 20°C
Initial boiling point:	approx. 350°C
Solidification point:	-33°C
Flash point:	approx. 190°C
Ignition temperature:	approx. 390°C
Usage:	closed systems

Description	Type	Capacity Litres	Temp. range °C	PK	Cat. No.
Thermal fluid DW-Therm HT	P20.340.32	5	+20 ... +340	1	**6.204 286**
Thermal fluid DW-Therm HT	P20.340.32	10	+20 ... +340	1	**6.222 503**

1 Unstirred waterbaths, JB Aqua Plus series, analogue

Grant

Analogue unstirred water baths JB Aqua Plus range. Quality meets value-for-money! The JB Aqua Plus range offers the simplicity of an analogue bath, with the quality and reliability expected in a Grant water bath. Blue transparent polycarbonate lid and polycarbonate base tray are included as standard to improve performance and limit water loss due to evaporation and energy wastage. The range consists of seven models including shallow and dual bath options.

- Drain tap available on JB Aqua 12 Plus, 18 Plus and 26 Plus
- Ambient +5°C to 98°C
- Stability: ±1.0°C
- Simple dial temperature setting
- User-settable sample protection and fixed thermal cut-out
- Polycarbonate lid and base tray - improve performance and reduce evaporation/energy loss
- Available as 120V or 230V.

Type	Volume litres	Rating kW	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	PK	Cat. No.
JB Aqua 2 Plus	2	0.13	190 x 200 x 215	140 x 115 x 125	1	**9.905 840**
JB Aqua 2s Plus	2	0.37	335 x 210 x 150	290 x 30 x 145	1	**9.905 841**
JB Aqua 5 Plus	5	0.37	335 x 215 x 270	290 x 115 x 145	1	**9.905 842**
JB Aqua 12 Plus	12	0.77	335 x 390 x 270	290 x 115 x 315	1	**9.905 843**
JB Aqua 18 Plus	18	1.50	335 x 570 x 270	290 x 115 x 495	1	**9.905 844**
JB Aqua 26 Plus	26	1.50	335 x 570 x 270	290 x 165 x 495	1	**9.905 845**
JB Aqua Dual Plus	5 & 12	1.20	540 x 360 x 225	290 x 115 x 315 & 290 x 115 x 145	1	**9.905 846**

Accessories available on request

2



2 Unstirred water baths SUB Aqua Plus series, digital

Grant

High quality and excellent temperature stability, in a value-for-money package designed to meet the needs of the world`s researchers. The SUB Aqua Plus range is composed of eight models, including shallow and dual baths.

- Three programmable temperature presets
- Drain tap on SUB Aqua 12 Plus,18 Plus, 26 Plus and 34 Plus
- Front panel lock-out
- Countdown timer with audible buzzer
- Ambient +5°C to 99°C operation
- Stability ±0.2°C
- Digital PID control for quick heat-up and precision control throughout the temperature range
- User-settable sample protection and fixed thermal cut-out
- High grade stainless steel tanks
- Grant non-drip polycarbonate lid and tray included as standard
- Wide range of tanks sizes and accessory options to suit different requirements

Available as 120V or 230V.

Type	Volume litres	Rating kW	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	PK	Cat. No.
SUB Aqua 2 Plus	2	0.13	190 x 200 x 215	140 x 115 x 125	1	**9.905 830**
SUB Aqua 2s Plus	2	0.37	335 x 210 x 150	290 x 30 x 145	1	**9.905 831**
SUB Aqua 5 Plus	5	0.37	335 x 215 x 270	290 x 115 x 145	1	**9.905 832**
SUB Aqua 12 Plus	12	0.77	335 x 390 x 270	290 x 115 x 315	1	**9.905 833**
SUB Aqua 18 Plus	18	1.50	335 x 570 x 270	290 x 115 x 495	1	**9.905 834**
SUB Aqua 26 Plus	26	1.50	335 x 570 x 270	290 x 165 x 495	1	**9.905 835**
SUB Aqua 34 Plus	34	2.10	340 x 750 x 270	290 x 160 x 630	1	**9.905 836**
SUB Aqua Dual Plus	5 & 12	1.20	540 x 360 x 225	290 x 115 x 145 & 290 x 115 x 315	1	**9.905 837**

E & OE.

1 Water bath/Tissue Float Bath 1052



Special bath to stretch and dry cut tissue samples embedded in wax, in histological, chemical, clinical and bacteriological laboratories. Temperature range from approx. 5°C above ambient to approx. +80°C. Precise temperature regulation, consistently ±0.5°C, ensures evenly stretched cuttings which are clearly visible in the black anodized bath. The cuttings are carefully dried on the warmed rim of the bath which is also black anodized. Comfortable and safe working due to low bath height of 100mm.
Bath interior made of black anodised aluminium. Housing in powder-coated aluminium. A control thermometer is fixed to rim of the bath within a stainless steel holder. Tested according to the German Equipment Safety Law, with CE mark. *GFL*

Specification

Temperature range:	up to +80°C
Interior dimensions (Dia. x H):	200 x 60mm
Exterior dimensions (Dia. x H):	280 x 100mm
Supply requirement:	230V 50/60Hz, 0.3 kW (alternative voltages are available - details on request)
Weight:	2kg

Type	PK	Cat. No.
Tissue Float Bath 1052	1	**9.905 952**
Black anodised aluminium dust cover, 1950	1	**9.905 951**

2 Incubation/Inactivation Water Baths



Water Baths for incubations and inactivations of cultures *GFL*

Models 1002/1005/1008/1012/1013

Microprocessor controlled temperature regulation. Temperature display and setting digitally via LED display in 0.1°C increments. Temperature constancy ±0.1°C, temporal.

Temperature range from approx. 5°C above ambient temperature to 99.9°C; after installation of a water level regulator 1919 (accessory) from approx. 3°C above tap water temperature to 99.9°C.

Short heating-up times. Electronic overtemperature cut-out, 4°C above set temperature and electromechanical >130°C. Electronic monitoring of the temperature regulator. In case of failure the cause of the fault is shown on the display. Soft touch keys with clear symbols. Interior (bath interior and heating element, cover frame, lid and perforated floor) made of stainless steel. Standard equipment includes lid and perforated floor*.
Tip-up, insulating lid with inner camber, no dripping back of condensate into the vessels. Corrosion-resistant outer housing is made of electrolytically galvanized sheet steel, powder-coated. Drain cock at the back. The units are tested according to the German Equipment Safety Law and have the CE mark. Electrical connection: 230 volt/50...60 Hz (other voltages available on request).

Model 1005

Especially suitable for warming medical hot packs. *Water bath 1005 is supplied without perforated floor if the rack for hot packs 1923 (accessory) is ordered.

Models 1012/1013

The circulation system ensures an optimal temperature uniformity throughout the whole bath. An electric motor with rotary magnet is flanged to the bath floor. Its torque is transmitted to a PTFE coated stirring magnet in the bath. The stirring magnet forces the water into the centre of the bath and then evenly back again.

Type	Capacity Litres	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	Power W	PK	Cat. No.
1002	7	330 x 395 x 255	245 x 200 x 145	1000	1	**9.905 902**
1003	14	485 x 440 x 255	400 x 245 x 145	1500	1	**9.905 903**
1004	21	685 x 440 x 255	600 x 245 x 145	1500	1	**9.905 904**
1005	40	495 x 490 x 445	410 x 296 x 315	1500	1	**9.905 905**
1008	20	485 x 440 x 325	400 x 245 x 205	1500	1	**9.905 908**
1012	7	330 x 395 x 325	245 x 200 x 145	1000	1	**9.905 912**
1013	14	485 x 440 x 325	400 x 245 x 145	1500	1	**9.905 913**

Table of racks held by water baths 1002-1013

GFL

	Max. number of rack types held				
Bath model	**Rack 1920**	**Rack 1921**	**Rack 1922**	**Rack 1923**	**Rack 1942**
1002	4	4	4	-	1
1003/1008	8	8	8	-	2
1004	12	12	12	-	3
1005	9	9	9	1	2
1012	4	4	4	-	1
1013	8	8	8	-	2



9.905 970



9.905 971



9.905 972

Stainless steel. 1920/1921/1922. Max height: 185mm.

Type	Description	PK	Cat. No.
1920	With 20 apertures, each 18 mm diameter for 16/17 mm test tubes	1	**9.905 970** 1
1921	With 5 apertures, each 31 mm diameter for test tubes	1	**9.905 971** 2
1922	With 20 apertures each 13 mm diameter for 12 mm test tubes	1	**9.905 972** 3
1923	For water bath 1005, especially for warming medical hot packs (no pict.)	1	**9.905 973**
1942	With 12 apertures 56 mm diameter for baby milk bottles (no pict.)	1	**9.905 977**



4 Steam Bath 1023

GFL

For gentle steaming work using Erlenmeyer flasks, bottles, etc. Bath, cover frame and perforated floor above the heating element are made of stainless steel.
Temperature range from approx. 5°C above ambient to boiling point, with temperature control by thermostat. Heating element protected by overtemperature cut-out. The adjustable water level regulator at the back of the unit and the set of rings are supplied as standard.
With removable, square cover (W 265mm x L 265mm) accommodating a 9-part set of rings, in heat-resistant plastic, which can be split. The aperture diameter can be adjusted in approx. 20mm steps (min. 32.5/max. 173.5mm). The bath housing is made of powder coated, electrolytically galvanized sheet steel. Mains supply 230V 50/60 Hz, 1.0kW (Other voltages available on request).
The unit is tested according to the German Equipment Safety Law and has the CE mark.

Type	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Capacity Litres	Power W	Weight kg	PK	Cat. No.
1023	240 x 240 x 120	342 x 400 x 180	7	1000	9	1	**9.905 923**

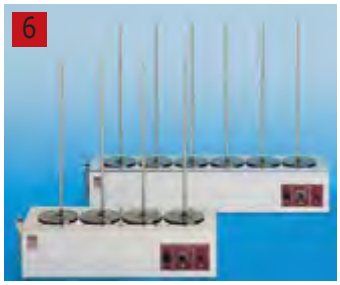


5 Water Baths for Fume Hoods 1031 and 1032

GFL

Special baths for gentle steaming work with Erlenmeyer flasks, bottles, etc., also suitable for use in fume hoods. Bath, removable recessed lid with holes and perforated floor above the heating element made of stainless steel.
Temperature range from approx. 5°C above ambient to boiling point, with thermostatic temperature controller. Heating element protected by over-temperature cut-out. The apertures in the lid are covered by sets of rings in heat-resistant plastic. The adjustable water level regulator at the right-hand side of the unit is included. The units are tested according to the German Equipment Safety Law and have the CE mark. Electrical connection: 230V/50/60Hz (other voltages on request).

Type	Apertures with sets of rings	Top diam. mm	External dimensions (W x D x H) mm	Power W	Working height mm	Weight kg	PK	Cat. No.
1031	6	91	430 x 300 x 155	1500	100	6.1	1	**9.905 931**
1032	8	111	670 x 300 x 155	1500	100	8.2	1	**9.905 932**



6 Multiple Water Baths 1041 and 1042

GFL

For gentle steaming work with Erlenmeyer flasks, bottles, etc. Bath interior, frame with apertures and perforated floor above the heating element made of stainless steel.
Temperature range from approx. 5°C above ambient to boiling point, with thermostatic temperature control. Heating element protected by overtemperature cut-out. The 131mm dia. apertures in the frame are covered by sets of rings in heat resistant plastic. With stainless steel support rod, 600mm x 12mm L x diameter behind each opening, for securing vessels. A water level regulator is included on the left-hand side of the bath. Working height 90mm. The units are tested according to the German Equipment Safety Law and have the CE mark.
Electrical connection: 230 Volt/50/60Hz (other voltages available on request).

Type	Apertures with sets of rings	Top diam. mm	External dimensions (W x D x H) mm	Power W	Working height mm	Weight kg	PK	Cat. No.
1041	4	131	682 x 232 x 190	1000	90	12.0	1	**9.905 941**
1042	6	131	982 x 232 x 190	1500	90	16.0	1	**9.905 942**

Water baths WNB/WNE

Memmert

A combination of high-grade, anti-corrosion stainless steel and state-of-the-art technology. Two performance classes available: "Basic" and "Excellent", tuned to varying requirements and applications.
Basic: the water bath for routine processes, with integral timer adjustable from 1min. up to 99.59 hrs, and with delayed switch-on and programmable hold time.
Excellent: with enhanced features for overtemperature protection, liquid level monitoring and continuous, long-term tests using two high-grade Pt100 sensors. The integral timer range is from 1 min. up to 999 hrs and allows a setpoint-dependent hold time to be programmed, in addition to all the Basic-level features. Audible alarms for overtemperature, low liquid level and programme end make operation even more convernient.

Interior - Heating Concept:
- easy-to-clean, grade 1.4301 (ASTM 304), laser-welded, stainless steel interior, reinforced by deep drawn ribbing
- corrosion-proof, large-area heating surface on 3 sides of the tank

1 Water baths WNB

Memmert

Control:
- microprocessor PID-temperature controller with integral autodiagnostic system and fault indicator
- solid state switching unit
- one, class A, 4-wire Pt100 sensor
- integral digital timer from 1 min. to 99.59 hours for:

On continuous operation
Wait (delayed On for continuous and limited timed operation)
Hold
- digital display (LED) of set and actual temperature and of (remaining) programme time
- LEDs for indication of programme status

Overtemperature protection (dual):
- if an overtemperature condition occurs due to a fault, heating is switched off at approx. 10°C above the set temperature (fixed value)
- an independent, mechanical, TB class 1 temperature limiter switches the heating off at approx. 30°C above max. bath temperature

With textured, grade 1.4301 (ASTM 304), corrosion resistant, stainless steel housing.

Without covers - please order separately.

Specifications

Temperature range: from +30°C (however, at least 5°C above ambient temperature) up to +95°C with additional boiling mode (+100°C)
Power supply: 230V (±10%), 50/60Hz

Type	Capacity Litres	Internal dimensions (W x D x H) mm	Housing (W x D x H) mm	Weight kg	Rating W	PK	Cat. No.
WNB 7	7	240 x 210 x 140	468 x 356 x 238*	11	1200	1	**9.906 581**
WNB 10	10	350 x 210 x 140	578 x 356 x 238*	13	1200	1	**9.906 582**
WNB 14	14	350 x 290 x 140	578 x 436 x 238*	15	1800	1	**9.906 583**
WNB 22	22	350 x 290 x 220	578 x 436 x 296*	16	2000	1	**9.906 584**
WNB 29	29	590 x 350 x 140	818 x 516 x 238*	22	2400	1	**9.906 585**
WNB 45	45	590 x 350 x 220	818 x 516 x 296*	24	2800	1	**9.906 586**

* High with flat cover.

1



1 2 3 4 Water baths WNE

Memmert

Control:
- fuzzy-supported, PID microprocessor controller with integral autodiagnostic system and fault indication
- solid state switching unit
- 2 class A , 4-wire Pt100 sensors, mutually monitoring and controlling the performance at the same temperature value
- digital timer from 1 min to 999 hours for:

On (continuous operation)
Delayed On Hold, or set temperature-dependent Hold, with fixed dwell time
- digital display (LED) of all set parameters, such as temperature, time and alarm values
- calibration facility on controller
- with audible and visual alarms at programme end, as input keypress confirmation and if low liquid level occurs (heating is switched off automatically)

Triple Overtemperature Protection:
- in case of overtemperature due to a fault, the heating is switched off at approx. 10°C above the set temperature (fixed value)
- independent, protection class 3.1, TWW electronic overtemperature controller, or protection class 2, TWB overtemperature limiter, are adjustable in set-up menu by the user
- class 1, TB mechanical temperature limiter switches the heating off at approx. 30°C above max. bath temperature
- set value display resolution: 0.1°C below 99.9°C, 1°C above 100°C

Textured, grade 1.4301 (ASTM 304), corrosion resistant stainless steel housing

Without lids - please order separately.

Specifications:

Temperature range: from +30°C (however, at least 5°C above ambient) up to +95°C with additional boiling mode (+100°C)

Power supply: 230V (±10%), 50/60Hz

Type	Capacity Litres	Internal dimensions (W x D x H) mm	Housing (W x D x H) mm	Weight kg	Rating W	PK	Cat. No.
WNE 7	7	240 x 210 x 140	468 x 356 x 238*	11	1200	1	**9.906 591**
WNE 10	10	350 x 210 x 140	578 x 356 x 238*	13	1200	1	**9.906 592**
WNE 14	14	350 x 290 x 140	578 x 436 x 238*	15	1800	1	**9.906 593**
WNE 22	22	350 x 290 x 220	578 x 436 x 296*	16	2000	1	**9.906 594**
WNE 29	29	590 x 350 x 140	818 x 516 x 238*	22	2400	1	**9.906 595**
WNE 45	45	590 x 350 x 220	818 x 516 x 296*	24	2800	1	**9.906 596**

*High with flat cover.

1



2



3



4



E & OE.

1 Accessories for all Memmert Water baths and Oil baths

Stainless steel flat cover with openings and ring sets. Stainless steel gabled cover. *Memmert*

Shaking device:
Shaking device including support frame (for racks or support basket with perforated mounting shelf) for use in water baths, shaking speed 35-160 strokes per minute (horizontal back/forth movement) requires special gabled cover

Peltier Cooling Device CDP 115
For precise operation with temperatures starting from +10°C. The temperature is controlled via the electronic controller of the waterbath with a precision of ±0.1 K
Easy fitting to bath by snap-on-technology, suitable for all tank sizes.
Power supply: 230 V, 50/60 Hz
Effective cooling capacity: 115W
Pumping capacity of circulation pump for coolant: 600ml/min.

1



Type	For Volume l	Well format	Diam. mm	PK	Cat. No.
Flat cover for water baths / oil baths	7	1	147	1	**9.906 530**
Flat cover for water baths / oil baths	10	3	107	1	**9.906 531**
Flat cover for water baths / oil baths	14	6	87	1	**9.906 532**
Flat cover for water baths / oil baths	22	6	87	1	**9.906 533**
Flat cover for water baths / oil baths	29	8	107	1	**9.906 534**
Flat cover for water baths / oil baths	45	8	107	1	**9.906 537**
Gabled cover for water baths / oil bath	7			1	**9.906 550**
Gabled cover for water baths / oil bath	10			1	**9.906 551**
Gabled cover for water baths / oil bath	14			1	**9.906 552**
Gabled cover for water baths / oil bath	22			1	**9.906 553**
Gabled cover for water baths / oil bath	29			1	**9.906 554**
Gabled cover for water baths / oil bath	45			1	**9.906 555**
Special gabled cover for WNB/WNE 29/45	29/45			1	**6.228 924**
Special gabled cover for WNB/WNE 14/22	14/22			1	**6.306 619**
Special gabled cover for WNB/WNE 7 for Peltier cooling device	7			1	**9.906 561**
Special gabled cover for WNB/WNE 10 for Peltier cooling device	10			1	**9.906 562**
Stainless steel flat cover for WNB/WNE 7 for Peltier cooling device	7	1	147	1	**9.906 565**
Stainless steel flat cover for WNB/WNE 10 for Peltier cooling device	10	3	107	1	**9.906 566**
Stainless steel flat cover for WNB/WNE 14/22 for Peltier cooling device	14/22	6	87	1	**9.906 567**
Stainless steel flat cover for WNB/WNE 29/45 for Peltier cooling device	29/45	8	107	1	**9.906 568**
Factory calibration certificate at 37°C for WNE / WPE; at 160°C for ONE models				1	**9.867 696**
CDP Peltier Cooling Device				1	**9.906 651**
Constant level device for WNB / WNE / WPE				1	**9.906 650**
Shaking device	29/45			1	**6.228 923**
Shaking device	14/22			1	**7.075 941**

Accessories for shaking waterbath are available on request.

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

memmert Experts in Thermostatics

1



1 Water bath with circulation pump WPE 45

Memmert

Control:
- fuzzy-supported, PID microprocessor controller with integral autodiagnostic system and fault indication
- solid state switching unit
- 2 class A, 4-wire Pt100 sensors, mutually monitoring and controlling performance at the same temperature value
- digital timer from 1 min to 999 hours for:

On (continuous operation)
Delayed On Hold, or set temperature-dependent Hold, with fixed dwell time
- pump can be switched on and off
- pump is switched off at programme end
- digital display (LED) of all set parameters, such as temperature, time and alarm values
- Calibration facility on controller
- audible and visual alarms at programme end, as input keypress confirmation and if low liquid level occurs (heating is switched off automatically)

Triple Overtemperature Protection:
- in case of overtemperature due to fault the heating is switched off at approx. 10°C above the set temperature (fixed value)
- independent, class 3.1, TWW electronic overtemperature controller or class 2, TWB overtemperature limiter, are adjustable in set-up menu by the user
- mechanical class 1 TB temperature limiter switches the heating off at approx. 30°C above max. bath temperature
- set value display resolution: 0.1°C below 99.9°C, 1°C above 100°C

Textured, grade 1.4301 (ASTM 304), corrosion resistant, stainless steel housing

Without covers - please order separately.

Specifications:

Temperature range:	from +30°C (however, at least 15°C above ambient) up to +95°C
Power supply:	230V (±10%), 50Hz

Type	Capacity Litres	Internal dimensions (W x D x H) mm	Housing (W x D x H) mm	Weight kg	Rating W	PK	Cat. No.
WPE 45	45	590 x 350 x 220	818 x 516 x 296*	32	2800	1	**9.906 589**

*High with flat cover

2



2 Water bath protection agent for water baths and shaking water baths

GFL

ProAquaTop prevents the formation of algae, bacteria, and mould. Biodegradable. Only 1ml per litre of water required. Replacement of the bath water is indicated by fading of the blue colouration.

Type	Volume ml	PK	Cat. No.
1910	200	1	**9.905 957**
1911	3 x 200	3	**9.905 958**
1912	6 x 200	6	**9.905 959**

3



3 Water bath preservative liquid Aqua Stabil

JULABO

- Prevents build-up of algae and bacteria in bath tanks providing hygienic operation
- No contamination of the tank or immersion thermostat components
- Economical - only 2 ml of Aqua Stabil is required for every 1 litres of water
- Remains effective for weeks, as shown by colour indicator.

Capacity ml	PK	Cat. No.
100 ml bottle	1	**9.858 040**

E & OE.

1 Shaking water bath OLS 200

Grant



High quality, robust design with unique magnetically coupled shaking mechanism for maximum reliability, consistency and quiet operation.
- Precision digital temperature control
- 0° to 99°C operating range (Accessory cooling required for operation below ambient)
- Stability ±0.1°C
- Easy changeover from linear to orbital shaking
- Precise, electronic control of temperature and shaking speed with digital setting and LED display
- Stainless steel tank and shaking trolley
- Requires, but is not supplied with, accessory trays for operation

Linear motion:
Setting A: 18mm stroke length, 340 strokes/minute
Setting B: 28mm stroke length, 240 strokes/minute
Setting C: 36mm stroke length, 180 strokes/minute

Orbital motion:
Adjustable from 20 to 200rpm with a 9mm fixed radius.

Tank dimensions:	505 x 300 x 200mm
Overall dimensions:	555 x 325 x 300mm
Flask immersion min./max.:	0/90mm
Weight:	15kg
Supply requirements:	220-240V 50Hz

Type	PK	Cat. No.
OLS 200	1	**9.905 800**

2 Shaking water baths GLS Aqua Plus series

Grant



GLS Aqua Plus linear shaking baths offers Grant quality and design combined with the temperature stability and functions required in a linear shaking bath for the laboratory.
- Two programmable temperature and shaking presets
- Drain tap
- Front panel lock-out
- Countdown timer with audible buzzer
- Choice of 2 tank sizes 12L and 18L high grade steel, with durable polished finish
- Flask immersion min./max.: 0/60mm
- Digital PID control for quick heat-up and precision control throughout the temperature range
- Ambient +5°C to 99°C operation
- Stability ±0.1°C
- User-settable sample protection and fixed thermal cut-out
- Choice of three versatile trays. Tray is required, specify when ordering.

Type	Capacity L	Rating kW	External dimensions (W x D x H) mm	Dimensions Shaking trays (D x W) mm	PK	Cat. No.
GLS Aqua 12 Plus	5.0	0.80	335 x 390 x 270	235 x 240	1	**9.905 819**
GLS Aqua 18 Plus	8.0	1.50	335 x 570x 270	235 x 420	1	**7.900 380**

3 Shaking water bath, accessories

Grant



Stainless steel sloping lid for shaking water baths. For use at temperatures above 60°C and below room temperature.

Type	For	PK	Cat. No.
LS200	OLS200	1	**9.905 809**
LU14	GLS12	1	**9.905 771**
LU28	GLS18	1	**9.905 772**

1



1 Accessories for shaking water bath

Versatile stainless steel tray. Designed to accommodate a variety of vessels. Adjustable spring configuration for maximum flask capacity. *Grant*

Type	For	PK	Cat. No.
UT12	GLS12	1	**9.905 818**
UT18	GLS18	1	**7.900 400**
UT200	OLS200	1	**9.905 801**

2



2 Test tube tray for shaking water baths

Test tube tray for shaking water baths. Compatible with H1 test tube racks. *Grant*

Type	For	PK	Cat. No.
TT12	GLS12	1	**9.905 816**
TT18	GLS18	1	**9.905 817**
TT200	OLS200	1	**9.905 802**

Plain trays for shaking water baths

NEW!

Grant

Type	For	PK	Cat. No.
UTP12	GLS12	1	**6.256 763**
UTP18	GLS18	1	**6.255 637**
UTP	OLS200	1	**9.905 813**

3



3 Test tube racks for shaking water bath, H1 series

Type H1-series test tube racks. Stainless steel, 200 x 75mm. The OLS 200 holds up to 5 H1 racks, GLS12 holds up to 3 H1 racks and GLS18 holds up to 5 H1 racks. Choice of 7 variants to accommodate different tube diameters and microtubes. Used with test tube tray order no. 9.905 802. *Grant*

Type	For tubes	PK	Cat. No.
H1-10	48 x 10mm	1	**9.905 803**
H1-13	44 x 13mm	1	**9.905 804**
H1-16	24 x 16mm	1	**9.905 805**
H1-19	21 x 19mm	1	**9.905 806**
H1-25	12 x 25mm	1	**9.905 807**
H1-30	10 x 30mm	1	**9.905 808**
H1-LE	48 x 1.5ml	1	**9.905 815**

4



4 Shaking water bath OLS200, accessories

Type CW200 heat exchange coil. For use with mains tap water or refrigerated circulator. It can be used down to 2°C above the temperature of the coolant . Fits underneath the shaking tray. *Grant*

Type	For	PK	Cat. No.
CW200	OLS200	1	**9.905 811**

5



5 Immersion cooler, CS200G

CS200G immersion cooler. The coil fits underneath the shaking tray. Cooling rate will depend on the ambient temperature, the supply voltage and the volume of liquid used. Fits underneath the shaking tray and is designed to be attached to a supply of cooling tap water or a refrigerated circulator. Can be used down to 2°C above the temperature of the coolant. Coil diameter/l mm 260/470/20. For 120V or 230V supply. *Grant*

Type	PK	Cat. No.
CS200G	1	**9.905 812**

E & OE.

1 Shaking Water Bath 1083



With Reciprocating Motion. *GFL*
Universally applicable for shaking tasks that require exactly reproducible temperatures.
For gentle mixing or vigorous shaking. Microprocessor controlled temperature regulation. Temperature display and setting via LED display in 0.1°C increments. Temperature range approx. 5°C above ambient to +99.9°C, alternatively after installation of water level regulator 1919 (accessory) approx. 3°C
above tap water temperature to +99.9°C.
Optimum temperature distribution throughout the whole bath interior.
Overtemperature cut-out: electronic, 4°C above set temperature, and electro-mechanical >130°C. Electronic monitoring of the temperature controller. Maintenance-free and durable shaking device, electronically controlled and continuously adjustable from 10 to 250rpm, with soft-start. Constant shaking frequency, independent of load, even when in continuous operation. All parts in contact with water made of stainless steel. No dripping back of condensate into the vessels due to double-walled insulating lid with internal gable. Corrosion-resistant housing is made of powder-coated, electrolytically galvanized sheet steel. Accessories to accept various kinds of vessels are quickly and safely attachable to the shaking device. Easily removable shaking rack. A drain tap is provided to empty the bath.
Tested according to the German Equipment Safety Law and CE marked.

Specifications

External dimensions (WxDxH):	715 x 520 x 330mm
Internal dimensions (WxDxH):	450 x 300 x 160mm
Usable capacity:	20 litres
Usable bath height:	190mm
Net/gross weight:	28/32kg
Shaking motion:	Reciprocating, can be switched on/off
Temperature constancy (temporal):	±0.1°C
Temperature display:	Digital LED
Overtemperature cut-out:	electronic 4°C above set temperature, and electro-mechanical > 130°C
Shaking frequency:	10 to 250rpm.
Shaking amplitude:	22mm
Supply requirements:	230V 50/60Hz, 1.5kW (alternative voltage models are available, details on request)

Type	PK	Cat. No.
1083	1	**9.905 983**

2 Shaking Water Bath 1086



Generally as model 1083, but with digital display of temperature and shaking frequency. *GFL*
Cooling coil supplied as standard. Tested according to the German Equipment Safety Law and CE marked.

Technical Specification

Shaking speed display:	Digital LED
Net/gross weight:	30/34kg
Shaking amplitude:	22mm

Type	PK	Cat. No.
1086	1	**9.905 984**

3 Shaking Water Bath 1092



Generally as model 1086, but with orbital motion. Cooling coil supplied as standard. *GFL*
Tested according to the German Equipment Safety Law and CE marked.

Technical Specification

External dimensions (WxDxH):	635 x 505 x 400mm
Internal dimensions(WxDxH):	450 x 300 x 160mm
Usable capacity:	20 litres
Temperature range:	approx. 5°C above ambient to +80°C, with water level regulator approx. 3°C above tap water temperature to +80°C
Net/gross weight:	35/40kg
Shaking motion:	Orbital, can be switched on/off
Shaking amplitude:	14mm dia.

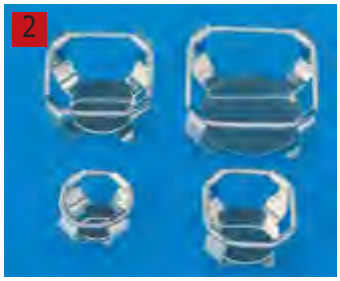
Type	PK	Cat. No.
1092	1	**9.905 985**



1 Tray type 3960

Accessory for **Shaking Water Baths 1083, 1086 and 1092.** *GFL*
Stainless steel, with holes to accept clamps for Erlenmeyer flasks, holder for reaction vessels 3926 and test tube racks 3924 and 3925. The tray has two handles that reach above the waters surface, for easy inserting and removing from the bath.

Type	PK	Cat. No.
3960	1	**9.837 960**

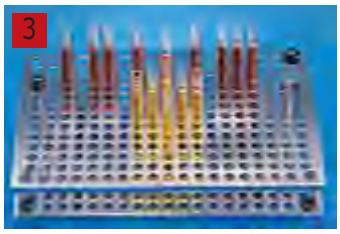


2 Clamps for Erlenmeyer Flasks

Accessory for **Shaking Water Baths 1083, 1086 and 1092**. *GFL*
Stainless steel, to be screwed onto **shaking tray 3960**. Supplied complete with fixing material (see also shaking shakers and incubators).

Type	For flasks ml	Max. number per tray	PK	Cat. No.
3983	25	52	1	**9.837 983**
3984	50	33	1	**9.837 984**
3985	100	22	1	**9.837 985**
3986	200	15	1	**9.837 986**
3987	250 to 300	13	1	**9.837 987**
3988	500	10	1	**9.837 988**
3989	1000	6	1	**9.837 989**

Type 3989 raised lid required (on request).



3 Test tube racks

Accessory for **Shaking Water Baths 1083, 1086 and 1092**. *GFL*
Stainless steel, with two handles for easy insertion and removal from the bath.

Type	For neck dia. mm	Max. no. plates	PK	Cat. No.
3920	16/17, max. length 180mm	243	1	**9.837 966**
3921	31	63	1	**9.837 967**
3922	12, max. length 180mm	372	1	**9.837 968**



4 Rack 3923

Accessory for **Shaking Water Baths 1083, 1086 and 1092.** *GFL*
Stainless steel, raised tray with 6 holding frames for test plates.

Type	PK	Cat. No.
3923	1	**9.905 998**



5 Holder 3926

Accessory for **Shaking Water Baths 1083, 1086 and 1092.** *GFL*
Holder for 58 reaction vessels 1.5ml to 2.0ml, made of stainless steel. With float protection, can be screwed onto **shaking tray 3960**. Max. 3 holders per tray.

Type	PK	Cat. No.
3926	1	**9.905 990**



6 Test Tube Racks 3924 and 3925

Accessory for **Shaking Water Baths 1083, 1086 and 1092**. Stainless steel. The holding device can be tilted by an angle of 90°, equipped with springs for secure support. It can be screwed onto **shaking tray 3960**. *GFL*

Type 3924: e.g. for 15ml Falcon tubes, max. 20 tubes x 12 to 17mm dia., max. 4 racks per tray.
Type 3925: e.g. for 50ml Falcon tubes, max. 12 tubes x 25 to 29mm dia., max. 3 racks per tray.

Type	PK	Cat. No.
3924	1	**9.905 996**
3925	1	**9.905 997**

E & OE.

1 Shaking water baths, SW series

JULABO

For simultaneous heating and shaking of samples, e.g. incubations, hybridizations etc.
Reciprocal motion.
- microprocessor technology with PID temperature control
- bright Multi-Display (LED) indicates five different temperature values and shaking speed
- splash-proof mains switch, built into plastic membrane keypad
- easy-to-use controls
- timer for selecting desired operating period
- RS232 interface provided
- shaking frequency 20 to 200 strokes/min., with 15mm stroke
- removable shaking carriage
- model SW23 has an internal circulation pump giving enhanced temperature stability

Bath lid not included.



Type	Capacity Litres	Working Temp. range °C	Temp. stability ± °C	Heating power W	Bath opening mm	Bath tank depth mm	PK	Cat. No.
SW22	20	20 to 99.9	0.2	2000	500 x 300	180	1	**9.906 383**
SW23	20	20 to 99.9	0.02	2000	500 x 300	180	1	**9.906 384**

2 Shaking water baths, SW 22, SW 23, accessories

JULABO

Type	PK	Cat. No.
Hinged Makrolon®-lid	1	**9.906 401**
Constant level device/cooling set	1	**9.906 402**



3 Trays for Erlenmeyer flasks

JULABO

Type	PK	Cat. No.
Tray for 32 x 50ml Erlenmeyer flasks	1	**9.906 386**
Tray for 15 x 200ml Erlenmeyer flasks	1	**9.906 387**
Tray for 11 x 250 to 300ml Erlenmeyer flasks	1	**9.906 388**
Tray for 8 x 500ml Erlenmeyer flasks	1	**9.906 389**



4 Spring clips for erlenmeyer flasks as indicated, to fit tray 9.906 390.

JULABO

For	PK	Cat. No.
10 ml flasks	1	**9.906 410**
25 ml flasks	1	**9.906 411**
50 ml flasks	1	**9.906 412**
100 ml flasks	1	**9.906 413**
200 to 250 ml flasks	1	**9.906 414**
300 ml flasks	1	**9.906 415**
500 ml flasks	1	**9.906 416**
1000 ml flasks	1	**9.906 417**
Tray for spring clips to hold Erlenmeyer flasks as required	1	**9.906 390**



5 Test tube trays

JULABO

For	PK	Cat. No.
240 test tubes, 16/17 mm Ø	1	**9.906 420**
360 test tubes, 12/13 mm Ø	1	**9.906 421**
360 microlitre vessels, 30 x 11/12 mm Ø	1	**9.906 422**
84 test tubes, 30 mm Ø	1	**9.906 423**



Water bath protection agent please see page 795.

1



1 Water baths, TW series

JULABO

- microprocessor technology with PID temperature control
- bright Multi-Display (LED) indicates five different temperature values
- splash-proof mains switch, built into a plastic membrane keypad
- easy-to-use controls
- timer for selecting desired operating period
- RS232 interface provided
- comprehensive range of accessories

Bath lid not included.

Type	Capacity Litres	Working Temp. range °C	Temp. stability ± °C	Heating power W	Bath opening mm	Bath tank depth mm	PK	Cat. No.
TW2	2	20 to 99.9	0.2	1000	150 x 130	110	1	**6.207 044**
TW8	8	20 to 99.9	0.2	2000	230 x 270	140	1	**9.906 424**
TW12	12	20 to 99.9	0.2	2000	350 x 270	140	1	**9.906 425**
TW20	20	20 to 99.9	0.2	2000	500 x 300	180	1	**9.906 426**

2



2 Water baths, TW series, accessories

One-piece moulded, transparent Makrolon® lids with handle and hinges. *JULABO*

For	Width mm	Depth mm	Height mm	PK	Cat. No.
TW2	170	160	160	1	**6.229 213**
TW8	290	320	160	1	**9.906 398**
TW12	400	320	160	1	**9.906 399**
TW20	560	350	170	1	**9.906 401**

3



3 Water baths, TW series, accessories

Test tube racks. *JULABO*

For	Description	PK	Cat. No.
TW2	24 test tubes, 16/17 mm dia.	1	**6.238 821**
TW8/TW12/TW20	60 test tubes, 16/17 mm dia.	1	**9.906 431**
TW8/TW12/TW20	90 test tubes, 12/13 mm dia.	1	**9.906 432**
TW8/TW12/TW20	90 microlitre vessels, 11/12 mm dia.	1	**9.906 433**
TW8/TW12/TW20	21 test tubes, 30/31mm dia.	1	**9.906 434**

4



HB 1500

5



HB 1500-S

4 5 Heating bath HB 1500/HB 1500-S

Heju

The heating bath HB 1500 is developed for varied tasks. As bath filling water, oils and sand is used. Different sizes are deliverable! The device has an integrated temperature controller with microprocessor. It is freely programmable and has also self optimization function and rampfunction!

- Microprocessor controller with 4-digits 7-segment display, 10 mm high, green,
- With selfoptimization and rampfunction
- Measurement and control range +20.0 to +250.0°C
- On-Off switch is light up green
- Setting of heat power from 1 to 99%
- Irreversible rapid shut-down when reaching the security temperature

Heating bath HB 1500-S
Equipment such as HB 1500, also with safety on separate microprocessor controller and an internal temperature sensor. Exceeding the safety temperature, the heating is switched off completely. The over-temperature shutdown >10K + reference deleted.

Type	Internal dimensions (Ø x H) mm	External dimensions (W x D x H) mm	Capacity Litres	Power W	Weight kg	PK	Cat. No.
HB 1500	200 x 130	290 x 270 x 275	2	1500	5.8	1	**9.234 512**
HB 1500	240 x 150	360 x 290 x 275	4	2000	6.5	1	**9.234 511**
HB 1500	280 x 180	370 x 320 x 285	8	2000	7.5	1	**9.234 510**
HB 1500-S	200 x 130	290 x 270 x 275	2	1500	5.8	1	**9.234 515**
HB 1500-S	240 x 150	360 x 290 x 275	4	2000	6.5	1	**9.234 514**
HB 1500-S	280 x 180	370 x 320 x 285	8	2000	7.5	1	**9.234 513**

E & OE.

Oil baths

A combination of high-grade, anti-corrosion stainless steel and state-of-the-art technology. *Memmert*
Excellent : With enhanced features for overtemperature protection and continuous, long-term tests using two high-grade Pt100 sensors. The integral timer range is from 1 min. up to 999 hrs and allows a setpoint-dependent hold time to be programmed, in addition to all the Basic-level features. Audible alarms for overtemperature and programme end.

Interior - Heating Concept:
- easy-to-clean, grade 1.4301 (ASTM 304), laser-welded, stainless steel interior, reinforced by deep drawn ribbing
- corrosion-proof, large-area heating surface on 3 sides of the tank

1 Oil baths, ONE

Control: *Memmert*
- fuzzy-supported PID microprocessor controller with integral autodiagnostic system and fault indication
- solid state switch unit
- 2 x class A, 4-wire, Pt100 sensors, mutually monitoring and controlling performance at the same temperature
- digital timer from 1 min to 999 hours for:

On (continuous operation)
Delayed On Hold, or set temperature-dependent Hold with fixed dwell time
- digital display (LED) of all set parameters, such as temperature, time and alarm values
- Calibration facility on controller
- audible and visual alarms at programme end, as keypress input acknowledgement and in the case of low liquid level (heating is switched off automatically)

Triple Overtemperature Protection:
- in the case of overtemperature due to fault the heating is switched off at approx. 10°C above the set temperature (fixed value)
- independent, class 2, TWB electronic overtemperature limiter
- class 1, TB mechanical temperature limiter switching the heating off at approx. 30°C above max. bath temperature
- set value display resolution: 0.1°C below 99.9°C, 1°C above 100°C

Textured, grade 1.4301 (ASTM 304), corrosion resistant, stainless steel housing.

Without covers - please order separately.

Specifications:
Temperature range: from +30°C (minimum 5°C above ambient) up to +200°C
Power supply: 230V (±10%), 50/60Hz

Type	Capacity Litres	Internal dimensions (W x D x H) mm	Housing (W x D x H) mm	Weight kg	Rating W	PK	Cat. No.
One 7	7	240 x 210 x 140	468 x 356 x 238*	11	1200	1	**9.906 601**
One 10	10	350 x 210 x 140	578 x 356 x 238*	13	1200	1	**9.906 602**
One 14	14	350 x 290 x 140	578 x 436 x 238*	15	1800	1	**9.906 603**
One 22	22	350 x 290 x 220	578 x 436 x 296*	16	2000	1	**9.906 604**
One 29	29	590 x 350 x 140	818 x 516 x 238*	22	2400	1	**9.906 605**
One 45	45	590 x 350 x 220	818 x 516 x 296*	24	2800	1	**9.906 606**

*High with flat cover

1



Accessories - please see page 803.

1



1 Heating baths HB 10

IKA

- Water- and oil heating bath for tempering of liquids
- Heating power 1350W
- Particularly suited for operation with the rotary evaporator RV 10
- Optimized bath shape for quick heating
- Integrated carrying handles for safe handling
- Adjustable safety circuit, for a safe switch-off in the case of errors
- Protection against dry running
- High-quality recyclable materials
- Digital display makes for easy operation
- Temperature controlled by micro controller
- IR interface for communication with the rotary evaporator RV 10 digital/control
- Choice of operating modes:

A: clear regulation of all parameters
B: a fixable safety temperature setting avoids unintentional readjustments
C: fixable set- and safety temperatures

Specifications:

Heating output:	1350W
Temperature range:	ambient to 180°C
Setting accuracy:	±1K
Offset:	±1K
Material:	stainless steel (AISI 304)
Useful volume:	3L
Ext./int. height:	185/134mm
Dimensions (WxDxH):	295 x 265 x 190mm
Weight:	3kg
Protection class DIN EN 60529:	IP 21
Tested to DIN EN IEC 61010-1.	

Type	PK	Cat. No.
HB 10 digital	1	**6.240 505**
HB 10	1	**6.258 322**

2



2 Heating baths HBR4 digital

A digital heating bath characterised by:

IKA

- digital display for set, actual, and overtemperature safety as well as stirring speed
- Fuzzy Logic electronic control
- integral magnetic stirring drive to circulate
 the bath heating liquid, enhancing heat distribution in the bath

Specifications:

Heating output:	1000W
Temperature range:	ambient to 200°C
Setting accuracy:	±1K
Offset:	±1K
Speed range:	100 to 800rpm
Material:	stainless steel (AISI 304)
Useful volume:	4L
Ext./int. diameters:	250mm/200mm
Ext./int. height:	250mm/160mm
Weight:	4.4kg
Protection class DIN EN 60529:	IP21
Tested to DIN EN IEC 61010-1.	

Type	PK	Cat. No.
HBR 4 digital	1	**9.906 106**
HBR 4 digital UK	1	**4.007 964**

3



4



3 4 Accessories for HB- baths

IKA

Type	PK	Cat. No.
Set of rings H 240 *	1	**9.906 121**
Intermediate base H 159 **	1	**9.906 125**

* For HB 4 basic digital bath.
** Allows insertion of vessels into the bath HB R 4, without affecting the stirrer motion.

E & OE.

1 Sand baths



Gestigkeit

For continuous operation. Electrical sand baths with thermostatic temperature control and separate power controller for performance adjustment to the heating requirements.
Anodised aluminium alloy hotplate. Excellent uniform temperature distribution over the entire heating surface. Asbestos free. The sand bath frame is tightly screwed onto the hotplate so that the sand is in direct contact with the hotplate. Useful depth 50mm. Stainless steel controller housing, with painted central section. Height-adjustable feet. Connection cable approximately 1.7m. With earthed plug for 230V supplies up to 3300W. A 400V 3-phase model is also available.

Type	Temp. range °C	Weight kg	Rating W	Dimensions (W x D x H) mm	Supply requirements V	PK	Cat. No.
ST 72	50 to 300	14.0	2200	360 x 360 x 220	230	1	**9.645 814**
ST 82	50 to 300	21.0	2850	514 x 364 x 220	230	1	**9.645 815**
ST 92-2	50 to 300	28.0	4000	592 x 442 x 220	230	1	**9.645 816**
ST 92-3	50 to 300	28.0	4000	592 x 442 x 220	400 (3-ph.)	1	**9.645 820**

2 Heating bath liquid, BASF



Buddeberg

Use:
BASF heating bath liquid can be used continuously as a heating medium up to approx. 170°C. Higher temperatures (below flash point) are possible, but will result in rapid darkening. The low pour point allows the bath liquid also to be used as a cooling medium. Mixtures with 10% to 30% water have proved best for this.

The crucial advantages of BASF heating bath liquid compared to the oils or other organic liquid mainly used are:
- accidental spillage of water into the bath does not lead to dangerous spitting at temperatures over 100°C, as the water dissolves in the heating bath liquid and subsequently evaporates safely
- BASF heating bath liquid can easily be rinsed away with water which eases cleaning of laboratory equipment, e.g. distillation flasks, and also bench or floor if the bath liquid is accidentally spilled.
- BASF heating bath liquid does not foam when mixed with water.

Viscosity on addition of water:
BASF heating bath liquid is quite viscous at ambient or low temperatures, and therefore sometimes difficult to dispense. The addition of 10-20% water reduces the viscosity and enables easier handling. If the mixture is then heated to 100°C, the water evaporates without boiling. Further heating is only shortly delayed by this. Before next heating, water can be added again.

Water solubility: BASF heating bath liquid can be mixed with water in any ratio. The hardness of the water has no effect on the bath liquid.

Chemical character:	Modified, polyvalent, aliphatic alcohol
Appearance:	Clear, colourless or lightly coloured liquid
Storage time: (unlimited at present knowledge)	When stored for long periods the product may become darker. This does not affect the performance of the product.
Density:	approx. 1.15g/cm³
Flashpoint	
to DIN 51758:	> 200°C
to DIN 51794:	approx. 255°C
Water solubility:	Heating bath liquid, BASF is miscible with water in each ratio. No susceptibility to water hardness in mixed water.

Container	PK	Cat. No.
5 litres	1	**9.906 200**

1 Microwave SEVERIN MW 7864

NEW!

Freestanding with cavity capacity of 23L. Digital multi-function display, microwave, grill and convection separately or combined switchable. Max. Microwave power: 800W, max. Grill power: 1200W. Preheat function to 190°C for convection, defrost by weight or time, Quick start button for instant full power, 10 different automatic cooking programs, grill grate with two selectable levels, child-proof lock. Dimensions (WxDxH): 495 x 415 x 295mm. Diameter turntable: 270mm.

Type	PK	Cat. No.
SEVERIN MW 7864	1	**9.106 785**

1



2 Microwave Sharp R-94ST

NEW!

Large combination microvave 3-in-1: Microwave, Convection or microvave and quarz grill. Freestanding with cavity capacity of 40L. Sturdy stainless steel housing and stainless steel Max. Microwave power: 1050W, 11 steps selectable, convection 1450W (40 to 250°C), max. Grill power: 1300W. 18 different automatic cooking programs. Dimensions (WxDxH): 550 x 535 x 368mm. Diameter turntable: 362mm.

Type	PK	Cat. No.
Sharp R-94ST	1	**9.106 795**

2



3 Microwave Sharp R-242 BKW

NEW!

Compact freestanding microwave with cavity capacity of 20 l. Grey painted cavity. Max. microwave power: 800W, 11 steps selectable, 8 different automatic cooking programs. Timer: up to 99min/50sec, +1-min-button for quickstart and child-proof lock. Dimensions (WxDxH): 439.5 x 257.8 x 358.5mm. Diameter turntable: 255mm.

Type	PK	Cat. No.
Sharp R-242 BKW	1	**9.106 798**

3



1 Universal Ovens UN/UF and UNplus/UFplus

NEW!

Memmert

1



The new heating and drying oven generation with the unique ControlCOCKPIT for a quick and intuitive operation. For a multitude of applications, ideally at temperatures above +50°C.

Standard equipment:
- PID microprocessor control with integrated auto-diagnostic system
- Interior made of stainless sttel No. 1.4031 (ASTM 304) with all-round deep-drawn ribs to integrate the large-area heating with ceramic-metal sheath
- Structured stainless steel housing, scratch-resistant, robust and durable; rear of zinc-plated steel
- High-temperature connectors on the rear of the appliance for single-phase power connection according to country specific systems and IEC standards
- Internal data logger with a storage capacity of at least 10 years
- German, English, French, Spanish language settings available on the ControlCOCKPIT
- Digital timer, adjustable between 1 minute and 99 days
- The SetpointWAIT function guarantees that the process time does not start until the set temperature is reached at all measuring points - optional for temperature values recorded by the freely positionable Pt100 sensors inside the chamber.
- Adjustment of three calibration values for temperature and additional appliance specific parameters directly at the ControlCOCKPIT

Type designation: plus = Models with TwinDISPLAY

Specifications

Type designation:	N = Natural convection, F = Forced air circulation
Working- temperature range:	at least 5°C (UN/UNplus) at least 10°C (UF/UFplus) above ambient temperature up to +300°C
Setting temperature range:	+20 up to +300°C
Setting accuracy:	up to 99.9°C: 0.1°C/from 100°C: 0.5°C

Universal Ovens UN and UF

NEW!

Memmert

2



9.869 697

SingleDISPLAY: ControlCOCKPIT with one TFT colour display
- Available parameters on the ControlCOCKPIT: Temperature (Celsius or Fahrenheit), fan speed, exhaust air flap position, programme time, time zones, summertime/wintertime
- One temperature sensor Pt100 DIN class A in a 4-wire circuit
- AtmoCONTROL software for reading out, managing and organising the data logger via Ethernet interface (90-days test version can be downloaded). USB stick with AtmoCONTROL software available as accessory (on demand)
- Ethernet interface on the rear of the appliance for reading out the protocol log and for online logging
- Double overtemperature protection: Electronic temperature monitoring with freely adjustable monitoring temperature with option A6 TWW/TWB (protection class 3.1 or 2), mechanical temperature limiter TB acc. to DIN 12 880.

Type	Internal volume	Int. dimensions (W x D x H)	Housing (W x D x H)	Shelf support ribs/shelves	Rating	Weight	PK	Cat. No.
	litres	mm	mm		W	kg		
UN30	32	400 x 250* x 320	585 x 434** x 707	3 / 1	1600	48	1	**9.869 681**
UN55	53	400 x 330* x 400	585 x 514** x 787	4 / 1	2000	57	1	**9.869 682**
UN75	74	400 x 330* x 560	585 x 514** x 947	6 / 2	2500	66	1	**9.869 683**
UN110	108	560 x 400* x 480	745 x 584** x 867	5 / 2	2800	78	1	**9.869 684**
UN160	161	560 x 400* x 720	745 x 584** x 1107	8 / 2	3200	96	1	**9.869 685**
UN260	256	640 x 500* x 800	824 x 684** x 1186	9 / 2	3400	110	1	**9.869 686**
UN450	449	1040 x 600* x 720	1224 x 784** x 1247	8 / 2	5800	170	1	**9.869 687**
UN750	749	1040 x 600* x 1200	1224 x 784** x 1726	14 / 2	7000	217	1	**9.869 688**
UF30	32	400 x 250* x 320	585 x 434** x 707	3 / 1	1600	48	1	**9.869 697** 2
UF55	53	400 x 330* x 400	585 x 514** x 787	4 / 1	2000	57	1	**9.869 698**
UF75	74	400 x 330* x 560	585 x 514** x 947	6 / 2	2500	66	1	**9.869 699**
UF110	108	560 x 400* x 480	745 x 584** x 867	5 / 2	2800	78	1	**9.869 700**
UF160	161	560 x 400* x 720	745 x 584** x 1107	8 / 2	3200	96	1	**9.869 701**
UF260	256	640 x 500* x 800	824 x 684** x 1186	9 / 2	3400	110	1	**9.869 702**
UF450	449	1040 x 600* x 720	1224 x 784** x 1247	8 / 2	5800	170	1	**9.869 703**
UF750	749	1040 x 600* x 1200	1224 x 784** x 1726	14 / 2	7000	217	1	**9.869 704**

Power supply at 230 V, 50/60 Hz, model sizes 450 and 750 at 400 V and 3 x 220 V without neutral, 50/60 Hz
Type designation: N = Natural convection, F = Forced air circulation
* Minus 39 mm for fan
**Depth without door handle, please add 56 mm

1



9.869 708

Universal ovens UNplus and UFplus

NEW!

Memmert

TwinDISPLAY: ControlCOCKPIT with two colour TFT displays

- Available parameters on the ControlCOCKPIT: Temperature (Celsius or Fahrenheit), fan speed, exhaust air flap position, programme time, time zones, summertime/ wintertime
- Two Pt100 sensors DIN class A in a 4-wire circuit for mutual monitoring, taking over functions in case of an error
- AtmoCONTROL software on a USB stick for programming, managing and transferring programmes via Ethernet interface or USB port
- HeatBALANCE function for application specific adjustment of heat output distribution (balance) between the upper and lower heating groups in an adjustment range between -50 % and +50 %
- ControlCOCKPIT with USB port for uploading programmes, reading out protocol logs, activating the User-ID function
- Displaying of already logged protocol data on the ControlCOCKPIT (max 10.000 values correspond to approx. 1 week)
- Ethernet interface on the rear of the appliance for reading out the protocol log and for uploading programmes and for online logging
- Multiple overtemperature protection: Electronic temperature monitoring TWW/TWB (protection class 3.1 or 2 and mechanical temperature limiter TB (protection class 1) acc. to DIN 12 880, AutoSAFETY automatically adjusts to the set value within a freely adjustable tolerance range. Setting individual MIN/MAX values for over/undertemperature

Type	Internal volume	Int. dimensions (W x D x H)	Housing (W x D x H)	Shelf support ribs/shelves	Rating	Weight	PK	Cat. No.
	litres	mm	mm		W	kg		
UN30plus	32	400 x 250* x 320	585 x 434** x 707	3 / 1	1600	48	1	**9.869 689**
UN55plus	53	400 x 330* x 400	585 x 514** x 787	4 / 1	2000	57	1	**9.869 690**
UN75plus	74	400 x 330* x 560	585 x 514** x 947	6 / 2	2500	66	1	**9.869 691**
UN110plus	108	560 x 400* x 480	745 x 584** x 867	5 / 2	2800	78	1	**9.869 692**
UN160plus	161	560 x 400* x 720	745 x 584** x 1107	8 / 2	3200	96	1	**9.869 693**
UN260plus	256	640 x 500* x 800	824 x 684** x 1186	9 / 2	3400	110	1	**9.869 694**
UN450plus	449	1040 x 600* x 720	1224 x 784** x 1247	8 / 2	5800	170	1	**9.869 695**
UN750plus	749	1040 x 600* x 1200	1224 x 784** x 1726	14 / 2	7000	217	1	**9.869 696**
UF30plus	32	400 x 250* x 320	585 x 434** x 707	3 / 1	1600	48	1	**9.869 705**
UF55plus	53	400 x 330* x 400	585 x 514** x 787	4 / 1	2000	57	1	**9.869 706**
UF75plus	74	400 x 330* x 560	585 x 514** x 947	6 / 2	2500	66	1	**9.869 707**
UF110plus	108	560 x 400* x 480	745 x 584** x 867	5 / 2	2800	78	1	**9.869 708** 1
UF160plus	161	560 x 400*x 720	745 x 584** x 1107	8 / 2	3200	96	1	**9.869 709**
UF260plus	256	640 x 500* x 800	824 x 684** x 1186	9 / 2	3400	110	1	**9.869 710**
UF450plus	449	1040 x 600* x 720	1224 x 784** x 1247	8 / 2	5800	170	1	**9.869 711**
UF750plus	749	1040 x 600* x 1200	1224 x 784** x 1726	14 / 2	7000	217	1	**9.869 712**

*Power supply at 230 V, 50/60 Hz, model sizes 450 and 750 at 400 V and 3 x 220 V without neutral, 50/60 Hz
Type designation: N = Natural convection, F = Forced air circulation, plus = models with TwinDISPLAY
* Minus 39 mm for fan
**Depth without door handle, please add 56 mm

Glass door for Universal ovens

Full-sight glass door (3 insulating glass) for UN, UNplus, UF, UFplus series.

Memmert

Type	PK	Cat. No.
B0 30	1	**9.868 120**
B0 55	1	**9.868 130**
B0 75	1	**9.868 140**
B0 110	1	**9.868 150**
B0 160	1	**9.868 155**
B0 260	1	**9.868 160**
B0 450	1	**9.868 170**
B0 750	1	**9.868 180**

For further accessories please see page 822.

E & OE.

1 Drying oven E28 series

BINDER

Robust, space-saving, low-profile ovens with hydraulic thermostat control and adjustable chamber ventilation.

- temperature range: 60°C to 230°C
- hydraulic thermostat temperature control
- chamber ventilation valve
- timer 0 to 120min
- available with, or without, overheat cut-out (Class 1)

1



Type	Internal volume litres	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Description	PK	Cat. No.
E 28	28	400 x 250 x 280	580 x 425 x 402	without overheat cut out	1	**9.883 543**
E 28*	28	400 x 250 x 280	580 x 425 x 402	with overheat cut out	1	**9.883 544**

* with overheat cut-out TB (Class 1)

Heating ovens, ED, FD, FED series

BINDER

Diversity for all types of thermal, whether efficient drying, long-term controlled elevated temperatures or sterilization tasks for homogeneous temperature distribution: a BINDER oven and heating chamber is up to any tasks thanks to its wide temperature range.
- Fast, even tempering
- Wide temperature range

ED Series: Drying ovens with gravity convection. Perfectly suited for routine drying and sterilisation applications up to 300°C.

FD Series: Drying ovens with forced convection. The right choice when it comes to fast drying and sterilization.

FED Series: Heating chambers with forced convection. The multi-talented unit with advanced control functions.

Euqipment:
- Electronically controlled APT.line™ preheating chamber assuring temperature accuracy and reproducible results
- Temperature range from 5°C above ambient temperature to 300°C
- Independent adjustable temperature safety device class 2 (DIN 12880), with visual temperature alarm
- Optional RS 422 Interface for APT-COM™ Data Control System communication software

2



9.883 545

3



9.883 555

Type	Internal volume litres	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	PK	Cat. No.
ED 23	20	222 x 277 x 330	433 x 516 x 492	1	**9.883 529**
ED 23*	20	222 x 277 x 330	433 x 516 x 492	1	**9.883 530**
ED 53	53	400 x 330 x 400	634 x 575 x 617	1	**9.883 545** 2
ED 53*	53	400 x 330 x 400	634 x 575 x 617	1	**9.883 548**
ED 115	115	600 x 400 x 480	834 x 645 x 702	1	**9.883 546**
ED 115*	115	600 x 400 x 480	834 x 645 x 702	1	**9.883 549**
ED 240*	240	800 x 500 x 600	1034 x 745 x 822	1	**9.883 550**
ED 400*	400	1000 x 500 x 800	1234 x 765 x 1022	1	**9.883 551**
ED 720*	720	1000 x 600 x 1200	1234 x 865 x 1528	1	**9.883 552**
FD 23	20	222 x 277 x 330	433 x 516 x 492	1	**9.883 808**
FD 53	53	400 x 330 x 400	634 x 575 x 617	1	**9.883 800**
FD 115	115	600 x 400 x 480	834 x 645 x 702	1	**9.883 801**
FD 240	240	800 x 500 x 600	1034 x 745 x 822	1	**9.883 802**
FED 53	53	400 x 330 x 400	634 x 575 x 617	1	**9.883 553**
FED 115	115	600 x 400 x 480	834 x 575 x 702	1	**9.883 554**
FED 240	240	800 x 500 x 600	1034 x 745 x 822	1	**9.883 555** 3
FED 400	400	1000 x 500 x 800	1234 x 765 x 1022	1	**9.883 803**
FED 720	720	1000 x 600 x 1200	1234 x 765 x 1528	1	**9.883 804**

* with RS 422

1 Safety drying ovens, FDL, MDL series

A safety drying oven from BINDER ensures the perfect test result of your solvent-based paints and coatings, absolute temperature precision even with high ventilation.

BINDER

Advantages:
- Defined solvent quantity according to EN 1539
- Wide temperature range up to 350°C

Series FDL: The silicone-free and dust-free inner chamber and symmetric airflow provides the perfect environment for all specimens containing solvents.

Series MDL: Thanks to high air flow at temperatures up to 350°C, it is perfectly suited for high-temperature testing.

Equipment:
- Electronically controlled APT.line™ preheating chamber
- Temperature range: from 5°C above ambient temperature to 300°C (FDL)
- Temperature range: from 5°C above ambient temperature to 350°C (MDL)
- Independent adjustable temperature safety device class 2 (DIN 12880), with visual temperature alarm
- RS 422 interface for use with APT-COM™ DataControlSystem communication software

Type	Internal volume litres	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	PK	Cat. No.
FDL 115	115	600 x 435 x 435	834 x 685 x 800	1	**9.883 580**
MDL 115	115	600 x 435 x 435	834 x 685 x 800	1	**9.883 581**

1



We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

BINDER
Best conditions for your success

E & OE.

2 Vacuum drying ovens VO

Memmert

Lean perfection, top precision. The Memmert vacuum ovens, based on state-of-the art technology, have been optimised to fulfil the most stringent demands, beyond merely vacuum control. In addition to direct heating of the shelves and digital control of the vacuum depth (adjustable from 10 mbar to 1100 mbar) these vacuum ovens have a weekly programmer and daily schedule function, protocol timer for temperature and pressure profiles of up to 40 ramps. The 8-digit, alphanumeric display (selection of language via set-up) makes programming easy and is also used for visualizing data during operation. The standard model is delivered with one thermoshelf made of aluminium, eloxadised, with works calibration certificate for +160°C at 50 mbar pressure, two connectors for thermoshelves, USB port, software "Celsius" as well as MEMoryCard. An internal datalogging memory with a capacity of 1024kB provides tamper-proof, storage and output of GLP-compliant, archive documentation of all relevant data. For total safety, a multi-level overtemperature protection system is provided, with audiovisual alarm system, protection class 3.1 microprocessor temperature monitor for over- and undertemperature, and additional integral Automatic Safety Function ASF for high and low temperature limits, automatically monitoring the set temperature and warning by an alarm when there is a temperature-related malfunction. Switching off the heating of the thermoshelf concerned when the temperature is exceeded. In addition, the VO series has a TB class 1 mechanical temperature control unit which activates when the actual temperature exceeds 10°C above the set value.

Proven Memmert quality: premium stainless steel for housing and interior. Interior hermetically welded, material 1.4404 (ASTM 316L). Safety glass door with spring-loaded safety glass on inside and anti-splinter screen ESG on outside of door

Temperature range: from + 20°C up to +200°C
Operating range: from 5°C above ambient

1



9.537 928

2



Type	Description	Internal volume litres	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
VO 200	incl. 1 thermoshelf, max. 2 connections ** for thermoshelves in the rear	29	385 x 250 x 305	550 x 400* x 600	58	1	**9.537 928** 1
VO 400	incl. 1 thermoshelf, max. 2 connections ** for thermoshelves in the rear	49	385 x 330 x 385	550 x 480* x 680	82	1	**9.537 929**
VO 500	incl. 1 thermoshelf, max. 2 connections ** for thermoshelves in the rear	101	545 x 400 x 465	710 x 550* x 760	120	1	**9.537 932**

*Depth without door handle, please add 38 mm
**with standard equipment

3 Accessories for Vacuum ovens VO

Memmert

Option inert gas inlet: Programmable and digitally controlled inlet for inert gas with flow rate reduction

Option pump control: Optimised rinsing procedures for the pump membranes as well as signal output for pump on/off

Premium module: The premium module comprises the inert gas inlet, the pump control, one printer interface, extra connectors for thermoshelves, one for VO 200, two for VO 400/500, an additional thermoshelf for model size 400/500 and a drip tray.

Description	PK	Cat. No.
Vacuum pump module cabinet without pump for VO 200	1	**9.537 933**
Vacuum pump module cabinet without pump for VO 400	1	**9.537 934**
Vacuum pump module cabinet without pump for VO 500	1	**9.537 935**
Chemically resistant vacuum pump, capacity 34 NI/min for VO 200, in combination with pump control or premium module	1	**9.537 936**
Chemically resistant vacuum pump, capacity 60 NI/min for VO 400/500 in combination with pump control or premium module	1	**9.537 937**
Thermoshelf, aluminium, eloxadised material 3.3547 (ASTM B209) for VO 200	1	**9.537 938**
Thermoshelf, aluminium, eloxadised material 3.3547 (ASTM B209) for VO 400	1	**9.537 939**
Thermoshelf, aluminium, eloxadised material 3.3547 (ASTM B209) for VO 500	1	**9.537 940**
Thermoshelf stainless steel, material 1.4404 (ASTM 316L) for VO 200	1	**6.071 767**
Thermoshelf stainless steel, material 1.4404 (ASTM 316L) for VO 400	1	**9.537 941**
Thermoshelf stainless steel, material 1.4404 (ASTM 316L) for VO 500	1	**6.225 112**
Option inert gas inlet	1	**9.537 942**
Option pump control	1	**9.537 943**
Premium module for VO 200	1	**9.537 944**
Premium module for VO 400	1	**9.537 945**
Premium module for VO 500	1	**9.537 946**

1



9.537 947

Vacuum drying ovens VOcool

NEW!

Memmert

The cooled vacuum oven VO200cool with its interior volume of 29L and VO400cool with its interior of 49L have a temperature range of +5°C to +90°C. For cooling purposes, a compact, energy-saving and extremely precise Peltier cooling unit was integrated. This way, the Memmert cooled vacuum ovens achieve a surface temperature distribution over its entire temperature range with a deviation of max. ±1 K.
Gentle low temperature vacuum drying and storage of micro-organisms or active pharmaceutical components is particularly applied in the food and pharmaceutical industry. Thanks to this process, unstable substances can be dried at moderate temperatures above zero without causing too much damage to the cell structure. Additionally, the cooled vacuum oven VOcool from Memmert can be deployed to easily and cost-effectively simulate storage and transport of pharmaceutical products during intercontinental flights.

Temperature range: from + 5°C up to +90°C
Extended range: from 0°C up to +90°C available on request

Type	Description	Internal volume litres	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Rating W	Weight kg	PK	Cat. No.
VO200cool	incl. 1 thermoshelf, fixed	29	385 x 250 x 305	550 x 650* x 600	400	68	1	**9.537 947** 1
VO400cool	incl. 1 thermoshelf, fixed	49	385 x 330 x 385	550 x 730* x 680	500	92	1	**9.537 949**

*Depth without door handle, please add 38mm

2



2 Vacuum drying ovens, VD, VDL series

BINDER

The standard when it comes to gentle drying: Vacuum drying ovens from BINDER dry without residues, without incrustations or oxidation. In addition, they have a reliable safety concept.
- Safe work with one-of-a-kind safety concept
- Fast, condensation-free drying processes
- Homogeneous sample trying in a vacuum

VD Series: Vacuum drying oven for non-flammable solvents. A BINDER vacuum drying oven is the first choice when it comes to efficient drying using homogeneous temperature distribution in a vacuum.

VDL Series: Safety vacuum drying oven for flammable solvents. For a VDL series vacuum drying oven, safety is the top priority, even flammable solvents can be gently dried.

Equipment:
- Electronically controlled APT.line™ preheating chamber
- Temperature range from 15°C above ambient temperature to 200°C
- Independent adjustable temperature safety device class 2 (DIN 12880), with visual temperature alarm
- Interface RS 422 for APT-COM™ DataControlSystem communication software
- Spring-mounted safety glass panel with shatter protection
- VDL safety concept: Pressure control device for heating activated <125mbar, Over pressure capsuled instrument panel with compressed air connection and maintenance unit, flame protection gasket
- 2 patented, flexible aluminum expansion racks
- Also available as complete system with module and vacuum pump

Type	Internal volume litres	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	PK	Cat. No.
VD 23	23	285 x 285 x 285	515 x 500 x 655	1	**9.883 540**
VD 53	53	400 x 330 x 400	634 x 550 x 775	1	**9.883 541**
VD 115	115	506 x 450 x 506	740 x 670 x 900	1	**9.883 542**
VDL 23	23	285 x 285 x 285	515 x 500 x 655	1	**9.883 531**
VDL 53	53	400 x 330 x 400	634 x 550 x 775	1	**9.883 532**
VDL 115	115	506 x 450 x 506	740 x 670 x 900	1	**9.883 533**

Vacuum pumps please see page 1019.

E & OE.

1 Incubators IN/IF and INplus/IFplus

NEW!

Memmert

The new incubator generation with the unique ControlCOCKPIT for a quick and intuitive operation.
For the gentle heating of organic chamber loads. The heating and control system are especially optimised for low temperatures of up to +80°C.
Standard equipment:
- PID microprocessor control with integrated auto-diagnostic system
- Interior made of stainless steel, material 1.4301 (ASTM 304) with all-round deep-drawn ribs to integrate the large-area heating with ceramic-metal sheath
- Structured stainless steel housing, scratch-resistant, robust and durable; rear of zinc-plated steel
- High-temperature connectors on the rear of the appliance for single-phase power connection according to country specific systems and IEC standards
- Internal data logger with a storage capacity of at least 10 years
- German, English, French, Spanish language settings available on the ControlCOCKPIT
- Digital timer, adjustable between 1 minute and 99 days
- The SetpointWAIT function guarantees that the process time does not start until the set temperature is reached at all measuring points - optional for temperature values recorded by the freely positionable Pt100 sensors inside the chamber.
- Adjustment of three calibration values for temperature and additional appliance specific parameters directly at the ControlCOCKPIT

Type designation: plus = Models with TwinDISPLAY

1



Specifications

Type designation:	N = Natural convection, F = Forced air circulation
Working temperature range	at least 5 above ambient temperature to +80°C
Setting temperature range	+20°C to +80°C
Setting accuracy	up to 99.9°C: 0.1°C/from 100°C: 0.5°C

Incubators IN and IF

NEW!

Memmert

SingleDISPLAY: ControlCOCKPIT with one TFT colour display
- Available parameters on the ControlCOCKPIT: Temperature (Celsius or Fahrenheit), fan speed, exhaust air flap position, programme time, time zones, summertime/wintertime
- One temperature sensor Pt100 DIN class A in a 4-wire circuit
- AtmoCONTROL software for reading out, managing and organising the data logger via Ethernet interface (90-days test version can be downloaded). USB stick with AtmoCONTROL software available as accessory (on demand)
- Ethernet interface on the rear of the appliance for reading out the protocol log and for online logging
- Double overtemperature protection: Electronic temperature monitoring with freely adjustable monitoring temperature, with option A6 TWW/TWB (protection class 3.1 or 2), mechanical temperature limiter TB acc. to DIN 12 880.

2



9.537 961

Type	Internal volume	Int. dimensions (W x D x H)	Shelf support ribs/shelves	Housing (W x D x H)	Rating	Weight	PK	Cat. No.
	litres	mm		mm	W	kg		
IN30	32	400 x 250* x 320	3 / 1	585 x 434** x 707	1600	48	1	**9.537 961** 2
IN55	53	400 x 330* x 400	4 / 1	585 x 514** x 787	1000	57	1	**9.537 962**
IN75	74	400 x 330* x 560	6 / 2	585 x 514** x 947	1250	66	1	**9.537 963**
IN110	108	560 x 400* x 480	5 / 2	745 x 584** x 867	1400	78	1	**9.537 964**
IN160	161	560 x 400* x 720	8 / 2	745 x 584** x 1107	1600	96	1	**9.537 965**
IN260	256	640 x 500* x 800	9 / 2	824 x 684** x 1186	1700	110	1	**9.537 966**
IN450	449	1040 x 600* x 720	8 / 2	1224 x 784** x 1247	1800	170	1	**9.537 967**
IN750	749	1040 x 600* x 1200	14 / 2	1224 x 784** x 1726	2000	217	1	**9.537 968**
IF30	32	400 x 250* x 320	3 / 1	585 x 434** x 707	1600	48	1	**9.537 977**
IF55	53	400 x 330* x 400	4 / 1	585 x 514** x 787	1000	57	1	**9.537 978**
IF75	74	400 x 330* x 560	6 / 2	585 x 514** x 947	1250	66	1	**9.537 979**
IF110	108	560 x 400* x 480	5 / 2	745 x 584** x 867	1400	78	1	**9.537 980**
IF160	161	560 x 400* x 720	8 / 2	745 x 584** x 1107	1600	96	1	**9.537 981**
IF260	256	640 x 500* x 800	9 / 2	824 x 684** x 1186	1700	110	1	**9.537 982**
IF450	449	1040 x 600* x 720	8 / 2	1224 x 784** x 1247	1800	170	1	**9.537 983**
IF750	749	1040 x 600* x 1200	14 / 2	1224 x 784** x 1726	2000	217	1	**9.537 984**

Type designation: N = Natural convection, F = Forced air circulation
* Minus 39 mm for an air vent in centre of rear panel
**Depth without door handle, please add 56 mm

1



9.537 990

1 Incubators INplus and IFplus

NEW!

Memmert

TwinDISPLAY: ControlCOCKPIT with two TFT colour displays

- Available parameters on the ControlCOCKPIT: Temperature (Celsius or Fahrenheit), fan speed, exhaust air flap position, programme time, time zones, summertime/wintertime
- Two Pt100 sensors DIN class A in a 4-wire circuit for mutual monitoring, taking over functions in case of an error
- AtmoCONTROL software on a USB stick for programming, managing and transferring programmes via Ethernet interface or USB port
- HeatBALANCE function for application specific adjustment of heat output distribution (balance) between the upper and lower heating groups in an adjustment range between -50 % and +50 %
- ControlCOCKPIT with USB port for uploading programmes, reading out protocol logs, activating the User-ID function
- Displaying of already logged protocol data on the ControlCOCKPIT (max 10.000 values correspond to approx. 1 week)
- Ethernet interface on the rear of the appliance for reading out the protocol log and for uploading programmes and for online logging
- Multiple overtemperature protection: Electronic temperature monitoring TWW/TWB (protection class 3.1 or 2 and mechanical temperature limiter TB (protection class 1) acc. to DIN 12 880, AutoSAFETY automatically adjusts to the set value within a freely adjustable tolerance range. Setting individual MIN/MAX values for over/undertemperature alarm

Type	Internal volume	Int. dimensions (W x D x H)	Shelf support ribs/shelves	Housing (W x D x H)	Rating	Weight	PK	Cat. No.
	litres	mm		mm	W	kg		
IN30plus	32	400 x 250* x 320	3 / 1	585 x 434** x 707	1600	48	1	**9.537 969**
IN55plus	53	400 x 330* x 400	4 / 1	585 x 514** x 787	1000	57	1	**9.537 970**
IN75plus	74	400 x 330* x 560	6 / 2	585 x 514** x 947	1250	66	1	**9.537 971**
IN110plus	108	560 x 400* x 480	5 / 2	745 x 584** x 867	1400	78	1	**9.537 972**
IN160plus	161	560 x 400* x 720	8 / 2	745 x 584** x 1107	1600	96	1	**9.537 973**
IN260plus	256	640 x 500* x 800	9 / 2	824 x 684** x 1186	1700	110	1	**9.537 974**
IN450plus	449	1040 x 600* x 720	8 / 2	1224 x 784** x 1247	1800	170	1	**9.537 975**
IN750plus	749	1040 x 600* x 1200	14 / 2	1224 x 784** x 1726	2000	217	1	**9.537 976**
IF30plus	32	400 x 250* x 320	3 / 1	585 x 434** x 707	1600	48	1	**9.537 985**
IF55plus	53	400 x 330* x 400	4 / 1	585 x 514** x 787	1000	57	1	**9.537 986**
IF75plus	74	400 x 330* x 560	6 / 2	585 x 514** x 947	1250	66	1	**9.537 987**
IF110plus	108	560 x 400* x 480	5 / 2	745 x 584** x 867	1400	78	1	**9.537 988**
IF160plus	161	560 x 400* x 720	8 / 2	745 x 584** x 1107	1600	96	1	**9.537 989**
IF260plus	256	640 x 500* x 800	9 / 2	824 x 684** x 1186	1700	110	1	**9.537 990**
IF450plus	449	1040 x 600* x 720	8 / 2	1224 x 784** x 1247	1800	170	1	**9.537 991**
IF750plus	749	1040 x 600* x 1200	14 / 2	1224 x 784** x 1726	2000	217	1	**9.537 992**

Type designation: N = Natural convection, F = Forced air circulation, plus = Models with TwinDISPLAY
* Minus 39 mm for fan
**Depth without door handle, please add 56 mm

Accessories for Universal ovens and Incubators

Stainless steel grids (max. loading: 30kg)

Memmert

Type	For	Description	PK	Cat. No.
E28884	for model size 30	stainless steel grid	1	**9.537 203**
E20164	for model size 55 und 75	stainless steel grid	1	**6.231 512**
E20165	for model size 110 und 160	stainless steel grid	1	**6.232 433**
E28891	for model size 260	stainless steel grid	1	**9.537 204**
E20182	for model size 450 und 750	stainless steel grid	1	**6.222 688**

Additional stainless steel shelves are available on request

Special equipment for Universal ovens and Incubators

Memmert

Type	Description	PK	Cat. No.
D00125	IQ/OQ/PQ check list, with works test data for one free-selectable temperature value, incl. temperature distribution survey for 9 measuring points to DIN 12 880: 2007-05 for validation by customer for model 30	1	**9.867 756**
D00127	IQ/OQ/PQ check list, with works test data for one free-selectable temperature value, incl. temperature distribution survey for 27 measuring points to DIN 12 880: 2007-05 for validation by customer for model 55 - 750	1	**9.867 757**
E29778	USB User ID Stick (only for units with TwinDISPLAY)	1	**6.257 480**
E06192	USB Ethernet adapter	1	**9.867 717**
E06189	Ethernet connection cable 5 m for computer interface	1	**9.867 758**
E29780	USB stick with documentation Software AtmoCONTROL and operating instructions for products with SingleDISPLAY (for units with TwinDISPLAY included as standard)	1	**9.867 759**

1 2 Mini Incubator 4010 and Mini Tube Roller Incubator 4020

GFL

Both models are well suited for incubations that require exactly reproducible temperatures in standard and research laboratory applications.
Mini Incubator 4010: also suitable for warming and drying of samples.
Mini Tube Roller Incubator 4020: also suitable for hybridisations that require exactly reproducible temperatures.
Compact, little space required for versatile applications directly on the workbench. Lift-up, transparent acrylic covers permit a clear view of the cultures in the interior cabinet. The units bear the CE mark.

- microprocessor-controlled temperature regulation, temperature range: approx. 8°C above ambient to +60°C, temperature constancy (temporal): ±0.2°C
- temperature setting and display: digital - LED, in 0.1°C increments
- fan ventilation ensures optimum temperature distribution throughout the cabinet interior
- electronic monitoring of the temperature controller, electronic overtemperature cut-out, with visual alarm at 4°C above the set value, and electro-mechanical >130°C
- soft-touch keys with clear symbols
- Outer casings made of powder-coated, electrolytically galvanized sheet steel
- W/D/H (outside): 280/510/280
- Mains supply: 230 V 50/60 Hz/0.3 kW (other are voltages on request)
- Net/gross weight: 4010 9.9/11.8kg, 4020 11.8/13.7kg

Mini Incubator 4010: Perforated tray and bottom tray made of stainless steel.
Mini Tube Roller Incubator 4020: Removable bottle rotating device, made of stainless steel, to accept hybridisation bottles from 32mm to 76mm dia. (can be placed individually or in pairs, even with different diameters - the outer axles can be placed into pre-fabricated seats without the use of tools). Even results and high resolutions of the detections even when in continuous use due to its constant frequency of 12rpm.

1



2



Type	Internal dimensions (W x D x H) mm	Max. load kg	Capacity Litres	Movement type	Speed rpm	PK	Cat. No.
Mini incubator 4010	230 x 310 x 170	5	12	-	-	1	**9.535 605**
Mini roller incubator 4020	230 x 300 x 140	3	10	rotating	12, fixed	1	**9.535 607**

Special hybridisation bottles for Tube Roller Incubator 4020: see Hybridisation Incubator 7601 (accessories).

Further Roller mixers - please see page 510.

3 Hybridisation Incubator 7601

GFL

For exact hybridisations of DNA and RNA probes with nucleic acid on filter paper and for incubations of protein blots with antibodies. The small quantity of hybridisation liquid that is required enables the user to work with high concentrations of probes or antibodies. Other applications are also possible. Instead of the removable rotating rack, the Incubator's interior can be equipped with up to five, non-tilt and pull-out, trays (accessories). The unit bears the CE mark.

- microprocessor-controlled temperature regulation. Temperature range: approx. 8°C above ambient to +99.9°C, Temperature constancy (temporal): ±0.5°C. Temperature setting and display: digital - LED, in 0.1°C increments.
- the ventilator ensures optimum temperature distribution throughout the cabinet interior
- overtemperature cut-out: electronical, with visual alarm at 4°C above the set temperature, and electro-mechanical > 130°C. Electronic monitoring.
- variable rotating rack for up to 8 hybridisation bottles 51mm dia. or 16 hybridisation bottles 32mm dia. Rack rotation speed: 10 per minute, fixed
- soft-touch keys with clear symbols
- clear view of the interior cabinet through a large 16mm thick, heat-insulating, acrylic glass window
- switches for two 15W cabinet lamps
- interior parts of rotating rack made of stainless steel
- two clip wheels with 8 spring clips (type 7937) and 4 hybridisation bottles (type 7945) are included as standard
- housing: electrolytically galvanized sheet steel
- WxDxH (internal): 400 x 330 x 380mm W x D x H (external): 585 x 630 x 650mm
- supply requirements: 230V 50/60Hz, 550W (other voltages are available - details on request)
- weight: 45kg

3



Type	PK	Cat. No.
7601	1	**9.535 601**



1 Clip Wheel for Hybridisation Incubator 7601

Clip wheel 7940. Stainless steel, with holes for spring clips. Two clip wheels are included. Two more clip wheels can be inserted to double the capacity of shorter vessels. *GFL*

Type	PK	Cat. No.
7940	1	**9.535 640**



2 Spring Clips for Hybridisation Incubator 7601

Spring clips 7935, 7936, 7937. To attach hybridisation bottles onto the clip wheels. Two spring clips are required for each bottle. The required fixings are supplied with each clip. Eight spring clips 7937 are in the standard scope of supply. *GFL*

Type	For dia. mm	PK	Cat. No.
7935	32 (16/32) *	1	**9.535 635**
7936	38 (8/16) *	1	**9.535 636**
7937	51 (8/16) *	1	**9.535 637**

* Maximum number of clips per clip plate/number of clips required.

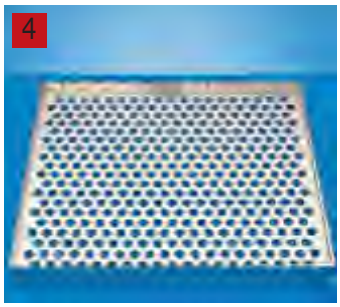


3 Special Hybridisation Bottles

Accessories for Hybridisation Incubator 7601 (see also GFL Tube Roller Incubator 4020). Borosilicate glass, with plastic screw cap perforated with 0.5mm centre hole for pressure compensation (also available unperforated on request). *GFL*

Type	Diam. mm	Length mm	Max. bottles per rack	PK	Cat. No.
7943	32	273	16	1	**9.535 643**
7944	38	273	8	1	**9.535 644**
7945	51	273	8	1	**9.535 645**

Other Accessories for GFL Shaking Incubators see Shakers, page 485.



4 Perforated Tray for Hybridisation Incubator 7601

Perforated tray 7914. Stainless steel, can only be used instead of the rotating rack, max. five trays. *GFL*

Type	PK	Cat. No.
7914	1	**9.535 614**

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

GFL

E & OE.

1 Incubator, mechanical control, B 28 series

BINDER

Robust, small, space-saving unit with hydraulic thermostat temperature controller and adjustable ventilation for accurate and reliable incubation.

- temperature range: 30°C to 70°C
- Adjustable air vent
- Inner glass door
- Available with, or without, overheat cut-out (Class 1)
- Internal volume: 28L
- External dimensions: 580 x 425 x 402mm
- Internal dimensions: 400 x 250 x 280mm

1



Type	Description	PK	Cat. No.
B28	without cut-out	1	**9.883 556**
B28*	with cut-out	1	**9.883 557**

* with overheat cut-out TB (Class 1)

2 Incubators, BD, BF series and cooling incubators, KB series

BINDER

BINDER incubators and cooling incubators stand for optimal incubation and for results that are reproducible in every routine test, even under high batch throughputs in long-term operation.
- Safe and reproducible incubation
- Disinfection routine at 100°C
- Broad range of products and applications

Serie BD: Incubators with gravity convection. The specialist for incubating organisms, as well as microbiological heating and conditioning.

Serie BF: Incubators with forced convection. It shines with its homogeneity and quick recovery times, even under a full load and high throughput.

Serie KB: Refrigerated incubators with forced convection. Safe incubation at high ambient temperatures. Additional options and a weekly programming function make it very versatile.

Equipment:
- Electronically controlled APT.line™ preheating chamber
- Temperature range: from 5°C above room temperature to 100°C (BD/BF), -5°C to 100°C (KB)
- Independent temperature safety device class 3.1 (DIN 12880) with optical and audible temperature alarm
- RS 422 interface for use with APT-COM™ DataControlSystem communication software
- Inner glass door

2



3



9.883 570

Type	Internal volume litres	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	PK	Cat. No.
BD 23	20	222 x 277 x 330	433 x 516 x 492	1	**9.883 599**
BD 53	53	400 x 330 x 400	634 x 575 x 617	1	**9.883 605**
BD 115	115	600 x 400 x 480	834 x 645 x 702	1	**9.883 606**
BD 240	240	800 x 500 x 600	1034 x 745 x 822	1	**9.883 607**
BD 400	400	1000 x 500 x 800	1234 x 765 x 1022	1	**9.883 603**
BD 720	720	1000 x 600 x 1200	1234 x 865 x 1528	1	**9.883 604**
BF 53	53	400 x 330 x 400	634 x 575 x 617	1	**6.206 495**
BF 115	115	600 x 400 x 480	834 x 645 x 702	1	**6.902 328**
BF 240	240	800 x 500 x 600	1034 x 745 x 822	1	**6.224 050**
BF 400	400	1000 x 500 x 800	1234 x 765 x 1022	1	**6.203 549**
BF 720	720	1000 x 600 x 1000	1234 x 865 x 1528	1	**9.883 625**
KB 23	23	222 x 277 x 330	433 x 516 x 618	1	**9.883 528**
KB 53	53	400 x 330 x 400	634 x 576 x 837	1	**9.883 568**
KB 115	115	600 x 400 x 480	834 x 646 x 1022	1	**9.883 569**
KB 240	240	650 x 485 x 785	925 x 800 x 1460	1	**9.883 570** 3
KB 400	400	650 x 485 x 1270	925 x 800 x 1945	1	**9.883 571**
KB 720	720	973 x 576 x 1250	1250 x 887 x 1925	1	**9.883 572**



1 Thermostatic cabinets

AQUALYTIC

The incubators from AQUALYTIC® are designed for continuous tempering for different applications, mainly for the determination of BOD, the storage of wastewater samples, and the determination of enzymatic activity.
The temperature range is +2°C up to +40°C and can be regulated in steps of 0.1°C.
Temperature tolerance is defined with ±1°C respectively ±0.5°C (at 20°C) and is specified to a stirred 500 ml sample in the middle of the cabinet.
The interior of the cabinets is equipped with sockets for connecting stirrers.
All cabinets are available with insulated glass door or standard metal door.

Specifications

Coolant:	R134a
Fan:	Axial, delivery rate 320m³/h
Power supply:	230V/50Hz

Description	Capacity L	PK	Cat. No.
With metal door	135	1	**9.699 040**
With metal door	195	1	**9.699 042**
With metal door	280	1	**9.699 044**
With metal door	395	1	**9.699 038**
With glass door	140	1	**9.699 041**
With glass door	195	1	**9.699 043**
With glass door	280	1	**9.699 045**
With glass door	395	1	**9.699 039**



9.538 012

Storage cooled chamber, IPS

NEW!

Memmert

Sample storage incubating and cooling in the food industry, medicine, the cosmetics industry, or pharmaceutics the storage cooled incubators with Peltier elements heat and cool seamlessly with one system.
Temperature range: + 14°C to +45°C.
maximum temperature fluctuation: better than 0.2°C (temporal), better then ±0.6°C (spatial at 18 to 25°C). With gentle, fan-assisted, air circulation via Peltier fan.
Further equipment see IPP models

Type	Internal volume	Internal dimensions (W x D x H)	Shelf support ribs/shelves	External dimensions (W x D x H)	Weight	PK	Cat. No.
	litres	mm		mm	kg		
IPS 260	256	640 x 500* x 800	9/2	824 x 774** x 1186	110.0	1	**9.538 011**
IPS 750	749	1040 x 600* x 1200	14/2	1224 x 874** x 1726	206.0	1	**9.538 012** 2

* Minus 10 mm for fan - Peltier
**Depth without door handle, please add 38mm



9.538 009

3 Peltier incubators IPP and IPPplus

NEW!

Memmert

The new incubator generation with the unique ControlCOCKPIT for a quick and intuitive operation. Heating and cooling seamlessly with one system thanks to Peltier technology.
Environmentally friendly and energy-saving. Vibration-free and extremely quiet.
Standard equipment:
- PID microprocessor control with integrated auto-diagnostic system
- Interior of stainless steel material 1.4301 (ASTM 304) with all-round deep-drawn ribs to integrate the large-area heating with ceramic-metal sheath
- Structured stainless steel housing, scratch-resistant, robust and durable; rear of zinc-plated steel
- High-temperature connectors on the rear of the appliance for single-phase power connection according to country specific systems and IEC standards
- Internal data logger with a storage capacity of at least 10 years
- German, English, French, Spanish language settings available on the ControlCOCKPIT
- Digital timer, adjustable between 1 minute and 99 days
- The SetpointWAIT function guarantees that the process time does not start until the set temperature is reached at all measuring points - optional for temperature values recorded by the freely positionable Pt100 sensors inside the chamber.
- Adjustment of three calibration values for temperature and additional appliance specific parameters directly at the ControlCOCKPIT

Type designation: plus = Models with TwinDISPLAY

Specifikations

Working temperature range without light:	0 to +70°C
Working temperature range with light:	+10 to +40°C
Setting temperature range:	0 to +70°C
Setting accuracy:	0.1°C

E & OE.

Peltier incubators IPP

NEW!

Memmert

SingleDISPLAY: ControlCOCKPIT with one TFT colour display

- Available parameters on the ControlCOCKPIT: Temperature (Celsius or Fahrenheit), fan speed, exhaust air flap position, programme time, time zones, summertime/wintertime
- One temperature sensor Pt100 DIN class A in a 4-wire circuit
- AtmoCONTROL software for reading out, managing and organising the data logger via Ethernet interface (90-days test version can be downloaded). USB stick with AtmoCONTROL software available as accessory (on demand)
- Ethernet interface on the rear of the appliance for reading out the protocol log and for online logging
- Double overtemperature protection: Electronic temperature monitoring with freely adjustable monitoring temperature with option A6 TWW/TWB (protection class 3.1 or 2), mechanical temperature limiter TB acc. to DIN 12 880.

1



9.538 002

Type	Internal volume	Internal dimensions (W x D x H)	Shelf support ribs/shelves	External dimensions (W x D x H)	Weight	PK	Cat. No.
	litres	mm		mm	kg		
IPP30	32	400 x 250* x 320	3 / 1	585 x 524** x 707	42	1	**9.538 001**
IPP55	53	400 x 330* x 400	4 / 1	585 x 604** x 787	51	1	**9.538 002** 1
IPP110	108	560 x 400* x 480	5 / 2	745 x 674** x 867	78	1	**9.538 003**
IPP260	256	640 x 500* x 800	9 / 2	824 x 774** x 1186	113	1	**9.538 004**
IPP750	749	1040 x 600* x 1200	14 / 2	1224 x 874** x 1726	208	1	**9.538 005**

* Minus 10 mm for fan - Peltier
**Depth without door handle, please add 56 mm

Peltier incubators IPPplus

NEW!

Memmert

TwinDISPLAY: ControlCOCKPIT with two TFT colour displays

- Available parameters on the ControlCOCKPIT: Temperature (Celsius or Fahrenheit), fan speed, exhaust air flap position, programme time, time zones, summertime/wintertime
- Two Pt100 sensors DIN class A in a 4-wire circuit for mutual monitoring, taking over functions in case of an error
- AtmoCONTROL software on a USB stick for programming, managing and transferring programmes via Ethernet interface or USB port
- HeatBALANCE function for application specific adjustment of heat output distribution (balance) between the upper and lower heating groups in an adjustment range between -50 % and +50 %
- ControlCOCKPIT with USB port for uploading programmes, reading out protocol logs, activating the User-ID function
- Displaying of already logged protocol data on the ControlCOCKPIT (max 10.000 values correspond to approx. 1 week)
- Ethernet interface on the rear of the appliance for reading out the protocol log and for uploading programmes and for online logging
- Multiple overtemperature protection: Electronic temperature monitoring TWW/TWB (protection class 3.3 or 2 resp. 3.3 for

units with active cooling) and mechanical temperature limiter TB (protection class 1) acc. to DIN 12 880, AutoSAFETY automatically adjusts to the set value within a freely adjustable tolerance range. Setting individual MIN/MAX values for over/undertemperature

2



9.538 009

Type	Internal volume	Internal dimensions (W x D x H)	Shelf support ribs/shelves	External dimensions (W x D x H)	Weight	PK	Cat. No.
	litres	mm		mm	kg		
IPP30plus	32	400 x 250* x 320	3 / 1	585 x 524** x 707	42	1	**9.538 006**
IPP55plus	53	400 x 330* x 400	4 / 1	585 x 604** x 787	51	1	**9.538 007**
IPP110plus	108	560 x 400* x 480	5 / 2	745 x 674** x 867	78	1	**9.538 008**
IPP260plus	256	640 x 500* x 800	9 / 2	824 x 774** x 1186	113	1	**9.538 009** 2
IPP750plus	749	1040 x 600* x 1200	14 / 2	1224 x 874** x 1726	208	1	**9.538 010**

Type designation: plus = Models with TwinDISPLAY
*Minus 10 mm for fan - Peltier
**Depth without door handle, please add 56mm

Cooled incubators with compressor cooling ICP

NEW!

Memmert

The new cooled incubator generation with the unique ControlCOCKPIT for a quick and intuitive operation. Ideal at temperatures around zero and below.
For rapid and precise alternation between heating up and cooling down times in ramp operation. Extraordinarily quiet.

Standard equipment:
- PID microprocessor control with integrated auto-diagnostic system
- Interior stainless steel, material 1.4301 (ASTM 304)
- Structured stainless steel housing, scratch-resistant, robust and durable; rear of zinc-plated steel
- High-temperature connectors on the rear of the appliance for single-phase power connection according to country specific systems and IEC standards
- Internal data logger with a storage capacity of at least 10 years
- German, English, French, Spanish language settings available on the ControlCOCKPIT
- Digital timer, adjustable between 1 minute and 99 days
- The SetpointWAIT function guarantees that the process time does not start until the set temperature is reached at all measuring points - optional for temperature values recorded by the freely positionable Pt100 sensors inside the chamber.
- Adjustment of three calibration values for temperature and additional appliance specific parameters directly at the ControlCOCKPIT
- mounted on lockable castors

TwinDISPLAY: ControlCOCKPIT with two TFT colour displays
- Available parameters on the ControlCOCKPIT: Temperature (Celsius or Fahrenheit), fan speed, exhaust air flap position, programme time, time zones, summertime/wintertime
- Two Pt100 sensors DIN class A in a 4-wire circuit for mutual monitoring, taking over functions in case of an error
- AtmoCONTROL software on a USB stick for programming, managing and transferring programmes via Ethernet interface or USB port
- HeatBALANCE function for application specific adjustment of heat output distribution (balance) between the upper and lower heating groups in an adjustment range between -50 % and +50 %
- ControlCOCKPIT with USB port for uploading programmes, reading out protocol logs, activating the User-ID function
- Displaying of already logged protocol data on the ControlCOCKPIT (max 10.000 values correspond to approx. 1 week)
- Ethernet interface on the rear of the appliance for reading out the protocol log and for uploading programmes and for online logging
- Multiple overtemperature protection: Electronic temperature monitoring TWW/TWB (protection class 3.3 or 2) and mechanical temperature limiter TB (protection class 1) acc. to DIN 12 880, AutoSAFETY automatically adjusts to the set value within a freely adjustable tolerance range. Setting individual MIN/MAX values for over/undertemperature alarm

Specifikations

Working temperature range:	- 12 to +60°C (ICP 55: 0 to +60°C
Setting temperature range:	- 12 to +60°C (ICP 55: -5 to +60°C
Setting accuracy:	- 0.1°C

Type	Internal volume	Shelf support ribs/shelves	Internal dimensions (W x D x H)	External dimensions (W x D x H)	Weight	PK	Cat. No.
	litres		mm	mm	kg		
ICP 55	53	4/1	400 x 330* x 400	585 x 514** x 1153	88	1	**9.538 013**
ICP 110	108	5/2	560 x 400* x 480	745 x 584** x 1233	109	1	**9.538 014**
ICP 260	256	9/2	640 x 500* x 800	824 x 684** x 1552	153	1	**9.538 015**
ICP 450	449	8/2	1040 x 600* x 720	1224 x 784** x 1613	217	1	**9.538 016**
ICP 750	749	14/2	1040 x 600* x 1200	1224 x 784** x 1950	249	1	**9.538 017** 1

* Minus 30 mm for fan
**Depth without door handle, please add 56 mm

1



9.538 017

E & OE.

CO_2 Incubators INCOmed

Memmert

For cell cultivation and for in-vitro fertilisation, the precision and reliability are of crucial importance. The classification as class IIa medical device confirms that the INCOmed models comply with the basic safety requirements of the European Medical Devices Directive 93/42/EEC.

Standard equipment

Ventilation and Control:
- uniform atmosphere and temperature distribution owing to enclosed non-turbulent ventilation system in working chamber
- adaptive, fuzzy-supported multifunctional digital microprocessor PID-controller
- integral fault diagnostics on temperature, CO_2 and humidity limit control
- 2 x Class A , 4-wire circuit, Pt100 sensors mutually monitoring and maintaining the performance at the same temperature value
- digital 7-day programme timer with real time clock, precise minute setting
- digital display (LED) of all set parameters, such as temperature, weekdays, time, CO_2, humidity and set-up values - language to be chosen in setup
- CO_2 supply via sterile filter
- digital electronic CO_2 control with automatic zeroing (infrared measuring system)
- CO_2-supply being interrupted upon door opening
- digital display of set and actual values (LED 0.1°C resolution) of temperature and CO_2-concentration
- integral humidity limit control (88 to 97%) with digital display of relative humidity - setting accuracy 1%
- non-volatile, programme memory
- chip card (STERICard) for sterilization of working chamber with fixed cycle (4 hours/160°C) without removal of sensors and mountings

Heating Concept:
- large-area multi-function heating system on four sides incl. additional door and back heating to avoid condensation
- incl. works calibration certificate for +37°C

Multiple Overtemperature Protection:
- with audible and visual alarm in case of over-/undertemperature and over-/under-CO_2,open door and empty gas cylinder
- independently working, digitally adjustable electronic overtemperature controller TWW protection class 3.1
- additional adjustable Auto-Safety-Function "ASF" for over- and undertemperature automatically following the set value at a preset tolerance range
- mechanical temperature limiter TB class 1 switching the heating off at approx. 10°C above max. oven temperature

Textured Stainless Steel Casing:
- fully insulated stainless steel door with double locking and 4-point adjustment
- inner glass door with opening (8mm dia.) to take gas samples
- zinc-plated, steel rear panel

Interior:
- easy-to-clean interior, made of stainless steel, reinforced by deep drawn ribbing, material no. 1.4301, hermetically welded

Temperature Range: from +20°C (however at least 8°C above ambient) up to +50°C
Power supply: 230V (±10%), 50/60Hz

1



9.867 732

2



9.867 733

Type	Internal dimensions/housing (WxHxD) mm
INCO108med	560 x 480 x 400*/710 x 778 x 550**
INCO153med	480 x 640 x 500*/630 x 938 x 650**
INCO246med	640 x 640 x 600*/790 x 938 x 750**
	* Minus 25 mm for fan
	** Depth without door handle, please add 38 mm

Type	Internal volume	Shelf support ribs	Shelves	Stainless steel water dishes	Rating	Weight	PK	Cat. No.
	litres				W	kg		
INCO108med basic model	108	4*	2*	1*	1000	70	1	**9.867 732** 1
INCO53med basic model	153	6*	3*	1*	1500	80	1	**9.867 733** 2
INCO246med basic model	246	6*	3*	2**	2000	110	1	**9.867 734**
INCO108med with Premium-Modul T5	108	4*	2*	1*	1000	70	1	**9.867 703**
INCO153med with Premium-Modul T5	153	6*	3*	1*	1500	80	1	**9.867 704**
INCO246med with Premium-Modul T5	246	6*	3*	2**	2000	110	1	**9.867 705**

*full width
**half width



9.867 702

Accessories for CO_2 Incubators INCOmed

Memmert

Comfort module:
two gas connections with quick release connectors, automatic switch-over gas cylinders (impossible in combination with O_2 module)
Hygiene module:
electropolished interior, seamlessly welded by laser
Communication module:
USB interface, "Celsius" standard software for the control and logging of temperature, CO_2; O_2 (with O_2 module) and relative humidity; internal log memory 1024 kB as ring memory for all setpoint values, actual values, errors, settings with real time and date: logging approx. 3 months at 1 min. logging interval; parallel printer interface for all PCL3-compatible printers
CO_2 module:
extended CO_2 range from 0 to 20%
Premium module:
includes Comfort, Hygiene, Communication and CO_2 module (impossible in combination with O_2 module)
Humidity module:
active microprocessor control for humidifying and dehumidifying (40 - 97% rh), incl. digital indication and auto-diagnostic system; humidity supply with distilled water (from an external tank) , dehumidifying via sterile filter; (standard humidity limit control and water dishes are omitted)
O_2 module:
control of oxygen concentration by N2 inlet, adjustment range 1% bis 20% O_2, setting accuracy 0.1%

Combination O_2 module with Comfort and Premium module impossible

Type	Description	PK	Cat. No.
B00325 INCOmed 108	Additional stainless steel shelf, full width	1	**9.867 707**
B00321 INCOmed 153	Additional stainless steel shelf, full width	1	**9.867 708**
B03813 INCOmed 246	Additional stainless steel shelf, full width	1	**9.867 748**
B02787 INCOmed 108	Additional stainless steel shelf, full width	1	**9.867 709**
B02784 INCOmed 153	Additional water tray, full width	1	**9.867 710**
B02786 INCOmed 246	Additional water tray, half width	1	**9.867 711**
E02087	CO_2 Pressure reduction valve (DIN 8546), incl. gas-cylinder monitor	1	**9.867 755**
E06162	O_2 Pressure reduction valve (DIN EN ISO 2503) incl. gas-cylinder-bottle monitor	1	**9.867 712**
B04459	HEPA Interior filter	1	**9.867 731**
V2	RS485 interface (for cross linking of several devices) instead of USB	1	**9.867 713**
E04337	Additional Steri-Card (only for interior-sterilization)	1	**9.867 702** 1
W6	RS232 interface instead of USB	1	**9.867 722**
T1	Comfort module for INCOmed 108/153/246	1	**9.867 735**
T2	Hygiene module for INCOmed 108	1	**9.867 736**
T2	Hygiene module for INCOmed 153	1	**9.867 737**
T2	Hygiene module for INCOmed 246	1	**9.867 738**
T3	Communication module for INCOmed 108	1	**9.867 739**
T3	Communication module for INCOmed 153	1	**9.867 740**
T3	Communication module for INCOmed 246	1	**9.867 741**
T4	CO_2 module for INCOmed 108	1	**9.867 742**
T4	CO_2 module for INCOmed 153	1	**9.867 743**
T4	CO_2 module for INCOmed 246	1	**9.867 744**
T5	Premium module for INCOmed 108	1	**9.867 745**
T5	Premium module for INCOmed 153	1	**9.867 746**
T5	Premium module for INCOmed 246	1	**9.867 747**
T6	O_2 module for INCO 108, 153, 246	1	**9.867 749**
K7	Active humidity control microprocessor (40 to 97% RH) for INCOmed 108/153/246	1	**9.867 706**
F7	Entry port in the rear, heated, with silicone stopper, 40 mm inner diameter	1	**9.867 750**



E & OE.

1 CO_2 incubators, C Series


1

The BINDER C is the fitting partner for routine applications for cell cultivation, contamination-free due to hot-air sterilisation at 180°C, reliable pH-stable thanks to the drift-free FPI infrared measuring system, high temperature precision with excellent dynamic and no risk of condensation even in high humidity. *BINDER*

Equipment:
- Air jacket system assuring temperature accuracy and excellent cell growth
- Temperature range from 7°C above ambient up to 50°C
- Water pan with built-in condensation control maintains dry interior walls
- Standard-compliant hot air sterilisation at 180°C (DIN 58947)
- Seamless deep-drawn inner chamber made of stainless steel with integrated shelf support system
- Drift-free infrared CO_2 measurement system
- Microprocessor with LED display for temperature and CO_2 concentration
- Independent temperature safety device class 3.1 (DIN 12880) with optical and audible temperature alarm
- Gas mixing head
- Interior volume 150L

Type	Description	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	PK	Cat. No.
C 150	right hinged door	500 x 500 x 600	680 x 815 x 820	1	**9.883 720**
C 150	left hinged door	500 x 500 x 600	680 x 815 x 820	1	**9.883 721**
2 C 150	incl. stacking adapter, right hinged door	500 x 500 x 600	680 x 815 x 1785	1	**9.883 722**
2 C 150	incl. stacking adapter, left hinged door	500 x 500 x 600	680 x 815 x 1785	1	**9.883 723**

CO_2 incubators, CB series


2

9.883 701


3

9.883 707

The BINDER CB series is the premium class for all sensitive incubation applications. Even during complex cultivation experiments or individual environments under hypoxic conditions, it is easy to grow thanks to a comprehensive assortment of options and accessories. *BINDER*

Advantages:
- Hot air sterilisation at 180°C
- Seamless, deep-drawn inner chamber made of stainless steel
- Unique BINDER technology (patented air jacket system, controlled condensation, etc.)

Equipment:
- Electronically controlled APT.line™ preheating chamber assuring temperature accuracy and reproducible results
- Temperature range from 5°C above ambient temperature to 60°C
- MCS controller for temperature and CO_2 concentration
- Standard-compliant hot air sterilization at 180°C (DIN 58947)
- VENTAIR™ Jacket System
- Drift-free infrared CO_2 measurement system
- Permadry System, condensation-free double-pan humidification system, maintains dry interior walls
- Seamless deep-drawn inner chamber made of stainless steel with integrated shelf support system (flanges)
- Electronic self-diagnostic system for errors with visual and audible alarms, as well as relay potential changeover contact for central monitoring
- Independent temperature safety device class 3.1 (DIN 12880) with optical and audible temperature alarm
- RS 422 interface for communication software APT-COM™ DataControlSystem
- 2 perforated stainless steel shelves with standard equipment and O2 control

Type	Internal volume litres	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	PK	Cat. No.
CB 53	53	400 x 332 x 400	580 x 545 x 720	1	**9.883 725**
CB 150	150	500 x 500 x 600	680 x 722 x 919	1	**9.883 701** 2
CB 210	210	560 x 500 x 750	740 x 722 x 1069	1	**9.883 702**
CB 53*	53	400 x 332 x 400	580 x 545 x 720	1	**9.883 620**
CB 150*	150	500 x 500 x 600	680 x 722 x 919	1	**9.883 707** 3
CB 210*	210	560 x 500 x 750	740 x 722 x 1069	1	**9.883 706**
CB 53**	53	400 x 332 x 400	580 x 545 x 720	1	**9.883 724**
CB 150**	150	500 x 500 x 600	680 x 722 x 919	1	**9.883 704**
CB 210**	210	560 x 500 x 750	740 x 722 x 1069	1	**9.883 703**
CB 53***	53	400 x 332 x 400	580 x 545 x 720	1	**7.900 354**
CB 150***	150	400 x 332 x 400	680 x 722 x 919	1	**9.883 709**
CB 210***	210	560 x 500 x 750	740 x 722 x 1069	1	**9.883 708**

* With divided glass door.
**With O2 control.
***With O2 control and divided glass door.

1 Midi 40 CO_2 Incubator with small volume

Thermo Scientific

The Thermo Scientific Midi 40 CO_2 incubator is designed specifically for cell culture scientists who require a compact culturing workspace to handle small workloads, perform personal use applications, or simply address limited space environments. With its 1.4 cu ft (40L) capacity, the Midi 40 adds a new dimension to the Thermo Scientific portfolio of leading CO_2 incubation solutions. It delivers the performance and capabilities of full-sized incubators in a space-saving footprint, ideal for those who wish to avoid shared-use environments that can present potential contamination risk through unnecessary sample handling and repeated door openings. Easy to operate and economical to own, the fully featured Midi 40 offers remarkable value in a small footprint.

The Midi 40 includes:
- Advanced IntrLogic™ II microprocessor: bright digital display and intuitive touchpad for simplified entry of temperature, CO_2 and alarm data, with keyed setpoint switch to prevent unauthorised changes to your operating parameters.
- Stainless steel culture chamber: seamless, non-corrosive and exceptionally easy to clean. The Midi 40 is provided with four removable shelves.
- Highly efficient direct heating design: provides even heat distribution to all sides of the chamber, for accurate control with uniformity of ±0.1°C.
- Precise and reliable CO_2 control: featuring accurate thermal conductivity sensor located directly in the chamber, ensuring responsive control and long service life.
- Removable water reservoir: generates relative humidity values up to 95% with rapid recovery rates that promote optimal cell growth.
- Heated inner glass door: provides sample security while preventing unwanted condensation.
- Convenient data communication: RS-485 signal output is standard, in addition to audible and visual alarm functions to ensure proper operations.

Type	PK	Cat. No.
Midi-40	1	**4.009 273**

1



Accessories for Midi 40 CO_2 Incubator

Thermo Scientific

Description	PK	Cat. No.
Shelf, Midi 40 CO_2	1	**4.009 356**
2-Stage Regulator - CO_2	1	**4.009 534**
Disposable Filter 99.97	1	**4.009 525**
Fyrite Fluid CO_2	3	**4.009 352**

1 2 3 Shaking Incubators 3031, 3032 and 3033 with Orbital Motion

GFL

Specialising in gentle mixing as well as vigorous shaking, GFL Shaking Incubators are used for applications that require exactly reproducible orbital motions and temperatures of up to +70°C, e.g. incubations, fermentations, homogenisations, chemical and biochemical reactions, enzyme and tissue studies, as well as for bacterial culture. The units bear the CE mark.
Incubation time, temperature and shaking frequency regulation are microprocessor-controlled. Fast and exact temperature setting, exact reproducibility of set values.

- built-in RS232 serial interface for remote control of measurement and control tasks via PC, compatible with PC software programme e.g. labworldsoft®
- temperature range: from 8°C above ambient to +70°C. Serial cooling coil for operation below ambient temperature. Operation with cooling coil: +20°C to +70°C (dependent on cooling media and ambient temperature)
- temperature constancy (temporal): ±0.2°C
- soft-touch keys with clear symbols
- setting and display of temperature (in 0.1°C increments), shaking frequency and incubation time: digital - LED.
- optimum temperature distribution throughout the cabinet interior with a ventilator
- electronic monitoring of the temperature controller. Over-temperature cut-out: electronical/dependent on the set value, to protect the test substances, and electro-mechanically, to protect the unit. Under-temperature cut-out: electronical, max. 9.9°C below set temperature.
- shaking motion: orbital, can be switched on and off.
- silent and robust shaking mechanism with gentle start-up.
- Incubation time: 1 minute to 999:59 hours
- the microprocessor-controlled timer continuously displays the remaining period of the incubation process and triggers an audible alarm at the finish
- Maximum load 3031/3032/3033: 12kg/12kg/20kg
- Supply requirements: 230V 50/60 Hz, 0.8kW (other voltages are available on request)

Type 3031:
Lift-up, transparent acrylic cover. Volume/capacity: approx. 46 litres/1 shaking tray. Outer casing made of heavy-duty ABS and powder-coated, electrolytically galvanized sheet steel. The aluminium shaking platform includes four plastic pins to accept a shaking tray or a universal mount (accessories).
- shaking frequency: 10 to 250rpm max.

Type 3032 (one-door design)/**Type 3033** (two-door design):
Acrylic window panels. Volume: approx. 45L/approx. 150L, capacity: 2 shaking trays (for vessel heights > 150 mm/180 mm: 1 shaking tray). Outer casing in powder-coated, electrolytically galvanized sheet steel. Interior cabinet, the insides of the doors and the shaking platform are stainless steel. The frame, permitting the use of two shaking trays, is included. A fluorescent lamp for interior illumination is separated from the interior cabinet by a diffusing screen.
- Shaking speed type 2032: 10 to max. 250rpm
- Shaking speed type 3033: 10 to max. 250rpm, if only bottom tray is fitted, max. 200rpm, if both trays are fitted

1



2



3



Type	Amplitude mm	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Max. kg	Weight kg	PK	Cat. No.
3031	30	450 x 450 x 280	525 x 665 x 570	12	38.50	1	**9.837 926**
3032	25	450 x 300 x 320	710 x 650 x 710	12	70.00	1	**9.837 927**
3033	25	674 x 540 x 430	930 x 890 x 820	20	135.00	1	**9.837 929**

Other accessories for GFL Shaking Incubators (test tube rack, holding frame for a test plate, non-slip rubber mat, universal mount) please see "GFL Shakers".

4 Trays for Shaking Incubators

GFL

Tray 3966 for Shaking Incubator 3031 and GFL Shakers 3011 to 3018
Stainless steel, 450mm x 450mm. With holes to accept clamps for Erlenmeyer flasks and other acessories.

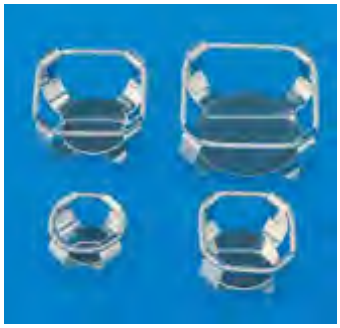
Tray 3970 for Shaking Incubator 3032
Stainless steel, 450mm x 300mm. With holes to accept clamps for Erlenmeyer flasks and other acessories.

Tray 3980 for Shaking Incubator 3033 and GFL Shakers 3019 to 3020
Anodised aliminium, 670mm x 537mm. With holes to accept clamps for Erlenmeyer flasks and other acessories.

4



Type	For Type	PK	Cat. No.
Tray 3966	3031 / 3011 to 3018	1	**9.837 936**
Tray 3970	3032	1	**9.837 990**
Tray 3980	3033 / 3019 / 3020	1	**9.837 980**



1 Clamps for Erlenmeyer Flasks

Clamps for Shaking Incubators 3031/3032/3033 with orbital motion, to be screwed onto **trays 3966, 3970 and 3980**. Made of stainless steel. *GFL*
Complete with fixing material (see also GFL Shakers 3005 to 3020).

Type	For flasks ml	Clips required shaker Model 3966	Clips required shaker Model 3970	Clips required shaker Model 3980	PK	Cat. No.
3983	25	79	52	99	1	**9.837 983**
3984	50	49	33	99	1	**9.837 984**
3985	100	36	22	50	1	**9.837 985**
3986	200	22	15	26	1	**9.837 986**
3987	250-300	16	13	26	1	**9.837 987**
3988	500	12	10	26	1	**9.837 988**
3989	1000	9	6	12	1	**9.837 989**
3990	2000		3	9	1	**9.837 991**

3032 (Shaking tray 3970): Clamps for 300ml and larger: 1 tray only can be used
3033 (Shaking tray 3980): Clamps for 1000ml and larger: 1 tray only can be used

Other clamps on request

Other Accessories for GFL Shaking Incubators see Shakers, please see page 485.

2



6.251 451

Shaking Incubators ES-20/ES-80

NEW!

Stable and reliable orbital shaker-incubator for vigorous or even mixing and incubation of samples in a variety of flasks and vessels. For Life Sciences, suitable for growing cell cultures in flasks, extracting tissue samples at physiological, temperatures, and sample preparation processes, mixing of biological liquids as well as the incubation and cultivation of biological liquids, growing e-coli, bioluminescence preparation. *Grant*

- Variable speed: 50 to 250rpm
- Digital control of time, temperature and shaking speed for accuracy and repeatability
- Display 2-line 16 character LCD
- Interchangeable platforms for shaking/incubating different vessels (please order separately)

Specifications

Speed range:	50 to 250rpm
Temperature range ES-20:	+25 to +42°C
Temperature range ES-80:	+25 to +80°C
Temperature setting resolution:	0.1°C
Stability:	±0.5°C
Shaking movement:	orbital
Orbit ES-20:	10mm
Orbit ES-80:	20mm
Continuous operation ES-20:	96hrs
Continuous operation ES-80:	168hrs
Timer:	1min to 96hrs
Load capacity ES-20:	2.5kg
Load capacity ES-80:	8kg
Power supply:	230V 50/60Hz
Supply requirements:	230V 50/60Hz

3



9.721 056

Type	Dimensions (W x D x H) mm	PK	Cat. No.
ES-20	340 x 340 x 435	1	**6.251 451** 2
ES-80	590 x 525 x 510	1	**9.721 056** 3

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

Grant

E & OE.

Accessories for Shaking Incubators ES-20/ES-80

Grant

Type	Description	For Type	PK	Cat. No.
P12-100	Platform with clamps for 12 x 100ml flasks / 150ml beakers	ES-20	1	**9.721 023** 1
PP-4	Flat platform with non slip rubber mat	ES-20	1	**9.721 022**
P6-250	Platform with clamps for 6 x 250ml flasks / 400ml beakers	ES-20	1	**9.721 024**
PUP-12	Universal platform	ES-20	1	**9.721 021** 2
P16-88	Platform with spring holders for 88 tubes up to 30mm	ES-20	1	**9.721 049** 3
PP-400	Flat platform with non slip rubber mat	ES-80	1	**9.721 060**
P30-100	Platform with clamps for 30 x 100 ml flasks	ES-80	1	**9.721 061**
P16-250	Platform with clamps for 16 x 250 ml flasks	ES-80	1	**9.721 062**
P9-500	Platform with clamps for 9 x 500 ml flasks	ES-80	1	**9.721 063**
P6-1000	Platform with clamps for 6 x 1000 ml flasks	ES-80	1	**9.721 064**

1



9.721 023

2



9.721 021

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9.721 049

4 Shaking Incubator's, SI500/SI505/SI600

Stuart

- Digital LED control panel
- Microprocessor controlled
- Independent control of speed and temperature
- Timer 1 second to 9 days
- Alarm
- Retraceble platform, easier access to the samples

4



Shaking Incubator, SI505

NEW!

Stuart

The SI505 has been designed specifically to combine a bench top laboratory incubator with the specific mixing action required for microtitre plates. With a tight orbit of 1.5mm and a high speed shaking action between 250rpm and 1250rpm even the smallest of vessels can be adequately mixed.
To minimize sample evaporation the SI505 is supplied with stainless steel water trays, these are strategically placed within the unit to maintain a humidity of up to 80%, thus dramatically reducing sample evaporation over a 24 hour period.

Specifications

Temperature range:	Amb.+7°C to 60°C
Samples:	4 x microplates or 2 x microtube racks
Display resolution:	0.1°C
Precision:	±0.5°C at 37°C
Fluctuation:	±0.5°C at 37°C
Variation:	< 0.6°C at 37°C
Speed range:	250 to1250rpm
Timer:	min/sec, hr/min, days/hrs
Platform size:	220 x 220mm
Max. load:	1kg
Heater power:	200W

Type	Amplitude	Internal dimensions (W x D x H)	External dimensions (W x D x H)	Weight	PK	Cat. No.
	mm	mm	mm	kg		
SI505	1.5	307 x 300 x 190	361 x 405 x 430	22.50	1	**9.645 350**

1



9.951 612

Shaking Incubator's, SI500/SI600

Stuart

The SI500 combined shaker and incubator is ideal for scientists doing cell culturing procedures, especially suspension culture applications. It is compact enough to be positioned on the laboratory bench. The platform of both models has a versatile clamping system which secures most sizes and mixtures of flask up to 1 litre capacity for the SI500 and 2 litre capacity for the SI600. Typically, the platform of the SI500 will accommodate the following Erlenmeyer flasks: 12 x 250ml, or 9 x 500ml or 6 x 1000ml. The SI600 will accomodate 6 x 2 l, 9 x 1000 ml or 15 x 500 ml Erlenmeyer flasks. A range of accessory racks are available to hold 1.5ml, 15ml, 30ml and 50ml sample tubes, the angle of the tubes can be adjusted up to 30°. These accessory racks are held to the orbiting platform by a patent pending Magnalock system, allowing quick coupling and de-coupling without tools. Both units also features a USB connection which allows the incubator to be connected to a PC for long term monitoring of the incubator temperature, over night of weekends for example.

Specifications

Temperature range:	Amb.+ 5°C to + 60°C
Samples:	adjustable platform or tube racks
Display resolution:	0.1°C
Precision:	±0.5°C at 37°C
Fluctuation:	±0.5°C at 37°C
Variation:	< 0.5°C at 37°C
Speed range:	30 to 300rpm
Timer:	min/sec, hr/min, days/hrs
Platform size	
SI500:	335 x 335mm
SI600:	526 x 390mm
Max. vessel height	
SI500:	250 mm
SI600:	300 mm
Volumen	
SI500:	51 l
SI600:	115 l
Max. load:	10kg
Heater power	
SI500:	250 W
SI600:	400 W
Supply requirements:	230V 50Hz

Type	Amplitude mm	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
SI500	16.0	422 x 408 x 297	450 x 474 x 522	30.00	1	**9.951 612** 1
SI600	16.0	623 x 465 x 395	675 x 542 x 642	55.00	1	**9.645 351**

2



2 Tube racks for Shaking incubator SI500/SI505/SI600

Stuart

Type	Capacity	For	PK	Cat. No.
SI500/1	64 x 1.5ml microtubes	SI500/SI600	1	**6.234 298**
SI500/2	25 x 15ml centrifuge tubes	SI500/SI600	1	**9.645 346**
SI500/3	12 x 50ml centrifuge tubes	SI500/SI600	1	**6.234 299**
SI500/4	16 x 30ml universal containers	SI500/SI600	1	**9.645 347**
SSM5/1	1.5 ml tubes	SI505	1	**9.728 851**
SSM5/2	0.5 ml tubes	SI505	1	**9.728 852**
SSM5/3	0.2 ml tubes	SI505	1	**9.728 854**

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

stuart

E & OE.

Incubator 1000, suitable for Heidolph Platform Shakers

1



9.839 875

This truly unique system enables you to perform a number of function simultaneously: *Heidolph*
Shaking, mixing and heating with visual reaction control. These platform shakers are
compatible with the incubator system: Duomax 1030, Polymax 1040, Titramax 1000, Unimax 1010 und Promax 1020.

- Heating module allows for gentle temperature adjustments up to 65°C
- Electrical heater allows for quick and even temperature distribution throughout the entire enclosure
- Unlimited visual reaction control at all times: The transparent and non-fogging PETG construction offers it all
- Three options available: A flat hood for small vessels and mictrotiter plates, a high hood for all common medium sized vessels and even a high hood XL for larger Erlenmeyer flasks up to 2000ml
- Immediate access: The incubator hood opens instantly and interlocks in any position
- Use ONE incubator for numerous shakers, interchangeability is ensured and takes less than 2 mins. You can incubate and mix simultaneously or independently

Heating module
- Heating capacity of 300W allows for quick temperature adjustments
- Digital temperature settings up to 65°C and separate display for actual temperature
- To protect your sample from thermal damages this unit features a safety circuit to prevent overheating
- Electrical heater comes with low, noise blower and provides accuracy of ±2°C up to 50°C and ±4°C over 50°C

Type	Width mm	Depth mm	Height mm	PK	Cat. No.
Incubator 1000, heating module	170	375	97	1	**9.839 875** 1
Incubation hood, low, for dishes, tubes etc.	546	394	163	1	**9.839 876**
Incubation hood, high, for beakers, flasks and funnels	546	394	267	1	**9.839 877**
Incubation hood XL	546	394	428	1	**9.839 878**

Platform shakers from Heidolph - please see page 500.

2 Benchtop Incubated Shaker MaxQ 420 HP

NEW!

2



Thermo Scientific MaxQ 420 HP Benchtop Incubated Orbital Shakers include *Thermo Scientific*
class-leading temperature uniformity for optimum growth, the highest large-flask
capacity for the best value, and durable components for long life. Performing over a wide temperature range of 5ºC
above ambient to 80ºC with control of ±0.1ºC it ensures flexibility for a broad range of applications.

- Double-wall, insulated chamber contributes to optimum growth
- Twin blowers and gasketed lid ensure temperature uniformity of ±0.3°C (in flask) creating an ideal environment for temperature sensitive cultures
- Microprocessor functions are calibrated through keypad
- Audible/visual over and under-temperature alarms ensure sample protection
- Clear acrylic lid withstands years of use without cracking or discolouration
- Spill tray, sealed mechanism and control panel, and outside-the-chamber location of electronics ensure that shaker components are not damaged by spills, contributing to long unit life

Specifications

Speed Range:	25rpm to 525rpm
Accuracy:	±1rpm
Orbit Diameter:	2.5cm
Timer Range:	1min to 199h 59min or continuous operation (hold)
Overall Dimensions (WxDxH):	61.7 x 73.7 x 53.1cm
Chamber Dimensions (WxDxH):	54.4 x 53.8 x 32.0cm
Power supply:	230V, 50/60Hz

Type	Description	Temp. range °C	Weight kg	PK	Cat. No.
MaxQ 420 HP	with hood	RT +5 ... +80	83,9	1	**9.721 205**

Platforms for Orbital Shakers 420 MaxQ HP

Thermo Scientific

Description	Size cm	PK	Cat. No.
Universal Platform	457 x 457	1	**4.009 442**
Special Platform with 49x25ml clamps	457 x 457	1	**4.009 446**
Special Platform with 49x50ml clamps	457 x 457	1	**4.009 447**
Special Platform with 25x125ml clamps	457 x 457	1	**4.009 448**
Special Platform with 18x250/300ml clamps	457 x 457	1	**4.009 449**
Special Platform with 16x500ml clamps	457 x 457	1	**4.009 450**
Special Platform with 8x1l clamps	457 x 457	1	**4.009 451**
Special Platform with 6x2l clamps	457 x 457	1	**4.009 452**
Special Platform with 4x4l clamps	457 x 457	1	**4.009 480**
Special Platform with 2x6l clamps	457 x 457	1	**4.009 481**
Special Platform with 4x2.8l clamps	457 x 457	1	**4.009 482**
Special Platform with 36x125ml clamps	457 x 457	1	**4.009 483**
Special Platform with 4x5l clamps	457 x 457	1	**4.009 487**

1 MaxQ 4000, Orbital Shaker with a Spacious Chamber

Thermo Scientific

- Spacious chamber holds six 2L flasks.
- View speed, time and temperature simultaneously.
- Choose from three temperature ranges.
- Clear lid allows sample viewing without disturbing chamber atmosphere.
- Choice of analog or digital operating systems.
- Triple eccentric drive handles heavy loads, provides uniform agitation and continuous 24-hour operation, even at high speeds.
- View speed, operating time and temperature simultaneously on three individual LED displays.
- User-adjustable speed calibration
- Unbalanced load sensor
- Soft start feature
- Over-temperature safety feature with independent thermostat provides additional backup by controlling heat if main temperature controller fails.
- Five year warranty on parts, one year labor and LIFETIME on mechanism.

Also available with analog operating system.

Platforms and clamps -please order separately.

Specifications

Speed range, rpm:	15 to 500, ±1 rpm digital 40 to 400, ±1 rpm analog
Temperature accuracy:	±0.1°C accuracy at 37°
Operating time:	0.1 hour to 999 hours or 0.1 minute to 999 minutes
Dimensions (L x W x H):	813mm x 572mm x 559mm
Supply requirements:	240V, 50/60 Hz

Description	Temp. range °C	Load max. kg	Amplitude mm	PK	Cat. No.
Bench-Top-Shaker incubated, analog	RT +10 ... 60	22.7	19.0	1	**4.011 049**
High Temperature Bench-Top-Shaker incubated, analog	RT +10 ... 80	22.7	19.0	1	**4.011 050**
Refrigerated Bench-Top-Shaker incubated, analog	RT - 15 ... 60	22.7	19.0	1	**4.011 051**
Bench-Top-Shaker incubated, digital	RT +10 ... 60	22.7	19.0	1	**4.011 060**
High Temperature Bench-Top-Shaker incubated, digital	RT +10 ... 80	22.7	19.0	1	**4.011 061**
Refrigerated Bench-Top-Shaker incubated, digital	RT - 15 ... 60	22.7	19.0	1	**4.011 062**



E & OE.

1 MaxQ 4450 Compact Benchtop Incubated Shakers, orbital

Thermo Scientific

- Holds up to 4 x 1L flasks.
- Requires minimal bench space.
- Choose between two temperature ranges, 5°C above ambient to 80°C or 5°C below ambient to 80°C.
- Clear lid lets you view samples without disturbing internal temperature
- Triple eccentric drive handles heavy loads, provides uniform agitation and continuous 24-hour operation, even at high speeds.
- Monitor and control chamber temperature range with ±0.1°C accuracy and ±0.5°C uniformity at 37°C.
- View speed, operating time and temperature simultaneously on three individual LED displays.
- Visual/audible alarms alert you to temperature deviations. Heat turns off if temperature deviates ±1°C of set point.
- Soft start feature eliminates sudden starts and stops, splashing of vessel contents or wetting of flask closure.
- Retains parameters during power failure and restarts unit automatically after power is restored.
- Over-temperature safety feature with independent thermostat provides additional backup by controlling heat if main temperature controller fails.
- Safety interlock stops platform motion when lid is opened.
- 5 year warranty and 10 year on drive mechanism.

Also available with analog operating system.

Specifications

Speed range, rpm:	15 to 500 ±1 rpm digital 40 to 400 ±1 rpm analog
Temperature range:	±0.1°C accuracy at 37°
Operating time:	0.1 hour to 999 hours or 0.1 minute to 999 minutes
Dimensions (L x W x H):	691mm x 358mm x 401mm
Supply requirements:	240V, 50/60 Hz

Description	Temp. range °C	Load max. kg	Amplitude mm	PK	Cat. No.
Benchtop Incubated Shaker, mini analog	RT +5°C - 80°C	15.9	19.0	1	**4.011 052**
Benchtop Incubated Shaker with Cooling Coil, mini analog	RT +5°C - 80°C	15.9	19.0	1	**4.011 053**
Benchtop Incubated Shaker, digital	RT +5°C - 80°C	15.9	19.0	1	**4.011 063**
Benchtop Incubated Shaker with Cooling Coil, digital	RT +5°C - 80°C	15.9	19.0	1	**4.011 064**



1 MaxQ 5000 Incubated and Refrigerated Floor Shakers, orbital

Thermo Scientific

- Combines Incubated/Refrigerated Temperatures with an Orbital Shaker for Large Capacity Applications
- Spacious chamber holds four 6L flasks
- Wide temperature range, 10°C above ambient to 60°C on incubated models and 15°C below ambient to 60°C on refrigerated models
- Easy-access drain system with quick disconnect fitting permits easy clean up of spills
- Drip pan under platform contains spills
- Foot pedal opens lid for hands free operation
- Retractable foot casters allow easy positioning in the lab
- Observe flask contents without opening the door through a large viewing window
- Access ports for probes, thermocouples or sensors provided through side of cabinet wall
- Triple eccentric drive handles heavy loads, provides uniform agitation and continuous 24-hour operation, even at high speeds.
- View speed, operating time and temperature simultaneously on three individual LED displays.
- Unbalanced load sensor stops platform motion when excess vibration is detected and visual/audio alarms signal until condition is corrected.
- Soft start feature eliminates sudden starts and stops, splashing of vessel contents or wetting of flask closure.
- Retains parameters during power failure and restarts unit automatically after power is restored.
- Over-temperature safety feature with independent thermostat provides additional backup by controlling heat if main temperature controller fails.
- 5 year warranty and 10 year on drive mechanism.

Also available with analog operating system.

Specifications

Speed range, rpm:	15 to 500 ±1rpm digital 40 to 400 ±1rpm analog
Temperature accuracy:	±0.1°C accuracy at 37°
Operating time:	0.1 hour to 999 hours or 0.1 minute to 999 minutes
Dimensions (L x W x H):	813mm x 1041mm x 1041mm
Supply requirements:	240V, 50/60 Hz

Description	Load max. kg	Amplitude mm	Temp. range °C	PK	Cat. No.
Incubated Floor Shaker, analog	34.0	25.4	RT +10°C - 60°C	1	**4.011 054**
Incubated and Refrigerated Floor Shaker, analog	34.0	25.4	RT -15°C - 60°C	1	**4.011 055**
Incubated Floor Shaker, digital	34.0	25.4	RT +10°C - 60°C	1	**4.011 065**
Incubated and Refrigerated Floor Shaker, digital	34.0	25.4	RT -15°C - 60°C	1	**4.011 066**



1 MaxQ 6000 Incubated and Refrigerated Stackable Shakers, orbital

Thermo Scientific

- Available in incubated or refrigerated models.
- Units can be stacked two high on the floor with the stacking kit accessory.
- Two adjustable-height shelves provide added storage.
- Large viewing window and internal light offer sample visibility.
- View temperature, speed and time simultaneously on three individual displays.
- Door can be hinged from the right or left by the user for convenient placement in lab.
- Triple eccentric drive handles heavy loads, provides uniform agitation and continuous 24-hour operation, even at high speeds.
- Visual/audible alarms alert you to temperature deviations. Heat turns off if temperature deviates ±1°C of set point.
- Shaker shut down and visual/audible alarms signal if unit operates ±10% of set speed, preventing shaker from moving.
- Unbalanced load sensor stops platform motion when excess vibration is detected visual/audio alarms signal until condition is corrected.
- Soft start feature eliminates sudden starts and stops, splashing of vessel contents or wetting of flask closure.
- Retains parameters during power failure and restarts unit automatically after power is restored.
- Over-temperature safety feature with independent thermostat provides additional backup by controlling heat if main temperature controller fails.
- Safety interlock stops shaking motion when the door is open.
- 5 year warranty and 10 year on drive mechanism.

Specifications

Speed range:	15rpm to 300rpm ±1rpm (stacked) 15rpm to 500rpm ±1rpm (unstacked)
Temperature	
Floor Shaker:	10°C above ambient to 80°C
Refrigerated Floor Shaker:	15°C below ambient to 80°C
Timer:	0.1 hr. up to 999 hr. or 0.1 to 999 min.
Power supply	
Floor Shaker:	240V 50/60Hz, 4.5A, 1100W
Refrigerated Floor Shaker:	240V 50/60Hz, 7A, 1500W
Dimensions (L x W x H):	838 x 699 x 1029 mm

Description	Load max. kg	Amplitude mm	PK	Cat. No.
Stackable Incubated Floor Shaker, digital	15.9	19.0	1	**4.011 067**
Stackable Incubated and Refrigerated Floor Shaker	15.9	19.0	1	**4.011 068**



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1 MaxQ 8000 Incubated and Refrigerated Stackable Shakers

Thermo Scientific

Can be Stacked Two to Three High on the Floor for Space Savings
- Choose from two temperature ranges to fulfill a number of molecular biology applications.
- HEPA filter ensures air inside the chamber remains clean and reduces cross contamination improving culturing conditions.
- Slide out platform provides convenient 100% sample access.
- Crevice-free Type 304 stainless steel chamber with coved corners and built-in drain keeps spills within the work area and promotes easy cleaning.
- Chamber is tall enough to accommodate 2L Erlenmeyer flasks.
- Top platform height is under 61.0 in. (154.9 cm) when units are stacked three high, ensuring ease-of-use and convenient accessibility.
- Easy to clean platforms are constructed of 5/16 in., heavy duty brushed anodized aluminum, which does not chip or rust.
- Large viewing window and internal xenon light allow sample visibility minimizing the need to open the chamber door.
- Electronic components and HEPA filter are easily accessed from the front of the unit, eliminating the need to move the shaker during regular maintenance or service.
- 5 year warranty and 10 year on drive mechanism.

For a complete system order:
1. Shaker, 2. Platform, 3. Clamps

Specifications

Speed range:	speed ranges from 25rpm to 400rpm ±1rpm
Temperature range:	±0.15°C
Operating time:	5 min. to 199 hours and 59 min.
Dimensions (L x W x H):	605 x 846 x 300 mm
Supply requirements:	240V, 50/60 Hz

Type	Temp. range °C	Load max. kg	Amplitude mm	PK	Cat. No.
MaxQ 8000 Incubated shaker	10°C above ambient to 60°C	16.1	25.4	1	**4.011 070**
MaxQ 8000 Refrigerated shaker	5°C or 20°C below ambient to 60°C	16.1	25.4	1	**4.011 071**

2



2 Universal Platform for MaxQ Shaker

Thermo Scientific

For	Dimensions (W x D) mm	PK	Cat. No.
MaxQ 2000 / 4450	280 x 330	1	**4.009 327**
MaxQ 2000	460 x 610	1	**4.009 329**
MaxQ 2000 / 4000 und MaxQ 6000	460 x 460	1	**4.009 330**
MaxQ 3000	760 x 460	1	**4.009 331**
MaxQ 3000 / 5000	760 x 460	1	**4.010 227**
MaxQ 3000	910 x 610	1	**4.010 228**
MaxQ 8000	750 x 460	1	**4.009 494**

3



3 Clamps for MaxQ Shaker (except MaxQ 8000)

Thermo Scientific

Description	PK	Cat. No.
Clamps for Microplate/Deep-well plate	1	**4.009 340**
Clamps for Erlenmeyer Flask 10ml	1	**4.010 229**
Clamps for Erlenmeyer Flask 25ml	1	**4.009 332**
Clamps for Erlenmeyer Flask 50ml	1	**4.010 230**
Clamps for Erlenmeyer Flask 125ml	1	**4.009 333**
Clamps for Erlenmeyer Flask 250ml	1	**4.010 231**
Clamps for Erlenmeyer Flask 300ml	1	**4.009 334**
Clamps for Erlenmeyer Flask 500ml	1	**4.010 232**
Clamps for Erlenmeyer Flask 1000ml	1	**4.010 233**
Clamps for Erlenmeyer Flask 2000ml	1	**4.009 335**
Clamps for Erlenmeyer Flask 4000ml	1	**4.009 336**
Clamps for Erlenmeyer Flask 6000ml	1	**4.009 337**
Clamps for Low Form Culture Flask 2500ml	1	**4.009 338**
Clamps for Fernbach Flask 2800ml	1	**4.009 339**

E & OE.

1 Racks for MaxQ Shaker

Thermo Scientific



Racks for	Size mm	Description	Colour	PK	Cat. No.
Test Tube Racks - Full Size	10-13	6x12	red	1	**4.010 234**
Test Tube Racks - Full Size	14-16	6x12	orange	1	**4.009 342**
Test Tube Racks - Full Size	17-20	4x10	white	1	**4.009 344**
Test Tube Racks - Full Size	21-25	4x10	blue	1	**4.009 346**
Test Tube Racks - Full Size	26-30	3x8	green	1	**4.009 348**
Microcentrifuge, 1.5ml - Full Size		8x12	blue	1	**4.009 350**
Test Tube Racks - Half Size	10-13	6x6	red	1	**4.009 341**
Test Tube Racks - Half Size	14-16	6x6	red	1	**4.009 343**
Test Tube Racks - Half Size	17-20	4x5	white	1	**4.009 345**
Test Tube Racks - Half Size	21-25	4x5	blue	1	**4.009 347**
Test Tube Racks - Half Size	26-30	3x3	green	1	**4.009 349**
Microcentrifuge, 1.5ml - Half Size		4x6	white	1	**4.009 351**

2 Adhesive Flask Mat for MaxQ Shakers

Thermo Scientific



Our Adhesive Flask Mat is an alternative to flask clamps for securing odd shaped objects such as bottles, volumetric flasks and test tube racks to a shaker platform. Simply place the 23cm x 23cm Adhesive Flask Mat on an anodised aluminum or stainless steel shaker platform and secure the vessel to it. It will hold Erlenmeyer flasks as large as 4L that contain 2L of media at speeds up to 250rpm.
The mat is not suitable for use in water baths.
- Easy-to-view samples. The white background makes it easy to determine when to harvest your samples
- Simple to clean. Can be restored to like new condition by wiping with alcohol
- Long lasting. Months of use without losing adhesive properties

Description	PK	Cat. No.
Flask Mat 23cm x 23cm	1	**4.009 506**



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9.837 882

KS 3000 i control/KS 3000 ic control

NEW!

IKA

Innovatively designed, compact incubator shaker to safely allow unattended operation in a temperature-controlled environment. The unit has a large LED display for speed, temperature and timer. An integrated PID temperature control allows the use of PT 1000 temperature sensors to assure highly accurate temperature control. The electronically controlled incubator comes equipped with RS 232 and USB ports for PC interface. All functions can be controlled and documented using labworldsoft® (software sold separately).

- Controls with antimicrobial coating for reduction of bacteria
- Junction box in the workspace for connection of an additional temperature sensor, e.g. PT 1000 (included with delivery)
- Wide range of attachments allows for using almost all shapes and sizes of vessels
- Unit stops automatically when hood is lifted
- Collecting tray with drain hose on rear of the unit
- Electronic timer
- Error code display

KS 3000 ic control additionally with built-in cooler for connection to an external cooling unit.

Specifications

Shaking movement:	orbital
Orbit:	20mm
Max. shaker weight (with attachment):	7.5kg
Motor rating input/output:	45/10W
Power consumption:	1.120W
Speed:	10 to 500rpm
Timer:	1s to 999h
Speed display:	LED
Heater power:	1000W
Temperature range KS 3000 i:	RT +5°C to +80°C
Temperature range KS 3000 ic:	RT -10°C to +80°C
Temperature stability (200ml H_2O at target T=37°C, RT 25°C):	±0.1K
Temperature range (inlet T>3°C) for KS 3000 ic:	+12 to +80°C
Dimensions (WxDxH):	465 x 695 x 430mm
Protection class acc. to DIN EN 60529:	IP 30
Interface:	RS 232, USB
Power supply:	230V, 50/60Hz

Type	PK	Cat. No.
KS 3000 i control	1	**9.837 881**
KS 3000 i control UK	1	**9.837 883**
KS 3000 i control CH	1	**9.837 884**
KS 3000 ic control	1	**9.837 882** 1
KS 3000 ic control UK	1	**9.837 885**
KS 3000 ic control CH	1	**9.837 886**

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

IKA®

E & OE.

1 Incubator Shaker KS4000i control

Innovative incubator shaker design allowing unattended operation in a temperature-controlled environment. *IKA*

- large LED display for speed and time settings
- controls with antimicrobial coating for reduction of bacteria
- integrated PID temperature control (two Pt1000 temperature sensors can be used)
- socket in the work area for connection of an additional temperature sensor e.g. PT1000.60 (included in delivery)
- electronic temperature and speed control
- electronic timer switch: 0 to 999h (set by the minute or by the hour)
- optional built-in cooler for connection to an external cooling unit e.g. KV600
- unit switches off automatically if disturbed
- unit stops automatically when hood is lifted
- collecting tray for spillages with draining tube at rear of unit
- all functions can be controlled and documented using labworldsoft® software
- attachments not included - Please order accessories as required

Specifications

Shaking movement:	orbital
Orbit:	20mm
Max. shaker weight (with attachment):	20kg
Motor rating input/output:	82/24W
Power consumption:	1120W (at 230V)
Operating time:	continuous
Speed range:	10 to 500rpm
Timer switch (select minutes/hours):	0 to 999 h/continuous
Heater power:	1000W
Temperature range:	RT +5°C to 80°C
Temperature stability (200 ml H_2O at target T = 37°C, RT 25°C):	0.1K
Recirculating cooler:	additional cooling function for KS 4000 ic
Dimensions (WxDxH):	580 x 750 x 525mm
Space required (W x D):	600 x 600mm
Weight:	55kg
Permissible ambient temperature:	15 to 32°C
Protection class acc. to DIN EN 60529:	IP30
Interface:	RS232
Supply requirements:	230V 50/60Hz

Tested to DIN EN IEC 61010-1.

Type	PK	Cat. No.
KS 4000 i control	1	**9.837 890**
KS 4000 i control UK	1	**4.008 075**
KS 4000 ic control*	1	**9.837 891**
KS 4000 ic control* UK	1	**4.008 077**

*with built-in cooler

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Accessories for Incubator Shaker KS4000i control

IKA

AS 4000.1 Universal attachment
For various types of vessels. Infinitely variable clamping rolls allow universal adaptation to various vessels.
Dimensions (WxDxH): 470mm x 447mm x 135mm
Base plate: 360mm x 410mm
Weight: 3200g
Included with delivery: 1 x AS 1.400 Basic holder, 6 x AS 1.401 Clamping roll, 12 x AS 1.402 Fastening screw

AS 4000.2 Fixing clip attachment
For shaking flasks, Erlenmeyer flasks and bottles with a round crosssection (without fixing clips).
Dimensions (W x D x H): 470mm x 444mm x 25 mm
Base plate: 430mm x 430mm
Weight: 2650g
Number of fixing clips (volume): 50 x AS 2.1(25ml), 48 x AS 2.2 (50ml), 25 x AS 2.3 (100ml), 16 x AS 2.4 (250ml), 12 x AS 2.5 (500ml), 7 x AS 2.6 (1000 ml)

AS 4000.3 Dish attachment
For smooth shaking operations in the low viscosity range, e.g. for cell cultures, nutrient media in Petri dishes, culture bottles and vessels with a low centre of gravity. With integrated slip-resistant foil (PP).
Dimensions (W x D x H): 470mm x 440mm x 25mm
Base plate: 430mm x 430mm
Weight: 800g

Type	Description	PK	Cat. No.	
AS 4000.1	Universal attachment	1	**9.837 894**	1
AS 1.400	Basic holder*	1	**9.837 895**	
AS 1.401	Clamping roll*	1	**9.837 896**	
AS 1.402	Fastening screw*	1	**9.837 897**	
AS 4000.2	Fixing clip attachment	1	**9.837 893**	2
AS 4000.3	Dish attachment	1	**9.837 892**	3
STICKMAX	Adhesive mat	1	**6.236 293**	

*Spare parts for universal attachment.

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9.837 894

2



9.837 893

3



9.837 892

Constant Climate Chambers HPP

NEW!

Memmert

The new constant climate chamber generation with the unique ControlCOCKPIT for a quick and intuitive operation.
Perfectly suited for stability tests, storage in controlled environment and conditioning. Energy efficient and maintenance free.

Standard equipment:
- PID microprocessor control with integrated auto-diagnostic system
- Interior stainess stel 1.4301 (ASTM 304),deep-drawn
- Structured stainless steel housing, scratch-resistant, robust and durable; rear of zinc-plated steel
- High-temperature connectors on the rear of the appliance for single-phase power connection according to country specific systems and IEC standards
- Internal data logger with a storage capacity of at least 10 years
- German, English, French, Spanish language settings available on the ControlCOCKPIT
- Digital timer, adjustable between 1 minute and 99 days
- The SetpointWAIT function guarantees that the process time does not start until the set temperature is reached at all measuring points - optional for temperature values recorded by the freely positionable Pt100 sensors inside the chamber.
- Adjustment of three calibration values for temperature and additional appliance specific parameters directly at the ControlCOCKPIT, for example relative humidity
- mounted on lockable castors

TwinDISPLAY: ControlCOCKPIT with two TFT displays
- Two high-resolution TFT colour displays with touch-sensitive buttons for selection of functions
- Available parameters on the ControlCOCKPIT: Temperature (Celsius or Fahrenheit), fan speed, exhaust air flap position, programme time, relative humidity, time zones, summertime/wintertime
- Two Pt100 sensors DIN class A in a 4-wire circuit for mutual monitoring, taking over functions in case of an error
- AtmoCONTROL software on a USB stick for programming, managing and transferring programmes via Ethernet interface or USB port
- HeatBALANCE function for application specific adjustment of heat output distribution (balance) between the upper and lower heating groups in an adjustment range between -50 % and +50 %
- ControlCOCKPIT with USB port for uploading programmes, reading out protocol logs, activating the User-ID function
- Displaying of already logged protocol data on the ControlCOCKPIT (max 10.000 values correspond to approx. 1 week)
- Ethernet interface on the rear of the appliance for reading out the protocol log and for uploading programmes and for online logging
- Multiple overtemperature protection: Electronic temperature monitoring TWW/TWB (protection class 3.1 or 2 and mechanical temperature limiter TB (protection class 1) acc. to DIN 12 880, AutoSAFETY automatically adjusts to the set value within a freely adjustable tolerance range. Setting individual MIN/MAX values for over/undertemperature alarm

Specifikations

Working-temperature range without light	0 to +70°C
Working-temperature range with light	+15 to +40°C (HPP110 + HPP260)
Setting temperatur range	0 to +70°C
Setting accuracy temperature	0.1°C
Adjustment range humidity without light	rh 10 to 90%
Adjustment range humidity with light	rh 10 to 85% (HPP110 + HPP260)
Setting accuracy humidity	1 % rh

Type	Capacity	Internal dimensions (W x D x H)	Shelf support ribs/shelves	Housing (W x D x H)	Weight	Rating	PK	Cat. No.
	l	mm		mm	kg	W		
HPP110	108	560 x 400* x 480	5/2	745 x 674** x 867	80	650	1	**9.868 021**
HPP260	256	640 x 500* x 800	9/2	824 x 774** x 1186	122	820	1	**9.868 022** 1
HPP750	749	1040 x 600* x 1200	14/2	1224 x 874** x 1726	208	1200	1	**9.868 023**

* Minus 10 mm for fan
**Depth without door handle, please add 56mm



9.868 022

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6.229 955

Humidity Chamber Model HCP

Memmert

Ramp programming for temperature and humidity, active humidity control as well as exact temperature control ensure a controlled, physiologically ideal environment.
The applications range from construction physics to corrosion testing and down to biological research.

Standard equipment:
Ventilation and Control:
- uniform atmosphere and temperature distribution owing to enclosed non-turbulent ventilation system in working chamber
- adaptive, fuzzy-supported multifunctional digital microprocessor PID-controller
- autodiagnostic system with fault indication on temperature and humidity control
- 2 x Class A , 4-wire-circuit, Pt100 sensors mutually monitoring and maintaining the performance at the same temperature value
- digital 7-day-programme-timer with real time clock, precise minute setting
- integrated timer for tempering profiles of up to 40 ramps, each segment adjustable from 1 min.up to 999 hours
- digital display (LED) of all set parameters, such as temperature, weekdays, time, humidity and set-up values - language to be chosen in setup
- digital display of set values (resolution: 0.1°C below 99.9°C, 0.5°C above 100°C) and actual values (resolution: 0.1°C) of temperature (LED)
- active control for humidifying and dehumidifying (20 to 95% rh) with digital display of relative humidity - resolution of display: 0.5%,setting accuracy 1%
- humidity supplied by distilled water from external tank using self-priming pump
- long-term documentation (ring store) of all relevant data, GLP-compliant data logger - 1024 kB
- non-volatile memory
- parallel printer interface (incl. real-time clock with date function) for all PCL3-compatible ink-jet printers for GLP-conforming documentation
- USB interface including Memmert "Celsius" software for programming and documentation
- chip card control incl. one MEMoryCard XL with 32 kB (up to 40 ramps)
- 2nd chip card (STERICard) for sterilization of working chamber with fixed cycle (4 hours/160°C) without removal of sensors

Heating Concept:
- large-area multi-function heating system on four sides incl. additional door and back heating to avoid condensation
- incl. works calibration certificate for +60°C

Multiple Overtemperature Protection
- with audible and visual alarm in case of over-/undertemperature and over-/under-humidity, open door and empty water tank
- independently working, digitally adjustable electronic overtemperature controller TWW protection class 3.1
- additional adjustable Auto-Safety-Function "ASF" for over- and undertemperature automatically following the set value at a preset tolerance range
- mechanical temperature limiter TB class 1 switching the heating off at approx. 10°C above max. oven temperature

Textured stainless Steel housing:
- W x H x D: 630 x 938 x 650mm
- fully insulated stainless steel door with double locking and 4-point adjustment
- inner glass door
- zinc-plated steel rear panel

Interior:
- easy-to-clean interior, made of stainless steel, reinforced by deep drawn ribbing,material no. 1.4301, electropolished and hermetically welded
- 2 perforated stainless steel shelves

Temperature Range:
- with humidity: from +20°C (however at least 8°C above ambient temperature) up to + 90°C
- without humidity: from +20°C (however at least 8°C above ambient temperature) up to + 160°C
- temperature variation in chamber at 50°C: < ±0.3K

Voltage/Power Rating:
- 230V (±10%) 50/60Hz

Type	Capacity	Internal dimensions (W x D x H)	Shelf support ribs/shelves	Housing (W x D x H)	Weight	Rating	PK	Cat. No.
	l	mm		mm	kg	W		
HCP 108	108	560 x 400* x 480	5/2	710 x 550** x 778	70	1000	1	**6.229 955** 1
HCP 153	153	480 x 500* x 640	7/2	630 x 650** x 938	80	1500	1	**9.868 006**
HCP 246	246	640 x 600* x 640	7/2	790 x 750** x 938	110	2000	1	**6.230 984**

* Minus 25 mm for fan
**Depth without door handle, please add 38mm

E & OE.

Accessories Humidity Chamber HCP

Memmert

Type	Description	PK	Cat. No.
B00325	Additional stainless steel shelf for HCP 108	1	**9.867 707**
B00321	Additional stainless steel shelffor HCP 153	1	**9.867 708**
B03813	Additional stainless steel shelf HCP 246	1	**9.867 748**
D00103	IQ check list with works test data for unit as support for validation by customer	1	**9.867 729**
D00104	OQ check list with works test data for one freely selectable humidity and temperature value incl. temperature distributation survey for 27 measuring points	1	**9.867 693**
E04004	MEMoryCard XL	1	**9.867 727**
E05019	FDA conforming software, "Celsius FDA-Edition"	1	**9.867 730**
E04159	Oven linked authorisation (user ID card)	1	**9.867 701**
V2	Interface RS485 (for cross linking of several devices) instead of USB	1	**9.867 713**
E05284	Temperature profile write/read unit for programming via PC	1	**9.867 726**

Options and Accessories Climatic Test Chamber CTC/TTC (see next page)

Memmert

Type	Description	PK	Cat. No.
BO	Full-sight glass door, heated	1	**9.868 015**
E20591	Stainless steel grid	1	**9.868 016**
B04410	External control and logging package	1	**9.868 017**
D00103	IQ check list with works test data for unit as support for validation by customer	1	**9.867 729**
D00104	OQ check list with works test data for one freely selectable humidity and temperature value incl. temperature distributation survey for 27 measuring points acc. to DIN 12 880: 2007-05	1	**9.867 693**
E05019	FDA conforming software, "Celsius FDA-Edition"	1	**9.867 730**
E04159	Oven-linked authorisation card (user ID card)	1	**9.867 725**
V2	RS485 interface (for cross linking of several devices) instead of USB	1	**9.867 713**
E05284	Temperature profile write/read unit for programming via PC	1	**9.867 726**
E04004	MEMoryCard XL	1	**9.867 727**



1



9.868 010

Climatic Test Chamber CTC 256/Temperature Test chamber TTC 256

Memmert

Simulate the perfect atmosphere for climate and temperature tests, specifically in accordance with DIN EN 60068-2-1, 2-2 and 2-3. Provide unlimited flexibility for controlled material and function tests as well as ageing tests.

Standard equipment

Ventilation and Control:
- high-performance air fan in working chamber
- depending on operation status automatically variable fan speed with manual adjustment from 10% to 100%
- adaptive, fuzzy-supported multifunctional digital microprocessor PID-controller
- autodiagnostic system with fault indication on temperature and humidity control
- 2 x Class A, 4-wire circuit, Pt100 sensors, mutually monitoring and maintaining performance at the same temperature value
- digital 7-day-programme-timer with real time clock, precise minute setting
- integral timer for heating profiles of up to 40 ramps, each segment adjustable from 1 min. up to 999 hours
- digital display (LED) of all set parameters, such as temperature, weekdays, time, humidity and set-up values - language to be chosen in setup
- digital display of set values (resolution: 0.1°C below 99.9°C, 0.5°C above 100°C) and actual values (resolution: 0.1°C) of temperature (LED)
- long-term documenting (ring store) of all relevant data, GLP-conforming as data logger - 1024 kB
- programme stored on power failure
- parallel printer interface (incl. real-time clock with date function) for all PCL3-compatible ink-jet printers for GLP-conforming documentation
- USB interface including Memmert "Celsius" software for programming and documentation
- chip card control incl. one MEMoryCard XL with 32 kB (up to 40 ramps)
- incl. works calibration certificate for -20°C and +160°C

Heating concept:
- high-performance ring heaters with optimised air circulation
- door heating to avoid condensate

Cooling Concept
- twin compressor
- speed adjustable condenser fan
- refrigerant R404A

Multiple Overtemperature Protection
- with audible and visual alarm in case of over-/undertemperature and over-/under-humidity, open door and empty water tank
- independently working, digitally adjustable electronic overtemperature controller, TWW protection class 3.3
- additional adjustable Auto-Safety-Function "ASF" for over- and undertemperature automatically following the set value at a preset tolerance range
- mechanical temperature limiter TB class 1 switching the heating off at approx.10°C above max. oven temperature

Temperature range:
CTC/TTC: without humidity control: from -42°C up to +190°C
CTC: with humidity control: from +10°C up to +95°C

Standards for CTC additionally:
- Electronically controlled active humidification and dehumidification from 10% to 98% rh with digital display of the relative humidity, display resolution 0.5%, setting accuracy 1%
- incl. works calibration certificate for +30°C at 60% rh
- Humidity supply with distilled water from 2 x 10 l tanks on integrated telescopic slide, with automatic water tank change-over
- 2 x 10L tanks acting as condensate collectors, on telescopic slide mounts

Type	Capacity	Internal dimensions (W x D x H)	Housing (W x D x H)	Shelf support ribs/shelves	Weight	Rating	PK	Cat. No.
	l	mm	mm		kg	W		
CTC 256	256	640 x 597 x 670	898 x 1100 x 1730	6/1	297	7000	1	**9.868 010** 1
TTC 256	256	640 x 597 x 670	898 x 1100 x 1730	6/1	297	7000	1	**9.868 011**

E & OE.

Constant climate chambers, KBF series

The BINDER constant climate chambers for long-term stable temperature/humidity/light simulation in one chamber. They are ideal for norm-compliant work according to ICH guidelines and work independent of water supply. Their special feature: climate and light tests can be performed at the same time in on chamber. *BINDER*

Advantages:
- Long-term stabile test conditions
- Independent of the water supply
- one-stop solution: Temperature/humidity/light simulation in one chamber

KBF Series: Constant climate chambers. The specialist for reliable stability testing.

KBF P Series: Constant climate chambers with ICH-compliant illumination. The ICH-compliant illumination device with BINDER Q1B Synergy Light™ makes it the expert for reliable photostability testing.

KBF LQC Series: Constant climate chambers with additional photometry. The constant climate chamber with Light Quantum Control is ideal for advanced photostability testing with precision light measurement.

Equipment:
- Electronically controlled APT.line™ preheating chamber with cooling system
- 2 variable position illumination cassettes (KBF P)
- Temperature range 0°C to 70°C (without humidity and illumination)
- Humidity range 10% to 80% RH (without illumination cassettes)
- MCS controller with 25 storable programs of 100 sections each for a maximum of 500 program segments
- Electronically controlled humidification and dehumidification system with capacitive humidity sensor
- Inner glass door with seal
- Independent temperature safety device class 3.1 (DIN 12880) with optical and audible temperature alarm
- Access port with silicone plug diam. 30mm, left side
- Ethernet interface for communication software APT-COM™ DataControlSystem

1



9.883 584

2



9.883 630

Type	Internal volume litres	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	PK	Cat. No.
KBF 115	115	600 x 351 x 483	885 x 650 x 1050	1	**9.883 630** 2
KBF 240	240	650 x 485 x 785	925 x 800 x 1460	1	**9.883 582**
KBF 720	720	973 x 576 x 1250	1250 x 887 x 1925	1	**9.883 579**
KBF P 240	240	650 x 485 x 785	925 x 800 x 1460	1	**9.883 583**
KBF P 720	720	973 x 576 x 1250	1250 x 887 x 1925	1	**9.883 584** 1
KBF LQC 240	240	650 x 485 x 785	925 x 800 x 1460	1	**6.236 223**
KBF LQC 720	720	973 x 576 x 1250	1250 x 887 x 1925	1	**6.236 224**



1



1 Environmental simulation chambers, MK series

BINDER

The BINDER MK series chamber is well-suited for all heating and cooling testing between -40°C and 180°C. The APT.line™ pre-heating chamber technology uniquely simulates a natural environment. For cyclical temperature testing, it is a smart alternative to complex individual solutions.

Advantages:
- State-of-the-art reliability
- User-friendly chamber interior
- Comprehensive standard equipment

Equipment:
- Electronically controlled APT.line™ preheating chamber
- Temperature range of -40°C to 180°C
- MCS controller with 25 storable programs of 100 sections each for a maximum of 500 program segments
- Heated viewing window with LED interior lighting
- Access port dia. 80mm top (MK 53), dia. 50mm, left side (MK 115, 240), 2 access ports dia. 80mm right and left side (MK 720)
- Independent adjustable temperature safety device class 2 (DIN 12880)
- Ethernet or RS 422 interface APT-COM™ DataControlSystem software

Type	Internal volume litres	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Description	PK	Cat. No.
MK 53	53	402 x 330 x 402	740 x 740 x 1222	Standard	1	**9.883 560**
MK 115	115	600 x 400 x 480	995 x 850 x 1718	Standard	1	**9.883 640**
MK 240	240	735 x 434 x 700	1140 x 946 x 1713	Standard	1	**9.883 641**
MK 720	700	1000 x 600 x 1168	1341 x 987 x 1998	Standard	1	**9.883 642**

2



9.883 710

Material test chambers, FP and M series

BINDER

The material test chambers from BINDER are highly precise and have a wide temperature range, as well as comprehensive programming options, with which you can customise ramps, profiles and processes.
- The specialists for demanding heating profiles
- Adjustable high air change rate

FP Series: Material test chamber with forced convection. For complex temperature testing.

M Series: Material test chambers with individual programming. Temperatures up to 300°C, high-performance fan and individual programming make it the first choice in material testing and aging testing.

Equipment:
- Electronically controlled APT.line™ preheating chamber assuring temperature accuracy and reproducible results
- Temperature range from 5°C above ambient temperature to 300°C
- Independent adjustable temperature safety device class 2 (DIN 12880), with visual temperature alarm
- RS 422 interface for use with APT-COM™ DataControlSystem communication software

3



9.883 565

Type	Internal volume litres	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	PK	Cat. No.
FP 53	53	400 x 330 x 400	634 x 575 x 617	1	**9.883 710** 2
FP 115	115	600 x 400 x 480	834 x 645 x 702	1	**9.883 711**
FP 240	240	800 x 500 x 600	1034 x 745 x 822	1	**9.883 712**
FP 400	400	1000 x 500 x 800	1234 x 765 x 1022	1	**9.883 713**
FP 720	720	1000 x 600 x 1200	1234 x 865 x 1528	1	**9.883 714**
M 53	53	400 x 330 x 400	634 x 575 x 779	1	**9.883 563**
M 115	115	600 x 400 x 480	834 x 645 x 863	1	**9.883 564**
M 240	240	800 x 500 x 600	1034 x 745 x 984	1	**9.883 565** 3
M 400	400	1000 x 500 x 800	1234 x 765 x 1184	1	**9.883 566**
M 720	720	1000 x 600 x 1200	1234 x 865 x 1692	1	**9.883 567**

E & OE.

Climate chambers with illumination, KBW, KBWF series

BINDER

Homogeneous lighting conditions with constant temperature and humidity conditions, the BINDER climate chambers with illumination. The responsive humidification system, the high-performance cooling and uniform light distribution ensure optimal growth conditions.

Advantages:
- Homogeneous light distribution
- Natural growth conditions
- Temperature, humidity & light in one unit

KBW Series: The KBW confidently meets all demands for optimal lighting and temperature conditions for precisely defined processes.

KBWF Series: The perfect combination of heat or cold, humidity and light in one chamber: The BINDER KBWF.

Equipment:
- Electronically controlled APT.line™ preheating chamber
- Temperature range 0°C to 70°C (without humidity and illumination)
- Humidity range 10% to 80% RH (without illumination)
- 2 variable position illumination cassettes each with 5 daylight fluorescent illumination tubes
- MCS controller for temperature, humidity, and lighting control with 25 storable programs of 100 sections each for a maximum of 500 program segments, for programming of day/night cycles
- Integrated electronic chart recorder
- Controlled humidification and dehumidification system with capacitive humidity sensor
- Independent temperature safety device class 3.1 (DIN 12880) with optical and audible temperature alarm
- Access port with silicone plug diam. 30mm, left side
- RS 422 interface for communication software APT-COM™ DataControlSystem

Type	Internal volume litres	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	PK	Cat. No.	
KBW 240	240	650 x 485 x 785	925 x 800 x 1460	1	**9.883 573**	
KBW 400	400	650 x 485 x 1270	925 x 800 x 1945	1	**9.883 535**	1
KBW 720	720	973 x 576 x 1250	1250 x 887 x 1925	1	**9.883 574**	
KBWF 240	240	650 x 485 x 785	925 x 800 x 1460	1	**9.883 575**	
KBWF 720	720	973 x 576 x 1250	1250 x 887 x 1925	1	**9.883 576**	2

1



9.883 535

2



9.883 576

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

BINDER
Best conditions for your success

1

Muffle furnaces series LE 1/11 - LE 14/11

Nabertherm

- Tmax 1100°C, 1050°C working temperature
- Heating from both sides with heating elements in quartz tubes
- Multi-layer fibreboard insulation within the furnace
- Housing manufactured from high-grade textured stainless steel
- Folding door which can be used as a clipboard
- Exhaust air outlet in the furnace rear wall
- Silent, solid-state power control relay
- R6 controller supplied with models LE1 - LE4 with adjustable target temperature. Models LE6 and LE14 available with controller B150 (one ramp, one holding time, delayed start time) or optionally with controller P300 (9 programmes each with 4 ramps and holding times).
- Controller mounted in side space (LE1 - LE4 space saving under the door)



9.764 543

2



9.764 538

Type/Controller	Capacity	Rating	Internal dimensions (W x D x H)	External dimensions (W x D x H)	Weight	PK	Cat. No.
	litres	kW	mm	mm	kg		
LE 1/11/R6	1	1.5	90 x 115 x 110	250 x 265 x 340	10.00	1	**9.764 543** 1
LE 2/11/R6	2	1.8	110 x 180 x 110	275 x 380 x 350	10.00	1	**9.764 537**
LE 4/11/R6	4	1.8	170 x 200 x 170	335 x 400 x 410	15.00	1	**9.764 538** 2
LE 6/11/B150	6	1.8	170 x 200 x 170	510 x 400 x 320	18.00	1	**9.764 539**
LE 6/11/P300	6	1.8	170 x 200 x 170	510 x 400 x 320	18.00	1	**9.764 540**
LE 14/11/B150	14	2.9	220 x 300 x 220	555 x 500 x 370	25.00	1	**9.764 541**
LE 14/11/P300	14	2.9	220 x 300 x 220	555 x 500 x 370	25.00	1	**9.764 542**

3

Muffle furnaces L 1/12 - L 40/11 series

Nabertherm

- Tmax 1100°C or 1200°C
- Ceramic heating plates with built-in heating wire, easy to replace
- Hardened vacuum-fibre, high-resistance muffle
- Housing manufactured from high grade stuctured stainless steel
- Double-walled housing for low surface temperature and high stability
- Available with folding door (L) which can be used as a clipboard or without additional charge with a lift gate (LT), where the hot side will be averted from the user
- Adjustable air inlet in the door
- Exhaust air outlet in the furnace rear wall
- Silent electronic relay
- Controller B180 with adjustable ramp holding temperature and holding time or controller P330 with 9 programmes each with 4 ramps and holding times, PC interface.



9.764 503

Type/Controller	Capacity	Rating	Internal dimensions (W x D x H)	External dimensions (W x D x H)	Weight	PK	Cat. No.
	litres	kW	mm	mm	kg		
L 1/12/R6	1	1.5	90 x 11 x 110	250 x 265 x 340	10.00	1	**9.764 508**
L3/11/B180	3	1.2	160 x 140 x 100	380 x 370 x 420	20.00	1	**6.059 769**
L5/11/B180	5	2.4	200 x 170 x 130	440 x 470 x 520	35.00	1	**6.092 769**
L9/11/B180	9	3.0	230 x 240 x 170	480 x 550 x 570	45.00	1	**6.302 391**
L15/11/B180	15	3.6	230 x 340 x 170	480 x 660 x 570	55.00	1	**6.056 446**
L24/11/B180	24	4.5	280 x 340 x 250	560 x 660 x 650	75.00	1	**6.206 861**
L3/11/P330	3	1.2	160 x 140 x 100	380 x 370 x 420	20.00	1	**9.764 503** 3
L5/11/P330	5	2.4	200 x 170 x 130	440 x 470 x 520	35.00	1	**9.764 505**
L9/11/P330	9	3.0	230 x 240 x 170	480 x 550 x 570	45.00	1	**9.764 509**
L15/11/P330	15	3.6	230 x 340 x 170	480 x 660 x 570	55.00	1	**9.764 507**
L24/11/P330	24	4.5	280 x 340 x 250	560 x 660 x 650	75.00	1	**9.764 504**
L40/11/P330	40	6.0	320 x 490 x 250	600 x 790 x 650	95.00	1	**9.764 506**

Other models available on request.

Ashing/Burn off furnaces LV 3/11 - LVT 15/11

NEW!

Nabertherm

The models LV 3/11 - LVT 15/11 are especially designed for ashing in the laboratory. A special air intake and exhaust system allows air exchange of more than 6 times per minute. Incoming air is preheated to ensure a good temperature uniformity.

- Tmax 1100°C
- Heating from two sides by ceramic heating plates
- Ceramic heating plates with integral heating element which is safeguarded against fumes and splashing, and easy to replace
- Highly durable, high-performance cured vacuum fiber module lining
- Housing made of sheets of textured stainless steel
- Dual shell housing for low external temperatures and stability
- Optional flap door (LV) which can be used as work platform or lift door (LVT) with hot surface facing away from the operator
- Solid state relays provide for low noise operation
- Air exchange of more than 6 times per minute
- Good temperature uniformity due to preheating of incoming air

1



9.764 575

2



6.235 610

Type/Controller	Capacity litres	Rating kW	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	PK	Cat. No.
LV 3/11/B180	3	1.2	380 x 370 x 750	160 x 140 x 100	1	**6.239 505**
LV 5/11/B180	5	2.4	440 x 470 x 850	200 x 170 x 130	1	**6.228 436**
LV 9/11/B180	9	3.0	480 x 550 x 900	230 x 240 x 170	1	**6.204 399**
LV 15/11/B180	15	3.6	480 x 650 x 900	230 x 340 x 170	1	**6.235 585**
LV 3/11/P330	3	1.2	380 x 370 x 750	160 x 140 x 100	1	**9.764 575** 1
LV 5/11/P330	5	2.4	440 x 470 x 850	200 x 170 x 130	1	**6.233 889**
LV 9/11/P330	9	3.0	480 x 550 x 900	230 x 240 x 170	1	**9.764 576**
LV 15/11/P330	15	3.6	480 x 650 x 900	230 x 340 x 170	1	**9.764 577**
LVT 3/11/B180	3	1.2	380 x 370 x 750	160 x 140 x 100	1	**9.764 578**
LVT 5/11/B180	5	2.4	440 x 470 x 850	200 x 170 x 130	1	**9.764 580**
LVT 9/11/B180	9	3.0	480 x 550 x 900	230 x 240 x 170	1	**6.232 352**
LVT 15/11/B180	15	3.6	480 x 650 x 900	230 x 340 x 170	1	**6.235 611**
LVT 3/11/P330	3	1.2	380 x 370 x 750	160 x 140 x 100	1	**9.764 579**
LVT 5/11/P330	5	2.4	440 x 470 x 850	200 x 170 x 130	1	**6.256 163**
LVT 9/11/P330	9	3.0	480 x 550 x 900	230 x 240 x 170	1	**6.255 458**
LVT 15/11/P330	15	3.6	480 x 650 x 900	230 x 340 x 170	1	**6.235 610** 2

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

Nabertherm
MORE THAN HEAT 30-3000 °C

High-temperature chamber furnaces with SiC rod heating HTC/HTCT 01/14 - 08/16 series

Nabertherm

These powerful laboratory muffle furnaces are available for temperatures up to 1400°C, 1500°C, or 1600°C. The durability of the SiC rods in periodic use, in combination with their high heating speed, make these furnaces to all-rounders in the laboratory. Heating times of 40 minutes to 1400°C can be achieved, depending on the furnace model and the conditions of use.

- Tmax 1400°C, 1500°C, or 1600°C
- Working Temperature 1550°C (for models HTC ../16), increased wear and tear of heating elements must be expected in case of working at higher temperatures
- Model HTCT 01/16 with single phase connection
- High-quality fiber material, selected for the working temperature
- Housing made of sheets of textured stainless steel
- Dual shell housing for low external temperatures and high stability
- Optional flap door (HTC) which can be used as work platform or lift door (HTCT) with hot surface facing away from the operator (HTCT 01/.. only with lift door)
- Switching system with solid-state-relays, power tuned to the SiC rods
- Controller P330 as standard with 9 programmes each with 4 ramps and holding times, PC interface
- Easy replacement of heating rods

Type/Controller	Temp. max. °C	Capacity L	Rating kW	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	PK	Cat. No.	
HTCT 01/14	1400	1.5	3.5	110 x 120 x 120	340 x 300 x 460	1	**9.764 581**	
HTCT 03/14	1400	3.0	9.0	120 x 210 x 120	400 x 535 x 530	1	**9.764 582**	
HTCT 08/14	1400	8.0	13.0	170 x 290 x 170	450 x 620 x 570	1	**6.252 321**	
HTCT 01/15	1500	1.5	3.5	110 x 120 x 120	340 x 300 x 460	1	**9.764 583**	
HTCT 03/15	1500	3.0	9.0	120 x 210 x 120	400 x 535 x 530	1	**9.764 584**	
HTCT 08/15	1500	8.0	13.0	170 x 290 x 170	450 x 620 x 570	1	**9.764 585**	
HTCT 01/16	1600	1.5	3.5	110 x 120 x 120	340 x 300 x 460	1	**9.764 586**	1
HTCT 03/16	1600	3.0	9.0	120 x 210 x 120	400 x 535 x 530	1	**9.764 587**	
HTCT 08/16	1600	8.0	13.0	170 x 290 x 170	450 x 620 x 570	1	**9.764 588**	
HTC 03/14	1400	3.0	9.0	120 x 210 x 120	400 x 535 x 530	1	**6.222 778**	
HTC 08/14	1400	8.0	13.0	170 x 290 x 170	450 x 620 x 570	1	**9.764 589**	
HTC 03/15	1600	3.0	9.0	120 x 210 x 120	400 x 535 x 530	1	**9.764 590**	
HTC 08/15	1600	8.0	13.0	170 x 290 x 170	450 x 620 x 570	1	**9.764 591**	
HTC 03/16	1600	3.0	9.0	120 x 210 x 120	400 x 535 x 530	1	**6.235 199**	
HTC 08/16	1600	8.0	13.0	170 x 290 x 170	450 x 620 x 570	1	**9.764 592**	2

1



9.764 586

2



9.764 592

E & OE.

Tube furnaces

NEW!

1

Nabertherm

Supplied with tube (Sillmantin 60) and two end stoppers, ensuring that most standard procedures can be conducted:
- srainless steel housing
- diameter of tubes from 30 up to 100 mm
- heating zones from 250 up to 1000 mm
- smooth electronic relay switching
- digital PID-controller B 180 as standard
- Additional P330 programmer with 9 programmes and 8 segments
- optional three zone controller C40 as master-control and 2 x zone controller C6z (from 750 mm heating length onwards in types 1300°C
- available for max. temp 1200 or 1300°C

Additional equipment:
- Over-temperature limit controller with manual reset for thermal protection class 2 in accordance with EN 60519-2 as temperature limiter to protect the oven and load
- Charge control with temperature measurement in the working tube and in the oven chamber behind the tube
- Three-zoned design with HiProSystem control (heated length from 750 mm, for 1300°C models)
- Process control and documentation with Controltherm MV software package

Alternative gas supply systems for protective gas or vacuum operation on request.



9.764 510

Type/Controller	Max. temp. °C	Tube diam. mm	Power W	Dimensions (W x D x H) mm	PK	Cat. No.
R 50/250/12/B180	1200	30.0	1200	400 x 240 x 490	1	**9.764 510** 1
R 50/250/12/B180	1200	40.0	1200	400 x 240 x 490	1	**9.764 511**
R 50/500/12/B180	1200	30.0	1800	650 x 240 x 490	1	**9.764 512**
R 50/500/12/B180	1200	40.0	1800	650 x 240 x 490	1	**9.764 513**
R 100/750/12/B180	1200	60.0	3600	1000 x 360 x 640	1	**9.764 514**
R 100/750/12/B180	1200	80.0	3600	1000 x 360 x 640	1	**9.764 515**
R 120/1000/12/B180	1200	100.0	6000	1300 x 420 x 730	1	**9.764 516**
R 50/250/13/B180	1300	40.0	1300	400 x 240 x 490	1	**9.764 518**
R 100/750/13/B180*	1300	60.0	4400	1000 x 360 x 640	1	**9.764 521**
R 100/750/13/B180*	1300	80.0	4400	1000 x 360 x 640	1	**9.764 522**
R 120/1000/13/B180*	1300	100.0	6500	1300 x 420 x 730	1	**9.764 523**

Furnaces are available in other sizes and max. temperatures- details on request.
* These models are also available in 3 zone versions.

2 Rapid incinerator

2

Gestigkeit

For individual and series incineration of solids and liquids. Upper platform with 8 openings of 34mm diameter, for porcelain crucibles up to 50mm diameter. Upper platform and housing made of stainless steel. With 120 minute timer with audible signal after timed period and separate continuous operation switch. A safety switch switches the mains supply off/on automatically on opening/closing the incinerator chamber. With 1.5 metre cable and earthed plug.

Type SVR/E
With electronic temeprature control which allows stepless heating adjustment from 10 to 100%. Complete for use.

Type SVD 95
With digital temperature adjustment and display. Complete for use.



Type	Temp. range °C	Rating W	Dimensions (W x D x H) mm	Weight kg	Supply requirements V	PK	Cat. No.
SVR/E	950	2500	450 x 310 x 180	7.0	230	1	**9.884 140**
SVD 95	950	2500	450 x 310 x 180	7.0	220	1	**9.884 141**

Spare parts for Rapid incinerator

Gestigkeit

Type EH 400
Complete, built-in heating element; Weight 1.6kg, for SVR/E.
Type EH 95
Complete, built-in heating element and integral thermocouple, for SVD 95.

Type	PK	Cat. No.
Heating element EH 400 for SVR/E	1	**9.884 142**
Heating element EH 95 for SVD 95	1	**9.884 143**

1



1 Single hotplate Ceran®

Housing made of stainless steel, brushed and polished, in a unique Softline Design, Schott Ceran cooking surface, adjustable power control with power-saving two-circle HiLight technique, thus extra large heating zone (dia. 210mm) can be activated, thermal shutdown and automatic cooking system, residual heat indicator and warning light.

Specifications:
One unit provides heat outputs of:
1. Heating area: dia. 140mm, 1000W
2. Heating area: dia. 210mm, 2200W
Supply requirements: 230 V

Type	Dimensions (W x D x H) mm	PK	Cat. No.
Single hotplate Ceran®	305 x 410 x 75	1	**9.645 510**

2



2 Laboratory hotplates, SLK 12

NEW!

Optimised for all-round use *SI Analytics GmbH*

The new laboratory hotplate SLK 12 with its pronounced characteristics meets high demands in quality and robustness. Even in very rough environments one can count on its dependability.
- The pore-free glass-ceramics surface (easy-to-clean) is highly resistant against chemical influences and temperature fluctuations.
- The glass-ceramics surface has a high infrared permeability and hence is exceptional economic saving energy and time.
- The heating surface is throughout planar and offers not heated border areas. This allows the vessel to be heated partially or completely removed off the hotplate.
- High-quality, unpainted and non sensitive stainless steel casing.
- Heating area with two zones (230V) for small and bigger vessels.
- Indicator LED for residual heat for safe operation.
- An optional compressed air connection allows operation in highly aggressive environment.

Type	Heated zone mm	Rating W	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
SLK 12	Ø 180	1700	330 x 300 x 73	4.5	1	**9.645 616**

3



6.252 739

4



7.656 840

5

5 Hotplates, analogue, US150/UC150

- Flashing "Hot" warning light for temperature above 50°C, mains independent *Stuart*
- Accurate temperature control with LED setting scale
- Compact space saving design
- Space saving integral fitting for a retort rod
- Can be used with SCT1 digital temperature controller

Model UC150 has a glass ceramic top which has excellent chemical resistance. The surface is easy to clean and allows high plate temperatures for faster heating. Heating area: 120 x 120mm

Model US150 has a robust aluminium/silicon alloy top plate for excellent heat transmission. The top plate has a thin ceramic coating for added chemical resistance. A 700W element gives rapid heating and ensures even temperature distribution across the whole surface of the plate.

With BioCote, silver-based, antimicrobial protection.

Specifications
Plate dimensions: 150 x 150mm
Weight: 2.2kg
Power supply: 230V, 50Hz
Protection class: IP 32

Type	Max. temp. °C	Power W	Dimensions (W x D x H) mm	PK	Cat. No.
UC 150	450	500	172 x 248 x 122	1	**6.252 739** 3
US 150	325	700	172 x 248 x 120	1	**7.656 840** 4
Digital contact thermometer SCT1				1	**9.645 342**
Retort rod SR1, 600mm x 12mm diam.				1	**9.645 335**

Boiling chips - please see page 620.

E & OE.

1 2 Hotplates, analogue, Stuart CB300 and CB500

Stuart

Energy regulator control with glass ceramic top plate and 'hot' warning lamp which illuminates when the plate temperature exceeds 50°C. For 230V 50/60 Hz single phase supplies. With BioCote, silver-based, antimicrobial protection. Maximum temperature as indicated.

Type	Max. temp. °C	Hot-plate mm	Weight kg	Rating W	Internal dimensions (W x D x H) mm	PK	Cat. No.
CB300	450	300 x 300	6.00	1200	320 x 370 x 120	1	**9.645 338**
CB500	375	500 x 300	12.00	2250	520 x 360 x 130	1	**9.645 316**

1



2

BioCote

3 4 Hotplates, analogue, Stuart SB 300 and SB 500

Stuart

Maximum temperature 300°C. Energy regulator control with cast aluminium/silicon alloy top plate and 'hot' warning lamp which illuminates when the plate temperature exceeds 50°C. The 300mm x 300mm top plate model has a retort rod mounting at the rear of the housing. With BioCote, silver-based, antimicrobial protection.

Model	**SB 300**
Top plate:	300 x 300mm
Overall WxDxH:	320 x 370 x 120mm
Weight:	6kg
Power:	600W
Model	**SB 500**
Top plate:	500 x 300mm
Overall WxDxH:	520 x 360 x 130mm
Weight:	12kg
Power:	1500W

As described. For 230V 50/60 Hz single phase supplies.

Type	PK	Cat. No.
SB300	1	**9.645 331**
SB500	1	**9.645 317**

3



4

BioCote

7 Hotplates digital, SD 300 and SD 500

Stuart

Maximum temperature 300°C. Digital setting and control of plate temperature with 1°C resolution and cast aluminium/silicon alloy top plate. The 300 x 300mm top plate model has a retort rod mounting at the rear of the housing. With BioCote, silver-based, antimicrobial protection.

Model	**SD300**
Top plate:	300 x 300mm
Overall (WxDxH):	320 x 370 x 105mm
Weight:	6kg
Power:	600W
Model	**SD500**
Top plate:	500 x 300mm
Overall (WxDxH):	520 x 360 x 130mm
Weight:	12kg
Power:	1500W

For 230V 50/60 Hz single phase supplies.

Type	Hot-plate mm	PK	Cat. No.
SD300	300 x 300	1	**9.645 320** 5
SD500	300 x 500	1	**9.645 321** 6

5



9.645 320

6



9.645 321

7

BioCote

1



9.720 496

2



9.720 497

3



9.720 498

Hotplates C-MAG HP 4/C-MAG HP 7/C-MAG HP 10

IKA

Made of glass ceramic which offers excellent chemical resistance.
- fixed safety circuit of 550°C
- Hot Top indicator: Hot surface warning to prevent burns
- exact temperature setting via digital display (LED)
- digital error code display
- raised control panel for protection against spilt liquids

C-MAG HP 7, C-MAG HP 10 additionally:
adapter according to DIN 12878 for connecting a contact thermometer, e.g. ETS-D5, enables precise temperature control

Specifications

Heating function	
Temperature display:	digital
Heat output	
C-MAG HP 4:	250W
C-MAG HP 7:	1000W
C-MAG HP 10:	1500W
Heating rate (1 litre H_2O)	
C-MAG HP 4:	2.5K/min
C-MAG HP 7/HP 10:	5K/min
Temperature range:	50 to 500°C
Setting accuracy:	±10K
Safety circuit fixed:	550°C
Control accuracy with sensor	
C-MAG HP 4:	-
C-MAG HP 7/HP 10:	
Heating plate	
Material:	ETS-D5/±0.5 K
Dimensions	100 x 100mm
C-MAG HP 4:	glass ceramic
C-MAG HP 7:	180 x 180mm
C-MAG HP 10:	260 x 260mm

Tested to DIN EN IEC 61010-1.

Type	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.	
C-MAG HP 4	150 x 260 x 105	3	1	**9.720 496**	1
C-MAG HP 7	220 x 330 x 105	5	1	**9.720 497**	2
C-MAG HP 10	300 x 415 x 105	6	1	**9.720 498**	3

Optional accessories: HP 7 and HP 10 additionally: Electronical thermometer ETS-D5

4



4 High-performance hotplates

Gestigkeit

With thermostatic temperature control. CERAN® glass ceramic material is highly resistant to breakage and changes in temperature, free from distortion, permeable to infrared light and highly acid-resistant. Bench-top instrument with built-in controller. SR model - with separate controller for wall mounting can be supplied on request.

Type	Hot-plate mm	Temp. range °C	Rating W	Dimensions (W x D x H) mm	Weight kg	Supply requirements V	PK	Cat. No.
11 A	280 x 280	50 to 500	2000	290 x 410 x 100	5.5	230	1	**9.645 711**
22 A	280 x 430	50 to 500	3000	290 x 560 x 100	6.5	230	1	**9.645 712**
33 A	430 x 430	50 to 500	4400	440 x 560 x 100	9.0	400 (3ph.)	1	**9.645 714**
44 A	580 x 430	50 to 500	5700	590 x 560 x 100	11.5	400 (3ph.)	1	**9.645 715**

E & OE.

1 High-performance hotplate

High-performance CERAN® glass ceramic hotplate with circular heating area 145mm diameter, stainless steel housing, power controller (adjustable 10% to 100%) and integral temperature monitor.

Gestigkeit



Type	Hot-plate mm	Temp. range °C	Rating W	Dimensions (W x D x H) mm	Weight kg	Supply requirements V	PK	Cat. No.
CT 10	175 x 175	500	1200	200 x 290 x 85	2.6	230	1	**9.645 740**

2 Precision hotplate, PZ 44

Automatic, precise regulation of temperatures between 20 and 450°C. Digital presetting and temperature display. Three power levels (825W, 1650W and 3300W) can be set and an additional electronic power controller (adjustable 10% to 100 %) is provided. At 825W and 3300 W settings the entire plate surface is heated. At 1650W setting only the right hand side of the plate is heated. As a result of heat conduction, the temperature from the right hand side to the left edge of the plate varies by approx. 40%. Built-in relay allows direct connection of electronic contact thermometers. With solid, flat, low-distortion, cast GG15 alloy. Switching differential ±1K.

Gestigkeit



Type	Hot-plate mm	Temp. range °C	Rating W	Dimensions (W x D x H) mm	Weight kg	Supply requirements V	PK	Cat. No.
PZ 44	290 x 440	20 to 450	3300	320 x 470 x 190	23.0	230*	1	**9.645 744**

* 400 V, 3-ph. versions are also available on request

Precision hotplate, PZ 44, accessories

Gestigkeit

Type	PK	Cat. No.
Cable with plug for temperature safety device, timer switch, contact thermometer	1	**9.645 747**
Temperature safety device for 82, 128, 156, 170, 182, 212, 228, 254 °C please state when ordering	5	**9.645 748**

3 Hotplates

For continuous operation. Electric hotplates with thermostatic temperature control and separate power controller for performance adjustment to the heating requirements.
Anodised aluminium alloy hotplate. Excellent uniform temperature distribution over entire heating surface. Asbestos free. Stainless steel housing, with painted central section. Height-adjustable feet. Mains cable approximately 1.7m. With earthed plug for 230V supplies up to 3300W. A 400V 3-phase model is also available.

Gestigkeit



Type	Hot-plate mm	Temp. range °C	Rating W	Dimensions (W x D x H) mm	Weight kg	Supply requirements V	PK	Cat. No.
HT 02	300 x 300	50 to 300°C	1800	312 x 312 x 170	11.0	230	1	**9.645 781**
HT 12	350 x 350	50 to 300°C	2200	358 x 358 x 170	13.0	230	1	**9.645 782**
HT 22	350 x 500	50 to 300°C	2850	514 x 364 x 170	19.0	230	1	**9.645 785**
HT 32-230	430 x 580	50 to 300°C	4000	592 x 442 x 170	26.0	230	1	**9.645 786**
HT 32-400	430 x 580	50 to 300°C	4000	592 x 442 x 170	26.0	3x400	1	**9.645 787**



1 Precision hotplates, PZ-series

Gestigkeit

For continuous operation. Provide extremely accurate, uniform temperatures, even in plate corners and on edges. Polished anodised aluminium heating surface.
Microprocessor-controlled temperature controller with temperature setting up to 99.9 in 0.1°C steps, over 99.9 in 1°C steps. Actual temperature displayed continuously. With separate power controller for performance adjustment to the heating requirements from 10 to 100%. Built-in relay allows direct connection of electronic contact thermometers. Adjustable temperature monitor from 50 to 300°C (with PZ 28-1, 30 to 110°C) to prevent excess temperatures.

Type	Hot-plate mm	Temp. range °C	Rating W	Dimensions (W x D x H) mm	Weight kg	Supply requirements V	PK	Cat. No.
PZ 28-1	200 x 280	20 to 110	500	210 x 300 x 135	7.0	230	1	**9.645 827**
PZ 28-2	200 x 280	20 to 300	1100	210 x 300 x 135	7.0	230	1	**9.645 828**
PZ 35	350 x 350	20 to 300	2200	365 x 365 x 155	14.0	230	1	**9.645 824**
PZ 60	610 x 160	20 to 300	2000	620 x 200 x 155	12.0	230	1	**9.645 829**

Precision hotplates, PZ-series, accessories

As described.

Gestigkeit

Type	PK	Cat. No.
SK 85 to Cable for contact thermometer	1	**9.645 831**
ST 12 to Support rod 12 mm D. (PZ 60 only)	1	**9.645 832**
HK 3 to Holder for contact thermometer	1	**9.645 833**



2 Multiple hotplate systems behrotest®

Multiple hotplate saystems with individually adjustable heating controls and indidicator lights.

Behr

Type	Description	PK	Cat. No.
HB 4	4 hotplates with metal protective grilles, 94mm dia.	1	**9.645 590**
HB 6	6 hotplates with metal protective grilles, 94mm dia.	1	**9.645 591**
HB 8	8 hotplates with metal protective grilles, 94mm dia.	1	**9.645 594**
HBS 4	Holder for HB 4 incl. 4 support rods	1	**9.645 592**
HBS 6	Holder for HB 6 incl. 6 support rods	1	**9.645 593**
HBS 8	Holder for HB 8 incl. 8 support rods	1	**9.645 595**



E & OE.

1 Standard heating mantles series KM-G

SAF Wärmetechnik

LabHEAT®-Heating mantles for flasks, round bottom. Flexible glass yarn heating element; outer jacket in glass silk; with Ø 60mm bottom out-let from 500ml; max. heating element temperature 450°C; 1.5m power supply (earthed) cable with heating-zone switch and RCD (residual current detection); nominal voltage 230V AC.



Capacity	Flask dia.	Rating	Heating areas	PK	Cat. No.
ml	mm	W			
25	41	65	1	1	**9.642 401**
50	51	75	1	1	**9.642 402**
100	64	120	1	1	**9.642 403**
250	85	180	2	1	**9.642 404**
500	105	250	2	1	**9.642 405**
1000	131	450	2	1	**9.642 406**
2000	166	600	2	1	**9.642 407**
3000	185	800	2	1	**9.642 408**
4000	207	900	2	1	**9.642 409**
5000	223	1200	2	1	**9.642 410**
6000	236	1400	2	1	**9.642 411**
10000	279	2000	2	1	**9.642 412**
20000	345	2200	2	1	**9.642 413**

Heating mantles with other specifications available on request.

2 Standard heating mantles series KM-GH

SAF Wärmetechnik

LabHEAT®-Heating mantles for flasks, round bottom. Designed identical to series KM-G, but the heating element is made of heat-resistant quartz yarn and permits a maximum temperature up to 900°C; 1.5m power supply (earthed) cable with heating-zone switch and RCD (residual current detection); nominal voltage 230V AC.



Capacity	Flask dia.	Rating	Heating areas	PK	Cat. No.
ml	mm	W			
100	64	200	1	1	**9.642 440**
250	85	300	2	1	**9.642 441**
500	105	500	2	1	**9.642 442**
1000	131	750	2	1	**9.642 443**
2000	166	1200	2	1	**9.642 444**
4000	207	1800	2	1	**9.642 445**
6000	236	2500	2	1	**9.642 446**

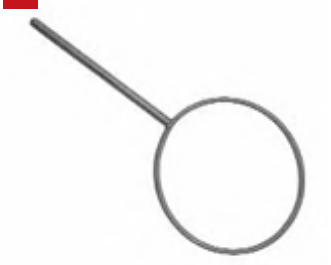
Heating mantles with other specifications available on request.

3 4 Accessories for Standard heating mantles

SAF Wärmetechnik

LabHEAT® - Accessories made of stainless steel (1.4301) for higher stability or to integrate within support wall. The heating mantles are able to be suspended on its four clips.





Description	For mantle	PK	Cat. No.
	ml		
Tripod	100	1	**9.642 600**
Tripod	250	1	**9.642 601**
Tripod	500	1	**9.642 602**
Tripod	1000	1	**9.642 603**
Tripod	2000	1	**9.642 604**
Tripod	3000	1	**9.642 605**
Tripod	4000	1	**9.642 606**
Tripod	5000	1	**9.642 607**
Tripod	6000	1	**9.642 608**
Tripod	10000	1	**9.642 609**
Tripod	20000	1	**9.642 610**
Support ring	25	1	**9.642 620**
Support ring	50	1	**9.642 621**
Support ring	100	1	**9.642 622**
Support ring	250	1	**9.642 623**
Support ring	500	1	**9.642 624**
Support ring	1000	1	**9.642 625**
Support ring	2000	1	**9.642 626**
Support ring	3000	1	**9.642 627**
Support ring	4000	1	**9.642 628**

1



1 Metal-cased heating mantles series KM-M, without controller

LabHEAT® - Heating mantles for flasks, round bottom. Flexible glass yarn heating element; plastic coated, chemical-resistant metal housing with built-in power-on and heating zone switch; max. heating element temperature 450°C; 1.5m power supply (earthed) cable and RCD (residual current detection); nominal voltage 230V AC. *SAF Wärmetechnik*

Capacity	Flask dia.	Rating	Heating areas	PK	Cat. No.
ml	mm	W			
50	51	55	1	1	**9.642 500**
100	64	100	1	1	**9.642 501**
250	85	150	2	1	**9.642 502**
500	105	200	2	1	**9.642 503**
1000	131	300	2	1	**9.642 504**
2000	166	500	2	1	**9.642 505**
3000	185	600	2	1	**9.642 506**
4000	207	750	2	1	**9.642 507**
5000	223	860	2	1	**9.642 508**
6000	236	1000	2	1	**9.642 509**
10000	279	1400	2	1	**9.642 510**
20000	345	2000	2	1	**9.642 511**

Serial heating units and Heating mantles with other specifications available on request.

2



2 Metal-cased heating mantles series KM-ME, with controller

LabHEAT® - Heating mantles for flasks, round bottom. Flexible glass yarn heating element; plastic coated, chemical-resistant metal housing with built-in power-on and heating zone switch, **in addition equipped with a controller** which allows a continuous adjustment of the heater power; max. heating element temperature 450°C; 1.5m power supply (earthed) cable and RCD (residual current detection); nominal voltage 230V AC. *SAF Wärmetechnik*

Capacity	Flask dia.	Rating	Heating areas	PK	Cat. No.
ml	mm	W			
50	51	55	1	1	**9.642 520**
100	64	100	1	1	**9.642 521**
250	85	150	2	1	**9.642 522**
500	105	200	2	1	**9.642 523**
1000	131	300	2	1	**9.642 524**
2000	166	500	2	1	**9.642 525**
3000	185	600	2	1	**9.642 526**
4000	207	750	2	1	**9.642 527**
5000	223	860	2	1	**9.642 528**
6000	236	1000	2	1	**9.642 529**
10000	279	1400	2	1	**9.642 530**
20000	345	2000	2	1	**9.642 531**

Heating mantles with other specifications available on request.

3



3 Metal-cased heating mantles series KM-MPE for different sized round bottom flasks

LabHEAT®-Heating mantles for flasks, round bottom. Designed and techical identical to series KM-ME, but to used **for round flasks of three different sizes,** max. heating element temperature 450°C; 1.5m power supply (earthed) cable and RCD (residual current detection); nominal voltage 230V AC. *SAF Wärmetechnik*

Capacity	Flask dia.	Rating	Heating areas	PK	Cat. No.
ml	mm	W			
50 to 250	51 to 85	160	3	1	**9.642 540**
250 to 1000	85 to 131	350	3	1	**9.642 541**
1000 to 3000	131 to 185	700	3	1	**9.642 542**

Serial heating units and Heating mantles with other specifications available on request.

4



4 Stirred heating mantles LabHEAT® KM-MER series

LabHEAT® - Heating mantles for flasks, round bottom. Designed and technical identical to series KM-ME, but **in addition equipped with a magnetic stirrer**; rotational frequency up to 1600rpm max. heating element temperature 450°C, 1.5m power supply (earthed) cable and RCD (residual current detection); nominal voltage 230V AC. *SAF Wärmetechnik*

Capacity	Flask dia.	Rating	Heating areas	PK	Cat. No.
ml	mm	W			
100	64	100	1	1	**9.642 545**
250	85	150	2	1	**9.642 546**
500	105	200	2	1	**9.642 547**
1000	131	300	2	1	**9.642 548**

Serial heating units and Heating mantles with other specifications available on request.

1 Support clamp KM-SK

LabHEAT®-Accessories for metal-cased heating mantles and serial heating unit to fix support rods up to diameter 13mm or to integrate the metal-cased heating mantles within support wall.

SAF Wärmetechnik

Type	PK	Cat. No.
KM-SK	1	**9.642 630**



2 Glass fibre-insulated heating tapes series KM-HT-BS30

LabHEAT®-Heating tapes. No protection against ingress of water; with inner metal protective braiding and glass fibre insulation; product dimensions 30 x 5mm; min. bending radius > 15mm; max. heating element temperature 450°C; preterminated with 1.0m cold end; nominal voltage 230V AC.

SAF Wärmetechnik

Length cm	Heating power W	PK	Cat. No.
50	125	1	**9.642 720**
100	250	1	**9.642 721**
150	375	1	**9.642 722**
200	500	1	**9.642 723**
250	625	1	**9.642 724**
300	750	1	**9.642 725**
400	1000	1	**9.642 726**
500	1250	1	**9.642 727**
700	1500	1	**9.642 728**
1000	2000	1	**9.642 729**

Other lenghts and other specifications available on request.



3 Glass fibre-insulated heating cables series KM-HC-G

LabHEAT®-Heating cables. No protection against ingress of water; glass fibre insulation without protective braiding; outer diameters dia. 3.5 to 4.5mm; min. bending radius > 5mm; max. heating element temperature 450°C; preterminated with 2 x 1.5m cold end; nominal voltage 230V AC.

SAF Wärmetechnik

Length cm	Heating power W	PK	Cat. No.
50	75	1	**9.642 750**
100	150	1	**9.642 751**
150	225	1	**9.642 752**
200	300	1	**9.642 753**
250	375	1	**9.642 754**
300	450	1	**9.642 755**
400	600	1	**9.642 756**
500	750	1	**9.642 757**
600	900	1	**9.642 758**

Other lenghts and other specifications available on request.



4 Power controller KM-L116

LabHEAT®-regulator. Electromechanical; infinitely variable control over power outlet; plastic housing (H x W x D) 55mm x 65mm x 120mm; switching power max. 3000W (13A); 1.5m power supply (earthed) cable with plug.

SAF Wärmetechnik

Type	PK	Cat. No.
KM-L116	1	**9.642 660**



1



1 Laboratory regulator series KM-RX1000

SAF Wärmetechnik

LabHEAT®-regulator. Freely configurable electronical temperature regulator with two displays indicating the desired and actual values. Pt-100 or thermocouples for temperatures up to 1200°C, metal housing (H x W x D) 75mm x 205mm x 140mm with fixed support clamp, switching power max. 2300W (10A), 1.5m power supply (earthed) cable with plug. Nominal voltage 230V AC.

Type	Sensor / Alarm connetion	PK	Cat. No.
KM-RX 1001	Socket / Socket	1	**7.619 815**
KM-RX 1004	Clamps / Clamps	1	**9.642 654**

2



2 Temperature sensors for Laboratory regulator series KM-RX1000

SAF Wärmetechnik

LabHEAT®-sensors. Suitable for temperature control and KM-KM-RX1001 RX1004 with permanently attached cable, with or without diode plug.

KM-TP2: Pt100, up to 400°C, sheated element V2A, dia. 4 x 50mm, 2.0m cable
KM-TPG: Pt100, up to 250°C, glass tube, dia. 6 x 400mm, 1.5m cable
KM-TNS: NiCr-Ni, up to 1200°C, rod sensor in Inconell, dia. 1.5 x 300mm, 2.0m cable
KM-TNF: NiCr-Ni, up to 400°C, flat sensor, 0.4 x 15 x 400mm, 1.5m cable

Type	Connection	For	PK	Cat. No.
KM-TP2	with diode plug	KM-RX1001	1	**7.619 816**
KM-TPG	with diode plug	KM-RX1001	1	**9.642 674**
KM-TNS	with diode plug	KM-RX1001	1	**6.237 998**
KM-TNF	with diode plug	KM-RX1001	1	**6.236 355**
KM-TP2	without diode plug	KM-RX1004	1	**9.642 672**
KM-TPG	without diode plug	KM-RX1004	1	**9.642 673**
KM-TNS	without diode plug	KM-RX1004	1	**9.642 671**
KM-TNF	without diode plug	KM-RX1004	1	**9.642 670**

Further models available on request.

3



3 Electronic heating mantles, EM series

Electrothermal

Polypropylene outer case is resilient and chemically- resistant. Highly efficient in heating up to an element temperature of 450°C. The flexible heating element is suspended in a thermal insulating cartridge to provide maximum heat transfer with minimum risk of flask breakage. Even at full power output, the exterior remains "cool-to-touch" due to good heating element insulation. All heating mantles have support clamp for rods of up to 12mm diameter, and are double fused, with earth (ground) screen to protect the user from electric shocks. Available as 220-240 V 50/60 Hz models; spare heater cartridges are available on request.

For flasks ml	Width mm	Depth mm	Height mm	Power W	PK	Cat. No.
100	175	260	127	60	1	**9.643 033**
250	175	260	127	150	1	**9.643 034**
500	238	310	145	200	1	**9.643 035**
1000	238	310	145	300	1	**9.643 036**
2000	350	400	190	500	1	**9.643 037**
3000	350	400	190	500	1	**9.643 038**
5000	350	400	190	800	1	**9.643 039**

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

Electrothermal

E & OE.

1 Electronic multi-size heating mantles, spill-proof, EMX series

Electrothermal

Solid stainless steel liner, which protects against fluid spills and is easy to clean, with central aperture to accommodate round-bottom and pear-shaped flask and 60° funnels. Polypropylene outer case is resilient and chemically- resistant. Highly efficient in heating up to an element temperature of 450°C. Even at full power output, the exterior remains "cool-to-touch" due to good heating element insulation. All heating mantles have support clamp for rods of up to 12mm diameter, and are double fused, with earth (ground) screen to protect the user from electric shocks. Available as 220-240 V 50/60 Hz models; spare heater cartridges are available on request.

For round bottom flasks, pear-shaped flasks and 60° funnels (Mantle is open at the bottom).

For flasks ml	Width mm	Depth mm	Height mm	Power W	PK	Cat. No.
500 to 1000	238	310	145	245	1	**9.643 081**
2000 to 5000	350	400	190	600	1	**9.643 083**

1



2 Electronic multi-size heating mantles, V-shaped, EMV series

Electrothermal

Solid, with mesh stainless steel liner, which protects against fluid spills, with central aperture to accommodate round-bottom and pear-shaped flask and 60° funnels. Polypropylene outer case is resilient and chemically- resistant. Highly efficient in heating up to an element temperature of 450°C. Even at full power output, the exterior remains "cool-to-touch" due to good heating element insulation. All heating mantles have support clamp for rods of up to 12mm diameter, and are double fused, with earth (ground) screen to protect the user from electric shocks. Available as 220-240 V 50/60 Hz models; spare heater cartridges are available on request.

For round bottom flasks, pear-shaped flasks and 60° funnels (Mantle is open at the bottom).

For flasks ml	For funnel diam. mm	Dimensions (W x D x H) mm	Power W	PK	Cat. No.
10 to 50	50 to 100	175 x 260 x 127	60	1	**9.643 072**
100 to 250	75 to 100	175 x 260 x 127	150	1	**9.643 073**
500 to 1000	100 to 200	238 x 310 x 145	300	1	**9.643 074**
1000 to 5000 *	200 to 300	350 x 400 x 190	800	1	**9.643 075**

* With 2 circuits, 1 x 300, 1 x 500 W.

2



3 Electronic stirrer mantles, EMA series

Electrothermal

Built-in adjustable heater control up to an element temperature of 450°C and magnetic stirring control up to approx. 520rpm with auto-reverse facility and automatic stirrer bar trap; the stirrer unit has an independent power supply. Polypropylene outer case is resilient and chemically-resistant. Even at full power output, the exterior remains "cool-to-touch" due to good heating element insulation. All heating mantles have support clamp for rods of up to 12mm diameter, and are double fused, with earth (ground) screen to protect the user from electric shocks. Available as 220-240 V 50/60 Hz models; spare heater cartridges are available on request.

For flasks ml	Width mm	Depth mm	Height mm	Power W	PK	Cat. No.
50	175	260	133	80	1	**9.643 122**
100	175	260	133	80	1	**9.643 123**
250	175	260	133	170	1	**9.643 124**
500	238	310	157	220	1	**9.643 125**
1000	238	310	157	320	1	**9.643 126**
2000	350	400	197	520	1	**9.643 127**

3



1



1 Contact thermometers

With MS 121st2 flat plug. *Heju*

Measuring range °C	Grad. °C	Length*	PK	Cat. No.
0 ... +100	1	50	1	**9.233 010**
-20 ... +150	1	50	1	**9.233 015**
0 ... +100	1	100	1	**9.233 110**
-20 ... +150	1	100	1	**9.233 115**
0 ... +250	2	100	1	**9.233 125**
0 ... +100	1	150	1	**9.233 210**
-20 ... +150	1	150	1	**9.233 215**
0 ... +250	2	150	1	**9.233 225**
-20 ... +150	1	200	1	**9.233 315**
0 ... +250	2	200	1	**9.233 325**
-20 ... +150	1	250	1	**9.233 345**
0 ... +250	2	250	1	**9.233 347**
-20 ... +150	1	300	1	**9.233 365**
-20 ... +150	1	300	1	**9.233 371**
0 ... +250	1	300	1	**6.090 811**
0 ... +250	2	300	1	**9.233 367**
0 ... +360	1	300	1	**9.233 369**

* Probe length (mm)

Contact thermometers, accessory connecting cable

With flat coupling and diode connection for relay. *Heju*

For	Cable m	PK	Cat. No.
Contact thermometers with flat plug MS 121st2	0.8	1	**9.233 400**
Contact thermometers with diode plug MS 121st3	1.5	1	**6.091 756**

2



2 Contact thermometers, accessory relay TST-tr

With Schuko power output socket and discrete control circuit. Plastic housing insulated to VDE. Automatic on/off switch. Will not function unless a contact thermometer is plugged in. Switch status display. Dimensions (WxDxH) 120mm x 80mm x 85mm. Switching capacity 220V 10A. *Heju*

Type	Description	PK	Cat. No.
TST tr		1	**9.234 253**
TST tr	for electronical contact thermometers	1	**9.234 254**

3



3 Temperature controllers, TEMPAT®-D

For controlling temperature of heating coils, hotplates, ovens, infrared radiators and water baths. TEMPAT®-D has a 10mm high, LED display which can even be seen in dark rooms and allows monitoring of actual temperature at any time. Set point can be entered via a 3 or 4 figure coding switch with 1°C resolution. Built-in sensor breakdown fuse, switching interval display and Xp trimmer to adjust variable gain amplification between 0 and 10K. Sensor connection is via a plug-in socket.

Appropriate temperature sensor please order separately.
If no temperature sensor is ordered, a loose plug is supplied.

Specifications

Input:	230V, 50/60Hz
Switching capacity:	2300W, 10A
Connection, appliance:	1.20M long connection cable with impact resistant plug
Consumer load:	earthed schuko socket, other plug-in connections in accordance with Swiss or French/Belgian standards, for example can be supplied at additional cost.
Housing:	Polycarbonate plastic, gray
Dimensions:	188mm x 110mm x 70mm
On/off switch:	via dipole luminous rocker switch
Probe connection:	via socket
Contact assignment Pt100:	1 and 2
Contact load:	1 + 3
Accuracy:	±1% from measuring range value

For	Temp. range °C	PK	Cat. No.
Probe Pt100	0 ... 400	1	**9.725 381**
Probe Fe-CuNi	0 ... 600	1	**9.725 382**
Probe NiCr-Ni	0 ... 1200	1	**9.725 383**

E & OE.

1 Probe for temperature controllers, TEMPAT®

All probes with 2m connecting cable and plug.

Type	Diam. mm	Length mm	PK	Cat. No.
Probe Pt100	1,6*	250	1	**9.725 320**
Probe Pt100	2,0*	250	1	**9.725 321**
Probe Pt100	2,5*	250	1	**9.725 378**
Probe Pt100	3,0*	250	1	**7.601 585**
Glass-probe Pt100	2,5	250	1	**9.725 322**
Glass-probe Pt100	3,0	250	1	**9.725 323**
Probe Fe-CuNi	1,5**	250	1	**9.725 394**
Probe NiCr-Ni	1,5**	250	1	**9.725 395**

* probe tube stainless steel 4301.
**mantle of austenitic stainless steel.

1



2 Power controller, VOLTRON-PLUS F

Alternating current controller for variable and no-loss control of resistive and inductive power devices with the following additional features:
- On/off luminous rocker switch, dipole switching, 10 A (4)
- IC controlled, hysteresis free
- Quiet running
- Anti-interference grade N
- Fast-blow fuse
- Protected fuse holder
- Power-on indicator lamp

Specifications

Voltage:	220-235V, 50/60Hz
Switching capacity:	Max. 2000VA
Switching current:	Max. 10A
Electronics:	Phase controls
Regulating range:	0 to 235V a.c.
Dimensions:	150 x 80 x 55mm
Weight:	0.7kg

Type	PK	Cat. No.
VOLTRON-PLUS F	1	**9.725 363**

2



3 Power controller, Voltron 20

Alternating current resistance controller with interference suppressor for variable, no-power-loss control of hotplates, heating tapes, soldering irons, light bulbs, infrared radiators etc., control range 25V to 225V. With single throw on/off potentiometer and shielded fuse holder for safe fuse replacement away from the internal circuit. Fitted with interference suppressor in accordance with EN standard.

Type	Power W	PK	Cat. No.
Voltron 20	2000	1	**9.725 094**

3



Volumetric apparatus 872
Measuring cylinders 872
Mixing cylinders 877
Graduated flasks 878

Pipettes 887
Volumetric pipettes 887
Graduated pipettes 891
Pasteur pipettes 896
Serological pipettes 897
Pipette balls 898
Pipettes Accessories 900
Capillary tubes 902
Pipette controllers 905
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Dispensing 954
Hand dispensers 954
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Titration 973
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Titrators 978
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Pumps 988
Drum pumps 988
Peristaltic pumps 995
Dosing pumps 1012
Gear pumps 1014
Rotary piston pumps 1015

1



9.274 176

Measuring cylinders, borosilicate glass 3.3, tall form, class A, blue graduated

Borosilicate glass 3.3. Conformity certified with batch ID. To DIN EN ISO 4788, DIN 12680. *Isolab*
High form, hexagonal foot with spout.

Capacity	Tolerance	Height	PK	Cat. No.
ml	± ml	mm		
5	0.050	115	1	**9.274 170**
10	0.100	140	1	**9.274 171**
25	0.250	170	1	**9.274 172**
50	0.500	200	1	**9.274 173**
100	0.500	260	1	**9.274 174**
250	1.000	335	1	**9.274 175**
500	2.500	390	1	**9.274 176** 1
1000	5.000	470	1	**9.274 177**
2000	10.000	570	1	**9.274 178**

2



9.274 183

Measuring cylinders, DURAN®, tall form, class A, blue graduation

IN (TD) calibrated. With spout and hexagonal glass base. Main point ring graduation. *Hirschmann*
With dated batch identification. Conformity certified. Graduation in durable blue enamel, acc.to DIN EN ISO 4788.

For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Capacity	Grad.	Tolerance	Height	PK	Cat. No.
ml	ml	± ml	mm		
5	0.1	0.05	115	1	**9.274 180**
10	0.2	0.1	140	1	**9.274 181**
25	0.5	0.25	170	1	**9.274 182**
50	1	0.5	200	1	**9.274 183** 2
100	1	0.5	260	1	**9.274 184**
250	2	1.0	335	1	**9.274 185**
500	5	2.5	390	1	**9.274 186**
1000	10	5.0	470	1	**9.274 187**
2000	20	10.0	570	1	**9.274 188**

Also available with dated batch identfication acc. to USP (US Pharmacopeia).

3



9.274 138

Measuring cylinders, borosilicate glass 3.3, tall form, class A, blue graduated

With spout, tall form. BLAUBRAND®. To DIN EN ISO 4788. *BRAND*
Conformity certified with works certified batch number. With spout and hexagonal foot.
Graduations and inscriptions in highly contrasting blue enamel. Calibrated to contain.
All BLAUBRAND® cylinders are delivered with batch number and one batch certificate per outer pack.
Also available with individual works, USP, or DAkkS (former DKD) calibration certificate on request.
The batch certificate is also available to download from the manufacturer's website.

Capacity	Grad.	Accuracy	Height	PK	Cat. No.
ml	ml	± ml	mm		
5	0.1	0.05	115	1	**9.274 105**
10	0.2	0.10	140	1	**9.274 108**
25	0.5	0.25	170	1	**9.274 120**
50	1	0.5	200	1	**9.274 128**
100	1	0.5	260	1	**9.274 138** 3
250	2	1.0	335	1	**9.274 148**
500	5	2.5	365	1	**9.274 154**
1000	10	5.0	465	1	**9.274 162**
2000	20	10	505	1	**9.274 164**

Measuring cylinders, DURAN®, tall form, class A, amber graduation

IN (TC) calibrated. With spout and hexagonal glass base. With dated batch identification. *Hirschmann*
Conformity certified. With durable amber stain graduation, acc. to DIN EN ISO 4788.
For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Capacity	Grad.	Accuracy	Height	PK	Cat. No.
ml	ml	± ml	mm		
5	0.1	0.05	115	1	**6.901 399**
10	0.2	0.1	140	1	**6.250 413**
25	0.5	0.25	170	1	**6.700 903**
50	1.0	0.5	200	1	**6.201 104**
100	1.0	0.5	260	1	**6.303 988** 1
250	2.0	1.0	335	1	**6.250 483**
500	5.0	2.5	390	1	**6.222 339**
1000	10.0	5.0	470	1	**6.200 496**
2000	20.0	10.0	570	1	**6.206 675**

1



6.303 988

Measuring cylinders, borosilicate glass 3.3, tall form, class A, white graduated

High form, hexagonal with spout, foot PP. Borosilicate glass 3.3. *Isolab*
Conformity certified with batch ID.To DIN EN ISO 4788, DIN 12680.

Capacity	Tolerance	Height	PK	Cat. No.
ml	± ml	mm		
10	0.100	135	1	**4.008 307**
25	0.250	160	1	**4.008 308**
50	0.500	195	1	**6.238 840**
100	0.500	240	1	**6.237 709** 2
250	1.00	320	1	**6.237 710**
500	2.50	380	1	**4.008 309**
1000	5.00	465	1	**4.008 310**

2



6.237 709

Measuring cylinders, borosilicate glas 3.3, tall form, class B, blue graduated

IN (TD) calibrated. With spout and hexagonal glass base. *Hirschmann*
Tolerances better than class B requirements.
Graduation in durable blue enamel, acc.to DIN EN ISO 4788.

Capacity	Grad.	Accuracy	Height	PK	Cat. No.
ml	ml	± ml	mm		
5	0.1	0,075	115	1	**9.274 198**
10	0.2	0,15	140	1	**9.274 199**
25	0.5	0,375	170	1	**9.274 200**
50	1	0,75	200	1	**9.274 201**
100	1	0,75	260	1	**9.274 202** 3
250	2	1,5	335	1	**9.274 203**
500	5	3,75	390	1	**9.274 204**
1000	10	7,5	470	1	**9.274 206**
2000	20	15,0	500	1	**9.274 207**

3



9.274 202

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6.510 180

Measuring cylinders, borosilicate glass 3.3, tall form, class B, amber graduation

IN (TC) calibrated. With spout and hexagonal glass base. Tolerances better than class B requirements. *Hirschmann*
With durable amber stain graduation, DIN EN ISO 4788.

Capacity	Grad.	Accuracy	Height	PK	Cat. No.
ml	ml	± ml	mm		
5	0.1	0.075	115	1	**6.078 159**
10	0.2	0.15	140	1	**6.200 432**
25	0.5	0.375	170	1	**6.200 433**
50	1.0	0.75	200	1	**7.200 508**
100	1.0	0.75	260	1	**6.510 180** 1
250	2.0	1.5	335	1	**6.200 434**
500	5.0	3.75	390	1	**6.510 181**
1000	10.0	7.5	470	1	**6.510 182**
2000	20.0	15.0	570	1	**6.510 183**
5000*	50.0	37.5	650	1	**7.510 242**

* Supplementary to DIN.

Measuring cylinders, borosilicate glass 3.3, tall form, class B, amber graduation

Available with glass, or detachable plastic, feet and PP protective collars (plastic feet and collar are not autoclavable). *BRAND*
With spout, tall form. SILBERBRAND Eterna. Class B. To DIN EN ISO 4788. With spout and hexagonal foot.
Graduations and inscriptions in Eterna permanent amber stain. Calibrated to contain.

Capacity	Grad.	Height	Accuracy	Foot	PK	Cat. No.
ml	ml	mm	± ml			
5	0.1	115	0.08	Glass	1	**9.274 005**
10	0.2	140	0.15	Glass	1	**9.274 008**
25	0.5	170	0.4	Glass	1	**9.274 020**
50	1	200	0.8	Glass	1	**9.274 028**
100	1	260	0.8	Glass	1	**9.274 038** 2
250	2	335	1.5	Glass	1	**9.274 048**
500	5	365	4	Glass	1	**9.274 054**
1000	10	465	8	Glass	1	**9.274 062**
2000	20	505	15	Glass	1	**9.274 064**
10	0.2	135	0.15	PP (detachable)	1	**9.274 071**
25	0.5	170	0.4	PP (detachable)	1	**9.274 072**
50	1	190	0.8	PP (detachable)	1	**9.274 073**
100	1	260	0.8	PP (detachable)	1	**9.274 074** 3
250	2	335	1.5	PP (detachable)	1	**9.274 075**
500	5	370	4	PP (detachable)	1	**9.274 076**
1000	10	450	8	PP (detachable)	1	**9.274 077**

2



9.274 038

3



9.274 074

Measuring cylinders, DURAN®, low form, class B, amber stain graduation

IN (TC) calibrated. With spout and hexagonal glass base. *Hirschmann*
Tolerances better than class B requirements. Short line graduation.
With durable amber stain graduation, DIN EN ISO 4788.

Capacity	Grad.	Height	PK	Cat. No.
ml	ml	mm		
10	1	100	1	**9.274 190**
25	1	120	1	**9.274 191**
50	2	145	1	**9.274 192**
100	2	160	1	**9.274 193** 1
250	5	190	1	**9.274 194**
500	10	255	1	**9.274 195**
1000	20	295	1	**9.274 196**
2000	50	325	1	**9.274 197**

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9.274 193

Measuring cylinders with spout, plastic

Measuring cylinders made of PP withstand exposure to temperatures up to 80°C without permanent loss of tolerance. Measuring cylinders made of PMP withstand exposure to temperatures up to 121°C (autoclaving) without permanent loss of tolerance. *BRAND*
Cleaning at temperatures below 60°C is recommended to preserve graduations and inscriptions on printed versions.
For autoclaving, we recommend the use of cylinders with moulded graduations.

Measuring cylinders, PMP, tall form, class A, blue graduations

Tall form. PMP. Class A DIN 12681 and ISO 6706. Transparent, with blue printed graduations and inscriptions. Exposure to temperatures up to 121 ºC (autoclaving) will not cause permanently exceeded error limits. Cleaning at temperatures below 60°C is recommended to preserve graduations and inscriptions. *BRAND*
Conformity certified. With batch number and quality certificate.
The batch certificate is available to download from the manufacturer's website.

Class A tolerance is not affected even after 20 washes and 10 autoclave treatments.
(DIN 12681 requires: 10 washes and 3 autoclave treatments).

Capacity	Grad.	Tolerance A	Height	PK	Cat. No.
ml	ml	± ml	mm		
10	0.2	0.10	145	1	**9.274 790**
25	0.5	0.25	170	1	**9.274 791**
50	1	0.5	200	1	**9.274 792** 2
100	1	0.5	250	1	**9.274 793**
250	2	1.0	315	1	**9.274 794**
500	5	2.5	360	1	**9.274 795**
1000	10	5	440	1	**9.274 796**
2000	20	10	535	1	**9.274 797**

2



9.274 792

Measuring cylinders, PMP, tall form, class A

Crystal clear. With a raised scale and ring marks at the primary scale points, calibrated IN. *VITLAB*
Class A tolerances according to DIN 12681/ISO 6706.
Hexagonal base with bottom studs provides high stability.
Thermal stress up to 121ºC (autoclaving) does not cause tolerance limits to be permanently exceeded.

Capacity	Accuracy	Grad.	Height	Diam.	PK	Cat. No.
ml	± ml	ml	mm	mm		
10	0.10	0.20	145	15	1	**9.274 508**
25	0.25	0.50	170	22	1	**9.274 520**
50	0.50	1.00	200	27	1	**9.274 528**
100	0.50	1.00	250	33	1	**9.274 538** 3
250	1.00	2.00	315	44	1	**9.274 548**
500	2.50	5.00	360	58	1	**9.274 554**
1000	5.00	10.00	440	69	1	**9.274 562**
2000	10.00	20.00	482	97	1	**9.274 564**

3



9.274 538

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9.274 084

Graduated cylinders, PP, tall form, class B, blue graduated

Tall form, highly transparent, with blue graduations, hexagonal base, calibrated to contain IN. Tolerances class B according to DIN 12681/ISO 6706.
Exposure to temperatures above 60°C may effect accuracy.
Cleaning up to max. 60°C is recommended to preserve marks and inscriptions.

Isolab

Capacity ml	Accuracy ± ml	Height mm	PK	Cat. No.
10	0,200	135	1	**9.274 080**
25	0,500	160	1	**9.274 081**
50	1,000	195	1	**9.274 082**
100	1,000	240	1	**9.274 083**
250	2,000	320	1	**9.274 084** 1
500	5,000	380	1	**9.274 085**
1000	10,000	465	1	**9.274 086**

2



9.274 411

Graduated cylinders, PP, class B, blue moulded graduations, tall form

Highly transparent. With easily readable, raised, embossed blue scale and ring marks at the primary scale points.
Calibrated IN. Class B tolerances according to DIN 12681/ISO 6706.
Hexagonal base with bottom studs provides high stability.
Thermal stress up to 80ºC does not cause tolerance limits to be permanently exceeded.
To preserve markings, do not clean at temperatures exceeding 60ºC.
Food-safe (suitable for contact with foodstuff in accordance with Regulation (EC) No. 10/2011).

VITLAB

Capacity ml	Grad. ml	Height mm	Accuracy ± ml	Diam. mm	PK	Cat. No.
10	0.20	145	0.2	15	1	**9.274 408**
25	0.50	170	0.5	22	1	**9.274 409**
50	1.00	200	1.0	27	1	**9.274 410**
100	1.00	250	1.0	33	1	**9.274 411** 2
250	2.00	315	2.0	44	1	**9.274 412**
500	5.00	360	5.0	58	1	**9.274 413**
1000	10.00	440	10.0	69	1	**9.274 414**
2000	20.00	482	20.0	97	1	**9.274 415**

3



9.274 438

Graduated cylinders, PP, tall form, class B, moulded graduations

Tall form. Highly transparent.
With a raised scale and ring marks at the primary scale points, calibrated IN.
Class B tolerances according to DIN 12681/ISO 6706.
Hexagonal base with bottom studs provides high stability.
Thermal stress up to 80ºC does not cause tolerance limits to be permanently exceeded.
Food-safe (suitable for contact with foodstuff in accordance with Regulation EC No. 10/2011).

VITLAB

Capacity ml	Grad. ml	Height mm	Accuracy ± ml	Diam. mm	PK	Cat. No.
10	0.20	145	0.2	15	1	**7.075 031**
25	0.50	170	0.5	22	1	**9.274 420**
50	1.00	200	1.0	27	1	**9.274 428**
100	1.00	250	1.0	33	1	**9.274 438** 3
250	2.00	315	2.0	44	1	**9.274 448**
500	5.00	360	5.0	58	1	**9.274 454**
1000	10.00	440	10.0	69	1	**9.274 462**
2000	20.00	482	20.0	97	1	**9.274 464**

4



7.008 999

Graduated cylinders, SAN, low form, class B, moulded graduations

NEW!

Short form. Crystal clear. With a raised scale and ring marks at the primary scale points, calibrated IN. Thermal stress up to 60ºC does not cause tolerance limits to be permanently exceeded.
Food-safe (suitable for contact with foodstuff in accordance with Regulation EC No. 10/2011).

VITLAB

Capacity ml	Grad. ml	Height mm	Accuracy ± ml	Diam. mm	PK	Cat. No.
25	0,50	122	0,50	22	1	**7.060 690**
50	1,00	142	1,00	27	1	**7.060 691**
100	2,00	163	2,00	37	1	**7.008 999** 4
250	5,00	192	5,00	51	1	**7.060 692**
500	10,00	218	10,00	67	1	**7.060 693**
1000	20,00	285	20,00	78	1	**7.060 694**

E & OE.

Graduated cylinders, SAN, tall form, class B, moulded graduations

NEW!

VITLAB

Tall form. Crystal clear.
With a raised scale and ring marks at the primary scale points, calibrated IN.
Class B tolerances according to DIN 12681/ISO 6706. Hexagonal base with bottom studs provides high stability.
Thermal stress up to 60ºC does not cause tolerance limits to be permanently exceeded. Food-safe
(suitable for contact with foodstuff in accordance with Regulation EC No. 10/2011).

Capacity ml	Grad. ml	Height mm	Accuracy ± ml	Diam. mm	PK	Cat. No.
10	0,20	140	0,20	16	1	**7.009 005**
25	0,50	169	0,50	21	1	**7.009 008**
50	1,00	199	1,00	28	1	**7.009 011**
100	1,00	260	1,00	34	1	**7.009 014** 1
250	2,00	315	2,00	47	1	**7.009 017**
500	5,00	350	5,00	61	1	**7.009 020**
1000	10,00	415	10,00	76	1	**7.009 023**
2000	20,00	482	20,00	97	1	**7.009 026**

1



7.009 014

2 Measuring cylinders, PP, tall form, class B, embossed graduation

NEW!

Isolab

- Manufactured from ultra clear, virgin polypropylene and its thick walls eliminate distortion.
- They offer high transperency, chemical resistance and remarkable heat tolerance.
- They meet the highest quality standards according to DIN 12681 and ISO 6706.
- Individually calibrated through automatic calibration process carried out by robots.
- Permanent quality control through all steps eliminate possible deviations from nominal values.
- Cylinders are calibrated to contain (In) and the tolerances are according to DIN/ISO Class "B" standards.
- Graduations are either as embossed scale or in blue enamel which is specially designed for plastic and resistant to 60°C.
- For consistent accurracy, polypropylene measuring cylinders should not be used with liquids over 60°C and should not be kept under direct sunlight or overheated conditions.

Capacity ml	Accuracy ± ml	Grad. ml	Height mm	PK	Cat. No.
25	0.500	0.500	160	1	**6.243 542**
100	1.000	1.000	240	1	**6.243 544**
250	2.000	2.000	320	1	**6.243 545**
500	5.000	5.000	380	1	**6.243 546**
1000	10.000	10.000	465	1	**6.243 547**

2



3 Graduated cylinders, PP, with handle

NEW!

Bel-Art Products

The large handle provides a secure grip for safer, more controlled and convenient pouring. A double scale is accurate and easy to read. The wide hexagonal base prevents tip over and rolling on the benchtop. One liter and two liter sizes.
- Steam autoclavable at 121°C

Capacity ml	PK	Cat. No.
1000	1	**7.638 738**
2000	1	**9.274 870**

3



Mixing cylinders, borosilicate glass 3.3, class A, blue graduated

Isolab

Borosilicate glass 3.3. High form. Conformity certified, with certified batch number.
PE-HD stoppers and hexagonal foot. To DIN EN ISO 4788, DIN 12680.

Capacity ml	Accuracy ± ml	Height mm	PK	Cat. No.
10	0.100	160	1	**9.275 070**
25	0.250	195	1	**9.275 071**
50	0.500	230	1	**9.275 072**
100	0.500	290	1	**9.275 073**
250	1.000	370	1	**9.275 074** 4
500	2.500	395	1	**9.275 075**
1000	5.000	510	1	**9.275 076**

4



9.275 074

1



9.275 083

Mixing cylinders, borosilicate glass 3.3, tall form, class A, white graduated

NEW!

Borosilicate glass 3.3 High form. Conformity certified, with certified batch number. *Isolab*
PE-HD stoppers and hexagonal foot. To DIN EN ISO 4788, DIN 12680.

Capacity ml	Accuracy ± ml	Height mm	PK	Cat. No.
10	0,100	160	1	**9.275 080**
25	0,250	195	1	**9.275 081**
50	0,500	230	1	**9.275 082**
100	0,500	290	1	**9.275 083** 1
250	1,000	370	1	**9.275 084**
500	2,500	395	1	**9.275 085**
1000	5,000	510	1	**9.275 086**

2



9.275 238

Mixing cylinders, borosilicate glass 3.3, tall form, class A, blue graduated

BLAUBRAND®. To DIN EN ISO 4788. *BRAND*
Conformity certified, with works certified batch number. PP stoppers and hexagonal foot.
Graduations and inscriptions in highly contrasting blue enamel. Calibrated to contain.
Height given is overall height without stopper. All BLAUBRAND® cylinders are delivered with batch number and one batch certificate is included in the manufacturer's outer pack. Individual works, USP, or DAkkS calibration certificates are also available on request. The batch certificate is also available to download from the supplier's website.

Capacity ml	Grad. ml	Neck NS	Height mm	PK	Cat. No.
10	0.2	10/19	160	1	**9.275 208**
25	0.5	14/23	190	1	**9.275 220**
50	1	19/26	220	1	**9.275 228**
100	1	24/29	285	1	**9.275 238** 2
250	2	29/32	350	1	**9.275 248**
500*	5	34/35	395	1	**9.275 254**
1000*	10	45/40	500	1	**9.275 262**

* Fitted with PE octagonal stoppers.

3



9.275 038

Mixing cylinders, borosilicate glass 3.3, stoppered, class B, amber graduated

SILBERBRAND Eterna. Class B. To DIN EN ISO 4788. *BRAND*
With PP stoppers and hexagonal foot. Graduations and inscriptions in Eterna amber stain.
Calibrated to contain. Height given is overall height without stopper

Capacity ml	Grad. ml	NS	Height mm	PK	Cat. No.
10	0.2	10/19	160	1	**9.275 008**
25	0.5	14/23	190	1	**9.275 020**
50	1.0	19/26	220	1	**9.275 028**
100	1.0	24/29	285	1	**9.275 038** 3
250	2.0	29/32	350	1	**9.275 048**
500*	5	34/35	395	1	**9.275 054**
1000*	10	45/40	500	1	**9.275 062**

* Fitted with PE octagonal stoppers.

4



7.930 291

Volumetric trapezoidal flasks, Borosilicate glass 3.3, class A, blue graduated

Borosilicate glass 3.3. Conformity certified, with batch certificate. Trapezoidal. *Isolab*
With NS and PE-HD stoppers, to DIN 12664, to DIN EN ISO 1042.

Capacity ml	NS	Tolerance ± ml	PK	Cat. No.
1	07/16	0.025	1	**6.237 705**
2	07/16	0.025	1	**6.236 426**
3	07/16	0.025	1	**7.930 290**
4	07/16	0.025	1	**7.930 291** 4

E & OE.

Volumetric trapezoidal flasks, DURAN®, Class A, blue graduated

IN (TD) calibrated. With dated batch identification. Conformity certified. NS with poly stopper. Ring mark and graduation in high contrasting blue enamel. According to DIN EN ISO 1042. *Hirschmann*
For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates). Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Capacity ml	NS	Tolerance ± ml	Height mm	PK	Cat. No.
1*	7/16	0.025	60	1	**9.276 645**
2*	7/16	0.025	70	1	**9.276 646**
5	7/16	0.025	70	1	**9.276 647**
5**	10/19	0.04	70	1	**9.276 648**
10	7/16	0.025	90	1	**9.276 649**
10**	10/19	0.04	90	1	**9.276 650**
20*	10/19	0.04	110	1	**9.276 651**
25	10/19	0.04	110	1	**9.276 652** 1
50	12/21	0.06	140	1	**9.276 653**

* Supplementary to DIN.
**wide neck.
Also available with dated batch identfication acc. to USP (US Pharmacopeia).

1



9.276 652

Volumetric trapezoidal flasks, borosilicate glass 3.3, class A, blue graduations

BLAUBRAND®. DIN EN ISO 1042. Conformity certified. With batch number. *BRAND*
Graduations and inscriptions in highly contrasting blue enamel. Calibrated to contain.
With PP stoppers. All BLAUBRAND® volumetric flasks are delivered with batch number and one batch certificate included per pack. Also available with individual works or DAkkS calibration certificate, please enquire. BLAUBRAND® volumetric flasks (except wide-neck flasks). Individual and batch works, USP calibration certificates are also available on request.
The batch certificate is also available to download from the supplier's website.

Capacity ml	NS	Accuracy ± ml	PK	Cat. No.
2	7/16	0.025	1	**9.276 002**
5	7/16	0.025	1	**9.276 003**
10*	10/19	0.04	1	**9.276 004**
20	10/19	0.04	1	**9.276 006**
25	10/19	0.04	1	**9.276 007**
50	12/21	0.06	1	**9.276 008** 2

* Wide neck version

2



9.276 008

Volumetric flasks, class A, blue graduations, borosilicate glass 3.3

Borosilicate glass 3.3. Conformity certified, with batch certificate. *Isolab*
With NS and PE-HD stoppers, to DIN 12664, to DIN EN ISO 1042.

Capacity ml	NS	Tolerance ± ml	PK	Cat. No.
5	10/19	0.025	1	**9.276 600**
10	10/19	0.025	1	**9.276 601**
20	10/19	0.040	1	**9.276 602**
25	10/19	0.040	1	**9.276 603**
25	12/21	0.040	1	**4.008 300**
50	12/21	0.060	1	**9.276 604**
50	14/23	0.060	1	**9.276 605**
100	12/21	0.100	1	**9.276 606**
100	14/23	0.100	1	**9.276 607**
150	14/23	0.100	1	**6.241 814**
200	14/23	0.150	1	**9.276 608**
250	14/23	0.150	1	**9.276 609**
300	14/23	0.200	1	**4.008 301**
400	19/26	0.200	1	**4.008 302**
500	19/26	0.250	1	**9.276 610** 3
1000	24/29	0.400	1	**9.276 611**
2000	29/32	0.600	1	**9.276 612**
5000	34/35	1.200	1	**9.276 613**
10000	45/40	2.000	1	**9.276 614**

3



9.276 610

1



9.276 692

Volumetric flasks. With NS. DURAN®. Class A, blue graduation

IN (TD) calibrated. With dated batch identification. Conformity certified. With NS and Polystopper. Ring mark and graduation in durable blue enamel, acc.to DIN EN ISO 1042. *Hirschmann*
For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Capacity	NS	Tolerance	Height	PK	Cat. No.
ml		± ml	mm		
5	7/16	0.025	70	1	**9.276 680**
5	10/19**	0.04	70	1	**9.276 681**
10	7/16	0.025	90	1	**9.276 682**
10	10/19**	0.04	90	1	**9.276 683**
20	10/19	0.04	110	1	**9.276 684**
20	12/21**	0.06	105	1	**9.276 679**
25	10/19	0.04	110	1	**9.276 685**
25	12/21**	0.06	110	1	**9.276 686**
50	12/21	0.06	140	1	**9.276 687**
50	14/23**	0.08	140	1	**9.276 688**
100	12/21	0.1	170	1	**9.276 689**
100	14/23	0.1	170	1	**9.276 690**
200	14/23	0.15	210	1	**9.276 691**
250	14/23	0.15	220	1	**9.276 692** 1
500	19/26	0.25	260	1	**9.276 693**
1000	29/32**	0.6	300	1	**9.276 694**
1000	24/29	0.4	300	1	**9.276 695**
2000	29/32	0.6	370	1	**9.276 696**
5000	34/35	1.2	470	1	**9.276 697**
10000*	45/40	2.0	570	1	**9.276 698**

* Supplementary to DIN.
**Wide neck.
Also available with dated batch identfication acc. to USP (US Pharmacopeia)

2



9.276 482

Volumetric flasks, DURAN®, Class A, blue graduated, with glass stopper

IN (TD) calibrated. With dated batch identification. Conformity certified. NS with glass stopper. Ring mark and graduation in high contrasting blue enamel. According to DIN EN ISO 1042. *Hirschmann*
For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Capacity	NS	Tolerance	Height	PK	Cat. No.
ml		± ml	mm		
5	7/16	0.025	70	1	**9.276 470**
5**	10/19	0.04	70	1	**9.276 471**
10	7/16	0.025	90	1	**9.276 472**
10**	10/19	0.04	90	1	**9.276 473**
20*	10/19	0.04	110	1	**9.276 474**
20**	12/21	0.06	105	1	**9.276 489**
25	10/19	0.04	110	1	**9.276 475**
25**	12/21	0.06	110	1	**9.276 476**
50	12/21	0.06	140	1	**9.276 477**
50**	14/23	0.08	140	1	**9.276 478**
100	12/21	0.1	170	1	**9.276 479**
100	14/23	0.1	170	1	**9.276 480**
200	14/23	0.15	210	1	**9.276 481**
250	14/23	0.15	220	1	**9.276 482** 2
500	19/26	0.25	260	1	**9.276 483**
1000**	29/32	0.6	300	1	**9.276 484**
1000	24/29	0.4	300	1	**9.276 485**
2000	29/32	0.6	370	1	**9.276 486**
5000*	34/35	1.2	470	1	**9.276 487**
10000*	45/40	2	570	1	**9.276 488**

* Supplementary to DIN.
**wide neck.
Also available with dated batch identfication acc. to USP (US Pharmacopeia).

Volumetric flasks, borosilicate glass 3.3, class A

BLAUBRAND®. Class A. DIN EN ISO 1042. Conformity certified with works certified batch number. *BRAND*
Ring marks and inscriptions in highly contrasting blue enamel. Calibrated to contain PP stoppers.
All BLAUBRAND® volumetric flasks are delivered with batch number and one batch certificate included per pack.
Also available with individual works or DAkkS (former DKD) calibration certificate, please enquire.
The batch certificate is also available to download from the manufacturer's website.

Capacity ml	NS	Accuracy ± ml	PK	Cat. No.
5*	10/19	0.04	1	**9.276 438**
10*	10/19	0.04	1	**9.276 443**
20	10/19	0.04	1	**9.276 446**
20*	12/21	0.06	1	**6.239 438**
25	10/19	0.04	1	**9.276 447**
25*	12/21	0.06	1	**4.000 074**
50	12/21	0.06	1	**9.276 448**
50*	14/23	0.10	1	**9.276 456**
100	12/21	0.10	1	**9.276 449**
100	14/23	0.10	1	**9.276 457**
200	14/23	0.15	1	**9.276 450**
250	14/23	0.15	1	**9.276 451** 1
500	19/26	0.25	1	**9.276 452**
1000	24/29	0.40	1	**9.276 453**
2000	29/32	0.60	1	**9.276 454**
5000	34/35	1.20	1	**9.276 455**
10000**	45/40	2.0	1	**9.276 436**

*wide neck version
**Supplementary to DIN.

1



9.276 451

Volumetric flasks, class A, amber graduation, DURAN®

IN (TD) calibrated. With dated batch identification. Conformity certified. NS with poly stopper. With durable amber stain graduation. According to DIN EN ISO 1042. *Hirschmann*
For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Capacity ml	NS	Accuracy ± ml	Height ± 5mm	PK	Cat. No.
5	10/19*	0.04	70	1	**9.276 758**
10	10/19*	0.04	90	1	**9.276 759**
20	10/19	0.04	110	1	**9.276 760**
25	10/19	0.04	110	1	**9.276 761**
50	12/21	0.06	140	1	**9.276 762**
50	14/23*	0.08	140	1	**9.276 763**
100	12/21	0.1	170	1	**9.276 764**
100	14/23	0.1	170	1	**9.276 765**
200	14/23	0.15	210	1	**9.276 766**
250	14/23	0.15	220	1	**9.276 767** 2
500	19/26	0.25	260	1	**9.276 768**
1000	24/29	0.4	300	1	**9.276 769**
2000	29/32	0.6	370	1	**9.276 770**

* wide neck

2



9.276 767

Volumetric flasks, borosilicate glass 3.3, class A

BLAUBRAND® Eterna. To DIN EN ISO 1042. Conformity certified. With batch number. *BRAND*
Graduation and inscriptions in Eterna amber stain. Calibrated to contain PP stoppers.
All BLAUBRAND® volumetric flasks are delivered with batch number and one batch certificate included per pack.
Also available with individual works or DAkkS (former DKD) calibration certificate, please enquire. BLAUBRAND® volumetric flasks (except wide-neck flasks) are also available with individual and batch USP certification.
The batch certificate is also available to download from the manufacturer's website.

Capacity ml	NS	Accuracy ± ml	PK	Cat. No.
5*	10/19	0,04	1	**9.276 260**
10*	10/19	0,04	1	**9.276 261**
20	10/19	0,04	1	**9.276 262**
20*	12/21	0,06	1	**4.007 850**
25	10/19	0,04	1	**4.007 849**
25*	12/21	0,06	1	**9.276 263**
50	12/21	0,06	1	**9.276 264**
50*	14/23	0,10	1	**9.276 265**
100	14/23	0,10	1	**9.276 270**
200	14/23	0,15	1	**9.276 271**
250	14/23	0,15	1	**9.276 272** 3
500	19/26	0,25	1	**9.276 273**
1000	24/29	0,40	1	**9.276 274**
2000	29/32	0,60	1	**9.276 275**

*Wide neck version

3



9.276 272

1



9.276 630

Volumetric flasks, borosilicate glass 3.3 amber, class A, white graduated, with PE-HD stoppers

Amber Borosilicate glass 3.3 with PE-HD stoppers, conformity certified, with batch certificate and white enamel graduations. To DIN EN ISO 1042, to DIN 12644. *Isolab*

Capacity	NS	Tolerance	PK	Cat. No.
ml		± ml		
5	10/19	0,025	1	**9.276 620**
10	10/19	0,025	1	**9.276 621**
20	10/19	0,040	1	**9.276 622**
25	10/19	0,040	1	**9.276 623**
25	12/21	0,040	1	**4.008 303**
50	12/21	0,060	1	**9.276 624**
50	14/23	0,060	1	**9.276 625**
100	12/21	0,100	1	**9.276 626**
100	14/23	0,100	1	**9.276 627**
150	14/23	0,150	1	**7.910 063**
200	14/23	0,150	1	**9.276 628**
250	14/23	0,150	1	**9.276 629**
300	14/23	0,200	1	**4.008 304**
400	19/26	0,200	1	**4.008 305**
500	19/26	0,250	1	**9.276 630** 1
1000	24/29	0,400	1	**9.276 631**
2000	29/32	0,600	1	**4.008 306**

2



9.276 708

Volumetric flasks, DURAN® amber glass, class A, with poly stopper

Amber glass. IN (TD) calibrated. With dated batch identification. Conformity certified. *Hirschmann*
With NS and Polystopper. Ring mark and graduation in durable white enamel, acc.to DIN EN ISO 1042.
For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Capacity	Tolerance	NS	Height	PK	Cat. No.
ml	± ml		mm		
5	0.025	7/16	70	1	**9.276 699**
5*	0.04	10/19	70	1	**9.276 700**
10	0.025	7/16	90	1	**9.276 701**
10*	0.04	10/19	90	1	**9.276 702**
20	0.04	10/19	110	1	**9.276 703**
25	0.04	10/19	110	1	**9.276 704**
25*	0.06	12/21	110	1	**9.276 710**
50	0.06	12/21	140	1	**9.276 705**
50*	0.08	14/23	140	1	**9.276 713**
100	0.1	12/21	170	1	**9.276 706**
100	0.1	14/23	170	1	**9.276 714**
200	0.15	14/23	210	1	**9.276 707**
250	0.15	14/23	220	1	**9.276 708** 2
500	0.25	19/26	260	1	**9.276 709**
1000	0.4	24/29	300	1	**9.276 711**
2000	0.6	29/32	370	1	**9.276 712**

* Wide neck.
Also available with dated batch identfication acc. to USP (US Pharmacopeia).



Volumetric flasks, DURAN® amber glas, Class A, with amber glass stopper, white graduated

IN (TD) calibrated. With dated batch identification. Conformity certified. With amber glass stopper. Ring mark and graduation in white enamel. According to DIN EN ISO 1042. *Hirschmann*
For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Capacity ml	NS	Tolerance ± ml	Height mm	PK	Cat. No.
5	7/16	0.025	70	1	**9.276 500**
5**	10/19	0.04	70	1	**9.276 501**
10	7/16	0.025	90	1	**9.276 502**
10**	10/19	0.04	90	1	**9.276 503**
20*	10/19	0.04	110	1	**9.276 504**
25	10/19	0.04	110	1	**9.276 505**
50	12/21	0.06	140	1	**9.276 506**
50**	14/23	0.08	140	1	**9.276 507**
100	12/21	0.1	170	1	**9.276 508**
100	14/23	0.1	170	1	**9.276 509**
200	14/23	0.15	210	1	**9.276 510**
250	14/23	0.15	220	1	**9.276 511** 1
500	19/26	0.25	260	1	**9.276 512**
1000	24/29	0.4	300	1	**9.276 513**
2000	29/32	0.6	370	1	**9.276 514**

* Supplementary to DIN.
**Wide neck.
Also available with dated batch identfication acc. to USP (US Pharmacopeia).

1


9.276 511

Volumetric flasks, borosilicate glass 3.3, class A, PUR Plastic coated, blue graduations

BLAUBRAND® PURprotect, conformity certified. Boro 3.3. DIN EN ISO 1042. *BRAND*
Calibrated to contain (TC, IN). Ring mark and inscriptions in high contrast blue enamel.
With PP stopper. The plain and high quality PUR coating envelops the volumetric flasks like a protective skin.
In the event of breakage, the safety coating helps contain the glass fragments. The light blue coating facilitates optical distinction. Suitable for dishwashers (cleaning up to max. 95°C). All BLAUBRAND® volumetric flasks are supplied with a batch number and an accompanying batch certificate within the outer packaging. They are also available with individual works, or DAkkS (former DKD) calibration certificate on request. With the exception of the wide neck version, the graduated flasks are also available with individual USP and batch certificates.
Further sizes available to special order/production on request.
The batch certificate is also available to download from the manufacturer's website.

Capacity ml	NS	Accuracy ± ml	PK	Cat. No.
50*	14/23	0.10	1	**9.276 460**
100	14/23	0.10	1	**9.276 461**
200	14/23	0.15	1	**9.276 462**
250	14/23	0.15	1	**9.276 463**
500	19/26	0.25	1	**9.276 464** 2
1000	24/29	0.4	1	**9.276 465**

*wide mouth
Further sizes availlable on request.

2


9.276 464

Volumetric flasks, borosilicate glass 3.3, Class B.

SILBERBRAND. To DIN EN ISO 1042. Graduation and inscriptions in highly contrasting white enamel. With PP stoppers. *BRAND*

Capacity ml	NS	Accuracy ± ml	PK	Cat. No.
10*	10/19	0.06	1	**9.276 243**
20	10/19	0.06	1	**9.276 246**
25	10/19	0.06	1	**9.276 247**
50	12/21	0.09	1	**9.276 248**
100	12/21	0.15	1	**9.276 249**
200	14/23	0.25	1	**9.276 250**
250	14/23	0.25	1	**9.276 251** 3
500	19/26	0.40	1	**9.276 252**
1000	24/29	0.60	1	**9.276 253**
2000	29/32	0.90	1	**9.276 254**
5000	34/35	1.80	1	**9.276 255**

* Wide neck

3


9.276 251

1



9.276 734

Volumetric flasks, DURAN®, with beaded rim, class A, blue graduation

IN (TD) calibrated. With beaded rim and dated batch identification. Conformity certified. *Hirschmann*
NS. Ring mark and graduation in high contrasting blue enamel.
According to DIN EN ISO 1042. For those products a Batch Calibration Report
(free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates),
Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Capacity ml	Tolerance ± ml	Height mm	PK	Cat. No.	
5	0.025	70	1	**9.276 715**	
10	0.025	90	1	**9.276 716**	
20	0.04	110	1	**9.276 717**	
25	0.04	110	1	**9.276 718**	
50	0.06	140	1	**9.276 719**	
100	0.1	170	1	**9.276 720**	
200	0.15	210	1	**9.276 733**	
250	0.15	220	1	**9.276 734**	1
500	0.25	260	1	**9.276 735**	
1000	0.4	300	1	**9.276 736**	
2000	0.6	370	1	**9.276 737**	
5000	1.2	470	1	**9.276 738**	
10000*	2.0	570	1	**9.276 739**	

* additional to DIN

2



2 Volumetric flasks for determination of oil content, SILBERBRAND, Borosilicate glass 3.3

DIN 51 368. For determination of oil content in aqueous oil emulsions (e.g. drilling oil). *BRAND*
With NS19/26, hollow glass stoppers. Graduations and inscriptions in highly contrasting white enamel. Capacity 100 ml, tolerance ±0.2 ml. Calibrated to contain.

Subdivisions: 0 to 5 ml : 0.1 ml, tolerance: ±0.1 ml.
Subdivisions: 5 to 30 ml : 0.5 ml, tolerance: ±0.5 ml.

Capacity ml	PK	Cat. No.
100	1	**9.276 880**

3



9.276 885

Volumetric flasks for sugar tests, Borosilicate glass 3.3, class B, white graduated

For sugar tests in the style of Kohlrausch. SILBERBRAND. *BRAND*
Tolerance equivalent to class B. Ring marks and inscriptions in highly contrasting white enamel.
Calibrated to contain.

Capacity ml	Accuracy ± ml	PK	Cat. No.	
100	0.2	1	**9.276 885**	3
200	0.3	1	**9.276 887**	

E & OE.

1 Volumetric flasks, PFA, class A

VITLAB

Highly transparent
Ring mark individually calibrated to IN.
Class A tolerances according to DIN EN ISO 1042.
The PFA screw cap guards against contamination.
Outstanding chemical resistance, can be used with strong oxidants, highly concentrated acids and alkalis, hydrocarbons, and ketones.
With laser-engraved lot number and batch certificate. Thermal stress up to 121ºC (autoclaving) does not permanently exceed the tolerance limit.
To preserve the ring mark, do not clean at temperatures exceeding 60ºC.

The advantages of PFA
- Long-term maintenance of low-concentration reference materials in PFA containers
- No memory effects
- Practically no carryover, no cross-contamination due to the extremely hydrophobic, anti-adhesive and smooth surfaces
- High thermal stability, from -200°C to +260°C
- Chemical inertness against nearly all chemicals
- Good transparency and dimensional stability, suitable for volumetric instruments
- Easy to clean
- Use of high purity raw materials



Capacity ml	Height mm	Neck thread GL	Accuracy ± ml	PK	Cat. No.
10	90	18	0.04	1	**9.276 919**
25	115	18	0.04	1	**9.276 920**
50	150	18	0.06	1	**9.276 921**
100	180	18	0.10	1	**9.276 922**
250	235	25	0.15	1	**9.276 923**
500	270	25	0.25	1	**9.276 924**

Spare screw caps, PFA for volumetric flasks, Class A

NEW!

BRAND

Neck thread GL	PK	Cat. No.
18	1	**4.000 117**
25	1	**4.000 118**

Volumetric flasks, PMP, class A

VITLAB

Crystal clear. With ring mark individually calibrated to IN. Class A tolerances according to DIN EN ISO 1042. With printed lot number and batch certificate. Thermal stress up to 121ºC (autoclaving) does not permanently exceed the tolerance limit. To preserve markings, do not clean at temperatures exceeding 60ºC

Capacity ml	Accuracy ± ml	Height mm	Stopper NS	PK	Cat. No.
10	0.04	90	10 / 19	1	**9.276 949**
25	0.04	115	10 / 19	1	**9.276 950**
50	0.06	150	12 / 21	1	**9.276 951**
100	0.10	180	14 / 23	1	**9.276 952** 2
250	0.15	235	19 / 26	1	**9.276 953**
500	0.25	270	19 / 26	1	**9.276 954**
1000	0.40	310	24 / 29	1	**9.276 955**



9.276 952



1 Volumetric flasks, plastic, class B

To DIN EN ISO 1042, with individually adjusted, blue printed graduation and inscriptions, with PP standard ground joint stoppers. Autoclavable.

Isolab

Capacity ml	Accuracy ± ml	NS	PK	Cat. No.
25	0,08	10/19	1	**9.276 590**
50	0,12	12/21	1	**9.276 591**
100	0,20	14/23	1	**9.276 592**
250	0,30	14/23	1	**9.276 593**
500	0,50	19/26	1	**9.276 594**
1000	0,80	24/29	1	**9.276 595**



9.276 838

Volumetric flasks, PP, Class B

Highly transparent.
With ring mark individually calibrated to IN.
Class B tolerances according to DIN EN ISO 1042.
Thermal stress up to 60ºC does not permanently exceed the tolerance limits.
To preserve markings, do not clean at temperatures exceeding 60ºC

VITLAB

Capacity ml	Height mm	NS	Accuracy ± ml	PK	Cat. No.
10	90	10 / 19	0.08	1	**9.276 818**
25	115	10 / 19	0.08	1	**9.276 820**
50	150	12 / 21	0.12	1	**9.276 828**
100	180	14 / 23	0.20	1	**9.276 838**
250	235	19 / 26	0.30	1	**9.276 848**
500	270	19 / 26	0.50	1	**9.276 854**
1000	310	24 / 29	0.80	1	**9.276 862**

2



9.277 050

Tilt pipettes (bottle top dispensing pipettes)

Bottle top dispensing pipettes. Made of DURAN® tubing. With or without 1000ml reservoir with NS29/32 joint.

Capacity ml	Description	PK	Cat. No.
5	with reservoir	1	**9.277 005**
10	with reservoir	1	**9.277 010**
20	with reservoir	1	**9.277 020**
25	with reservoir	1	**9.277 025**
50	with reservoir	1	**9.277 050**
100	with reservoir	1	**9.277 100**
5	without reservoir	1	**9.277 105**
10	without reservoir	1	**9.277 110**
20	without reservoir	1	**9.277 120**
25	without reservoir	1	**9.277 125**
50	without reservoir	1	**9.277 150**

3



E & OE.

Volumetric pipettes, AR-Glas®, class AS, blue graduation

EX (TD) calibrated. With dated batch identification. Conformity certified. Mark, ringmarked and graduation in high-contrast blue colour. Acc. to DIN EN ISO 648. *Hirschmann*
For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Volume ml	Graduations ml	Tolerance ± ml	Overall length ± 10 mm	PK	Cat. No.
1.0	-	0.008	325	1	**9.273 270**
2.0	-	0.01	350	1	**9.273 271**
2.5*	-	0.01	350	1	**9.273 272**
3.0*	-	0.01	350	1	**9.273 273**
5.0	-	0.015	410	1	**9.273 276**
10.0	-	0.02	450	1	**9.273 280**
15.0*	-	0.03	520	1	**9.273 281**
20.0	-	0.03	520	1	**9.273 282**
25.0	-	0.03	530	1	**9.273 284** 1
50.0	-	0.05	550	1	**9.273 286**
100.0	-	0.08	600	1	**9.273 288**

* Supplementary to DIN.

1



9.273 284

Volumetric pipettes, class AS, AR-Glas®, blue graduation

BLAUBRAND®. DIN EN ISO 648. *BRAND*
Conformity certified. With batch number. Graduations and inscriptions in highly contrasting blue enamel.
Adjusted to EX. All BLAUBRAND® volumetric pipettes are supplied with batch number and one works batch certificate per manufacturer's outer pack (up to 2ml: 12 cylinders, above 2ml: 6 cylinders per pack).
The batch certificate is also available to download from the supplier's website.

Volume ml	Graduations ml	Tolerance ± ml	Overall length ± 10 mm	PK	Cat. No.
0,5	-	0.005	300	1	**9.273 101**
1	-	0.008	300	1	**9.273 102**
2	-	0.010	330	1	**9.273 103**
2,5	-	0.010	330	1	**9.273 104**
3	-	0.010	330	1	**9.273 105**
4	-	0.015	400	1	**9.273 106**
5	-	0.015	400	1	**9.273 107**
6	-	0.015	400	1	**9.273 108**
7	-	0.015	400	1	**9.273 109**
8	-	0.02	440	1	**9.273 110**
9	-	0.02	440	1	**9.273 111**
10	-	0.02	440	1	**9.273 112**
15	-	0.03	510	1	**9.273 113**
20	-	0.03	510	1	**9.273 114**
25	-	0.03	520	1	**9.273 115** 2
30	-	0.03	520	1	**9.273 116**
40	-	0.05	540	1	**9.273 117**
50	-	0.05	540	1	**9.273 118**
100	-	0.08	585*	1	**9.273 119**

* ±15 mm

2



9.273 115

Volumetric pipettes, soda glass, class AS

Soda glass. Conformity-certified. With batch date identification. *Isolab*
DIN EN ISO 648, DIN 12691 and BS 700 - 1583. Calibrated to deliver (Ex).
Ring mark and inscriptions in permanent blue enamel.

Volume ml	Graduations ml	Tolerance ± ml	Length mm	PK	Cat. No.
1	-	0.007	310	1	**9.272 260**
2	-	0.010	330	1	**9.272 261**
3	-	0.010	360	1	**9.272 262**
4	-	0.015	360	1	**9.272 263**
5	-	0.015	400	1	**9.272 264**
10	-	0.020	440	1	**9.272 265**
15	-	0.030	455	1	**9.272 267**
20	-	0.030	510	1	**9.272 268**
25	-	0.030	520	1	**9.272 269**
50	-	0.050	540	1	**9.272 270** 3

3



9.272 270

Cleaning equipment for pipettes - please see page 1148.

1



6.084 072

Volumetric pipettes, AR-Glas®, class AS, amber stain graduation

EX (TD) calibrated. With dated batch identification. Conformity certified. *Hirschmann*
With durable amber stain graduation, acc.to DIN EN ISO 648.
For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Volume ml	Graduations ml	Tolerance ± ml	Overall length ± 10 mm	PK	Cat. No.
0,5	-	0.005	300	1	**6.200 955**
1	-	0.008	325	1	**6.052 959**
1,5*	-	0.01	350	1	**7.200 075**
2	-	0.01	350	1	**6.092 721**
2,5*	-	0.01	350	1	**6.079 397**
3*	-	0.01	350	1	**6.303 738**
4*	-	0.015	410	1	**6.300 028**
5	-	0.015	410	1	**6.081 798**
6*	-	0.015	410	1	**6.300 025**
7*	-	0.015	410	1	**6.300 026**
8*	-	0.02	450	1	**6.077 361**
9*	-	0.02	450	1	**6.300 299**
10	-	0.02	450	1	**6.050 827**
15*	-	0.03	520	1	**6.057 100**
20	-	0.03	520	1	**6.084 029**
25	-	0.03	530	1	**6.084 072** 1
30*	-	0.03	530	1	**6.057 101**
40*	-	0.05	550	1	**6.077 366**
50	-	0.05	550	1	**6.054 343**
100	-	0.08	600	1	**6.055 472**

* Supplementary to DIN.
Also available with dated batch identifikation acc. to USP (US Pharmacopeia).

2



9.273 225

Bulb pipettes, AR-Glas®, class AS, 1 mark, amber graduation

BLAUBRAND® Eterna. DIN EN ISO 648. Calibrated to deliver (TD, EX). *BRAND*
Graduations and inscriptions in Eterna amber stain (particularly resistant to aggressive cleaning methods).
All BLAUBRAND® bulb pipettes are supplied with a batch number and one batch certificate per manufacturer's outer pack (up to 2ml: 12 cylinders, above 2ml: 6 cylinders per pack). Also available with an individual works, USP, or DAkkS (former DKD) calibration certificate on request.
The batch certificate is also available to download from the supplier's website.

Volume ml	Graduations ml	Tolerance ± ml	Overall length ± 10 mm	PK	Cat. No.
1	-	0.008	300	1	**9.273 220**
2	-	0.010	330	1	**9.273 221**
5	-	0.015	400	1	**9.273 222**
10	-	0.02	440	1	**9.273 223**
20	-	0.03	510	1	**9.273 224**
25	-	0.03	520	1	**9.273 225** 2
50	-	0.05	540	1	**9.273 226**

E & OE.

Volumetric pipettes, AR-glass®, class AS, amber graduation

EX (TD) calibrated. Volume between two marks (parial delivery). *Hirschmann*
With dated batch identification. Conformity certified. Volume mark, ringmark and graduation in durable amber stain graduation, acc. to DIN EN ISO 648.
For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Volume ml	Graduations ml	Tolerance ± ml	Overall length mm	PK	Cat. No.
0.5	-	0.005	300	1	**6.801 018**
1	-	0.008	325	1	**6.801 019**
2	-	0.01	350	1	**6.801 020**
3*	-	0.01	350	1	**6.056 820**
5	-	0.015	410	1	**6.801 021**
10	-	0.02	450	1	**6.071 748**
15*	-	0.03	520	1	**6.225 909**
20	-	0.03	520	1	**6.801 022**
25	-	0.03	530	1	**6.801 023** 1
50	-	0.05	550	1	**6.801 024**
100	-	0.08	600	1	**6.800 124**

* Supplementary to DIN.

1



6.801 023

Volumetric pipettes, AR-Glas®, class AS, 2 marks, blue graduation

BLAUBRAND®. Conformity certified. DIN EN ISO 648. Adjusted to EX. Graduations and inscriptions in highly contrasting blue enamel. All BLAUBRAND® volumetric pipettes are supplied with batch number and one works batch certificate per manufacturer's outer pack (up to 2 ml: 12 cylinders, above 2ml: 6 cylinders per pack). Also available with individual works, USP or DAkkS (former DKD) calibration certificate on request. *BRAND*
The batch certificate is also available to download from the supplier's website.

Volume ml	Graduations ml	Tolerance ± ml	Overall length ± 10 mm	PK	Cat. No.
0.5	-	0.005	300	1	**9.273 121**
1.0	-	0.008	300	1	**9.273 122**
2.0	-	0.010	330	1	**9.273 123**
3.0	-	0.010	330	1	**9.273 125**
5.0	-	0.015	400	1	**9.273 127**
10.0	-	0.02	440	1	**9.273 132**
15.0	-	0.03	510	1	**9.273 133**
20.0	-	0.03	510	1	**9.273 134**
25.0	-	0.03	520	1	**9.273 135** 2
50.0	-	0.05	540	1	**9.273 138**

2



9.273 135

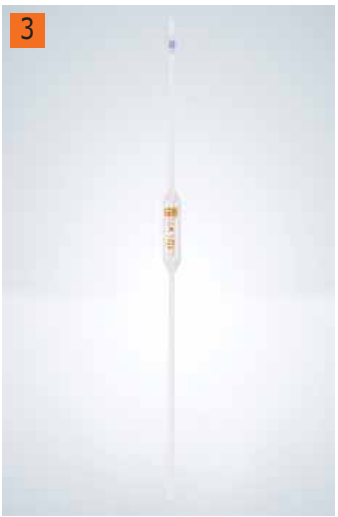
Volumetric pipettes, AR-Glas®, class B, amber stain graduation

EX (TD) calibrated. Tolerances better than class B requirements. *Hirschmann*
With durable amber stain graduation, acc. to DIN EN ISO 648.

Volume ml	Graduations ml	Tolerance ± ml	Overall length ± 10 mm	PK	Cat. No.
0.5	-	0.008	300	1	**9.273 258**
1	-	0.012	325	1	**9.273 259**
2	-	0.015	350	1	**9.273 260**
3*	-	0.015	350	1	**9.273 261**
4*	-	0.023	410	1	**9.273 257**
5	-	0.023	410	1	**9.273 262**
10	-	0.03	450	1	**9.273 263**
15*	-	0.045	520	1	**9.273 264**
20	-	0.045	520	1	**9.273 265**
25	-	0.045	530	1	**9.273 266** 3
50	-	0.075	550	1	**9.273 268**
100	-	0.12	600	1	**9.273 269**

* Supplementary to DIN.

3



9.273.266

Cleaning equipment for pipettes - please see page 1148.

1



9.273 015

Volumetric pipettes, Class B, AR-Glas®, amber graduation

SILBERBRAND Eterna. DIN EN ISO 648. Graduations and inscriptions in Eterna permanent amber diffusion stain. Adjusted to EX. *BRAND*

Volume ml	Graduations ml	Tolerance ± ml	Overall length ± 10 mm	PK	Cat. No.
0.5	-	0.007	300	1	**9.273 001**
1	-	0.010	300	1	**9.273 002**
2	-	0.015	330	1	**9.273 003**
3	-	0.015	330	1	**9.273 005**
5	-	0.025	400	1	**9.273 007**
10	-	0.03	440	1	**9.273 012**
15	-	0.04	510	1	**9.273 013**
20	-	0.04	510	1	**9.273 014**
25	-	0.04	520	1	**9.273 015** 1
50	-	0.07	540	1	**9.273 018**
100	-	0.12	585*	1	**9.273 019**

* ±15 mm

2



9.273 239

Volumetric pipettes, PP, 1 mark

Highly translucent. Streak-resistant, blue-printed graduations and inscriptions. *BRAND*
Adjusted to "Ex". Exposure to temperatures up to 60°C will not affect tolerances.
Cleaning at temperatures below 60°C is recommended to preserve graduations and inscriptions.

Volume ml	Graduations ml	Tolerance ± ml	Overall length ± 10 mm	PK	Cat. No.
1	-	0.02	300	1	**9.273 232**
2	-	0.02	300	1	**9.273 233**
5	-	0.03	300	1	**9.273 235**
10	-	0.04	440	1	**9.273 236**
25	-	0.06	450	1	**9.273 238**
50	-	0.1	460	1	**9.273 239** 2

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

BRAND

E & OE.

Graduated pipettes, soda glass, class AS, type 3

Soda glass. Conformity-certified. With batch date identification. *Isolab*
DIN EN ISO 835, DIN 12697 and BS700 - 1583. Calibrated to deliver (EX).
Ring marks and graduations in permanent blue enamel.

Volume	Graduations	Tolerance	Length	PK	Cat. No.
ml	ml	± ml	mm		
1	0.01	0.007	360	1	**9.272 250**
2	0.02	0.010	360	1	**9.272 251**
5	0.05	0.030	360	1	**9.272 252**
10	0.1	0.050	360	1	**9.272 253**
20	0.1	0.100	450	1	**9.272 254** 1
25	0.1	0.100	450	1	**9.272 255**
50	0.1	0.200	720	1	**9.272 256**

1



9.272 254

Graduated pipettes, AR-glass® , AS class, blue graduation, type 3

EX (TD) calibrated. Main point ring graduation. With dated batch identification. *Hirschmann*
Conformity certified. High-contrast blue graduation.
Graduated to the tip, Type 3, acc. to DIN EN ISO 835. From 5ml with cotton plug end as standard.
For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Volume	Grad.	Tolerance	Overall length	PK	Cat. No.
ml	ml	± ml	± 5 mm		
0.5	0.01	0.006	360	1	**9.272 380**
1.0	0.01	0.007	360	1	**9.272 381**
1.0*	0.10	0.007	360	1	**9.272 382**
2.0*	0.01	0.01	360	1	**9.272 383**
2.0	0.02	0.01	360	1	**9.272 384**
2.0*	0.10	0.01	360	1	**9.272 385**
5.0	0.05	0.03	360	1	**9.272 387**
5.0*	0.10	0.03	360	1	**9.272 388**
10.0	0.10	0.05	360	1	**9.272 389** 2
20.0*	0.10	0.1	360	1	**9.272 390**
25.0	0.10	0.1	450	1	**9.272 391**
50.0*	0.20	0.2	450	1	**9.272 392**

* Supplementary to DIN

2



9.272 389

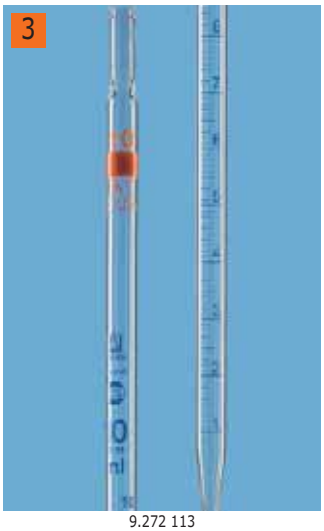
Graduated pipettes, Class AS, AR-Glas®, blue graduation, type 3 (zero at top)

BLAUBRAND®. DIN EN ISO 835. Type 3 (Zero at top). Supplied with conformity certificate with batch number. Delivery to tip. Adjusted to EX. Waiting time 5 seconds. *BRAND*
Ring mark and inscriptions in high contrast, blue enamel.
One batch certificate included per standard pack.
The batch certificate is also available to download from the manufacturer's website.

Volume	Grad.	Tolerance	Length	PK	Cat. No.
ml	ml	± ml	mm		
0.5	0.01	0.006	360	1	**9.272 105**
1	0.01	0.007	360	1	**9.272 106**
1[w]	0.01	0.007	360	1	**9.272 117**
1	0.1	0.007	360	1	**9.272 107**
2**	0.01	0.010	360	1	**9.272 108**
2	0.02	0.010	360	1	**9.272 109**
2[w]	0.02	0.010	360	1	**9.272 118**
2	0.1	0.010	360	1	**9.272 110**
5[w]	0.05	0.030	360	1	**9.272 111**
5[w]	0.1	0.030	360	1	**9.272 112**
10[w]	0.1	0.05	360	1	**9.272 113** 3
20[w]	0.1	0.10	360	1	**9.272 114**
25[w]	0.1	0.10	450	1	**9.272 115**
50*[w]	0.5	0.2	450	1	**9.272 116**

* Supplementary to DIN 12699.
**Supplementary to DIN 12699, not conformity certified.
[w] Cotton plugged

3



9.272 113

1



6.058 191

Graduated pipettes, AR-glas® , class AS, amber graduation, type 3

Hirschmann

EX (TD) calibrated. Main point ring graduation. With dated batch identification.
Conformity certified. With durable amber stain graduation. Graduated to the tip,
zero on top. Type 3, acc. to DIN EN ISO 835. From 5ml with cotton plug end as standard.
For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Volume	Grad.	Tolerance	Overall length	PK	Cat. No.
ml	ml	± ml	± 5 mm		
0.5	0.01	0.006	360	1	**6.059 364**
1	0.01	0.007	360	1	**6.301 732**
1	0.1	0.007	360	1	**6.303 032**
2*	0.01	0.01	360	1	**6.305 430**
2	0.02	0.01	360	1	**6.059 699**
2	0.1	0.01	360	1	**6.202 868**
5	0.05	0.03	360	1	**6.081 209**
5	0.1	0.03	360	1	**6.059 800**
10	0.1	0.05	360	1	**6.058 191** 1
20	0.1	0.1	360	1	**6.200 448**
25	0.1	0.1	450	1	**6.303 743**
50*	0.2	0.2	450	1	**6.234 515**

* in addition to DIN.
Available also with dated batch USP (U.S. Pharmacopeia).

2



9.272 353

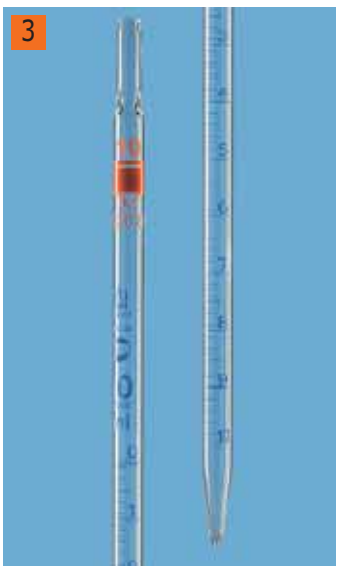
Graduated pipettes, AR-glas® , class AS, amber graduation, type 2

Hirschmann

EX (TD) calibrated. Main point ring graduation. With dated batch identification.
Conformity certified. With durable amber stain graduation. Graduated to the tip,
zero in tip. Type 2, acc. to DIN EN ISO 835. From 5ml with cotton plug end as standard.
For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Volume	Grad.	Tolerance	Overall length	PK	Cat. No.
ml	ml	± ml	± 5 mm		
0.5	0.01	0.007	360	1	**9.272 350**
1	0.01	0.007	360	1	**9.272 351**
1	0.1	0.007	360	1	**9.272 352**
2	0.02	0.01	360	1	**9.272 353** 2
2	0.1	0.01	360	1	**9.272 354**
5	0.05	0.03	360	1	**9.272 355**
5	0.1	0.03	360	1	**6.202 713**
10	0.1	0,05	360	1	**6.202 714**
20	0.1	0.01	360	1	**9.272 358**
25	0.1	0.01	450	1	**9.272 359**

3



9.272 129

Graduated pipettes, BLAUBRAND® , partial delivery, blue graduations, type 1

BRAND

AR-Glas®. Conformity certified. DIN EN ISO 835. Type 1 (Zero at top).
Calibrated to deliver (TD, EX). Waiting time 5 seconds. Ring mark and and inscriptions in high contrast blue enamel.
All BLAUBRAND® graduated pipettes are supplied with batch number and one batch certificate per manufacturer's outer pack (up to 10ml: 12 pipettes, 25 ml: 6 pipettes). Also available with individual works, USP, or DAkkS (former DKD) calibration certificate on request.
The batch certificate is also available to download from the supplier's website.

Volume	Graduations	Tolerance	Overall length	PK	Cat. No.
ml	ml	± ml	± 10 mm		
0.5	0.01	0.006	360	1	**9.272 121**
1	0.01	0.007	360	1	**9.272 122**
2*	0.01	0.010	360	1	**9.272 124**
2	0.02	0.010	360	1	**9.272 125**
5**	0.05	0.030	360	1	**9.272 127**
10**	0.1	0.050	360	1	**9.272 129** 3
25**	0.1	0.100	450	1	**9.272 131**

* in completion to DIN, not with conformity certificate
**Cotton plugged

Graduated pipettes, Class AS, amber graduations, type 2

BLAUBRAND®, conformity certified, AR-Glas®. DIN EN ISO 835. Type 2 (zero at top), total delivery. Calibrated to deliver (TD, EX). Waiting time 5 seconds. Schellbach-stripe. Marks and inscriptions in high contrast blue enamel. All BLAUBRAND® graduated pipettes are supplied with a batch number and an accompanying batch certificate in the original packaging (up to 10 ml: 12 pipettes, above 10ml: 6 pipettes). Also available with individual works, USP, or DAkkS (former DKD) calibration certificate on request. Supplementary to the DIN range. *BRAND*

Volume ml	Grad. ml	Tolerance ± ml	Overall length ± 10 mm	Suitable for cotton plugs	PK	Cat. No.
0.5	0.01	0.006	360	no	1	**9.272 000**
1	0.01	0.007	360	no	1	**9.272 001**
1	0.01	0.007	360	yes	1	**9.272 002**
2	0.02	0.010	360	no	1	**9.272 003**
2	0.02	0.010	360	yes	1	**9.272 004**
5	0.05	0.030	360	yes	1	**9.272 005**
5	0.10	0.030	360	yes	1	**9.272 006**
10	0.1	0.05	360	yes	1	**9.272 007** 1
20	0.1	0.10	360	yes	1	**9.272 008**
25	0.1	0.10	450	yes	1	**9.272 009**

1



9.272 007

Graduated pipettes, Class AS, AR-Glas®, blue graduation, type 2

BLAUBRAND®, DIN EN ISO 835, conformity certified. Type 2 (nominal volume at top), total delivery. Calibrated to deliver (TD, EX). Waiting time 5 seconds. Marks and inscriptions in high contrast blue enamel. All BLAUBRAND® graduated pipettes are supplied with batch number and one batch certificate per manufacturer's outer pack (up to 10ml: 12 pipettes, above 10ml: 6 pipettes). Also available with individual works, USP, or DKD calibration certificate on request. The batch certificate is also available to download from the supplier's website. *BRAND*

Volume ml	Grad. ml	Tolerance ± ml	Overall length ± 10 mm	PK	Cat. No.
0.5	0.01	0.006	360	1	**9.272 016**
1	0.01	0.007	360	1	**9.272 017**
1	0.1	0.007	360	1	**9.272 018**
1[c]	0.01	0.007	360	1	**9.272 027**
2	0.02	0.010	360	1	**9.272 019**
2	0.1	0.010	360	1	**9.272 020**
2[c]	0.02	0.010	360	1	**9.272 028**
5[c]	0.05	0.030	360	1	**9.272 021**
5[c]	0.1	0.030	360	1	**9.272 022**
10[c]	0.1	0.05	360	1	**9.272 023** 2
20[c]	0.1	0.10	360	1	**9.272 024**
25[c]	0.1	0.10	450	1	**9.272 025**
50[c*]	0.5	0.2	450	1	**9.272 026**

[c] Cotton plugged
*Supplementary to DIN.

2



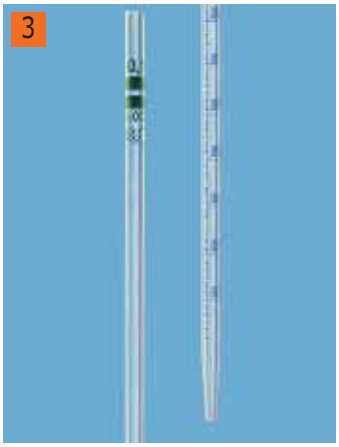
9.272 023

Graduated pipettes, BLAUBRAND®, class A, conformity certified, blue graduations

AR-Glas®. In addition to DIN 12689. Length 360 mm. Calibrated to contain (TC, IN). Graduations and inscriptions in high contrast blue enamel. An excellent combination of resistance and readability. All BLAUBRAND® bulb pipettes are supplied with batch number and one batch works certificate per pack unit. Individual works, USP or DAkkS (former DKD) calibration certificates are available - details on request. The batch certificate is also available to download from the supplier's website. *BRAND*

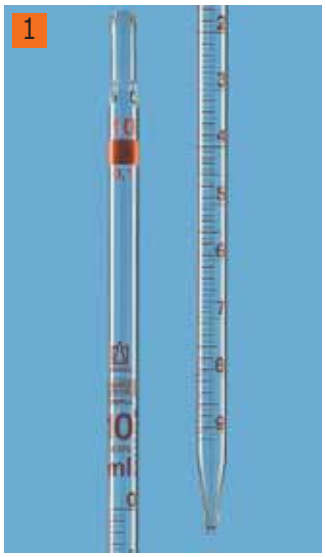
Volume ml	Graduations ml	Tolerance ± ml	Overall length ± 10 mm	PK	Cat. No.
0.1	0.001	0.001	360	1	**9.272 102** 3
0.2	0.002	0.002	360	1	**9.272 104**

3



9.272 102

1



9.272 077

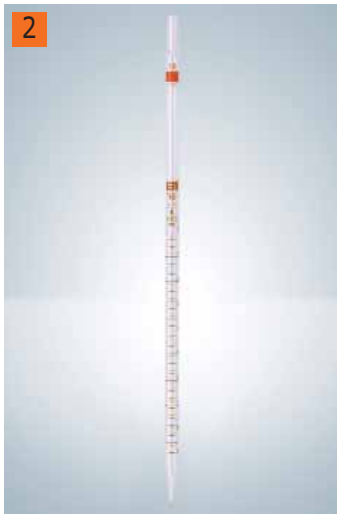
Graduated pipettes, Class B, AR-Glas®, brown graduations, type 3

SILBERBRAND Eterna. DIN EN ISO 835. Type 3 (zero at top). *BRAND*
Graduations and inscriptions in Eterna permanent amber diffusion stain.
Adjusted to EX.

Volume ml	Grad. ml	Tolerance ± ml	Overall length ± 10 mm	PK	Cat. No.
0.5	0.01	0.006	360	1	**9.272 069**
1	0.01	0.010	360	1	**9.272 070**
1[c]	0.01	0.010	360	1	**9.272 086**
1	0.1	0.010	360	1	**9.272 071**
2*	0.01	0.015	360	1	**9.272 072**
2	0.02	0.015	360	1	**9.272 073**
2[c]	0.02	0.015	360	1	**9.272 089**
2	0.1	0.015	360	1	**9.272 074**
5[c]	0.05	0.05	360	1	**9.272 075**
5[c]	0.1	0.05	360	1	**9.272 076**
10[c]	0.1	0.08	360	1	**9.272 077** 1
20[c]	0.1	0.150	360	1	**9.272 078**
25[c]	0.1	0.150	450	1	**9.272 079**

* Supplementary to ISO.
[c] Cotton plugged

2



9.272 373

Graduated pipettes, AR-Glas®, class B, amber stain graduation

EX (TD) calibrated. Tolerances better than class B requirements. *Hirschmann*
With durable amber stain graduation, short line, graduated to tip, zero on top,
type 3, acc. to DIN EN ISO 835.
From 5ml with cotton plug end as standard.

Volume ml	Grad. ml	Tolerance ± ml	Overall length ± 5 mm	PK	Cat. No.
0.5*	0.01	0.0075	360	1	**9.272 366**
1	0.01	0.01	360	1	**9.272 367**
1*	0.1	0.01	360	1	**9.272 368**
2*	0.01	0.015	360	1	**9.272 376**
2	0.02	0.015	360	1	**9.272 369**
2*	0.1	0.015	360	1	**9.272 370**
5	0.05	0.045	360	1	**9.272 371**
5*	0.1	0.045	360	1	**9.272 372**
10	0.1	0.075	360	1	**9.272 373** 2
20*	0.1	0.15	360	1	**9.272 374**
25*	0.1	0.15	450	1	**9.272 375**
50*	0.2	0.3	450	1	**9.272 377**

* Supplementary to DIN.
Also available with dated batch identfication acc. to USP (US Pharmacopeia).

3



6.080 523

Graduated pipettes for tissue culture, AR-glas®, amber graduations

EX (TD) calibrated. Short form. Main point ring graduation. Specially for tissue culture and working on cleanroom benches. With durable amber stain graduation. *Hirschmann*
Zero to the tip, Cotton plugged (8mm outer diameter).
For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Volume ml	Grad. ml	Tolerance ± ml	Overall length ± 3 mm	PK	Cat. No.
1	0.1	-	230	1	**6.080 498**
2	0.1	-	230	1	**6.090 340**
5	0.1	-	230	1	**6.080 523** 3
10	0.1	-	230	1	**6.510 172**
25	0.2	-	230	1	**6.510 335**

Cleaning equipment for pipettes - please see page 1148.

Graduated pipettes, soda AR-Glas®, class A

FORTUNA®. With permanent, amber, enamelled graduations. *Poulten & Graf*
With interchangeable suction pistons (except 100ml size).
Graduated pipettes with blue enamelled graduations are also available on request.

Capacity	Grad.	Tolerance	PK	Cat. No.	
ml	ml	± ml			
1	0.01	-	1	**9.273 301**	
2	0.02	-	1	**9.273 302**	
5	0.05	-	1	**9.273 305**	
10	0.1	-	1	**9.273 310**	1
20	0.1	-	1	**9.273 320**	
25	0.1	-	1	**9.273 325**	
50	0.2	-	1	**9.273 350**	
100	1.0	-	1	**9.273 399**	



9.273 310

Graduated pipettes, AR-Glas®, Class AS, amber graduations, type 3

NEW!

BLAUBRAND® ETERNA, conformity certified, AR-Glas®. DIN EN ISO 835. *BRAND*
Type 3 (Zero point at the top), total delivery. Calibrated to deliver (TD, EX).
Waiting time 5 seconds. Ring mark and inscription in ETERNA amber stain.
All BLAUBRAND® graduated pipettes are supplied with a batch number and an accompanying batch certificate in the original packaging. On request, they are also available with an individual certificate, USP individual certificate or DAkkS (former DKD) calibration certificate. Pack of 12 (20 and 25 ml: 6).

Volume	Graduations	Accuracy	Suitable for cotton plugs	PK	Cat. No.	
ml	ml	± ml				
0.5	0.01	0.006	no	1	**9.272 031**	
1	0.01	0.007	no	1	**9.272 032**	
1	0.01	0.007	yes	1	**7.018 397**	
2	0.02	0.010	no	1	**9.272 033**	
2	0.02	0.010	yes	1	**7.018 398**	
5	0.05	0.030	yes	1	**7.060 678**	
5	0.1	0.030	yes	1	**9.272 034**	
10	0.1	0.05	yes	1	**9.272 036**	2
20	0.1	0.10	yes	1	**7.018 413**	
25	0.1	0.10	yes	1	**9.272 037**	

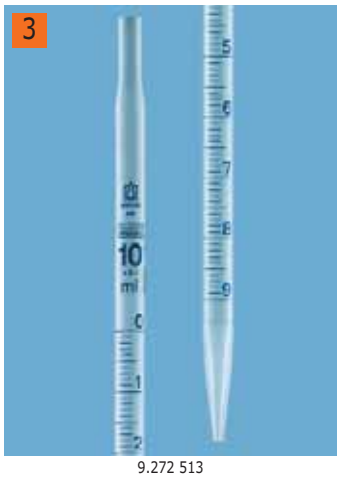


9.272 036

Graduated pipettes, PP

Highly transparent. Streak resistent. With blue graduations and markings. *BRAND*
Particularly suitable for education and for applications where glass pipettes should not be used.
Calibrated for delivery (EX).
Exposure to temperatures up to 60°C will not cause permanent exceeding of tolerance limits.
Cleaning below 60°C is recommended to preserve graduations and inscriptions.

Capacity	Graduations	Tolerance	Overall length	PK	Cat. No.	
ml	ml	± ml	± 10 mm			
1	0.1	0.02	300	1	**9.272 507**	
2	0.1	0.02	300	1	**9.272 510**	
5	0.1	0.05	330	1	**9.272 512**	
10	0.1	0.1	330	1	**9.272 513**	3



9.272 513

1



1 Macropipette controllers

The handwheel allows precise suction of the liquid into the pipette with one hand. *Isolab*
The handwheel which enables the suction piston is designed for easy operation by using only the thumb. When the wheel stops, the piston remains in the desired position.
The liquid can be blown out by pressing the piston back or allowed to flow out by setting the lateral switch to EX.
A slight pressure applied to the discharge lever opens the valve and lets the liquid flow out easily

For	PK	Cat. No.
Pipette volume up to 2ml	1	**4.008 322**
Pipette volume up to 10ml	1	**4.008 323**
Pipette volume up to 25ml	1	**4.008 324**

2



2 Maxi pipette filler, 1 to 100ml

Large capacity bulb which works perfectly with all pipette sizes from 1ml up to 100ml. *Isolab*
First squeeze the silicone bulb and the thumb lever controls both the aspirate and dispense modes. Incorporates central button to blow out the residual liquid into the pipettes

Type	PK	Cat. No.
Maxi pipette filler	1	**6.238 525**

3



3 LLG-Pasteur pipettes, glass

Single use. With uniform shape and length. With long drawn, 1.1mm diameter fine tip, 20mm suction tube and constriction for tight fitting of cotton wool plugs. External diameter: 7.1mm. Please order Pipette teats separately.

Length mm	PK	Cat. No.
150	1000	**9.411 015**
230	1000	**9.411 020**

4 5 LLG-Pasteur Pipettes, PE

Manufactured from transparent PE. Sterile or non-sterile. Graduated.

Type	Capacity ml	Length mm	PK	Cat. No.
Pasteur pipettes, macro, graduated, non-sterile	3.0	150	500	**9.401 080**
Pasteur pipettes, macro, graduated, non-sterile	1.0	150	500	**9.401 081**
Pasteur pipettes, macro, graduated, sterile, single wrapped	3.0	150	1000	**9.401 084**
Pasteur pipettes, macro, graduated, sterile, single wrapped	1.0	150	1000	**9.401 085**

4



5



E & OE.

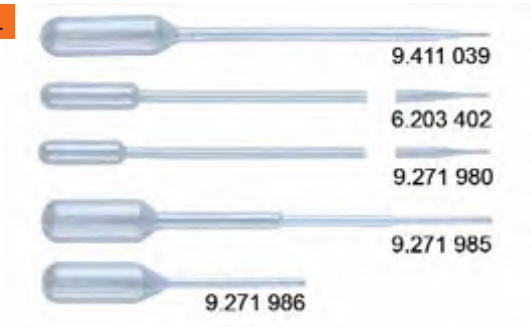
1 2 Pipettes, Pasteur, PE

Disposable. PE. Micro pipette contains a capillary suction tip.
Ideal for daily use.

Type	Capacity ml	Length mm	PK	Cat. No.
Ultra Pastette® non-graduated, non-sterile	1.0	63	500	**9.271 986**
Mini Pastette® non-graduated, non-sterile	1.0	104	400	**9.271 985**
Capillary, grad., sterile, single wrapped*	1.0	144	500	**9.411 039**
Standard, without grad., sterile, single wrapped*	1.0	150	500	**9.411 038**
Standard, grad., non-sterile	1.0	155	500	**9.411 031**
Pasteur-Plast-Pipette, non sterile	1.5	230	400	**7.200 111**
Disposable pasteur pipette, glass	2.0	150	250	**7.020 294**
Disposable pasteur pipette, glass	2.0	225	250	**7.020 295**
Micro, without grad., non-sterile*	3.0	150	500	**9.411 032**
Macro, grad., sterile, single wrapped	3.0	150	500	**9.411 035**
Macro, grad., non-sterile	3.0	155	500	**9.411 030**
Jumbo Pastette® non-graduated, non-sterile	7.3	300	100	**9.271 980**
Standard, with ring mark, non-sterile	10.0	170	200	**9.411 033**
Pasteur-Plast-Pipette	10.0	300	100	**6.203 402**

* Total volume

1



2

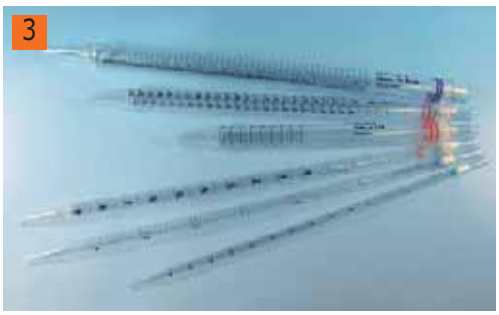


3 4 5 LLG-Serological pipettes, PS, graduated, sterile

- Graduations for accurate dispensing up to ±2%
- Colour coding for easy volume identification
- Pyrogen-free
- Sterile, individually packed

Volume ml	Grad. ml	Colour code	PK	Cat. No.
1	1/100	yellow	500	**9.380 440**
2	1/50	green	500	**9.380 441**
5	1/10	blue	200	**7.930 401**
10	1/10	orange	200	**7.930 402**
10	1/10	orange (wide mouth)	200	**9.380 442**
25	2/10	red	150	**7.930 403**
50	5/10	purple	100	**9.380 443**

3



4



5



For our Life Science product range - please see page 1274.





1 2 Pipettes, plastic, disposable, serological, PS

Ratiolab

These serological pipettes were specially designed for cell culture. The special colour-coded system makes it easy to identify the size of the pipette in use. The pipettes are made from high-grade polystyrene and have the following features:
- Guaranteed sterile (gamma irradiated)
- Guaranteed non-pyrogenic
- Guaranteed non-cytotoxic
- Guaranteed non-haemolytic
- Cotton plugged and colour coded
- Larger capacity through extra graduations
- 5ml, 10ml and 25ml pipettes are graduated with bi-directional secondary scale, enabling easier reading.
- Secure and easy-to-open 'tear off' packaging.

Capacity ml	Colour	Grad. ml	Negative graduations up to	PK	Cat. No.
1	Yellow	1/100	0.3 ml	500	**9.380 431**
2	Green	1/50	0.4 ml	500	**9.380 432**
5	Blue	1/10	3.0 ml	250	**9.380 433**
10	Orange	1/10	3.0 ml	200	**9.380 434**
25	Red	1/5	10.0 ml	100	**9.380 435**
50	Purple	1/5	5.0 ml	100	**9.380 436**



3 Serological Pipettes, PS, sterile

Sterilin

High-quality polystyrene.
Colour coded according to ISO requirements.

Volume ml	Grad. ml	Negative graduations up to	PK	Cat. No.
1*	1/100	0.2 ml	1000	**9.380 123**
1	1/100	0.2 ml	1000	**9.380 125**
5*	1/10	2.0 ml	200	**9.380 131**
5	1/10	2.0 ml	200	**9.380 133**
10*	1/10	3.0 ml	500	**9.380 135**
10	1/10	3.0 ml	500	**9.380 137**
25*	1/5	10.0 ml	200	**9.380 139**

* sterile, individually packed



4 Serological pipettes, PS

NEW!

Thermo Scientific

Radiation-sterilised. Black graduations. Upper end with cotton wool plug.
Individual sizes color coded. Additional scale for using the complete volume.
Individually packed. Pyrogen-free.

Capacity ml	Grad. ml	additional scale ml	Accuracy ± ml	Colour code	PK	Cat. No.
1	1/100	0.3	0.02	yellow	1000	**9.380 453**
2	1/100	0.3	0.04	black	500	**9.380 454**
5	1/10	2	0.10	blue	200	**9.380 455**
10	1/10	3	0.20	orange	200	**9.380 456**
25	2/10	10	0.50	green	200	**9.380 457**
50	2/10	10	0.75	purple	100	**9.380 458**



5 Pipette bulbs

Rubber. For quick and easy pipetting. Colour coding to prevent confusion.

Capacity ml	Colour	PK	Cat. No.
1	Green	1	**9.115 501**
2	Grey	1	**9.115 502**
5	Yellow	1	**9.115 505**
10	Blue	1	**9.115 506**
15	Red	1	**9.115 507**

1 Safety pipette bulb Howorka-Ball®



Advantages:
- no rigid connection with tube
- no valves or side vent on tubes
- suitable for all standard tube diameters, including pipettes, burettes, filter tubes etc.
- no unstable air pockets
- long operational life due to durable components
- Easily cleaned and steam sterilized if contaminated with liquids

Capacity ml	PK	Cat. No.
20	1	**9.273 826**
50	1	**9.273 827**

2 Safety pipette bulb Flip™



Fits virtually all pipette sizes.
Only two valve operation points.
With automatic vent valve that can be removed for cleaning.

Type	PK	Cat. No.
Flip™	1	**9.273 838**

3 Safety bulb pipette fillers, rubber



Chemically resistant rubber. With valves for suction, emptying and air release, controlled by thumb and finger pressure.

Type	Figure	PK	Cat. No.
Standard, for pipettes up to 8mm diameter	1	1	**9.273 836**
Universal, for most pipettes	2	1	**9.273 837**

4 Pipette teats



Choice of materials as indicated.

Description	PK	Cat. No.
Natural rubber/Latex (NR)	1	**9.072 681**
Silicone (VMQ)	10	**9.072 682**
Red (NR/SBR)	1	**9.072 683**



1 Pipette bulb, 'Aspirette'

Patented pipette bulb for safe pipetting of all kinds of liquids. Easy to use and accurate.
Highly recommended even with critical or aggressive liquids.
Suitable to accommodate pipettes up to 11mm ext. diam.

Type	PK	Cat. No.
Aspirette	1	**9.273 870**



2 Macropipette controllers 0.1 to 200ml

BRAND

For use with volumetric and graduated pipettes from 0.1 to 200ml. Unique valve system. Particularly easy to use and lightweight. With hydrophobic membrane filter to prevent penetration of liquid into the controller body. The macropipette controller is autoclavable (121°C).

Type	PK	Cat. No.
Macropipette controller, grey	1	**9.273 850**
Macropipette controller, magenta	1	**9.273 853**
Macropipette controller, green	1	**9.273 851**
Macropipette controller, blue	1	**9.273 852**
Spare hydrophobic membrane filter	1	**9.273 868**
Valve assembly	1	**9.273 860**
Spare adapter, silicone	1	**9.273 861**
Adapter housing	1	**9.273 848**
Replacement bulb with screw ring	1	**9.273 849**



3 Pipette stand, horizontal, PP

Isolab

Pipette stand for 12 pipettes, horizontal is made from moulded polypropylene which is autoclavable. On each side, 6 pipettes (longer than 22 cm) can be stored horizontally.
Easy to clean.

Dimensions mm	PK	Cat. No.
240 x 180 x 290	1	**9.273 896**



4 Pipette stand "vertical", PP

Isolab

Pipette stand, vertical is made from moulded polypropylene.
This stand can hold up to 94 pipettes and rotates on a central vertical axis for easy selection of any particular pipette. The base plate has a raised edge which catches dripping liquids.

Type	PK	Cat. No.
Pipette stand "vertical"	1	**9.273 895**

1 Pipette storage container

With lid. Base dia. x height: 130 x 430mm, int. dia.: 83mm.
Suitable for dust-proof storage of pipettes up to 400mm long.

Kartell



Type	Bottom diam. mm	Height mm	PK	Cat. No.
With lid (PP container, HDPE lid)	83	430	1	**9.273 900**

2 Pipette baskets, PE-HD

Cylindrical, with handle.

Kartell



For pipette length mm	Bottom diam. mm	Height mm	PK	Cat. No.
360	145	495	1	**9.273 980**
460	145	645	1	**9.273 985**
600	145	870	1	**9.273 990**

3 Pipette soaking jar, PE-HD

Kartell



For pipette length mm	Int. diam. mm	Height mm	PK	Cat. No.
250	125	250	1	**9.273 928**
500	160	500	1	**9.273 920**
650	160	650	1	**9.273 925**

4 Pipette rinsers, PE-HD

For easy and gentle cleaning of pipettes using the repetitive siphon principle.
The complete rinsing system comprises rinser, soaking jar and pipette basket.
Water flow should be adjusted to approx. 2 litres/min.
Please order soaking jar and pipette basket separately.

Kartell



For pipette length mm	Capacity Litres	Int. diam. mm	Height mm	PK	Cat. No.
460	13	150	740	1	**9.409 238**
600	17	150	1000	1	**9.409 239**

Further pipette cleaning devices please see our chapter 11

5 Rack for serological pipettes

Ideal for your serological pipettes. Use as individual units, or click together horizontally or vertically. Magnets on both sides of units connect safely to metal surface such as file cabinets, fume hoods, refrigerators, and freezers.
Angled shelves store your 0.1ml to 50ml pipettes within arm's reach for use.
Protective lid encloses the unit to prevent dust build up. Colour: 3 different shades of blue.
Dimensions (L x W x H): 301mm x 100mm x 127.5mm each.

Heathrow Scientific



Type	PK	Cat. No.
Cargo Manual Pipette Rack	3	**9.273 930**

6 Pipette sterilizing boxes, square

Square section. Stackable.18/10 stainless steel. With silicone pad in base and lid.
Box W x D: 70 x 70 mm. Sterilizable up to 205°C.

Bochem



Length mm	Effective length mm	Diam. mm	PK	Cat. No.
210	202	70 x 70	1	**9.010 781**
290	282	70 x 70	1	**9.010 782**
340	332	70 x 70	1	**9.010 783**
435	427	70 x 70	1	**9.010 784**

1



1 Pipette sterilizing boxes

Cylindrical. 18/10 stainless steel. With silicone pad in base and lid. *Bochem*
Rotating the lid exposes or hides the lid perforations.
Sterilizable up to 205°C.

Height mm	Effective length mm	Diam. mm	PK	Cat. No.
450	442	65	1	**9.010 793**
380	372	80	1	**9.010 794**
500	492	80	1	**9.010 795**

2



2 Variable pipette boxes

Comprising two, sliding aluminium sections which can be gently pressed together in a telescopic fashion to fit the length of the pipettes to be sterilized. *Isolab*
This means that only one container size for 280 to 420 mm long standard pipettes and one for 145 to 235 mm long short or pasteur pipettes are required. 2mm thick silicone rubber pad prevents damage to pipettes when loading and transporting. Silicone rubber pad - please order separately.

Type	Variable length mm	Int. diam. mm	PK	Cat. No.
Pipette box	145 to 235	60	1	**9.010 801**
Pipette box	280 to 420	60	1	**9.010 800**
Silicone pad		58	1	**9.010 770**

3



3 Disposable micropipettes ring marked, intraMARK

BLAUBRAND®. DIN ISO 7550. *BRAND*
Conformity-certified from 5µl upwards, in accordance with German Weights and Measure Regulations. Calibrated to contain (In). Colour code according to ISO for clear identification.

Length 125 mm
Accuracy ≤ ±0.25 %.
Precision ≤ 0.5 %.
(Capacity 5 µl: Accuracy ≤ ±0.3 %, precision ≤ 0.6 %).
CE-marked according to IVD 98/79 EG.

Marks at µl	Colour	PK	Cat. No.
1/2/3/4/5*	White	250	**9.411 307**
10	Orange	250	**9.411 309**
20	Black	250	**9.411 318**
25*	White - white	250	**9.411 322**
40*	Red - red	250	**9.411 327**
20 + 40*	Red - red	250	**9.411 328**
50	Green	250	**9.411 333**
100	Blue	250	**9.411 344**
50 +100	Blue	250	**9.411 345**
200	Red	200	**9.411 357**

* Conformity-certified for 5 µl division only.

4



4 Disposable micropipettes, delbrück pattern, intraEND

BLAUBRAND®. DIN ISO 7550. Conformity-certified. Volume defined by end-to-end filling. *BRAND*
Calibrated to contain (In). Sodium heparinised. Ideal for blood capillary sampling.
With a length of only 30mm the pipette can be placed directly into the microcentrifuge tube where it releases the sample during centrifugation. CE-marked according to IVD directive 98/79 EC.
Accuracy: ≤ ±0.5 %.
Precision: ≤ 1 %.

Capacity µl	Length mm	PK	Cat. No.
20	30.0	100	**9.411 242**
50	30.0	100	**9.411 246**

For our Life Science product range - please see page 1274

E & OE.

1 Pipetting aid, intraEnd

For BLAUBRAND® intraEnd micropipettes. *BRAND*
Consists of the PET plastic tube, silicone adapter, and TPE suction bellows with venting hole.

Type	PK	Cat. No.
Pipetting aid, intraEnd	10	**9.411 440**



2 Pipette holders

For intraEND micropipettes. *BRAND*

Type	PK	Cat. No.
Pipette holders	1	**9.411 260**



3 Capillary pipettes, ringcaps®

Disposable capillary pipettes with ring marks. *Hirschmann*
Ringcaps® are exclusively made out of DURAN® glass (CE marked, ISO 7550).
The accurately designed ring mark guarantees precise determination of volume,
the international color code on every single micropipette prevents the risk of confusion.
Unit = 1 box of 250 pieces.
Version 100 + 200 = 1 bos of 100 pieces.

Advantages:
- No risk of cross contamination owing to single use
- DURAN® glass
- Handy length of 125mm
- Conformity certified in accordance with the applicable weights and measures regulations

Type	Capacity µl	PK	Cat. No.
5 marks	1 + 2 + 3 + 4 + 5	250	**9.600 105**
1 mark	10	250	**9.600 110**
1 mark	20	250	**9.600 120**
1 mark	25	250	**9.600 125**
1 mark	40	250	**9.600 140**
1 mark	50	250	**9.600 150**
1 mark	100	250	**9.600 199**
1 mark	200	100	**9.600 122**
2 marks	5 + 10	250	**9.600 210**
2 marks	20 + 40	250	**9.600 240**
2 marks	50 + 100	250	**9.600 299**
2 marks	100 + 200	100	**9.600 222**



Capillary pipettes, minicaps

Minicaps micro capillary pipettes, end-to-end. Available in sodium-heparinized and non-heparinized. Conformity certified. Acc. the German "Eichordnung". With batch number on the packaging. Made in Germany out of original SCHOTT DURAN®. Acc. ISO 7550. CE acc. IVD 98/79 EG. *Hirschmann*

Advantages:
- Error-free filling end-to-end
- Only 30mm to 32mm long
- Easy-to-remove, color-coded dispenser cap
- Conformity certified in accordance with the applicable weights and measures regulations

Supplied in drums of 100 within an outer pack of 1000.

1



1 Capillary pipettes, DURAN®, minicaps end-to-end, Na-hep

Sodium heparinized. Conformity certified, ISO 7550 CE acc. IVD 98/79/EC. *Hirschmann*

Capacity µl	Length mm	PK	Cat. No.
5	30 to 32	100	**9.411 252**
10	30 to 32	100	**9.411 253**
25	30 to 32	100	**9.411 255**

Other sizes available.

2



9.411 254

Disposable micro capillary pipettes, DURAN®, minicaps end-to-end acc. "Prof. Dr. Delbrück"

Minicaps - disposable micro capillary pipettes, end-to-end. Conformity certified. With batch number on packaging. Made out of original SCHOTT DURAN®. Suitable for the analysis acc. to Prof. Dr. Delbrück.Sodium-heparinized, acc. ISO 7550. CE acc. IVD 98/79 EG. Packaging unit: 100 minicaps in each glass cartridge, 10 cartridges and a pipette filler. *Hirschmann*

Capacity µl	Length mm	PK	Cat. No.
20	30 ±0.5	100	**9.411 254** 2
40	30 ±0.5	100	**9.411 256**
50	30 ±0.5	100	**9.411 258**

Other sizes on request.

3



3 Capillary pipettes, DURAN®, minicaps end-to-end

Non-heparinized. Conformity ceritfied ISO 7550, CE acc. IVD 98/79/EG. *Hirschmann*

Capacity µl	PK	Cat. No.
0.5	100	**9.411 265**
1	100	**9.411 266**
2	100	**9.411 267**
3	100	**9.411 268**
4	100	**9.411 270**
5	100	**9.411 271**
10	100	**9.411 273**
20	100	**9.411 274**
25	100	**9.411 275**
30	100	**9.411 276**
40	100	**9.411 277**
50	100	**9.411 279**
100	100	**9.411 280**

4



6.200 639

5



7.200 409

Haematocrit capillary tubes

Disposable capillaries for blood centrifugation tests, length 75mm, outer diameter 1.42mm - 1.68mm, with heavy wall thickness and color-coded acc. to DIN 12 772, CE acc. IVD 98/79 EG. *Hirschmann*

Type	Colour	PK	Cat. No.
Plain	blue	1000	**6.200 639** 4
Sodium-heparinized	red	1000	**7.200 409** 5

1 Micro-haematocrit capillary tubes



Comply with BS 4316-68 and DIN ISO 12 772 specifications. *BRAND*
For use in microhaematocrit centrifuges. Without calibration marks.

Heparinised.
For capillary blood sampling. The entire inner surface is coated with sodium-heparinate. Code: red.

Non-heparinised.
To determine heparinised venous blood. Code: blue.

CE-marked according to IVD 98/79 EG.

Length:	75 mm ±0.5 mm
Wall thickness:	approx. 0.2 mm
Internal diameter:	1.1 to 1.2 mm
External diameter:	1.5 to 1.6 mm

- CE marked according to IVD 98/79 EG.

Type	PK	Cat. No.
Heparinised	100	**9.411 215**
Non-heparinised	100	**9.411 220**

2 Haematocrit sealing compound



Non-drying vinyl plastic compound on a plastic plate. *BRAND*
For rapid and safe sealing of several hundred micro-haematocrit capillaries.
Pairs of capillaries (24 in total) can be placed upright in the numbered storage places on each side of the plate.
CE marked.

Type	PK	Cat. No.
Haematocrit sealing compound	10	**9.411 240**

3 Micropipette controller



For disposable pipettes with micro ring mark and many other small glass pipettes *BRAND*
up to 1ml. Autoclavable (121°C). The micropipette controller reduces risk of infection.
Contaminated disposable micropipettes can be removed using the integral ejection button.

Type	PK	Cat. No.
Micropipette controller	1	**9.288 200**
Spare suction system	3	**9.288 201**

4 Pipette controllers, micro-classic



Specially designed for IVF laboratory applications. Comfortable and reliable. *BRAND*
Thanks to its ergonomic design and easy handling, the micro-classic pipette controller
provides the comfort needed for difficult work under the microscope.
Suitable for disposable micropipettes with ring marks and other microlitre volume pipettes with a capacity up to 1ml.
Suitable for left, or right-handed operation. The adapter and suction tube are autoclavable at 121°C.

Description	PK	Cat. No.
Micro-classic, complete, with 2 spare tubes	1	**9.281 080**
Spare adapter with suction tube	3	**9.281 085**

1



1 LLG-Electrical pipette pump plus

This ergonomic pipette controller is lightweight, made from UV resistant material, features adjustable valves and is microprocessor controlled for reliability and accuracy. The powerful pump offers rapid yet sensitive aspiration and dispensing. Filling and dispensing speed is easily set using the same hand by pressing the large control button.
The bright LED display will indicate which of the three modes has been selected, High, Low or Gravity Mode. The user labeling area enables customization, instant recognition and/or task designation. Additional features include hand neutral design, concave padded triggers, a 1ml pipette adapter to increase stability of small pipettes, a long life Li-Ion battery that allows
20 hours of continuous usage, low battery indicator and two holders as standard

- For 1-100ml glass or plastic pipettes
- Soft touch triggers
- 5 different coloured autoclavable nose pieces as standard included
- Uses standard 0.45µm hydrophobic filters
- Long life, easily changeable rechargeable battery
- Sensitive and adjustable aspiration and dispensing
- Labeling area for identification
- Delivered completely with universal voltage and plug faced charger
- Comes with bench stand and magnetic/fixable wall mount

Description	PK	Cat. No.
LLG-Electrical pipette pump plus	1	**9.281 041**
Membrane filter, 0.45µm, PTFE, non-sterile	5	**9.281 005**

2



2 Pipette controller accu-jet® pro

BRAND

Superb control, all with one hand. Choose your operating mode: powered blow-out for speed or sensitivity; delivery by gravity for volumetric accuracy. Set the motor speed range suited to the pipette volume: full power for large volumes; lower speed range for small-volume pipettes. Then, achieve the finest control of filling and delivery by adjusting the pipetting speed as needed without stopping your work; speed is continuously adjustable using button pressure within the selected speed range.

- Exceptionally sensitive meniscus control, even with low-volume pipettes
- Light weight (190g) and smoothly rounded grip ensure comfort and minimize fatigue
- Securely holds all pipettes from 0.1ml to 200ml
- Active vapour exhaust, check valve and filter help protect instrument from liquids and vapours
- Additional battery compartment cover (included) allows instrument to be inverted on the bench to avoid contamination of the pipette adapter.
- 8 hours of continuous pipetting (with a 10ml pipette) on each charge; LED low-battery signal; instrument operates during recharge.

Items supplied: accu-jet® pro, incl. wall support, 2 membrane filters 0.2µm sterile, NiMH battery pack, 2 battery compartment covers, instruction manual and 100-240V 50/60Hz power supply unit for continental Europe.

Description	PK	Cat. No.
accu-jet® pro, dark blue	1	**9.281 090**
accu-jet® pro, magenta	1	**9.281 086**
accu-jet® pro, green	1	**9.281 087**
accu-jet® pro, royal blue	1	**9.281 088**

3



3 Accessories for accu-jet® controller

BRAND

Description	PK	Cat. No.
NiMh-Akku battery charger only	1	**9.281 096**
Silicone adapter, with non-return valve (PTFE)	1	**9.281 094**
Membrane filter, 0.2 µm, in blister pack, sterile*	1	**9.281 092**
Membrane filter, 0.2 µm, in PE bag, non-sterile	10	**9.281 091**
Membrane filter, 3 µm in blister pack, non-sterile	1	**9.273 868**
Membrane filter, 3 µm, in PE bag, non-sterile	10	**9.281 095**

* Sterilized with ethylene oxide (ETO), guaranteed SAL of 10^{-6}.

E & OE.

1 Pipette filler, pipetus®

Hirschmann

The pipetus® is suitable for all pipette types, provides absolute safety, fatigue-free and simple push-button operation. Safe, handy, network-independent, without cables.
It is ergonomically sophisticated in every detail despite most modern technology, powerful and light-weight.
Fits graduated, volumetric and Pasteur pipettes from 0.1ml to 200 ml. Without reloading it can be operated up to one week. The colour display shows the selected defaults (speed) and the current battery capacity.

- Automatic inductive charge in the park station guarantees constant readiness
- Controlled pipetting by a simple push of a button
- EX/Blow out switch for precise operating
- Speed key for 5 operating speeds
- No memory effect by inserted microcontroller
- Clear colour display with permanent display
- Optimal meniscus adjustment by sensitive valve technique
- Standard relief valve against penetration of liquid
- Ergonomic design for fatigue-free serial pipetting
- Scope of supply: pipetus® with inductive charger station, 2 additional round PTFE filters, safety valve and wall mount

Supplied with:
Charger with plug socket, including inductive charging stand, wall unit and PTFE membrane filter.

1



Type	PK	Cat. No.
pipetus®	1	**9.283 958**

Pipette controllers, pipetus®, accessories

Hirschmann

Type	PK	Cat. No.	
Pipet holder, complete	1	**9.283 970**	2
Filter disc with one-sided plug-in connection (5 pcs)	5	**9.283 965**	3
Spare silicone adapter	1	**9.283 961**	
Spare safety valve	1	**9.283 962**	4
Charging set 230 V including inductive charging station Mounting bracket	1	**9.283 966**	
Retainer Ring "white"	1	**9.283 967**	
Pipet holder housing	1	**9.283 968**	5
Table Stand	1	**9.283 969**	
	1	**9.287 859**	

2



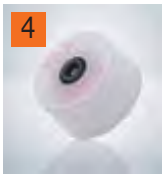
9.283 970

3



9.283 965

4



9.283 962

5



9.283 968

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

HIRSCHMANN®

1



2



3



4



5



6



1 2 3 4 5 6 LLG-Digital Microlitre pipettors

Comfortable to use
Minimal effort is required for pipetting which reduces the risk of repetitive strain injuries (RSI).
Volume setting is easy and precise, using the push button, even when wearing gloves. With integrated soft grip.

Maximum Precision and Accuracy
Thermal insulation of the internal components, using the innovative, ergonomic, coloured soft grip, improves accuracy and ensures safe, easy handling.

Universal Blow-out System
Two step plunger operation allows reverse pipetting. This also facilitates last drop dispensing by soft plunger movements. High accuracy and precision are guaranteed.

Easy Maintenance and Adjustment
Easy to adjust, with just one tool. Maintenance and adjustment take only a few minutes. The pipettor design and the universal tool are a perfect partnership for simple, rapid adjustment.

Contamination-free Pipetting
The pipettor is fully autoclavable, ideal for applications where sterility is important.

Satisfaction Guaranteed
Each pipette is individually tested and calibrated twice, conforming to EN ISO 8655 and DIN 12650 Standards.
A certificate is included.

Made in Germany, CE certified.

Capacity µl	Accuracy ≤ ± A% (max. vol.)	Reproducibility ≤ ± V% (max. vol.)	Colour code	PK	Cat. No.
0.1 to 2.5	1.5	0.8	grey	1	**9.280 000**
0.5 to 10	1.0	0.5	grey	1	**9.280 001**
2 to 20	4.5	1.0	grey	1	**9.280 002**
10 to 100*	2.8	0.8	yellow	1	**9.280 003**
20 to 200	2.5	0.6	yellow	1	**9.280 004**
100 to 1000*	2.9	0.6	blue	1	**9.280 005**
500 to 5000*	2.4	0.6	purple	1	**9.280 006**
1000 to 10000**	3.0	0.6	turquoise	1	**9.280 007**

*Filters for pipettors available on request.
** 10000µl Pipettor does not have a tip ejector

7



7 LLG-Digital Microlitre pipettors, Packages

These two pipettor packages cover the most used volumes:

Package 1 Micro comprises:
a) 3 Microlitre pipettors with the volumes
- LLG-microlitre pipettor 0.5 to 10µl
- LLG-microlitre pipettor 10 to 100µl
- LLG-microlitre pipettor 100 to 1000µl
b) for each pipettor one bag of tips
- crystal (0.1 to 10µl) 1000 tips
- yellow (10 to 100µl), 1000 tips
- blue (100 to 1000µl), 1000 tips

Package 2 Macro comprises:
a) 3 Microliter pipettors with the volumes
- LLG-microlitre pipettor 100 to 1000µl
- LLG-microlitre pipettor 500 to 5000µl
- LLG-microlitre pipettor 1000 to 10000µl
b) for each pipettor one bag of tips
- blue (100 to 1000µl), 1000 tips
- clear (100 to 5000µl), 250 tips
- clear (1000 to 10000µl), 100 tips

Type	PK	Cat. No.
Package 1 Micro	1	**9.280 008**
Package 2 Macro	1	**9.280 009**
Package 1 Micro + 4-place-rack	1	**6.237 000**
Package 1 Micro + 6-place-rack	1	**6.237 001**
Package 2 Macro + 4-place-rack	1	**6.237 002**
Package 2 Macro + 6-place-rack	1	**6.237 003**

Pipette tips please see page 936.

E & OE.

1 2 3 LLG-Electronic Pipettors

NEW!

The new LLG-Electronic Pipettors have been designed for maximum performance, accuracy and simple operation. The microprocessor-based system reduces the possibility for human error. Lightweight and ergonomic controls help to reduce the risk of repetitive strain injuries which is common in manual pipetting. Attractively designed with an extraordinary finishing of parts due to high grade mould selection gives the LLG-Electronic Pipettor its final touch.

Superior in form and function
The LLG-Electronic Pipettor is designed to meet strict criteria: high performance, high accuracy, safety and innovative ergonomic.

Ingenious single operation
All software controls and functions of the LLG-Electronic Pipettors are done by one patented user-friendly innovative knob (jog-dial). No small switches and no snippy button keys as in old, conventional electronic pipettors. Each pipettor can be easily selected and identified by colour coding.

Modern visual display
An innovating OLED-Display for a graphic readout as status indicator for all functions of the new LLG-Electronic Pipettors.

Self-calibration system
The user can calibrate the pipettor for solutions of different viscosity. The system also permanently controls all functions and indicates all errors.

Resourceful SCS-System
This system controls the piston movement of the LLG-Electronic Pipettors and guarantees highest precision and accuracy.

CE-Marking
The LLG-Electronic Pipettor is CE-marked as IVD certified and adjusted for the delivery (Ex) of its nominal volume as defined in ISO 8655.

1



2



3



Capacity µl	Accuracy ≤ ± A% (max. vol.)	Reproducibility ≤ ± V% (max. vol.)	Dispensing steps	PK	Cat. No.
0.2 to 10	5	6	0.01	1	**9.281 050**
5 to 100	2.5	1.5	0.10	1	**9.281 051**
10 to 200	0.9	0.5	0.20	1	**9.281 052**
50 to 1000	0.4	0.5	1.00	1	**9.281 053**
100 to 5000	0.4	0.5	5.00	1	**9.281 054**

All LLG-Electronic Pipettors are supplied with EU, UK and US chargers.

4 LLG-Racks for Microlitre pipettors, PMMA

White, stable plastic (PMMA), industrial grade.
Pipettors are held in an ergonomic position for easy withdrawal and replacement.
Adjustable heights. Suitable for all kind of pipettors.

Description	PK	Cat. No.
for 4 pipettors	1	**9.280 014**
for 6 pipettors	1	**9.280 011**

4



5 Pipette stand Flip & Grip™

NEW!

Heathrow Scientific

Unique pipette holder that gives you the option of using on the bench top, or as a hanging under shelf holder to help maximize your working space available.
- Will hold up to 6 single channel pipette, or a combo of 3 single and 3 multichannel
- Holds most common brands. Rubber grips prevent scratching pipette
- Holder rotates for easy pipette selection and storage
- Weighted base. Fixing screw provided for under shelf option
- Dimensions (W x H): 193 x 332mm (bench top style); 193 x 187mm (under shelf style)

5



Colour	PK	Cat. No.
Blue	1	**9.194 002**
Lime	1	**9.194 003**
Magenta	1	**9.194 004**

1



1 Racks for Microlitre pipettors

Manufactured from robust, high density acrylic. It has a bottom section with a closure lid for storage of different types of micropipette tips. It has a modern and ergonomic design that enables extremely easy handling and storing of six micropipettes and pipette tips.

Description	PK	Cat. No.
station for 6 micropipettes	1	**4.008 503**

2



2 Clamp for Microlitre pipettors Clamp-Ette®, PP

Chemical-resistant PP. Autoclavable. *Heathrow Scientific*

Type	Dimensions mm	PK	Cat. No.
Pipettor clamp, plastic	110 x 45 x 105	1	**9.280 012**

3



3 Single-channel microlitre pipettors, Transferpette® S Fixed Volume

BRAND

Transferpette® S models are the perfect manual pipettors for the most demanding applications in the laboratory. They include all of the features requested by Life Science users: rugged construction, one-hand volume adjustment, complete autoclavability, highest precision, and Easy Calibration™ technology for convenient, long-term reliability.

Transferpette® S features at a glance:
- familiar, centrally placed pipetting key and separate tip ejector
- ergonomic finger rest that adapts to your hand for a relaxed grip
- for right-or left-handed users
- entirely autoclavable at 121°C (2 bar), according to DIN EN 285
- colour indicates volume range
- corrosion-resistant piston and ejector for durability
- volume range from 10µl to 1000µl
- CE-IVD-conform
- UV-resistant

Items supplied: Transferpette® S Fixed Volume, conformity-certified, with quality certificate, shelf mount and siliconeoil.

Capacity µl	Grad. µl	Accuracy %	Imprecision %	Tip µl	PK	Cat. No.
10	-	≤± 1,0	≤ 0,5	0.1 - 20, 0.5 - 20, 1 - 50, 0.5 - 10*, 1 - 20*	1	**9.280 040**
20	-	≤± 0,8	≤ 0,4	2 - 200, 5 - 300, 2 - 20*, 5 - 100*	1	**9.280 041**
25	-	≤± 0,8	≤ 0,4	2 - 200, 5 - 300, 5 - 100*	1	**9.280 042**
50	-	≤± 0,8	≤ 0,4	2 - 200, 5 - 300, 5 - 100*	1	**9.280 043**
100	-	≤± 0,6	≤ 0,2	2 - 200, 5 - 300, 5 - 100*	1	**9.280 044**
200	-	≤± 0,6	≤ 0,2	2 - 200, 5 - 300, 5 - 200*	1	**9.280 045**
500	-	≤± 0,6	≤ 0,2	50 - 1000, 50 - 1000*	1	**9.280 046**
1000	-	≤± 0,6	≤ 0,2	50 - 1000, 50 - 1000*	1	**9.280 047**

* Filter tips

E & OE.

1 Single-channel microlitre pipettors, Transferpette® S Digital Adjustable Volume



BRAND

The Transferpette® S models are the perfect manual pipettors for the most demanding applications in the laboratory. They include all of the features requested by Life Science users: rugged construction, one-hand volume adjustment, complete autoclavability, highest precision, and Easy Calibration™ technology for convenient, long-term reliability.

Transferpette®S features at a glance:
- Familiar, centrally placed pipetting key and separate tip ejector
- Ergonomic finger rest that adapts to your hand for a relaxed grip
- Easy, one-handed volume setting for right-or left-handed users
- Easy-to-read 4-digit volume display for highest precision
- Entirely autoclavable at 121°C (2 bar), DIN EN 285
- Colour indicates volume range
- Corrosion-resistant piston and ejector for durability
- Easy Calibration technology on the Transferpette® S digital models, providing calibration adjustments without tools, and a clear indication when the pipettes have been adjusted from factory settings
- Volume range from 0.1µl to 10 ml!
- CE-IVD-conform
- UV-resistant

Items supplied: Transferpette® S Digital Adjustable Volume, conformity-certified, with quality certificate, shelf mount and silicone oil.

Capacity	Grad.	Accuracy	Imprecision	Tip	PK	Cat. No.
µl	µl	%	%	µl		
0,1 -1	0.001	≤± 2	≤1,2	0.1 - 20, 0.1 - 1*	1	**9.280 050**
0,5 - 10	0.01	≤± 1	≤ 0,5	0.1 - 20, 0.5 - 20, 1 - 50, 0.1 - 1*, 0.5 - 10*, 1 - 20*	1	**9.280 051**
2 - 20	0.02	≤± 0,8	≤ 0,4	2 - 200, 5 - 300, 2 - 20*, 5 - 100*	1	**9.280 052**
10 - 100	0.1	≤± 0,6	≤ 0,2	2 - 200, 5 - 300, 2 - 20*, 5 - 100*	1	**9.280 053**
20 - 200	0.2	≤± 0,6	≤ 0,2	2 - 200, 5 - 300, 2 - 20*, 5 - 100*, 5 - 200*	1	**9.280 054**
100 - 1000	1	≤± 0,6	≤ 0,2	50 - 1000, 50 - 1000*	1	**9.280 055**
500 - 5000	5	≤± 0,6	≤ 0,2	0.5 - 5 ml	1	**9.280 056**
1000 - 10000	10	≤± 0,6	≤ 0,2	1 - 10 ml	1	**9.280 057**

* Filter tips

2 Pipettors, Transferpette®, accessories



Racks, bench-top, for Transferpettes as indicated.

BRAND

For	PK	Cat. No.
1 x 3 transferpettes	1	**9.280 521**
2 x 3 transferpettes (rondell)	1	**9.280 522**

3 Single channel pipettor Starter-Kits, Transferpette® S



Cost-saving Starter-Kits containing three Transferpette® S pipettes of different volumes with corresponding racked pipette tips from BRAND and shelf-mounting, pipettor holders.

BRAND

Items supplied: 3 Transferpette® S Adjustable volume pipettors, 3 x Tip-Boxes (filled), 3 shelf mounts.

Type	Description	PK	Cat. No.
Starter-Kit Micro	0.1 to 1 µl, 0.5 to 10 µl, 10 to 100 µl	1	**9.280 060**
Starter-Kit Midi	2 to 20 µl, 20 to 200 µl, 100 to 1000 µl	1	**9.280 061**
Starter-Kit Macro	100 to 1000 µl, 500 to 5000 µl, 1000 to 10000 µl	1	**9.280 062**
Starter-Kit Standard	0,5 to 10 µl, 10 to 100 µl, 100 to 1000 µl	1	**9.280 063**

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1 Stand for Transferpette® S single channel microlitre pipettors

BRAND

Description	PK	Cat. No.
Bench stand for 1 pipettor*	1	**7.510 391**
Bench stand for 6 pipettors	1	**9.280 065**
Shelf hanger for one pipettor	1	**9.280 066**

* for Transferpette®-8/12 or Transferpette® S-8/12

Positive displacement pipettors, Transferpettor

For easy, clean pipetting of problematic media. *BRAND*

Transferpettor operates by positive displacement, which makes it ideal for pipetting:

- Highly viscous media such as oils, resins and fats up to a viscosity of 50000mm²/sec.
- Media with high vapour pressure up to 500mbar (Alcohols, ethers, hydrocarbons etc.)
- Media with a high density up to 13.6g/cm³ (e.g. mercury and sulphuric acid)
- Media that tend to foam (surfactant solutions).
- Working temperature range: 15°C to 40°C

Capillary tubes and tips can be used over and over again, since residual wetting is negligible and generally has no influence on the overall result. This leads to lower material costs and reduced waste.

But: In cases, where no contamination is permitted, e.g. with infectious or radioactive media, the Brand Transferpette® is recommended, an air displacement pipettor for comfortable working with disposable tips.

Items supplied: Transferpettor, conformity-certified, with quality certificate.

2 Pipettors Transferpettor Type Digital

Other capacities are available on request. *BRAND*

Capacity µl	Grad. µl	color code	Accuracy %	Imprecision %	Cap material	PK	Cat. No.
2,5 - 10	0.01	orange	≤± 1,0	≤ 0,8	glass*	1	**9.280 602**
5 - 25	0.1	2 x white	≤± 0,8	≤ 0,5	glass*	1	**9.280 605**
10 - 50	0.1	green	≤± 0,6	≤ 0,4	glass*	1	**9.280 610**
20 - 100	0.1	blue	≤± 0,6	≤ 0,4	glass*	1	**9.280 620**
100 - 500	1.0	green	≤± 0,5	≤ 0,2	PP**	1	**9.280 724**
200 - 1000	1.0	yellow	≤± 0,5	≤ 0,2	PP**	1	**9.280 726**
1000 - 5000	10.0	red	≤± 0,5	≤ 0,2	PP**	1	**9.280 730**
2000 - 10000	10.0	orange	≤± 0,5	≤ 0,2	PP**	1	**9.280 732**

* PTFE-Seals
**PE-Seals

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3



4



3 4 Caps for pipettors Transferpettor Digital

BRAND

Capacity µl	Material	PK	Cat. No.
1, 2, 5	glass	100	**9.280 800**
10	glass	100	**9.280 801**
20	glass	100	**9.280 802**
25	glass	100	**9.280 803**
50	glass	100	**9.280 805**
100 / 200	glass	50	**9.280 810**
100 to 500	PP	10	**9.280 741**
200 to 1000	PP	10	**9.280 742**
1000 to 5000	PP	10	**9.280 743**
2000 to 10000	PP	10	**9.280 745**

E & OE.

1 2 Seals for pipettor Transferpettor

BRAND

Capacity µl	Material	PK	Cat. No.
20	PTFE	3	**9.280 901**
50	PTFE	3	**9.280 903**
100 / 200	PTFE	3	**9.280 905**
100 to 500	PE	10	**9.280 751**
200 to 1000	PE	10	**9.280 752**
1000 to 5000	PE	10	**9.280 753**
2000 to 10000	PE	10	**9.280 755**





3 Pipettors, Transferpettor, accessories

Transferpettor stations. For storage of 4 instruments up to 200 µl with accessories or 2 instruments from 0.5 to 10 ml with accessories.

BRAND

Type	PK	Cat. No.
For 2 instruments with accessories	1	**9.280 581**
For 4 instruments with accessories	1	**9.280 850**



4 Transferpette® electronic, electronic single pipettors

The Transferpette® electronic design ensures significantly easier operation and is the first microlitre pipette worldwide to be awarded the "Ergonomics Approved" certificate from the TUV Rhineland.

BRAND

The optimal design, the arrangement of the operating keys and the adjustable finger rest allow the motorized Transferpette® electronic to be tailored to the shape of your hand.

- motor-driven, to reduce the risk of RSI and imprecision/inaccuracy caused by operator variability
- five operating modes: Pipetting mode, Reverse pipetting, Mixing, Dispensing, Gel-electrophoresis modes
- Easy Calibration function for rapid adjustment of the unit without tools
- extremely fast pipetting speed
- simple, in-lab maintenance
- completely autoclavable pipette shafts and multichannel manifolds
- NiMH rechargeable battery pack and battery regeneration-mode
- CE-marked according to IVD-Directive 98/79 EC

Every single-channel Transferpette® electronic is supplied with its own power supply unit.
As an alternative the accessory three-pipette stand can charge up to three instruments at the same time.
With the charging stand, individual chargers are not needed.





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1 Pipettors, Transferpette® electronic

BRAND

Items supplied: Transferpette® electronic, conformity certified, with performance certificate, battery, 230V/50Hz power supply adapter (with continental European plug, alternative versions available on request), silicone oil.

Capacity	Grad.	Accuracy	Imprecision	Tip	PK	Cat. No.
µl	µl	%	%	µl		
0,5 - 10	0.01	≤± 1,0	≤ 0,4	0.1 - 20, 0.5 - 20, 1 - 50, 0.1 - 1*, 0.5 - 10*, 1 - 20*	1	**9.280 113**
2 - 20	0.02	≤± 1,0	≤ 0,4	0.1 - 20, 0.5 - 20, 1 - 50. 0.5 - 10*, 1 - 20*	1	**9.280 100**
20 - 200	0.2	≤± 0,8	≤ 0,2	2 - 200, 5 - 300, 2 - 20*, 5 - 100*, 5 - 200*	1	**9.280 101**
100 - 1000	1.0	≤± 0,6	≤ 0,2	50 - 1000, 50 - 1000*	1	**9.280 102**
500 - 5000	5.0	≤± 0,6	≤ 0,2	500 - 5000	1	**9.280 114**
0,5 - 10**	0.01	≤± 1,0	≤ 0,4	0.1 - 20, 0.5 - 20, 1 - 50, 0.1 - 1*, 0.5 - 10*, 1 - 20*	1	**9.280 115**
2 - 20**	0.02	≤± 1,0	≤ 0,4	0.1 - 20, 1 - 50, 0.5 - 20, 0.5 - 10*, 1 - 20*	1	**9.280 103**
20 - 200**	0.2	≤± 0,8	≤ 0,2	2 - 200, 5 - 300, 2 - 20*, 5 - 100*, 5 - 200*	1	**9.280 104**
100 - 1000**	1.0	≤± 0,6	≤ 0,2	50 - 1000, 50 - 1250, 50 - 1000*	1	**9.280 105**
500 - 5000**	5.0	≤± 0,6	≤ 0,2	500 - 5000	1	**9.280 116**

* Filter tips
**without a.c. adapter, please order with 3-device charging stand 9.280 106

Stands only for Transferpette® electronic single channel pipettors

BRAND

Type	PK	Cat. No.	
3-pipettor charging stand with a.c. adapter (230V 50Hz, continental European plug)	1	**9.280 106**	2
Single stand, for pipettors up to 1000 µl	1	**9.280 129**	
Single stand, for 500 to 5000 µl pipettors	1	**9.280 130**	3

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9.280 106

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9.280 130

1 Multichannel microliter pipette Transferpette® S -8/-12

BRAND

The new Transferpette® S -8/-12 multichannel pipettes are the perfect manual pipettes for the most demanding applications in the lab. They provide all of the features required by users working in the life sciences field. A particular advantage of the new multichannel pipette is the easy operation, e.g. when performing serial pipetting of immunological assays, while serial dilutions or when filling the 96-well plates for cell cultures.
The use of new innovative materials results in a pipette that is light, precise, rugged and reliable. Transferpette® S -8/-12 pipettes are each available in 5 different models and cover the volume range from 0.5µl to 300µl.

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Highlights at a glance:
- Central pipetting button and big separate tip ejector for reducing tip ejection forces.
- Short pipetting stroke; reduces the risk of RSI and enhances comfort for operators with smaller hands.
- Curved finger rest supports pipette for relaxed pipetting.
- Real one-handed operation; volume change and volume change protection.
- 4-digit volume display for precise volumes; always remains visible during pipetting.
- Completely autoclavable at 121°C (2 bar) without disassembly, DIN EN 285.
- Corrosion-resistant piston.
- Easy Calibration Technique: calibration and adjustments are done within seconds; adjustment from factory settings is clearly visible from the outside.
- Replaceable nose cones and seals to simplify service for long instrument life.
- Compatible with most common tips.
- Color indicates volume range
- CE-marked according to IVD-Directive 98/79 EC.
- UV-resistant

Items supplied:
Transferpette® S -8/-12, conformity certified, performance certificate, 1 Tip-Box N filled with pipette tips from BRAND, 1 Tip-Rack refill unit, 1 shelf/rack mount, 1 reagent-reservoir, 1 mounting tool, 1 set of sealing rings made of FKM and silicon oil.

Multichannel pipettors Transferpette® S-8/S-12

BRAND

Type	Capacity	Grad.	Accuracy	Imprecision	Tip	PK	Cat. No.
	µl	µl	%	%	µl		
S-8	0.5 - 10	0.1	≤± 1.6	≤ 1.0	0.1 - 20, 0.5 - 20, 0.1 - 1*, 0.5 - 10*	1	**9.280 030** 2
S-8	5 - 50	0.1	≤± 0.8	≤ 0.4	2 - 200, 5 - 300, 2 - 20*, 5 - 100*, 5 - 200*	1	**9.280 031**
S-8	10 - 100	0.2	≤± 0.8	≤ 0.3	2 - 200, 5 - 300, 2 - 20*, 5 - 100*, 5 - 200*	1	**9.280 032**
S-8	20 - 200	0.2	≤± 0.8	≤ 0.3	2 - 200, 5 - 300, 2 - 20*, 5 - 100*, 5 - 200*	1	**9.280 033**
S-8	30 - 300	0.5	≤± 0.6	≤ 0.3	2 - 200, 5 - 300, 5 - 100*, 5 - 200*	1	**9.280 034**
S-12	0.5 - 10	0.1	≤± 1.6	≤ 1.0	0.1 - 20, 0.5 - 20, 1 - 50, 0.1 - 1*, 0.5 - 10*, 1 - 20*	1	**9.280 035**
S-12	5 - 50	0.1	≤± 0.8	≤ 0.4	2 - 200, 5 - 300, 2 - 20*, 5 - 100*, 5 - 200*	1	**9.280 036**
S-12	10 - 100	0.2	≤± 0.8	≤ 0.3	2 - 200, 5 - 300, 2 - 20*, 5 - 100*, 5 - 200*	1	**9.280 037**
S-12	20 - 200	0.2	≤± 0.8	≤ 0.3	2 - 200, 5 - 300, 2 - 20*, 5 - 100*, 5 - 200*	1	**9.280 038** 3
S-12	30 - 300	0.5	≤± 0.6	≤ 0.3	2 - 200, 5 - 300, 5 - 100*, 5 - 200*	1	**9.280 039**

* Filter tips

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9.280 030

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9.280 038



1 Pipette Leak Testing Unit (PLT unit)

NEW!

BRAND

Improved process reliability with functional validation of air-displacement pipettes.
The most frequent cause of inaccuracy in piston-operated pipettes is leakage. This arises from damage either to the seals, pistons or tip cones. Often not detectable by the naked eye, leaks lead to significant volume errors.
The BRAND pipette leak tester (PLT unit) for air displacement pipettes finds even the smallest leaks within seconds.

- Limit values for the commercially available single- and multichannel pipettes in the volume range 1µl to 10ml are pre-programmed.
- Testing with and without tips
- Test results in seconds
- Patent pending

According to monitoring of measuring instruments, air-displacement pipettes must be checked at regular intervals and the results must be compared with the ISO 8655-2 error limits. However, a calibration certificate only reflects the results at the time of testing. The time between these calibrations is crucial, since leaks can occur at any time. Well over 80% of pipettes sent in for repair have leaks and are outside their volume tolerances, even if they don't drip.

While the PLT unit cannot replace regular gravimetric testing, daily pipette checks can provide a safeguard during the periods between calibrations. Even the smallest leaks are detected. Process reliability for the pipettes is thus significantly improved.

Items supplied:
PLT unit (Pipette Leak Testing Unit) including one adapter each for testing air-displacement pipettes with tip (mounted) and without tip, 2 plugs, 3 replacement PE filters for the pipette adapters, universal AC adapter, quality certificate and operating manual.

Type	PK	Cat. No.
Pipette Leak Testing Unit	1	**4.007 886**

Accessories for Pipette Leak Testing Unit (PLT unit)

NEW!

BRAND

Description	PK	Cat. No.	
1-channel pipette adapter, for testing with tip, incl. 1 blind plug	1	**9.280 575**	2
1-channel pipette adapter, for testing without tip, incl. 1 blind plug	1	**9.280 576**	3
4-channel pipette adapter, for testing with and without tip, incl. 1 blind plug	1	**9.280 577**	4
Filters, PE, for pipette adapter	10	**9.280 578**	5
Universal AC adapter, Input: AC 100V - 240V, 50/60Hz, Output: DC 6.5V, 800mA	1	**9.280 579**	6



9.280 575



9.280 576



9.280 577



9.280 578



9.280 579



E & OE.

1 2 Acura® 825/835 *manual* - digital reading micropipettors

Socorex

The latest Acura® *manual* pipette line was built with the same attention to detail that made the brand famous over several instrument generations. Introducing a smooth, modern design with easy volume reading. It also features a number of innovations enabling safe and easy, high performance pipetting.

The Acura® line features:
- Effortless activation
- Smart and reliable volume adjustment
- Precision digital display visible at all times
- Justip™ adjustable tip ejector fitting most tips
- *Swift-set* user calibration system
- Shock, UV-light and autoclaving resistance
- CE certified IVD 98/79 EEC
- Three-year warranty

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2



Type	Capacity µl	Accuracy ≤ ± A% (min. vol.)	Accuracy ≤ ± A% (max. vol.)	Repro-ducibility ≤ ± V% (min. vol.)	Repro-ducibility ≤ ± V% (max. vol.)	PK	Cat. No.
825	0.1 to 2	6.0	2.0	5.0	1.5	1	**9.411 590**
825	0.5 to 10	2.5	1.0	1.8	0.5	1	**9.411 591**
825	1 to 10	2.5	1.0	2.5	0.7	1	**9.411 592**
825	2 to 20	2.5	1.0	1.7	0.5	1	**9.411 593**
825	5 to 50	1.5	1.0	1.0	0.4	1	**9.411 594**
825	10 to 100	1.5	0.8	1.0	0.2	1	**9.411 595**
825	20 to 200	1.5	0.6	0.6	0.2	1	**9.411 596**
825	100 to 1000	1.5	0.5	0.5	0.2	1	**9.411 597**
835	200 to 2000	1.5	0.5	0.5	0.2	1	**6.230 186**
835	500 to 5000	1.5	0.6	0.6	0.3	1	**9.411 598**
835	1000 to 10000	1.5	0.5	0.5	0.2	1	**9.411 599**

Pipettors, air displacement, variable macro volume, Acura® 835, accessories

Socorex

Description	PK	Cat. No.
Protection filter for 10ml model	100	**9.411 484**
Glass Pasteur pipette	250	**9.411 483**
2ml natural macrotip, bag	500	**9.411 501**
5ml natural macro tips, bag	500	**9.411 449**
5ml natural macro tips, box	100	**6.224 893**
10ml natural macrotips, bag	300	**9.411 502**
Nozzle filter for model 2 and 5ml	250	**6.205 906**

3 Micropipettes Acura® *manual* Triopack ™

Socorex

Set with 3 pipettors.
Nine different packs up to 10ml, each containing three adjustable micropipettes to cover all individual requirements in any research or routine application.
Available at attractive saver prices.

3



Type	Capacity µl	PK	Cat. No.
Acura 825 Triopack.C	2, 10, 50	1	**9.411 620**
Acura 825 Triopack.J	2, 20, 200	1	**9.411 621**
Acura 825 Triopack.M	10, 50, 200	1	**9.411 622**
Acura 825 Triopack.O	10, 100, 1000	1	**9.411 628**
Acura 825 Triopack.P	10, 100, 1000	1	**9.411 623**
Acura 825 Triopack.S	20, 200, 1000	1	**9.411 624**
Acura 825 Triopack.T	50, 200, 1000	1	**9.411 625**
Acura 825 Triopack.V	0.1, 1.5ml	1	**9.411 626**
Acura 825 Triopack.Y	1, 5, 10ml	1	**9.411 627**

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1 Extra sharp micropipettors Acura® *manual* XS

Socorex

The Acura® *manual* XS line was designed with the research scientists in mind.
Shorter, smoother, lighter in weight, the eight models offer key features aiming at excellence in pipetting.

Features:
- Excellent ergonomic shape and size ratio
- Short, narrow shaft fitting smaller microtubes
- Reduced weight, lighter than other leading brands
- New tightness seal for smooth activation
- Adjustable tip ejector
- Swift-set user calibration system
- Autoclavable fully assembled
- Self-locking click-stops for precise and safe volume setting
- Free rotating, colour coded cap, independent from volume adjustment
- Soft padded, large tip ejection button, comfortable thumb position
- Ergonomic finger rest in line with overall hand comfort
- CE marking in conformity with IVD 98/79 EEC directives
- Weights: 83 to 88g
- Shaft length reduction improves drivability
- Narrow, conical shaft end, easy access to microtubes
- Justip™ up and down adjustment system of tip ejector
- Seal sticker protects *Swift-set* calibration lock
- Robust material, offers extended lifespan

Capacity	Grad.	Accuracy ≤ ± A% (max. vol.)	Reproducibility ≤ ± V% (max. vol.)	Tip	PK	Cat. No.
µl	µl			µl		
0,1 - 2	0,002	2,0	1,5	Ultra 10	1	**9.411 640**
0,5 - 10	0,01	1,0	0,5	Ultra 10	1	**9.411 641**
1 - 10	0,01	1,0	0,7	200	1	**9.411 642**
2 - 20	0,02	1,0	0,5	200	1	**9.411 643**
5 - 50	0,1	1,0	0,4	200	1	**9.411 644**
10 - 100	0,1	0,8	0,2	200	1	**9.411 645**
20 - 200	0,2	0,6	0,2	200	1	**9.411 646**
100 - 1000	1	0,5	0,2	1000	1	**9.411 647**

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2 Micropipettors TwiXS Pack Acura® *manual* XS 826

Socorex

Six different pipette packs up to 1.000ml. For all individual requirements in any research application. Available at attractive saver prices.

Ready-to-use set includes:
- Two Acura® manual XS pipettes
- Shelf pipette holder for two pipettors
- Qualitips® samples
- QC certificate
- Operating instructions

Type	Capacity	Tip	PK	Cat. No.
	µl	µl		
Pack E	0,1 - 2 + 2 - 20	Ultra 10 - 200	1	**9.411 650**
Pack G	0,5 - 10 + 10 - 100	Ultra 10 - 200	1	**9.411 651**
Pack H	2 - 20 + 20 - 200	200 - 200	1	**9.411 654**
Pack K	5 - 50 + 20 - 200	200 - 200	1	**9.411 652**
Pack N	10 - 100 + 100 - 1000	200 - 1000	1	**9.411 653**
Pack Q	20 - 200 + 100 - 1000	200 - 1000	1	**9.411 655**

3



3 Shelf pipette holder 332

Socorex

For two Acura® and Calibra® micro, macro and/or multichannel pipettes.
Material: polycarbonate (PC). Maintenance: clean with mild detergent.
Not autoclavable.

Type	PK	Cat. No.
Shelf pipette holder for two microdispenser	1	**6.235 370**

1 Dilution pipette Acura® *manual* 810

Socorex

This air displacement micropipette allows subsequent pipetting of 1 and 0.1mL of same liquid.
The two pre-calibrated fixed volumes eliminate any setting.
A universal metal nozzle accommodates straw tips (length 190 or 240mm, diameter 4 mm), most adequate to aspirate from deep, narrow vials or Stomacher bags.

Ideal alternative to conventional graduated glass pipettes when performing serial 1:10 dilutions in bacteriology.



Volume ml	Accuracy ≤ ± A% (max. vol.)	Reproducibility ≤ ± V% (max. vol.)	PK	Cat. No.
1 / 0.1	0.5	0.4	1	**6.203 235**

2 Straw tips for Dilution pipette Acura® *manual* 810, PP

Socorex

Colourless Polypropylene straw tips with a diameter of 4mm are specially designed for easy reach deep into narrow vials and Stomacher bags.
Their large diametre allows pick up of particle containing liquids.
Qualitips® straw tips can be used directly in microbiological tests.
They are supplied sterilized, in sealed bags.



Capacity ml	Length mm	PK	Cat. No.
1.1	190	1000	**6.210 059**
2.2	240	1000	**6.240 366**

3 Pipettors, air displacement, variable volume, Calibra® *digital* 822/832

Socorex

- Seven micropipettes: 0.2 to 100µl
- two macropipettes: 0.2 to 10ml
- Instant, volume adjustment
- Unsurpassed performance and calibration stability
- Shock, heat, chemicals and UV light resistance
- Reliable user calibration
- Macro models accommodate interchangeable nozzle filters
- CE certified conform to IVD 98/79 EEC
- Autoclavable at 121°C/250°F
- Three-year warranty



Type	Capacity µl	Grad. µl	Accuracy ≤ ± A% (min. vol.)	Accuracy ≤ ± A% (max. vol.)	Repro-ducibility ≤ ± V% (min. vol.)	Repro-ducibility ≤ ± V% (max. vol.)	Tip µl	PK	Cat. No.
822	0.2 to 2	0,1	6.0*	2.0	5.0*	1.5	10	1	**9.411 473**
822	1 to 10	0,05	2.5	1.0	2.0	0.5	10	1	**9.411 474**
822	1 to 10	0,05	2.5	1.0	2.5	0.7	200	1	**9.411 475**
822	2 to 20	0,1	2.5	1.0	1.7	0.5	200	1	**9.411 476**
822	10 to 100	0,5	1.5	0.8	1.0	0.2	200	1	**9.411 477**
822	20 to 200	1	1.5	0.6	0.6	0.2	200	1	**9.411 478**
822	100 to 1000	5	1.5	0.5	0.5	0.2	1000	1	**9.411 479**
832	200 to 2000	10	1.5	0.5	0.5	0.2	2000	1	**9.411 480**
832	1000 to 10000	100	1.5	0.5	0.3	0.15	10000	1	**9.411 481**

*at 0.5µl

4 Pipettors, air displacement, variable macro volume, Calibra® 832, accessories

Socorex



Description	PK	Cat. No.
Protection filter for 2ml model	250	**9.411 482**
Glass Pasteur pipette for 2ml model	250	**9.411 483**
Protection filter for 10ml model	100	**9.411 484**
2ml natural macrotip	500	**9.411 501**
10ml natural macrotip	300	**9.411 502**
Autoclaving box for 24 x 10ml macrotips	4	**9.411 503**

Blender bags please see page 586

1 Micropipettors Acura® *manual* 855

Socorex

- 8- and 12-channel models up to 350µl
- Light weight and perfect hand fitting
- Easy to handle
- Precision digital display visible at all time
- 360° rotation of volumetric module
- Adjustable tip ejector fitting most tips
- Integrated user calibration system
- CE certified conform to IVD 98/79 EEC
- Autoclavable at 121°C/250°F
- Three-year warranty

Description	Capacity	Grad.	PK	Cat. No.
	µl	µl		
8-channel	0.5 to 10	0.01	1	**9.411 630**
8-channel	5 to 50	0.10	1	**9.411 631**
8-channel	20 to 200	0.20	1	**9.411 632**
8-channel	40 to 350	0.40	1	**9.411 633**
12-channel	0.5 to 10	0.01	1	**9.411 634**
12-channel	5 to 50	0.10	1	**9.411 635**
12-channel	20 to 200	0.20	1	**9.411 636**
12-channel	40 to 350	0.40	1	**9.411 637**

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2 Acura® *electro* XS 926, 936 electronic micropipettes

Socorex

Microprocessor-controlled instrument line featuring intuitive software avoiding any complicated programming steps. No particular skills are required to get quick access to six working modes and many volumes to select from. Unsurpassed metrological performance and stability.

Pipetting modes:
- Forward: aspiration and pipetting of set volume
- Reverse: aspiration in excess, followed by dosing of set volume
- Stepper: tip filling and step-by-step distribution
- Dilution: aspiration of 2 or 3 different volumes for restitution in one shot
- Tactile: "start-stop-start" slow liquid measurement, titration and gel loading
- Mixing: "Up and down" liquid flow

The Acura® *electro* features:
- Optimal ergonomics, light weight
- Easy, intuitive, self-teaching programme
- Large display, reversible right/left reading
- Swift-interchange battery pack
- Fast charge, long working autonomy
- Adjustable tip ejector fitting most tips
- Pipetting cycle counter
- Interchangeable volumetric modules
- Two years warranty

Initial package is recommended when purchasing an Acura® *electro* for the first time. Each initial package contains one electronic pipette, QC certificate and operating instructions, charging stand, power supply, additional battery pack, Qualitips® pipette tips samples. Thereafter, additional pipettes can be purchased alone and charged on existing stand.

1 2 Micropipettes Acura® *electro* XS 926/Macropipettes Acura® electro 936

Socorex

Supplied with:
electronic pipette with 4.8V battery, operating instructions and QC certificate, Qualitips® pipette tips samples, silicone grease

Initial package supplied with:
electronic pipette with 4.8V battery, additional battery pack, charging stand, power supply, operating instructions and QC certificate, Qualitips® pipette tips samples, silicone grease

Description	Capacity µl	Accuracy ≤ ± A% (min. vol.)	Accuracy ≤ ± A% (max. vol.)	Reproducibility ≤ ± V% (min. vol.)	Reproducibility ≤ ± V% (max. vol.)	Tip	PK	Cat. No.
Acura® *electro* XS 926	0,5 - 10	1,2	0,6	1,5	0,35	Ultra 10 µl	1	**9.411 661**
Acura® *electro* XS 926	5 - 100	1,0	0,5	0,7	0,2	200 µl	1	**9.411 665**
Acura® *electro* XS 926	50 - 1000	0,8	0,4	0,4	0,1	1000 µl	1	**9.411 667**
Initial package Acura® *electro* XS 926	0,5 - 10	1,2	0,6	1,5	0,35	Ultra 10 µl	1	**9.411 669**
Initial package Acura® *electro* XS 926	2,5 - 50	1,0	0,5	0,7	0,25	200 µl	1	**9.411 672**
Initial package Acura® *electro* XS 926	10 - 200	1,0	0,4	0,6	0,15	200 µl	1	**9.411 674**
Initial package Acura® *electro* XS 926	50 - 1000	0,8	0,4	0,4	0,1	1000 µl	1	**9.411 675**
Initial package Acura® *electro* XS 926	5 - 100	1,0	0,5	0,7	0,2	200 µl	1	**9.411 673**
Acura® electro 936	10ml	1,0	0,5	0,5	0,15	0.5 to 10	1	**9.411 682**
Initial package Acura® electro 936	10ml	1,0	0,5	0,5	0,15	0.5 to 10	1	**9.411 685**

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Accessoires for Acura® *electro* pipettes

Socorex

Description	PK	Cat. No.
Stand for pipettes or battery packs, 3 positions	1	**6.225 818**
Stand for power handles only, 3 positions	1	**6.225 848**
Spare battery for blue Acura® *electro* line, NiMH, 4.8V	1	**9.411 708**

1 2 Pipette stand Twister™ universal 336 for Microliter pipettors

NEW!

Socorex

Unique design 6-position pipette work station with great characteristics. Model fits six pipettes of most brands providing for an ideal storage solution in any laboratory.
Rotation enables quick instrument selection. Easy disassembling for simple maintenance.
Available in seven translucent colours. Discs are exchangeable.

Colour	PK	Cat. No.
Sapphire blue	1	**6.253 916**
Emerald green	1	**6.253 917**
Topaz orange	1	**6.253 918**
Quartz grey	1	**6.253 919**
Ruby red	1	**6.253 920**
Diamond white	1	**6.253 921**
Citrine yellow	1	**6.253 922**

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3 Pipette stand for Calibra® and Acura® models

Socorex

Innovative design fits all Calibra® and Acura® models. Easy reach of each instrument.
Heavy base plate and anti-slip pads guarantee high stability. Polyamide construction.

Description	PK	Cat. No.
Pipette stand 340 for 3 pipettes	1	**9.411 505**

4



4 Universal pipette stand 337

Socorex

- Holds up to 7 single-channel pipettes of most brands
- Available in 5 attractive colours
- Space-saving table-mounted models
- Polyacrylamide (PA) material is easy to clean

Colour	PK	Cat. No.
Light grey	1	**9.411 491**
Pink	1	**9.411 504**
Ice blue	1	**9.411 492**
Mint green	1	**9.411 493**
Vanilla yellow	1	**9.411 494**

1 Single channel pipettor F1-ClipTip

NEW!

Thermo Scientific

The innovative ClipTip interlocking technology ensures a complete seal with minimal tip attachment and ejection force. Achieve newfound confidence knowing that once attached, your tips are locked firmly in place, and will not loosen or fall off regardless of application pressure. The innovative three interlocking clip design ensures the tip is held securely on the F1-ClipTip pipette only until it is released.

- Tip is locked and sealed in place until ejected, no dropped tips that waste valuable samples
- Complete seal to secure the sample volume in the tip, enhanced accuracy and precision
- Tips are attached and ejected with a light touch, which eliminates the frustration of banging tips on the pipette
- Ergonomic design and Soft-touch tip ejection: Offering low attachment, ejection and plunger forces for safe and comfortable use
- Remarkably lightweight: Modern design protects user from the risk of Repetitive Strain Injuries (RSI)
- Adjustable comfort: The 120° adjustable finger rest for both right- and left-handed operator comfort, allows the hand to relax during pipetting cycles
- Super blow-out: 150% increase in air boost to ensure efficient delivery of micro-volumes and prevent capillary action (Available for models up to 50µl)
- Volume Lock Adjustment for Variable Volume models: The secure volume setting prevents undesirable volume drift during operation
- Industry-leading lifetime warranty: With convenient online registration
- Compliance: The F1-ClipTip pipetting system is CE-marked in accordance with IVD Directive in Europe
- Certifications: Manufactured according to ISO 9001, ISO 14001 and ISO 13485.

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Single channel pipettor F1-ClipTip, fixed volume

NEW!

Thermo Scientific

Capacity µl	Accuracy %	Imprecision %	Tip	PK	Cat. No.
1	4	4	ClipTip 20	1	**9.282 638**
5	1.40	1.40	ClipTip 20	1	**9.282 639**
10	0.90	0.80	ClipTip 20	1	**9.282 640**
20	0.70	0.50	ClipTip 20	1	**9.282 641**
25	0.60	0.50	ClipTip 50	1	**9.282 642**
50	0.60	0.40	ClipTip 50	1	**9.282 643**
100	0.40	0.30	ClipTip 200	1	**9.282 644**
200	0.40	0.30	ClipTip 200	1	**9.282 645**
250	0.40	0.30	ClipTip 300	1	**9.282 646**
500	0.30	0.30	ClipTip 1000	1	**9.282 647**
1000	0.30	0.30	ClipTip 1000	1	**9.282 648**

Single channel pipettor F1-ClipTip, variable volume

NEW!

Thermo Scientific

Capacity µl	Grad. µl	Accuracy %	Imprecision %	Colour code	Tip	PK	Cat. No.
1-10	0.02	1.0-2.5	0.5-2.0	Pink	ClipTip 20	1	**9.282 631**
2-20	0.02	1.0-3.0	0.4-2.5	Pink	ClipTip 20	1	**9.282 632**
5-50	0.1	0.6-3.0	0.3-2.5	Violet	ClipTip 50	1	**9.282 633**
10-100	0.2	0.8-3.0	0.2-1.0	Yellow	ClipTip 200	1	**9.282 634**
20-200	0.2	0.6-1.8	0.2-0.7	Yellow	ClipTip 200	1	**9.282 635**
30-300	1	0.6-1.5	0.2-0.6	Orange	ClipTip 300	1	**9.282 636**
100-1000	1	0.6-1.0	0.2-0.6	Blue	ClipTip 1000	1	**9.282 637**



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1 Multi channel pipettor F1-ClipTip, variable volume

NEW!

Thermo Scientific

The innovative ClipTip interlocking technology ensures a complete seal on every channel with minimal tip attachment and ejection force.
Achieve newfound confidence knowing that once attached, your tips are locked firmly in place, and will not loosen or fall off regardless of application pressure. The innovative three interlocking clip design ensures the tip is held securely on the F1-ClipTip pipette only until it is released.

- Tip is locked and sealed in place until ejected, no dropped tips that waste valuable samples
- Complete seal to secure the sample volume in each tip, enhanced accuracy and precision
- Tips are attached and ejected with a light touch, which eliminates the frustration of banging tips on the pipette
- Ergonomic design and Soft-touch tip ejection: Offering low attachment, ejection and plunger forces for safe and comfortable use
- Remarkably lightweight: Modern design protects user from the risk of Repetitive Strain Injuries (RSI)
- Adjustable comfort: The 120° adjustable finger rest for both right- and left-handed operator comfort, allows the hand to relax during pipetting cycles
- Super blow-out: 150% increase in air boost to ensure efficient delivery of micro-volumes and prevent capillary action (Available for models up to 50µl)
- Volume Lock Adjustment for Variable Volume models: The secure volume setting prevents undesirable volume drift during operation
- Industry-leading lifetime warranty: With convenient online registration
- Compliance: The F1-ClipTip pipetting system is CE-marked in accordance with IVD Directive in Europe
- Certifications: Manufactured according to ISO 9001, ISO 14001 and ISO 13485.

Channels	Capacity	Grad.	Accuracy	Imprecision	Colour code	Tip	PK	Cat. No.
	µl	µl	%	%				
8	1-10	0.02	2.4-12	1.6-8.0	Pink	ClipTip 20	1	**9.282 651**
8	5-50	0.1	1.5-5.0	0.7-2.0	Violet	ClipTip 50	1	**9.282 652**
8	10-100	0.2	1.35.0	0.5-2.0	Yellow	ClipTip 200	1	**9.282 653**
8	30-300	1	1.0-5.0	0.3-2.0	Orange	ClipTip 300	1	**9.282 654**
12	1-10	0.02	2.4-12	1.6-8.0	Pink	ClipTip 20	1	**9.282 655**
12	5-50	0.1	1.5-5.0	0.7-2.0	Violet	ClipTip 50	1	**9.282 656**
12	10-100	0.2	1.3-5.0	0.5-2.0	Yellow	ClipTip 200	1	**9.282 657**
12	30-300	1	1.0-5.0	0.3-2.0	Orange	ClipTip 300	1	**9.282 658**

2



2 Pipette Tips ClipTip

Thermo Scientific

Thermo Scientific ClipTip pipette tips provide security with a unique and innovative interlocking technology that ensures a complete seal on every channel with minimal tip attachment and ejection force. Achieve newfound confidence knowing that once attached, your tips are locked firmly in place, and will not loosen or fall off. The innovative three interlocking clip design ensures the tip is held securely on the F1-ClipTip pipette only until it is released.

- Tips are attached and ejected with a light touch: Eliminates the frustration of banging tips on the pipette
- Low retention: Special technology to enable maximium sample recovery
- Versatile Tip Range: Choose from five sizes: 20, 50, 200, 300 and 1000µL
- Immediate traceability: Each tip insert has ink-jetted lot and volume information; the convenient color key makes it easy to match the color of the F1-ClipTip pipette plunger cap with the corresponding ClipTip pipette tip rack insert
- Compliance: The F1-ClipTip pipetting system is CE-marked in accordance with IVD Directive in Europe.
- Certifications: Manufactured according to ISO 9001, ISO 14001, ISO 13485 and free of RNase, DNase, DNA, ATP and endotoxin contamination

Pipette Tips ClipTip 20

NEW!

Thermo Scientific

Length 4.6cm, volume range 1-20µl, colour code pink.
Suitable for F1-ClipTips Cat. No. 9.282 631, 9.282 632, 9.282 638, 9.282 639, 9.282 640, 9.282 641, 9.282 651 and 9.282 655.

Description	Packing	PK	Cat. No.
Racks	10 racks of 96	960	**9.282 661**
Racks, sterile	10 racks of 96	960	**9.282 662**
Racks, refill packs	10 inserts of 96	960	**9.282 663**
Racks, refill packs, sterile	10 inserts of 96	960	**9.282 664**
Filter tips in racks, sterile	10 racks of 96	960	**9.282 665**
Filter tips, refill packs, sterile	10 inserts of 96	960	**9.282 666**

Pipette Tips ClipTip 50

NEW!

Thermo Scientific

Length 5.1cm, volume range 5-50µl, colour code violet.
Suitable for F1-ClipTips Cat. No. 9.282 633, 9.282 642, 9.282 643, 9.282 652 and 9.282 656.

Type	Packing	PK	Cat. No.
Racks	10 racks of 96	960	**9.282 667**
Racks, sterile	10 racks of 96	960	**9.282 668**
Racks, refill packs	10 inserts of 96	960	**9.282 669**
Racks, refill packs, sterile	10 inserts of 96	960	**9.282 670**
Filter tips in racks, sterile	10 racks of 96	960	**9.282 671**
Filter tips, refill packs, sterile	10 inserts of 96	960	**9.282 672**

E & OE.

Pipette Tips ClipTip 200

NEW!

Length 5.6cm, volume range 10-200µl, colour code yellow.
Suitable for F1-ClipTips Cat. No. 9.282 634, 9.282 635, 9.282 644, 9.282 645, 9.282 653 and 9.282 657.

Thermo Scientific

Type	Packing	PK	Cat. No.
Racks	10 racks of 96	960	**9.282 673**
Racks, sterile	10 racks of 96	960	**9.282 674**
Racks, refill packs	10 inserts of 96	960	**9.282 675**
Racks, refill packs, sterile	10 inserts of 96	960	**9.282 676**
Filter tips in racks, sterile	10 racks of 96	960	**9.282 677**
Filter tips, refill packs, sterile	10 inserts of 96	960	**9.282 678**

Pipette Tips ClipTip 300

NEW!

Length 6.3cm, volume range 30-300µl, colour code orange.
Suitable for F1-ClipTips Cat. No. 9.282 636, 9.282 646, 9.282 654 and 9.282 658.

Thermo Scientific

Type	Packing	PK	Cat. No.
Racks	10 racks of 96	960	**9.282 679**
Racks, sterile	10 racks of 96	960	**9.282 680**
Racks, refill packs	10 inserts of 96	960	**9.282 681**
Racks, refill packs, sterile	10 inserts of 96	960	**9.282 682**
Filter tips in racks, sterile	10 racks of 96	960	**9.282 683**
Filter tips, refill packs, sterile	10 inserts of 96	960	**9.282 684**

Pipette Tips ClipTip 1000

NEW!

Length 9.5cm, volume range 100-1000µl, colour code blue.
Suitable for F1-ClipTips Cat. No. 9.282 637, 9.282 647 and 9.282 648.

Thermo Scientific

Type	Packing	PK	Cat. No.
Racks	10 racks of 96	768	**9.282 685**
Racks, steril	10 racks of 96	768	**9.282 686**
Racks, refill packs	10 inserts of 96	768	**9.282 687**
Racks, refill packs, sterile	10 inserts of 96	768	**9.282 688**
Filter tips in racks, sterile	10 racks of 96	768	**9.282 689**
Filter tips, refill packs, sterile	10 inserts of 96	768	**9.282 690**

Empty Racks for Pipette Tips F1-ClipTip

NEW!

Thermo Scientific

Type	For	PK	Cat. No.
ClipTip Rack small	ClipTip 20, ClipTip 50	10	**9.282 691**
ClipTip Rack medium	ClipTip 200, ClipTip 300	10	**9.282 692**
ClipTip Rack large	ClipTip 1000	8	**9.282 693**

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

Thermo SCIENTIFIC

1



1 Finnpipette F1 Fixed Volume Single Channel

Thermo Scientific

The Thermo Scientific Finnpipette F1 pipetter incorporates state-of-the-art innovations for ease of use and proven results. The Advanced Volume Gearing mechanism (AVG) is a self-supporting modular volume adjustment mechanism that enhances pipetting performance. It also delivers dependable accuracy and precision with real durability with its separate pipetter body.

- Integrated surface protection - helps keep the pipette clean and free from contaminants
- Set and Forget pipetting button - easy and secure locking mechanism to adjust the volume
- Adjustable finger rest - can be adjusted 120° for optimal pipetting and tip ejection position
- Advanced Volume Gearing (AVG) Mechanism - increased accuracy, precision and durability
- Light pipetting forces - improved ergonomics to minimise the risk of RSI
- Patented super blow-out piston in models with volumes of 50il and below to ensure the delivery of micro-size drops
- Patented soft touch tip ejection mechanism
- 5 year warranty

Capacity	Grad.	Accuracy	Imprecision	For Finntip Tips	PK	Cat. No.
µl	µl	%	%			
1	-	±4.00	4.00	Flex 10, 10, 50 Mikro	1	**9.282 400**
5	-	±1.40	1.40	Flex 10, 10, 50 Mikro	1	**9.282 401**
10	-	±0.90	0.80	Flex 200, 250 Univ., 200 Ext.	1	**9.282 402**
25	-	±0.60	0.50	Flex 200, 250 Univ., 200 Ext.	1	**9.282 403**
50	-	±0.60	0.40	Flex 200, 250 Univ., 200 Ext.	1	**9.282 404**
100	-	±0.40	0.30	Flex 200, 250 Univ., 200 Ext.	1	**9.282 405**
250	-	±0.40	0.30	Flex 1000, 1000, 1000 Ext.	1	**9.282 406**
500	-	±0.30	0.30	Flex 1000, 1000, 1000 Ext.	1	**9.282 407**
1000	-	±0.30	0.30	Flex 1000, 1000, 1000 Ext.	1	**9.282 408**
2000	-	±0.30	0.20	5ml	1	**9.282 409**
3000	-	±0.30	0.20	5ml	1	**9.282 410**
5000	-	±0.30	0.20	5ml	1	**6.240 071**
10000	-	±0.30	0.20	10ml	1	**9.282 411**

2



2 Finnpipette F1 Single Channel with variable volume

Thermo Scientific

The Thermo Scientific Finnpipette F1 Adjustable-Volume Pipetter offers a simple "set-and-forget" lock mechanism to adjust the volume, adjustable finger rest, and soft touch tip ejection while an innovative antimicrobial treatment protects the instrument against contamination.

- Integrated surface protection - helps keep the pipette clean and free from contaminants
- Set and Forget pipetting button - easy and secure locking mechanism to adjust the volume
- Adjustable finger rest - can be adjusted 120° for optimal pipetting and tip ejection position
- Advanced Volume Gearing (AVG) Mechanism - increased accuracy, precision and durability
- Light pipetting forces - improved ergonomics to minimise the risk of RSI
- Patented super blow-out piston in models with volumes of 50µl and below to ensure the delivery of micro-size drops
- Patented soft touch tip ejection mechanism
- 5 year warranty

Capacity	Grad.	Accuracy	Imprecision	Colour code	For Finntip Tips	PK	Cat. No.
µl	µl	%	%				
0.2-2 Microtip	0,002	±12.0 - 2.5	2.00	Pink	Flex 10, 10, 50 Mikro	1	**9.282 412**
0.5-5 Microtip	0.010	±6.0 - 1.50	1.00	Pink	Flex 10, 10, 50 Mikro	1	**9.282 413**
1-10 Microtip	0.020	±2.5 - 1.00	0.50	Pink	Flex 10, 10, 50 Mikro	1	**6.242 557**
1-10	0.020	±3.5 - 1.00	0.80	Yellow	Flex 200, 250 Univ.	1	**9.282 414**
2-20 Microtip	0.020	±3.0 - 1.00	0.40	Turquoise	50 Mikro	1	**9.282 415**
2-20	0.020	±3.0 - 1.00	0.40	Yellow	Flex 200, 250 Univ.	1	**9.282 416**
10-100	0.200	±3.0 - 0.80	0.20	Yellow	Flex 200, 250 Univ., 300, 200 Ext.	1	**9.282 417**
20-200	0.200	±1.8 - 0.60	0.20	Yellow	Flex 200, 250 Univ., 300, 200 Ext.	1	**6.241 373**
30-300	1.000	±1.5 - 0.60	0.20	Orange	Flex 300, 300	1	**9.282 418**
100-1000	1.000	±1.0 - 0.60	0.20	Blue	Flex 1000, 1000, 1000 Ext.	1	**9.282 419**
500-5000	10.000	±2.0 - 0.50	0.20	Green	5 ml	1	**9.282 420**
1000-10000	20.000	±2.0 - 0.50	0.20	Red	10 ml	1	**9.282 421**

E & OE.

1 Finnpipette F2 Single Channel with fixed volume

1



Thermo Scientific

Experience superior comfort, performance, reliability, and repeatability in one of the lightest pipetters available.
These pipetters include a Advanced Volume Gearing mechanism (AVG) - a self-supporting modular volume adjustment mechanism that enhances pipetting performance.

- Light pipetting forces - improved ergonomics to minimise the risk of RSI
- Double-action pipetting button - prevents accidental volume alteration during pipetting
- Very large Ergovisio display - very big and clear display
- Super blow-out piston with volumes of 50 µL and below ensures delivery of micro-size drops
- Both single channel and multichannel pipettes are fully autoclavable
- 5 year warranty

Capacity µl	Accuracy %	Imprecision %	For Finntip Tips	PK	Cat. No.
1	±4.00	4.0	Flex 10, 10, 50 Mikro	1	**9.282 450**
5	±1.40	1.4	Flex 10, 10, 50 Mikro	1	**9.282 451**
10	±0.90	0.8	Flex 200, 250 Univ., 200 Ext.	1	**9.282 452**
25	±0.60	0.5	Flex 200, 250 Univ., 200 Ext.	1	**9.282 453**
20	±0.60	0.5	Flex 200, 250 Univ., 200 Ext.	1	**9.282 463**
50	±0.60	0.4	Flex 200, 250 Univ., 200 Ext.	1	**9.282 454**
100	±0.40	0.3	Flex 200, 250 Univ., 200 Ext.	1	**9.282 455**
200	±0.40	0.3	Flex 200, 250 Univ., 200 Ext.	1	**9.282 464**
250	±0.40	0.3	Flex 1000, 1000, 1000 Ext.	1	**9.282 456**
500	±0.30	0.3	Flex 1000, 1000, 1000 Ext.	1	**9.282 457**
1000	±0.30	0.3	Flex 1000, 1000, 1000 Ext.	1	**9.282 458**
2000	±0.30	0.2	5ml	1	**9.282 459**
3000	±0.30	0.2	5ml	1	**9.282 460**
5000	±0.30	0.2	5ml	1	**9.282 461**
10000	±0.30	0.2	10ml	1	**9.282 462**

2 Finnpipette F2 Single Channel with variable volume

2



Thermo Scientific

Experience superior comfort, performance, reliability, and repeatability in one of the lightest pipetters available.
These pipetters include a Advanced Volume Gearing mechanism (AVG) - a self-supporting modular volume adjustment mechanism that enhances pipetting performance.

- Light pipetting forces - improved ergonomics to minimise the risk of RSI
- Double-action pipetting button - prevents accidental volume alteration during pipetting
- Very large Ergovisio display - very big and clear display
- Super blow-out piston with volumes of 50 µL and below ensures delivery of micro-size drops
- Both single channel and multichannel pipettes are fully autoclavable
- 5 year warranty

Capacity µl	Grad. µl	Accuracy %	Imprecision %	Colour	For Finntip Tips	PK	Cat. No.
0.2-2 microtip	0.002	±12.0 - 2.5	2.00	Pink	Flex 10, 10, 50 Mikro	1	**6.240 102**
0.5-5 microtip	0.010	±6.0 - 1.5	1.00	Pink	Flex 10, 10, 50 Mikro	1	**6.233 742**
1-10 microtip	0.020	±2.5 - 1.0	0.50	Pink	Flex 10, 10, 50 Mikro	1	**9.282 465**
1-10	0.020	±3.5 - 1.0	0.80	Yellow	Flex 200, 250 Univ.	1	**6.240 360**
2-20 microtip	0.020	±3.0 - 1.0	0.40	Turquoise	50 Mikro	1	**9.282 466**
2-20	0.020	±3.0 - 1.0	0.40	Yellow	Flex 200, 250 Univ.	1	**6.233 743**
5-50 microtip	0.1	±0.3 - 0.15	0.30	Turquoise	50 Mikro	1	**6.251 900**
5-50	0.1	±0.3 - 0.15	0.30	Yellow	Flex 200, Flex 300, 250 Univ., 200 Ext.	1	**6.239 178**
10-100	0.200	±3.0 - 0.8	0.20	Yellow	Flex 200, 250 Univ., 300, 200 Ext.	1	**9.282 467**
20-200	0.200	±1.8 - 0.6	0.20	Yellow	Flex 200, 250 Univ., 300, 200 Ext.	1	**6.233 744**
100-1000	1.000	±1.0 - 0.6	0.20	Blue	Flex 1000, 1000, 1000 Ext.	1	**6.233 745**
500-5000	10,.00	±2.0 - 0.5	0.20	Green	5 ml	1	**6.238 106**
1000-10000	20.000	±2.0 - 0.5	0.20	Red	10 ml	1	**6.239 136**

1



1 Finnpipette Novus Single Channel with variable volume

Thermo Scientific

Thermo Scientific Finnpipette Novus Single Channel Electronic Pipetters offer performance with simple operation and reduced stress for comfortable, productive pipetting.

- Easy to use simple text guided user interface and operator button layout.
- Large display shows all the names of the functions without abbreviations.
- Ergonomic and lightweight design with balanced weight distribution enables longer work periods without fatigue.
- Finger rest is adjustable by 120 degrees to find the optimal pipetting position for both left hand and right hand users.
- Adjustable finger rest leaves your index finger free to control pipetting with minimum effort using the trigger action pipetting button.
- Light-touch tip ejector minimizes strain on your thumb with the very low tip ejection force and can be used with both right and left-hand.
- Novus has 10 different pipetting functions to cover most pipetting applications in the laboratory.
- 9 different speeds which can be separately adjusted for dispensing and aspirating, to optimize pipetting with different reagents.
- 9 built-in memory slots to store your own combination of the 10 different pipetting functions.
- Intuitive menu ensures easy access to pipetting functions for all laboratory pipetting applications.
- Light, long lasting battery allowing over 4000 pipetting actions.
- Fast recharge battery, fully recharged within 1 hour and the pipet is fully operational while recharging.
- Novus designed for easy in-lab calibration and service.
- The tip cone is fully autoclavable.
- Color coded buttons and color coded ring help identify the matching Finntip model.

Capacity µl	Step size µl	Colour	For Finntip Tips	PK	Cat. No.
1-10, microtip	0.010	pink	10	1	**6.228 698**
1-10	0.010	yellow	250 Univ., 200 Ext.	1	**9.282 480**
5-50, microtip	0.100	turquoise	50	1	**6.228 699**
5-50	0.100	yellow	250 Univ., 200 Ext.	1	**6.228 700**
10-100	0.100	yellow	250 Univ., 200 Ext.	1	**6.228 701**
30-300	1.000	orange	300	1	**6.228 702**
100-1000	1.000	blue	1000, 1000 Ext.	1	**6.228 703**
500-5000	10.000	green	5ml	1	**6.228 704**
1000-10000	10.000	red	10ml	1	**6.228 705**

2



2 Mikroliter pipettors F1-ClipTip GLP Kits

NEW!

Thermo Scientific

F1-ClipTip GLP Kit 1 includes:
- one F1-ClipTip single channel pipettor with 1-10µl, 10-100µl and 100-1000µl each
- one F series stand
- ClipTip 20, 200 and 1000 pipette tips (one rack with 96 tips each)
- one 25ml reservoir
- two divided reservoirs (25 and 100ml)

F1-ClipTip GLP Kit 2 includes:
- one F1-ClipTip single channel pipettor with 2-20µl, 10-200µl and 200-2000µl each
- one 8-channel pipettor with 30-300µl
- one F series stand
- ClipTip 20, 200, 300 and 1000 pipette tips (one rack with 96 tips each)
- one 25ml reservoir
- two divided reservoirs (25 and 100ml)

Type	PK	Cat. No.
F1-ClipTip GLP Kit 1	1	**9.282 614**
F1-ClipTip GLP Kit 2	1	**9.282 615**

E & OE.

1 Finnpipette F1 Multichannel Pipettes with variable volume

Thermo Scientific

Finnpipette F1 multichannel pipettes are available in 8-, 12- and 16-channel models with a wide selection of volume ranges. As with the single channel Finnpipette F1 pipettes, the AVG mechanism ensures a high level of accuracy and precision.
The soft-touch tip ejection is especially useful on multichannel models, significantly reducing the effort needed to eject multiple tips. In addition, in the low volume models the super blow-out function ensures accurate dispensing for even the lowest volumes.



Channels	Capacity µl	Step size µl	Colour	For Finntip Tips	PK	Cat. No.
8	1-10	0.020	pink	Flex 10, 10, 50 Mikro	1	**9.282 430**
8	5-50	0.100	yellow	Flex 200, 250 Univ., 200 Ext.	1	**9.282 431**
8	10-100	0.200	yellow	Flex 200, 250 Univ., 200 Ext.	1	**9.282 432**
8	30-300	1.000	orange	Flex 300, 300	1	**9.282 433**
12	1-10	0.020	pink	Flex 10, 10, 50 Mikro	1	**9.282 434**
12	5-50	0.100	yellow	Flex 200, 250 Univ., 200 Ext.	1	**9.282 435**
12	10-100	0.200	yellow	Flex 200, 250 Univ., 200 Ext.	1	**9.282 436**
12	30-300	1.000	orange	Flex 300, 300	1	**9.282 437**
16	1-10	0.020	violet	Flex 10 (384), 50 Mikro	1	**9.282 438**
16	5-50	0.100	turquoise	50 Mikro	1	**9.282 439**

2 Finnpipette F2 Multichannel Pipettes with variable volume

Thermo Scientific

The Finnpipette F2 multichannel pipettes are available in 8-, 12- and 16-channel models with a selection of volume ranges. As with the single channel Finnpipette F2 pipettes, the AVG mechanism ensures a high level of accuracy and precision.
In addition, in the low volume models the super blow-out function ensures accurate dispensing for even the lowest volumes.



Channels	Capacity µl	Step size µl	Colour	For Finntip Tips	PK	Cat. No.
8	1-10	0.020	pink	Flex 10, 10, 50 Mikro	1	**9.282 470**
8	5-50	0.100	yellow	Flex 200, 250 Univ., 200 Ext.	1	**9.282 471**
8	10-100	0.200	yellow	Flex 200, 250 Univ., 200 Ext.	1	**9.282 472**
8	30-300	1.000	orange	Flex 300, 300	1	**9.282 473**
12	1-10	0.020	pink	Flex 10, 10, 50 Mikro	1	**9.282 474**
12	5-50	0.100	yellow	Flex 200, 250 Univ., 200 Ext.	1	**9.282 475**
12	10-100	0.200	yellow	Flex 200, 250 Univ., 200 Ext.	1	**9.282 476**
12	30-300	1.000	orange	Flex 300, 300	1	**9.282 477**
16	1-10	0.020	violet	Flex 10 (384), 50 Mikro	1	**9.282 478**
16	5-50	0.100	turquoise	50 Mikro	1	**9.282 479**

3 Pipette Stand, F-Stand

Thermo Scientific



Description	PK	Cat. No.
With 6 slots	1	**9.282 440**

4 Multichannel Pipette Stand

Multichannel Pipette Stand, 1 position.

Thermo Scientific



Description	PK	Cat. No.
Multichannel Pipette Stand	1	**9.282 441**

1



1 Finnpipette Novus Multichannel with variable volume

Thermo Scientific Finnpipette Novus Multichannel Pipetters offer superior performance for microplate applications. *Thermo Scientific*

- Easy to use simple text guided user interface and operator button layout.
- Large display shows all the names of the functions without abbreviations.
- Ergonomic and lightweight design with balanced weight distribution enables longer work periods without fatigue.
- Finger rest is adjustable by 120 degrees to find the optimal pipetting position for both left hand and right hand users.
- Adjustable finger rest leaves your index finger free to control pipetting with minimum effort using the trigger action pipetting button.
- Light-touch tip ejector minimizes strain on your thumb with the very low tip ejection force and can be used with both right and left-hand.
- Novus has 10 different pipetting functions to cover most pipetting applications in the laboratory.
- 9 different speeds which can be separately adjusted for dispensing and aspirating, to optimize pipetting with different reagents.
- 9 built-in memory slots to store your own combinations of the 10 different pipetting functions.
- Intuitive menu ensures easy access to pipetting functions for all laboratory pipetting applications.
- Light, long lasting battery allowing over 4000 pipetting actions.
- Fast recharge battery, can be fully recharged within 1 hour and the pipet is fully operational while recharging.
- Novus designed for easy in-lab calibration and service.
- The module is fully autoclavable.
- Color coded buttons to help identify the matching Finntip model.
- Wide range of multichannel models for demanding laboratory tasks.
- Lightweight handle and module has a balanced weight distribution preventing muscle stress and strain.

Channels	Capacity µl	Step size µl	Colour	For Finntip Tips	PK	Cat. No.
8	1-10	0.100	pink	10, 20, 50	1	**6.228 706**
8	5-50	0.100	yellow	250	1	**6.228 707**
8	30-300	1.000	orange	300	1	**6.228 708**
8	100-1200	1.000	turquoise	1200	1	**6.228 709**
12	1-10	0.100	pink	10, 20, 50	1	**9.282 481**
12	5-50	0.100	yellow	250	1	**9.282 482**
12	30-300	1.000	orange	300	1	**9.282 483**
16	5-50	0.100	turquoise	50	1	**9.282 484**

2



2 Pipette Stand Novus

For Thermo Scientific Novus pipettes. *Thermo Scientific*

Type	PK	Cat. No.
Novus	1	**6.228 761**



E & OE.

Eppendorf Research® plus Pipettors

Eppendorf AG

The ultra light Eppendorf Research plus pipettor meets the highest requirements in precision and accuracy - combined with ultimate ergonomics and increased flexibility. A spring loaded tip cone, a secondary calibration option, an improved volume display - and all this within a fully autoclavable pipette.

Ergonomics:
- ultra light
- pipetting forces greatly reduced
- the spring-loaded tip cone

Flexibility:
- calibrate your Research plus to your needs,
- autoclave the entire pipettor, or only the lower housing
- choose among single channel, multichannel and fixed volume pipettors in different sizes.

Robustness:
- durability has been tested thoroughly and meets the highest quality requirements
- resistance to chemical, thermal and mechanical stress is now unchallenged

- volume adjustment: Only a few turns needed to reach your desired volume
- control button: Requires minimal operating force, colour indicates volume, ergonomically positioned for comfort
- ejector: requires minimal operating force, ergonomically positioned for comfort
- volume display: 4 digits, magnifying window
- calibration display & adjustment opening: Calibrate your pipettor to a specific liquid and volume.

1 Single-channel pipette Eppendorf Research® plus (fix)

Eppendorf AG

- Eppendorf PerfectPiston™: ultra-light piston made of Fortron® (except 2.5µl, 10µl, 5ml and 10ml pipettors)
- quick connection clip: remove lower housing easily (except 5ml and 10ml pipettors)
- spring loaded tip cone: improved ergonomics, tight fit to the tip (except 5ml and 10ml pipettors)

1



Capacity µl	Control button colour	PK	Cat. No.
10	mid grey	1	**9.283 210**
10	yellow	1	**9.283 211**
20	light grey	1	**9.283 212**
20	yellow	1	**9.283 213**
25	yellow	1	**9.283 214**
50	yellow	1	**9.283 215**
100	yellow	1	**9.283 216**
200	yellow	1	**9.283 217**
200	blue	1	**9.283 218**
250	blue	1	**9.283 219**
500	blue	1	**9.283 220**
1000	blue	1	**9.283 221**

2 Single-channel pipette Eppendorf Research® plus (variabel)

Eppendorf AG

- Eppendorf PerfectPiston™: Ultra light piston made of Fortron® (except 2.5µl, 10µl, 5ml and 10ml pipettors)
- quick connection clip: easily removable lower part (not in 5ml and 10ml pipettes)
- spring loaded tip cone: Improved ergonomics, tight fit to the tip (except 5ml and 10ml pipettors)

2



Capacity µl	Control button colour	PK	Cat. No.
0,1 - 2,5	dark grey	1	**9.283 200**
0,5 - 10	mid grey	1	**9.283 201**
2 - 20	yellow	1	**9.283 202**
2 - 20	light grey	1	**9.283 208**
10 - 100	yellow	1	**9.283 203**
20 - 200	yellow	1	**9.283 204**
30 - 300	orange	1	**9.283 209**
100 - 1000	blue	1	**9.283 205**
0,5 - 5	purple	1	**9.283 206**
1 - 10	turquoise	1	**9.283 207**

1



1 Pipettors, air displacement, fixed volume, Reference® Fix

Eppendorf AG

- TÜV award for user friendliness and user tested
- chemical- and corrosion-resistant, free-running piston
- robust material, which is UV-resistant and fully autoclavable without impairing accuracy or precision
- one button operation
- conformity certified
- Includes service kit with tips
- 3 year guarantee

Grey control button:	for 20µl, or GELoader tips
Yellow control button:	for 200µl tips
Blue control button:	for 1000µl tips
Red control button:	for 2500µl tips

Capacity µl	Control button colour	PK	Cat. No.
1	grey	1	**9.283 280**
2	grey	1	**9.283 281**
5	grey	1	**9.283 282**
10	grey	1	**9.283 283**
10	yellow	1	**9.283 279**
20	yellow	1	**9.283 284**
25	yellow	1	**9.283 285**
50	yellow	1	**9.283 286**
100	yellow	1	**9.283 287**
200	blue	1	**9.283 288**
250	blue	1	**9.283 289**
500	blue	1	**9.283 290**
1000	blue	1	**9.283 291**
1500	red	1	**9.283 292**
2000	red	1	**9.283 293**
2500	red	1	**9.283 294**

2



2 Single-channel pipette Eppendorf Reference® adjustable

Eppendorf AG

- Fully autoclavable
- One button operation for aspiration, dispensing and tip ejection
- Volume is automatically locked (this is only appropriate for the adjustable volume units)
- TÜV award for user friendly and user tested
- Chemically resistant
- One handed operation
- 3 year warranty

Capacity µl	Control button colour	PK	Cat. No.
0,1 to 2,5	anthracite	1	**9.283 295**
0,5 to 10	grey	1	**9.283 296**
2 to 20	grey	1	**9.283 297**
2 to 20	yellow	1	**9.283 303**
10 to 100	yellow	1	**9.283 298**
50 to 200	yellow	1	**9.283 299**
100 to 1000	blue	1	**9.283 300**
500 to 2500	red	1	**9.283 301**

3



3 Variable pipettors, epReference³ Pack

Eppendorf AG

Option 1:
- 3 x Eppendorf Reference® PhysioCareConcept pipettors (0.5 to 10µl, 10 to 100µl, 100 to 1000µl)
- 3 x epTIPS (max. capacity 20µl, 200µl, and 1000µl) in refillable boxes of 96
- 3 pipette wall-holders

Option 2:
- 3 x Eppendorf Reference® PhysioCareConcept pipettors (2 to 20µl, 20 to 200µl, 100 to 1000µl)
- 3 x epTIPS (max. capacity 200µl and 1000µl) in refillable boxes of 96
- 3 pipette wall-holders

Type	PK	Cat. No.
epReference³ Pack, Option 1	1	**9.283 304**
epReference³ Pack, Option 2	1	**9.283 305**

E & OE.

1 2 Electronic single-channel pipette Eppendorf Xplorer®

Eppendorf AG

The new electronic pipette Eppendorf Xplorer® sets new standards in terms of simplicity, precision and reproducibility.

- Multifunctional rocker: "Up is up and down"™ principle
- Easy selection of all functions with the practical selection dial
- Operate in the language of your choice
- Clearly arranged colour display
- No sub-menus
- Help function
- Innovative rocker: When the tip is ejected, the piston automatically returns to zero position
- Tips always rest in the same position
- Volume & speed precisely and reproducibly adjustable
- Adjustable to your work environment and requirements
- Incl. 230V/50Hz charging adapter. The pipette can be charged directly with the charging adapter. Aditionally the charging adapter can also be used with the optional charging stand (Cat. No. 9.283 254) which holds the pipette safely whilst charging.

1



2



Capacity µl	Type	Control button colour	PK	Cat. No.
0.5 to 10	Single-channel	medium grey	1	**9.283 240**
5 to 100	Single-channel	yellow	1	**9.283 241**
15 to 300	Single-channel	orange	1	**9.283 242**
50 to 1000	Single-channel	blue	1	**9.283 243**
250 to 5000	Single-channel	purple	1	**9.283 244**
500 to 10000	Single-channel	turquoise	1	**9.283 245**

3 Multichannel pipette Eppendorf Xplorer®

Eppendorf AG

Capacity µl	Type	Control button colour	PK	Cat. No.
0,5 to 10	8-channel	medium grey	1	**9.283 246**
5 to 100	8-channel	yellow	1	**9.283 248**
15 to 300	8-channel	orange	1	**9.283 250**
50 to 1200	8-channel	green	1	**9.283 252**
0,5 to 10	12-channel	medium grey	1	**9.283 247**
5 to 100	12-channel	yellow	1	**9.283 249**
15 to 300	12-channel	orange	1	**9.283 251**
50 to 1200	12-channel	green	1	**9.283 257**

3



Multichannel pipette Eppendorf Xplorer® plus

NEW!

Eppendorf AG

Type	Capacity µl	Control button colour	PK	Cat. No.
8-channel	0,5 to 10	medium grey	1	**9.283 187**
8-channel	5 to 100	yellow	1	**9.283 189**
8-channel	15 to 300	orange	1	**9.283 191**
8-channel	50 to 1200	green	1	**9.283 193**
12-channel	0,5 to 10	medium grey	1	**9.283 188**
12-channel	5 to 100	yellow	1	**9.283 190**
12-channel	15 to 300	orange	1	**9.283 192**
12-channel	50 to 1200	green	1	**9.283 194**

1



1 Charging stand for Single- and Multi-channel pipettes Eppendorf Xplorer®

Charging stand for holding one single channel or multichannel pipette Eppendorf Xplorer® using the charger adapter (230V/50Hz) which is supplied with each pipette.

Eppendorf AG

Type	PK	Cat. No.
Charging stand	1	**9.283 254**

2



2 Single-channel pipette Eppendorf Research plus 3-Packs

3 adjustable Eppendorf Research® plus pipettes per pack, choice of 3 packs. Special "mL" large-volume pack with up to 10ml nominal volume, ideal for pipetting cell culture media.
Ready-to-use: delivered with matching Eppendorf pipette tips for ultimate user comfort and precision!

Eppendorf AG

Option 1: 0.5-10µl, 10-100µl, 100-1.000µl + 3 reusable epT.I.P.S.® boxes with 96 pipette tips each.
Option 2: 2-20µl, 20-200µl, 100-1.000µl + 3 reusable epT.I.P.S.® boxes with 96 pipette tips each.
Option 3: 100-1.000µl, 0.5-5ml, 1-10ml with samples of matching pipette tips.

Type	PK	Cat. No.
Research plus 3-Packs, Option 1	1	**9.283 228**
Research plus 3-Packs, Option 2	1	**9.283 229**
Research plus 3-Packs, Option 3	1	**9.283 230**

3



3 Multichannel pipettors Eppendorf Research® plus

- channel indicator: - use the pipette the same way round - all the time
- remove individual channels: gain flexibility for individual needs
- Eppendorf PerfectPiston™: ultra-light piston made of Fortron® (except 10µl pipettors)
- quick connection clip:Easily removable lower housing
- spring loaded tip cone: improved ergonomics, tight fit to the tip

Eppendorf AG

Capacity µl	Type	Control button colour	PK	Cat. No.
0,5 - 10	8-channel	mid grey	1	**9.283 222**
0,5 - 10	12-channel	mid grey	1	**9.283 223**
10 - 100	8-channel	yellow	1	**9.283 224**
10 - 100	12-channel	yellow	1	**9.283 225**
30 - 300	8-channel	orange	1	**9.283 226**
30 - 300	12-channel	orange	1	**9.283 227**

E & OE.

1 Pipettor rack, carousel

- Space saving pipettor rack to hold up to six pipettors *Eppendorf AG*
- Carousel pipette stand
- Can accommodate a wide range of pipettors using accessory pipettor adapters

Type	PK	Cat. No.
Carousel stand for 6 pipettors	1	**9.283 581**
Pipette holder for attachment to the wall	1	**9.283 580**
Multipette adapter for pipette carousel	1	**9.283 656**
Multipette adapter for wall mounting	1	**9.283 657**



2 Transferpette® Type fixed volume/digital adjustable, single-channel pipettors

BRAND

The Transferpette® pipette is built for routine lab and research applications.
The hook-shaped handle design, light weight and side-mounted pipetting key work together to minimize the strain of repetitive pipetting. Every control key has a dedicated function to prevent inadvertent volume changes or tip ejection.
The slim shaft facilitates easy access also to narrow vessels. The unique nose cone shape is optimized to fit PLASTIBRAND® tips and will accommodate tips from most other major manufacturers.

- Digital models with „Easy Calibration" readjustment without special tools
- Fixed-volume models easy to calibrate with supplied tool
- Autoclavable lower housing (121°C). Separate tip ejector
- Colored tip ejector caps indicate appropriate tips to use
- Transferpette® 0.1-1 µl maximum precision for molecular biology work, especially when pipetting enzymes
- Corrosion resistant design
- CE-marked according to IVD-Directive 98/79 EC.

Items supplied:
Transferpette® Fixed volume or Adjustable volume, conformity certified, with quality certificate, calibration key for Fix type (no tools are needed for Adjustable volume).



3 Pipettors Transferpette® digital

NEW!

BRAND



Capacity µl	Accuracy ≤ ± A% (max. vol.)	Reproducibility ≤ ± V% (max. vol.)	Grad. µl	Tip µl	PK	Cat. No.
0.1 to 1	2.0	1.2	0.005	0.1 - 20, 0.1 - 1	1	**9.280 099**
0.5 to 10	1.0	0.8	0.05	0.1 - 20, 0.5 - 20, 1 - 50, 0.1 - 1*, 0.5 - 10*, 1 - 20*	1	**9.280 089**
2 to 20	0.8	0.4	0.1	0.1 - 20, 0.5 - 20, 1 - 50, 0.5 - 10*, 1 - 20*	1	**9.280 093**
2 to 20	0.8	0.4	0.1	2 - 200, 5 - 300, 2 - 20*, 5 - 100*	1	**9.280 090**
5 to 50	0.8	0.4	0.1	2 - 200, 5 - 300, 2 - 20*, 5 - 100*	1	**9.280 091**
10 to 100	0.6	0.2	0.1	2 - 200, 5 - 300, 2 - 20*, 5 - 100*	1	**9.280 092**
20 to 200	0.6	0.2	1	2 - 200, 5 - 300, 2 - 20*, 5 - 100*, 5 - 200*	1	**9.280 095**
25 to 250	0.6	0.2	1	50 - 1000, 50 - 1250	1	**9.280 094**
100 to 1000	0.6	0.2	1	50 - 1000, 50 - 1000*	1	**9.280 096**
500 to 5000	0.6	0.2	10	500 - 5000	1	**9.280 097**

* Filter tips

1



1 Pipettors Transferpettor Fixed volume

NEW!

BRAND

With pipettor caps and seals.
Other capacities are available on request.

Capacity µl	Accuracy ≤ ± A% (max. vol.)	Reproducibility ≤ ± V% (max. vol.)	Seal material	Cap material	PK	Cat. No.
1	4.0	4.0	---	glass	1	**9.280 696**
50	0.6	0.4	PTFE	glass	1	**9.280 705**
100	0.6	0.4	PTFE	glass	1	**9.280 710**
200	0.5	0.2	PTFE	glass	1	**9.280 720**

LLG-Pipette tips for digital Microlitre pipettors

Certified free of DNase, RNase, suitable for microbiology. Guaranteed metal-free.
CE-certified for In-Vitro-Diagnostics acc. to 98/79/EG. Sterility acc. EN 552/ISO 11137 and DIN EN 556.

LLG universal fit tips are engineered for a wide variety of pipettors and are ideal for laboratories with multiple brands of pipettors, even multi-channel pipettors. Our tips feature the universal grip design, using flexible materials with a series of bands and supports producing a positive seal. LLG tips have thin walls and a small surface area at the tip, greatly minimising the possibility of the tip retaining sample droplets. In addition the small surface area reduces the touch-off angle between the outer tip wall and the receiving sample tube. This reduced touch-off angle virtually eliminates the potential of capillary retention between the tip orifice and tube wall. Each of our tips is molded to give a flash-free and uniform delivery orifice for consistent accuracy and reproducible sample delivery.
All our tips are provided with calibration lines at specific volumes, acting as visual checks to minimise any risk of errors during sample aspiration.

2



2 LLG-Pipette tips "economy" for digital microlitre pipettors

Certified free of DNase, RNase, suitable for microbiology. Guaranteed metal-free.
CE-certified for In-Vitro-Diagnostics acc. to 98/79/EG. Sterility acc. to EN 552/ISO 11137 and DIN EN 556.

LLG universal fit tips are engineered for a wide variety of pipettors and are ideal for laboratories with multiple brands of pipettors, even multi-channel pipettors. Our universal tips feature the universal grip design, using flexible materials with a series of bands and supports producing a positive seal. LLG tips have thin walls and a small surface area at the tip, greatly minimising the possibility of the tip retaining sample droplets. In addition the small surface area reduces the touch-off angle between the outer tip wall and the receiving sample tube. This reduced touch-off angle virtually eliminates the potential of capillary retention between the tip orifice and tube wall. Each of our tips is moulded to give a flash-free and uniform delivery orifice for consistent accuracy and reproducible sample delivery.
All our tips are provided with calibration lines at specific volumes, acting as visual checks to minimise any risk of errors during sample aspiration.

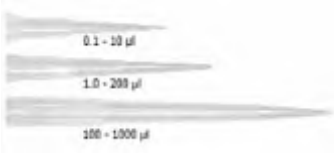
Capacity µl	Colour	Type	PK	Cat. No.
0.1 to 10	clear	1 bag of 1000	1000	**9.409 099**
0.1 to 10	clear	10 racks of 96	960	**9.409 045**
1 to 200	yellow	1 bag of 1000	1000	**9.409 046**
1 to 200	clear	10 racks of 96	960	**6.253 577**
1 to 200	yellow	10 racks of 96	960	**9.409 047**
100 to 1000	blue	1 bag of 1000	1000	**9.409 048**
100 to 1000	blue	10 racks of 96	960	**9.409 049**
100 to 5000*	clear	1 bag of 250	250	**9.409 097**
100 to 5000**	clear	1 bag of 250	250	**6.254 364**
1000 to 10000	clear	1 bag of 100	100	**9.409 098**

*for manual pipettors
**for electronic pipettors

1 LLG-Low-Retention Pipette tips for digital Microlitre pipettors

NEW!

1



Certified free of DNase, RNase, suitable for microbiology.
Guaranteed metal-free.
CE-certified for In-Vitro-Diagnostics acc. to 98/79/EG.
Sterility acc. EN 552/ISO 11137 and DIN EN 556.

Sample retention can be a major contributor to pipetting inaccuracy, and siliconization of tips has proved unsatisfactory because of autoclaving and contamination problems. For LLG quality tips a new polymer, Novelle-Polypropylenehas been developed, that produces a "super slick surface" on our new ULR-tips, that actually improves with autoclaving and cannot leach from the tip surface. On average, Novelle Polymer and LLG ULR-tips reduces the tip retention by near 85% and decreases the standard deviation of the retained volume by more than 75%. Also liquid handling accuracy and precision are crucial to success in today's molecular biology laboratories, especially for DNA analysis and protein handling. A significant culprit of pipette inaccuracy is binding of sample. The LLG ULR-tips reduces the binding, thus increasing sample delivery accuracy. Tests demonstrates that LLG ULR-Tips significantly reduces the amount of DNA and protein bound by the tip. Furthermore LLG ULR-Tips offer a marked improvement over the best low retention technologies.

Capacity µl	Colour	Type	PK	Cat. No.
0.1 to 10	Clear	1 bag of 1000	1000	**9.409 038**
0.1 to 10	Clear	10 racks of 96	960	**9.409 039**
1 to 200	Clear	1 bag of 1000	1000	**9.409 041**
1 to 200	Clear	10 racks of 96	960	**9.409 042**
100 to 1000	Clear	1 bag of 1000	1000	**9.409 043**
100 to 1000	Clear	10 racks of 96	960	**9.409 044**

2 LLG-Low retention filter tips for digital Microliter pipettors

NEW!

2



Certified free of DNase, RNase, suitable for microbiology.
Guaranteed metal-free.
CE-certified for In-Vitro-Diagnostics acc. to 98/79/EC. Sterility acc. to EN 552/ISO 11137 and DIN EN 556.

Sterile. Filter pore size (effective) 4 to 6µm.
Also liquid handling accuracy and precision are crucial to success in today's molecular biology laboratories, especially for DNA analysis and protein handling. A significant culprit of pipette inaccuracy is binding of sample. The LLG ULR-tips reduce the binding, thus increasing sample delivery accuracy. Tests demonstrate that LLG ULR-Tips significantly reduce the amount of DNA and protein bound by the tip. Furthermore LLG ULR-Filter Tips offer a marked improvement over the best low retention technologies.

Capacity µl	Colour	Type	PK	Cat. No.
0.1 to 100	Clear	10 racks of 96	960	**9.409 033**
1 to 20	Clear	10 racks of 96	960	**9.409 034**
1 to 100	Clear	10 racks of 96	960	**9.409 035**
1 to 200	Clear	10 racks of 96	960	**9.409 036**
100 to 1000	Clear	10 racks of 96	960	**9.409 037**

3 Pipette tips, bulk packed

3



Precise design and manufacture ensures highest quality tips. *Ratiolab*
- Moulded with high quality polypropylene
- Firm fit on pipettor cones
- Optimum handling due to straight shape
- Special ionization process guarantees dust free tip production
- Excellent transparency due to optimum surface quality
- Minimum fluid retention due to controlled raw material quality
- Excellent volumetric accuracy due to precisely moulded tip orifices
- Most practical tip volumes
- Non-sterile
- Autoclavable

Type A fits pipettors ratiopetta®, Biohit® Proline, Biohit® m-Line, Brand® Transferpette®, CappAero, Eppendorf® Research®, Eppendorf® Reference®, Finnpipette® Digital, Finnpipette® Focus, Gilson® Pipetman®, Gilson® Ultra, Labmate®, Socorex® Acura and Socorex® Calibra

Type B fits pipettors ratiopetta®, Gilson® Pipetman®, Gilson® Ultra, Labmate®, Socorex® Acura und Socorex® Calibra

Type C fits pipettors ratiopetta®, Gilson® Pipetman®, Gilson® Ultra, Labmate®

Capacity µl	Colour	Type	Fits	PK	Cat. No.
0.1 to 10	Crystal	1 bag of 1000	Type C	1000	**9.409 130**
0.5 to 20	Crystal	1 bag of 1000	Type A	1000	**9.409 129**
1 to 200	Yellow	1 bag of 1000	Type A	1000	**9.409 138**
1 to 250	Yellow	1 bag of 1000	Type B	1000	**9.409 128**
200 to 1000	Blue	1 bag of 1000	Type A	1000	**9.409 139**

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9.409 145

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9.409 146

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9.409 147

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9.409 148

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9.409 149

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9.409 140

Pipette tips with Aerosol Barrier Filter, PE-HD

Ratiolab

Pipette tips with special filters, to effectively prevent the the pipettor shaft from contamination with aerosols and liquids to be drawn into the pipettor.
- certified RNase- and DNase-free
- pipette tips and aerosol filters made of ultra-hydrophobic PE-HD
- minimized retention due to special surface treatment
- sterile
- perfect and close fit on all major pipettor brands
- aeroject® 10µl xl has extended length for operation with narrow vessels and reduced risk of cross-contamination
- packed in plastic racks with hinge lids

Fits pipettors: ratiopetta®, Biohit® Proline, Biohit® m-Line, Brand® Transferpette®, CappAero, Eppendorf® Research®, Eppendorf® Reference®, Finnpipette® Digital, Finnpipette® Focus, Gilson® Pipetman®, Gilson® Ultra, Labmate® and Socorex® Calibra, Labpipetten

Capacity µl	Type	PK	Cat. No.	
0.1 to 10	10 racks of 96	960	**9.409 145**	1
1 to 20	10 racks of 96	960	**9.409 146**	2
1 to 100	10 racks of 96	960	**9.409 147**	3
1 to 200	10 racks of 96	960	**9.409 148**	4
100 to 1000	10 racks of 96	960	**9.409 149**	5
1000 to 5000	Folding box 1 x 75	75	**9.409 140**	6



1 2 3 Pipette tips and filter tips

BRAND

Pipette tips and filter tips are manufactured by BRAND in a cleanroom under the most modern production conditions, and are automatically rack packed and packaged to ensure that the tips are of consistently high quality.

Quality features:
- High-purity polypropylene, free from DiHEMDA and oleamide
- Manufactured without lubricants
- Cadmium-free pigments
- Graduation for a quick volume check
- All tips and filter tips up to 1000 µl are free of DNA (<40 fg), RNase (<8.6 fg), endotoxins (<1 pg) and ATP (<1 fg)
- All sterile products in BIO-CERT® Quality: sterile acc. ISO 11 137 and AAMI guidelines, a SAL of 10-6 is obtained.
- Autoclavable at 121°C (2 bar), acc. DIN EN 285
- Environmentally friendly packaging systems
- CE-marked according to IVD-Directive 98/79 EC
- Pipette and filter tips from BRAND are tested for BRAND pipettes and most of the pipette types of Gilson®, Thermo Fisher Scientific Finnpipette®, Eppendorf® and Biohit.

The 5 ml tip is exclusively tested for BRAND pipettes and Thermo Fisher Scientific Finnpipette®.
The 10 ml tip is suitable for BRAND, Eppendorf® and Gilson®.
All sizes up to 1000 µl available in 96-unit format.

Ultra Low Retention-tips
The surfaces of the Ultra Low Retention tips are produced through a special, patented physicochemical process. The homogeneous, defect-free surface thus produced has extremely low surface tension - over 50% less than PTFE. This significantly reduces sample loss and provides substantially higher reproducibility when working with critical media.
- Ideal for biological samples that contain detergents such as Triton® X-100, SDS, Tween etc.
- No additives that can be leached out! No siliconization of the surface!
- High chemical resistance. Ideal for working with solvents.
- The tips can be autoclaved at 121°C (2 bar) without damaging the material properties.

Filter Tips
Non-self-sealing filter tips from BRAND have a PE filter that is free from chemical additives. Permeability is controlled by the combination of pore size and filter length, so that no aerosols can reach the pipette shaft. These filters function with consistent reliability. On the other hand, liquids can pass very slowly should they accidentally contact the filter. Since the filter does not swell as in the case of self-sealing filter tips, the sample can be recovered from the filter by simply actuating the pipettes blow-out function, or by centrifugation if necessary. This is clearly an important advantage of non-self-sealing filters, especially when working with valuable samples. As an added advantage, the absence of filter additives protects samples from this source of contamination.

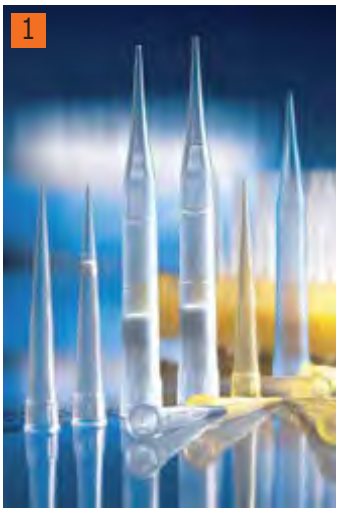
Bulk packed in reclosable bags.
All tips and filter tips are produced under supervised state-of-the-art clean-room conditions and automatically shrink-wrapped in reclosable bags and packaged in cardboard boxes. The batch number is printed on every bag.

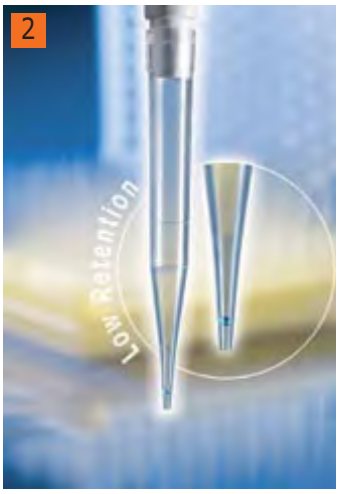
TipBox, sterile and non sterile, BIO-CERT®
PP. Two different sizes. Stackable and repeatedly autoclavable at 121°C (2 bar), acc. DIN EN 285.
- All sizes up to 1000 µl available in 96-unit format
- Dual function: hinged and push-on lid, simply rotate 180° to change closure method.
- Opening and closing with one hand. The clamping mechanism holds the tip-tray securely in the box.
- Transparent window for better all-round visual inspection.
- No deflection during tip loading. The tip-tray is fabricated from especially rigid PP.
- Usable with a partially loaded multichannel pipette. The rimless tip-tray border enables problem-free loading of individual pipette tips with multichannel instruments.
- Colored tip-trays with side panel labeling. The contents of the box are always clearly visible.

TipStack™, non sterile and sterile, BIO-CERT®
A tip tower containing 5 filled tip-trays and a TipBox constitute the new, space-saving refill system for 20 µl, 200 µl and 1000 µl tips. Tightly sealing spacers prevent the tips from getting stuck together, and ensure them to be free from DNA, RNases, endotoxins and ATP. The sterile TipStacks (BIO-CERT® quality) are supplied with a transfer aid for contamination-free use in a previously sterilized TipBox.
- All components are recyclable
- Reduced amount of waste
- Sterilizable and reusable TipBox
- High purity of the pipette tips and filter tips
- Space-saving design

TipRack, sterile and non sterile, BIO-CERT®
Refill unit for TipBox. Compared to the filled TipBoxes, the amount of waste with the new refill units is reduced by over 20%. All pipette tips and filter tips up to 1000 µl are free of DNA, RNases, endotoxins and ATP.
TipRacks in BIO-CERT® quality are sterile according to ISO 11 137 and the AAMI guidelines, a SAL of 10-6 is obtained. These racks are supplied with a transfer aid that enables simple, contamination-free transfer into a previously sterilized TipBox. All tip-trays are printed on one side with information on the contents.

TipBox 5/10 ml, non sterile
The 5 ml and 10 ml tips are only available as a racked tip version in these specially corresponding TipBox.







1



1 Pipette tips, bulk, in reclosable bags, non-sterile

All tips and filter tips are produced under supervised state-of-the-art clean-room conditions and automatically shrink-wrapped in reclosable bags and packaged in cardboard boxes. The batch number is printed on every bag.

BRAND

Capacity µl	Colour	Bags per pack	PK	Cat. No.
0,1 - 20	natural	2 (à 1000)	2000	**9.409 669**
0,5 - 20	natural	2 (à 1000)	2000	**9.409 670**
1 - 50	natural	2 (à 1000)	2000	**9.409 671**
2 - 200	yellow	1 (à 1000)	1000	**9.409 672**
5 - 300	natural	1 (à 1000)	1000	**9.409 673**
50 - 1000	blue	2 (à 500)	1000	**9.409 674**
0,5 - 5 ml	natural	1 (à 200)	200	**9.409 223**
1 - 10 ml	natural	2 (à 100)	200	**9.409 191**
0,1 - 20	natural	10 (à 1000) XXL	10000	**9.409 675**
0,5 - 20	natural	10 (à 1000) XXL	10000	**9.409 676**
1- 50	natural	10 (à 1000) XXL	10000	**9.409 677**
2 - 200	yellow	10 (à 1000) XXL	10000	**9.409 678**
5 - 300	natural	10 (à 1000) XXL	10000	**9.409 679**
50 - 1000	blue	10 (à 500) XXL	5000	**9.409 680**
0,5 - 5 ml	natural	5 (à 200) XXL	1000	**9.409 199**
1 - 10 ml	natural	10 (à 100) XXL	1000	**9.409 192**

2



2 Filter pipette tips, in reclosable bags, non-sterile

NEW!

All tips and filter tips are produced under supervised state-of-the-art clean-room conditions and automatically shrink-wrapped in reclosable bags and packaged in cardboard boxes. The batch number is printed on every bag.

BRAND

Capacity µl	Type	PK	Cat. No.
0.1 - 1	pack of 960	960	**9.409 681**
0,5 - 10	pack of 960	960	**9.409 682**
1.0 - 20	pack of 960	960	**9.409 683**
2 - 20	pack of 960	960	**9.409 684**
5 - 100	pack of 960	960	**9.409 685**
5 - 200	pack of 960	960	**9.409 686**
50 - 1000	pack of 960	960	**9.409 687**

3



3 Pipette tips, racked in TipRack, non-sterile

NEW!

For TipBox. Refill unit, protected in an environmentally compatible packaging of recyclable PET.

BRAND

Capacity µl	Type	PK	Cat. No.
0.1 - 20	10 TipRacks à 96	960	**9.409 757**
0.5 - 20	10 TipRacks à 96	960	**9.409 758**
1 - 50	10 TipRacks à 96	960	**9.409 759**
2 - 200	10 TipRacks à 96	960	**9.409 760**
5 - 300	10 TipRacks à 96	960	**9.409 761**
50 - 1000	10 TipRacks à 96	960	**9.409 762**

4



4 Filter tips racked in TipRack, non-sterile

NEW!

For TipBox. Refill unit, protected in an environmentally compatible packaging of recyclable PET.

BRAND

Capacity µl	Type	PK	Cat. No.
0.1 - 1	10 TipRacks à 96	960	**9.409 769**
0,5 - 10	10 TipRacks à 96	960	**9.409 770**
1.0 - 20	10 TipRacks à 96	960	**9.409 771**
2 - 20	10 TipRacks à 96	960	**9.409 772**
5 - 100	10 TipRacks à 96	960	**9.409 773**
5 - 200	10 TipRacks à 96	960	**9.409 774**
50 - 1000	10 TipRacks à 96	960	**9.409 775**

E & OE.

1 Pipette tips racked in TipRack, sterile, BIO-CERT®

NEW!

For TipBox. Refill unit, protected in an environmentally compatible packaging of recyclable PET. Sterile TipRacks are supplied with a transfer aid so that the rack can be put into a previously autoclaved box without hand contact.

BRAND



Capacity µl	Type	PK	Cat. No.
0.1 - 20	10 TipRacks à 96	960	**9.409 763**
0.5 - 20	10 TipRacks à 96	960	**9.409 764**
1 - 50	10 TipRacks à 96	960	**9.409 765**
2 - 200	10 TipRacks à 96	960	**9.409 766**
5 - 300	10 TipRacks à 96	960	**9.409 767**
50 - 1000	10 TipRacks à 96	960	**9.409 768**

2 Filter tips racked in TipRack, sterile, BIO-CERT®

NEW!

For TipBox. Refill unit, protected in an environmentally compatible packaging of recyclable PET. Sterile TipRacks are supplied with a transfer aid so that the rack can be put into a previously autoclaved box without hand contact.

BRAND



Capacity µl	Type	PK	Cat. No.
0.1 - 1	10 TipRacks à 96	960	**9.409 776**
0,5 - 10	10 TipRacks à 96	960	**9.409 777**
1.0 - 20	10 TipRacks à 96	960	**9.409 778**
2 - 20	10 TipRacks à 96	960	**9.409 779**
5 - 100	10 TipRacks à 96	960	**9.409 780**
5 - 200	10 TipRacks à 96	960	**9.409 781**
50 - 1000	10 TipRacks à 96	960	**9.409 782**

3 4 Filter tips, racked in TipBox, PP, non-sterile

NEW!

PP. With hinged lid/push-on lid. Simply rotate 180° to change closure method. Usable with a partially loaded multichannel pipette. Two different sizes. Stackable and repeatedly autoclavable at 121°C (2 bar), acc. DIN EN 285.

BRAND





Capacity µl	Type	Description	PK	Cat. No.
0.1 - 1	5 boxes of 96	Standard	480	**9.409 700**
0,5 - 10	5 boxes of 96	Standard	480	**9.409 701**
1.0 - 20	5 boxes of 96	Standard	480	**9.409 702**
2 - 20	5 boxes of 96	Standard	480	**9.409 703**
5 - 100	5 boxes of 96	Standard	480	**9.409 704**
5 - 200	5 boxes of 96	Standard	480	**9.409 705**
50 - 1000	5 boxes of 96	Standard	480	**9.409 706**
0.1 - 1	5 boxes of 96	Low Retention	480	**9.409 707**
0,5 - 10	5 boxes of 96	Low Retention	480	**9.409 708**
1.0 - 20	5 boxes of 96	Low Retention	480	**9.409 709**
2 - 20	5 boxes of 96	Low Retention	480	**9.409 712**
5 - 100	5 boxes of 96	Low Retention	480	**9.409 713**
5 - 200	5 boxes of 96	Low Retention	480	**9.409 714**
50 - 1000	5 boxes of 96	Low Retention	480	**9.409 715**

5 6 Pipette tips, racked in TipBox, PP, non-sterile

NEW!

PP. With hinged lid/push-on lid. Simply rotate 180° to change closure method. Usable with a partially loaded multichannel pipette. Two different sizes. Stackable and repeatedly autoclavable at 121°C (2 bar), acc. DIN EN 285.

BRAND





Capacity µl	Type	Description	PK	Cat. No.
0.1 - 20	5 Boxes of 96	Standard	480	**9.409 688**
0.5 - 20	5 Boxes of 96	Standard	480	**9.409 689**
1 - 50	5 Boxes of 96	Standard	480	**9.409 690**
2 - 200	5 Boxes of 96	Standard	480	**9.409 691**
5 - 300	5 Boxes of 96	Standard	480	**9.409 692**
50 - 1000	5 Boxes of 96	Standard	480	**9.409 693**
0.1 - 20	5 Boxes of 96	Low Retention	480	**9.409 694**
0.5 - 20	5 Boxes of 96	Low Retention	480	**9.409 695**
1 - 50	5 Boxes of 96	Low Retention	480	**9.409 696**
2 - 200	5 Boxes of 96	Low Retention	480	**9.409 697**
5 - 300	5 Boxes of 96	Low Retention	480	**9.409 698**
50 - 1000	5 Boxes of 96	Low Retention	480	**9.409 699**



1 Pipette tips, racked in Tip-Box, sterile, Bio-Cert®

NEW!

PP. With hinged lid/push-on lid. Simply rotate 180° to change closure method.
Usable with a partially loaded multichannel pipette. Two different sizes.
Stackable and repeatedly autoclavable at 121°C (2 bar), acc. DIN EN 285.

BRAND

Capacity µl	Type	Description	PK	Cat. No.
0.1 - 20	10 boxes of 96	Standard	960	**9.409 716**
0.5 - 20	10 boxes of 96	Standard	960	**9.409 717**
1 - 50	10 boxes of 96	Standard	960	**9.409 718**
2 - 200	10 boxes of 96	Standard	960	**9.409 719**
5 - 300	10 boxes of 96	Standard	960	**9.409 721**
50 - 1000	10 boxes of 96	Standard	960	**9.409 722**
0.1 - 20	10 boxes of 96	Low Retention	960	**9.409 730**
0.5 - 20	10 boxes of 96	Low Retention	960	**9.409 733**
1 - 50	10 boxes of 96	Low Retention	960	**9.409 734**
2 - 200	10 boxes of 96	Low Retention	960	**9.409 735**
5 - 300	10 boxes of 96	Low Retention	960	**9.409 736**
50 - 1000	10 boxes of 96	Low Retention	960	**9.409 737**



2 Filter tips, racked in TipBox, sterile, Bio-Cert®

NEW!

PP. With hinged lid/push-on lid. Simply rotate 180° to change closure method.
Usable with a partially loaded multichannel pipette. Two different sizes.
Stackable and repeatedly autoclavable at 121°C (2 bar), acc. DIN EN 285.

BRAND

Capacity µl	Type	Description	PK	Cat. No.
0.1 - 1	10 boxes of 96	Standard	960	**9.409 723**
0,5 - 10	10 boxes of 96	Standard	960	**9.409 724**
1.0 - 20	10 boxes of 96	Standard	960	**9.409 725**
2 - 20	10 boxes of 96	Standard	960	**9.409 726**
5 - 100	10 boxes of 96	Standard	960	**9.409 727**
5 - 200	10 boxes of 96	Standard	960	**9.409 728**
50 - 1000	10 boxes of 96	Standard	960	**9.409 729**
0.1 - 1	10 boxes of 96	Low Retention	960	**9.409 738**
0,5 - 10	10 boxes of 96	Low Retention	960	**9.409 739**
1.0 - 20	10 boxes of 96	Low Retention	960	**9.409 740**
2 - 20	10 boxes of 96	Low Retention	960	**9.409 741**
5 - 100	10 boxes of 96	Low Retention	960	**9.409 742**
5 - 200	10 boxes of 96	Low Retention	960	**9.409 743**
50 - 1000	10 boxes of 96	Low Retention	960	**9.409 744**



3 Pipette tips refill TipStack™, non-sterile

NEW!

Space-saving, environmentally compatible refill system for TipBox. 5 racks, each having 96 tips incl. 1 TipBox. Each packaging unit contains 2 TipStacks.

BRAND

Capacity µl	Container	Description	PK	Cat. No.
0.5 - 20	2 x 5 Racks à 96 tips	Standard	960	**9.409 745**
2 - 200	2 x 5 Racks à 96 tips	Standard	960	**9.409 746**
50 - 1000	2 x 5 Racks à 96 tips	Standard	960	**9.409 747**
0.5 - 20	2 x 5 Racks à 96 tips	Low Retention	960	**9.409 751**
2 - 200	2 x 5 Racks à 96 tips	Low Retention	960	**9.409 752**
50 - 1000	2 x 5 Racks à 96 tips	Low Retention	960	**9.409 753**



4 Pipette tips refill TipStack™, sterile, BIO-CERT®

NEW!

Space-saving, environmentally compatible refill system for TipBox. 5 racks, each having 96 tips incl. 1 TipBox. Sterile TipStacks are supplied with a transfer aid so that the rack can be put into a previously autoclaved box without hand contact. Each packaging unit contains 2 TipStacks.

BRAND

Capacity µl	Container	Description	PK	Cat. No.
0.5 - 20	2 x 5 Racks à 96 tips	Standard	960	**9.409 748**
2 - 200	2 x 5 Racks à 96 tips	Standard	960	**9.409 749**
50 - 1000	2 x 5 Racks à 96 tips	Standard	960	**9.409 750**
0.5 - 20	2 x 5 Racks à 96 tips	Low Retention	960	**9.409 754**
2 - 200	2 x 5 Racks à 96 tips	Low Retention	960	**9.409 755**
50 - 1000	2 x 5 Racks à 96 tips	Low Retention	960	**9.409 756**

E & OE.

1 TipBox 5/10 ml, non-sterile

The 5 ml and 10 ml tips are only available as a racked tip version in these specially corresponding TipBox.

BRAND

Capacity µl	Type	Description	PK	Cat. No.
0,5 - 5 ml	1 Box à 28	Standard	28	**9.408 905**
1 - 10 ml	1 Box of 28	Standard	18	**9.408 909**



2 TipBox, PP, with Tip-Tray, empty

NEW!

PP. With hinged lid/push-on lid. Two different sizes. Stackable and repeatedly autoclavable at 121°C (2 bar), acc. DIN EN 285. This box can be refilled.

BRAND

Capacity µl	Description	PK	Cat. No.
up to 20	TipBox, unfilled	1	**9.409 783**
for 200	TipBox, unfilled	1	**9.409 784**
for 300	TipBox, unfilled	1	**9.409 785**
for 1000	TipBox, unfilled	1	**9.409 786**



3 Pipette tips Finntip 10

This tip is specially designed for pipetting micro-sized drops.
It is ideal for use with micro volume Finnpipettes.

Thermo Scientific

Capacity µl	Description	Type	PK	Cat. No.
0.2-10	non sterile	1000/Bag	1000	**6.080 908**
0.2-10	non sterile	10x96/Rack	960	**6.084 681**
0.2-10	sterile	10x96/Rack	960	**6.224 231**
0.2-10	non sterile	4x192/Rack + 10x192/Refill	2688	**6.228 718**
0.2-10	non sterile	20x196/Refill	3840	**6.228 719**



4 Pipette tips Finntip 20

The Finntip 20 is suitable for applications requiring high precision and volumes of 0.2-20µl. The tips are provided in convenient racks of 384 tips.

Thermo Scientific

Capacity µl	Description	Type	PK	Cat. No.
0.2-20	non sterile	1000/Bag	1000	**6.224 412**
0.2-20	non sterile	10x384/Rack	3840	**6.228 720**
0.2-20	sterile	10x384/Rack	3840	**9.282 500**



5 Pipette tips Finntip 50

For use with the 16 channel multichannel.
Will also fit micro volume single channels, volume 50µl length 43mm.

Thermo Scientific

Capacity µl	Description	Type	PK	Cat. No.
0.5-50	non sterile	1000/Bag	1000	**6.301 604**
0.5-50	non sterile	10x384/Rack	3840	**6.301 538**
0.5-50	sterile	10x384/Rack	3840	**9.282 501**



1



1 Pipette tips Finntip 200 Extended

The Finntip 200 extended is an extra-long, tapered tip.
It is designed to fit in extremely narrow vessels.

Thermo Scientific

Capacity µl	Description	Type	PK	Cat. No.
5-200	non sterile	400/Box	400	**6.222 480**
5-200	non sterile	10x96/Rack	960	**6.227 486**
5-200	sterile	10x96/Rack	960	**6.224 233**

2



2 Pipette tips Finntip 250 Universal

This quality product is ideal for single channel and multichannel Finnpipettes.
It was also designed to be used with pipettes from other manufacturers.
Finntip universals are also available in refill packs.

Thermo Scientific

Capacity µl	Description	Type	PK	Cat. No.
0.5-250	non sterile	500/Box	500	**6.070 424**
0.5-250	non sterile	1000/Bag	1000	**6.092 728**
0.5-250	non sterile	20,000/Bulk	20000	**6.228 715**
0.5-250	non sterile	10x96/Rack	960	**6.082 633**
0.5-250	sterile	10x96/Rack	960	**6.510 864**
0.5-250	non sterile	4x96/Rack + 10x96/Refill	1344	**6.228 716**
0.5-250	non sterile	20x96/Refill	1920	**6.803 185**

3



3 Pipette tips Finntip 300

These tips were specially designed for the Finnpipette multichannels (reverse pipetting is possible with the 300µl). The Finntip 300µl is also suitable for single channel pipets in the 5-200µl range. The packaging options include refill packs.

Thermo Scientific

Capacity µl	Description	Type	PK	Cat. No.
5-300	non sterile	1000/Bag	1000	**6.057 011**
5-300	non sterile	20.000/Bulk	20000	**6.224 235**
5-300	non sterile	10x96/Rack	960	**6.056 947**
5-300	sterile	10x96/Rack	960	**6.084 976**
5-300	non sterile	20x96/Refill	1920	**6.204 184**

4



4 Pipette tips Finntip Flex

The Thermo Scientific Finntip Flex system offers flexible, soft and sophisticated high-end tips for discerning users. Finntip Flex system consisting new-generation tips and easy-to-use operation rack and space-saving refill kit. All elements in the system have been designed to fulfill the most demanding requirements for ergonomics and flexibility in pipetting tasks for todays fast-paced aboratories.

Thermo Scientific

- Low attachment and ejection forces
- High precision molding with virgin polypropylene
- Smooth surface for low liquid retention
- Non-slip rack with hinged cover
- Easy to use and economical refill system

5



5 Pipette tips Finntip Flex 10

Thermo Scientific

Capacity µl	Description	Type	PK	Cat. No.
0,2-10	non sterile	1000/Bag	1000	**9.282 510**
0,2-10	non sterile	10x96/Rack	960	**9.282 511**
0,2-10	sterile	10x96/Rack	960	**9.282 512**
0,2-10	non sterile	1x96/Rack + 20x96/Refill	2016	**9.282 513**
0,2-10	non sterile	20x96/Refill	1920	**9.282 514**

E & OE.

Pipette tips Finntip Flex 200

Thermo Scientific

Capacity µl	Description	Type	PK	Cat. No.
1-200	non sterile	1000/Bag	1000	**9.282 515**
1-200	non sterile	10x96/Rack	960	**9.282 516** 1
1-200	sterile	10x96/Rack	960	**9.282 517**
1-200	non sterile	1x96/Rack + 20x96/Refill	2016	**9.282 518**
1-200	non sterile	20x96/Refill	1920	**9.282 519**

1



9.282 516

Pipette tips Finntip Flex 300

Thermo Scientific

Capacity µl	Description	Type	PK	Cat. No.
5-300	non sterile	1000/Bag	1000	**6.228 755**
5-300	non sterile	10x96/Rack	960	**6.224 234** 2
5-300	sterile	10x96/Rack	960	**6.228 752**
5-300	non sterile	1x96/Rack + 20x96/Refill	2016	**6.228 753**
5-300	non sterile	20x96/Refill	1920	**6.228 754**

2



6.224 234

Pipette tips Finntip Flex 1000

Thermo Scientific

Capacity µl	Description	Type	PK	Cat. No.
100-1000	non sterile	1000/Bag	1000	**6.235 571**
100-1000	non sterile	10x96/Rack	960	**6.230 775** 3
100-1000	sterile	10x96/Rack	960	**9.282 520**
100-1000	non sterile	1x96/Rack + 16x96/Refill	1632	**9.282 521**
100-1000	non sterile	16x96/Refill	1536	**9.282 522**

3



6.230 775

Pipette tips Finntip Flex 1200

Thermo Scientific

Capacity µl	Description	Type	PK	Cat. No.
50-1200	non sterile	1000/Bag	1000	**6.228 758**
50-1200	non sterile	10x96/Rack	960	**6.228 756** 4
50-1200	sterile	10x96/Rack	960	**6.228 757**
50-1200	non sterile	1x96/Rack + 16x96/Refill	1632	**9.282 523**
50-1200	non sterile	16x96/Refill	1536	**9.282 524**

4



6.22 8756

Pipette tips Finntip Flex Extended

Thermo Scientific

Capacity µl	Description	Type	PK	Cat. No.
1000-10000	non sterile	100/Bag	100	**7.651 616**
1000-10000	sterile	50/Bag	50	**9.282 525**

Pipette tips Finntip Flex Filter, sterile

Thermo Scientific

Capacity µl	Description	Type	PK	Cat. No.
0,2-10	sterile	10x96/Rack	960	**9.282 526**
1-30	sterile	10x96/Rack	960	**9.282 527**
1-100	sterile	10x96/Rack	960	**9.282 528**
1-200	sterile	10x96/Rack	960	**9.282 529**
5-300	sterile	10x96/Rack	960	**9.282 530**
100-1000	sterile	10x96/Rack	960	**9.282 531**
50-1200	sterile	10x96/Rack	960	**9.282 532**
1000-10000	sterile	50/Bag	50	**9.282 533**

1



1 Pipette tips Finntip 1000

This mid-size tip comes in several pack sizes. The 10 x 96 rack is available sterile. *Thermo Scientific*

Capacity µl	Description	Type	PK	Cat. No.
100-1000	non sterile	200/Box	200	**6.085 561**
100-1000	non sterile	1000/Bag	1000	**6.085 852**
100-1000	non sterile	10.000/Bulk	10000	**6.076 481**
100-1000	non sterile	10x96/Rack	960	**6.802 498**
100-1000	sterile	10x96/Rack	960	**6.206 884**
100-1000	non sterile	5x192/Refill	960	**6.228 679**

2



2 Pipette tips Finntip 1000 Extended

Tapered to 105mm in length the Finntip 1000 extended allows access to the narrowest container. *Thermo Scientific*

Capacity µl	Description	Type	PK	Cat. No.
100-1000	non sterile	1000/Bag	1000	**7.200 433**
100-1000	non sterile	5x96/Rack	480	**6.224 236**
100-1000	sterile	5x96/Rack	480	**6.228 676**

3



3 Pipette tips Finntip 5ml

Designed to prevent foaming and vortexing, this tip fits into all common sizes of laboratory vessels. *Thermo Scientific*

Capacity µl	Description	Type	PK	Cat. No.
1000-5000	non sterile	75/Box	75	**6.076 989**
1000-5000	non sterile	500/Bag	500	**6.510 003**
1000-5000	non sterile	3000/Bulk	3000	**6.058 016**
1000-5000	non sterile	5x54/Rack	270	**6.053 602**
1000-5000	sterile	5x54/Rack	270	**6.900 937**

4



4 Pipette tips Finntip 10 ml

The Finntip 10 ml was designed to eliminate vortexing and prevent foaming in the sample liquid. *Thermo Scientific*

Capacity µl	Description	Type	PK	Cat. No.
2000-10000	non sterile	40/Box	40	**6.051 993**
2000-10000	non sterile	100/Bag	100	**6.051 307**
2000-10000	non sterile	5x24/Rack	120	**6.051 881**
2000-10000	sterile	5x24/Rack	120	**6.228 721**

E & OE.

1 Pipette tips Finntip with Filter Tips

Thermo Scientific



- Volume range 0.2µl-10ml
- Thirteen different models including extended versions
- Filters made from polyethylene, cannot be autoclaved
- Supplied in vacuum sealed sterilized tip racks
- Ideal for PCR and other amplification methods
- Pipetting of radioactive and infectious samples
- Certified free from endotoxin, DNA, DNase, RNase Type

Capacity µl	Description	Type	PK	Cat. No.
0.2-10	sterile	10x96/Rack	960	**6.224 227**
0.2-20	sterile	10x384/Rack	3840	**9.282 544**
0.2-50	sterile	10x384/Rack	3840	**6.228 742**
0.5-10	sterile	10x96/Rack	960	**6.224 228**
0.2-20	sterile	10x96/Rack	960	**6.228 743**
0.3-30	sterile	10x96/Rack	960	**6.228 744**
0.5-100	sterile	10x96/Rack	960	**6.076 896**
0.5-101	sterile	10x96/Rack	960	**6.228 745**
0.5-200	sterile	10x96/Rack	960	**6.224 229**
0.5-200	sterile	10x96/Rack	960	**6.228 746**
5-300	sterile	10x96/Rack	960	**6.228 747**
100-1000	sterile	10x96/Rack	1080	**6.085 289**
100-1000	sterile	5x96/Rack	480	**6.228 748**
150-1500	sterile	10x96/Rack	960	**6.228 749**
500-5000	sterile	5x54/Rack	270	**6.224 230**
1000-10000	sterile	5x24/Rack	120	**6.228 750**

2 Pipette tips Finntip Wide

Thermo Scientific



With its wide orifice tip, the Finntip Wide was designed especially for pipetting fragile cell suspensions and macromolecules like genomic DNA. This tip eliminates the mechanical shearing that causes cell fragmentation.

Capacity µl	Description	Type	PK	Cat. No.
10-250	non sterile	1000/Bag	1000	**9.282 552**
10-250	non sterile	10x96/Rack	960	**9.282 554**
10-250	sterile	10x96/Rack	960	**9.282 555**
100-1000	non sterile	400/Bag	400	**6.206 960**
100-1000	non sterile	6500/Bulk	6500	**6.228 740**
100-1000	non sterile	10x96/Rack	960	**6.089 601**
100-1000	sterile	10x96/Rack	960	**9.282 556**

3 Pipette tips Finntip BioCon

Thermo Scientific



- Certified free from endotoxin, DNA, DNase, RNase
- Supplied individually packed
- Ideal for PCR and other purity demanding applications

Capacity µl	Description	Type	PK	Cat. No.
0.2-10	sterile	100/Box	100	**6.224 232**
0.5-250	sterile	100/Box	100	**9.282 570**
10-1000	sterile	50/Box	50	**6.228 751**



1 epT.I.P.S. Set

Starter kit, consisting of one epT.I.P.S box filled with tips and 4 reload trays. *Eppendorf AG*

Capacity µl	Length mm	Colour	PK	Cat. No.
0.1 to 10	34	anthracite	480	**9.409 480**
0.1 to 20	40	grey	480	**9.409 481**
0.5 to 20	46	light grey	480	**9.409 482**
2 to 200	53	yellow	480	**9.409 483**
20 to 300	55	orange	480	**9.409 484**
50 to 1000	71	blue	480	**9.409 485**
50 to 1250	76	green	480	**9.409 486**
500 to 2500	115	red	240	**9.409 487**



2 Pipette tips epT.I.P.S. Box

- Work box, filled with tips *Eppendorf AG*
- autoclavable
- contamination-free refilling system suitable for loading epT.I.P.S reloads

Capacity µl	Length mm	Colour	PK	Cat. No.
0.1 to 10	34	anthracite	96	**9.409 470**
0.1 to 20	40	grey	96	**9.409 471**
0.5 to 20	46	light grey	96	**9.409 472**
2 to 200	53	yellow	96	**9.409 473**
20 to 300	55	orange	96	**9.409 474**
50 to 1000	71	blue	96	**9.409 475**
50 to 1250	76	green	96	**9.409 476**
50 to 1250	103	dark green	96	**6.238 120**
500 to 2500	115	red	48	**9.409 477**
100 to 5000	120	purple	24	**9.409 478**



3 Pipette tips epT.I.P.S. Standard

Original Eppendorf, high quality, pipette tips at an attractive price. *Eppendorf AG*
- packed in multi sealable bag
- tips available in various sizes from 10µl up to 10ml

Capacity µl	Length mm	Colour	PK	Cat. No.
0.1 to 10	34	anthracite	1000	**9.409 410**
0.1 to 20	40	grey	1000	**9.409 411**
0.5 to 20	46	light grey	1000	**9.409 412**
2 to 200	53	yellow	1000	**9.409 413**
20 to 300	55	orange	1000	**9.409 414**
50 to 1000	71	blue	1000	**9.409 415**
50 to 1250	76	green	1000	**9.409 416**
50 to 1250	103	dark green	1000	**6.238 121**
500 to 2500	115	red	500	**9.409 417**
100 to 5000	120	purple	500	**9.409 418**
1000 to 10000	165	turquoise	200	**9.409 403**
1000 to 10000	243	turquoise	200	**9.409 404**



4 epT.I.P.S. Standard, clear

Eppendorf AG

Capacity µl	Length mm	Colour	PK	Cat. No.
2 to 200	53	clear	1000	**9.409 407**
20 to 300	55	clear	1000	**9.409 408**
50 to 1000	71	clear	1000	**9.409 409**



5 epT.I.P.S. Reloads

- Practical refilling system for epT.I.P.S box *Eppendorf AG*
- Trays supplied either double-sided or as stack packs, depending on tip size
- Contamination-free transfer to the trays into the work box
- Autoclavable trays are available
- Colour-coded trays for simple identification of the tips.

Capacity µl	Length mm	Colour	PK	Cat. No.
0.1 to 10	34	anthracite	960	**9.409 450**
0.1 to 20	40	grey	960	**9.409 451**
0.5 to 20	46	light grey	960	**9.409 452**
2 to 200	53	yellow	960	**9.409 453**
20 to 300	55	orange	960	**9.409 454**
50 to 1000	71	blue	960	**9.409 455**
50 to 1250	76	green	960	**9.409 456**
50 to 1250	103	dark green	960	**6.238 117**
500 to 2500	115	red	480	**9.409 457**

E & OE.

1 2 epT.I.P.S. Reloads

Eppendorf AG

- practical refilling system for epT.I.P.S. Box
- workbox with tips
- autoclavable
- PCR quality
- certified free from human DNA, DNase, RNase and PCR inhibitor

Capacity µl	Length mm	Colour	PK	Cat. No.
0.1 to 10	34	anthracite	960	**9.409 460**
0.1 to 20	40	grey	960	**9.409 461**
0.5 to 20	46	light grey	960	**9.409 462**
2 to 200	53	yellow	960	**9.409 463**
20 to 300	55	orange	960	**9.409 464**
50 to 1000	71	blue	960	**9.409 465**
50 to 1250	76	green	960	**9.409 466**
50 to 1250	103	dark green	960	**6.238 118**
500 to 2500	115	red	480	**9.409 467**

1



2



3 4 epT.I.P.S. Racks, Biopur®

Eppendorf AG

Highest biological purity Eppendorf Biopur pipette tips
(sterile, pyrogen-, RNase-, DNA-, ATP-free)
- batch controlled
- batch specific certificate available on request
- individually boxed racks, 5 Boxes per pack

Capacity µl	Length mm	Colour	PK	Cat. No.
0.1 to 20	40	grey	480	**9.409 430**
2 to 200	53	yellow	480	**9.409 431**
20 to 300	55	orange	480	**9.409 432**
50 to 1000	71	blue	480	**9.409 433**
50 to 1250	76	green	480	**9.409 434**
50 to 1250	103	dark green	480	**6.238 119**
500 to 2500	115	red	240	**9.409 435**
1000 to 10000	165	turquoise	120	**9.409 405**

3



4



5 6 epT.I.P.S. Singles, Biopur®

Eppendorf AG

- Eppendorf Biopur® Individually blister-packed tips
- Batch number and the date of expiry indicated on each blister pack
- Batch specific certificate on request
- Biopur quality: sterile, Pyrogen, RNAse-, DNA and ATP free

Capacity µl	Length mm	Colour	PK	Cat. No.
0.1 to 20	40	grey	100	**9.409 420**
2 to 200	53	yellow	100	**9.409 421**
50 to 1000	71	blue	100	**9.409 422**

5



6



We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

eppendorf

1



2

two phase filter

1 2 epT.I.P.S. Dualfilter tips

Eppendorf AG

- Pipette tips boxed in racks with integral, twin-layer ep Dualfilter made from hydrophobic polyethylene without additives. One layer protects the user against aerosols, the other against airborne microbes
- All tips are **sterile, pyrogen free** and **PCR clean** (free from human DNA, DNase, RNase, PCR Inhibitors)
- batch specific certificate available on request
- The filter doesn´t retain liquid when accidentally wetted during aspiration, the whole sample can be recovered easily

Capacity µl	Length mm	Colour	PK	Cat. No.
0.1 to 10	34	anthracite	960	**9.409 440**
0.1 to 10	40	anthracite	960	**9.409 441**
0.5 to 20	46	light grey	960	**9.409 442**
2 to 20	53	yellow	960	**9.409 443**
2 to 100	55	yellow	960	**9.409 444**
2 to 200	59	yellow	960	**9.409 448**
20 to 300	55	orange	960	**9.409 445**
50 to 1000	76	blue	960	**9.409 446**
50 to 1250	103	dark green	480	**6.237 379**
100 to 5000	120	purple	120	**9.409 447**
1000 to 10000	243	blue	100	**9.409 406**

3



4



3 4 Pipette tips epT.I.P.S. LoRetention

Eppendorf AG

Ideally suited for all applications with samples that contain detergents:
- PCR and real-time PCR preparation of enzyme solutions and master mixes
- Isolation, purification and denaturation of proteins
- Restriction digestions and ligations
- Pipetting DNA ladders during gel electrophoresis

Features:
- Ultrahomogeneous surface for maximum reproducibility
- Ultrahydrophobic surface for minimum loss of sample
- Air bubbles and foaming are signifcantly reduced during pipetting
- Autoclavable, high chemical resistance - 5 year shelf life

Simple differentiation of racks and reloads through a new, clear lid with a white seal. When open, the text **LoRetention** can be seen from the inside. The reusable seal makes it also possible to label existing ep T.I.P.S. boxes.

Pipette tips epT.I.P.S. LoRetention Dual Filter, racks

PCR clean, sterile, pyrogene free. 10 x 96 tips.

Eppendorf AG

Capacity µl	Length mm	PK	Cat. No.
0.1 to 10	34	960	**9.409 425**
0.5 to 20	46	960	**9.409 426**
2 to 100	55	960	**9.409 427**
20 to 300	55	960	**9.409 428**
50 to 1000	76	960	**9.409 429**

Pipette tips epT.I.P.S. LoRetention, Reloads

10 x 96 tips.

Eppendorf AG

Type	Length mm	PK	Cat. No.
0.1 to 10	34	960	**9.409 495**
0.5 to 20	46	960	**9.409 496**
2 to 200	59	960	**9.409 497**
50 to 1000	76	960	**9.409 498**

Pipette tips epT.I.P.S. LoRetention, Reloads PCR clean

PCR clean, sterile, pyrogen-free. 10 x 96 tips.

Eppendorf AG

Capacity µl	Length mm	PK	Cat. No.
0.1 to 10	34	960	**9.409 490**
0.5 to 20	46	960	**9.409 491**
2 to 200	59	960	**9.409 492**
50 to 1000	76	960	**9.409 493**

E & OE.

1 Pipette tips, blackKnights



Conductive pipette tips. *Ritter GmbH*

The constant trend towards robotic pipetting systems has increased the requirements for high-quality consumables. With Ritter blackKnights even the smallest volumes can be precisely handled without any contamination risk. Their electrical conductivity allows the system to recognise the filling level and guarantees the minimal immersion of the tip into the liquid.

- Electrically conductive polypropylene
- Available in ready-to-use rack of 96 pipette tips or loose in bags
- Total tip capacity available: 20µl, 50µl, 200µl, 300µl, 1000µl or 1100µl
- Dimensional and fitting accuracy of the racked pipette tips guarantees safe robotic pipetting into the centre of the cavity with no risk of interference with the walls

Compatibility of robotic pipette tips blackKnights with the robotic instruments from:

1
Abbott Diagnostic: en4lisa, m2000
Bio-Rad: Evolis
Biotest: Quickstep
Dada Behring (Siemens): Bep 2000 Advance
Diasorin: Etimax 3000
Diffchamb: T4U
Euroimmun: Euroimmun Analyzer
Grifols: Triturus
Human: Elisys Quattro
Qiagen: Biorobot 3000, 8000, 9600, 9604
Virion/Serion: Immunomat TWINsystem

2
Tecan: Genesis, Freedom, Evo, Miniprep & Carvo Workstations
Perkin Elmer: Multiprobe II, Janus (w/ Multiprobe Head)

3
Beckman Coulter/Olympus: OLA 2500

Type	Capacity µl	compatible with	PK	Cat. No.
96 tips in rack	20	2	960	**9.409 564**
96 tips in rack, sterile	20	2	960	**9.409 565**
96 tips in rack	50	2	960	**9.409 566**
96 tips in rack, sterile	50	2	960	**9.409 567**
96 tips in rack, sterile, with filter	50	2	960	**9.409 568**
96 tips in rack	200	2	960	**9.409 594**
96 tips in bag	200	2	960	**9.409 595**
96 tips in rack, sterile	200	2	960	**9.409 569**
96 tips in rack, sterile, with filter	200	2	960	**9.409 570**
96 tips in rack	300	1	960	**9.409 590**
96 tips in bag	300	1	960	**9.409 591**
96 tips in rack, sterile	300	1	960	**9.409 560**
96 tips in rack, sterile, with filter	300	1	960	**9.409 561**
96 tips in rack	1000	2	960	**9.409 596**
96 tips in bag	1000	2	960	**9.409 597**
96 tips in rack, sterile	1000	2	960	**9.409 571**
96 tips in rack, sterile, with filter	1000	2	960	**9.409 572**
96 tips in rack	1100	1	960	**9.409 592**
96 tips in bag	1100	1	960	**9.409 593**
96 tips in rack, sterile	1100	1	960	**9.409 562**
96 tips in rack, sterile, with filter	1100	1	960	**9.409 563**
6 racks with 140 tips	1000	3	840	**9.409 558**
140 tips in bag	1000	3	1400	**9.409 559**



1



2



1 2 LLG-Disposable Reagent reservoirs, with clearly visible volume markings

NEW!

LLG-Reagent reservoirs offer a convenient solution for the temporary storage of non-solvent based liquids during any pipetting application. The system consists of disposable, crystal clear polystyrene inserts that fit into reusable bases with clearly visible volume markings. The pour-back spouts in the corners of the reservoir allow pouring back the liquid into the original container without spills. The reagent reservoirs are available in 25 or 100 ml in size and are stackable for space saving storage.

Features and benefits:
- Light is refracted so that graduations below the liquid surface become invisible, making it easier to identify the exact desired volume line.
- Pour-back spouts moulded into the corners of each reagent reservoir control liquid flow and enable the easy, spill-free return of reagent to its original container.

Delivery: 4 packs of 50 pcs., sterile wrapped, 1 base per case.

Capacity ml	Description	PK	Cat. No.
25	LLG Reagent Reservoirs incl. 1 base	200	**9.409 731**
100	LLG Reagent Reservoirs incl. 1 base	200	**9.409 732**

3



3 Reagent Reservoirs

With 25ml interval graduations and indents to prevent stacked reservoirs from sticking together. For multichannel pipettors. The bottom of each reservoir tapers down into a narrow trough, to help you get the last drop of liquid. *Heathrow Scientific*

Capacity ml	Description	PK	Cat. No.
55	PVC, clear, non-sterile	100	**6.236 945**
55	PS, white, non-sterile	100	**9.409 663**
55	PS, white, sterile	50	**9.409 666**
100	PS, white, non-sterile	100	**9.409 664**
100	PS, white, sterile	50	**9.409 667**

4



4 Reagent reservoirs

Polypropylene solution basin/reagent reservoir has a standard 50mL basin on one side and 12 individual 5mL basins on the other side. Wells are angled both downward and outward, guiding multichannel pipettor tips toward a centered position, which helps to avoid contamination and waste. Imprinted indices identify samples; loose-fitting lids prevent evaporation and contamination. Non-sterile. *Heathrow Scientific*

Type	PK	Cat. No.
Dual Solution	25	**9.409 665**

5

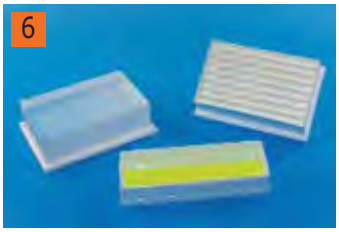


5 Multichannel pipette reservoir

PP. Translucent. Maximum filling volume 60ml. Suitable for multichannel pipettes with 8 or 12 channels. Autoclavable (121°C). *BRAND*

Description	PK	Cat. No.
non-sterile, with lid	10	**9.280 131**
sterile, without lid (single packed)	100	**9.280 132**
sterile, without lid (in bags with 5 pieces)	200	**9.280 133**

6



6 Multichannel Pipetting Reservoir

Three different, autoclavable reservoirs are available: *Thermo Scientific*
- 60ml reservoir with a V-shape for optimal utilisation
- 125ml reservoir with a sloping bottom
- 8-channel reservoir with 8 x 10ml volume, floor sloping to one side

Volume ml	PK	Cat. No.
1 x 60	5	**6.077 002**
8 x 10	10	**6.222 853**
1 x 125	10	**6.238 478**

E & OE.

1 Acrylic-dispensing box



Highly transparent, for dust-free storage and dispensing of disposables, such as microtubes, pipette tips etc.
With drop-on/ lift -off lid.

No. of chambers	Width mm	Length mm	Height mm	PK	Cat. No.
2	160	140	365	1	**9.301 540**
3	160	210	215	1	**9.301 541**
4	160	290	215	1	**9.301 542**

2 Storage system "MultiStore"



White, made of highly impact resistant polystyrol. Tilt bins made of crystal clear PS.
- for small components and accessories e.g. in industries, hospitals and laboratories
- dust-free and clean storage of contents
- multifunctional for individual storage solutions

Description	External dimensions (W x D x H) mm	Dimensions* (W x D x H) mm	PK	Cat. No.
4 tilt bins	601 x 171,5 x 206	125,5 x 128 x 133,5	1	**9.301 553**
3 tilt bins	601 x 198 x 238	176 x 149 x 161	1	**9.301 554**
2 tilt bins	601 x 310,5 x 353	265 x 221 x 241	1	**9.301 555**

*Dimensions of each single tilt bin

3 Pipettor Station Sharkfin™

Organize your lab workspace with three interlocking storage devices

Sharkfin™ Tip Rack Stand: Innovative design stores 96-well tip racks at a 10° angle: This makes accessing the tips easy! Tabs on the sides connect to the Sharkfin Pipettor Stand, Sharkfin Double Bin, or another Sharkfin Tip Rack Stand. Designed to hold one or two tip racks and is compatible with most 96 well racks. Both stand spaces allow tip rack lid to stay open.

Sharkfin™ Double Bin: Double Bin stores commonly used items such as pipette tips or tubes. Side tabs connect to Sharkfin Pipettor Stand, Sharkfin Tip Rack Stand, or another Sharkfin Double Bin. Hinged lids make filling/dispensing easy and keep products dust-free. Generous compartments store loose items securely.

Sharkfin™ Pipettor Stand: Pipettor Stand securely holds two pipettors and accommodates most pipettor brands. Side tabs connect to Sharkfin Tip Rack Stand, Sharkfin Double Bin, or another Sharkfin Pipettor Stand. Stand holds pipettors at an angle with gaps between allowing easy retrieval.

All stands constructed in translucent ABS with non-slip rubber feet.

Description	PK	Cat. No.
Pipettor Station Sharkfin™	1	**9.280 013**



1



1 Pipettors, positive displacement, stepper type, Multipette® plus

Eppendorf AG

- Easy to read: Combitip identification with digital volume display
- Positive displacement principle is ideal for viscous or high vapour pressure liquids
- Up to 100 dispensings from one fill for easy processing of long series
- 112 different volumes, also "non-standard" volumes, such as 1µl, 3µl and 17µl.
- Simple, variable volume setting from 1µl to 10ml
- Easy Combitip insertion without contact
- 2-year guarantee

2



2 3 Dispensers Multipette® Stream and Multipette® Xstream

Eppendorf AG

Applications
- dispensing volumes in long series
- electronic dispensing with memory functions
- contamination-free dispensing using positive displacement principle
- ideal for viscous solutions (e.g. glycerol, oil) or liquids with high vapour pressure (e.g. acetone, ethanol)

Product features, Multipette® Stream
- dispensing and pipetting according to positive displacement principle
- automatic dispensing
- rapid, ergonomic dispensing with motorized piston
- one-button tip ejector
- Li-Ion battery
- selection wheel
- automatic Combitip® plus tip recognition
- IVD conformity
- volume range from 1µl to 50ml
- charging possible whilst in use

Additional product features of Multipette® Xstream
- aspirating (pipetting of supernatants)
- titration
- sequential dispensing

3



Type	PK	Cat. No.
Multipette® stream incl. charger	1	**9.283 615**
Multipette® Xstream incl. charger	1	**9.283 616**
Charge stand for Multipette®/Repeater Stream/Xstream	1	**9.283 618**

4



4 5 Pipette tips, Biopur® Combitips®

Eppendorf AG

For RNase-, DNA-, ATP- and pyrogen-free work.
- continuous quality control by independent laboratory
- can be supplied with a batch-related quality certificate upon request

The Eppendorf Biopur seal stands for the highest biological purity. Eppendorf Biopur disposable products are guaranteed sterile, pyrogen-free, RNase-free, DNA-free and ATP-free. They therefore meet the highest requirements in the medical, pharmaceutical and food industries, in PCR technology, molecular biology and cell technology. This new dimension of purity is made possible because of a production process that is comprehensively automated through all of the manufacturing stages up to the end product and that excludes contamination with biological substances. Biopur Combitips, individually blister packed in outer cases of 100.

5



Type	Minimum Interval (µl)	Maximum Interval (µl)	PK	Cat. No.
1.25ml	25	125	100	**9.283 502**
12.5ml	250	1250	100	**9.283 505**

E & OE.

1 Pipette tips, Eppendorf Combitips advanced®

NEW!

Eppendorf AG

The Eppendorf Combitips have been completely redesigned and optimised so that they are capable of meeting the increased requirements of a modern laboratory to a greater extent than ever before. The result is the Combitips advanced®.
As they offer a wide variety of advantages in comparison with the Combitips plus, we talk about the 360° Evolution.
The Combitips advanced replace the Combitips plus. The Combitips advanced also function according to the positive displacement principle. Thus they always dispense the correct desired volume independently of the density of the liquid and its flow characteristics (e.g. increased vapour pressure or increased viscosity).
Working with radioactive, aggressive or toxic materials also becomes safer due to the hermetically sealed piston preventing aerosol contamination.
After dispensing with the Multipette, just eject the Combitips advanced and dispose of.

Whether Multipette 4780, Multipette plus, Multipette stream or Xstream the Combitips advanced are optimized for all Multipette models to create the perfect connection!

Type	Capacity ml	Colour code	PK	Cat. No.
Combitips advanced®	0.1	white	100	**9.283 135**
Combitips advanced®	0.2	light blue	100	**9.283 136**
Combitips advanced®	0.5	purple	100	**9.283 137**
Combitips advanced®	1.0	yellow	100	**9.283 138**
Combitips advanced®	2.5	green	100	**9.283 139**
Combitips advanced®	5.0	blue	100	**9.283 140**
Combitips advanced®	10.0	orange	100	**9.283 141**
Combitips advanced®	25.0	red	100	**9.283 142**
Combitips advanced®	50.0	light grey	100	**9.283 143**
Combitips advanced®, PCR clean	0.1	white	100	**9.283 144**
Combitips advanced®, PCR clean	0.2	light blue	100	**9.283 145**
Combitips advanced®, PCR clean	0.5	purple	100	**9.283 146**
Combitips advanced®, PCR clean	1.0	yellow	100	**9.283 147**
Combitips advanced®, PCR clean	2.5	green	100	**9.283 148**
Combitips advanced®, PCR clean	5.0	blue	100	**9.283 149**
Combitips advanced®, PCR clean	10.0	orange	100	**9.283 150**
Combitips advanced®, PCR clean	25.0	red	100	**9.283 151**
Combitips advanced®, PCR clean	50.0	light grey	100	**9.283 152**
Combitips advanced® Biopur®	0.1	white	100	**9.283 153**
Combitips advanced® Biopur®	0.2	light blue	100	**9.283 154**
Combitips advanced® Biopur®	0.5	purple	100	**9.283 155**
Combitips advanced® Biopur®	1.0	yellow	100	**9.283 156**
Combitips advanced® Biopur®	2.5	green	100	**9.283 157**
Combitips advanced® Biopur®	5.0	blue	100	**9.283 158**
Combitips advanced® Biopur®	10.0	orange	100	**9.283 159**
Combitips advanced® Biopur®	25.0	red	100	**9.283 160**
Combitips advanced® Biopur®	50.0	light grey	100	**9.283 161**
Combitips advanced® Assortment pack (1pc. of each size plus each 1pc. 25ml and 50ml adapter)			1	**9.283 167**

1



2



3



9.283 166

2 Accessories for Pipette tips, Eppendorf Combitips advanced®

NEW!

Eppendorf AG

Type	Capacity ml	Colour code	PK	Cat. No.
advanced® Adapter	25.0	red	1	**9.283 162**
advanced® Adapter	50.0	light grey	1	**9.283 163**
advanced® Adapter biopur®	25.0	red	7	**9.283 164**
advanced® Adapter biopur®	50.0	light grey	7	**9.283 165**
advanced® Rack for 8 Combitips			1	**9.283 166**



1 Manual repetitive pipette HandyStep® S

HandyStep® S - the repetitive pipette for any occasion! *BRAND*

Ideal for routine or research applications in diagnostics, molecular biology, environmental analysis, and many more. HandyStep® S and PD-tips work on the direct displacement principle. This offers the highest-precision dispensing of liquid media with high viscosity, high density, or high vapor pressure. Direct displacement permits contamination-free operation, since no aerosols are formed.

More data and facts:

- increased chemical resistance through innovative plastic materials
- easy tip mounting - PD-tip is now simply inserted from below
- dispensed volume range from 2 µl to 5ml
- up to 49 dispensing steps
- weighs only 108g
- suitable for use with BRAND PD-tips, Encode™ tips, Repet tips, Combitips®, Combitips® plus and other compatible dispenser tips
- CE- IVD -compliant

Items supplied
HandyStep® S, conformity-certified, with serial number, performance cerficate, operating manual, shelf/rack mount, 3 PD-Tips: 0.1ml, 1ml and 10ml.

Type	PK	Cat. No.
HandyStep® S incl. rack holder	1	**9.280 944**
Rack holder for HandyStep® S	1	**9.280 945**



2 Repetitive pipette HandyStep® electronic

Microprocessor-controlled manual repetitive pipette for fatigue-free use, serial dispensing in a wide range of applications. Ergonomic shape permits comfortable use and provides uniform precision, independent of user influence. *BRAND*

- automatic size recognition of new Brand PD tips with piston coding
- can be used with most other commercial dispenser tips
- variable volume setting between 1µl and 50ml
- LCD readout of volume, number of dispensing steps and aspirating/dispensing speed
- functions: dispensing, auto dispensing, pipetting with continuously variable volume
- innovative recharging dock concept reduces downtimes
- user-friendly, intuitive menu system
- auto dispensing with learning feature (average speed of first three dispensings memorized, then used for subsequent procedures during session)
- CE marked according to IVD 98/79 EG.
- NiMH battery pack can be recharged when fitted or separately.

Type	PK	Cat. No.
HandyStep® electronic, incl. NiMH battery pack, charging dock and 230V 50Hz power adapter with continental European plug*	1	**9.284 040**

*Other adapters (UK/Ireland, USA/Japan or Australia) are available on request.

Pipettors, positive displacement, stepper type, HandyStep® electronic, from BRAND

HandyStep® electronic with PD-Tip	Capacity	Subdivision	Accuracy (Nom. capacity ≤ ± %) 100 % / 50% / 10 % / 1%	Reproducibility (Nom. capacity ≤ %) 100 % / 50% / 10 % / 1%
0.1ml	1µl - 100µl	0.1µl	1.0 / 1.2 / 1.6 / 16	0.5 / 1.0 / 2.0 / 12
0.5ml	5µl - 100µl 100µl - 500µl	0.1µl 1µl	0.9 / 0.9 / 0.9 / 9	0.25 / 0.5 / 1 / 6
1.25ml	12.5µl - 100µl 100µl - 1000µl 1 ml - 1.25 ml	0.5µl 1µl 10µl	0.6 / 0.8 / 0.9 / 8	0.15 / 0.3 / 0.6 / 3.5
2.5ml	25µl - 1000µl 1 ml - 2.5 ml	1µl 10µl	0.5 / 0.5 / 0.8 / 8	0.1 / 0.2 / 0.4 / 2.5
5.0ml	50µl - 1000µl 1 ml - 5 ml	1µl 10µl	0.5 / 0.5 / 0.8 / 8	0.08 / 0.15 / 0.3 / 1.5
12.5ml	125µl - 1000µl 1 ml - 10 ml 10 ml - 12.5 ml	5µl 10µl 100µl	0.4 / 0.4 / 0.5 / 5	0.08 / 0.15 / 0.25 / 1.25
25ml	250µl - 10 ml 10 ml - 25 ml	10µl 100µl	0.3 / 0.3 / 0.3 / 3	0.08 / 0.15 / 0.25 / 1.25
50ml	500µl - 10 ml 10 ml - 50 ml	10µl 100µl	0.3 / 0.3 / 0.3 / 3	0.08 / 0.15 / 0.25 / 1.25

Tolerances according to ISO 8655.

1 Accessories for pipettors, positive displacement, stepper type, HandyStep® electronic



BRAND

Type	PK	Cat. No.
European plug, 230 V 50 Hz power supply only*	1	**9.284 041**
Charging dock only, without power supply	1	**9.284 042**
NiMH battery pack, spare	1	**9.284 043**

* Other power supplies on request.

2 Adapters



Adapters for 25ml and 50ml PD tips.

BRAND

Type	PK	Cat. No.
Adapter, non-sterile	10	**9.280 942**
Adapter, sterile*	5	**9.280 943**

* Individually packed.

3 Precision Dispenser Tips for Stepper Pipettors



BRAND

The BRAND PD-Tips from BRAND with patented size encoding are the ideal system component for the HandyStep® electronic (with automatic tip size recognition), HandyStep® S and HandyStep® from Brand. They can be used also with compatible, third-party dispensing systems. The automatic size detection option is available with HandyStep® electronic, Gilson® Repetman®, and Rainin AutoRep™ E. In addition, PD-Tips can be used with HandyStep®, HandyStep® S, Rainin AutoRep™ M, Eppendorf® Multipette® 4780 and EDOS® 5221 among others. PD-Tips are Conformity-certified, comply with ISO 8655 requirements and come with a batch certificate.
CE-marked according to IVD-Directive 98/79 EC. PD-Tips are available in 10 different sizes from 0.1ml to 50ml. They are available non-sterile, sterile/endotoxin-free (individually wrapped), as well as in Bio-Cert® quality (available on request). Bio-Cert® products are free from DNA, RNase and ATP.
Quality control is conducted at an independent, accredited test laboratory.
A batch-related certificate will be provided.
For 25 and 50ml tips, an adapter is required and is included.

Capacity ml	Type	PK	Cat. No.
0.10	non-sterile	100	**9.280 923**
0.50	non-sterile	100	**9.280 928**
1.00	non-sterile	100	**4.007 854**
1.25	non-sterile	100	**9.280 930**
2.50	non-sterile	100	**9.280 932**
5.00	non-sterile	100	**9.280 934**
10.00	non-sterile	100	**4.007 855**
12.50	non-sterile	100	**9.280 936**
25.00	non-sterile	50	**9.280 938**
50.00	non-sterile	25	**9.280 940**
0.10	sterile, endotoxin free	100	**9.280 924**
0.50	sterile, endotoxin free	100	**9.280 929**
1.00	sterile, endotoxin free	100	**4.007 856**
1.25	sterile, endotoxin free	100	**9.280 931**
2.50	sterile, endotoxin free	100	**9.280 933**
5.00	sterile, endotoxin free	100	**9.280 935**
10.00	sterile, endotoxin free	100	**4.007 857**
12.50	sterile, endotoxin free	100	**9.280 937**
25.00	sterile, endotoxin free	25	**9.280 939**
50.00	sterile, endotoxin free	25	**9.280 941**
0.10	sterile, Bio-Cert®	100	**6.229 625**
0.50	sterile, Bio-Cert®	100	**7.615 367**
1.00	sterile, Bio-Cert®	100	**4.007 858**
1.25	sterile, Bio-Cert®	100	**6.207 277**
2.50	sterile, Bio-Cert®	100	**9.409 653**
5.00	sterile, Bio-Cert®	100	**6.206 732**
10.00	sterile, Bio-Cert®	100	**4.007 859**
12.50	sterile, Bio-Cert®	100	**6.206 733**
25.00	sterile, Bio-Cert®	25	**9.409 656**
50.00	sterile, Bio-Cert®	25	**6.224 557**

1



1 Manual step dispenser, ripette®

Ritter GmbH

Ritter ripette® is a very comfortable device for hand dispensing of long series.
A special technical mechanism guarantees the precision of all selected dosage volumes:
1 to 5000µl.

Product advantages:
- Chart with dosage setting volumes incorporated into each dispenser.
- Lightweight (approx. 100g)
- Easy-to-use adjustment dial for the selection of dosage volume and the number of steps
- No mechanical parts that wear out, no maintenance

Description	PK	Cat. No.
ripette® with 25/50ml adaptor	1	**9.284 190**

2 3 Manual step dispenser, ripette® pro

NEW!

Ritter GmbH

- Due to its low weight the Ripette® pro is most-suitable for long dispensing series.
- Ergonomic design which allows an one-hand-operation of volume selection, loading and dispensing of liquids.
- The dosing table shows all dosing possibilities at a glance for choosing the most-suitable tip for your application.
- The Ripette pro is reliable and maintenance-free due to its robust design and a minimum of wear parts.
- By using selected premium materials the Ripette® pro shows a high resistance towards a broad range of chemicals.
- With the Ripette® pro you can work ! flexible and practical with 12 tip sizes, 10 volume adjustments and 120 program steps.

Description	PK	Cat. No.
Ripette® pro	1	**9.284 207**

2



3



Manual step dispenser, ripette® genX

1

Selecting the aliquots with the digital display and dispensing with high accuracy. *Ritter GmbH*
An extremely ergonomic design allows almost every aliquot to be dispensed in just one step.

- self-controlled tip-selection
- speed adjustment
- unbeatable accuracy and precision due to DC-motor
- electronic tip ejection
- the charging process also during the dispensing mode possible

Description	PK	Cat. No.
Comfort-Set ripette® genX with euro a.c. adapter and stand	1	**9.284 206** 1
ripette® genX mit Euro AC-Adapter	1	**9.284 202**



9.284 206

Accessories for manual step dispenser, ripette® genX

Description	PK	Cat. No.
Euro AC-Adapter for ripette® genX	1	**9.284 203**
Stand with loading function ripette® genX	1	**9.284 204**
Spare batterie ripette® genX	1	**9.284 205**

2 Dispenser tips ritips® professional

2



New generation of Ritter dispenser tips in 9 newly designed sizes, standard and bioclean® (sterile). Suitable for use together with Ritter ripette®, Multipette® 4780, HandyStep®, Minilab 100/1001, Stepmate, EasyStep, Distriman®, Multipette® plus* and HandyStep® electronic. Dosage volumes for use with Multipette® plus and other compatible systems are printed on each box.
CE-marking according to IVD-directive 98/79 EG on each box. *Ritter GmbH*

Type	PK	Cat. No.
0.1 ml / Standard	100	**9.284 191**
0.2 ml / Standard	100	**9.284 192**
0.5 ml / Standard	100	**9.284 193**
1.0 ml / Standard	100	**9.284 194**
2.5 ml / Standard	100	**9.284 195**
5.0 ml / Standard	100	**9.284 196**
10.0 ml / Standard	100	**9.284 197**
25.0 ml / Standard	25	**9.284 198**
50.0 ml / Standard	25	**9.284 199**
Tip-Mix, standard**	100	**9.284 200**
Adapter for25 ml and 50 ml Tips	1	**9.284 201**
0.1 ml / sterile	100	**9.284 210**
0.2 ml / sterile	100	**9.284 211**
0.5 ml / sterile	100	**9.284 212**
1.0 ml / sterile	100	**9.284 213**
2.5 ml / sterile	100	**9.284 214**
5.0 ml / sterile	100	**9.284 215**
10.0 ml / sterile	100	**9.284 216**
25.0 ml / sterile	25	**9.284 217**
50.0 ml / sterile	25	**9.284 218**

* When used with Multipette® plus the display is inoperative. Electronic tip recognition suppressed.
** Tip-mix consists of 20 x 0.5ml, 20 x 1.0ml, 20 x 2.5ml, 20 x 5.0ml and 20 x 10.0ml sizes.

1



1 Dispenser tips, ritips®

Precision dispenser tips by Ritter in 8 sizes standard and bioclean® (sterile). *Ritter GmbH*
Suitable for use together with Ritter ripette®, Multipette® 4780, HandyStep®, Minilab 100/101, Stepmate, EasyStep, Distriman® and HandyStep® electronic.
CE-marking according to IVD-directive 98/79 EG on each box.

Type	PK	Cat. No.
0.05 ml / standard	100	**9.284 220**
0.5 ml / standard	100	**9.284 221**
1.25 ml / standard	100	**9.284 222**
2.5 ml / standard	100	**9.284 223**
5.0 ml / standard	100	**9.284 224**
12.5 ml / standard	100	**9.284 225**
25.0 ml / standard	25	**9.284 226**
50.0 ml / standard	25	**9.284 227**
0.05 ml / sterile	100	**9.284 237**
0.5 ml / sterile	100	**9.284 230**
1.25 ml / sterile	100	**9.284 231**
2.5 ml / sterile	100	**9.284 232**
5.0 ml / sterile	100	**9.284 233**
12.5 ml / sterile	100	**9.284 234**
25.0 ml / sterile	25	**9.284 235**
50.0 ml / sterile	25	**9.284 236**

2



2 Pipettors, positive displacement, variable, repeating, Stepper™ 411

Highly comfortable pipette, intended for reliable repeat dispensing from 10 to 5000µl. *Socorex*
Unique trigger action mechanism eliminates thumb fatigue. Selected materials ensure reliability in use, day after day. Compact shape greatly limits internal instrument contamination. Wide selection between 53 different volumes; up to 73 doses per filling. Two-year warranty.

Product advantages
- 4-finger activation
- setting knobs bear clear indication of volumes and number of aliquots
- three positive displacement syringes, colour coded
- self-locking mechanism
- clear setting indication

Description	PK	Cat. No.
Stepper™ 411 supplied with colour-coded adjustment knobs, adapter, samples of Ecostep syringes	1	**9.411 561**
Spare PVC workstation	1	**9.411 567**
Spare adapters for 37.5ml (red) Ecostep syringe tips	5	**9.411 568**

3



3 Syringe tips, Ecostep

Individually wrapped sterile, or loose-packed non-sterile. *Socorex*

Type	PK	Cat. No.
Non-sterile, 0.75ml, 10 to 100µl	100	**9.411 509**
Sterile, 0.75ml, 10 to 100µl	100	**9.411 510**
Non-sterile, 3.75ml, 50 to 500µl	100	**9.411 511**
Sterile, 3.75ml, 50 to 500µl	100	**9.411 512**
Non-sterile, 37.5ml, 500 to 5000µl	100	**9.411 513**
Sterile, 37.5ml, 500 to 5000µl	100	**9.411 514**

E & OE.

1 Self-filling syringes Dosys™


1

Socorex

- Optimal hand balance and ergonomics
- Fast and reliable volume setting
- Excellent reproducibility
- Plunger tightness without O-ring
- High chemical resistance
- Fully autoclavable at 121°C/250°F
- Self-refilling automatic

Dosys™ classic 162/172
- Fill-by-fill (automatic) through needle or cannula
- Supplied without valve system
- Luer Lock nozzle

Package includes syringe, PVC protection sleeve and operating instructions.

Dosys™ classic 163/173
- Integrated valve system
- Luer Lock nozzle

Package includes syringe, one meter silicone feed tube, sinker, PVC protection sleeve, aspiration and vent cannulas, set of spare for valve, operating instructions.

Dosys™ premium 164/174
- Detachable valve system
- Enhanced corrosion resistance
- Luer Lock nozzle

Package includes syringe, one meter silicone feed tube, sinker, PVC protection sleeve, aspiration, vent and dosing cannulas, set of spare for valve, operating instructions.

Further Self-filling syringes available on request.

Type	Volume ml	Valve	With	PK	Cat. No.
Dosys™ basic 162	0.5 to 5	without	2-ring handle	1	**6.229 740**
Dosys™ classic 163	0.3 to 2	integrated	2-ring handle	1	**6.206 201**
Dosys™ premium 164	0,3 to 2	detachable	2-ring handle	1	**6.204 472**
Dosys™ premium 164	1 to 10	detachable	2-ring handle	1	**6.224 207**
Dosys™ basic 172	0.1 to 1	without	pistol grip	1	**9.411 524**
Dosys™ basic 172	0.3 to 2	without	pistol grip	1	**9.411 525**
Dosys™ basic 172	0.5 to 5	without	pistol grip	1	**9.411 526**
Dosys™ basic 172	1 to 10	without	pistol grip	1	**9.411 527**
Dosys™ classic 173	0.1 to 1	integrated	pistol grip	1	**6.205 165**
Dosys™ classic 173	0.5 to 5	integrated	pistol grip	1	**6.231 686**
Dosys™ classic 173	1 to 10	integrated	pistol grip	1	**6.230 535**
Dosys™ classic 173	5 to 20	integrated	pistol grip	1	**7.630 775**
Dosys™ premium 174	0.1 to 1	detachable	pistol grip	1	**9.411 520**
Dosys™ premium 174	0.3 to 2	detachable	pistol grip	1	**9.411 521**
Dosys™ premium 174	0.5 to 5	detachable	pistol grip	1	**9.411 522**
Dosys™ premium 174	1 to 10	detachable	pistol grip	1	**9.411 523**

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

SOCOREX SWISS

1



1 LLG-Bottletop dispenser

- Definitely the best choice to provide high precision with consistent delivery. Reliable measuring results with bubble-free dispensing.
- Individually calibrated in accordance with ISO 8655 standards and each unit is supplied with an individual calibration certificate.
- Highest degree of chemical resistance is provided due to the use of high quality materials in contact with dispensed liquids.
- Springless PTFE valve manifold ensures excellent chemical compatibility and leak proof valve functioning reproducibility.
- Specially designed PTFE piston with silicone O-ring ensures smooth, effortless piston movement.
- Dosing cylinder is protected against breaking by a polypropylene sleeve which prevents any glass splitting in case of any accidental breaking.
- The telescopic extractable intake tube can be adjusted easily and smoothly to the varying heights of the bottles.
- Nozzle cap reduces contact with air and prevents drying. No drips when the tip cover is attached.
- Each dispenser comes with five adaptors to fit in most of the laboratory reagent bottles.

Quick volume settings with the practical sets screw. After loosening the locking screw, desired volume can be set, then locking screw is fixed.

Volume ml	Grad. ml	PK	Cat. No.
0.3 - 2.5	0.05	1	**9.284 180**
0.5 - 5	0.10	1	**9.284 181**
1.0 - 10	0.20	1	**9.284 182**
2.5 - 30	0.50	1	**9.284 183**
5.0 - 60	1.00	1	**9.284 184**
10.0 - 100	2.00	1	**9.284 185**

2



2 Dispensers, bottle-top, POLYFIX®

Poulten & Graf

For dispensing of all chemicals, where polypropylene is resistant.
With vacuum calibrated, glass dispensing barrel.
Valve block not detachable for safety reasons.

- conformity-certified
- ergonomically designed plunger handle for comfortable operation
- user-friendly, volume setting with easy movement and rotatable fine adjustment
- PP valve block (GL32) with FIX adapter which aligns the dispenser on the bottle.

Not suitable for solvents.

Supplied with 2 x PP bottle adapters (GL40 and GL45).

Description	Volume ml	Grad. ml	PK	Cat. No.
with glass piston and clear glass cylinder*	2 to 10	0.50	1	**9.283 800**
with glass piston and clear glass cylinder*	10 to 50	1.00	1	**9.283 810**
with PTFE-coated piston and clear glass cylinder**	2 to 10	0.50	1	**9.283 801**
with PTFE-coated piston and clear glass cylinder**	10 to 50	1.00	1	**9.283 802**
with glass piston and amber dosing cylinder***	2 to 10	0.50	1	**9.283 803**
with glass piston and amber dosing cylinder***	10 to 50	1.00	1	**9.283 804**

* For dosing of aqueous media
**For dosing of weak acids and bases
***For dispensing light sensitive liquids

1 Dispensers, bottle-top, FORTUNA® OPTIFIX® BASIC

Poulten & Graf

For problem-free dispensing of aqueous media and acids as well as solutions subject to crystallization. With solid, PTFE-sleeved dispensing piston, highly polished, 100% corrosion-free, vacuum calibrated, plastic-coated, precision glass cylinder (visible dispensing process). Stopper ring made of fibre-glass reinforced, PTFE. Black-graduated, dispensing cylinder. PTFE valve block (no metal springs to contaminate the dispensed liquid).
With colour-coded handle inscriptions. Autoclavable.



Items supplied:
Dispenser without reservoir bottle, PTFE suction and discharge tubes and two PP bottle adapters (GL40 and GL45). Conformity-certified, with precision certificate.

Type	Volume	Grad.	Accuracy ≤ ± A% (max. vol.)	Reproducibility ≤ ± V% (max. vol.)	PK	Cat. No.
	ml	ml				
Basic-27	0.4 to 2	0.1	0.6	0.2	1	**9.287 902**
Basic-33	1 to 5	0.1	0.6	0.2	1	**9.287 903**
Basic-38	2 to 10	0.2	0.6	0.2	1	**9.287 904**
Basic-44	6 to 30	0.5	0.6	0.2	1	**9.287 905**
Basic-48	10 to 50	1.0	0.6	0.2	1	**9.287 906**
Basic-51	20 to 100	2.0	0.6	0.2	1	**9.287 907**
Basic-53	40 to 200	5.0	0.6	0.2	1	**9.287 908**
Basic-56*	60 to 300	5.0	0.6	0.2	1	**9.287 909**
Basic-58*	100 to 500	5.0	0.6	0.2	1	**9.287 951**

*not included in ISO 8655/5

2 Dispensers, bottle-top, FORTUNA® OPTIFIX® SAFETY

Poulten & Graf

For strong acids (excl. HF) and aggressive chemicals. Visible dispensing process, dispensing piston made of PTFE-sleeved, solid glass, with additional sealing lip at the end of the piston to prevent acid fumes and odours from escaping.
No metal springs in the valve block (no contamination of the dispensed liquid).
With colour-coded handle inscriptions.



Items supplied:
Dispenser without reservoir bottle, 1 discharge tube, incl. 2 PTFE-adapters (GL 40+45), 1 PTFE suction tube.

Type	Volume	Grad.	Accuracy ≤ ± A% (max. vol.)	Reproducibility ≤ ± V% (max. vol.)	PK	Cat. No.
	ml	ml				
Safety-27	0.4 to 2	0,1	0.6	0.2	1	**9.287 962**
Safety-33	1 to 5	0,2	0.6	0,2	1	**9.287 963**
Safety-38	2 to 10	0,5	0.6	0,2	1	**9.287 964**
Safety-44	6 to 30	1,0	0.6	0,2	1	**9.287 965**
Safety-48	10 to 50	1,0	0.6	0,2	1	**9.287 966**
Safety-51	20 to 100	2,0	0.6	0,2	1	**9.287 967**

3 Dispensers, bottle-top, FORTUNA® OPTIFIX® SAFETY S

Poulten & Graf

Bottle-top dispensers for dispensing strong fuming acids and very aggressive liquids, with safety stopcock and additional safety valve in the ventilation tube, with PTFE-encased dispensing piston with sealing lip, FIX adaptor made of solid PTFE, comes with 2 x PTFE GL40/GL45 adapters and PTFE inlet tube.



Type	Volume	Grad.	Accuracy ≤ ± A% (max. vol.)	Reproducibility ≤ ± V% (max. vol.)	PK	Cat. No.
	ml	ml				
Safety S-27	0.4 to 2	0.1	0.6	0.2	1	**6.206 600**
Safety S-33	1 to 5	0.2	0.6	0.2	1	**6.227 942**
Safety S-38	2 to 10	0.5	0.6	0.2	1	**9.287 995**
Safety S-44	6 to 30	1.0	0.6	0.2	1	**9.287 996**
Safety S-48	10 to 50	1.0	0.6	0.2	1	**9.287 997**
Safety S-51	20 to 100	2.0	0.6	0.2	1	**9.287 998**

1



1 Dispensers, bottle-top, FORTUNA® OPTIFIX® SOLVENT

Poulten & Graf

For organic solvents and liquid compounds that may swell PTFE. With vacuum calibrated, glass dispensing barrel and precision glass piston. Barrel graduated in black. Visible dispensing. PTFE valve block (GL32). With colour-coded plunger handles. Autoclavable.

Items supplied:
Dispenser without reservoir bottle, PTFE suction and discharge tubes and two PP bottle adapters (GL40 and GL45). Conformity-certified, with precision certificate.

Suitable bottles may be found in the Bottles section.

Type	Capacity ml	Grad. ml	Accuracy ≤ ± A% (max. vol.)	Reproducibility ≤ ± V% (max. vol.)	PK	Cat. No.
SOLVENT-27	0.4 to 2	0.10	0.6	0.2	1	**9.287 953**
SOLVENT-33	1 to 5	0.20	0.6	0.2	1	**9.287 954**
SOLVENT-38	2 to 10	0.50	0.6	0.2	1	**9.287 955**
SOLVENT-44	6 to 30	1.00	0.6	0.2	1	**9.287 956**
SOLVENT-48	10 to 50	1.00	0.6	0.2	1	**9.287 957**
SOLVENT-51	20 to 100	2.00	0.6	0.2	1	**9.287 958**
SOLVENT-53	40 to 200	5.00	0.6	0.2	1	**9.287 959**
SOLVENT-56*	60 to 300	5.00	0.6	0.2	1	**9.287 960**
SOLVENT-58*	100 to 500	5.00	0.6	0.2	1	**9.287 961**

* in addition to ISO 8655

2



2 Dispensers, bottle-top, FORTUNA UNIVERSAL® OPTIFIX® HF

Poulten & Graf

With solid PTFE dispensing barrel and glass-cored, PTFE coated plunger with seal (prevents acid vapours escaping from the storage bottle).
With colour-coded plunger handles.
Items supplied:
Hydrofluoric acid dispenser without reservoir bottle, with PTFE valve block (GL32), PTFE suction and discharge tubes and two PTFE bottle adapters (GL40 and GL45).

Type	Volume ml	PK	Cat. No.
HF-33	1 to 5	1	**9.287 970**
HF-38	2 to 10	1	**9.287 968**
HF-44	6 to 30	1	**9.287 969**
HF-48	10 to 50	1	**6.241 198**

3



3 Dispensers, VITLAB® genius

NEW!

VITLAB

- quick, easy and precise volume adjustment
- patented recirculation valve avoids reagent waste
- no drips after tube has been capped
- easy calibration adjustment
- High-quality materials (PTFE, PFA, FEP, borosilicate glass, platinum-iridium) ensure good chemical resistance to most acids, solvents and bases
- a positive displacement plunger with PFA seal minimizes the crystallization of liquids and therefore the possibility of the plunger jamming
- easy to dismantle for cleaning, no tools necessary
- completely autoclavable at 121°C
- can be rotated 360° on bottle
- certificate of conformity according to DIN 12600
- margin of error according to DIN EN ISO 8655-5: Accuracy <±0.5% (Nominal volume 0.25 - 2.5ml <±0.6%) Coefficient of variation <±0.1%
- items supplied: 3 polypropylene adapters (see chart), 1 telescopic inlet tube (200 to 350mm), 1 mounting tool, operation manual, quality certificate stating all test values
- with recirculation valve and media-specific recalibration

Volume ml	Grad. ml	Neck thread GL	Adapter	PK	Cat. No.
0.25 to 2.5	0.05	32	GL 28, 45, S 40	1	**9.284 022**
0.5 to 5.0	0.10	32	GL 28, 45, S 40	1	**9.284 023**
1.0 to 10.0	0.20	32	GL 28, 45, S 40	1	**9.284 024**
2.5 to 25.0	0.50	45	GL 32, 38, S 40	1	**9.284 025**
5.0 to 50.0	1.00	45	GL 32, 38, S 40	1	**9.284 026**
10.0 to 100.0	2.00	45	GL 32, 38, S 40	1	**9.284 027**

S 40 = saw tooth thread

E & OE.

1 Dispensers, VITLAB® simplex

NEW!

VITLAB

- quick, easy and precise volume adjustment
- no drips after tube has been capped
- high-quality materials (PTFE, PFA, FEP, borosilicate glass, platinum-iridium) ensure high chemical resistance against most acids, solvents and bases
- a positive displacement plunger with a PFA seal minimizes the crystallization of liquids and thus the clogging of the plunger
- easy to dismantle for cleaning, no tools necessary
- completely autoclavable at 121°C
- device can be rotated 360° on bottle
- certificate of conformity according to DIN 12600
- margin of error according to DIN EN ISO 8655-5: Accuracy <±0.5% (Nominal volume 0.25 - 2.5ml <±0.6%) Coefficient of variation <±0.1%
- items supplied: 3 polypropylene adapters (see chart), 1 telescopic inlet tube (200 to 350mm), 1 mounting tool, operation manual, quality certificate stating all test values
- with variable volume

1



Volume	Grad.	Neck thread	Adapter	PK	Cat. No.
ml	ml	GL			
0.25 to 2.5	0.05	32	GL 28, 45, S 40	1	**9.284 030**
0.5 to 5.0	0.10	32	GL 28, 45, S 40	1	**9.284 031**
1.0 to 10.0	0.20	32	GL 28, 45, S 40	1	**9.284 032**
2.5 to 25.0	0.50	45	GL 32, 38, S 40	1	**9.284 033**
5.0 to 50.0	1.00	45	GL 32, 38, S 40	1	**9.284 034**
10.0 to 100.0	2.00	45	GL 32, 38, S 40	1	**9.284 035**

S 40 = saw tooth thread

2 Bottle-top dispensers Calibrex™ organo 525/Calibrex™ solutae 530

NEW!

Socorex

Calibrex organo 525 models include a ground glass plunger, best suited for organics, non-crystallizing acid and base solutions.
Calibrex solutae 530 dispensers have a PFA coated plunger preventing plunger and barrel from seizing together. This enables trouble free distribution of salt solutions, weak and strong acids, as well as bases.

Volume ranges up to 25, 50 and 100 mL
Integrated calibration system
Choice of adjustment button with each unit
Long lasting performance stability
Autoclavable at 121°C fully assembled
Two-year warranty

Supplied with 45 mm base thread, 120 mm delivery jet and stopper, 350 mm feed tube, alternative screw-type volume setting button, three bottle neck adapters (32, 38 and 40 mm), QC certificate and operating instructions. Optional extended delivery jet (150 mm) available as accessory.

2



Type	Volume	Grad.	Accuracy ≤ ± A% (max. vol.)	± µl	Reproducibility ≤ ± V% (max. vol.)	± µl	Recycle valve	PK	Cat. No.
	ml	ml							
Calibrex™ organo 525	2.5 to 25	0.5	0.6	150	0.1	25	without	1	**9.411 562**
Calibrex™ organo 525	5 to 50	1.0	0.6	300	0.1	50	without	1	**9.411 563**
Calibrex™ organo 525	10 to 100	1.0	0.6	600	0.1	100	without	1	**9.411 564**
Calibrex™ solutae 530	2.5 to 25	0.5	0.6	150	0.1	25	without	1	**9.411 565**
Calibrex™ solutae 530	5 to 50	1.0	0.6	300	0.1	50	without	1	**9.411 566**
Calibrex™ solutae 530	10 to 100	1.0	0.6	600	0.1	100	without	1	**6.258 446**



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Dispensers, bottle-top, ceramus® classic

Hirschmann

With ceramic pistons. High precision, bottle-top dispensers adjustable in fixed steps for the reproducible dispensing of liquids. With patented, high-purity, alumino-ceramic pistons and highly polished, DURAN® glass cylinders, guaranteeing continual durability and precision.
- no surface abrasion
- no sticking due to plastic swelling
- no thermal expansion problems

Ratchet adjustment mechanism prevents accidental adjustment of the set volume. When not in use the pistons can be locked and the delivery tubes capped to prevent loss of reagent. The glass cylinders are encased in plastic for added safety and have a window for viewing the contents.Autoclavable up to max. 121°C/2bar.

- inlet and outlet valves are easily replaced
- fully supported delivery jet prevents 'side fling' of reagent
- screw-fixed, inlet suction tube
- supplied with one each A28, A45, S40 to fit most types of reagent bottle, suction tube with swivel nut, outlet jet and valve spanner.
- Works calibrated volume certificate with serial number and 12-month manufacturer's guarantee. Without reservoir bottle.
- High-grade materials (ECTFE, DURAN® glass, FEP) are used throughout.

Scope of supply: complete with thread A 32 mm, 3 thread adapters (A 28, A 45, S 40), 1 screw-coupled suction tube, 1 dischargetube unit with individual serial number and Single Calibration Report.



9.287 831

Volume ml	Dispensing steps	Accuracy ≤ ± A% (max. vol.)	Reproducibility ≤ ± V% (max. vol.)	PK	Cat. No.
0,2 - 1	0.05	0,6	0,2	1	**9.287 831** 1
0,4 - 2	0.05	0,6	0,1	1	**9.287 832**
1 - 5	0.10	0,6	0,1	1	**9.287 833**
2 - 10	0.25	0,6	0,1	1	**9.287 834**
5 - 30	0.50	0,6	0,1	1	**9.287 835**
10 - 60	1.00	0,6	0,1	1	**9.287 836**

Dispensers, bottle-top, ceramus®

Hirschmann

New dispenser technology from Hirschmann laboratory apparatus, with ceramic pistons. ceramus® are a high-precision, bottle-top dispenser range for almost all liquids.
- Environmentally-friendly, reagent-saving, recirculation valves
- Tough, ceramic pistons
- Simple, self-locking volume selection
- When not in use, pistons can be locked and delivery tubes capped to prevent loss of reagent.
- Fixed interval graduations give excellent reproducibility
- 45mm screw neck and adapters supplied allow use with a variety of reservoir bottles
- Smooth-action piston minimises operator fatigue during serial dispensing
- High-grade construction materials provide long operational life
- With individual serial number and Single Calibration Report



9.287 802

Type	Volume ml	Grad. ml	Accuracy ≤ ± A% (max. vol.)	Reproducibility ≤ ± V% (max. vol.)	PK	Cat. No.
Variable	0.2 to 1.0	0.05	0,6	0,2	1	**9.287 800**
Variable	0.4 to 2.0	0.05	0,6	0,2	1	**9.287 801**
Variable	1.0 to 5.0	0.1	0,6	0,2	1	**9.287 802** 2
Variable	2.0 to 10.0	0.25	0,6	0,2	1	**9.287 803**
Variable	5.0 to 30.0	0.5	0,6	0,2	1	**9.287 804**
Variable	10.0 to 60.0	1.0	0,6	0,2	1	**9.287 805**
Fixed	1.0	-	0,6	0,2	1	**9.287 806**
Fixed	2.0	-	0,6	0,2	1	**9.287 807**
Fixed	5.0	-	0,6	0,2	1	**9.287 808**
Fixed	10.0	-	0,6	0,2	1	**9.287 809**
Fixed	25.0	-	0,6	0,2	1	**9.287 815**
Fixed	50.0	-	0,6	0,2	1	**9.287 816**



1 Bottle holder for bottle-top dispenser ceramus® and digital burette solarus®

Suitable for all bottles up to diam. approx. 75mm to 120mm. *Hirschmann*

Description	PK	Cat. No.
Bottle holder	1	**9.287 820**



2 Bottle-top dispenser Dispensette®

The Dispensette® bottle-top dispenser has proven itself the world over with its wide range of practical applications. It has been continuously improved over decades to meet the increasing demands of the laboratory. *BRAND*

Brand offers three different models of Dispensette®:
- Dispensette® III: the approved dispenser for acids, alkalies, hydrochloric acids and many other organic solutions.
- Dispensette® Organic: especially for dispensing organic solvents and acids.
- Dispensette® TA: Trace Analysis for the dispensing of high-purity chemicals and for dispensing hydrofluoric acid.

(A detailed chemical compatibility chart is available to download from the supplier's website.)

The Dispensette® is available in different types:

Dispensette® Digital Easy Calibration:
- Digital display: especially easy to read, and dispensing volume can be set accurately and reproducibly (mechanical counter).
- Easy Calibration: Innovative technique for adjustment in seconds without tools.

Dispensette® Analog-adjustable:
- Fast volume adjustment with analog slide.
- Simple calibration adjustment with supplied tool.

Dispensette® Fixed-volume:
- Fixed-volume for standard applications.
- Simple calibration adjustment with supplied tool.

In general every Dispensette® offers:
- SafetyPrime™ recirculation valve (optional) reduces risk of splashes caused by air bubbles during instrument priming and permits recirculation during priming to avoid reagent waste.
- The integrated safety discharge system reduces the risk of inavertent dispensing and splashes if discharge tube is improperly installed or missing.
- Discharge tube safety screw cap protects against reagent contact and is easy to attach and remove, even while wearing gloves.
- To allow the bottle label to face the user, the valve block can be rotated 360°.
- Telescoping filling tube adjusts easily to different size bottles - without measuring or cutting.
- The minimal force needed to operate the floating piston makes serial dispensing convenient and effortless.
- Easy to dismantle for cleaning and replaceable filling valves.
- Conformity certified
- Easy to calibrate and adjust in order to comply with ISO 9001 and GLP guidelines.
- Autoclavable (121°C)

Items supplied: Dispensette®, conformity certified and supplied with performance certificate, discharge tube, telescopic filling tube, SafetyPrime™ recirculation valve (optional), mounitng tool and adapters of PP.

1 Bottle-top dispensers, seripettor®/seripettor® pro



The economy dispensers for routine dispensing *BRAND*

The seripettor® and seripettor® pro are innovative bottle-top dispensers with a special design. A lifting spring provides automatic filling. When the piston seal is worn out, the entire dispensing unit can be exchanged by the user rapidly and easily, without tools. Eliminating expensive repairs!

- low-cost replaceable dispensing cartridge with wiping seal. One spare dispensing cartridge included.
- semi-automatic dispensing. The spring loaded piston refills the cylinder after dispensing.
- volume setting. Toothed setting track allows quick and precise adjustment of desired volume.
- disassembles without tools. All parts can be replaced quickly. The innovative design of seripettor®/seripettor® pro makes cleaning and maintenance easy
- fits most bottles

seripettor®
For dispensing alkaline, buffer and vitamin solutions, as well as culture media, e.g. agar nutrient medium, up to 60°C.

seripettor® pro
Broader scope of application compared to the seripettor®; for dispensing many acidic, alkaline and saline solutions, and solvents such as essential oils.

Items supplied
Discharge tube, filling tube, spare dispensing cartridge and adapters, PP (GL45/32 and GL45/S40).

Type	Volume	Grad.	Accuracy ≤ ± A% (max. vol.)	Reproducibility ≤ ± V% (max. vol.)	PK	Cat. No.
	ml	ml				
seripettor®	0.2 to 2	0.04	1.2	0.2	1	**9.284 849**
seripettor®	1 to 10	0.2	1.2	0.2	1	**9.284 850**
seripettor®	2.5 to 25	0.5	1.2	0.2	1	**9.284 851**
seripettor® pro	0.2 to 2	0.04	1.2	0.2	1	**9.284 854**
seripettor® pro	1 to 10	0.2	1.2	0.2	1	**9.284 852**
seripettor® pro	2.5 to 25	0.5	1.2	0.2	1	**9.284 853**

* End test values relate to the nominal values (= max. volume) printed on the dispenser when the temperature (20°C) of the device, environment and distilled water is uniform, and when operated smoothly.

2 Bottle-top dispenser Dispensette® III Fix



Dispensette® III, fixed volume, conformity certified. *BRAND*
Further fixed volume dispensers (from 0.5 up to 100ml) are availlable on request.

Volume	Accuracy ≤ ± A% (max. vol.)	± µl	Reproducibility ≤ ± V% (max. vol.)	± µl	Recycle valve	PK	Cat. No.
ml							
1	0.5	5	0.1	1	with	1	**9.284 441**
2	0.5	10	0.1	2	with	1	**9.284 445**
5	0.5	25	0.1	5	with	1	**9.284 451**
10	0.5	50	0.1	10	with	1	**9.284 455**
1	0.5	5	0.1	1	without	1	**9.284 440**
2	0.5	10	0.1	2	without	1	**9.284 444**
5	0.5	25	0.1	5	without	1	**9.284 450**
10	0.5	50	0.1	10	without	1	**9.284 454**



1 Bottletop Dispenser Dispensette® III, Analog-adjustable

BRAND

The wide range of Dispensette® dispensers provides premium dispensing options for the complete spectrum of liquid reagents. Dispensette® III (red color-code): For dispensing aggressive reagents, including concentrated acids such as H3PO4, H_2SO_4, bases like NaOH, KOH, saline solutions, as well as many organic solvents - directly from the supply bottle.
Fast volume adjustment with analog slide. Simple calibration adjustment with supplied tool. A positive indicator automatically indicates adjustment from factory settings. The Dispensette® is easy for dismantle for cleaning, has replaceable filling valves and is autoclavable at 121°C. The parts of the Dispensette® III which are in contact with medium consists of the following high-grade materials: borosilicate glass, ceramic, platinum-iridium, PTFE, FEP and PFA. The discharge tube safety screw cap is PP. Operating limits: vapor pressure max. 600 mbar, viscosity max. 500mm²/s, temperature max. 40°C, density max. 2.2g/cm³.

Items supplied with: Each Dispensette® is conformity certified and supplied with performance certificate, discharge tube, telescoping filling tube, SafetyPrime(TM) recirculation valve (optional), mounting tool and adapters of polypropylene .

Volume ml	Grad. ml	Accuracy ≤ ± A% (max. vol.)	± µl	Reproducibility ≤ ± V% (max. vol.)	± µl	Recycle valve	PK	Cat. No.
0,05 - 0,5	0,01	1,0	5	0,2	1	without	1	**9.284 404**
0,05 - 0,5	0,01	1,0	5	0,2	1	with	1	**9.284 405**
0,2 - 2	0,05	0,5	10	0,1	2	without	1	**9.284 410**
0,2 - 2	0,05	0,5	10	0,1	2	with	1	**9.284 411**
0,5 - 5	0,10	0,5	25	0,1	5	without	1	**9.284 414**
0,5 - 5	0,10	0,5	25	0,1	5	with	1	**9.284 415**
1 - 10	0,20	0,5	50	0,1	10	without	1	**9.284 420**
1 - 10	0,20	0,5	50	0,1	10	with	1	**9.284 421**
2,5 - 25	0,50	0,5	125	0,1	25	without	1	**9.284 424**
2,5 - 25	0,50	0,5	125	0,1	25	with	1	**9.284 425**
5 - 50	1,00	0,5	250	0,1	50	without	1	**9.284 430**
5 - 50	1,00	0,5	250	0,1	50	with	1	**9.284 431**
10 - 100	1,00	0,5	500	0,1	100	without	1	**9.284 434**
10 - 100	1,00	0,5	500	0,1	100	with	1	**9.284 435**



2 Bottletop Dispenser Dispensette® Organic, Analog-adjustable

BRAND

The wide range of Dispensette® dispensers provides premium dispensing options for the complete spectrum of liquid reagents. Dispensette® Organic (yellow color-code):
ideal for dispensing of organic solvents including chlorinated and fluorinated hydrocarbons (e.g., trichlorotrifluoroethane and dichloromethane), concentrated acids (e.g., HCl and HNO_3), trifluoroacetic acid (TFA), tetrahydofuran (THF) and peroxides.

Fast volume adjustment with analog slide. Simple calibration adjustment with supplied tool.
Alteration of factory setting is automatically indicated by a red recalibration flag. The Dispensette® is easy for dismantle for cleaning, has replaceable filling valves and is autoclavable at 121°C. The parts of the Dispensette® ORGANIC which are in contact with medium consists of the following high-grade materials: borosilicate glass, Al_2O_3-ceramic, tantalum, PTFE, FEP, PFA and PP (discharge tube safety screw cap). Operating limits: vapor pressure max. 600 mbar, viscosity max. 500 mm²/s, temperature max. 40°C, density max. 2.2 g/cm³.

Items supplied with: Each Dispensette® is conformity certified and supplied with performance certificate, discharge tube, telescoping filling tube, SafetyPrime(TM) recirculation valve (optional), mounting tool and adapters of polypropylene .

Volume ml	Grad. ml	Accuracy ≤ ± A% (max. vol.)	± µl	Reproducibility ≤ ± V% (max. vol.)	± µl	Recycle valve	PK	Cat. No.
0,5 - 5	0,1	0,5	25	0,1	5	without	1	**9.284 078**
0,5 - 5	0,1	0,5	25	0,1	5	with	1	**9.284 082**
1 - 10	0,2	0,5	50	0,1	10	without	1	**9.284 079**
1 - 10	0,2	0,5	50	0,1	10	with	1	**9.284 083**
2,5 - 25	0,5	0,5	125	0,1	25	without	1	**9.284 080**
2,5 - 25	0,5	0,5	125	0,1	25	with	1	**9.284 084**
5 - 50	1,0	0,5	250	0,1	50	without	1	**9.284 081**
5 - 50	1,0	0,5	250	0,1	50	with	1	**9.284 085**
10 - 100	1,0	0,5	500	0,1	100	without	1	**9.284 086**
10 - 100	1,0	0,5	500	0,1	100	with	1	**9.284 087**

E & OE.

1 Bottle-top dispensers, Dispensette® Organic Fix

Further fixed volume dispensers (from 2 up to 100ml) are availlable on request. *BRAND*



Volume ml	Accuracy ≤ ± A% (max. vol.)	± µl	Reproducibility ≤ ± V% (max. vol.)	± µl	Recycle valve	PK	Cat. No.
5	0.5	25	0.1	5	without	1	**9.284 088**
5	0.5	25	0.1	5	with	1	**9.284 089**
10	0.5	50	0.1	10	without	1	**9.284 092**
10	0.5	50	0.1	10	with	1	**9.284 093**

2 Bottletop Dispenser Dispensette® TA, Analog

Dispensette® TA provides outstanding performance for precise-volume dispensing of high-purity media for trace analysis. The components of the fluid path are constructed of the highest purity materials, such as PFA, PTFE and sapphire. *BRAND*

- Plastics in contact with media consist of high-purity materials such as PTFE, ETFE, FEP, and PFA.
- The purest sapphire is used for replaceable valves. Depending on the application, platinum-iridium or tantalum are available as spring materials.
- The 45mm standard thread plus the included adapters fit most common lab bottles.
- The valve block can be rotated 360° so that the bottle label always faces the user for safety.
- Telescoping filling tube adjusts to different bottle sizes
- Easy disassembly for replacement of the dispensing cartridge



Volume ml	Valve spring	Grad. ml	Accuracy ≤ ± A% (max. vol.)	± µl	Reproducibility ≤ ± V% (max. vol.)	± µl	Recycle valve	PK	Cat. No.
1 to 10	Pt / Ir	0.2	0.5	50	0.1	10	without	1	**4.007 914**
1 to 10	Pt / Ir	0.2	0.5	50	0.1	10	with	1	**4.007 915**
1 to 10	Tantalum	0.2	0.5	50	0.1	10	without	1	**4.007 916**
1 to 10	Tantalum	0.2	0.5	50	0.1	10	with	1	**4.007 917**

3 Bottle-top dispensers Dispensette® III

Dispensette® III, Easy Calibration, conformity certified. *BRAND*

- Dispensette® III offers a broad application range for dispensing aggressive reagents, including strong acids such as H_3PO_4, H_2SO_4, alkaline solutions such as NaOH, KOH, saline solutions as well as a number of organic solvents. For fuming, concentrated HCl and HNO_3 and for trifluoroacetic acid (TFA), tetrahydrofuran (THF), dichloromethane and peroxide we recommend Dispensette® Organic

- Those components which come into contact with liquids are made of the following high-grade materials: borosilicate glass, ceramic, platinum-iridium, ETFE, FEP, PFA and PP (discharge tube screw cap).

- Restrictions: vapour pressure max. 600 mbar, viscosity max. 500 mm²/s, temperature max. 40°C, min. 4°C, density max. 2.2 g/cm³.



Volume ml	Grad. ml	Accuracy ≤ ± A% (max. vol.)	± µl	Reproducibility ≤ ± V% (max. vol.)	± µl	Recycle valve	PK	Cat. No.
0.2 to 2	0.01	0.5	10	0.1	2	with	1	**9.284 461**
0.5 to 5	0.02	0.5	25	0.1	5	with	1	**9.284 465**
1 to 10	0.05	0.5	50	0.1	10	with	1	**9.284 471**
2.5 to 25	0.10	0.5	125	0.1	25	with	1	**9.284 475**
5 to 50	0.20	0.5	250	0.1	50	with	1	**9.284 481**
0.2 to 2	0.01	0.5	10	0.1	2	without	1	**9.284 460**
0.5 to 5	0.02	0.5	25	0.1	5	without	1	**9.284 464**
1 to 10	0.05	0.5	50	0.1	10	without	1	**9.284 470**
2.5 to 25	0.10	0.5	125	0.1	25	without	1	**9.284 474**
5 to 50	0.20	0.5	250	0.1	50	without	1	**9.284 480**

1



1 Bottle-top dispensers Dispensette® Organic

BRAND

Dispensette® Organic (colour coded yellow), variable volume, is the ideal device for dispensing solvents, e.g. chlorinated and fluorinated hydrocarbons such as trichlorotrifluoroethane and dichloromethane, or concentrated acids such as fuming HCl and HNO_3, trifluoroacetic acid, tetrahydrofuran and peroxides.
For alkaline and saline solutions we recommend Dispensette® III.

Components which come into contact with liquid are made of the following high-grade materials: borosilicate glass, ceramic, tantalum, PTFE, FEP, PFA and PP (discharge tube screw cap).
Restrictions: vapour pressure max. 600mbar, viscosity max. 500 mm^2/s, temperature max. 40°C, density max. 2.2 g/cm^3.

Dispensette® Organic, Easy Calibration, conformity certified

Volume ml	Grad. ml	Accuracy ≤ ± A% (max. vol.)	± µl	Reproducibility ≤ ± V% (max. vol.)	± µl	Recycle valve	PK	Cat. No.
0.5 to 5	0.02	0.5	25	0.1	5	without	1	**9.284 070**
0.5 to 5	0.02	0.5	25	0.1	5	with	1	**9.284 074**
1 to 10	0.05	0.5	50	0.1	10	without	1	**9.284 071**
1 to 10	0.05	0.5	50	0.1	10	with	1	**9.284 075**
2.5 to 25	0.1	0.5	125	0.1	25	without	1	**9.284 072**
2.5 to 25	0.1	0.5	125	0.1	25	with	1	**9.284 076**
5 to 50	0.2	0.5	250	0.1	50	without	1	**9.284 073**
5 to 50	0.2	0.5	250	0.1	50	with	1	**9.284 077**

2



2 Check flasks, DAkkS calibrated, borosilicate glass 3.3, class A, with 3 marks, blue graduations

NEW!

BRAND

BLAUBRAND®, DIN EN ISO 1042. Calibrated to contain (TC, IN). DAkkS (former DKD) certificate included.
The volumetric flask with 3 marks is used to check the functioning of a dispenser. The mark in the middle shows the nominal volume, the upper and lower marks show the error limits as specified in the table below.
If the error limit is exceeded even with repeated measurements, the dispenser is defective.
The DAkkS-calibrated volumetric flask does not replace the gravimetric test of the monitoring of measuring instruments according to ISO 8655.

For	NS	PK	Cat. No.
Dispensette® 10 ml	10 / 19*	1	**9.276 010**
Dispensette® 25 ml	10 / 19	1	**9.276 011**
Dispensette® 50 ml	12 / 21	1	**9.276 012**
Dispensette® 100 ml	14 / 23	1	**9.276 013**

* Neck/ground socket connection enlarged, other sizes on demand.

3



3 Dispenser/bottle-top flasks, amber soda-lime glass

BRAND

Amber soda-lime glass.With PP screw cap and PE-LD pouring ring.Reservoir bottles.
Space-saving, square design, except 2500ml reservoir which is cylindrical.

Capacity ml	Neck thread GL	Width mm	Height mm	PK	Cat. No.
100	32	50	125	1	**9.284 541**
250	32	65	160	1	**9.284 542**
500	32	80	195	1	**9.284 543**
1000	45	95	230	1	**9.284 544**
2500*	45	140	300	1	**9.284 545**

* cylindrical design

More bottles please see page 58

1 Burettes, with straight stopcock, borosilicate glass 3.3, class AS

With class AS, conformity certified, with batch identification, blue graduations, DIN EN 385.
PTFE spindle.

Isolab

Capacity	Grad.	Tolerance	Description	PK	Cat. No.
ml	ml	± ml			
10	0.02	0.020	with Schellbach line	1	**4.008 311**
25	0.05	0.030	with Schellbach line	1	**9.270 100**
50	0.10	0.050	with Schellbach line	1	**9.270 101**
10	0.02	0.020	without Schellbach line	1	**9.270 102**
25	0.05	0.030	without Schellbach line	1	**9.270 103**
50	0.10	0.050	without Schellbach line	1	**9.270 104**

1



Burettes, with straight stopcock, DURAN®, Class AS

Schellbach line for easier reading, conformity certified, with dated batch identification, high-contrast blue graduations, ring graduation at major subdivisions,
EX (TD) calibrated, acc. to DIN 12700 T2. Scale length approx. 500mm.
The batch certificate is available to download from the manufacturer's website.

Hirschmann

Capacity	Grad.	Tolerance	Stopcock with	PK	Cat. No.
ml	ml	± ml			
10	0.02	0.02	Glass key	1	**9.270 161** 2
25	0.05	0.05	Glass key	1	**9.270 162**
50	0.1	0.1	Glass key	1	**9.270 163**
10	0.02	0.02	PTFE spindle	1	**9.270 164** 3
25	0.05	0.05	PTFE spindle	1	**9.270 165**
50	0.1	0.1	PTFE spindle	1	**9.270 166**
10	0.02	0.02	PTFE key	1	**9.270 167** 4
25	0.05	0.05	PTFE key	1	**9.270 168**
50	0.1	0.1	PTFE key	1	**9.270 169**

2



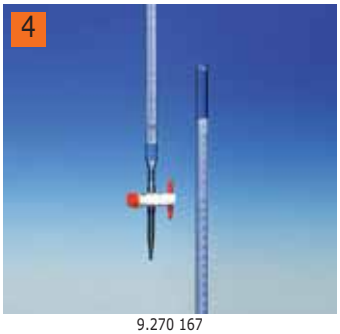
9.270 161

3



9.270 164

4



9.270 167

1



1 Burettes, with straight stopcock, borosilicate glass 3.3, Class AS

BLAUBRAND®. DIN EN ISO 385. *BRAND*
Conformity certified. Calibrated to deliver (TD, EX). Schellbach stripe. Length approx. 800mm.
Ring graduations at major subdivisions. Marks and inscriptions in high contrast blue enamel.
With batch number and one batch certificate per pack included.
Also available with individual works, USP or DAkkS (former DKD) calibration certificate, please enquire.
The batch certificate is also available to download from the manufacturer's website.

Capacity	Grad.	Accuracy	Stopcock with	PK	Cat. No.
ml	ml	± ml			
10	0.02	0.02	PTFE spindle	1	**9.270 115**
25	0.05	0.03	PTFE spindle	1	**9.270 116**
50	0.1	0.05	PTFE spindle	1	**9.270 117**
10	0.02	0.02	Glass key	1	**9.270 118**
25	0.05	0.03	Glass key	1	**9.270 119**
50	0.1	0.05	Glass key	1	**9.270 120**

2



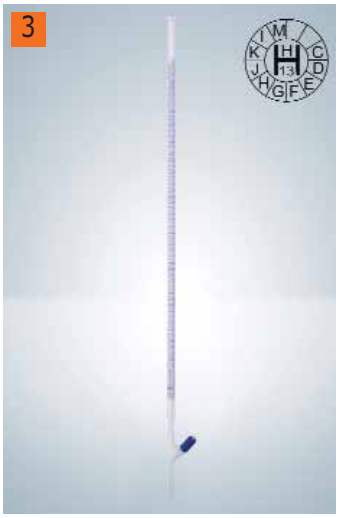
2 Burette with straight standard ground stopcock, DURAN®, class AS

NEW!

The original DURAN® burettes are manufactured from chemically highly resistant borosilicate glass 3.3. Thanks to the precise scale, they are ideal for titration. *DURAN Group*
Calibration is based on the released volume ("Ex") at a + 20°C reference temperature. This means the fluid quantity released can be taken exactly from the scale, as the liquid adhesion to the glass is taken into account in the calibration. Volume content tolerances conform to DIN and ISO accuracy limits. From now on the approved DURAN® burettes are also available with PTFE keys. Unlike the glass keys, the PTFE keys need not be greased, which makes work in the laboratory easier.
- Available in three sizes, the right burette for each application
- Proven DURAN® properties
- With Schellbach stripe and main graduations as circular divisions
- Conforms to ISO 385
- Autoclavable
- Corresponds to USP/EP and JP guidelines

Capacity	Grad.	Tolerance	Stopcock with	Height	PK	Cat. No.
ml	ml	± ml		mm		
10	0.02	0.02	Glass key	750	1	**7.022 042**
25	0.05	0.03	Glass key	750	1	**7.022 043**
50	0.1	0.05	Glass key	750	1	**7.022 044**
100	0.2	0.1	Glass key	750	1	**9.270 925**
10	0.02	0.02	PTFE key	750	1	**9.270 921**
25	0.05	0.03	PTFE key	750	1	**9.270 922**
50	0.1	0.05	PTFE key	750	1	**9.270 923**
100	0.2	0.1	PTFE key	750	1	**9.270 924**

3



3 Burettes, with lateral stopcock, DURAN®, Class AS

With Schellbach stripe. EX (TD) calibrated. With dated batch identification. Conformity certified. *Hirschmann*
High-contrast blue graduation for easier reading. Main point ring graduation, lateral stopcock with glass key or with PTFE-Spindle, DIN EN ISO 385. Scale length 500mm.
For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Capacity	Grad.	Tolerance	Stopcock with	PK	Cat. No.
ml	ml	± ml			
10	0.02	0.02	Glass key	1	**9.270 155**
25	0.05	0.03	Glass key	1	**9.270 156**
50	0.1	0.05	Glass key	1	**9.270 157**
10	0.02	0.02	PTFE spindle	1	**9.270 158**
25	0.05	0.03	PTFE spindle	1	**9.270 159**
50	0.1	0.05	PTFE spindle	1	**9.270 160**

1 Burettes, with lateral stopcock, borosilicate glass 3.3, Class AS

BLAUBRAND®. DIN EN ISO 385. Conformity certified. *BRAND*
With batch number. Graduations and inscriptions in highly contrasting blue enamel.
With Schellbach stripe. Length approx. 800mm. Calibrated to deliver.

All BLAUBRAND® burettes are delivered with batch number and one batch certificate included per manufacturer's pack.
Also available with individual works, USP or DAkkS (former DKD) calibration certificate, please enquire.
The batch certificate is also available to download from the manufacturer's website.


1

Capacity	Grad.	Accuracy	Stopcock with	PK	Cat. No.
ml	ml	± ml			
10	0,02	0,02	PTFE spindle	1	**9.270 144**
25	0,05	0,03	PTFE spindle	1	**9.270 147**
50	0,1	0,05	PTFE spindle	1	**9.270 148**
10	0,02	0,02	Glass key	1	**9.270 121**
25	0,05	0,03	Glass key	1	**9.270 122**
50	0,1	0,05	Glass key	1	**9.270 125**

Automatic burettes, schilling pattern, borosilicate glass 3.3/PE-LD

Isolab

- Described as automatic burettes with fast titration and practical usage.
- Especially suitable for field analysis where there is a risk of breaking.
- The entire system consists of a burette tubing with automatic zeroing system together with a valve stopcock, a reservoir bottle and a bottle stand.
- Rapid filling by squeezing the bottle and fast titration by valve stopcock
- Inscriptions and graduations are printed either with blue enamel or with white enamel which is specially designed for glass use.
- Clear burettes are manufactured with schellbach stripe.
- Amber burettes are manufactured without schellbach stripe.
- 10ml burette has a polyethylene reservoir bottle of 500ml volume whereas 25 and 50ml burettes are used with bottles of 1000ml volume.


2 4.008 314


3 4.008 316

Capacity	Grad.	Accuracy	Description	PK	Cat. No.
ml	ml	± ml			
10	0,05	0,030	clear glass, schellbach, blue graduated	1	**4.008 314** 2
25	0,10	0,050	clear glass, schellbach, blue graduated	1	**6.241 904**
50	0,10	0,050	clear glass, schellbach, blue graduated	1	**4.008 315**
10	0,05	0,030	amber, without schellbach, white graduated	1	**4.008 316** 3
25	0,10	0,050	amber, without schellbach, white graduated	1	**4.008 317**
50	0,10	0,050	amber, without schellbach, white graduated	1	**4.008 318**

Automatic burettes acc. Dr. Schilling pattern, blue graduated, DURAN®

Fast flow burette with 500ml plastic reservoir bottle (up to 10ml) or 1000ml (up to 15ml). Schellbach stripe and graduation in high contrast blue enamel, scale length approx. 330mm. *Hirschmann*


4 6.070 072

Capacity	Grad.	Accuracy	Bottle size	PK	Cat. No.
ml	ml	± ml	ml		
5	0,05	0,03	500	1	**6.070 009**
10	0,05	0,03	500	1	**7.510 426**
15	0,1	0,045	1000	1	**6.223 256**
25	0,1	0,045	1000	1	**7.510 427**
50	0,1	0,075	1000	1	**6.070 072** 4



1 Automatic burettes, glass, Schilling pattern, AR-Glas®/PE-LD, class B

SILBERBRAND. Tolerances to class B, DIN EN ISO 385. AR soda-glass burette®. *BRAND*
PVC filling tube and silicone outlet tubing. PE-LD reservoir bottle with PE-HD base.
Brass/PP micrometer screw. Graduations and inscriptions are in highly contrasting black enamel.
With Schellbach stripes. Squeezing of bottle allows rapid filling. Fine titration is easy using the micrometer screw.
Coarse titration is achieved by removal of the micrometer screw and using the push button. Calibrated to deliver.

Capacity	Grad.	Accuracy	Capacity	Height	PK	Cat. No.
ml	ml	± ml	ml	mm		
50**	0.1	0.1	1000	900	1	**6.239 724**
10*	0.05	0.05	500	530	1	**9.271 053**
15*	0.1	0.08	500	510	1	**9.271 055**
25*	0.1	0.08	1000	620	1	**9.271 056**
50*	0.1	0.1	1000	830	1	**9.271 058**

* Narrower divisions
**amber



9.271 082



9.271 087

Automatic burettes, Schilling pattern, borosilicate glass 3.3, PE-LD, class B

Made of borosilicate glass 3.3. Class B. Conformity with DIN ISO 384. *VITLAB*
With Schellbach stripes (blue/white) and easily readable, black scaling. Calibrated to deliver, EX.
Automatic zeroing. The burette stopcock is made of high quality plastic. Its PTFE key turns easily and allows fine titration. Special protection against breakage if the apparatus gets knocked over: A small bumper has been attached to the upper end of the upright measuring tube. This feature reduces the chance of breakage.
Material: burette of borosilicate glass 3.3, PP filling tube, PMP/PTFE burette stopcock, PE-LD reservoir bottle.

Amber borosilicate burette made of glass 3.3. Class B, for light sensitive substances. Conformity with DIN ISO 384.
With easily readable black scaling. Calibrated to deliver EX. Automatic zeroing. The stopcock of the burette is made of high quality plastic. Its PTFE key turns easily and allows fine titration. A small bumper has been attached to the upper end of the upright measuring tube. This feature reduces the chance of breakage.
Materials: burette of borosilicate glass 3.3, PP filling tube, PMP/PTFE burette stopcock, PE-LD reservoir bottle.

Burette capacity	Grad.	Accuracy	Bottle capacity	Height	Burette	PK	Cat. No.
ml	ml	± ml	ml	mm			
25	0.05	0.05	1000	900	with plastic coating	1	**9.271 082** 2
50	0.10	0.10	1000	900	with plastic coating	1	**9.271 084**
25	0.05	0.05	1000	900	without plastic coating	1	**9.271 085**
50	0.10	0.10	1000	900	without plastic coating	1	**9.271 086**
25	0.05	0.05	1000	900	amber glass	1	**9.271 087** 3
50	0.10	0.10	1000	900	amber glass	1	**9.271 088**



4.008 312



6.238 473

Automatic burettes, borosilicate glass 3.3, class AS

- Manufactured from pre-vacuum calibrated borosilicate glass. They meet the highest quality standards according to DIN EN ISO 385 and DIN 12700. *Isolab*
- Permanent quality control through all steps eliminates possible deviations from nominal values.
- Calibrated to deliver (Ex) and the tolerances are according to DIN/ISO Class "AS" standards.
- Conformity ("H") certified, with a batch number printed on the body. Batch certificate can be downloaded from the suppliers website.
- Supplied with an automatic zeroing system, VALVE stopcock and also an intermediate PTFE stopcock to recirculate the remaining liquid.
- Clear burettes are manufactured with schellbach stripe.
- Inscriptions and graduations are printed with special blue enamel. For amber burettes, white enamel is used to maximise visibility and durability.

Glass bottle - Please order separately.

Capacity	Graduations	Accuracy	Glass	Description	Graduations	PK	Cat. No.
ml	ml	± ml					
10	0.02	0.020	clear	schellbach	blue graduated	1	**4.008 312** 4
25	0.05	0.030	clear	schellbach	blue graduated	1	**6.241 216**
50	0.10	0.050	clear	schellbach	blue graduated	1	**6.237 627**
10	0.02	0.020	amber	without schellbach	white graduated	1	**6.238 473** 5
25	0.05	0.030	amber	without schellbach	white graduated	1	**6.242 463**
50	0.10	0.050	amber	without schellbach	white graduated	1	**6.241 116**

Automatic burettes acc. Pellet, without intermediate stopcock, class AS, DURAN®

Lateral PTFE-spindle without intermdiate stopcock. Main point ring graduation. Schellbach stripe. With dated batch identification. Conformity certified. Graduation in high-contrast blue enamel, acc. to DIN EN ISO 385. Incl. 2L clear glass bottle. Scale length approx. 500mm. *Hirschmann*

For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Capacity	Grad.	Accuracy	PK	Cat. No.
ml	ml	± ml		
10	0.02	0.02	1	**6.079 718**
25	0.05	0.03	1	**7.630 409**
50	0.1	0.05	1	**9.270 785** 1

1



9.270 785

Automatic burettes acc. Pellet, with stopcock, class AS, DURAN®

Lateral PTFE-spindle and intermdiate stopcock. Scale length approx. 500mm. *Hirschmann*
Main point ring graduation. Schellbach stripe. With dated batch identification.
Conformity certified. Graduation in high-contrast blue enamel, acc. to DIN EN ISO 385. Incl. 2 l clear glass bottle.

For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Capacity	Grad.	Accuracy	PK	Cat. No.
ml	ml	± ml		
10	0.02	0.02	1	**6.079 157**
25	0.05	0.03	1	**6.056 580**
50	0.1	0.05	1	**6.079 156** 2

2



6.079 156

Automatic burettes acc, Pellet, with PTFE-spindle and intermediate stopcok, class AS, DURAN®

Lateral PTFE-spindle and intermdiate stopcock. Scale length approx. 500mm. *Hirschmann*
Main point ring graduation. Schellbach stripe. With dated batch identification.
Conformity certified. Graduation in high-contrast blue enamel, acc. to DIN EN ISO 385.
Incl. 2 l clear glass bottle.

For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Capacity	Grad.	Accuracy	PK	Cat. No.
ml	ml	± ml		
10	0.02	0.02	1	**6.228 424**
25	0.05	0.03	1	**6.228 425**
50	0.1	0.05	1	**9.270 780** 3

3



9.270 780



1 Automatic burettes, Pellet pattern, borosilicate glass 3.3, Class AS, with stopcock

BLAUBRAND®. Class AS, to DIN EN ISO 385. Boro 3.3. With intermediate stopcock. *BRAND*
Conformity certified. With batch number. Graduations and inscriptions in highly contrasting blue enamel.
With Schellbach stripes. Intermediate stopcock allows residual reagent in the burette after titration to be recycled into the reservoir. Automatic zero point setting. Calibrated to deliver.
Choice of models, either with needle-valve stopcock with PTFE spindle (intermediate stopcock with PTFE-key) or with NS glass stopcock (intermediate stopcock with glass key).

Complete with 2 litre, soda-lime glass reservoir (160mm dia. x 200mm height, with 29/32 ground glass neck). Overall height with bottle approx. 1m. All BLAUBRAND® burettes are delivered with batch number and one batch certificate included per pack. Also available with individual works, USP or DAkkS (former DKD) calibration certificate, please enquire. The batch certificate is also available to download from the manufacturer's website.

Capacity ml	Grad. ml	Accuracy ± ml	Stopcock	PK	Cat. No.
10	0.02	0.02	PTFE	1	**9.270 764**
25	0.05	0.03	PTFE	1	**9.270 767**
50	0.1	0.05	PTFE	1	**9.270 768**
10	0.02	0.02	Glass	1	**9.270 734**
25	0.05	0.03	Glass	1	**9.270 737**
50	0.1	0.05	Glass	1	**9.270 738**



2 Automatic burettes, Pellet pattern, borosilicate glass 5.4 amber, class B, with stopcock

Amber borosilicate glass type 5.4.SILBERBRAND. With intermediate stopcock. *BRAND*
25ml: Class B, Tolerance to DIN EN ISO 385.
50ml: Class B, to DIN EN ISO 385.
Automatic zero point setting. Graduations and inscriptions in white enamel. Intermediate stopcock for evacuation of remaining liquid. Calibrated to deliver. Choice of models, either with PTFE or glass key dispensing and intermediate stopcocks. Complete with 2-litre soda-lime glass reservoir (160mm dia. x 200mm height, with 29/32 ground glass neck). Overall height with bottle approx. 1m.

Capacity ml	Grad. ml	Accuracy ± ml	Keys	PK	Cat. No.
25*	0.1	0.08	Glass	1	**9.270 536**
50	0.1	0.1	Glass	1	**9.270 538**
25*	0.1	0.08	PTFE	1	**9.270 540**
50	0.1	0.1	PTFE	1	**9.270 542**

* Narrower divisions.



9.270 905

Burette bottles, borosilicate glass 3.3

Burette bottle for automatic burettes is made from heat resistant glass.
Each bottle has a NS 29/32 neck grinding that fits to burette.

Capacity ml	Diam. mm	Height mm	Colour	PK	Cat. No.
1000	110	200	clear	1	**9.270 905** 3
1000	110	200	brown	1	**9.270 915**
2000	160	200	clear	1	**6.237 628** 4
2000	160	200	brown	1	**6.238 474** 5



6.237 628



6.238 474



6 Spare reservoir bottles, glass

Boro 3.3. Available in clear glass or amber glassor soda-lime glass. Volume: 2000ml, diameter: 160mm, height: 200mm. *BRAND*

Material	Capacity ml	Diam. mm	Height mm	Colour	PK	Cat. No.
Boro 3.3	2000	160	200	clear	1	**6.018 346**
Boro 3.3	2000	160	200	amber	1	**6.018 347**
Soda-lime glass	2000	160	200	clear	1	**7.059 541**
Soda-lime glass	2000	160	200	amber	1	**7.400 768**

E & OE.

Burette clamp

- Metal burette clamps are made out of steel and can hold one burette at a time.
  Graduations and meniscus line of the burette are clearly visible.
  They can be used on support rods of 8-14mm diameter.
- Polypropylene burette clamp can hold one burette at a time.
  Graduations and meniscus line of the burette are clearly visible.
  They can be used on support rods of 10-12mm diameter.

Description	PK	Cat. No.	
Burette clamp, metal	1	**4.008 313**	1
Burette clamp, PP	1	**6.240 474**	2

1



4.008 313

2



6.240 474

Further Burette clamp please see our chapter 1

3 Rubber blowballs

Non-rigid PVC. Red-brown, smooth. With 6mm i.d. outlet hole.

Type	Capacity ml	Diam. mm	PK	Cat. No.
B oval	5	30	1	**9.115 404**
0	10	30	1	**9.115 411**
2	28	42	1	**9.115 430**
3	42	48	1	**9.115 450**
5	90	62	1	**9.115 480**
7	145	72	1	**9.115 485**
9	225	84	1	**9.115 487**

3



4 Orsat blowball

Natural rubber. Translucent.

Type	PK	Cat. No.
Orsat blowball	1	**9.115 510**

4



5 Hand bellows

Single spray. Without net.
Size 3.

Type	PK	Cat. No.
Hand bellows	1	**9.270 995**

5



6 Hand bellows

Burette bellows for automatic burettes is made out of best quality natural rubber.

Type	PK	Cat. No.
Burette bellow	1	**6.237 629**

6



1



1 Hand bellows

Double spray. With net.
Size 5.

Type	PK	Cat. No.
Hand bellows	1	**9.270 990**

2 Digital Burettes, VITLAB® continuous

NEW!

VITLAB

The pulse-free, dispensing operation of the Continuous burettes makes titration safer at high-level precision.
The Continuous series can be used for titration agents up to a concentration of 1 Mol/l. The patented dual pristons pump provides permanent and pulse-free the liquid requested. Refills are not necessary.
The Continuous burette series undercuts the margins of error defined by DIN EN ISO 8655-3 especially in partial volumes.
All operation controls and the digital display have an ergonomic and functional design and are arranged clearly.

- Pulse-free dispensing technique for continuous and quick titration
- patented recirculation valve avoids reagent waste
- Timesaving elimination of filling procedures
- Clear and precise display of titrated volume
- Battery-operated, easily replaceable micro-batteries (1.5V)
- Dispensing range from 0.010ml to 999.9ml
- Dispensing volume per hand wheel revolution: 2.5ml (Continuous E), 5.0ml (Continuous RS)
- Can be calibrated
- Service-friendly modular design
- Device can be rotated on the bottle 360°
- Telescopic inlet tube extendible from 200 to 350mm
- Adapters for drying tube and filter
- Certificate of conformity according to DIN 12600

Accuracy <±0.2%, Coefficient of variation <±0.1%

Supplied with:
Burette continuous, 3 PP adapter (GL 32, GL 38, S 40), 1 teleskopic suction tube, 1 teleskopic discharge tube, 2 micro batteries 1.5 V (LR 03/AAA), manual, quality certificate.

Type	Capacity ml	Neck thread GL	Capacity/U ml	PK	Cat. No.
E	2.5	45	2.5	1	**9.284 020**
RS	5.0	45	5.0	1	**9.284 021**

2



E & OE.

1 Bottle top burette Titrette®

BRAND

Titrette® - The next generation digital burette!
With the Titrette® bottle-top burette, you can titrate quickly and reliably with highest precision, even in close quarters, with no mains supply needed - in the lab, in production, or in the field!


1

High accuracy
- precise titration within the error limits of Class A for glass burettes
- Smooth-running operation
- for sensitive, drop-wise titration
- Compact design
- light and stable
- Easy Handling
- no switching between "fill" and "titrate"
- Simple maintenance
- cleaning and parts replacement right in the lab
- Titrette® SH to determinate the acid content of milk and liquid dairy according to Soxhlet-Henkel (4 °SH = 1ml)

Smooth operation
The large, easy-grip hand wheels are conveniently easy to turn. With the optimized gear ratio, you can fill the device quickly and titrate drop-wise with great sensitivity.

Class? Like Class A!
The Titrette® bottle-top burette has an innovative new measuring system which matches the Class A accuracy of glass burettes and, if needed, can offer the precision of 3 decimal places below 20ml. This is an important feature for users who need to work within the Class A error limits as with glass burettes according to DIN EN ISO 385 (e.g., pharmaceutical work):

Lightweight and compact!
All components only move within the housing, saving room on top. The compact design and the light-weight ensure good stability. The titrating tube can be adjusted horizontally and vertically. This provides flexibility when positioning the instrument, e.g., when using a magnetic stirrer or different bottle sizes.

Items supplied: Titrette® bottle-top burette, conformity certified, performance certificate, telescoping filling tube (170 to 330 mm), recirculation tube, 2 x 1.5V batteries (AAA/UM4/LR03), 3 x PP bottle adapters (GL45/32, GL 45/S40 and GL32/NS 29/32), 2 coloured light shield inspection windows, operating manual.

Volume ml	Accuracy ≤ ± A% (max. vol.)	Reproducibility ≤ ± V% (max. vol.)	Interface	PK	Cat. No.
°SH (25)	0,07	0,025	without	1	**4.007 918**
10	0,10	0,05	without	1	**6.259 209**
25	0,07	0,025	without	1	**9.271 332**
50	0,06	0,02	without	1	**9.271 333**
10	0,10	0,05	incl.	1	**9.271 338**
25	0,07	0,025	incl.	1	**9.271 334**
50	0,06	0,02	incl.	1	**9.271 335**

Accessories for Titrette®

BRAND

Description	PK	Cat. No.
Dispensing cylinder with valve head for Titrette® 25ml	1	**4.000 395**
Dispensing cylinder with valve head for Titrette® 50ml	1	**4.000 396**
Telescopic filling tubes 170 to 330mm	1	**9.284 503**
Telescopic filling tubes 250 to 480mm	1	**9.284 504**
Titrating tube	1	**4.000 393** 2
Inspection window, brown	1	**4.000 394**
Filling valve	1	**9.284 482**


2

4.000 393

Digital burette, Titronic® *universal*

SI Analytics GmbH

Motorised piston burette for precise fixed volume dispensing, with dispensing volume and speed adjustment, for incremental dispensing tasks with input of pause time between dispensing stages and for manual titration tasks.
The Titronic® universal burette can be controlled directly from a PC via an RS232 interface.
Several burettes can also be 'daisy chain' linked to each other. Thanks to the motor driven, 2/3-way valve, the Titronic® universal burette can be used with all standard laboratory aqueous and non-aqueous titration reagents and many other solutions.

Titronic® *universal*, 20 ml, module I:
Supplied with: Titronic® *universal* 20 ml dispensing attachment, TZ 1503 titration tip, TZ 3665 support rod, TZ 3660 electrode/titration tip holder, TZ 3680 mini keyboard

Titronic® *universal*, 20 ml, module II:
Supplied with: as module I, but with additional TM 96 magnetic stirrer

Titronic® *universal*, 50 ml, module I:
Supplied with: see above 20ml, module I listing

Titronic® *universal*, 50 ml, module II:
Supplied with: as module I, but with TM 96 magnetic stirrer

1 Digital burette, Titronic® *universal*

SI Analytics GmbH

Specifications

Interfaces:	2 x RS232-C for connection to a serial printer, PC or other Titronic® universal
Stirrer connection:	piston burettes, plug-in connection with integral low-voltage power supply for TM 96 magnetic stirrer
Keyboard connection:	Operation via 6 instrument keys and TZ 3680 mini keyboard
Display:	4 digit LCD display
Volume indicator:	00.00 to 999.9ml
Display resolution:	0.01 ml
Dispensing speed:	0.1 to 40ml/min. (with 20ml dispensing unit) 0.1 to 100ml/min. (with 50ml dispensing unit)
Fill time:	30secs. to 99secs. adjustable (time depends on cylinder volume)
Pre-titration volume:	0.1 to 99.9ml
Pause time between increments:	0.01 to 999.9s
Dispensing cylinder:	20ml or 50ml DURAN® glass cylinder with UV protection sleeve
Burette resolution:	1/8000
Dispensing accuracy:	0.1% system measurement deviation, 0.05% accidental measurement deviation determined in accordance with EN ISO 8665, Part 3
Supply requirements:	230 V 50/60 Hz or 115 V 50/60 Hz
Conformity:	ISO 8665, Part 6
CE mark:	In accordance with European Council guidelines 89/336/EWG and 72/23/EWG

Type	Burette attachment ml	PK	Cat. No.
Module I	20	1	**9.863 205**
Module II	20	1	**9.863 206**
Module I	50	1	**9.863 207**
Module II	50	1	**9.863 208**

1



E & OE.

1 Digital Titrator, TitroLine® *easy*

SI Analytics GmbH



Specifications

Conformity:	EN ISO 8665-3
Cylinder:	20ml DURAN® glass with UV protection
Valve:	Motor driven 3/2 way PTFE/ETFE valve
Tubing:	FEP with UV protection
Dispensing accuracy:	0.1% systematic measurement deviation 0.05% accidental measurement deviation in accordance with EN ISO 8655-6
Volume indicator:	0.01 to 999.9ml
Display:	LCD matrix display 69 x 39mm, 64 x 128 pixel
Mini keyboard:	Plug-in connection: 4-pin mini round DIN plug
Stirrer:	Plug-in connection with integral low-voltage power supply for TM 96
Electrodes:	pH/mV: DIN or BNC connector Measuring ranges, pH: 0 to 14, mV: -1400 to +1400
Temperature sensor:	Pt1000, measuring range -30 to +115°C
RS232-C:	bidirectional RS232-C interface
Supply requirements:	230V 50/60 Hz or 115V, 50/60 Hz
Case dimensions:	135 x 310 x 205mm (W x H x D), height includes dispensing unit, stirrer not included
Weight:	approx. 2.2kg
Operating range:	Ambient temperature: +10 to +40°C

The manufacturer reserves the right to amend technical specifications.

Type	Description	PK	Cat. No.
Module 1		1	**9.863 130**
Module 2	for pH titrations	1	**9.863 131**
Module 3	for argentometric titrations	1	**9.863 132**

2 Motor-driven piston burette TITRONIC® 500

SI Analytics GmbH



Motor-driven piston burette with intelligent exchangeable doing units with automatic recognition of unit size and reagent data. Besides manual titration and highly precise dosing tasks the TITRONIC® 500 can also be used for the preparation of solutions by entering the weights. The connection of an analytical balance allows the easy automatisation of the solution preparation. The TITRONIC® 500 can completely controlled from a PC via the USB- or RS-232-interface. Up to 16 burettes can be connected to one another via the RS232 interface according to the daisy chain principle.

T 500: TITRONIC® 500 basic unit without magnetic stirrer, with stand rod TZ 1510, titration clamp Z 305, controller TZ 3880, power supply 100-240.V

T 500-M1: TITRONIC® 500 basic unit with magnetic stirrer TM 235, with stand rod TZ 1510, titration clamp Z 305, controller TZ 3880, power supply 100-240V

T 500-M2/20: TITRONIC® 500 basic unit with magnetic stirrer TM 235 and exchangeable unit WA 20, with stand rod TZ 1510, titration clamp Z 305, controller TZ 3880, power supply 100-240V

Specifications

Interfaces:	3x USB (2x USB A and 1x USB B), 2x RS-232-C
Stirrer connection:	TM 235 or alternative paddle stirrer
Keyboard:	The unit is operated using the keys on the device itself., the controller TZ 3880 and optional PC-keyboard (USB)
Display:	graphics-capable 3.5" TFT display
Volume display:	00.00 to 999.9ml
Display resolution:	0.001ml (depending on exchangeable unit)
Dosing speed:	max. 100ml/min (with 50ml unit)
Filling speed:	min. 20 to 999 sec adjustable (time according to the cylinder volume)
Exchangeable units:	5, 10, 20ml or 50ml exchangeable units with reagent recognition
Burette resolution:	10000
Dosing accuracy:	systematic error 0.1%, random error 0.05% in compliance with EN ISO 8655-6
Netzanschluss:	100-240V; 50/60Hz
Conformity:	ISO 8655, part 6
CE-mark:	EMC: 2004/108/EG; safety EG- Directive 2006/95

Type	Description	PK	Cat. No.
T 500	Basic unit	1	**9.863 210**
T 500-M1	With magnetic stirrer	1	**9.863 211**
T 500-M2/20	With magnetic stirrer and 20ml exchangeable unit	1	**9.863 212**

1 Automatic Titrators, TitroLine® 6000

Compact new titrator with intelligent exchangeable units with automatic recognition of unit size and reagent data. *SI Analytics GmbH*
Thanks to the modern USB- and additional RS232 interfaces,connection of printer, balance and further accessories are possible at the same time. The brilliant, very high-contrast TFT-display allows the easy parameterisation and tracking of the titration curve.

TL 6000-M1/10: TitroLine® 6000 basic unit with magnetic stirrer TM 235 and 10ml exchangeable unit WA 10, incl. amber glass bottle for titration reagent, GL 45 and S 40-bottle adapter, tubes, drip off tube and titration tip.

TL 6000-M1/20: TitroLine® 6000 basic unit with magnetic stirrer TM 235 and 20ml exchangeable unit WA 20, incl. amber glass bottle for titration reagent, GL 45 and S 40-bottle adapter, tubes, drip off tube and titration tip.

TL 6000-M1/50: TitroLine® 6000 basic unit with magnetic stirrer TM 235 and 50ml exchangeable unit WA 50, incl. amber glass bottle for titration reagent, GL 45 and S 40-bottle adapter, tubes, drip off tube and titration tip.

TL 6000-M2/20: TitroLine® 6000 basic unit with magnetic stirrer TM 235 and 20ml exchangeable unit WA 20, incl. amber glass bottle for titration reagent, GL 45 and S 40-bottle adapter, tubes, drip off tube and titration tip. With pH-combination electrode IL-pHT-A120MF-DIN-N and buffer set.

Specifications

Measuring input pH/mV:	pH/mV-input with DIN or BNC socket	µA-input for double platinum electrode (socket 2 x 4mm), pole voltage adjustable
Measuring input Dead Stop:	Temperature:	for resistance probes Pt 1000 (socket: 2 x 4mm)
	Interfaces:	3x USB (2x USB-A und 1x USB-B), 2x RS-232-C
	Stirrer connection:	TM 235 or alternative paddle stirrer
	Keyboard:	The unit is operated using the keys on the device itself., the controller TZ 3880 and optional PC-keyboard (USB)
	Display:	graphics-capable 3.5" TFT display
	Exchangeable units:	5, 10, 20ml or 50ml exchangeable units with reagent recognition
	Burette resolution:	10000
	Dosing accuracy:	systematic error 0.1%, random error 0.05% in compliance with EN ISO 8655-6
	Supply requirements:	100-240V; 50/60Hz
	Conformity:	ISO 8655, part 6
	CE-mark:	EMC: 2004/108/EG; safety EG- Directive 2006/95

Type	Description	PK	Cat. No.
TL 6000-M1/10	With 10ml exchangeable unit	1	**9.863 150**
TL 6000-M1/20	With 20ml exchangeable unit	1	**9.863 151**
TL 6000-M1/50	With 50ml exchangeable unit	1	**9.863 152**
TL 6000-M2/20	With 20ml exchangeable unit and pH Electrode	1	**9.863 153**

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

SI Analytics

E & OE.

1 Automatic Titrators, TitroLine® 7000

SI Analytics GmbH

Compact new titrator with intelligent exchangeable units with automatic recognition of unit size and reagent data. ID sensors are being detected automatically. Thanks to the modern USB- and additional RS232 interfaces, connection of printer, balance and further accessories are possible at the same time.
The brilliant, very high-contrast TFT-display allows the easy parameterisation and tracking of the titration curve.

TL 7000-M1/10: TitroLine® 7000 basic unit with magnetic stirrer TM 235 and 10ml exchangeable unit WA 10, incl. amber glass bottle for titration reagent, GL 45 and S 40-bottle adapter, tubes, drip off tube and titration tip.

TL 7000-M1/20: TitroLine® 7000 basic unit with magnetic stirrer TM 235 and 20ml exchangeable unit WA 20, incl. amber glass bottle for titration reagent, GL 45 and S 40-bottle adapter, tubes, drip off tube and titration tip

TL 7000-M1/50: TitroLine® 7000 basic unit with magnetic stirrer TM 235 and 50ml exchangeable unit WA 50, incl. amber glass bottle for titration reagent, GL 45 and S 40-bottle adapter, tubes, drip off tube and titration tip

TL 7000-M2/20: TitroLine® 7000 basic unit with magnetic stirrer TM 235 and 20ml exchangeable unit WA 20, incl. amber glass bottle for titration reagent, GL 45 and S 40-bottle adapter, tubes, drip off tube and titration tip. With pH-combination electrode IL-pHT-A120MF-DIN-N and buffer set.

Specifications

Measuring input pH/mV:	pH/mV-input with DIN or BNC socket with ID function for automatic detection of electrode
Measuring input Dead Stop:	µA-input for double platinum electrode (socket 2 x 4 mm), pole voltage adjustable
Temperature:	for resistance probes Pt 1000 (socket: 2 x 4 mm)
Interfaces:	3x USB (2x USB A and 1x USB B), 2x RS-232-C
Stirrer connection:	TM 235 or alternative paddle stirrer
Keyboard:	The unit is operated using the keys on the device itself., the controller TZ 3880 and optional PC-keyboard (USB)
Display:	graphics-capable 3.5" TFT display
Exchangeable units:	5, 10, 20 or 50ml exchangeable units with reagent recognition
Burette resolution:	10000
Dosing accuracy:	systematic error 0.1%, random error 0.05% in compliance with EN ISO 8655-6
Power supply:	100-240V; 50/60Hz
Conformity:	ISO 8655, part 6
CE-mark:	EMC: 2004/108/EG; safety EG-Directive 2006/95

Type	Description	PK	Cat. No.
TL 7000-M1/10	With 10ml exchangeable unit	1	**9.863 160**
TL 7000-M1/20	With 20ml exchangeable unit	1	**9.863 161**
TL 7000-M1/50	With 50ml exchangeable unit	1	**9.863 162**
TL 7000-M2/20	With 20ml exchangeable unit and pH Electrode	1	**9.863 163**

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1



6.255 582

2



9.863 172

KF Titrators TitroLine 7500® KF/TitroLine 7500® KF trace

NEW!

SI Analytics GmbH

You can´t go wrong with the new TitroLine® KF titrators from SI-Analytics.
The TitroLine® 7500 KF is the volumetric generalist for a wide range of use and the TitroLine® 7500 KF trace is the specialist for low water contents.
Both new titrators are to be characterized by following features:
- Fast, easy and precise
- With standard methods for different applications (titer determination, blank value...)
- High visible full color display, that can be easily viewed from a distance and extreme angles
- Storage of results via USB port (PDF and CSV -format)
- with online curve
- With intelligent interchangeable modules (only TitroLine® 7500 KF)

Applications TitroLine 7500® KF: KF volumetry, dead-stop-titrations (SO_2, bromine number)
Applications TitroLine 7500® KF trace: KF coulometry, bromine number

Volumetric KF-Titrators supplied with:
TL 7500 KF 05: titrator unit, interchangeable module WA 05, TM 235 KF titration stand with integrated stirrer and pump, titration vessel TZ 1770, micro-dual platinum electrode KF 1100 and starter kit, power supply 100-240 V
TL 7500 KF 10: titrator unit, interchangeable module WA 10, TM 235 KF titration stand with integrated stirrer and pump, titration vessel TZ 1770, micro-dual platinum electrode KF 1100 and starter kit, power supply 100-240 V
TL 7500 KF 20: titrator unit, interchangeable module WA 20, TM 235 KF titration stand with integrated stirrer and pump, titration vessel TZ 1770, micro-dual platinum electrode KF 1100 and starter kit, power supply 100-240 V

Coulometric KF-titrators supplied with:
TL 7500 KF trace M1: titrator unit, generator electrode TZ 1752 without diaphragm, magnetic stirrer TM 235, titration vessel TZ 1751, micro-dual platinum electrode KF 1150
TL 7500 KF trace M2: titrator unit, generator electrode TZ 1752 without diaphragm, TM 235 KF titration stand with integrated stirrer and pump, titration vessel TZ 1754, micro-dual platinum electrode KF 1150
TL 7500 KF trace M3: titrator unit, generator electrode TZ 1753 with diaphragm, magnetic stirrer TM 235, titration vessel TZ 1751, microdual platinum electrode KF 1150
TL 7500 KF trace M4: titrator unit, generator electrode TZ 1753 with diaphragm, TM 235 KF titration stand with integrated stirrer and pump, titration vessel TZ 1754, micro-dual platinum electrode KF 1150

Specifications

Measuring range TitroLine 7500® KF:	10ppm - 100%
Dosing accuracy:	<0.15%
Measuring range TitroLine 7500® KF trace:	1ppm - 5% (10µg to 100mg)
Accuracy:	0.3% at 1mg water
Number of user methods:	50
Printer:	HP PCL, Seiko DPU S 445, PDF
Interface:	2 x USB-A, 1 x USB-B, 2 x RS232
PC Software:	TitriSoft 3.0

Type	PK	Cat. No.	
TL 7500 KF 05	1	**9.863 170**	
TL 7500 KF 10	1	**6.255 582**	1
TL 7500 KF 20	1	**9.863 171**	
TL 7500 KF trace M1	1	**9.863 172**	2
TL 7500 KF trace M2	1	**9.863 173**	
TL 7500 KF trace M3	1	**9.863 174**	
TL 7500 KF trace M4	1	**9.863 175**	

Accessories for TITRONIC® 500, TitroLine® 6000 and TitroLine® 7000

SI Analytics GmbH

Type	Description	PK	Cat. No.
TM 235	Magnetic stirrer	1	**9.863 154**
WA 05	5ml exchangeable unit, complete	1	**9.863 155**
WA 10	10ml exchangeable unit, complete	1	**9.863 156**
WA 20	20ml exchangeable unit, complete	1	**9.863 157**
WA 50	50ml exchangeable unit, complete	1	**9.863 158**
TZ 3835	USB keyboard	1	**9.863 159**

E & OE.

Digital burettes, solarus®

A titration unit with a reagent recirculation system for manual titration directly from the reagent bottle. Power supplied by a solar cell.
Available in three volumes (10 ml, 20 ml and 50 ml). *Hirschmann*

Advanced energy concept, precision results - sets standards as the world's first digital burette with integrated solar cell. The power supply for the electronics and display is derived exclusively from an integrated solar cell. Batteries can be completely dispensed with. Easily replaceable valves, individual calibration with "Quick-Cal" and permanent storage of the manufacturer's calibration facilitate rapid and flexible adaptation. The vivid digital display prevents meniscus reading errors and is always clearly legible, regardless of the viewing angle. The handwheels with soft touch surface are ergonomically optimised for particularly precise control.

Overview of details:
- Power supplied by a solar cell
- Free rotation
- Media recirculating system for simple and rapid venting without reagent loss
- Easily replaceable valves
- Handwheels with soft touch surface
- Clearly legible display, regardless of the viewing angle
- A light protection window for the valve block is also included in the scope of delivery
- Individual calibration of user-specified adaptations with "Quick-Cal"
- Serial bidirectional interface (RS 232 and USB)

1



9.287 779

Description	PK	Cat. No.
Capacity 10 ml	1	**9.287 779** 1
Capacity 20 ml	1	**9.287 780**
Capacity 50 ml	1	**9.287 781**
Interface cable	1	**9.287 756**

Accessories and spare parts, Solarus®

Smart accessories for daily laboratory work. *Hirschmann*

Description	PK	Cat. No.
Discharge unit titration with fine tip	1	**9.287 881**
Discharge tube unit, flexible, spiral shaped, inner dia. 1.5mm	1	**6.206 625**
Discharge unit titration, variable, complete with tube holder, approx. 400 mm, FEP	1	**9.287 882**
Adapter with A 45 filler	1	**9.287 883**
Thread adapter, silicone, A 45 compliant with NS 29/32 ground adapter	1	**9.287 884**

Digital-burette, opus®

A titration unit with a reagent recirculation system for motor-powered titration directly from the reagent bottle. Available in three volumes (10 ml, 20 ml and 50 ml). *Hirschmann*

Drop by drop towards precise analysis results - combines accuracy with time-saving and user-friendliness. Electronic control of titration enables the achievement of reproducible results and precisely defined dynamics each time. Time-saving rapid titration with subsequent fine titration enhances accuracy and efficiency. The titration impulse triggered by the motor enables the achievement of a droplet break-up with output volumes from 10 µl to 99.999 ml and delivers resolutions up to the third decimal place. The titration procedure is configured on the intuitive TFT touchscreen. The user is guided through menu functions which are easily legible and comprehensible. Nine different titration procedures with their complete settings can be saved in the method memory and reactivated at any time if required.

Overview of details
- Electronic control and dispensing of volumes
- A light protection window for the valve block is also included in the scope of delivery
- Titration impulse triggered by the motor enables the achievement of a droplet break up from 10 µl for precision determination
- Media recirculating system for simple and rapid venting without reagent loss
- Free rotation
- TFT touchscreen with user-friendly menu
- Method memory for nine different titration procedures with storage o f all settings
- USB and RS232 interface for PC connection
- Integration in automated procedures possible

2



9.287 875

Description	PK	Cat. No.
Volume 10 ml	1	**9.287 875** 2
Volume 20 ml	1	**9.287 870**
Volume 50 ml	1	**9.287 871**



1 Drum pump Pump-it®

Bürkle

For rapid and clean emptying from cans, drums and small barrels up to 60L.
- Precise dosing, without dripping
- for liquids up to a viscosity of 1500 cPs at 20°C
- Pump connection suitable for 64mm dia. (BSI) container threads
- stepless length adjustment of immersion tube
- Threaded adapters for most commercially-sold containers available
- Not suitable for HCl

Material	Immersion depth mm	Flow rate L / min.	PK	Cat. No.
PP/FKM	1000	8	1	**9.001 110**



2 Adapter set for Pump-it® drum pump

Bürkle

Consisting of:
- 2" Coarse thread, Mauser L ring, green
- 2" coarse thread, Leer/Tri-Sure®, brown
- 2" Fine thread steel drum, blue
- DIN 60, Mauser-barrel, black
- DIN 51, black (image in centre)

Type	PK	Cat. No.
Adapter set for Pump-it can pump	1	**9.001 111**



3 Hand pumps Otal

Bürkle

For jerry cans and ballons up to 60l capacity. Universal bungs for container openings of 30 to 70mm diameter.
PP: weak acids, caustic solutions and detergents
PVDF: chlorine bleaching, not for strongly oxidizing acids and caustic solutions
Stainless steel: solvents and liquids of VbF Hazard Class AIII (not easily flammable)

Material	Diam. mm	Flow rate L / min.	Immersion depth mm	PK	Cat. No.
PP*	10	4	450	1	**9.001 210**
PP	12	14	700	1	**9.001 112**
PP	15	20	700	1	**9.001 115**
PP	18	26	700	1	**9.001 118**
PVDF	16	20	700	1	**9.001 135**
Stainless steel tubing	18	26	900	1	**9.001 137**
PP / PVC dispensing tube	12	12	700	1	**9.001 138**

*Miniature pump for container openings 20 to 36mm.



4 Foot pumps Otal

Bürkle

For jerry cans and ballons up to 120l capacity. Universal bungs for container openings of 30 to 70mm diameter.
PP: weak acids, caustic solutions and detergents
PVDF: chlorine bleaching, not for strongly oxidizing acids and caustic solutions
Stainless steel: solvents and liquids of VbF Hazard Class AIII (not easily flammable)

Material	Diam. mm	Flow rate L / min.	Immersion depth mm	PK	Cat. No.
PP	15	20	700	1	**9.001 015**
PP	18	26	700	1	**9.001 018**
PP	22	30	900	1	**9.001 022**
PVDF	16	20	700	1	**9.001 130**
Stainless steel tubing	18	26	900	1	**9.001 132**
PP / PVC dispensing tube	12	12	700	1	**9.001 133**

E & OE.

1 Siphons

Transparent with stopcock. Simple to use, suitable for occasional dispensing of non-aggressive liquids from a higher drum to a lower vessel, following the siphoning principle.

Bürkle

Material	Immersion depth mm	Diam. mm	Flow rate L / min.	PK	Cat. No.
LDPE/PVC	1000	15	9	1	**9.001 355**



2 Barrel pumps, stainless steel

Stainless steel V2A and PTFE.
For safe dispensing of liquids with a low flash point. Electrostatic charge can be dissipated through accessories antistatic set and drum screwthread connection.
Not suitable for acetone.

Bürkle

Immersion depth mm	Diam. mm	Description	PK	Cat. No.
570	32	rigid dispensing tube	1	**9.001 340**
910	32	rigid dispensing tube	1	**9.001 341**
570	32	flexible tubing with stopcock	1	**9.001 362**
910	32	flexible tubing with stopcock	1	**9.001 363**
360	32	Removable discharge tube	1	**6.083 463**
360	32	flexible tubing with stopcock	1	**6.802 513**



3 4 Barrel pumps, PP

- For decanting acids, caustic solutions and aggressive detergents
- Excellent recovery of residual liquid in the barrel provided by base-sitting, non-return valve and steplessly adjustable immersion tube
- For barrels and tanks from 60 to 1000l.

Bürkle

Type A: With rigid, angled, dispensing nozzle.
Type B: With flexible, PVC dispensing hose and stopcock.

Immersion tube dia.: 32mm
Max. pump capacity: up to approx. 12 L/min.

Type	Immersion depth mm	Length mm	PK	Cat. No.
A	500	600	1	**9.001 356**
B	500	600	1	**9.001 366**
A	650	740	1	**9.001 357**
B	650	740	1	**9.001 367**
A	800	900	1	**9.001 358**
B	800	900	1	**9.001 368**
A	1000	1090	1	**9.001 359**
B	1000	1090	1	**9.001 369**
A	1250	1340	1	**9.001 364**
B	1250	1340	1	**9.001 370**
A	1500	1590	1	**9.001 365**
B	1500	1590	1	**9.001 371**





Screwthread connections for PP and PTFE drum pumps

Bürkle

Type	Material	PK	Cat. No.	
R2", internal steel barrel thread	PP	1	**9.001 335**	1
Drum stoppers for 40 to 70 mm	PVC	1	**9.001 336**	2
Mauser 2", internal coarse screwthread	PP	1	**9.001 337**	3
Tri-Sure®, internal coarse screwthread	PP	1	**9.001 338**	4
Drum screwthread connection 2", counternut	PP	1	**9.001 347**	

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9.001 335

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9.001 336

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9.001 337

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9.001 338

5



9.001 345

6



6.090 497

Barrel pumps, screw joints

Barrel screw joints for stainless steel drum pumps. *Bürkle*
Constructed in nickel-plated brass. For containers with R2", internal steel barrel thread.

Description	PK	Cat. No.	
Barrel screw joint 2"	1	**9.001 345**	5
Barrel screw joint, gas-tight 2", hermetic sealing	1	**6.090 497**	6

7



8



7 8 Solvent pump foot operated

Bürkle

- for barrels up to 220L (fully adjustable)
- for dispensing ultrapure solvents
- solvent-wetted materials: Stainless steel and PTFE
- rigid angled tube or flexible tubing with stainless steel/PTFE stopcock
- electrostatic charge can be dissipated through the accessory antistatic set (please order separately)
- supplied with gas tight, R2" steel barrel internal thread connection

Description	Immersion depth mm	Flow rate L / min.	PK	Cat. No.
Pump with rigid angled tube	950	30	1	**9.001 134**
Pump with flexible tubing	950	30	1	**6.236 800**

E & OE.

1 2 Solvent pump hand operated

Bürkle

- For contamination-free, dispensing of organic solvents and flavouring agents.
- Suitable for all commercially available, stainless steel drums up to 60L with R2" fine thread necks (immersion depth 600mm - fully adjustable).
- Gas-tight pump can be completely shut-off using two ball valves.
- Medium-contacting parts are made of stainless steel with PTFE-seals.
- Supplied with gas tight, R2" steel barrel internal thread connection.
- Electrostatic charge can be dissipated through the accessory antistatic set (please order separately).





Immersion depth mm	PK	Cat. No.
600	1	**6.237 176**
600	1	**9.001 349**

3 Anti-static set

Bürkle

When dispensing combustible/explosive liquids pump, both dispensing and filling drum involved in the process must be sufficiently earthed, in order to prevent ignition or explosion through electrostatic discharges.
Antistatic set, includes three colour-coded connecting cables with clamps, supplied complete in plastic case.



Type	PK	Cat. No.
Antistatic set	1	**9.001 346**



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1 2 3 Barrel pumps AccuOne and EnergyOne

Bürkle

Bürkle barrel pumps AccuOne and EnergyOne with the unique hybrid system ensure fast, flexible and convenient filling, whenever and wherever you want. The pumps are equipped with two different power supply systems:
AccuOne, driven by a high-performance rechargeable battery or EnergyOne, with a power cable for direct connection to mains electricity. Innovative new feature: The power supply units are interchangeable! The rechargeable battery or the power supply unit are fitted with a clip lock and are removable. They can be exchanged quickly and easily. Thus AccuOne can also be operated with the power supply cable unit and EnergyOne can be operated with the rechargeable battery. With a replacement rechargeable battery as an accessory, you never have to wait for charging. The drive can also be disconnected quickly and easily from the pump station with a clip lock. This makes it possible to use one drive for filling at several stationary pump stations. AccuOne and EnergyOne are designed for applications in which even very small amounts of liquid can be added to small containers with narrow openings. The TouchPanel is sealed against dust, dirt and water. By a foil Keyboard it can be used to regulate the flow rate continuously and precisely from 0.4l/min to 12 l/min. In addition to the discharge tube, a flexible discharge hose (1.2m) with nozzle (PVC, PP, V2A, FKM) is available as an option. The light and powerful pumps are made of high-quality materials, PP, PVDF and Hastelloy C, to ensure outstanding chemical resistance. This also makes them suitable for dispensing acids and bases. Please make note of detailed information related to chemical resistance!

AccuOne	
Maximum pumping capacity	12l/min.
Weight	750g
Discharge connection	¾"
Rechargeable battery capacity	up to 600l
Battery type	Li-Ion
Voltage	14.4V
Electrical charge	1.5Ah
Parts in contact with media:	
Shaft	Hastelloy C
Pump station	PP
Seals	PTFE
EnergyOne	
Maximum pumping capacity	12l/min.
Weight	580g
Discharge connection	¾"
Power supply via 230 V power supply unit, international plug adapter included with delivery.	
Parts in contact with media:	
Shaft	Hastelloy C
Pump station	PP
Seals	PTFE

Description	PK	Cat. No.
AccuOne with rechargeable battery, rigid discharge tube and charger, immersion pipe length 500mm	1	**9.001 420**
AccuOne with rechargeable battery, rigid discharge tube and charger, immersion pipe length 700mm	1	**9.001 421**
AccuOne with rechargeable battery, rigid discharge tube and charger, immersion pipe length 1000mm	1	**9.001 422**
EnergyOne with power supply unit and rigid discharge tube, immersion pipe length 500mm	1	**9.001 423**
EnergyOne with power supply unit and rigid discharge tube, immersion pipe length 700mm	1	**9.001 424**
EnergyOne with power supply unit and rigid discharge tube, immersion pipe length 1000mm	1	**9.001 425**

4



4 Accessories for AccuOne and EnergyOne

Bürkle

Description	PK	Cat. No.
Rechargeable battery without charger	1	**9.001 426**
Charger	1	**9.001 427**
Power supply unit incl. connector	1	**9.001 428**
Drive without rechargeable battery, power supply unit and pump station	1	**9.001 429**
Discharge tube	1	**9.001 430**
Discharge hose 1.2m with nozzle	1	**9.001 431**
Pump station with immersion pipe length 500mm	1	**9.001 432**
Pump station with immersion pipe length 700mm	1	**9.001 433**
Pump station with immersion pipe length 1000mm	1	**9.001 434**
Barrel screw connection, PP for R2" steel barrel internal thread	1	**9.001 335**
Drum screwthread connection 2", counternut	1	**9.001 347**
Barrel plug, PVC for openings from 40 to 70mm diameter	1	**9.001 336**
Barrel screw connection, PP for Mauser 2", coarse internal thread	1	**9.001 337**
Barrel screw connection, PP for Tri-Sure®, coarse internal thread	1	**9.001 338**

1 Drum pumps GLP 25

Grün-Pumpen GmbH

GLP 25 is your ideal helper for clean and safe liquid transfer from small containers and drums up to 220litres. Various media such as undiluted acids and bases, dies, emulsions, dispersions and low-viscosity liquids can be measured out without any problems.
Wetted materials are PP, stainless steel and Viton®. The pump is therefore additionally media resistant against aggressive liquids. Driveshaft made from stainless steel. Delivery rates from 1 to 20 l/min adjustable.
Pump Set supplied with: motor, pump unit, PP, ¾" dia. inlet tubing (length 500, 700 or 1000mm), PP discharge tubing, 250mm long and adapter for drum necks of 40 to 58mm.

1



Description	Length mm	PK	Cat. No.
Pump set	500	1	**9.001 410**
Pump set	700	1	**9.001 411**
Pump set	1000	1	**9.001 412**

2 3 Accessories for drum pumps GLP 25

Grün-Pumpen GmbH

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3



Description	PK	Cat. No.
Motor for all pump units	1	**9.001 400**
Pump unit with inlet tubing length 500mm, incl. discharge tube	1	**9.001 401**
Pump unit with inlet tubing length 700mm, incl. discharge tube	1	**9.001 402**
Pump unit with inlet tubing length 1000mm, incl. discharge tube	1	**9.001 403**
Discharge tube PP, length 25cm	1	**9.001 404**
Adapter PP, diam. 65 to 70mm	1	**9.001 405**
Nozzle PP, reinforced PVC outlet tubing 1.5m, DN19	1	**9.001 406**

4 5 Drum pumps, mains-powered

Lutz Pumpen

Lightweight and powerful pump for transferring small amounts of aqueous liquids up to 300 mPas from cans and drums with infinitely variable speed controller.

- Motor 230V, 200W (IP 24)
- Sealless pump tube
- Polypropylene version for acids and alkalis
- Stainless steel verstion for low-viscosity lubricants
- Suitable accessory flow meter required
- Pump with tubing connection
- Supplied as a set with 1.5m PVC tubing, nozzle in polypropylene, wall bracket

Type	Material	Immersion depth mm	Flow rate l / min.	Immersion tube diam. mm	Delivery head mWS	PK	Cat. No.
Pump	PP	500	75	32	7.0	1	**9.880 300**
Pump	PP	700	75	32	7.0	1	**9.880 301**
Pump	PP	1000	75	32	7.0	1	**9.880 302**
Pump	stainless steel	500	68	28	6.5	1	**9.880 303**
Pump	stainless steel	700	68	28	6.5	1	**9.880 304**
Pump	stainless steel	1000	68	28	6.5	1	**9.880 305**
Pump set	PP	500	75	32	7.0	1	**9.880 310**
Pump set	PP	700	75	32	7.0	1	**9.880 311**
Pump set	PP	1000	75	32	7.0	1	**9.880 312**
Pump set	stainless steel	500	68	28	6.5	1	**9.880 313**
Pump set	stainless steel	700	68	28	6.5	1	**9.880 314**
Pump set	stainless steel	1000	68	28	6.5	1	**9.880 315**

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5



Commitment to Quality – made by Lutz

The name Lutz stands for high quality and reliable pumps for the emptying and transfer of different liquids from canisters, drums and containers.

The Lutz production programme includes laboratory-, drum- and container pumps, eccentric screw pumps, air operated double diaphragm pumps, vertical and horizontal centrifugal pumps as well as flow meter systems.



Lutz®
The Fluid Managers

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Horizontal centrifugal pumps, magnetically coupled

Lutz Pumpen

These new magnetic drive pumps are designed for pumping acids, bases, mixtures of acids and bases, solvents, photochemicals into alkali stripping baths, galvanic baths, as well as radioactive, sterile, expensive or highly corrosive liquids.
The pumps are sealless. The impeller is driven by the magnetic force of the outer magnets, therefore no mechanical seal is required.
As the pump housing is hermetically sealed no leaks can occur.
The use of high performance, permanent magnets, ensures high transmission forces even at elevated temperatures.

- viscosity up to 20 mPas
- pump complete with flanged-to motor

Magnetic drive pump 15 Watt:
Motor 230V, material PP (fibre-glass reinforced), stainless steel (shaft), Viton® (O-ring), tubing connection 14mm

Magnetic drive pump 29 Watt:
Motor 230V, material PP (fibre-glass reinforced), ceramics (shaft), Rulon (guide bearing), Viton® (O-ring), suction/discharge G ¾" OT (BSP)

Description	Flow rate L / min.	Delivery head mWS	PK	Cat. No.	
15 Watt, without thread	12	2.0	1	**9.880 360**	1
29 Watt, with ¾'' outer thread	24	3.0	1	**9.880 361**	2

1



9.880 360

2



9.880 361

E & OE.

1 Laboratory peristaltic pumps, PLP

Compact laboratory peristaltic pumps with stepless, adjustable flow rate, pump rotor, two compression and four guide rollers.
Changing pump tubing is easy, no tools or other aids are required.
For 220V 50Hz a.c. supplies.

Dülabo Laborgeräte

Type	Flow rate ml/min.	Weight g	PK	Cat. No.
PLP 33	7 - 33	1300	1	**9.700 420**
PLP 66	17 - 66	1300	1	**9.700 421**
PLP 330	66 - 400	1300	1	**9.700 422**
PLP 1000	250 - 1000	1440	1	**9.700 423**



Peristaltic Multichannel Pump PLP 380

Flow rates from 0.0002 to 380 ml/min. The speed can be adjusted manually or automatically through optional external control.
Easy to operate.
- Accepts various pump heads
- Prime key for fast filling and emptying
- Adjust speed manually or automatically through optional external control
- Memory function, storing the running parameters automatically
- Membrane keypad, easy to operate
- Good performance and low price

Dülabo Laborgeräte

Specifications

Speed:	0.1 to 100rpm, reversible
Speed precision:	0.1rpm
Speed control:	Membrane keypad
Display:	3-digit LED displays current rpm
Communication interface:	RS485
Power supply:	90 bis 260 V_{ac} 50/ 60 Hz
Power consumption:	< 30 W
Operating condition:	0 to 40°C
Relative humidity:	< 80%
Dimensions (L x W x H in mm):	232 x 142 x 149
Drive weight (without Pump Head):	2.3kg
IP rating:	IP 31

Type	Description	Flow rate ml/min.	PK	Cat. No.
PLP 380	Peristaltic pump	0.00025 - 380	1	**9.700 430**

Flow rate PLP 380

Dülabo Laborgeräte

Pump Head	Channels	Flow rate per channel ml/min
PPH 103	1	0.07 - 380
PPH 303	1	1.7 - 150
PPH 5061	1	0.00025 - 48
PPH 5062	2	0.00025 - 48



1 Peristaltic Pump PLP 6000

Dülabo Laborgeräte

Easy to operate. DC brushless motor and close loop control integrate circuit.
It features big torque, small vibration, high efficiency and non maintenance.
Flow rates from 4.2 to 6000 ml/min. The speed can be adjusted manually
or automatically through optional external control.
- Accepts various pump heads
- Prime key for fast filling and emptying
- Adjust speed manually or automatically through optional external control
- Memory function, storing the running parameters automatically
- High torque grants the use of double channel pump heads
- Easy to operate through start/stop switch and rotary encoded switch for speed control
- Good performance and low price

Specifications

Speed:	60 to 600rpm
Speed precision:	±1%
Resolution:	1rpm
Torque:	>=1.60 Nm
Speed control:	Start/stop switch and rotary encoded switch
Display:	3-digit LED displays current rpm
Communication interface:	RS485
Power supply:	176 to 264 V_{ac} 50/ 60 Hz
Power consumption:	< 200 W
Operating condition:	0 to 40°C
Relative humidity:	< 80%
Dimensions (L x W x H in mm):	285 x 207 x 180
Drive weight (without Pump Head):	5.2kg
IP rating:	IP 31

Type	Description	Flow rate ml/min.	PK	Cat. No.
PLP 6000	Peristaltic pump	4.2 - 6000	1	**9.700 433**

Flow rate PLP 6000

Dülabo Laborgeräte

Pump Head	Channels	Flow rate per channel ml/min
PPH 103	1	4.2 - 2200
PPH 303	1	100 - 1600
PPH 603	1	200 - 6000
PPH 7042	2	50 - 1800

Pump Heads for PLP 380, PLP 2000 and PLP 6000

Dülabo Laborgeräte

Type	Flow rate L / min.	Max. speed rpm	Rollers	Channels	Weight kg	For Type	PK	Cat. No.
PPH 103	2200	600	3	1	0.40	PLP 380, PLP 380 multi, PLP 2200, PLP 6000	1	**9.700 435**
PPH 303	1600	600	3	1	0.35	PLP 380, PLP 380 multi, PLP 2200, PLP 6000	1	**9.700 436**
PPH 5061	48	100	6	1	0.21	PLP 380	1	**9.700 437**
PPH 5062	48	100	6	2	0.27	PLP 380, PLP 380 multi	1	**9.700 438**
PPH 603	6000	600	3	1	0.79	PLP 6000	1	**9.700 442**
PPH 7042	1800	600	4	2	0.82	PLP 6000	1	**9.700 443**



E & OE.

1 2 3 Laboratory peristaltic pumps FH10/FH15/FH30

NEW!

Thermo Scientific

- Simple, fast tubing changes
- Fixed occlusion eliminates adjustment after tubing changes and assures operation against pressure up to 30 PSIG
- Contamination free pumping fluid contacts only the tubing material
- Controls are mounted on front panel with a separate single-turn speed control
- Flow direction switch with center "OFF" position
- Green LED power "ON" indicator
- "Prime" button runs pump at maximum speed to rapidly prime or flush tubing
- Reversible pump direction permits purging of tubing prior to use
- Flow rates less than 2 ìl/min to 105 ml/min
- Pressure up to 2.5 bar (30 PSIG)
- Accurate and repeatable flow delivery
- Filtration, up to 60 PSIG
- Address a wide range of critical applications with tubing materials that are approved to USP class VI, FDA and NSF standards
- Accommodates all sizes and formulations of microbore flow rated tubing ergonomic design
- Space efficient low profile, stackable design
- Remote capability actuate unit with a foot switch or contact closure



FH10



FH15



FH30

Specifications

Operating temperature:	0 to 40ºC
Storage temperature:	-25 to 65ºC
Housing materials:	Powder-coated steel
IP rating	IP 22
Agency approvals:	UL, cUL, CE, ROHS Power Supply
Controller dimensions (L x W x H):	17.8 x 13.4 x 11.4cm
Weight:	1.5kg
Voltage (50/60 Hz):	90-130 or 160-260V AC (auto selected)
Motor type:	PMDC
Control type:	PWM (Pulse Width Modulated)

Type	Channels	Flow rate ml/min.	Rotation speed rpm	PK	Cat. No.
FH10	1	0.002 - 1.65	1.2 - 10	1	**9.828 601**
FH10	1	0.017 - 11	13 - 80	1	**9.828 602**
FH15	1	0.07 - 50	50 - 300	1	**9.828 603**
FH15	1	0.8 - 105	20 - 100	1	**9.828 604**
FH30	2	0.8 - 14	20 -100	1	**9.828 605**

Tubing Links for FH15 and FH30 Pumps

NEW!

Thermo Scientific

Type	Size	Int. diam. mm	Wall thickness mm	PK	Cat. No.
Platinum-cured silicone	14	1.60	1.60	8	**9.828 635**
Platinum-cured silicone	16	3.20	1.60	8	**9.828 636**
BioPharm Plus, silicone	14	1.60	1.60	8	**9.828 639**
BioPharm Plus, silicone	16	3.20	1.60	8	**9.828 640**
PharMed® BPT	14	1.60	1.60	8	**9.828 643**
PharMed® BPT	16	3.20	1.60	8	**9.828 644**

Other sizes available on request.

Connection Tubing for FH15 and FH30 Pumps

NEW!

Thermo Scientific

Type	Int. diam. mm	Wall thickness mm	PK	Cat. No.
BioPharm GP, silicone	1.60	1.60	15,2	**9.828 646**
BioPharm GP, silicone	3.20	1.60	15,2	**9.828 647**
PharMed®BPT GP	0.80	1.60	7,6	**9.828 649**
PharMed®BPT GP	1.60	1.60	7,6	**9.828 650**
PharMed®BPT GP	3.20	1.60	7,6	**9.828 651**

Other sizes available on request.

General Purpose Tubing

NEW!

Thermo Scientific

Type	Int. diam. mm	Wall thickness mm	PK	Cat. No.
BioPharm GP, silicone	6.40	1.60	15,2	**9.828 653**
BioPharm GP, silicone	8.00	1.60	15,2	**9.828 654**
BioPharm GP, silicone	4.80	2.40	15,2	**9.828 655**
BioPharm GP, silicone	6.40	2.40	15,2	**9.828 656**
BioPharm GP, silicone	8.00	2.40	15,2	**9.828 657**
BioPharm GP, silicone	9.50	2.40	15,2	**9.828 658**
PharMed®BPT GP	6.40	1.60	7,6	**9.828 659**
PharMed®BPT GP	4.80	1.60	7,6	**9.828 660**

Other sizes available on request.

Precision Pump Tubing Links

NEW!

Thermo Scientific

Type	Size	Wall thickness mm	Int. diam. mm	PK	Cat. No.
BioPharm, silicone	13	1.60	0.80	12	**9.828 661**
BioPharm, silicone	14	1.60	1.60	12	**9.828 662**
BioPharm, silicone	16	1.60	3.20	12	**9.828 663**
BioPharm, silicone	17	1.60	6.40	12	**9.828 665**
BioPharm, silicone	18	1.60	8.00	12	**9.828 666**
BioPharm, silicone	15	2.40	4.80	12	**9.828 667**
BioPharm, silicone	24	2.40	6.40	12	**9.828 668**
PharMed®BPT	13	1.60	0.80	12	**9.828 671**
PharMed®BPT	14	1.60	1.60	12	**9.828 672**
PharMed®BPT	25	1.60	4.80	12	**9.828 674**
PharMed®BPT	17	1.60	6.40	12	**9.828 675**
PharMed®BPT	18	1.60	8.00	12	**9.828 676**
PharMed®BPT	15	2.40	4.80	12	**9.828 677**
PharMed®BPT	24	2.40	6.40	12	**9.828 678**



1 Laboratory peristaltic pumps FH100/FH100X

NEW!

Thermo Scientific

- New loading pump head enables rapid tubing changes
- Robust motor and drive system provides low maintenance long-term operation
- Contamination free, pumping the fluid contacts only the tubing material
- Intuitive control keypad
- Stop and start from the front panel
- Easily increase/decrease flow through the membrane key-pad
- Universal voltage and frequency capability allows operation world-wide IEC320 socket provided
- Reversible pump direction permits purging of tubing prior to use
- Quick start guide included for fast easy set-up
- Utilises various tubing sizes to provide a broad flow range
- Ability to pump against pressure up to 60 PSIG providing longer filtration cycles
- Space efficient low-profile, stackable design
- Safety interlocks powers unit down when changing tubing
- Remote control capability ideal for automated process applications
- Accurate, reliable control of flow and dosing digital display of RPM for accurate control

Specifications

External Control - Input:	4-20 mA; 0-10V; Remote/Local; Dir (CW/CCW); Start/Stop
Operating temperature:	0°C to 40°C
Storage temperature:	-25°c to 65°C
Housing and pump head construction:	Housing: ABS; Pump head: GF Nylon, Delrin®, Stainless steel, Cold-rolled steel, Buna N, Polycarbonate
IP rating:	IP 31
Agency approvals:	ETL, cETL, CE, RoHS
Dimensions (L x W X H):	31.7 x 27.9 x 15.2cm
Weight:	7kg
Voltage 60/50 (Hz):	90 to 130V AC or 200 to 260V AC; Single phase, auto-selected
Motor Type:	PMDC
Motor Size:	1/10 (75w)
Phase Control:	Phased Controlled
Display (rpm):	7-segment, 3-digit, Blue LED, 1 rpm resolution
Speed regulation (accuracy):	±0.25%

Type	Flow rate ml/min.	Rotation speed rpm	PK	Cat. No.
FH100 (thin wall)	0.5 - 3.000	4 - 400	1	**9.828 606**
FH100X (thick wall)	14 - 4.000	4 - 400	1	**9.828 607**

E & OE.

1 Dispenser Pumps FH100D/FH100DX

NEW!

Thermo Scientific



- New rapid loading pump head allows tubing change in less than 30 seconds
- Robust motor and drive system provides low maintenance long-term operation
- Contamination free pumping, the fluid contacts only the tubing material
- Programmable in seven languages provides easy set-up in almost any global location
- Universal voltage and frequency capability allows operation world-wide IEC320 socket provided
- Reversible pump direction permits purging of tubing prior to use
- Quick start guide included for fast, easy set-up
- Control capabilities include programmable dispensing by volume, time, or copy modes with a programmable delay between cycles for convenient, automated dispensing
- Each pump utilises various tubing sizes providing a broad flow range
- Able to pump against pressure up to 60 PSIG providing longer filtration cycles
- Optimises system accuracy by calibrating the pump system in process the calibration is stored in memory, one calibration value per tubing size
- Safety interlock powers down unit when changing tubing
- Broad range of remote control options ideal for automated process applications
- Space efficient, low-profile, stackable design
- Accurate, reliable control of flow and dosing, digital display of RPM for accurate control

Specifications

Operating temperature:	0°C to 40°C
Storage temperature:	-25°C to 65°C
Housing materials:	Housing: ABS; Pump head: GF Nylon, Delrin®, Stainless steel, Cold-rolled steel, Buna N, Polycarbonate
IP rating:	IP 31
Agency approvals:	ETL, cETL, CE, ROHS
Controller dimensions (L × W × H):	31.7 x 27.9 x 15.2cm
Weight:	7kg
External control - input:	0 to 20 mA, 4 to 20 mA, or 0 to 10V; Scalable; START/STOP, DIR. (CW/CC), PRIME via contact closure; Remote/Local Indication
External control - output:	4 to 20 mA, or 0 to 10V; N.O. or N.C. (1A @ 24V); 5V, TTL pulse
Voltage (50/60 Hz):	115/230V AC (auto selected)
Motor type:	1/10 HP, (75 w) PMDC
Control type:	Phase-Controlled
Speed resolution (repeatability):	±0.1 rpm @ 4 to 400 rpm
Speed regulation:	±0.25% (full scale)

Type	Flow rate ml/min.	Rotation speed rpm	PK	Cat. No.
FH100D (thin wall)	0.5 - 3000	4 -400	1	**9.828 614**
FH100DX (thick wall)	14 - 4000	4 -400	1	**9.828 615**

Pump systems and Accessories for FH100 and FH100D

NEW!

Thermo Scientific

Type	PK	Cat. No.
Dispensing handle FH120DH for FH100 and FH100X	1	**9.828 710**
Dispensing handle FH120DH for FH100D and FH100DX	1	**9.828 711**
Foot switch for FH100 and FH100X	1	**9.828 712**
Foot switch for FH100D and FH100DX	1	**9.828 714**
Sinker set 1x large and 1x small	1	**9.828 716**
Sinker, small fo tube I.D. 1.6 - 3.2mm	1	**9.828 717**
Sinker, large for tube I.D. 4.8 - 6.4mm	1	**9.828 718**



1 Multichannel Pumps FH100M

NEW!

Thermo Scientific

Thermo Scientific FH100M Series peristaltic pumps provide multichannel pumping with the accuracy of flow control and broad flow range to efficiently service most pumping applications, including bioassays, electrophoresis, chromatography, and pH control. With flow ranges from 1.2 microliters per minute to 760ml/min and three modes of operation: flow, timed flow and programmable cycle dispensing FH100M Series multichannel pumps can save considerable time and resources while greatly improving process efficiency.
Featuring remote control of speed, pumping direction, and start/stop/purge, FH100M pumps are available with a wide range of interchangeable multichannel pump heads, drives, and tubing and can deliver up to 12 channels simultaneously. A configured FH100M pump system consists of a pump head, drive, and a full set of cassettes.

Easy to maintain
- Cassette design provides fast tubing changes and eliminates hardware in other multi-channel designs
- Rugged motor and controls ensure long-term reliable operation
- Contamination free pumping the fluid contacts only the tubing material

Easy to use
- Programmable in seven languages provides easy set-up in almost any global location
- Universal voltage and frequency capability allows operation world-wide IEC320 socket provided
- Quick start guide included for fast, easy set-up

Diverse performance range
- Three modes of operation flow, Timed Flow and Programmable Cycle Dispensing
- Lower pulsation flow and higher accuracy at low volumes and low flow rates
- High repeatability on all channels
- Cassettes provide defined and repeatable occlusion conditions
- Available in 4, 8, or 12 channel models (2, 4, and 6 channels when using the large cassettes)
- Capable of accurate, metered, parallel flows with difficult or multiphase fluids

Ergonomic design
- Digital display of pump speed or percent of maximum speed or number of dispense cycles
- Adjustable occlusion setting provides flow and pressure performance, and optimises tubing life
- Valveless replacement alternative to diaphragm and piston pumps

Specifications

Operating temperature:	0°C to 40 °C
Storage temperature:	-25°C to 65 °C
Housing materials:	Housing: ABS; Pump head: Polysulfone, Stainless steel, Anodized aluminum, Rulon, Buna-N; Cartridge: Polycarbonate, GF Nylon, Anodized aluminum knob.
IP rating:	IP 31
Agency approvals:	ETL, cETL, CE, ROHS
Controller dimensions (L × W × H):	31.7 x 27.9 x 15.2cm
Shipping weight:	7kg
External control - input:	0 to 20 mA, 4 to 20 mA, or 0 to 10V; Scalable; START/STOP, DIR. (CW/CC), PRIME via contact closure; Remote/Local Indication
External control - output:	4 to 20 mA, or 0 to 10 V; N.O. or N.C. (1A @ 24V); 5V, TTL pulse
Voltage (50/60 Hz):	115/230V AC (auto selected)
Motor type:	1/10 HP, (75 w) PMDC
Control type:	Phase-Controlled
Speed resolution (repeatability):	±0.1 rpm @ 4 to 400 RPM
Speed regulation:	±0.25% (full scale)

Type	Channels	Rollers	Flow rate ml/min.	Rotation speed rpm	PK	Cat. No.
FH100M 4/6	4	6	0,21 - 360	4 - 200	1	**9.828 608**
FH100M 4/8	4	8	0,013 - 67,0	4 - 200	1	**9.828 609**
FH100M 8/3	8	3	0,22 - 760	4 - 200	1	**9.828 610**
FH100M 8/4	8	4	0,02 - 100	4 - 200	1	**9.828 611**
FH100M 12/6	12	6	0,002 - 14,0	0,8 - 80	1	**9.828 612**
FH100M 12/8	12	8	0,033 - 128,0	0,8 - 80	1	**9.828 613**

E & OE.

Tubing and Tubing Link for use with FH100M Multichannel Pump Systems

NEW!

Thermo Scientific

Type	Int. diam. mm	Size	PK	Cat. No.
Link, silicone	0.89	26	6	**9.828 681**
Link, silicone	1.42	34	6	**9.828 682**
Link, silicone	2.79	48	6	**9.828 684**
Transfer tubing, silicone	0.89	26	15,2	**9.828 685**
Transfer tubing, silicone	1.42	34	15,2	**9.828 686**
Transfer tubing, silicone	2.79	48	15,2	**9.828 688**
Link, Santoprene	0.25	12	12	**9.828 689**
Link, Santoprene	0.89	26	12	**9.828 690**
Link, Santoprene	1.42	34	12	**9.828 691**
Link, Santoprene	2.79	48	12	**9.828 693**
Transfer tubing, Santoprene	0.25	12	30,4	**9.828 694**
Transfer tubing, Santoprene	0.89	26	30,4	**9.828 695**
Transfer tubing, Santoprene	1.42	34	30,4	**9.828 696**
Transfer tubing, Santoprene	2.79	48	30,4	**9.828 697**
Link, silicone	0.08	13	6	**9.828 698**
Link, silicone	1.60	14	6	**9.828 699**
Link, silicone	3.20	16	6	**9.828 700**
Link, silicone	6.40	17	6	**9.828 701**
Link, silicone	4.80	15	6	**9.828 703**
Link, PharMed® BPT	0.08	13	12	**9.828 704**
Link, PharMed® BPT	1.60	14	12	**9.828 705**
Link, PharMed® BPT	3.20	16	12	**9.828 706**

Other sizes available on request.

General advantages Heidolph-pump

Heidolph

- High precision even for flow rates starting at 0.005ml/min
- Optional foot-pedal remote control via cable to operate pump drive outside a closed fume hood facilitate operation
- For the use in cell biology just use a pump head which features convex rollers and does not squeeze the tubing as conventional rollers
- All models feature a smooth start operation which prevents spills and splashing media. The speed will ramp up slowly until your set rpm has been reached
- Safety for continuous operation: the motor will be switched off if a high thermal load situation occurs to prevent accidents

Analog Pump drive PD 5001/5006

Heidolph

Pumpdrive PD 5001 - Flow rates of 0.8 to 790ml/min with single-channel pump heads
- Low speed range from 10rpm to 120rpm
- This pump drive is suitable for multi-channel operation
- Multi-channel flow rates from 0.005ml/min to 320ml/min
- Upgrade your PD 5001 for multi-channel operation in just minutes with a pump head adaptor

Pumpdrive PD 5006 - Flow rates of 3.6 to 3900ml/min with single-channel pump heads
- High speed range from 50rpm to 600rpm
- This pump drive is not suitable for multi-channel operation

The pump head is not included. Please order separately.

1



9.829 241

Type	PK	Cat. No.
PD 5001	1	**9.829 240**
PD 5006	1	**9.829 241** 1

1



9.829 243

Pump drive PD 5101/5106

For reproducible results - liquid transfer *Heidolph*

- Control the speed (rpm) in a clockwise or counter-clockwise direction and On/Off via analog interface for 0-10V or 4-20mA
- Adjust the variable speed on the analog control knob from 5.0rpm to 600rpm. Your speed is held constant even under changing loads
- This model features electronic speed control at an accuracy of ±3.5%
- This model connects to an optional foot pedal remote control via cable to start and stop your pump drive outside a closed fume hood increasing your personal safety or ease of use in multiple sample fills
- At the press of a button the pump operates clockwise or counter-clockwise
- A press of the max button accelerates the filling and draining of your tubing

PD 5101 Flow rates of 0.3 to 790ml/min with single-channel pump heads
- Low speed range from 5rpm to 120rpm
- This pump drive is suitable for multi-channel operation
- Multi-channel flow rates from 0.005ml/min to 320ml/min
- Upgrade your PD 5101 for multi-channel operation in just minutes with a pump head adaptor

PD 5106 Flog rates of 1.3 to 3900ml/min with single-channel pump heads
- High speed range from 24rpm to 600rpm
- This pump drive is not suitable for multi-channel operation

The pump head is not included. Please order separately.

Type	Flow rate ml/min.	PK	Cat. No.
PD 5101	0.005 to 790	1	**9.829 242**
PD 5106	1.3 to 3900	1	**9.829 243** 1

2



9.829 244

Pump drive PD 5201/5206

Reproducibility - pumping and dosing *Heidolph*

- Control the speed (rpm) direction and On/Off via analog interface for 0-10V, 4-20mA or digital RS232 interface
- Flow characteristic of pump heads in combination with various tubing diameters is pre-programmed for accurate flow rate numbers
- Digital read-out of: Speed (rpm), Tubing diameter, Flow rate in ml/min, Dosing volume, Interval dosing, Pause function
- Easily change all process parameters via these buttons
- This model connects to an optional foot pedal remote control via cable to start and stop your pump drive outside a closed fume hood increasing your personal safety or easy use in multiple sample fills
- This model features electronic speed control and an accuracy of ±0.5%
- A press of the max button accelerates the filling and draining of your tube
- At the press of a button the pump operates clockwise or counter-clockwise
- Calibrate your flow volume and flow rate individually

Pumpdrive PD 5201 - Flow rates of 0.3 to 790ml/min with single-channel pump heads
- Low speed range from 5rpm to 120rpm
- This pump drive is suitable for multi-channel operation
- Multi-channel flow rates from 0.005 to 320ml/min
- Upgrade your PD 5201 for multi-channel operation in just minutes with a pump head adaptor

Pump drive PD 5206 - Flow rates of 1.3 to 3900ml/min with single-channel pump heads
- High speed range from 24rpm to 600rpm
- This pump drive is not suitable for multi-channel operation

The pump head is not included. Please order separately.

Type	PK	Cat. No.
PD 5201	1	**9.829 244** 2
PD 5206	1	**9.829 245**

E & OE.

Single-channel pump heads SP quick/SP quick d

Heidolph

SP quick
- Fast and convenient tube changes
- Low pulsation due to 5 roller system
- Pump head features ball bearings
- Rollers made of stainless steel
- For tubes with a 1.6mm or 2.5mm wall thickness (wt)
- Depending on drive and tubing, the flow rate ranges from 0.4 to 3300ml per minute

SP quick d
- Choose SP quick in combination with SP quick d to attach two pump heads to one drive
- This combination is suitable for pump drives PD 5001/5101/5201 only

Type	Tubing wall thickness	Flow rate ml/min.	PK	Cat. No.
SP quick	1.6	0.3 to 3300	1	**9.829 250** 1
SP quick	2.5	0.3 to 3300	1	**9.829 251**
SP quick d	1.6	0.3 to 3300	1	**9.829 252**
SP quick d	2.5	0.3 to 3300	1	**9.829 253**

1



9.829 250

2 Peristaltic pump tubing, Tygon R 3607

With 2 colour-coded bridges (international standards). ID 0.13 to 0.64 wall thickness: 0.9mm, ID 0.76 to 3.18 wall thickness: 0.85mm.
Shore: 55. Fits most common peristaltic pump models, e.g. Verder, Ismatec, Watson-Marlow, IKA and Heidolph.
Standard tubing, transparent. Length 380mm. Long working lifespan. Good resistance to acids and alkalis.
Suitable for general use and with food.

2



Int. diam. mm	Colour	PK	Cat. No.
0.13	orange-black	12	**9.208 201**
0.19	orange-red	12	**9.208 202**
0.25	orange-blue	12	**9.208 203**
0.38	oragne-green	12	**9.208 204**
0.51	orange-yellow	12	**9.208 205**
0.64	orange-white	12	**9.208 206**
0.76	black-black	12	**9.208 207**
0.89	orange-orange	12	**9.208 208**
1.02	white-white	12	**9.208 209**
1.14	red-red	12	**9.208 210**
1.30	grey-grey	12	**9.208 211**
1.42	yellow-yellow	12	**9.208 212**
1.52	yellow-blue	12	**9.208 219**
1.65	blue-blue	12	**9.208 213**
1.85	green-green	12	**9.208 214**
2.06	purple-purple	12	**9.208 215**
2.29	purple-black	12	**9.208 216**
2.54	purple-orange	12	**9.208 217**
2.79	purple-white	12	**9.208 218**
3.18	black-white	12	**9.208 222**

Single-channel pump heads SP standard and SP vario

Heidolph

SP standard
- Recommended for standard applications
- Convex rollers do not squeeze or crush organic cell cultures
- Pump head features ball bearings
- Rollers made of stainless steel and polyamide
- For tubes with a 1.6mm or 2.5mm wall thickness (wt)
- Depending on drive and tubing, the flow rate ranges from 0.3 to 3900ml per minute

SP vario
- Suitable for most Heidolph tubing due to adjustable roller spacing
- Convex rollers do not squeeze or crush organic cell cultures
- Pump head features ball bearings
- Rollers made of stainless steel and aluminum
- Depending on drive and tubing, the flow rate ranges from 0.3 to 3900ml per minute

3



9.829 254

4



9.829 256

Type	Tubing wall thickness	Flow rate ml/min.	PK	Cat. No.
SP standard 1.6*	1.6	0.5 to 3644	1	**9.829 254** 3
SP standard 2.5*	2.5	0.5 to 3644	1	**9.829 255**
SP vario**	var.	0.5 to 3644	1	**9.829 256** 4

* for simple flow requirements.
** rotor with adjustable roller distance.

Multi-channel pumps C4/C8/C12

Heidolph

- These pump drives are able to be configured for multi-channel use: PD 5001, PD 5101 and PD 5201
- Increase your output by running up to 12 individual cassettes on one single pump drive and pump head system
- Separate metering into multiple vessels with different feed rates at the same time by using different tubing dimensions to adjust flow rates
- Save time: Tubing change is done in just seconds
- In addition to standard pump heads which feature a 4 roller system you can choose 8 roller pump heads for low pulsation
- Change your cassettes easily, even during operation - there are no restrictions
- Cassettes adjustments and changes are simple, just click in place
- No additional pump drive purchase needed: Upgrade your single channel pump drive with just an adaptor for multi-channel use and pick the head/cassette configuration that matches your application needs

Type	Description	PK	Cat. No.
C4	for max. 4 x small cassettes	1	**9.829 285** 1
C8	for max. 8 x medium or 4 x large cassettes	1	**9.829 286** 2
C12	for max. 12 x small cassettes	1	**9.829 287** 3
Cassette, small	Flowrate: 0.005 to 40.8 ml/min	1	**9.829 288**
Cassette, medium	Flowrate: 0.29 to 25.2 ml/min	1	**9.829 289**
Cassette, large	Flowrate: 1.0 to 336 ml/min	1	**9.829 290**
Multi channel adaptor		1	**9.829 291**

1



9.829 285

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9.829 286

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9.829 287

4



4 Masterflex pump head

Heidolph

- Constructed with rugged anodized aluminum frames, stainless steel rotor assemblies and a precision machined aluminum occlusion bed for 4 channels.
- This occlusion bed is designed to compress the tubing for optimum performance, no occlusion adjustment is required.
- Thus, it is possible that several pump heads can operate parallel at the same time.

Type	Description	PK	Cat. No.
Masterflex	Multi channel peristaltic pumps	1	**9.829 292**

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

Heidolph Research made easy

E & OE.

1 Peristaltic pump drives, MCP standard/MCP process

Can be combined with over 20 pumpheads for flow rates of 0.01 to 3700ml/min (depending on pump-head).
Combined peristaltic pump and precise dispenser. Microprocessor controlled, with precise controlled rotation speed and metering unit for 1 to 24 pump channels.
The speed (1rpm to 240rpm) is adjustable to 0.1rpm, key-pad with LED-display, programmable.
Different dosing modes supply very exact and reproducible results.
With RS232 interface, tubing valve operation, dosing handle and foot switch.
Can be used for sterile dosing up to 135°C (with adequate tubing).
Dimensions (WxDxH): 155mm x 220mm x 260 mm (without pumphead).

1



Ismatec

Programmable functions:
- ml/min
- drive speed
- drop-free (roller reverse step)
- calibration ml/min in ml (volume)
- drive unit on/off

Dosing:
- volume ml
- volume/time unit
- dosing time (0.1 to 999 h)

Additonal functions MCP process:
- progammable sequences
- dust-tight and water-proof

Specifications	**MCP-Process**
Motor type:	d.c. motor
Speed:	1 to 240rpm
Speed setting:	rpm, resolution 0.1rpm
Flow rate setting:	ml/min, ml/min, l/min
Power consumption:	100W
Power supply:	100 to 230V, 50 to 60Hz a.c.
Protection rating:	IP65
Weight:	6.9kg (without pumphead)
	MCP-Standard
Motor type:	d.c. motor
Speed:	1 to 240rpm
Speed setting:	rpm, resolution 0.1rpm
Flow rate setting:	ml/min, ml/min, l/min
Power consumption:	100W
Power supply:	230V 50Hz; 115V, 60Hz a.c. selectable
Protection rating:	IP30
Weight:	6.4kg (without pumphead)

Type	PK	Cat. No.
MCP-Process	1	**9.828 510**
MCP-Standard	1	**9.828 367**



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9.828 366

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9.828 512

Peristaltic pump drives, BVP-Standard/BVP-Process

Can be combined with over 20 pump-heads for flow rates of 0.01 to 3700ml/min (depending on pump-head). *Ismatec*

For the continuous pumping of liquids and suspensions with up to 60 % solids content according to capacity or time.
Analogue interface for Start/Stop, rotation direction, autostart. LED display on BVP Process.
Stainless steel housing, dust-tight and water-proof.
Dimensions (W X D x H): 155 x 220 x 260mm (without pump-head).
Power supply: 230V/50Hz, 115V/60Hz

Specifications: BVP Standard
- speed 2.4 to 240 rpm
- speed setting: 1-99.9%, resolution 0.1%
- protection rating: IP30
- weight: 5.7kg

Specifications: BVP Process
- speed 1 to 240 rpm
- speed setting: rpm, resolution: 0.1 rpm
- protection rating: IP65
- weight: 6.9kg

Type	Flow rate ml / min.	PK	Cat. No.
BVP-Standard	0.003 - 3700	1	**9.828 366** 1
BVP-Process	0.001 - 3700	1	**9.828 512** 2

3



3 Single-channel-pumpheads for peristaltic pumps BVP-Standard (-Process) and MCP-Standard (-Process) drive units

Ismatec

Pumphead type	Inputs	Flow rate ml / min.	Rollers	PK	Cat. No.
7518-10 Easy-Load®*	1	0.07 - 1100	3	1	**9.828 391**
Easy-Load removable plate	-	-		1	**9.828 530**
PTFE tubing pumphead*	1	0.07 - 45	6	1	**9.828 395**

* Removable plate 9.828 530 is required for operation.

4



4 Single-channel pumpheads for BVP-Standard (-Process) and MCP-Standard (-Process) peristaltic pump drive units

For tubing with max. wall thickness: 1.6mm *Ismatec*

Pumphead type	Flow rate ml / min.	Inputs	Rollers	PK	Cat. No.
360	0.072 - 530	1	3	1	**9.828 371**
380	0.44 - 2800	1	3	1	**9.828 372**
380 AD**	0.41 - 3600	1	3	1	**9.828 373**
Pro 280	0.49 - 3700	1	2	1	**9.828 520**
Pro 380	0.45 - 3400	1	3	1	**9.828 521**
Pro 281*	3.6 - 3100	1	2	1	**9.828 394**
Pro 381*	3.3 - 2900	1	3	1	**9.828 396**

* Tubing wall thickness 2.4 mm
**Pump head for tubing wall thickness of 1.6 to 2.4 mm

5



5 Multichannel pumpheads for BVP-Standard/Process and MCP-Standard/Process drive units

Ismatec

Pumphead type	Flow rate ml / min.	Inputs	Rollers	PK	Cat. No.
SB removable plate	-	-	6	1	**9.828 533**
SB-3V*	0.09 - 530	3	6	1	**9.828 216**
SB-2V*	1.1 - 1100	2	6	1	**9.828 215**

* Removable plate 9.828 533 is required for operation.

E & OE.

1 2 Multichannel pumpheads for BVP-Standard/Process and MCP-Standard/Process drive units

Ismatec

Pumphead type	Flow rate ml / min.	Inputs	Rollers	PK	Cat. No.
CA4	0.002 - 230	4	8	1	**9.828 379**
CA8	0.002 - 230	8	8	1	**9.828 380**
CA12	0.002 - 230	12	8	1	**9.828 381**
MS/CA8-6*	0.002 - 100	8	6	1	**9.828 375**
MS/CA4-12**	0.001 - 57	4	12	1	**9.828 377**
MS/CA8 cartridge block	0.002 - 100	8	6	1	**9.828 376**
MS/CA4-12 cartridge block	0.001 - 57	4	12	1	**9.828 378**

*extendible to 24 channels
**extendible to 16 channels

1



2



3 Pump, peristaltic, Flowmaster FMT 300

Ismatec

Offers high flow rates from 37ml/min to 13l/min for industrial applications.
Protection level IP65, sterile tube insertion without priming.
Simple detachable pumphead makes cleaning easy, no tools required.
Dispensing in intervals possible.

Specifications

Pumping speed:	5 to 500rpm, accuracy 0.1rpm, waterproof keypad, LED readout
Power consumption:	500W
Power supply:	115/230V 60Hz a.c., switchable
Protection:	IP 65
Dimensions (HxWxD):	220x500x262mm
Weight:	26kg
Flowrate:	37 ml/min - 13l/min
Pumphead:	Comprises a 3-roller pumphead for tubing with a thickness of 3.2 mm

Type	PK	Cat. No.
Flowmaster FMT 300	1	**9.828 541**

3



1



1 Pumps, peristaltic, multichannel, precision, IPC, IPC-N-IP and IP-N

Ismatec

IP and IP-N series, without dispensing features
- Microprocessor controlled
- very precise pumping

IPC and IPC-N series, with dispensing features
- Microprocessor controlled
- very precise pumping
- with "standby-mode" (prevents draining the tubing line e.g. overnight)
- with dispensing and calibration functions

IPC-N and IP-N series
- 4, 8, 12, 16 or 24 channels
- 8 actively driven stainless steel rollers
- Transparent keyboard and LED-display
- Click´n´go cassettes providing defined and repeatable occlusion conditions.
- different tube sizes can be inserted in each channel.
- 2 Stopper tubes
- Differential pressure: 1.0 bar

Specifications IPC and IPC-N:

Motor type:	d.c. motor
Flow rates:	IPC: 0.4 up to 44 l/min IPC-N: 0.11 up to 11.25 l/min
Speed range:	1 to 100 %, resolution 0.1 % in µl/min to ml/min
Input:	30W
Supply requirements:	230V 50Hz, 115V 60Hz (selectable)
Protection class:	IP 30

Specifications IP and IP-N:

Motor type:	d.c. motor
Flow rates:	IP: 0.4 up to 44 l/min IP-N: 0.11 up to 11.25 l/min
Speed range:	1 to 100 %, resolution 0.1 % IP; rpm, resolution 0.1 l/min IP-N: rpm, resolution 0.03 l/min
Input:	30W
Supply requirements:	230V 50Hz, 115V 60Hz a.c. (selectable)
Protection class:	IP 30

Type	Flow rate ml/min.	Inputs	Dimensions (W x D x H) mm	PK	Cat. No.
IP-4	0.002 - 44	4	175 x 180 x 130	1	**9.828 346**
IP-8	0.002 - 44	8	175 x 220 x 130	1	**9.828 347**
IP-12	0.002 - 44	12	175 x 260 x 130	1	**9.828 348**
IP-16	0.002 - 44	16	175 x 300 x 130	1	**9.828 349**
IP-24	0.002 - 44	24	175 x 380 x 130	1	**9.828 350**
IP-N-4	0.0004 - 11	4	175 x 180 x 130	1	**9.828 356**
IP-N-8	0.0004 - 11	8	175 x 220 x 130	1	**9.828 357**
IP-N-12	0.0004 - 11	12	175 x 260 x 130	1	**9.828 358**
IP-N-16	0.0004 - 11	16	175 x 300 x 130	1	**9.828 360**
IP-N-24	0.0004 - 11	24	175 x 380 x 130	1	**9.828 370**
Foot switch T-51-S	-	-	-	1	**9.828 359**
IPC-4	0.002 - 44	4	175 x 180 x 130	1	**9.828 351**
IPC-8	0.002 - 44	8	175 x 220 x 130	1	**9.828 352**
IPC-12	0.002 - 44	12	175 x 260 x 130	1	**9.828 353**
IPC-16	0.002 - 44	16	175 x 300 x 130	1	**9.828 354**
IPC-24	0.002 - 44	24	175 x 380 x 130	1	**9.828 355**
IPC-N-4	0.0004 - 11	4	175 x 180 x 130	1	**9.828 361**
IPC-N-8	0.0004 - 11	8	175 x 220 x 130	1	**9.828 362**
IPC-N-12	0.0004 - 11	12	175 x 260 x 130	1	**9.828 363**
IPC-N-16	0.0004 - 11	16	175 x 300 x 130	1	**9.828 364**
IPC-N-24	0.0004 - 11	24	175 x 380 x 130	1	**9.828 365**

E & OE.

Pumps, peristaltic, Ecoline

Flow rate 0.003 to 5400 ml/min. Robust and economical. Stainless steel housing. *Ismatec*
Easy handling. For all applications in laboratory and industry.

Ecoline VC-280:
Economical, basic, single-channel drive model for flow rates up to 5.4 l/min. with variable speed.

Ecoline VC-360 and VC380:
1-channel tubing pumps, microprocessor controlled. With 2-digit potentiometer, scaled 1 to 99% and analogue interface for Start/Stop, rotation direction, speed control (0 to 5 or 0 to 10V/0 to 20 or 4 to 20mA).

Ecoline VC-drive without pump heads:
- combinable with Easy-Load®, MS/CA 8-6 and MS/CA 4-12 pumpheads

1



9.828 514

2



9.828 515

Type	Channels	Rollers	Flow rate ml / min.	To fit tubing mm	PK	Cat. No.
VC-280 II	1	2	1.7 - 5400	1.6 - 11.1	1	**9.828 513**
VC-360 II	1	3	0.25 - 1300	0.8 - 6.4	1	**9.828 514** 1
VC-380 II	1	3	1.6 - 5000	1.6 - 11.1	1	**9.828 515** 2
Ecoline VC-drive			0.23 - 5400	-	1	**9.828 516**
Easy-Load®	1	3	0.23 - 1600	0.8 - 8.0	1	**9.828 391**
MS/CA 8-6	8	6	0.005 - 150	0.13 - 3.17	1	**9.828 376**
MS/CA4-12	4	12	0.003 - 83	0.13 - 3.17	1	**9.828 378**

3 Pumps, peristaltic, Reglo-Analogue

For high precision pumping in the ml-range and below (0.002 to 68ml/min). *Ismatec*
Simple Click'n'go mini tubing assembly cartridges.
With remote control for on/off and speed.

- speed setting: 2-99%, resolution: 1%
- power consumption 20W
- overload control
- analogue interface
- for 0.13 to 3.17mm tubing i.d.
- 3-stop, colour-coded tubing

Dimensions (WxDxH)
2-channel versions: 100 x 178 x 143 mm
4-channel versions: 100 x 190 x 143 mm

Type	Rotation speed rpm	Flow rate ml/min.	Channels	Rollers	PK	Cat. No.
MS-2/6-160	3.2 - 160	0.005 - 68	2	6	1	**9.828 470**
MS-2/8-160	3.2 - 160	0.004 - 57	2	8	1	**9.828 471**
MS-2/12-160	3.2 - 160	0.003 - 38	2	12	1	**9.828 474**
MS-4/6-100	2,0 - 100	0.003 - 43	4	6	1	**9.828 472**
MS-4/8-100	2,0 - 100	0.003 - 35	4	8	1	**9.828 473**
MS-4/12-100	2,0 - 100	0.002 - 24	4	12	1	**9.828 475**

3



1



1 Pumps, peristaltic, Reglo-Digital

Ismatec

For high precision pumping in the ml-range and below (0.001 to 68ml/min).
Simple Click'n'go mini tubing assembly cartridges.
Microprocessor controlled, with RS232 interface and can be calibrated.
Programmable flow rates, dispensing volume and pause times.
Digital LED display. For: 0.13 to 3.17mm i.d. tubing.

Programmable functions:
- ml/min
- the drive speed (rpm)
- drip-free by rolling back steps
- calibration: ml/min (flow rate); ml (volume)
- power ON/OFF

Dosing by:
- volume ml
- volume/unit time
- metering (0.1 to 999 hours)
- interval metering with preset pause
- selectable number of dispensing

Type	Rotation speed rpm	Flow rate ml/min.	Inputs	Rollers	PK	Cat. No.
MS-2/6-160	1.6 - 160	0.003 - 68	2	6	1	**9.828 480**
MS-2/8-160	1.6 - 160	0.002 - 57	2	8	1	**9.828 481**
MS-2/12-160	1.6 - 160	0.002 - 38	2	12	1	**9.828 484**
MS-4/6-100	1.0 - 100	0.002 - 43	4	6	1	**9.828 482**
MS-4/8-100	1.0 - 100	0.002 - 35	4	8	1	**9.828 483**
MS-4/12-100	1.0 - 100	0.001 - 24	4	12	1	**9.828 485**

2



2 Peristaltic pumps, Reglo ICC

NEW!

Ismatec

Independent 3-Channel Control Pump
- Increased efficiency
- Control of complex pump applications with only one pump
- Controlled by computer or directly through the control panel on the pump
- Continuous pumping and precise dosing
- Flexible bi-directional flow direction in each channel
- Self-priming
- Especially for viscous or foaming liquids, also when containing particles or live cells
- Contamination-free pumping even under sterile conditions

Specifications

Flow rate: 0.002 to 35ml/min
Differential Pressure: Max. 1.0 bar (14.5 psi)

Type	PK	Cat. No.
Reglo ICC	1	**9.828 487**

3



3 Compact peristaltic pumps MS-CA

Ismatec

Flow rate 0.021 to 26ml/min. Simple Click'n'go mini tubing assembly cartridges.
- 3-stop colour-coded tubing
- fixed-speed motor
- Dimensions MS-CA2 (WxDxH): 88 x 135 x 125mm
- Dimensions MS-CA4 (W x D x H): 88 x 135 x 145mm

Type	Rotation speed rpm	Flow rate ml/min.	Channels	Rollers	PK	Cat. No.
MS-CA 2/620	20	0.028 - 8.5	2	6	1	**9.828 142**
MS-CA 2/660	60	0.083 - 26.0	2	6	1	**9.828 146**
MS-CA 2/640	40	0.6 - 17	2	6	1	**9.828 144**
MS-CA 2/840	40	0.043 - 14	2	8	1	**9.828 154**
MS-CA 2/820	20	0.021 - 7.1	2	8	1	**9.828 152**
MS-CA 2/860	60	0.064 - 21.0	2	8	1	**9.828 156**

E & OE.

1 Rotarus® standard 50

NEW!

Peristaltic pump for continuous delivery in speed ranges from 0.2 to 100 revolutions per minute. *Hirschmann*


1

rotarus® standard is the powerful basic model in the peristaltic pump series. The cost-effective, precise delivery pump for small delivery volumes and high viscosities is ideal for flexible applications, thanks to the use of diverse pump heads and hoses. The control panel on the housing enables simple and rapid configuration of the most important parameters, and the speed can be programmed directly on the unit. Performance class with 50 Watt ensures exact delivery in speed ranges from 0.2 to 100 revolutions per minute. Housings are available with a white powder coating (protection class IP54) and inox stainless steel design (rotarus® standard 50i, protection class IP65). The pump head connection technology was developed for rapid handling.

Overview of details:
- Changeable pump heads, single and multichannel design
- Rapid tool-free changing of pump heads - Control panel located directly on pump housing
- Calibratable
- Operation with 24 V DC
- USB and RS232 interface for PC link using interface (available as accessory)
- Pump heads from other manufacturers can be fitted without difficulty using an adapter
- Comprehensive accessory range

Type	PK	Cat. No.
standard 50	1	**6.258 629**
standard 50i	1	**6.258 630**

2 Rotarus® Volume 100

NEW!

Peristaltic pump for continuous delivery in speed ranges from 3 to 500 revolutions per minute. *Hirschmann*


2

rotarus® volume 100 is a comfortable, rapid dispensing pump for high flow rates with control options for velocity, flow rate, dispensing duration and total volume. Variable cycles and graduated pump speeds can be controlled reliably and precisely. Performance class with 100 Watt ensures rapid delivery in speed ranges from 3 to 500 revolutions per minute. Housings are available with a white powder coating (protection class IP54) and inox stainless steel design (rotarus® volume 100i, protection class IP65). RFID technology is used in the rotarus® volume to detect the pump head. The model also has automatic blockage detection and hose rupture monitoring. A control panel for the most important functions is integrated directly into the housing. In addition, rotarus® volume is equipped with an external control unit with touchscreen. The pump head connection technology guarantees rapid handling as a standard feature.

Overview of details:
- Changeable pump heads, single and multichannel design
- Rapid tool-free changing of pump heads
- Automatic pump head and hose detection with RFID technology
- Control panel located directly on pump housing
- TFT touchscreen with user-friendly menu
- Calibratable
- Method memory
- Operation with 24 V DC
- USB and RS232 interface for PC link using interface (available as accessory)
- Pump heads from other manufacturers can be fitted without difficulty using an adapter
- Comprehensive accessory range

Type	PK	Cat. No.
volume 100	1	**6.257 247**
volume 100i	1	**6.256 566**

Rotarus® pump heads

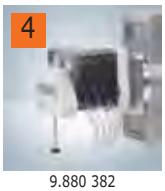
NEW!

Hirschmann

Type	Description	PK	Cat. No.
PK 10-16	Single channel pump head	1	**9.880 380**
PK 10-24	Single channel pump head	1	**9.880 381** 3
MKF 4-8	4 Channel pump head	1	**9.880 382** 4
MKF 8-4	8 Channel pump head	1	**9.880 383** 5
MKF 12-8	12 Channel pump head	1	**9.880 384** 6


3

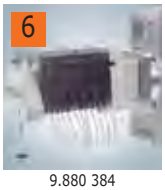
9.880 381


4

9.880 382


5

9.880 383


6

9.880 384

1



1 Chemically-resistant Diaphragm Dosing Pumps SIMDOS®

KNF

The chemically-resistant diaphragm pumps SIMDOS 02 and SIMDOS 10 are the ideal solution to transfer liquids accurately and reliably. With a repeatability of ±1%, this is true for small volumes, too.
The pump head of SIMDOS 02 and SIMDOS 10 is available in PP, PVDF and PTFE.
The valve material is FFKM, the diaphragm is PTFE covered.

The advantages of SIMDOS 02 and SIMDOS 10:
- Simple and intuitive operation
- Easy calibration
- Adaptable to fluid characteristics
- Self priming, can run dry
- Analog and impulse control (RC)
- Splashproof IP65
- Small footprint

Fields of application:
- Chemistry
- Synthetic organic chemistry
- Pharmacy
- Adhesives and glue
- Polymers & polymer coating
- Food technology
- Detergents

Control versions:
S - Version
- Manual operation

RC - Version:
- Analog control: 0-10 V, 0-20 mA, 4-20 mA, from 0 to 100%
- Start/Stop through logic control (TTL)
- Reset/Prime through logic control (TTL)
- Output signal fault alarm
- Cable for external control included

Specifications

Max. pressure:	6bar ü
Power supply:	100 - 240V/50 - 60Hz
Allowed ambient temperature:	+5 to +40°C
Allowed liquid temperature:	+5 to +80°C
Maximum viscosity:	150cSt
Repeatability:	±1%
Power consumption:	10W
Protection class:	IP65
Dimensions:	140 x 87 x 130mm
Weight:	0.9kg
Hydraulic connection	
SIMDOS 02:	UNF 1/4"-28
SIMDOS 10:	Tubing 4mm ID/6mm OD

Type	Head	Control	Flow rate	Dosing volume	Max. suction height	PK	Cat. No.
FEM 1.02 KT.18 S	PP	S-Version (manual)	30µl - 20ml/min	30µl - 999ml	2m	1	**9.880 565**
FEM 1.02 TT.18 S	PVDF	S-Version (manual)	30µl - 20ml/min	30µl - 999ml	2m	1	**9.880 567**
FEM 1.02 FT.18 S	PTFE	S-Version (manual)	30µl - 20ml/min	30µl - 999ml	2m	1	**9.880 569**
FEM 1.02 KT.18 RC	PP	RC-Version (man./extern)	30µl - 20ml/min	30µl - 999ml	2m	1	**9.880 566**
FEM 1.02 TT.18 RC	PVDF	RC-Version (man./extern)	30µl - 20ml/min	30µl - 999ml	2m	1	**9.880 568**
FEM 1.02 FT.18 RC	PTFE	RC-Version (man./extern)	30µl - 20ml/min	30µl - 999ml	2m	1	**9.880 570**
FEM 1.10 KT.18 S	PP	S-Version (manual)	1ml - 100ml/min	1 - 1000ml	3m	1	**9.880 560**
FEM 1.10 TT.18 S	PVDF	S-Version (manual)	1ml - 100ml/min	1 - 1000ml	3m	1	**9.880 561**
FEM 1.10 FT.18 S	PTFE	S-Version (manual)	1ml - 100ml/min	1 - 1000ml	3m	1	**9.880 562**
FEM 1.10 KT.18 RC	PP	RC-Version (man./extern)	1ml - 100ml/min	1 - 1000ml	3m	1	**9.880 563**
FEM 1.10 TT.18 RC	PVDF	RC-Version (man./extern)	1ml - 100ml/min	1 - 1000ml	3m	1	**9.880 564**
FEM 1.10 FT.18 RC	PTFE	RC-Version (man./extern)	1ml - 100ml/min	1 - 1000ml	3m	1	**6.239 423**

E & OE.

1 Diaphragm liquid pumps LIQUIPORT®

KNF



The LIQUIPORT® diaphragm liquid pumps of the NF 100/1.100_.18 S series reliably pump neutral and aggressive liquids. A knob with LED makes it easy to vary the pumping capacity. These pumps work quietly and with low vibrations.

- acid, alkali, solvent resistant
- self-priming
- dry running
- maintenance-free
- splashproof (IP65 level)
- flow rate manually adjustable, LED display
- standby mode
- maximum pressure limitation
- quiet pumping, low vibrations.

Pump head material:
KT = PP
TT = PVDF
Membrane: PTFE coated
Valves: FFPM

Specifications

Suction head:	3 mWS
Pressure head:	10 mWS
Ambient temp.:	+5 to +40°C
Liquid temp.:	+5 to +80°C
Supply requirements:	100-230V, 50/60Hz

Type	Flow rate l / min.	Int. diam. mm	Rating W	Weight kg	Width mm	Length mm	Height mm	PK	Cat. No.
NF 100 KT.18 S	0.2 to 1.3	8	12	1.0	99	130	177	1	**9.880 597**
NF 100 TT.18 S	0.2 to 1.3	8	12	1.0	99	130	177	1	**9.880 598**
NF 300 KT.18 S	0.5 to 3.0	12	24	1.5	104	160	190	1	**9.880 599**
NF 300 TT.18 S	0.5 to 3.0	12	24	1.5	104	160	190	1	**9.880 600**

Further designs available on request.

2 Double diaphragm pumps, oil-free

Lutz Pumpen

Oil-free, air-operated, double diaphragm pumps are an ideal solution for handling viscous, corrosive, abrasive and flammable liquids.
Pump inlet size ¼" (larger pumps on request).
The pumps are available in Polypropylene (PP), PVDF and Nylon.
The diaphragms, balls and valve seats are available in Geolast® and PTFE . Solids up to 1.6mm diameter can be pumped.

Specifications

Flow rate:	16L/min
Suction lift dry:	6m
Operating pressure:	min. 1.4 bar/max. 6.8 bar
Temperature max:	66°C
Suction/ Discharge:	¼" BSP female

Description	Material	Membrane	PK	Cat. No.
For liquids based on water, lubricant, mineral oil	PP	Geolast®	1	**9.880 350**
For corrosive liquids, inorganic alkalis and acids	PP	PTFE	1	**9.880 351**
For concentrated alkalis and acids with higher temperature	PVDF	PTFE	1	**9.880 352**
For solvents, paints, fuel	Nylon	PTFE	1	**9.880 353**

2



1



9.828 308

2



9.828 309

Gear pump drives, MCP-Z-Standard, MCP-Z-Process

Ismatec

2 drive units can be combined with 20 interchangeable magnetically-coupled pumpheads. Flow rates of 1 to 7241ml/min. are attainable with pulse-free flow. Up to 5.6 bar differential pressure and 21 bar system pressure.

MCP-Z-Standard
Microprocessor controlled. Digital display of rotation speed, flow rate, dispensing volume or dispensing time. 4 programme memory and 6 programmable pumping or dispensing functions with calibration mode. Flow rates stored for 20 pumpheads. With RS232 and analogue interfaces.

MCP-Z-Process
Industrial process-adapted drive, dust and watertight, washdown (IP 65) capability through completely sealed stainless steel housing. PC programmed processes can be stored in the pump memory and operated without PC. Other specifications are as MCP-Z-Standard.

Förderbereich 1 bis 7241 ml/min (depending on pump-head)

Specifications:MCP-Z Standard
- speed: 60-6000 min^{-1}
- speed setting: 1-99.9%, resolution 0.1%
- power supply: 230 V/50 Hz - 115 V/60 Hz
- weight: 6.4 kg (without pump head)
- protection rating: IP 30

Specifications: MCP-Z Process
- speed: 60-6000 min^{-1}
- speed setting: min^{-1}. resolution: 0.1 min^{-1}
- power supply: 100-230V/50-60Hz
- weight: 6.9 kg (without pump head)
- protection rating: IP 65

Type	PK	Cat. No.	
MCP-Z-Standard	1	**9.828 308**	1
MCP-Z-Process	1	**9.828 309**	2
Spare magnet for MCP-Z-Standard	1	**9.828 344**	
Spare magnet for MCP-Z-Process	1	**9.828 345**	

Please order two tubing connectors separately.
Tubing connectors - see Gear pump heads.

3



3 Gear pump drive BVP-Z

Ismatec

Flow rates of 1 to 7241ml/min. Motor speed: 60 to 6000 rpm, adjustable in 0.1% steps. Up to 5.2 bar differential pressure and 21 bar system pressure, Rotation speed adjustable via 2 or 3-digit, mechanical push-button potentiometer, with analogue interface and double overload protection. With magnet.

- Weight 5.7kg
- 155 x 220 x 260mm
- Supply requirements: 230V 50Hz, 150W

Type	PK	Cat. No.
BVP-Z	1	**9.828 307**
Spare magnet for BVP-Z	1	**9.828 344**

Please order two tubing connectors separately.
Tubing connectors - see Gear pump heads.

E & OE.

1 Pumps, liquid, ceramic piston, MCP-CPF Process

1



Ismatec

Flow-rate from 0.025 to 2300 ml/min (depending of the pump head).
Operate on a valveless rotating piston principle with liquid pathway materials made of sapphire-hard, chemically inert ceramic (99.7 % Al_2O_3).
Ideal for chemically aggressive and viscous or crystallizing materials.
Differential pressure up to 6.9 bar. Industrial process-adapted drive, dust- and water-tight, with washdown (IP 65) capability due to completely sealed stainless steel housing.
PC-programmed routines can be stored in the pump memory and run without needing a PC.

Specifications

Motor:	d.c. motor
Rotation speed:	10.0 to 1800 rpm.
Speed resolution:	1rpm, 0.1 rpm selectable.
Flowrate setting:	µl/min, ml/min, l/min
Power rating:	100 W
Overall (WxDxH):	155 x 220 x 260 mm (without pumphead)
Safety protection:	IP 65
Weight:	6.9kg (without pumphead)
Supply requirements:	100 to 230V a.c. 50/ 60 Hz

Type	Flow rate	Width	Depth	Height	PK	Cat. No.
	ml / min.	mm	mm	mm		
MCP-CPF process	0.025 - 2300	155	220	260	1	**9.828 511**
Reglo-CPF*	0.08 - 180	100	175	135	1	**9.828 368**

2 Gyro flask pumpheads for MCP-CPF-Process

2



Ismatec

Type	Pump head	Working vol. µl	Flow rate ml / min.	To fit tubing mm	PK	Cat. No.
RH00SKY-LF	steel SS316	2.5 - 25	0.025 - 45	i.d. 1.5	1	**9.828 423**
RH00CKC-LF	ceramic	2.5 - 25	0.025 - 45	i.d. 1.5	1	**9.828 422**
RH0CKC	ceramic	5 - 50	0.050 - 90	o.d. 6.4	1	**9.828 420**
RH1CKC	ceramic	10 - 100	0.10 - 180	o.d. 6.4	1	**9.828 421**

Alternative Gyro flask pumpheads RH... and QP... available on request !

3 Gyro flask pumpheads for MCP-CPF Process pump drive

3



Ismatec

Type	Pump head	Working vol. µl	Flow rate ml / min.	To fit tubing mm	PK	Cat. No.
QP.QO.SSY	Steel SS316	3.2 - 80	0.04 - 144	6.4	1	**9.828 430**
QP.Q2.CSC	Ceramic	28.8 - 720	0.29 - 1300	9.5	1	**9.828 432**
QP.Q3.CKC	Ceramic	51.2 - 1280	0.51 - 2300	12.7	1	**9.828 433**
QP.Q1.CSC.W*	Ceramic	12.8 - 320	0.13 - 576	9.5	1	**9.828 434**
QP.Q2.CSC.W*	Ceramic	28.8 - 720	0.29 - 1300	9.5	1	**9.828 435**
QP.Q1.CSC-WT**	Ceramic	12.8 - 320	0.13 - 576	9.5	1	**9.828 424**
QP.Q2.CSC-WT**	Ceramic	28.8 - 720	0.29 - 1300	9.5	1	**9.828 425**

Alternative pumpheads are available - details on request !
*W - with rinsing inlet
**WT - with rinsing and thermostatic control inlet

Diaphragm pumps 1018

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Desiccator cabinets 1045

Laboratory Freeze drying 1051

Freeze dryers 1051

1



1 Pumps, vacuum/pressure, diaphragm

For general vacuum and pumping applications. *KNF*

These diaphragm pumps are single- and double-head, dry-running devices used in a wide range of laboratory applications. They transfer and pump down without contamination. The pumps are offered in various materials. Supply requirements: 230V 50Hz.

Pump head/Material in contact with the pumped media
KN = PP/EPDM
KT = PP/PTFE-coated
AN = Aluminium/CR
FT = PTFE/PTFE-coated

Type	Flow rate L / min.	Ultimate vacuum mbar (abs).	Max. pressure bar	Accessory codes type (see table)	PK	Cat. No.
N 86 KN.18*	6	100	2.4	1+2+6+13	1	**9.880 510**
N 86 KT.18*	6	160	2.4	1+2+6+13	1	**9.880 680**
N 811 KN.18*	11	240	2	1+2+6+13	1	**9.880 685**
N 022 AN.18*	15	100	4	2+4+14+10	1	**9.880 530**
N 816.3KN.18*	16	15	0.5	1	1	**9.880 543**
N 820 FT.18**	20	100	1		1	**9.880 670**
N 820 AN.18**	22	100	1		1	**9.880 687**
N 820.3 AN.18**	22	8	1		1	**9.880 688**
N 026.3 AN.18*	22	20	-	9	1	**9.880 538**
N 816.1.2KN.18*	30	100	0.5		1	**9.880 544**
N 026.1.2 AN.18*	39	100	2	3+5+8+9	1	**9.880 537**
N 035 AN.18*	30	100	4		1	**9.880 539**
N 035.1.2 AN.18*	55	100	4		1	**9.880 547**
N 035.3 AN.18*	30	13	-		1	**9.880 554**
N 035 AN.18**	30	100	4	3+12+7+11	1	**9.880 540**
N 035.1.2 AN.18**	55	100	4	3+12+7+11	1	**9.880 541**
N 035.3 AN.18**	30	13	-		1	**9.880 553**

* IP20 protection system.
** IP44 protection system.

Accessories for standard diaphragm pumps

KNF

Type	Description	PK	Cat. No.
1	silencer	1	**9.880 515**
2	vacuum filter	1	**9.880 519**
3	vacuum filter / silencer	1	**9.880 548**
4	pressure relief valve, 4 bar	1	**9.880 641**
5	pressure relief valve, 2 bar	1	**9.880 664**
6	fine adjustment heads with pressure gauge	1	**9.880 532**
7	fine adjustment heads with pressure gauge	1	**9.880 545**
8	fine adjustment heads with pressure gauge	1	**9.880 533**
9	fine adjustment heads with pressure gauge	1	**9.880 534**
10	fine adjustment heads with pressure gauge	1	**9.880 536**
11	fine adjustment heads with pressure gauge	1	**9.880 546**
12	Overpressure valve ¼'', 4 bar	1	**9.880 642**
13	fine adjustment heads with pressure gauge	1	**9.880 531**
14	fine adjustment heads with pressure gauge	1	**9.880 535**

2



2 Diaphragm vacuum pumps LABOPORT®

PTFE diaphragm pumps for evacuating and pumping corrosive gases and vapours. *KNF*
Maintenance and oil free. Pumpheads and valves are made of chemically resistant materials. Freely moving, stress resistance-optimised, structured diaphragm achieves maximum vacuum performance from even the smallest dimensions. A sealed PTFE coating on the diaphragm and a special sealing zone on the outer rim of the diaphragm make these pumps exceptionally gas-tight. High vapour and condensate compatibility is afforded by a new valve system. Compact, space-saving design. Built-in foldaway handle.
Supply requirements: 230V, 50Hz.

Type	Flow rate L / min.	Ultimate vacuum mbar (abs).	PK	Cat. No.
N 810.3 FT.18	10	8	1	**9.880 612**
N 820.3 FT.18	20	8	1	**9.880 613**
N 840.3 FT.18	34	8	1	**9.880 614**
N 842.3 FT.18	34	2	1	**9.880 675**
N 840.1.2 FT.18	60	90	1	**9.880 660**

E & OE.

1 Diaphragm vacuum pumps LABOPORT®-SD, chemically-resistant


1

With self-drying system for vacuum drying. Oil-free, positive displacement pumps for neutral, highly aggressive or corrosive gases and vapours. Unadulterated, pumped gas/vapour output. Constant vacuum. More environment-friendly and cost-effective than water jet pumps. *KNF*

The new self-drying system enables condensate to be blown out of the pumphead at high speed during the evacuation process. The vacuum in the vessel being pumped remains constant. The drying cycle can be synchronised in three different ways according to individual process requirements. With drying the pump achieves a better vacuum and can evacuate more quickly than pumps without drying systems.

Pump components that come into contact with media
Pump head: PTFE
Diaphragm: PTFE
Valves: FFPM

Supplied as follows: Chemistry laboratory vacuum pumps are complete instruments that are ready for connection with mains switch, mains cable (supply requirements: 230V/50Hz, other voltages and frequencies available on request) and fully automatic self-drying system. Easy connection to vacuum desiccator cabinets.

Type	Flow rate L / min.	Ultimate vacuum mbar (abs).	Width mm	Length mm	Height mm	PK	Cat. No.
N 820.3 FT.40.18	20	10	177	312	220	1	**9.880 615**
N 840.3 FT.40.18	34	10	189	341	239	1	**9.880 616**
N 842.3 FT.40.18	34	4	189	341	242	1	**9.880 617**

Aluminium diaphragm pumps

Diaphragm pumps made with Aluminium and FPM as the wetted materials are the optimal selection for non-corrosive applications such as backing pumps for wide range and turbomolecular pumps, for regenerating cryopumps, for evacuating or transferring gases and for analysis equipment. Vacuum filtration is one of the most common applications used for sample preparation in chemistry, microbiology, waste water control and other analytical processes. The new ME 1 and ME 1 C diaphragm pumps offer a compact, high perfomance and easy to use solution which is perfect for both single and multiple filtrations. *VACUUBRAND*


2

9.880 930


3

9.880 080

Type	Connector	Number of steps	Flow rate (50/60 Hz) m³ / hr.	Ultimate pressure mbar	Weight kg	Dimensions (W x D x H) mm	PK	Cat. No.
ME 1	CEE	1	0,7 / 0,85	100	5.0	247 x 121 x 145	1	**9.880 930** 2
ME 1	CH	1	0,7 / 0,85	100	5.0	247 x 121 x 145	1	**9.880 931**
ME 1	UK	1	0,7 / 0,85	100	5.0	247 x 121 x 145	1	**9.880 932**
MD 1	CEE	3	1,2 / 1,4	1,5	6.7	303 x 143 x 215	1	**9.880 080** 3

Chemistry diaphragm pumps

Gases and vapours only come into contact with chemically-resistant, fluorine-derived plastics in chemical ("C") diaphragm pumps. Does not require a cooling trap.
Optional accessories or direct use of complete pumping units based on these pumps enable almost 100% recovery of the solvents in use and protection of the atmosphere. *VACUUBRAND*


4

9 880 934


5

9.880 083

Type	Connector	Flow rate (50/60 Hz) m³ / hr.	Ultimate pressure mbar	Weight kg	Dimensions (W x D x H) mm	PK	Cat. No.
ME 1C	CEE	0,7 / 0,85	100	5.0	247 x 121 x 145	1	**9.880 934** 4
ME 1C	CH	0,7 / 0,85	100	5.0	247 x 121 x 145	1	**9.880 935**
ME 1C	UK	0,7 / 0,85	100	5.0	247 x 121 x 145	1	**9.880 936**
MZ 1C	CEE	0,75 / 0,9	12	6.7	312 x 121 x 170	1	**6.254 394**
MZ 1C	UK	0,75 / 0,9	12	6.7	312 x 121 x 170	1	**9.880 947**
MZ 1C	CH	0,75 / 0,9	12	6.7	312 x 121 x 170	1	**9.880 948**
MD 1C	CEE	1,3 / 1,5	2	6.7	316 x 143 x 223	1	**9.880 083** 5

Diaphragm pumps ATEX-models available on request.

1



1 Accessories for ME 1, ME 1C and MZ 1C

Vacuum regulator valve for ME 1, ME 1C and MZ 1C with manual vacuum control using air bleed. The manometer can be mounted and pivoted in several orientations for optimal visibility. High chemical compatibility (especially with the vacuum regulator valve for ME 1C)

VACUUBRAND

Description	PK	Cat. No.
Vacuum regulator valve for ME 1	1	**9.880 938**
Vacuum regulator valve for ME 1C and MZ 1C	1	**9.880 939**
Vacuum tubing, rubber, DN 6*	1	**9.881 930**
Vacuum tubing, rubber, DN 10*	1	**9.881 932**

*Supplied per metre

Diaphragm pumps NT Series, Aluminium

VACUUBRAND

- improved performance, increased pumping speed (up to 16m³/h) and better ultimate vacuum extend applications with non-aggressive gases whether used in the laboratory or for industrial processes
- very low leak rate due to enhanced leak-tight tubing connections, resulting in consistent performance characteristics - even after many years operation. Ideal for analytical applications
- long diaphragm and valve lifetimes: made of highly flexible FPM, with fabric-reinforced double diaphragms for improved long term stability
- whisper quiet and ultra low vibration due to compact drive with patented motor drive system. Ideal as a built-in component for sensitive analytical equipment
- easy to clean due to smooth surfaces. A robust solution for numerous applications in industrial environments

Specifications:

Vacuum inlet	
10 mm tubing nozzle:	ME4NT, ME4RNT, ME8NT, MZ2NT
KF DN16:	MZ2DNT, MD4NT, MV2NT
Pressure outlet	
Silencer:	ME4NT, MZ2NT, MZ2DNT, MD4NT, MV2NT
Twin silencers:	ME8NT
Tubing nozzle:	ME4RNT

2



9.880 890

3



9.880 952

Type	Connector	Description	Flow rate (50/60 Hz) m³ / hr.	Ultimate vacuum mbar (abs).	Dimensions (W x D x H) mm	PK	Cat. No.
ME 2 NT	CEE	one-stage	2,0 / 2,2	70	243 x 211 x 198	1	**9.880 940**
ME 4 NT	CEE	one-stage	4,0 / 4,4	70	239 x 243 x 198	1	**9.880 883**
ME 4R NT	CEE	one-stage	3,8 / 4,2	100/4	239 x 243 x 290	1	**9.880 884**
ME 8 NT	CEE	one-stage	7,3 / 8,1	70	239 x 325 x 198	1	**9.880 885**
ME 8 NT	CH	one-stage	7,3 / 8,1	70	239 x 325 x 198	1	**9.880 886**
ME 16 NT	CEE	one-stage	16,4 / 18,4	70	554 x 260 x 359	1	**9.880 952** 3
ME 16 NT	UK	one-stage	16,4 / 18,4	70	554 x 260 x 359	1	**9.880 953**
MZ 2 NT	CEE	two-stage	2,2 / 2,4	7	239 x 243 x 198	1	**9.880 887**
MZ 2 NT	CH	two-stage	2,2 / 2,4	7	239 x 243 x 198	1	**9.880 888**
MZ 2D NT	CEE	two-stage	2,3 / 2,5	4	242 x 243 x 198	1	**9.880 889**
MD 12 NT	CEE	three-stage	12,1 / 13,3	2	554 x 260 x 359	1	**9.880 949**
MD 12 NT	UK	three-stage	12,1 / 13,3	2	554 x 260 x 359	1	**9.880 950**
MD 12 NT	CH	three-stage	12,1 / 13,3	2	554 x 260 x 359	1	**9.880 951**
MD 4 NT	CEE	three-stage	3,8 / 4,3	1	239 x 325 x 198	1	**9.880 890** 2
MD 4 NT	CH	three-stage	3,8 / 4,3	1	239 x 325 x 198	1	**9.880 891**
MV 2 NT	CEE	four-stage	2,2 / 2,4	0,5	239 x 325 x 198	1	**9.880 892**
MV 2 NT	CH	four-stage	2,2 / 2,4	0,5	239 x 325 x 198	1	**9.880 893**
MV 10 NT	CEE	four-stage	10,4 / 11,6	0,5	554 x 260 x 359	1	**9.880 954**



GREEN VACUUBRAND!

- lowering your energy use and costs
- reducing waste of resources and emissions of pollutants
- improving laboratory working conditions



www.vacuubrand.com

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vacuubrand

Technology for Vacuum Systems

1



1 Chemistry diaphragm vacuum pumps -NT Series

VACUUBRAND

- improved performance, increased pumping speed and lower ultimate vacuum extend applications in both the laboratory and in industrial applications
- long-life diaphragm with PTFE sandwich construction and unstressed diaphragm support
- easy service/exchange of diaphragm or valves due to novel integrated valve head assembly. Easy dismantling, cleaning and reassembly without requiring readjustment
- whisper quiet and ultra low vibration due to compact drive with patented motor control system. Ideal as a built-in component for sensitive equipment in both the laboratory and in industry
- superior vapour tolerance due to integral tubing connections and gas ballast valve for continuous purge (at ME 16C NT, MZ 2C NT, MD 4C/12C NT and MV 10C NT).
- easy to clean due to smooth exterior surfaces

Specifications

Vacuum inlet: 10mm tubing nozzle
Pressure outlet: 10mm tubing nozzle

Type	Connector	Description	Flow rate (50/60 Hz) m³ / hr.	Ultimate vacuum mbar (abs).	Dimensions (W x D x H) mm	PK	Cat. No.
ME 2C NT	CEE	single-stage	2,1 / 2,4	70	243 x 211 x 198	1	**9.880 943**
ME 4C NT	CEE	single-stage	3,9 / 4,4	70	243 x 255 x 198	1	**9.880 894**
ME 4C NT	CH	single-stage	3,9 / 4,4	70	243 x 255 x 198	1	**9.880 895**
ME 8C NT	CEE	single-stage	7,1 / 7,8	70	243 x 325 x 198	1	**9.880 896**
ME 8C NT	CH	single-stage	7,1 / 7,8	70	243 x 325 x 198	1	**9.880 897**
ME 16C NT	UK	single-stage	16,3 / 18,4	70	533 x 260 x 359	1	**9.880 956**
ME 16C NT	CEE	single-stage	16,3 / 18,4	70	533 x 260 x 359	1	**9.880 955**
MZ 2C NT	CEE	double-stage	2,0 / 2,3	7*	243 x 243 x 198	1	**9.880 898**
MZ 2C NT	CH	double-stage	2,0 / 2,3	7*	243 x 243 x 198	1	**9.880 899**
MD 4C NT	CEE	three-stage	3,4 / 3,8	1,5**	243 x 325 x 198	1	**9.880 900**
MD 4C NT	CH	three-stage	3,4 / 3,8	1,5**	243 x 325 x 198	1	**9.880 901**
MD 4CRL NT	Power cord	three-stage	3,4 / 3,8	1,5***	243 x 325 x 198	1	**9.880 926**
MD 12C NT	CEE	three-stage	11,1 / 12,3	2	533 x 260 x 359	1	**9.880 957**
MD 12C NT	UK	three-stage	11,1 / 12,3	2	533 x 260 x 359	1	**9.880 958**
MD 12C NT	CH	three-stage	11,1 / 12,3	2	533 x 260 x 359	1	**9.880 959**
MV 10C NT	CEE	four-stage	9,5 / 10,7	0,9	533 x 260 x 359	1	**9.880 960**

Ultimate vacuum with gas ballast: *12 mbar, **3 mbar, ***diaphragm pump with reduced leakage rate

Rotary evaporators please see page 642.

2



2 3 Variable speed vacuum system SC 920 with remote control

KNF

Freeing up space in the lab: this vacuum pump system can be placed above or below the lab bench and controlled remotely with the hand terminal. The new vacuum pump system SC 920 now supports remote control from a portable handset, thus ensuring maximum flexibility in the laboratory. Short process times and high accuracy, and automatic boiling point detection are the outstanding features of this new product.The intuitive user guidance on the handset ensures ease of operation; the process parameters can be entered over a touch screen and a rotary knob.

Simply touch the various menus to enter:
- parameters, such as the setpoint
- pressure or suction capacity of the system
- units of measurement
- operating language
- operating modes

3



Specifications:

Control: over hand terminal and Windows®-based software
Mains connection: 100-240V 50/60Hz
Power consumption: max. 135W
Hose connections, pneumatic: 10mm i.d.
Hose connections for coolants: 8mm i.d.
Current consumption: max. 1.7A
Weight: 15kg
Dimensions (H x W x D): 423 x 366 x 294mm

Type	Description	Flow rate L / min.	Vacuum mbar	PK	Cat. No.
SC 920	Vacuum pump system	20	2	1	**9.880 645**

With overload protection and mains fuse

VARIO® Chemistry Pumping Units

VARIO® Chemistry Pumping Units offer all the advantages of modern control technology and provide excellent possibilities for solvent recovery. They attain an ultimate vacuum down to 0.6mbar. They are exceptionally quiet in operation and entirely oil-free. Inside the pump, vapours and gases only come into contact with fluoroplastics of optimum chemical resistance.
VARIO® Chemistry Pumping Units provide vacuum control by adaptation of motor speed. This has clear advantages compared to even the best of two-point control systems. The vacuum is continuously adjusted to actual process requirements, irrespective of apparatus size and vapour volume. Process times are typically shortened by 30%.
Solvent recovery next to 100% is supported through continuous evaporation.
All VARIO® Chemistry Pumping Units include a chemistry diaphragm vacuum pump and an integrated vacuum controller with display and vacuum sensor.
The new PC 3001 VARIO^{pro} version builds on the worldwide popular PC 3001 VARIO unit, boosting the pumping speed and thereby extending its range to larger applications.

VACUUBRAND

1



9.881 337

Type	Connector	Flow rate m³ / hr.	Ultimate pressure mbar	Weight kg	Width mm	Depth mm	Height mm	PK	Cat. No.
PC 3001 VARIO^{pro}	CEE	2,0	2 / 4	7.7	306	300	400	1	**9.881 337** 1
PC 3002 VARIO	CEE	2,8	7 / 12	17.9	258	422	516	1	**9.881 338**
PC 3003 VARIO	CEE	2,8	0,6 / 2	20.5	258	422	516	1	**9.881 346**
PC 3004 VARIO	CEE	4,6	1,5 / 3	20.5	258	422	516	1	**9.881 339**
PC 3010 NT VARIO	CEE	11,6	0,6	29.7	616	387	420	1	**9.881 322**
PC 3012 NT VARIO	CEE	12,9	1,5 / 3	29.7	616	387	420	1	**9.881 320**
PC 3010 NT VARIO	CH	8,6	0,6 / 9	35.8	645	365	600	1	**9.881 323**
PC 3012 NT VARIO	CH	12,9	1,5 / 3	29.7	616	387	420	1	**9.881 321**
PC 3001 VARIO^{pro}	CH	2,0	2 / 4	7.7	306	300	400	1	**9.881 336**
PC 3002 VARIO	CH	2,8	7 / 12	17.9	258	422	516	1	**9.881 335**
PC 3003 VARIO	CH	2,8	0,6 / 2	20.5	258	422	516	1	**9.881 334**
PC 3004 VARIO	CH	4,6	1,5 / 3	20.5	258	422	516	1	**9.881 333**
PC 3016 NT VARIO	CEE	19,3	70 / 100	29.7	616	387	420	1	**9.881 329**

2 VARIO Chemistry Pumping Unit PC 3001 VARIO^{pro} with condenser Peltronic®

This VARIO^{pro} chemistry pumping unit provides vacuum control by precise and continuous adaptation of the diaphragm pump's motor speed.
The compact size and lowweight of the pumping unit offer great convenience in the lab.
The pump's variable motor speed responds to demand, reducing energy waste and mechanical wear, ensuring unrivalled service life for the diaphragms.
The PC 3001 is based on MD 1C chemistry diaphragm pump;
The emission conderser Peltronic® at outlet of the pump is highly efficient with a very compact design.
It provides near-100% recovery of solvents without any external coolants.

Items supplied:
VARIO® chemistry pumping unit PC 3001 VARIO^{pro} completely mounted with conderser Peltronic®, ready for use, with manual. Without mains cable, please order separately.

VACUUBRAND

2



Description	Connector	Flow rate m³ / hr.	Ultimate pressure mbar	Weight kg	Width mm	Depth mm	Height mm	PK	Cat. No.
PC 3001 VARIO^{pro} with conderser Peltronic®		2,0	2	10.0	400	300	400	1	**9.881 330**
Power cable	CEE							1	**6.901 984**
Power cable	CH							1	**9.882 240**

Accessories for VACUUBRAND chemistry pumps

VACUUBRAND

Description	PK	Cat. No.
External sensor VSK 3000	1	**9.882 850**
Cooling water valve VKW-B	1	**9.882 852**
Air bleed valve VBM-B	1	**9.882 849**
Extension cable for VACUU·BUS®, 2m	1	**9.882 853**
Y-Adapter VACUU·BUS®	1	**9.882 854**
Liquid level sensor for Vacuubrand 500ml catchpot	1	**9.882 848**

1 Exhaust Vapour Condenser Peltronic

VACUUBRAND

- Solvent recovery without coolants, such as water or dry ice
- Fully automatic electronic control of cooling surface temperature and fan
- Ideal for integrated laboratory vacuum installations: No need for coolant pipes - no installation cost, no risk of water damage

Specifications:

Cooling power at 21°C:	50W
Ambient temperature range:	10 to 40°C
Preset cooling temperature:	10°C
Inlet connection (thread for PTFE tube):	10/8mm
Outlet connection:	Hose nozzle DN 10, or thread for PTFE tube 10/8 mm
Condensate catchpot:	500ml/with KS 35
Materials in contact with media:	PP, PFA, ETFE/ECTFE, borosilicate glass
Mains supply:	100 - 230V 50/60Hz
Power consumption:	7 to 60W (controlled)
Dimensions (WxDxH):	175 x 179 x 392mm
Weight approx.:	4.3kg

Type	PK	Cat. No.
Peltronic	1	**9.880 852**

1



We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

vacuubrand

Vacuum Pumps Rotavac Valve/Vario

Heidolph

Rotavac Valve Control - For all Hei-VAP models
- Two-stage diaphragm pump made from chemical-resistant material
- High suction capacity of 2.0m³/h for fastest evacuation
- Suction capacity for up to 3 rotary evaporators at the same time
- Achieves an ultimate vacuum of 7mbar
- Can be combined with a condenser
- Power input: 180W; Weight: 12.8kg
- Dimensions (L x W x H): 195 x 245 x 310mm
- Vacuum can be controlled manually or via valve operated vacuum controllers
- Depending on your application you can switch on and off the vacuum pump via switchbox

1



9.812 385

Rotavac Vario Control - For Hei-VAP Precision
- Three-stage diaphragm pump is made from chemical-resistant material
- High suction capacity of 1.7m³/h for fastest evacuation
- Achieves an ultimate vacuum of 2mbar
- Can be combined with a condenser
- Power input: 160W; Weight: 5.4kg
- Dimensions (L x W x H): 236 x 167 x 196mm
- Even if the gas ballast valve is open an excellent ultimate vacuum is reached when working with easily condensable vapors. This makes distilling high boiling point solvents such as DMF or DMSO possible at low bath temperatures

2



6.231 964

Rotavac Valve Tec - For all Hei-VAP models
- Two-stage diaphragm pump made from chemical-resistant material
- Suction capacity of 0.75m³/h
- Achieves an ultimate vacuum of 12mbar
- Can be combined with a condenser
- Power input: 80W; Weight: 6kg
- Dimensions (L x W x H): 315 x 145 x 169mm
- Recommended for solvents with low or medium boiling points
- Vacuum can be controlled manually or via valve operated vacuum controllers

Rotavac Vario Tec - For Hei-VAP Precision
- Two-stage diaphragm pump is made from chemical-resistant material
- Suction capacity of 1.0m³/h
- Achieves an ultimate vacuum of 12mbar
- Can be combined with a condenser
- Power input: 160W; Weight: 4.3kg
- Dimensions (L x W x H): 236 x 156 x 196mm
- Recommended for solvents with low or medium boiling points

3



9.812 478

Fully controllable stand-alone pumping unit including vacuum controller - For Hei-VAP Value and Hei-VAP Advantage
- Three-stage diaphragm pump is made from chemical-resistant material
- High suction capacity of 1.7 ³m/h for fastest evacuation
- Achieves an ultimate vacuum of 5mbar
- Can be combined with a condenser (order nr. 9.812 377)
- Power input: 160W, Weight: 6kg
- Dimensions (L x W x H): 193 x 263 x 299mm
- Precise vacuum control avoids bumping and eliminates foaming of your evaporation solution
- Due to automatic vacuum supply to the process parameters you have more time for important laboratory activities

4



9.812 365

Type	PK	Cat. No.	
Rotavac Valve Control	1	**9.812 385**	1
Cooler for Rotavac Valve Control Hei-VAP	1	**6.401 205**	
Rotavac Vario Control for Hei-VAP	1	**9.812 477**	
Rotavac Valve Tec for Hei-VAP	1	**6.231 964**	2
Cooler for Rotavac Valve Tec for Hei-VAP	1	**9.812 378**	
Rotavac Vario Tec for Hei-VAP	1	**9.812 478**	3
Vacuum Valve	1	**9.812 405**	
Woulff Bottle	1	**9.812 406**	
Manual vacuum controller for Hei-VAP Valve and Advantage	1	**6.238 796**	
Rotavac Vario stand-alone pumping	1	**9.812 365**	4
Condenser for Rotavac Vario Pumping unit	1	**9.812 377**	
Switchbox, connects up to 3 rotary evaporators to one pump and control vacuum individually	1	**6.223 990**	

Heidolph Rotary evaporators - please see page 642.

1



1 Valve-regulated vacuum pump Rotavac 20

NEW!

Includes secondary condenser and air intake separation vessel. *Heidolph*
This vacuum system can be applied in many different fields in order to evacuate, evaparate and pump out gases and vapors. Thanks to the emission condenser it is possible to achieve a chemical recovery of almos 100%.
- Excellent compatibility with chemicals and condensate
- Excellent ultimate vacuum of 2 mbar
- Very quiet and very low Vibration
- Very high suction capacity of 3.0 m³/h
- Size (w x d x h): 350 x 275 x 495 mm
- Weight: 19.9 kg

Type	PK	Cat. No.
Rotavac 20	1	**6.257 926**

2



2 Modular vacuum system KNF LABOPORT®

All LABOPORT® pumps can be fitted with separators, high-performance condensers and vacuum controllers to create customised systems. If a larger diaphragm pump is used for two different processes simultaneously for economic reasons, then a second vacuum controller is required. The control unit always switches the pump off when the desired vacuum has been achieved, even if two receivers are used. This reduces the noise level and increases operational life. Supply requirements: 230V /50Hz. *KNF*

Module/configuration:

1. Baseplate.
The separator and all other modules are mounted together with the pump on the baseplate to form the LABOPORT® vacuum system

2. Separator.
Additional, implosion-proof NR 800 module can be integrated on the inlet or outlet side.
Solvent droplets contained in the vapour at the outlet are separated to prevent them from being released into the surrounding air. On the inlet side the separator traps any particles contained in the system.

3. High-performance condenser.
For efficient condensation of solvents contained in the vapour. Connected to the pump at the outlet enabling controlled solvent recovery, saving valuable resources and protecting the environment.

4./5. Vacuum controller.
For precise and accurate attainment of the required vacuum after the set point has been entered. A highly accurate, piezo-ceramic measuring cell monitors the process and is resistant to all aggressive media.

Simple assembly.
Components can be quickly and easily assembled to create a system using plug-in connectors.

Type	Flow rate L / min.	Ultimate vacuum mbar (abs).	Pump Model	Module no.	PK	Cat. No.
LABOPORT® SR 810	10	8	N 810.3 FT.18	1A 2 2	1	**9.880 621**
LABOPORT® SH 810	10	8	N 810.3 FT.18	1A 2 3	1	**9.880 622**
LABOPORT® SC 810	10	8	N 810.3 FT.18	1A 2 3 4	1	**9.880 623**
LABOPORT® SCC 810	10	8	N 810.3 FT.18	1A 2 3 4 5	1	**9.880 624**
LABOPORT® SR 820	20	8	N 820.3 FT.18	1A 2 2	1	**9.880 625**
LABOPORT® SH 820	20	8	N 820.3 FT.18	1A 2 3	1	**9.880 626**
LABOPORT® SC 820	20	8	N 820.3 FT.18	1A 2 3 4	1	**9.880 627**
LABOPORT® SCC 820	20	8	N 820.3 FT.18	1A 2 3 4 5	1	**9.880 628**
LABOPORT® SR 840	34	8	N 840.3 FT.18	1 2 2	1	**9.880 629**
LABOPORT® SH 840	34	8	N 840.3 FT.18	1 2 3	1	**9.880 631**
LABOPORT® SC 840	34	8	N 840.3 FT.18	1 2 3 4	1	**9.880 632**
LABOPORT® SC 842	34	2	N 842.3 FT.18	1 2 3 4	1	**9.880 639**
LABOPORT® SCC 840	34	8	N 840.3 FT.18	1 2 3 4 5	1	**9.880 633**
LABOPORT® SCC 842	34	2	N 842.3 FT.18	1 2 3 4 5	1	**9.880 640**

Accessory modules for vacuum pump systems LABOPORT®

Modules for LABOPORT® system vacuum pumps. *KNF*
See details outlined below for the relevant descriptions.

Module no.	Type	PK	Cat. No.
1A	Baseplate NP 810/820	1	**9.880 643**
1	Baseplate NP 840	1	**9.880 634**
3	High-performance condenser	1	**9.880 636**
4	Vacuum controller (First controller)	1	**9.880 637**
5	Vacuum controller (Second controller)	1	**9.880 638**

E & OE.

1 Vacuum system LABOXACT®, chemical-resistant

KNF

Rotary evaporation processes can be reliably monitored using the LABOXACT® vacuum system. A closed system arrangement enables gentle distillation and high recovery rates, even with low-boiling solvents.



Advantages:
- gentle distillation, due to closed system
- stepless, fine-adjustment valve for precise vacuum regulation
- careful control of evaporation
- very economical
- environmentally friendly

Items supplied:
LABOXACT® vacuum systems are ready-to-use. With chemically resistant membrane vacuum pump, separator, condenser, fine-adjustment valve, digital vacuum meter, safety vent valve, switch and cable. Supply requirements: 230V 50Hz (other voltages and frequencies are available on request).

Type	Flow rate L / min.	Ultimate vacuum mbar (abs).	PK	Cat. No.
SEM 810	10	8	1	**9.880 549**
SEM 820	20	8	1	**9.880 550**
SEM 840	34	8	1	**9.880 551**
SEM 842	34	2	1	**9.880 552**

2 LABOBASE® multi-user vacuum systems, chemical-resistant

KNF

Comprises a central base station with vacuum controller which provides a vacuum to multiple laboratory work stations or outlets. Outlets may either be controlled with a separate vacuum controller plus solenoid valve (even as a mobile unit) or with a manual valve as an unregulated outlet.
LABOBASE® can be retrofitted into existing laboratories or integrated into new constructions.
This multi-user, vacuum system saves precious lab bench space.

Pump units or base stations are connection ready; complete with chemical-resistant, diaphragm vacuum pump and appropriate fittings (see table) on a single base stand, power cable (mains connection 230V 50Hz, other voltages and frequencies on request).

Integral components
diaphragm vacuum pump with base stand, separator, condenser and vacuum controller

Description	Flow rate l / min.	Ultimate vacuum mbar (abs).	PK	Cat. No.
Base unit LABOBASE® SBC 840	34	8	1	**9.050 715**
Base unit LABOBASE® SBC 844	40	2	1	**9.050 716**
Base unit LABOBASE® SBC 860	60	2	1	**9.050 717**
Mobile control unit for regulated outlet			1	**9.050 721**
Vacuum supply point manually controlled for fume hoodschemical resistant			1	**9.050 722**
Vacuum supply point manually controlled, chemical resistant			1	**9.050 723**



1



9.880 921

Chemistry Vacuum Systems NT

VACUUBRAND

Compact design, ready to use, no set-up required. Constructed in highly chemical resistant materials. Quiet operation.
- 100% oil-free pumping of gases
- gas ballast as standard for working with condensable vapours
- good ultimate vacuum even with gas ballast
- high vapour tolerance for water and solvents
- long service life, low maintenance

Features:
2AK: Inlet and outlet separator
AK + EK: Inlet separator, exhaust vapour condenser
PC 510 NT(two-stage)/610 NT(three-stage) : with AK + EK; 1 electronically controlled vacuum port
PC 511 NT(two-stage)/611 NT(three-stage) : with AK + EK; 1 electronically controlled and 1 manually controlled vacuum port
PC 520 NT(two-stage) /620 NT(three-stage) : with AK + EK; 2 electronically controlled vacuum ports

Characteristics and applications:

2



9.880 912

Without vacuum control:
MZ 2C NT +2AK:
e.g. filtration, distillation without condensation at the outlet
MZ 2C NT +AK+EK:
Well-proven unit for a wide range of applications for the single-user, e.g. gel drying, vacuum for gels that were previously dried using water-jet pumps, e.g. sequence gels, SDS-PAGE up to 10%. For low-boiling-point solvents.
MD 1C +AK+EK:
Space-saving single-user configuration with 2 mbar ultimate vacuum. For high-boiling-point solvents.
MD 4C NT + AK+EK:
Larger or multi-user applications (e.g. several gel dryers) in a local-area vacuum network (VACUU·LAN®). 1.5/3 mbar ultimate vacuum. For high-boiling-point solvents and/or gradient gels, SDS-PAGE >10%.
MV 10C NT +EK:
Four-stage diaphragm pump with exhaust vapour condenser. 0.9mbar ultimate vacuum. For particularly high demands regarding low ultimate vacuum and pumping speed in chemistry laboratories, pilot plant or small production units.

With vacuum controller:
PC 510 NT/511 NT:
Well-proven units for a wide range of processes in chemistry laboratories, e.g. all "classical" low-boiling-point solvents. 7/12mbar ultimate vacuum.
The PC 511 NT has an additional, manually controlled, vacuum port.
PC 610 NT /611 NT:
Well-proven units for vacuum generation and control up to 1.5/3mbar ultimate vacuum, including high-boiling-point solvents.
The PC 611NT has an additional, manually controlled, vacuum port.
PC 520 NT/620 NT:
Synchro chemistry pumping units with two, independent, vacuum controllers for running two separate processes. PC 520 with 7/12mbar ultimate vacuum, PC 620 NT with 1.5/3mbar ultimate vacuum.

Type	Connector	Flow rate (50/60 Hz) m³ / hr.	Ultimate vacuum mbar (abs).	Dimensions (W x D x H) mm	PK	Cat. No.	
MZ 2 C NT +2 AK	CEE	2,0 / 2,3	7 / 12	242 x 319 x 309	1	**9.880 832**	
MZ 2 C NT +AK+EK	CEE	2,0 / 2,3	7 / 12	242 x 326 x 402	1	**6.234 067**	
MZ 2 C NT +AK SYNCHRO + EK	CEE	2,0 / 2,3	7 / 12	242 x 326 x 402	1	**9.880 921**	1
MD 4 C NT +AK+EK	CEE	3,4 / 3,8	1,5 / 3	242 x 326 x 402	1	**9.880 837**	
MD 1 C +AK+EK	CEE	1,3 / 1,5	2*	275 x 270 x 490	1	**9.880 828**	
PC 510 NT	CEE	2,0 / 2,3	7**	243 x 419 x 444	1	**9.880 910**	
PC 511 NT	CEE	2,0 / 2,3	7**	243 x 435 x 444	1	**9.880 912**	2
PC 520 NT	CEE	2,0 / 2,3	7**	361 x 435 x 444	1	**9.880 914**	
PC 610 NT	CEE	3,4 / 3,8	1,5***	243 x 419 x 444	1	**9.880 916**	
PC 611 NT	CEE	3,4 / 3,8	1,5***	243 x 435 x 444	1	**9.880 918**	
PC 620 NT	CEE	3,4 / 3,8	1,5***	361 x 435 x 444	1	**9.880 919**	
MZ 2 C NT +2 AK	CH	2,0 / 2,3	7 / 12	242 x 319 x 309	1	**9.880 844**	
PC 510 NT	CH	2,0 / 2,3	7**	243 x 419 x 444	1	**9.880 911**	
PC 511 NT	CH	2,0 / 2,3	7**	243 x 435 x 444	1	**9.880 913**	
PC 520 NT	CH	2,0 / 2,3	7**	361 x 435 x 444	1	**9.880 915**	
PC 610 NT	CH	3,4 / 3,8	1,5***	243 x 419 x 444	1	**9.880 917**	
PC 620 NT	CH	3,4 / 3,8	1,5***	361 x 435 x 444	1	**9.880 920**	
MZ 2 C NT +AK SYNCHRO + EK	CH	2,0 / 2,3	7 / 12	242 x 326 x 402	1	**9.880 922**	
MZ 2 C NT +AK+EK	CH	2,0 / 2,3	7 / 12	242 x 326 x 402	1	**9.880 923**	
MD 4 C NT +AK+EK	CH	3,4 / 3,8	1,5 / 3	242 x 326 x 402	1	**9.880 924**	
MD 1 C +AK+EK	CH	1,3 / 1,5	2*	275 x 270 x 490	1	**9.880 925**	
MV 10C NT +EK	CEE	9,5 / 10,7	0,9	528 x 387 x 395	1	**9.880 976**	
MD 12C NT +AK+EK	CEE	11,1 / 12,3	2	616 x 387 x 395	1	**9.880 968**	
MD 12C NT +AK+EK	CH	11,1 / 12,3	2	616 x 387 x 395	1	**9.880 969**	
MD 12C NT +AK+EK	UK	11,1 / 12,3	2	616 x 387 x 395	1	**9.880 970**	

Ultimate vacuum with gas ballast: *4mbar, **12mbar, ***3mbar

1 Pumps, vacuum/pressure, diaphragm, for gel dryers

Highly efficient and oil-free. Inlet separator and exhaust condenser supplied *VACUUBRAND*

- quiet running
- continuous, totally oil-free pumping of gases
- components in contact with gases are manufactured in chemical-resistant materials
- with gas ballast for reducing condensates
- Optimum service life, easy to exchange diaphragm and valves
- compact design with small footprint
- close to 100% solvent recovery
- easy to maintain
- supply requirements: 230V 50/60Hz

MZ 2C NT +AK+EK:	Ultimate pressure 7/12mbar.
Simple use (Gel dryer)	Vacuum for gels, which were previously evacuated using water jet pumps, e.g. sequencing gels, SDS-PAGE up to 10%.
MD 4C NT +AK+EK:	Ultimate pressure 1.5/3mbar.
Multiple use (several gel dryers) with Vacuulan® local vacuum network	For high-boiling point solvents at low temperatures and/or gradient gels, SDS-PAGE >10 %.
MD 1C + AK + EK:	Ultimate pressure 2mbar.
Simple use (Gel dryer)	Space-saving and compact solution, for high-boiling point solvents.

Type	Flow rate	Ultimate pressure	PK	Cat. No.
	m³ / hr.	mbar		
MD 1C +AK+EK	1.3 / 1.5	2	1	**9.880 828**
MZ 2 C NT +AK+EK	2.0 / 2.3	9	1	**6.234 067**
MD 4C NT +AK+EK	3.4 / 3.8	2	1	**9.880 837**

1



Rotary evaporators please see page 642.

1



1 Rotary vane pumps

VACUUBRAND

Vacuubrand rotary vane pumps encompass one and two stage pumps with throughputs from 2 to 16m³/h.
Typical rotary vane pump applications include, use as a backing pump for turbomolecular pumps but also serve in diverse chemical laboratory applications.

Features and important characteristics: high water vapour tolerance, vacuum tight pumping mechanism when switched off, high performance gas ballast mechanisms. These increase the overall performance potential of these pumps, the service life of mechanical parts, increase oil-change intervals and reduce maintenance overheads.

Type	Flow rate	Ultimate pressure	Weight	Width	Depth	Height	PK	Cat. No.
	m³ / hr.	mbar	kg	mm	mm	mm		
RE 2.5	2.3 / 2.8	3×10^{-1}	10.2	316	125	190	1	**9.880 120**
RE 6	5.7 / 6.8	1×10^{-1}	15.3	370	142	207	1	**9.880 121**
RE 9	8.9 / 10.2	1×10^{-1}	21.4	460	152	232	1	**9.880 101**
RE 16	16.6 / 19.1	1×10^{-1}	25.2	505	152	232	1	**9.880 102**
RZ 2.5	2.3 / 2.8	2×10^{-3}	11.4	316	125	190	1	**9.880 123**
RZ 6	5.7 / 6.8	2×10^{-3}	16.4	370	142	207	1	**9.880 124**
RZ 9	8.9 / 10.2	2×10^{-3}	24.2	460	152	232	1	**9.880 125**
RZ 16	16.6 / 19.1	2×10^{-3}	29.0	545	152	232	1	**9.880 104**

2



2 Chemistry Hybrid Pump RC 6

VACUUBRAND

The Chemistry Hybrid Pump RC 6 has been designed to minimise the adverse effects of condensable and corrosive vapours. Its main components are a two-stage rotary-vane pump and a two-stage chemistry diaphragm for optimited corrosion resistance. The diaphragm pump continuously evacuates the oil reservoir of the rotary-vane pump in order to keep the partial pressures of solvent vapours, oxygen and corrosive gases at a low level and/or below their condensation point. The RC 6 is a low-maintenance pump for freeze-drying and other applications requiring an ultimate vacuum in the 10^{-3} mbar range.

Items supplied: Pump with on/off switch, overload circuit breaker and 2m cable with plug, centering and clamping ring for inlet, particulate filter and operating instructions. Oil supplied in separate bottle.

Specifications:

Pumping speed 50/60 Hz:	5.9/6.9 m³/h
Ultimate vacuum (partial) without gas ballast:	4×10^{-4} mbar
Ultimate vacuum (total) without gas ballast:	2×10^{-3} mbar
Ultimate vacuum (total) with gas ballast:	1×10^{-2} mbar
Oil capacity (B-Oil):	min. 0.34 l; max. 0.53 l
Inlet connection:	Small flange NW 16
Outlet connection:	Hose nozzle NW 10
Motor rating:	0.37kW
Nominal speed 50/60Hz:	1500/1800rpm
Dimensions (L x W x H):	510 x 305 x 230mm
Weight:	24.2kg
Protection class:	IP 40

Type	PK	Cat. No.
RC 6 with plug CEE	1	**9.882 235**
RC 6 with plug CH	1	**9.882 236**

3



3 Chemistry pumping units

VACUUBRAND

Vacuubrand chemistry vacuum systems and chemistry pumping units for fine to high vacuum ranges. Complete chemical vacuum systems and chemical pump stands offer the advantages of practical, connection-ready units.
- compact structure, little space requirement and a high degree of mobility
- the great convenience of proven pump stand configuration
- good ultimate vacuum even with gas ballast and smooth running
- high tolerance to water and solvent vapours due to efficient gas ballast

Type	Pump	Flow rate (50/60 Hz)	Ultimate pressure	Width	Depth	Height	PK	Cat. No.
	Model	m³ / hr.	mbar	mm	mm	mm		
PC 3 with RZ 2.5	RZ 2.5	2.3 / 2.8	4×10^{-4}	342	448	608	1	**9.881 368**
PC 3 with RZ 6	RZ 6	5.7 / 6.8	4×10^{-4}	370	448	608	1	**9.881 369**
PC 3 with RZ 9	RZ 9	8.9 / 10.2	4×10^{-4}	460	486	608	1	**9.881 370**
PC 3 with RZ 16	RZ 16	16.6 / 19.1	4×10^{-4}	545	486	608	1	**9.881 371**

E & OE.

1 Chemistry Vacuum Pumping Unit PC 8/RC 6

VACUUBRAND

The Chemistry Vacuum Pumping Unit PC 8/RC 6 incorporates the Chemistry Hybrid Pump RC 6 (Cat. No. 9.882 235). It achieves an ultimate vacuum in the 10^{-4} mbar range and is used for demanding vacuum applications such as freeze drying, drying chambers, concentrators, etc. The RC 6 combines the vacuum performance of an oil-sealed rotary-vane pump and, to a large extent, the good corrosion resistance of a chemistry diaphragm pump.

Items supplied:
Pumping unit completely mounted, with Chemistry Hybrid Pump RC6, insulated exhaust vapour condenser,condensate catchpot on pumping unit console, on/off switch, cable with plug and instructions for use.

1



Specifications:

Pumping speed 50/60 Hz:	5.9/6.9 m^3/h // 4.1cfm
Ultimate vacuum (partial) without gas ballast:	4 x 10^{-4} mbar // 3 x 10^{-4} Torr
Ultimate vacuum (total) without gas ballast:	2 x 10^{-3} mbar // 1.5 x 10^{-3} Torr
Ultimate vacuum (total) with gas ballast:	1 x 10^{-2} mbar // 0.75 x 10^{-2} Torr
Oil capacity (B-Oil):	min. 0.34 l max. 0.53 l
Inlet connection:	Small flange NW 16
Outlet connection:	Hose nozzle NW 10
Cooling water connection:	2 x hose nozzle NW 6/8
Motor rating:	0.37kW
Nominal speed 50/60Hz:	1500/1800rpm
Dimensions (L x W x H):	507 x 377 x 430mm
Weight:	31.4kg
Protection class:	IP 40

Type	PK	Cat. No.
PC 8 / RC 6 with plug CEE	1	**9.882 239**
Plug CH	1	**9.882 240**

2 Vacuum pump trolley

KGW

Vacuum pump trolley with two condensate traps that can be operated alternately or together. The pump trolley consists of an aluminium frame mounted on lockable castors with a lower PE-shelf for a vacuum pump and a PE-top shelf which accommodates two cold traps. The condensate traps can each hold approx. 150ml. Spherical ground joints are sealed with FEP covered O-rings. Supplied without pump. The standard assembly is designed for use with LN_2 as coolant. When using CO_2 and acetone please order 2 x CO_2 grid (Cat. No. 9.032 081).

2



Type	PK	Cat. No.
With pressure gauge	1	**9.881 380**
Without pressure gauge	1	**9.881 381**

Note: Price does not include vacuum pump.

3 Oil for rotary vane pumps

VACUUBRAND

Oil for rotary vane pumps B: Standard pump oil. High viscosity, low vapour pressure, good chemical resistance.
Oil for rotary vane pumps K 8: For acid vapours. Strongly hygroscopic, with limited capacity for water vapour. Pump must be factory-adjusted to accept this oil.
Perfluorpolyether oil: Synthetic Oil. Certified for pumping pure oxygen.

3



Type	Capacity L	PK	Cat. No.
Oil for rotary vane pumps B	1.00	1	**9.881 921**
Oil for rotary vane pumps B	5.00	1	**9.881 922**
Oil for rotary vane pumps K 8	1.00	1	**9.881 911**
Oil for rotary vane pumps K 8	5.00	1	**9.881 915**
Perfluorpolyether oil 2	0.50	1	**9.882 924**
Perfluorpolyether oil 1	0.30	1	**9.882 925**

1



1 Small flange fittings

Small flanges. Stainless steel. With male or female conical ground joints and DN flange as outlined below.

VACUUBRAND

Type	NS	PK	Cat. No.
Male ground joint - DN 10	14 / 23	1	**9.882 504**
Male ground joint - DN 10	19 / 38	1	**9.882 501**
Male ground joint, DN 25	19 / 38	1	**9.882 502**
Male ground joint - DN 25	29 / 32	1	**9.882 503**
Male ground joint - DN 40	29 / 32	1	**9.882 505**
Male ground joint - DN 40	45 / 40	1	**9.882 507**
Female ground joint - DN 10	14 / 35	1	**9.882 510**
Female ground joint DN 10	19 / 38	1	**9.882 511**
Female ground joint - DN 25	19 / 38	1	**9.882 512**
Female ground joint - DN 25	29 / 32	1	**9.882 513**
Female ground joint - DN 40	29 / 32	1	**9.882 514**
Female ground joint - DN 40	45 / 40	1	**9.882 515**

2



2 Vacuum fittings, clamping rings for type KF small flange

VACUUBRAND

Type	Size	PK	Cat. No.
Aluminium	DN 10/16	1	**9.882 401**
Aluminium	DN 20/25	1	**9.882 402**
Aluminium	DN 32/40	1	**9.882 403**
Aluminium	DN 50	1	**9.882 404**
Stainless steel	DN 10/16	1	**9.882 411**
Stainless steel	DN 20/25	1	**9.882 412**
Stainless steel	DN 32/40	1	**9.882 413**
Stainless steel	DN 50	1	**9.882 414**

3



3 Vacuum fittings, centring rings

Stainless steel/FPM (e.g. Viton®). For Type KF small flange.

VACUUBRAND

Size	PK	Cat. No.
DN 10	1	**9.882 415**
DN 16	1	**9.882 419**
DN 20	1	**9.882 416**
DN 25	1	**9.882 420**
DN 32	1	**9.882 417**
DN 40	1	**9.882 421**
DN 50	1	**9.882 418**

4



4 Vacuum fittings, external centering rings

Plastic 'PBT'. For Type KF small flange.

VACUUBRAND

Type	Size	PK	Cat. No.
NBR	DN 10/16	1	**9.882 441**
NBR	DN 20/25	1	**9.882 442**
NBR	DN 32/40	1	**9.882 443**
NBR	DN 50	1	**9.882 444**
FPM	DN 10/16	1	**9.882 451**
FPM	DN 20/25	1	**9.882 452**
FPM	DN 32/40	1	**9.882 453**
FPM	DN 50	1	**9.882 454**

5



5 Vacuum fittings, nozzles

Flanged tubing nozzles, aluminium. For Type KF small flange.

VACUUBRAND

Size	For tubing Ø mm	PK	Cat. No.
DN 10	6	1	**9.882 492**
DN 16	6	1	**9.882 497**
DN 16	10	1	**9.882 498**
DN 25	8	1	**9.882 494**
DN 25	10	1	**9.882 493**
DN 25	12	1	**9.882 491**
DN 25	15	1	**9.882 495**
DN 40	8	1	**9.882 499**
DN 40	10	1	**9.882 490**
DN 40	15	1	**9.882 496**

E & OE.

1 PTFE Vacuum tubing with stainless steel small flanges, KF



Antistatic PTFE. Flanges in grade 1.4305 stainless steel. *VACUUBRAND*
Virtually smooth internal walls to prevent accumulation of condensate or particles, provide high throughput with minimal turbulence.
- chemically resistant PTFE
- antistatic according to BS 2050:1978*, <10^7 Ohm resistance between inside and flanges to prevent formation of electrostatic charges inside and outside, as required for ATEX applications.

Size	Length	B* One-off bending	B* Repeated bending	PK	Cat. No.
	mm				
DN 16	500	150	300	1	**9.882 617**
DN 16	1000	150	300	1	**9.882 618**
DN 25	500	200	400	1	**9.882 619**
DN 25	1000	200	400	1	**9.882 620**

* Minimum bend radius for...
Other small-flange components, vacuum valves and tubes on request.

Further vacuum tubing - please see page 137.

2 Condensation traps, borosilicate glass 3.3



Borosilicate 3.3 glass, comprising bottle with ground glass cone neck fitting a separate inlet/outlet head with choice of tubing or ground joint connections.

Capacity	Cone	Socket	Connection	PK	Cat. No.
ml	NS	NS			
100	29	29	Tubing connections	1	**9.305 350**
250	45	45	Tubing connections	1	**9.305 351**
100	29	29	Cone / socket NS 29	1	**9.305 352**
250	45	45	Cone / socket NS 29	1	**9.305 353**

3 Cold traps, borosilicate glass 3.3



Borosilicate 3.3 glass, one-piece, with GL 45 neck and cap closure, GL 14 threaded side connections with caps and plastic tubing adapters.

Capacity	PK	Cat. No.
ml		
250	1	**9.305 349**



Cold traps with Dewar flask, borosilicate glass 3.3

KGW

Cold traps with Dewar flasks are made from 3.3 DIN/ISO 3585 borosilicate glass to hold LN_2 for vacuum applications. The flasks are vacuum insulated and silver-plated. They are encased in metal sheet, blue coated for protection and have a plastic ring collar, into which the cold trap is inserted. Thus no additional support is needed for the cold trap.
The Dewar flask has got a theoretical coolant capacity of 1.0L or 2.0L respectively.
The cold trap has got a theoretical condensate capacity of 150ml or 250ml respectively.

Items supplied: Cold trap, Dewar-flask, plastic ring.

Dewar type 12C/18C: see no. 9.032.024/9.032.030
Versions Cold trap joints:
S29 = spherical joints
GL18 = glass screwthead with PTFE olive 10mm
O 29 = spherical joints S29 with O-ring seal

The standard assembly is designed for use with LN_2 as coolant. When using CO_2 and acetone please order CO_2 grid separately (Dewar Type 12 C Cat. No. 9.032 081 and Dewar Type 18 C Cat. No. 9.032 082).

Type	Condensate capacity	Coolant capacity	Dewar	Cold trap	PK	Cat. No.	
	ml	ml	Type	joints			
KF 29-K	150	1000	12 C	S 29	1	**9.032 065**	1
KF 29-OK	150	1000	12 C	O 29	1	**9.032 066**	3
KF 29-GL	150	1000	12 C	GL 18	1	**9.032 067**	2
KFL 29-K	250	2000	18 C	S 29	1	**9.032 068**	
KFL 29-OK	250	2000	18 C	O 29	1	**9.032 069**	
KFL 29-GL	250	2000	18 C	GL 18	1	**9.032 070**	
KF 29-K-A	150	1000	12 C	S 29	1	**9.032 071**	
KF 29-OK-A	150	1000	12 C	O 29	1	**9.032 072**	
KF 29-GL-A	150	1000	12 C	GL 18	1	**9.032 073**	4
KFL 29-K-A	250	2000	18 C	S 29	1	**9.032 074**	
KFL 29-OK-A	250	2000	18 C	O 29	1	**9.032 075**	
KFL 29-GL-A	250	2000	18 C	GL 18	1	**9.032 076**	

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9.032 065

2

9.032 067

3

9.032 066

4

9.032 073

Dewar vessels please see page 760.

5


5 Cold traps, SKF H, stainless steel

VACUUBRAND

Cold traps protect both the vacuum system and the pump. They extend maintenance intervals and improve the overall performance of the vacuum installation.
- sturdy, easy-to-clean design
- easy to disassemble
- double-wall design without separate insulating vacuum for good conductance
- long operating time with one filling
- easy condensate drain and cleaning without disassembling

Type	Connection	Length mm	Width mm	Height mm	PK	Cat. No.
SKF H 25	KF DN 25	166	140	303	1	**9.882 855**
SKF H 40	KF DN 40	166	140	319	1	**9.882 856**

1 Woulff bottles, DURAN®

Erlenmeyer pattern (5000ml is bottle-shaped), with reinforced walls, for work under vacuum and plastic coating to act as a splinter and implosion protection. A glass insert is fitted with removable PP tubing connections, vent valve head and analogue pressure gauge with 2 scale ranges (1000 to 0mbar, 760mm to 0mm Hg).



Capacity ml	Diam. mm	Form	PK	Cat. No.
500	110	Erlenmeyer pattern	1	**9.305 340**
1000	140	Erlenmeyer pattern	1	**9.305 341**
2000	170	Erlenmeyer pattern	1	**9.305 342**
5000	185	bottle-shaped	1	**9.305 343**
10000	240	bottle-shaped	1	**9.305 344**
15000	255	bottle-shaped	1	**9.305 345**
20000	290	bottle-shaped	1	**9.305 346**

2 Woulff bottles, DURAN®

DIN 12480. With 3 NS standard ground joints. Without base tubulature. *DURAN Group*
Vacuum resistant. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable.



Capacity L	Diam. mm	Neck NS	PK	Cat. No.
0.50	87	19/26	1	**9.305 319**
1.00	113	24/29	1	**9.305 324**
2.00	135	29/32	1	**9.305 329**
5.00	185	34/35	1	**9.305 336**

3 LLG-Vacuum measuring instrument DVR 2

NEW!

Versatile vacuum gauge for vacuum measurement between atmospheric pressure and 1 mbar.
With integral, alumina ceramic, pressure transducer providing excellent corrosion resistance and long-term stability.

Also available with DKD initial delivery calibration (Cat. No. 9.882 221). Please order separately.



Specifications:

Measuring range:	1080 to 1mbar (hPa), 810 to 1 Torr
Measurement principle:	Capacitive; gas type-independent absolute pressure measurement
Measuring accuracy:	< 1mbar (0.75 Torr) ±1 digit
Power supply/battery:	9V Lithium battery/1.2 Ah Ultralife U9VL
Dimensions (WxDxH):	115 x 115 x 66mm
Weight:	0.40kg

Type	PK	Cat. No.
DVR 2	1	**9.882 209**
DKD initial delivery calibration	1	**9.882 221**

1



1 Vacuum measuring instrument DCP 3000

VACUUBRAND

The DCP 3000 is an outstanding vacuum gauge for rough and fine vacuum (1080 to 0.1mbar). A large illuminated display shows the measuring values of all sensors by a simple turn of a button. The VSK 3000 capacitive vacuum gauge head measures independent of gas type, is very corrosion resistant and has an outstanding measuring accuracy and long term stability. Simultaneous connection of up to four of these pressure transducers allows flexible measuring on the spot. The communication of the DCP 3000 and the external components proceeds via the VACUU·BUS® digital bus system. This system is characterized by fully automatic configuration, unified plug connections and cable lengths of up to 30m. Supply requirements: 100-230V 50/60Hz CEE/CH/UK/US/AUS.

Items supplied: Vacuum gauge, ready to use with 1 vacuum gauge head VSK 3000 with measuring cable, wall-mounted power supply and manual
- external sensor on-the-spot measuring, flexible and upgradeable up to four sensors
- external capacitive alumina-ceramic vacuum gauge head with excellent chemical resistance
- outstanding measuring accuracy and long term stability
- splash-proof pressure transducer for tough operation conditions
- datalogger with 32000 measurement reading recording capacity

Specifications:

Measurement range:	1080 to 0.1mbar (hPa), 810 to 0.1 Torr
Measuring principle:	Capacitive; gas type independent, absolute pressure measurement
Measurement accuracy:	< ±1 mbar (Torr) ±1 digit
Vacuum connection:	Small flange KF DN 16, PTFE-tubing conn. 10/8mm, hose nozzle DN 6/10mm
Power supply:	100-230V/50-60Hz
Dimensions (L x W x H):	138 x 124 x 115mm
Weight of display unit:	0.44kg

Type	PK	Cat. No.
DCP 3000	1	**9.882 206**
DKD initial delivery calibration	1	**9.882 221**

2



2 Vacuum measuring instrument DCP 3000 with Pirani sensor VSP 3000

VACUUBRAND

The Pirani-type vacuum sensor VSP 3000 offers an outstanding corrosion resistance and mechanical robustness for fine vacuum measurements. It is primarily designed for applications in chemistry and process engineering.
The vacuum gauge DCP 3000 is now also available with this new Pirani sensor VSP 3000 for an increased measuring range down to the 10^{-3} mbar range. Up to eight external gauge heads (four of ceramic diaphragm-type VSK 3000 and four VSP 3000) can be connected simultaneously to the DCP 3000 vacuum gauge for easy measurements at multiple points. Communication between the DCP 3000 and the external components is provided by the especially developed bus control system VACUU·BUS®. It is self-configuring, easy to use due to standardized plug connectors and allows cable extensions up to 30m. The large illuminated display, controlled by a simple jog wheel, displays the readings from each gauge head.

Performance features
- brand new rugged vacuum sensor VSP 3000 made of plastics and ceramics with high chemical resistance
- wide measurement range from atmospheric pressure to fine vacuum (10^{-3} mbar) due to Pirani measurement system (thermal conductivity)
- upto 8 gauge heads VSP 3000 (Atm. to 10^{-3} mbar), VSK 3000 (Atm. to 0.1mbar) can be connected (4 of each)
- rugged, splash-water proof vacuum sensor, also for rough operating conditions
- with vacuum controller CVC 3000, VSP 3000 and vacuum solenoid valves of type VV-B vacuum control from atm. to 10^{-3} mbar is achieved

Specifications:

Upper measuring limit mbar/hPa/torr:	1 x 10^3/7.5 x 10^2
Lower measuring limit mbar/hPa/torr:	1 x 10^{-3}/1 x 10^{-3}
Measurement principle	Thermal conductivity acc. to Pirani
Measurement uncertainty	±15% of indicated value in the range 0.01-10mbar/hPa/torr
Vaccum connection	Small flange KF DN 16 and hose nozzle DN 6/10mm
Control connections:	1 socket for supply/Vario pump 2 expandable sockets for external sensors/valves
Rated mains voltage	100-240V 50/60 Hz a.c. 1ph.
Dimensions (desktop unit, L x W x H):	138 x 124 x 115mm
Weight (without mains adapter):	0.44kg

Description	PK	Cat. No.
Vacuum gauge Set DCP 3000 + VSP 3000	1	**9.882 207**

E & OE.

Accessories for DCP 3000

VACUUBRAND

Type	PK	Cat. No.
External sensor VSK 3000	1	**9.882 850**
Air admittance valve VBM-B	1	**9.882 849**
Extension cable for VACUU·BUS®, 2m	1	**9.882 853**
Y-adapter for VACUU·BUS®	1	**9.882 854**
Vacuu-Control software	1	**9.882 866**
cable RS 232 C, 9-pole, Sub-D	1	**9.882 867**
External sensor VSP 3000	1	**6.238 192**
External sensor MPT 100	1	**9.882 869**
Cable for MPT 100	1	**9.882 870**

1 Automatic Vacuum Controller CVC 3000

Extremely versatile vacuum controller for the laboratory. *VACUUBRAND*



No configuration required. Just connect and the CVC 3000 will identify all apparatus with VACUU·BUS® VACUUBRAND pumps, vacuum valves, cooling water valves, external sensors, etc. Intuitive menu guidance via graphics display with analogue and digital vacuum readout. Demand-related control of process vacuum, cooling water and venting. Integral sensor made of highly resistant, alumina ceramic provides reliable absolute-pressure measurement. Boiling-point monitoring facility for evaporations*. No more searching for data or data input. Preset for many common vacuum applications, e.g. vacuum ovens, filtration.

Specifications:

Measuring range:	1080 to 0.1mbar (810 to 0.1 Torr)
Vacuum control range:	1060 to <0.1mbar (795 to 1 Torr) (depending on vacuum pump)
Uncertainty of measurement:	< ±1mbar (0.75 Torr) (after calibration)
Temperature coefficient:	< ±0.07mbar/K (< ±0.05 Torr/K)
Control interface:	Digital VACUU·BUS®
Control connections:	1 socket for supply/Vario pump 2 expandable sockets for external sensors/valves
Supply requirements (mains adapter):	100-240V 50/60Hz a.c. 1ph.
Dimensions (desktop unit, L x W x H):	138 x 124 x 115mm
Weight (without mains adapter):	0.44kg

Description	PK	Cat. No.
CVC 3000	1	**9.882 861**
DKD calibration at initial delivery	1	**9.882 221**
Package CVC 3000 + VACUU·BUS® VV-B 6C valve	1	**9.882 860**

* in conjunction with VACUUBRAND Vario NT pumps

2 3 Automatic Vacuum Controller CVC 3000 Package with integrated chemistry valve

Extremely versatile vacuum controller for the laboratory. *VACUUBRAND*



No configuration required. Just connect and the CVC 3000 will identify all apparatus with VACUU·BUS® Vacuubrand pumps, vacuum valves, cooling water valves, external sensors, etc. Intuitive menu guidance via graphics display with analogue and digital vacuum readout. Load-sensitive control of process vacuum, cooling water and venting. Integral sensor in highly resistant, alumina ceramic provides reliable absolute-pressure measurement. Two-step control for rotary evaporators. Preset for many common vacuum applications, e.g. vacuum ovens, filtration.



Specifications:

Measuring range:	1080 to 0.1mbar (810 to 0.1 Torr)
Vacuum control range:	1060 to <0.1 mbar (795 to 1 Torr) (depending on vacuum pump)
Uncertainty of measurement:	< ±1mbar (0.75 Torr) (after calibration)
Temperature coefficient:	< ±0.07mbar/K (< ±0.05 Torr/K)
Control interface:	Digital VACUU·BUS®
Control connections:	1 socket for supply/Vario pump 2 expandable sockets for external sensors/valves
Supply requirements (mains adapter):	100-240V 50/60Hz a.c. 1ph. CEE/CH/UK/US/AUS
Dimensions (desktop unit, L x W x H):	162 x 138 x 114mm
Weight (without mains adapter):	1kg
Vacuum connection:	2 x hose nozzle SW DN 6/10 Connections for integrated venting valve DN 4 to 5mm
Interface:	RS232C

Description	PK	Cat. No.
Package CVC 3000 + valve VV-B 6C + mounting bracket + 2 x tubing nozzle connectors + venting valve	1	**9.882 859**

1



1 Accessories for Automatic Vacuum Controller CVC 3000

VACUUBRAND

Description	PK	Cat. No.
Solenoid inline valve VV-B 6C	1	**9.882 851**
External sensor VSK 3000	1	**9.882 850**
Cooling water valve VKW-B	1	**9.882 852**
Air admittance valve VBM-B	1	**9.882 849**
Extension cable for VACUU·BUS®, 2m	1	**9.882 853**
Y-adapter for VACUU·BUS®	1	**9.882 854**
Liquid level sensor for VACUUBRAND 500ml catchpot	1	**9.882 848**

2



6.251 423

3



6.251 424

Controller package Pirani

NEW!

Controller package fine vacuum with CVC 3000 and VSP 3000 for KF DN 16 or 25 *VACUUBRAND*

The packages enable convenient vacuum control in the fine vacuum range down to 10^{-3} mbar and consist of a CVC 3000 vacuum controller, a VSP 3000 external Pirani vacuum sensor, a VV-B 15C in-line solenoid valve and all necessary small flange components. VACUUBRAND offers two packages, one with small flanges KF DN 16, suitable, e.g., for the VACUUBRAND RE/RZ 2.5 to RE/RZ 6 rotary vane pumps or RC 6 Chemistry-HYBRID pump; or select the small flange KF DN 25 version suitable for our RE/RZ 9 to RE/RZ 16 rotary vane pumps.

Specifications:

Vacuum sensor	VSP 3000
Upper measuring limit	1000/750 mbar/torr
Lower measuring limit	1 x 10^{-3}/1 x 10^{-3} mbar/torr
Measurement principle	Thermal conductivity (Pirani), chemically resistant plastics/ceramics
Measurement uncertainty	±15% of indicated value in the range 0.01-10 mbar/hPa/torr
Venting valve, connection	No
Ambient temperature range (operation)	10 - 40°C
Ambient temperature range (storage)	-10 - 60°C
Max. media temp. for continuous operation/short times	40 - 80°C
Interface	RS 232C
Weight	0.44kg

Description	PK	Cat. No.
Controller package fine vacuum with CVC 3000 and VSP 3000 for KF DN 16	1	**6.251 423** 2
Controller package fine vacuum with CVC 3000 and VSP 3000 for KF DN 25	1	**6.251 424** 3

4



4 Water jet pump, PP

NEW!

This pump will work on pressures up to 10 kg/cm². With built-in, non-return valve to eliminate back flow. Useful for vacuum removal of spilt chemicals, as well as for filter work. Easily dismantled for cleaning. *Kartell*

Description	PK	Cat. No.
Water jet vacuum pump	1	**9.303 031**
Tubing connectors	1	**9.303 032**

E & OE.

1 Water jet pumps, PP



With constant ultimate vacuum, high suction flow rate and very low water consumption. *BRAND*
Can be connected to mains water system in a number of different ways using the adapter supplied and reducing adapters that are available as accessories. For continuous use at temperatures up to 80°C max. High chemical resistance as the media being pumped only comes into contact with PP, FKM and PTFE. Integral non-return valve increases safety.

Comprises:
Water jet pump, including:
Mains water connections: R ¾" sleeve nut, R ½" reducing adapter and flexible tubing connection (nozzle) with external diameter from 10mm to 12mm.
Vacuum connection: Detachable nozzle with external diameter from 6mm to 9mm and GL 14 screw cap.

Performance characteristics at 4.5 bar water supply pressure at 12°C

Water consumption:	190L/hr.
Ultimate vacuum:	16 mbar
Flow rate at atmospheric pressure:	400L/hr. free air

Type	PK	Cat. No.
Reducing adapter R 3/8" for water jet filter pump	1	**7.020 037**
Reducing adapter M 22x1 for water jet filter pump (thread for screen tap)	1	**7.020 038**
Water jet pump	1	**9.303 125**

2 Water jet pump, Nickel-plated



Nickel-plated brass, non-return valve, adapter for rapid action hose.

Description	PK	Cat. No.
Water jet pump	1	**9.303 000**
Rapid action hose for water jet pump	1	**9.303 001**

3 LLG-Vacuum-Desiccators, soda-lime glass, with glass stopcock and porcelain plate

NEW!



Plate diam. mm	PK	Cat. No.
150	1	**9.042 740**
200	1	**9.042 741**
250	1	**9.042 742**
300	1	**9.042 743**

4 Desiccators, borosilicate glass 3.3, with plastic knob and porcelain plate

NEW!



Desiccators borosilicate glass 3.3. *Bohemia (Simax)*

DN	Ext. diam. mm	Plate diam. mm	PK	Cat. No.
100	151.0	90	1	**9.042 810**
150	210.0	140	1	**9.042 811**
200	269.0	190	1	**6.230 515**
250	329.0	240	1	**9.042 812**
300	392.0	290	1	**6.225 773**



1 Vacuum-Desiccators, borosilicate glass 3.3, with tubes, stopcock SJ 24/29 and porcelain plate

NEW!

Desiccators borosilicate glass 3.3. *Bohemia (Simax)*

DN	Ext. diam. mm	Plate diam. mm	PK	Cat. No.
100	151.0	90	1	**9.042 815**
150	210.0	140	1	**6.226 934**
200	269.0	190	1	**6.226 935**
250	629.0	240	1	**6.226 936**
300	392.0	290	1	**6.227 443**



2 Vacuum-Desiccators, DURAN®, with knob lid

DURAN®. Clear glass. With ground flange and knob lid. Without junction and without disc or plate. Vacuum-tight. DIN 13130. *DURAN Group*

DN	Height mm	PK	Cat. No.
100	187	1	**9.042 019**
150	252	1	**9.042 031**
200	309	1	**9.042 038**
250	357	1	**9.042 043**
300	433	1	**9.042 047**



3 Vacuum-Desiccators, DURAN®, with stopcock

DURAN®. Clear glass. With ground flange and Novus stopcock assembly in lid. Without disc or plate. Vacuum-tight. DIN 13130. *DURAN Group*

DN	Height mm	Tube socket NS	PK	Cat. No.
100	174	24/29	1	**9.042 119**
150	239	24/29	1	**9.042 131**
200	296	24/29	1	**9.042 138**
250	344	24/29	1	**9.042 143**
300	420	24/29	1	**9.042 147**

E & OE.

Vacuum-Desiccators, DURAN®, complete

NEW!

DURAN® vacuum desiccator "ready to use". *DURAN Group*

Type NOVUS
DURAN® Vacuum desiccator with plane flange and porcelain plate, with NOVUS standard ground joint (NS 24/29), junction tube in the lid and stopcock.

Type MOBILEX
DURAN ® Vacuum Desiccator with flat flange, no outlet, DURAN ® desiccator lid with threaded outlet type Mobilex GL 32, porcelain desiccator plate, silicone sealing ring with bonded PTFE face, DURAN ® stopcock with PTFE spindle, PBT screw cap with pierced aperture GL 32.

Type	DN	Height mm	Tube socket NS	PK	Cat. No.
NOVUS	150	239	24/29	1	**9.042 132** 1
NOVUS	200	296	24/29	1	**9.042 139**
NOVUS	250	344	24/29	1	**9.042 144**
NOVUS	300	420	24/29	1	**9.042 148**
MOBILEX	150	239	GL 32	1	**9.042 232** 2
MOBILEX	200	296	GL 32	1	**9.042 239**
MOBILEX	250	344	GL 32	1	**9.042 244**
MOBILEX	300	420	GL 32	1	**9.042 248**

1



9.042 132

2



9.042 232

3 Desiccator lids with knob, DURAN®

DURAN®. Clear glass. Knob lid. Fits all desiccator bases with the corresponding flat flange. Vacuum-tight. DIN 13130. *DURAN Group*

DN	Height mm	ID diam. Flange mm	OD diam. Flange mm	PK	Cat. No.
100	75	119	153 ± 2	1	**9.042 319**
150	98	172	215 ± 2	1	**9.042 331**
200	107	224	270 ± 2	1	**9.042 338**
250	122	274	320 ± 2	1	**9.042 343**
300	150	332	380 ± 2	1	**9.042 347**

3



4 Desiccator lids, NOVUS type, DURAN®

DURAN®. Clear glass. Tube top, for NOVUS stopcock assembly. Without stopcock. Vacuum-tight. DIN 13130. *DURAN Group*

DN	Height mm	NS	ID diam. Flange mm	OD diam. Flange mm	PK	Cat. No.
100	62	24 / 29	119	153 ± 2	1	**9.042 419**
150	85	24 / 29	172	215 ± 2	1	**9.042 431**
200	94	24 / 29	224	270 ± 2	1	**9.042 438**
250	109	24 / 29	274	320 ± 2	1	**9.042 443**
300	137	24 / 29	332	380 ± 2	1	**9.042 447**

4

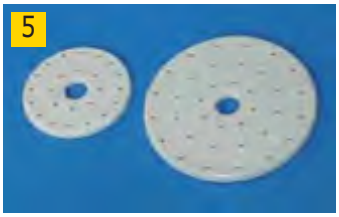


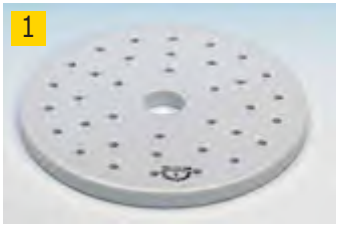
5 LLG-Plate for desiccator, porcelain

DIN 12911

Diam. mm	PK	Cat. No.
90	1	**9.042 801**
140	1	**9.042 802**
190	1	**9.042 803**
235	1	**9.042 804**
280	1	**9.042 805**

5





1 Desiccator plates, porcelain

Perforated. Without feet. To DIN 12911. 20mm diameter central hole and 5mm diameter outer holes.

Haldenwanger

Diam. mm	PK	Cat. No.
90	1	**9.042 509**
140	1	**9.042 514**
190	1	**9.042 519**
235	1	**9.042 523**
280	1	**9.042 528**



2 Desiccator stopcock, Borosilicate glass 3.3

With PTFE spindle. To fit side outlet. For NOVUS-type desiccators. bore: NW 2.5mm, hose connection: outer dia. 8mm

Lenz

Length mm	NS	PK	Cat. No.
108	24/29	1	**9.042 500**



3 Desiccator stopcock, Borosilicate glass 3.3

With PTFE spindle. To fit tube top lid. For NOVUS-type desiccators. bore: NW 2.5 mm, hose connection: outer dia. 8 mm

Lenz

Length mm	NS	PK	Cat. No.
124	24/29	1	**9.042 505**



4 Desiccators, vacuum, O- ring seals

Soft rubber. These O-ring seals make glass lubrication unnecessary.
Suitable for desiccators, Witt jars etc.

For DN mm	PK	Cat. No.
100	1	**9.042 710**
150	1	**9.042 715**
200	1	**9.042 720**
250	1	**9.042 725**
300	1	**9.042 730**



5 LLG-Vacuum desiccators, PC, round form, "Heavy Duty", VDR Serie

NEW!

Cost effective alternative to glass desiccators. Highly transparent, lightweight, shatterproof, made of polycarbonate. Silicon O-ring and specially designed 'locking clip' allows use without grease. Flange lock holds the bottom and the lid together during non-vacuum conditions.
Three-way stopcock provides great convenience for consistent vacuum draw, vacuum release or gas exchange e.g. inert gas.
Maximum vacuum of 1 Torr (1.3mbar; 1.3 x 10^{-4} MPa) for more than 72 hours.
Also available in brown with UV-blocking effect for light sensitive samples.
G Models will be delivered with a vacuum gauge.
Included in delivery: Drying agent tray, perforated sample tray, O-ring and flange locker.

Type	Ext. diam. mm	Height mm	Capacity litres	PK	Cat. No.
VDR-20 Vacuum Desiccator	242	279	6	1	**9.042 751**
VDR-20G Vacuum Desiccator with gauge	242	354	6	1	**9.042 753**
VDR-25 Vacuum Desiccator	308	325	10	1	**9.042 755**
VDR-25G Vacuum Desiccator with gauge	308	400	10	1	**9.042 757**
VDR-30 Vacuum Desiccator	385	399	20	1	**9.042 759**
VDR-30G Vacuum Desiccator with gauge	385	475	20	1	**9.042 761**

E & OE.

Accessories for Desiccators VDR Serie

NEW!

Description	PK	Cat. No.
Drying Agent Tray for VDR-20 Serie	1	**9.042 771**
Drying Agent Tray for VDR-25 Serie	1	**9.042 772**
Drying Agent Tray for VDR-30 Serie	1	**9.042 773**
Perforated Sample Tray for VDR-20 Seri	1	**9.042 776**
Perforated Sample Tray for VDR-25 Serie	1	**9.042 777**
Perforated Sample Tray for VDR-30 Serie	1	**9.042 778**

1 Desiccators, plastic, vacuum, PC/PP

Crystal clear, PC dome lid. PP. Lower section and desiccant tray. Venting stopper with non-return valve in lid. Polychlorbutadiene rubber (CK) O-ring seal between lid and base which is compressed when vacuum is applied. Lightweight and easy to use. *Kartell*



Nominal dia. mm	Diam. mm	Height mm	PK	Cat. No.
150	170	195	1	**9.042 615**
200	235	240	1	**9.042 620**
250	285	300	1	**9.042 625**

2 Spare O-Rings

Neoprene rubber. *Kartell*



Diam. mm	PK	Cat. No.
150	1	**9.042 681**
200	1	**9.042 682**
250	1	**9.042 683**

3 Desiccator plates, PP

PP. For use at room temperature. Not suitable for use with hot crucibles. *Kartell*



Diam. mm	PK	Cat. No.
141	1	**9.042 674**
189	1	**9.042 675**
238	1	**9.042 676**

4 Accessory venting stopper for desiccators, PC

PC. With non-return valve. *BRAND*



Type	PK	Cat. No.
Desiccators	1	**9.042 684**

5 Desiccators, Type 5309, 5310, PC, blue

Transparent PC bell and blue PP lower part. Will not break or implode under vacuum provided that the operating instructions are obeyed. Lower part is resistant to diluted acids, alkalis and other common desiccants. Vacuum connection at lower part. TFE stopcock is suitable for vacuum tubing 6.4mm i.d. For air tight sealing it is sufficient to grease sealing surface a little. No additional sealing ring is necessary. The additional rim at the bell prevents grease stains on lab benches. *Thermo Scientific*



External diameter: 330mm
Internal diameter: 246mm

Type	Description	PK	Cat. No.
5309	Desiccator, without stopcock	1	**7.048 801**
5310	Desiccator, with stopcock (not autoclavable)	1	**7.048 802**



1 Desiccator disc, Type 5312, enamel

Light-green, ceramic-metal composite. With numbered quadrants. Autoclavable. *Thermo Scientific*
Recommended for use with 7.048 802 and 9.042 690.

Type	Ext. diam. mm	PK	Cat. No.
5312	230	1	**9.042 573**



2 Desiccator, Type 5311, PC

Transparent, lightweight, unbreakable, for vacuum or non-vacuum use. With stopcock. *Thermo Scientific*
Large, stable base. No danger of implosion. Capable of maintaining 0.95bar negative pressure over a 24 hour period. With silicone O-ring, no lubrication required.
Suitable for 230mm diameter desiccator discs or plates. Max. height over plate 195mm. Plate not included.

External diameter: 280mm
Internal diameter: 251mm

Type	PK	Cat. No.
5311	1	**9.042 690**

Vacuum drying ovens please see page 819.



3 LLG-Desiccant beads

With orange indicator colour. Grain size 1 to 3mm or 2 to 5mm. This self-indicating drying agent (white silica gel) is free from any heavy metals and therefore environmentally compatible. The gel is naturally orange when active and at a 6 weight-% saturation level. As the gel adsorbs moisture, the colour changes into white. The total adsorption capacity is approximately 23 in weight-% at 40% RH. The range of application is identical with that of white silica gel. The colour change, however, represents a great advantage since it allows monitoring of the saturation level. The gel can be regenerated when heated at a temperature of maximum 120°C until it turns to its original orange colour.

Container	Capacity kg	PK	Cat. No.
Box, 1 to 3mm	1	1	**9.042 555**
Box, 1 to 3mm	3	1	**9.042 556**
Bucket, 1 to 3mm	8	1	**9.042 557**
Cardboard box, 1 to 3mm	25	1	**9.042 558**
Box, 2 to 5mm	1	1	**9.042 543**
Box, 2 to 5mm	3	1	**9.042 544**
Bucket, 2 to 5mm	8	1	**9.042 545**



4 Disposable Desiccant Cartridges

NEW!

Use to reduce moisture in desiccator cabinets or within cases containing precision laboratory instruments. Silica gel beads transform to pink color when saturated with moisture. The desiccant cartridges can be regenerated by gentle overnight heating in a 50°C oven. For quicker regeneration, cut open the membrane and transport beads to a glass or porcelain dish and heat in a 150°C oven for one hour. Silica gel is non-toxic, non-corrosive and inert. *Bel-Art Products*

- Transparent polystyrene dish permits instantaneous visual examination of silica gel color.
- Large or small cartridges to match requirements.
- Cartridges are shipped in individual sealed pouches, ready for immediate use.

Diam. mm	Weight g	PK	Cat. No.
65	16	6	**9.042 530**
100	38	6	**6.235 377**

E & OE.

1 2 LLG-Vacuum desiccator cabinets, PC, square form, "Heavy Duty", VDC Serie

NEW!

High-quality and stable construction made of polycarbonate. Highly transparent, lightweight, shatterproof and stackable.
Silicon O-ring and specially designed locking clip' allows use without grease. Three-way stopcock provides great convenience for consistent vacuum draw, vacuum release or gas exchange e.g. inert gas.
Maximum vacuum of 1 Torr (1.3mbar; 1.33 x 10^{-4} MPa) for more than 72 hours, with built-in vacuum gauge.
Also available in brown with UV-blocking effect for light sensitive samples.
Included in delivery: Vacuum gauge, O-ring, drying agent tray, 2 x perforated sample trays (VDC-11 and VDC-21) or 3 x perforated sample trays (VDC-31 and VDC-41).

Type	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Capacity litres	Max. number shelves	PK	Cat. No.
VDC-41	355 x 374 x 445	420 x 397 x 491	45	6	1	**9.042 763**
VDC-31	355 x 375 x 345	420 x 397 x 381	35	5	1	**9.042 765**
VDC-21	346 x 365 x 246	420 x 392 x 281	23	4	1	**9.042 767**
VDC-11	248 x 254 x 238	322 x 285 x 271	11	4	1	**9.042 769**

1



Accessories for Desiccators VDC Serie

NEW!

Description	PK	Cat. No.
Drying Agent Tray for VDC-41/31/21 Serie	1	**9.042 774**
Drying Agent Tray for VDC-11 Serie	1	**9.042 775**
Perforated Sample Tray for VDC-41/31/21 Serie	1	**9.042 779**
Perforated Sample Tray for VDC-11 Serie	1	**9.042 780**

2



Mini Desiccator Basic/Premium, polycarbonate

SICCO

Three versions (one, two or three permanently fixed compartments), one-touch door, including desiccant.

Mini Premium Desiccator including 2 shelves, hygrometer. Bottom with non-slip rubber feet.

Product advantages:
- One Touch Door with circular seal
- Robust construction
- Transparent, shatterproof cabinet made of polycarbonate
- Superb all-round visibility
- Hinge door with wide opening angle
- Lightweight, transportable
- Stackable
- Desiccant in a handy, resealable container included in delivery

3



9.042 646

Applications:
Ideal for small parts, very handy.

SICCO Desiccators are designed for storing or drying humidity sensitive products using silica gel. The tight fitting door protects the contents from contamination from the atmosphere. The controlled environment inside the desiccators are ideal for storing reference materials, retained samples, metallographic specimen, tobacco and DNA-samples.

4



9.042 647

5



9.042 648

Specifications:

Panels:	clear
Temperature resistance:	from -35°C to +70°C
Use:	normal pressure

Type	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	Volume litres	Weight kg	PK	Cat. No.
Mini 1 Basic	221 x 214 x 183	212 x 180 x 162	6.2	0.9	1	**9.042 646** 3
Mini 2 Basic	221 x 214 x 362	212 x 180 x 162	2 x 6.2	1.8	1	**9.042 647** 4
Mini 3 Basic	221 x 214 x 540	212 x 180 x 162	3 x 6.2	2.7	1	**9.042 648** 5
Mini 1 Premium	221 x 214 x 183	212 x 180 x 162	6.2	0.9	1	**9.042 652** 6
Mini 2 Premium	221 x 214 x 362	212 x 180 x 162	2 x 6.2	1.8	1	**9.042 653**
Mini 3 Premium	221 x 214 x 540	212 x 180 x 162	3 x 6.2	2.7	1	**9.042 654**

6



9.042 652

1



9.042 655

2



9.042 660

Mini Desiccators Black Basic/Premium and Protect Basic/Premium, polycarbonate

NEW!

Including desiccant, black or orange, non-transparent polycarbonate panels reduce light incidence and protect against ultraviolt radiation, stackable. *SICCO*

Mini Black Premium and Mini Protect Premium Exsikkator including 2 shelves, hygrometer. Bottom with non-slip rubber feet.

Product advantages:
- One Touch Door with circular seal
- Robust construction
- shatterproof cabinet made of polycarbonate
- Hinge door with wide opening angle
- Lightweight, transportable
- Stackable
- Desiccant in a handy, resealable container included in delivery

Specifications:

Panels:	black or orange
Temperature resistance:	from -35°C to +70°C
Use:	normal pressure

Type	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	Volume litres	Weight kg	PK	Cat. No.	
Mini Black Basic	221 x 214 x 183	212 x 180 x 162	6.2	0.9	1	**9.042 655**	1
Mini Protect Basic	221 x 214 x 183	212 x 180 x 162	6.2	0.9	1	**9.042 656**	
Mini Black Premium	221 x 214 x 183	212 x 180 x 162	6.2	0.9	1	**9.042 659**	
Mini Protect Premium	221 x 214 x 183	212 x 180 x 162	6.2	0.9	1	**9.042 660**	2

Mini Desiccators Mobile Basic/Premium, polycarbonate

NEW!

With practical handle, one compartment, including desiccant. *SICCO*

Mini Mobile Premium Exsikkator including 2 shelves, hygrometer. Bottom with non-slip rubber feet.

Product advantages:
- One Touch Door with circular seal
- Robust construction
- Transparent, shatterproof cabinet made of polycarbonate
- Superb all-round visibility
- Hinge door with wide opening angle
- Lightweight, transportable
- With practical handle
- Desiccant in a handy, resealable container included in delivery

Specifications:

Panels:	black or orange
Temperature resistance:	from -35°C to +70°C
Use:	normal pressure

Type	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	Volume litres	Weight kg	PK	Cat. No.	
Mini Mobil Basic	221 x 214 x 183	212 x 180 x 162	6.2	1.0	1	**7.638 923**	3
Mini Mobil Premium	221 x 214 x 183	212 x 180 x 162	6.2	1.0	1	**9.042 657**	4

3



7.638 923

4



9.042 657

E & OE.

Mini-Desiccators for Gas Filling Basic/Premium, polycarbonate

NEW!

Including desiccant and hose with quick couplings for gas filling, stackable. *SICCO*

Mini-Desiccators for Gas Filling Premium including two shelves, hygrometer and non-slip rubber feet.

Product advantages:
- One Touch Door with circular seal
- Robust construction
- Transparent, shatterproof cabinet made of polycarbonate
- Superb all-round visibility
- Hinge door with wide opening angle
- Lightweight, transportable
- Stackable
- Two connections for gas filling including quick couplings with self-sealing valves and hose
- Desiccant in a handy, resealable container included in delivery

Specifications:

Panels:	clear
Temperature resistance:	from -35°C to +70°C
Use:	normal pressure

Type	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	Volume litres	Weight kg	PK	Cat. No.
Mini Inertgas Basic	221 x 214 x 183	212 x 180 x 162	6.2	0.9	1	**7.629 763** 1
Mini Inertgas Premium	221 x 214 x 183	212 x 180 x 162	6.2	0.9	1	**9.042 658** 2

1



7.629 763

2



9.042 658

3 Desiccator Star, PMMA



Desiccators are designed for storing or drying humidity-sensitive products, using silica gel. The tight fitting door protects the contents from atmospheric contamination. *SICCO*
The controlled environment inside the desiccators are ideal for storing reference materials, library samples, metallographic specimens, tobacco and DNA-samples. Includes four transparent acrylic shelves, tray, hygrometer and desiccant, with positions for up to 26 shelves and stackable.
- Reinforced aluminium frame with acrylic panels
- Door with magnetic catch and circular rubber seal
- Non-slip rubber feet
- Easy to read electronic hygrometer
- Variable height shelves made of acrylic glass
- Telescopic shelves
- Desiccant tray
- Silica gel included
- Raster and rails made metal-free PA/fiberglass
- Rails with level numbering

Specifications:

Panels:	clear
Material:	PMMA
Temperature resistance:	-20°C to + 70°C
Usable volume/Total volume	42L/45L
Use:	normal pressure
Stand:	rubber feet
Maximum all-over load per shelf	10kg
Total all-over load	30kg

Type	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
Star - Desiccator	260 x 330 x 480	310 x 375 x 525	7.0	1	**9.042 651**



1 Desiccators Super Star, PMMA

SICCO

Gas filling Desiccators provide ideal conditions for the safe and secure storing of poisonous chemicals. An inert gas such as nitrogen can be introduced as soon as the door is closed tightly. Unlike the ambient air, the inert gas does not react with the stored substances. Includes four transparent acrylic shelves, positions for up to 26 shelves, hygrometer, tray, desiccant and tubing with quick coupling for gas filling and door lock.

- Reinforced aluminium frame with acrylic panels
- Door with magnetic catch, circular rubber seal and cylinder lock
- Non-slip rubber feet
- Extra big electronic hygrometer
- Variable height shelves made of acrylic glass
- Telescopic shelves
- Two connections for gas filling with quick couplings
- Non-return valve and tubing
- Raster and rails made metal-free PA/fiberglass
- Rails with level numbering

Spefications:

Panels:	clear
Material:	PMMA
Temperature resistance:	from -20°C to +70°C
Usable volume/Total volume	42L/45L
Use:	normal pressure
Stand:	rubber feet
Maximum all-over load per shelf	10kg
Total all-over load	30kg

Type	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
Super-Star	260 x 330 x 480	310 x 375 x 525*	7.1	1	**6.800 667**

* Additional space requirement for coupling, 150mm per side.



2 Desiccator Auto-Star, PMMA

SICCO

With automatic drying that can maintain a constant humidity of between 20% and 30%, Automatic Desiccators are highly suitable for long-term storage. Even frequent opening of the door is compensated for automatically. The ideal solution for storing reference materials, electronics, photo equipment, papers, historical artefacts and much more. With four transparent acrylic shelves and hygrometer with positions for up to 26 shelves and stackable.

- Reinforced aluminium frame with acrylic panels
- Door with magnetic catch and circular rubber seal
- Non-slip rubber feet
- Easy to read electronic hygrometer
- Variable height shelves made of acrylic glass
- Telescopic shelves
- Automatic drying
- Constant low interior humidity between 20% and 30%
- Raster and rails made metal-free PA/fiberglass
- Rails with level numbering

Spefications:

Panels:	clear
Material:	PMMA
Temperature resistance:	-20°C to +70°C
Usable volume/Total volume:	42L/45L
Use:	normal pressure
Stand:	rubber feet
Maximum all-over load per shelf	10kg
Total all-over load	30kg

Type	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
Auto-Star	260 x 330 x 480	310 x 375 x 525	7.3	1	**6.201 892**

1 Star-Desiccator Protect, PMMA

NEW!

SICCO

Including four shelves made of acrylic glass, tray, hygrometer and desiccant, usable with up to 26 shelves, stackable, orange acrylic panels reduce light incidence and protect against ultraviolet radiation.


1

Product advantages:
- Reinforced aluminium frame with acrylic panels
- Door with magnetic catch and circular rubber seal
- Non slip rubber feet
- Easy to read electronic hygrometer
- Variable height shelves made of acrylic glass
- Telescopic shelves
- Desiccant tray
- Silica gel included

Spefications:

Panels:	orange
Temperature resistance:	from -20°C to +70°C
Use:	normal pressure
Stand:	rubber feet

Type	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
Star-Desiccator Protect	260 x 330 x 480	310 x 375 x 525	7.0	1	**6.901 030**

2 Desiccator Auto-Big-Star, PMMA

SICCO

Including two shelves made of stainless steel, tray and hygrometer, usablewith up to 17 shelves, stackable.
- Reinforced aluminium frame with acrylic panels
- Door with magnetic catch and circular rubber seal
- Four casters (two of the casters with brakes)
- Easy to read electronic hygrometer
- Variable height shelves made of stainless steel
- Telescopic shelves
- Automatic drying
- Constant low interior humidity between 20% and 30%


2

Spefications:

Excess length of drying unit:	100mm
Usable volume:	140L
Total volume:	150L
Maximum all-over load per shelf:	30kg
Total all-over load:	80kg

Type	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
Auto-Big-Star	495 x 540 x 500	560 x 580 x 560	22.0	1	**9.042 007**

3 Desiccator Big Star, PMMA

SICCO

To protect sensitive materials from humidity or dust during storage.
This is achieved by addition of silica gel which reduces significantly the humidity inside the desiccator.
The desiccator is made of a strong aluminium frame with transparent acrylic panels.
For easy handling, the door is equipped with a magnetic strip and lined with foam rubber gasket.
The standard equipment includes a digital precision hygrometer which displays temperature and humidity as well as two removable and adjustable shelves made of stainless steel and a tray for silica gel.
The desiccator can be equipped with up to 17 shelves.


3

Type	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
Big Star	502 x 502 x 502	585 x 560 x 555	18.0	1	**6.300 334**



1 Desiccator Star-Vitrium, borosilicate glass 3.3

SICCO

Panels made of borosilicate glass 3.3, including four shelves made of stainless steel, tray, hygrometer and desiccant, usable with up to 26 shelves, stackable.
- Reinforced aluminium frame with borosilicate glass panels
- Door with magnetic catch and circular rubber seal
- Non slip rubber feet
- Easy to read electronic hygrometer
- Variable height shelves made of stainless steel
- Telescopic shelves
- Desiccant tray
- Silica gel included

Specifications:

Usable volume:	42L
Total volume:	45L
Maximum all-over load per shelf:	10kg
Total all-over load:	30kg

Type	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
Star-Vitrum	260 x 330 x 480	310 x 375 x 525	14.0	1	**9.042 006**



2 Desiccator Horizontal-Star, PMMA

SICCO

To protect sensitive materials from humidity or dust during storage. This is achieved by addition of silica gel which reduces significantly the humidity inside the desiccator.
The desiccator is made of a strong aluminium frame with transparent acrylic panels.
For easy handling, the door is equipped with a magnetic strip and lined with foam rubber gasket.
The standard equipment includes a digital precision hygrometer which displays temperature and humidity as well as two removable and adjustable shelves made of PMMA and a tray for silica gel.
The desiccator can be equipped with up to 13 shelves.
Raster and rails made metal-free PA/fiberglass.
Rails with level numbering.

Type	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
Horizontal-Star	480 x 320 x 260	520 x 375 x 340	7.0	1	**6.800 632**



9.042 643



9.042 644

Desiccators Maxi 1 and Maxi 2, PMMA

SICCO

SICCO Desiccators are designed for storing or drying humidity sensitive products using silica gel. The tight fitting door protects the contents from contamination from the atmosphere. The controlled environment inside the desiccators are ideal for storing reference materials, retained samples, metallographic specimen, tobacco and DNA-samples.
- Reinforced aluminium frame with acrylic panels
- Door with magnetic catch and circular rubber seal
- Four casters (two of the casters with brakes)
- Easy to read electronic hygrometer
- Variable height shelves made of stainless steel
- Telescopic shelves
- Desiccant tray

Maxi 1: Including four shelves made of stainless steel, tray and hygrometer, usable with up to 34 shelves.

Maxi 2: Two chambers, two doors, each chamber usable with up to 17 shelves. Including two shelves per chamber, two trays and two hygrometers.

Speficiations:	**Maxi 1/Maxi 2**
Usable volume:	280/140L
Total volume:	300/150L
Maximum all-over load per shelf:	30/80kg
Total all-over load:	160kg

Type	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
Maxi 1	495 x 1030 x 540	560 x 1150 x 580	30.0	1	**9.042 643** 3
Maxi 2	495 x 500 x 450*	560 x 1150 x 580	80.0	1	**9.042 644** 4

* per chamber.

E & OE.

1 Laboratory Freeze Dryer ALPHA 1-2 LDplus Package

NEW!

Christ

1



Small but big in performance in routine applications. Complete, universal package for sample drying in up to 8 flasks, alternatively for handling materials in dishes on up to 3 unheated shelves.
With new user-friendly controller "Lyo Display LDplus".
- Graphic LC display with a clear layout showing the most important process data (ice condenser temperature, process time, section time and vacuum).
- Comfortable and self-explaining menu guidance in German, English or French language.
- Vacuum control for optimization and reduction of process time.
- Conversion of product temperature and vacuum according to the vapour pressure curve above ice.
- RS232 communication interface available as an option.

Equipped with 8 rubber valves for flasks and 3 unheated shelves (diameter 200 mm) for drying in dishes.

Required for operation: two-stage rotary vane vacuum pump with a suction capacity of min. 2 m³/h suction capacity, final vacuum approx. 5x10-3 mbar (e.g. type RZ 2.5, manufacturer VACUUBRAND).

Universal applicable accessories for almost all drying applications such as flasks, dishes, ampoules, injection bottles available.

Specifications:

Total ice capacity:	2.5kg
Ice condenser temperature:	-55°C
Line voltage:	230V/50Hz
Dimensions (WxDxH):	315 x 460 x 345mm (basic unit)
Weight:	approx. 28kg

Type	PK	Cat. No.
ALPHA 1-2 LDplus Package	1	**9.883 151**
Rotary vane pumps RZ 2.5, 2 steps, 230V/50-60Hz	1	**9.880 123**

2 Laboratory Freeze Dryer Alpha 2-4 LDplus Package

NEW!

Christ

2



Large-capacity laboratory freeze dryer for routine applications in up to 8 flasks, due to low ice condenser temperature most suitable for drying of samples containing organic solvents (e. g. alcohols). With new user-friendly controller "Lyo Display LDplus".
- Graphic LC display with a clear layout showing the most important process data (ice condenser temperature, process time, section time and vacuum).
- Comfortable and self-explaining menu guidance in German, English or French language.
- Vacuum control for optimization and reduction of process time.
- Conversion of product temperature and vacuum according to the vapour pressure curve above ice.
- RS232 communication interface available as an option.

Equipped with stainless steel manifold for up to 8 flasks.

Required for operation: chemically resistant two-stage rotary vane vacuum pump with a suction capacity of min. 5m³/h suction capacity, final vacuum approx. 5x10-3mbar (e.g. type RC 6, manufacturer VACUUBRAND).

Specifications:

Total ice capacity:	4kg
Ice condenser temperature:	-85°C
Line voltage:	230V/50Hz
Dimensions WxDxH:	390 x 555 x 415mm (basic unit)
Weight:	approx. 65kg

Type	PK	Cat. No.
ALPHA 2-4 LDplus Package	1	**9.883 152**
Chemistry Hybrid Pump RC 6 230V/50-60Hz, with plug CEE	1	**9.882 235**

1 Laboratory Freeze Dryer BETA 1-8 LDplus Package

NEW!

Christ

Laboratory freeze dryer for routine drying processes of larger sample quantities.
This complete package provides a universal system for drying in up to 12 flasks, alternatively in dishes on 5 unheated shelves.
With new user-friendly controller "Lyo Display LDplus":
- Graphic LC display with a clear layout showing the most important process data (ice condenser temperature, process time, section time and vacuum).
- Comfortable and self-explaining menu guidance in German, English or French language.
- Vacuum control for optimization and reduction of process time.
- Conversion of product temperature and vacuum according to the vapour pressure curve above ice.
- RS232 communication interface available as an option.

Equipped with 12 rubber valves for flasks and 5 unheated shelves (diameter 265mm) for drying in dishes.

Required for operation: two-stage rotary vane vacuum pump with a suction capacity of min. 5m³/h suction capacity, final vacuum approx. 5x10-3mbar (e.g. type RZ 6, manufacturer VACUUBRAND).

Specifications:

Total ice capacity:	8kg
Ice condenser temperature:	-55°C
Line voltage:	230V/50Hz
Dimensions WxDxH:	780 x 545 x 415mm (basic unit)
Weight:	approx. 63kg

Type	PK	Cat. No.
BETA 1-8 LDplus Package	1	**9.883 153**
Rotary vane pump RZ6, 2 steps, 230V/50-60Hz	1	**9.880 124**

1



E & OE.

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1



1 Illuminated magnifying lens Lux-50

Orange body colour, with illuminator and plastic lens. Requires 2 x 1.5 V AA batteries for operation (not included).

Mag-nification	Lens dia. mm	PK	Cat. No.
Lux-50	2.5x to 5x	1	**9.151 817**

2



9.151 680

Magnifying lens, economic

With practical additional lens in the handle. Particularly suitable for those who require a low level of magnification. An additional high-magnification lens enables small details to be read. *Eschenbach*
Transparent plastic frame ensures easy orientation on the reading material. With eyelet in the end of the handle for round-the-neck cord which is supplied. The biconvex reading magnifiers offer a large visual field in a medium magnification range. Plano-convex additional lens with 5x magnification in handle.

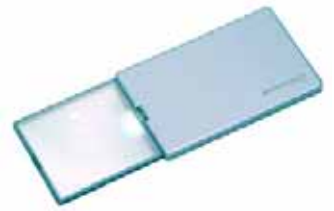
3



9.151 688

Mag-nification	Lens dia. mm	PK	Cat. No.
3x/7,4 dpt	Ø 65	1	**9.151 680** 2
2,25x/5,1 dpt	Ø 80	1	**9.151 682**
2,25x/5,0 dpt	80 x 40	1	**9.151 688** 3

4



4 Magnifying lens, easyPOCKET

Silver, with illumination: ultra flat SMD-LED. *Eschenbach*

Mag-nification	Lens dia. mm	PK	Cat. No.
3x / 8.0dpt	86 x 55 x 6	1	**9.151 147**

5



5 Illuminated pocket magnifiers, mobilux economy

Great value illuminated pocket magnifier with NF filament bulb. Batteries are very handy to change when the battery compartment is opened, the upper and lower sections of the housing remain connected via a hinge and can be easily closed again. *Eschenbach*
Bulb: NF lens bulb 2.5 V, 250 mA, E10.

Mag-nification	Lens dia. mm	PK	Cat. No.
7.0x/28.0dpt	dia. 35	1	**9.151 148**
10.0x/38.0dpt	dia. 35	1	**9.151 149**

Illuminated magnifier, powerlux

Very simple to use, the ergonomic design promotes intuitive movement on the reading material. Automatic switch-off function, preserves battery life. Very comfortable to hold in the hand. Consistently bright and glare-free illumination. *Eschenbach*
- 2 SMD LEDs are positioned opposite each other to provide shadow-free illumination
- Supplied with protective hard foam case.

Colour of light 3000 K available on request.

Mag-nification	Lens dia. mm	Light colour K	PK	Cat. No.
5x / 20.0dpt	dia. 58	8000	1	**9.151 186**

E & OE.

1 Micromagnifier with illumination

Eschenbach

Suitable for inspecting a wide variety of surfaces such as metals, textiles, minerals, varnishes, etc. The wide focusing range enables raised or depressed features (e.g. holes) to be examined in detail.

- Precise focusing with adjustable wheel
- The light can be used when required
- Magnification 30 x, glass lenses

Mag-nification	Description	PK	Cat. No.
30x	with illumination	1	**9.151 594**

1



2 Precision linen testers, plastic

Eschenbach

- Linen tester with lateral scale
- Black plastic housing
- Scale: lateral scale with mm graduation

Mag-nification	Lens dia. mm	Field of view mm	Height mm	PK	Cat. No.
8x/30dpt	diam. 18	20 x 20	35	1	**6.236 477**

2



3 Precision linen testers, metal

A. Schweizer

- Brass frame, chrome-plated, silk matt finish
- Silica glass lenses, biconvex

Mag-nification	Lens dia. mm	Field of view mm	PK	Cat. No.
12x / 48dpt	diam. 12.5	10 x 10	1	**9.151 423**
10x / 40dpt	diam. 14.5	15 x 15	1	**9.151 427**
8x / 32dpt	diam. 17.5	20 x 20	1	**9.151 433**
6x / 24dpt	diam. 22.5	25 x 25	1	**9.151 442**
5x / 20dpt	diam. 31.5	30 x 30	1	**9.151 453**

3



Precision folding magnifiers, plastic

Eschenbach

- Glass fibre reinforced, non-breakable polyamide body
- The body is dustproof when closed
- Glass lenses

Mag-nification	Lens dia. mm	Lens	Description	PK	Cat. No.
3x + 6x = 9x	Ø 23	Achromatic, coated	Distortion-free image	1	**9.151 055** 4
10x	Ø 23	Aplanatic	Distortion-free image	1	**9.151 155** 5

4



9.151 055

5



9.151 155

1



9.151 051

Precision folding magnifiers, metal

- Matte-chromed brass housing with eye
- Lens surround in black-painted metal

Eschenbach

Mag-nification	Lens	Lens dia. mm	PK	Cat. No.
10x	Achromatic	diam. 15	1	**9.151 040**
20x	Achromatic	diam. 17	1	**9.151 050**
8x	Aplanatic	diam. 21	1	**9.151 051** 1
10x	Aplanatic	diam. 21	1	**9.151 052**
12x	Aplanatic	diam. 15	1	**9.151 053**

2



9.151 107

3



9.151 108

Precision scale magnifiers

- Distortion-free image with pinpoint clarity
- Fine focusing via easy-grip focusing ring
- Supplied with standard scale, measuring range 20mm, 1/10mm graduation, size: dai. 23mm
- Housing made from glass fibre reinforced polyamide
- Supplied in a solid plastic box with space for other scales

Eschenbach

LED lighting unit for precision scale magnifiers.
- Handle holds 2 batteries (not included)

4



9.151 106

Description	Mag-nification	PK	Cat. No.
Magnification	7x / 28,0 dpt	1	**9.151 107** 2
Magnification	10x / 40,0 dpt	1	**9.151 108** 3
Handle with LED illumination for magnifying lenses	--	1	**9.151 106** 4

5



5 Mini Light Box and Mini Magnifier

Mini Light Box saves bench space and can be stored in a drawer. Viewing area is perfect for quick screening of 96-well plates, petri dishes, electrophoresis gels, slides, and transparencies. Powered by two AA batteries (included). Viewing area dimensions (W x D): 127 x 102mm. Overall dimensions (WxDxH): 161mm x 135mm x 44mm.

Heathrow Scientific

Mini Magnifier enlarges objects for easier viewing. To use with Mini Light Box or separately. Swiveling, molded lens. 1.75x magnification. Lens dimensions (W x D): 185mm x 100mm. Stand height: 207mm.

Description	PK	Cat. No.
Mini Magnifier, 1.75x	1	**9.151 509**
Mini Light Box, incl. 2 AA batteries	1	**9.151 510**

6



6 Illuminated magnifier

Magnifier lens complete with articulated arm.

Exacta Optech

Lens power:	3 diopters
Lens dimensions:	190mm x 157mm
Illumination:	2 fluorescent lamps: 9W (230V /50Hz)
Clamp opening:	70mm

Type	PK	Cat. No.
Magnifier lamp	1	**9.170 701**

E & OE.

Illuminated magnifier, RLL 122 T

Waldmann

Strong, shadow-free illumination, using circular 22W fluorescent lamp.
Distortion-free,4 dioptre, glass magnifier (120mm diameter). With an accessory snap-on lens of 8 dioptres, resolving is boosted to 12 dioptres. Smooth, easy adjustment. Spring balanced joints.

Specifications

Supply req.:	230V 50Hz
Fitted with:	1 x fluorescent lamp T-R29 22 W
Shade material:	Plastic
Lamp housing:	Opal white polycarbonate
Colour:	Light grey
Lens diameter:	120mm
Lens magnification, dioptres:	4

1



9.705 078

Type	Description	PK	Cat. No.
RLL 122 T	Illuminated magnifier	1	**9.705 078**
RLL 122 T	Illuminated magnifier + blocked lens dia. 31.5mm	1	**6.204 902**
TK 1/45	Table clamp	1	**9.705 088**

2 Clip-on magnifiers labo-clip

Eschenbach

The labo-clip system can be easily attached to the spectacle frame. The labo-clip leaves both hands free for working. Comfortable working distance even with a high level of magnification.

- Used with distance spectacles to achieve optimum image quality.
- Lenses easily interchangeable.
- Lens sizes: monocular dia. 40mm, binocular 74.5 x 22.5mm
- Lightweight
- Lens clamp made from glass fibre reinforced plastic
- Supplied with protective box

2



Type	Mag-nification	Working Distance mm	Description	PK	Cat. No.
labo-clip*	2x/2.5dpt	250	binocular	1	**9.151 175**
labo-clip	2.5x/5.0dpt	180	binocular	1	**9.151 171**

* Shorter working distance due to integrated convergence supporting prisms.

3 Headband magnifiers labo-med

Eschenbach

Both hands are free for working.
Comfortable working distance even with a high level of magnification.
- Lenses easily interchangeable
- Lens clamp made from glass fibre reinforced plastic
- The labo-med clip-on magnifiers are only suitable for non-spectacle wearers
- Discreet metal frame, black matt finish
- Supplied with protective box
- labo-med can also be used with monocular lenses which are available as an accessory

3



Type	Mag-nification	Working Distance mm	Description	PK	Cat. No.
labo-med*	2x/2.5dpt	250	binocular	1	**9.151 178**
labo-med	2,5x/5.0dpt	180	binocular	1	**9.151 179**

* Shorter working distance due to integrated convergence supporting prisms.

Educational Microscopes, F11 Series

NEW!

Motic

- Monocular head, 45º inclined, 360º rotating
- Widefield eyepiece WF10X/18mm
- Quadruple revolving nosepiece
- Achromatic objectives DIN 4X, 10X, 40X S
- Coarse and fine focusing system with tension adjustment
- Plain stage with sample clips
- 0.65 N.A. condenser built in on stage with iris diaphragm (F1110)
- Focusable 1.25 N.A. Abbe condenser with iris diaphragm (F1115)
- LED illumination 20mA, 3.5V, 70mW with intensity control
- Power supply 220V (CE)
- Dust cover

1



6.239 879

Type	Description	PK	Cat. No.
F1110 LED	0.65 N.A. condenser built in on stage with iris diaphragm	1	**6.239 879** 1
F1115 LED	Focusable 1.25 N.A. Abbe condenser with iris diaphragm	1	**6.243 414**

Educational Microscopes, BA81

Motic

- Monocular (BA81A-MS corded)/Binocular (BA81B-MS w/100X corded) head
- 45° inclined, 360° rotating
- Widefield eyepiece WF10X/18mm
- Reversed quadruple revolving nosepiece
- Achromatic objectives EA 4X, 10X, 40X S
- Achromatic objectives EA 4X, 10X, 40X S and 100x S Oil (BA81B-MS w/100X corded)
- Coaxial coarse and fine focusing system with tension adjustment
- Built in low position coaxial mechanical stage
- Focusable N.A. 1.25 Abbe condenser
- Iris diaphragm with filter holder
- LED illumination 20mA, 3.5V, 70mW with intensity control
- Main supply 220V-240V (CE)
- Dust cover

Type	Description	PK	Cat. No.
BA81A-MS	Monocular	1	**9.727 032** 2
BA81B-MS	Binocular	1	**9.727 033** 3

2



9.727 032

3



9.727 033

E & OE.



Motic®
25
YEARS+
with you

1988

Motic is founded as a hi-tech industry specialized in designing and manufacturing advanced microscopy products

1995-98

Motic consolidates its presence in Europe by opening sales offices in Wetzlar and Barcelona with the aim of offering the best service

2001

Motic opens a sales office in Vancouver (Canada) to match its increasing demand in the American market

2002

The birth of the Moticams turns Motic into one of the leading brand names of digital microscopy products

2003

Motic enters into the high-end market with its popular AE and BA series of inverted and upright microscopes

2013

Motic shows its strength in its 25th birthday by creating new advanced products and introducing Wifi technology

Life always sets out **new challenges**

Our main challenge is to be **with you** for the next 25 years

Motic®
MORE THAN MICROSCOPY

Discover more at **www.moticeurope.com**

Binocular Microscopes for Schools/Laboratories, B1-220ASC, B1-223ASC

Motic

- Observation Tube Binocular 45° -/Phototube 30°, 360° rotating
- Widefield eyepieces WF10X/20mm
- Quadruple revolving nosepiece
- Achromatic Super Contrast objectives ASC 4X, 10X, 40X S, 100X S-Oil
- Coaxial coarse and fine focusing system with tension adjustment
- Built in lowposition coaxial mechanical stage
- Focusable 1.25 N.A. Abbe condenser with iris diaphragm and filter holder
- Halogen illumination 12V/20W with intensity control
- Power supply 100V-240V (CE)
- Blue, yellow and green filters, dust cover and immersion oil

Type	PK	Cat. No.	
B1-220ASC	1	**9.727 002**	1
B1-220ASC UK	1	**9.727 003**	
B1-223ASC	1	**7.900 085**	2

1



9.727 002

2



7.900 085

3



6.243 410

Advanced Microscope for University and Laboratory use, B3-220ASC

NEW!

Motic

- Observation Tube Siedentopf Type, Binocular -/Phototube 30°, F.N. 20
- Widefield eyepieces WF10X/20mm
- Reversed quintuple revolving nosepiece
- Achromatic Super Contrast objectives ASC 4X, 10X, 40X S, 100X S-Oil
- Coaxial coarse and fine focusing system with tension adjustment
- Built in low position coaxial mechanical stage
- Focusable 1.25 N.A. Abbe condenser with iris diaphragm and filter holder
- Koehler illumination halogen 12V/20W with intensity control
- Power supply 100V-240V (CE)
- Blue, yellow and green filters, dust cover and immersion oil

Type	Description	PK	Cat. No.	
B3-220ASC	binocular	1	**6.243 410**	3
B3-223ASC	trinocular	1	**7.636 721**	

E & OE.

Basic Biological Microscope for Education and Routine, BA210

Motic

- Infinity Optics [CCIS®]
- Observation Tube Binocular -/Phototube 30°, F.N. 20
- Interpupillary Distance 55-75mm
- Eyepieces High-Eyepoint N-WF 10x/20mm provide dioptre adjustment for both eyes
- Nosepiece reversed quadruple
- Objectives CCIS EF-N Plan 4x, 10x, 40x-S, 100x-S-Oil
- Stage 140 x 135mm surface, 76 x 50mm movement, coaxial controls right hand
- Condenser focusable Abbe N.A. 1.25 with iris diaphragm and slider slot
- Focus Z-Axis movement 25mm stroke, fine focus with 2µm increment, coarse focus with torque adjustment
- Illumination 6V/30W halogen with intensity control
- Universal power supply 100-240V (CE)

Supplied with: diameter 45mm blue filter, immersion oil (5ml), power cord, Allen hexagonal key, vinyl dust cover
Optional lenses for phase contrast 10x/20X/40x/100X means of a slide, 10x-40x darkfield, polarization

Type	Description	PK	Cat. No.	
BA210	Binocular	1	**9.727 025**	1
BA210	Trinocular	1	**6.238 591**	2
BA210	Binocular UK	1	**6.251 200**	

1



9.727 025

2



6.238 591

Advanced Upright Microscope for Life Science and Laboratoriess, BA310

Motic

- Infinity Optics [CCIS®]
- Observation Tube Binocular -/Phototube 30°, F.N. 20
- Interpupillary Distance 48mm to 75mm
- Eyepieces High-Eyepoint N-WF 10x - 20mm provide dioptre adjustment for both eyes
- Nosepiece reversed quintuple
- Objectives CCIS EF-N Plan 4x, 10x, 40x-S, 100x-S-Oil
- Stage 174mm x 140mm surface, 76mm x 50mm movement, coaxial controls right hand
- Condensor focusable Abbe N.A. 0.90/1.25 with iris diaphragm and slider slot
- Focus Z-Axis movement 20mm stroke, fine focus with 2ìm increment, coarse focus with torque adjustment
- Illumination Koehler 6V/30W halogen with intensity control
- Universal power supply 100V-240V (CE)

Supplied with: dia. 45mm blue filter, immersion oil (5ml), power cord, Allen hexagonal key, vinyl dust cover.
Optional lenses for phase contrast 10x/20X/40x/100x means of a slide or rotary condenser, Darkfield 10x-40x means of a slide or rotary condenser, polarization

Type	Description	PK	Cat. No.	
BA 310	Binokular	1	**9.727 004**	3
BA 310 UK	Binokular	1	**9.727 005**	
BA 310	Trinokular	1	**7.626 190**	4

3



9.727 004

4



7.626 190

Lab Microscope for advanced applications, BA410

Motic

- Infinity Optics [CCIS®]
- Observation Tube Binocular -/Phototube 30°, F.N. 22
- Interpupillary Distance 48mm-75mm
- Eyepieces High-Eyepoint N-WF 10x/22mm provide diopter adjustment for both eyes
- Nosepiece reversed sextuple
- Objectives CCIS EC-H Plan 4x, 10x, 40x-S, 100x-S-Oil
- Stage 174 x 145mm surface, 80 x 53mm movement, coaxial controls right hand
- Condensor achromatic swing-out Abbe 0.90/0.13
- Focus Z-Axis movement 27mm stroke, fine focus with 1µm increment, coarse focus with torque adjustment
- Illumination Externally mounted lamp house, Koehler 6V/30W Quartz halogen with intensity control
- Universal power supply 100V-240V (CE)

Supplied with: dia. 45mm blue filter, immersion oil (5ml), power cord, Allen hexagonal key, vinyl dust cover.
Optional available Phase-contrast (Ph 1.2.3), DF 10x-40x, Polarization, Plan fluar objectives, Epi-fluorescence, LED-Modul for transmitted light

Type	Description	PK	Cat. No.	
BA410	Binocular sextuple	1	**9.727 026**	5
BA410	Trinocular sextuple	1	**9.727 027**	6

5



9.727 026

6



9.727 027

1



9.727 030

2



9.727 031

Inverted Routine microscope for live cell, AE2000

Motic

- Infinity Optics [CCIS®]
- Observation Tube Binocular -/Phototube 45°, F.N. 20
- Interpupillary Distance 48mm-75mm
- Eyepieces High-Eyepoint N-WF 10x/20mm provide dioptre adjustment for both eyes
- Side facing quadruple nosepiece
- Objectives CCIS Plan achromat PL 4x, LWD PL 40x
- CCIS Plan Achromat Phase PL Ph10x, LWD PL Ph20x
- Stage plain stage 200mm x 239mm surface with metal & glass stage inserts
- Condensor ELWD N.A. 0.3 with phase slider (Ph1, BF)
- Illumination 6V/30W halogen with intensity control and sleeping mode
- Universal power supply 100V-240V (CE)

Supplied with: dia. 45mm blue, green interference and neutral density filters with filter slider, centering telescope, power cord, Allen hexagonal key, vinyl dust cover.
Optional available Phase-contrast 4x/40x, mechanical stage with well plate holder, LED-Modul

Type	Description	PK	Cat. No.
AE2000	Binokular	1	**9.727 030** 1
AE2000	Trinokular	1	**9.727 031** 2

3



9.727 015

Inverted Microscope for advanced applications AE31

Motic

- Infinity Optics [CCIS®]
- Observation Tube Binocular -/Phototube 45°, F.N. 22
- Interpupillary Distance 55mm-75mm
- Eyepieces High-Eyepoint N-WF 10x/22mm with diopter adjustment on both eyepieces
- Side facing quintuple nosepiece
- Objectives CCIS Plan achromat PL 4x,
- CCIS Plan Achromat Phase PL Ph10x, LWD PL Ph20x, LWD PL Ph40x
- Plain stage 200mm x 260mm surface with metal & glass stage inserts
- Condensor ELWD N.A. 0.3 with phase slider (Ph1, BF, Ph3)
- Illumination Externally mounted lamp house, Koehler 6V/30W Quartz halogen with intensity control
- Universal power supply 100V-240V (CE)

Included: Ø 45mm blue, green intereference and ground glass filters, centering telescope power cord, Allen hexagonal key, vinyl dust cover
Optional available: mechanical stage with well plate holder, Epi-Fluorescence

Type	Description	PK	Cat. No.
AE31	Trinocular	1	**9.727 015** 3
AE31 UK	Trinocular	1	**9.727 016**

4



4 Stereomicroscope, ST-36C

Motic

- Binocular head, 45º inclined, 360º rotating
- Widefield eyepieces WF10X/20mm
- Objective turret magnification changer (2X, 4X)
- Coarse focusing system with tension adjustment
- Base stand with pole
- Incident and transmitted rechargeable LED illumination (ST36C-6LED)
- Incident and transmitted illumination 12V/10W (ST36C-2L00)
- Power supply 100V-240V (CE), charger and batteries included (ST36C-6LED)
- Main supply 220V-240V (CE) (ST36C-2L00)
- Black/white and frosted glass stage plates Ø 80mm, dust cover

Type	Description	Illumunation	PK	Cat. No.
ST-36C-2LOO		Tungsten	1	**9.727 007**
ST-36C-2LOO UK		Tungsten	1	**9.727 008**
ST-36C-6LED	battery	LED	1	**9.727 009**
ST-36C-6LED UK	battery	LED	1	**9.727 010**

E & OE.

Compact zoom stereomicroscope, SMZ-140 series

Motic

The Greenough optical system provides clear stereoscopic images ruggadized to operate in harsh environments of the laboratory or machines.
- Observation Tube Binocular 45°, 360° rotating, F.N. 20
- Widefield eyepieces WF10X/20mm, diopter adjustement on both eyepiece tubes
- 4.1 Zoom ratio, WD=80mm
- Magnification range: 10X-40X
- Possible magnification with additional objectives of 3.5X up to 60X
- N2GG: Base stand with pole and head holder
- 12V/15W incident and 12V/10W transmitted halogen illumination with intensity control
- Main supply 220V-240V (CE)
- Black/white and frosted glass stage plates Ø 80mm, blue filter and dust cover

Supplied with: Dust cover, eyecups, blue filter

1



6.240 716

2



6.243 423

Type	PK	Cat. No.
SMZ-140-N2GG	1	**6.240 716** 1
SMZ-143-N2GG	1	**6.243 423** 2

High-performance zoom stereomicroscope, SMZ 168-series

Motic

- Observation Tube Binocular -/Phototube 35°, 360° rotating, F.N. 23
- 100:0 (eyetubes), 0:100 (left eyetube/trinocular tube) optical split
- Widefield eyepieces WF10X/23mm, diopter adjustement on both eyepiece tubes
- 6.7:1 Zoom ratio, WD=113mm
- Magnification range: 7.5X-50X
- Possible magnification with additional objectives of 2.3X up to 100X
- 2111: Large working area stand with head holder
- 12V/10W incident and transmitted halogen illumination with intensity control
- Main supply 100V-240V (CE)

Supplied with: Black/White and frosted glass stage plates Ø 95mm, blue filter, dust cover and eyecups.
Additional accessories available: FBGG LED base optional available, 5500K colour temperature, 3W Lambertian LED individual bulb for incident/transmitted, Adjustable intensity control; linear.

PLEASE NOTE: Camera and C-mount adapters are not included.

3



6.243 339

4



9.727 013

Type	Description	PK	Cat. No.
SMZ-168BL	Binocular Zoom stereomicroscope	1	**6.243 339** 3
SMZ-168TL	Trinocular Zoom stereomicroscope	1	**9.727 013** 4
SMZ-168TL UK	Trinocular Zoom stereomicroscope	1	**9.727 014**
AX6602603	2X SLR projection lens	1	**6.241 830**
SP100456	0.35X C-mount camera adapter (focusable) for 1/4"chip sensors	1	**6.243 360**
SW0113N7	0.45X C-mount camera adapter (focusable) for 1/3" chip sensors	1	**6.239 776**
SW0113W9	0.65X C-mount camera adapter (focusable) for1/2" chip sensors	1	**6.241 518**
SP100458	1.0X C-mount camera adapter (without lens)	1	**6.243 361**

1



1 Digital Microscope for Schools/Laboratories, DM-1802

Motic

- Monocular head, 30º inclined with Built-in digital camera CMOS 1/2" chip
- 3MP - 2048x1536 pixels with USB2.0 output
- Widefield eyepiece WF10X/18mm
- Reversed quadruple revolving nosepiece
- Achromatic objectives EA 4X, 10X, 40X S
- Coarse and fine focusing system with tension adjustment
- Built in low position coaxial mechanical stage
- Focusable 1.25 N.A. Abbe condenser with iris diaphragm and filter holder
- Halogen illumination 12V/20W with intensity control
- Power supply 100V-240V (CE)
- Blue filter and dust cover
- Motic Images Plus 2.0 for PC & Mac
- Calibration slide

Type	PK	Cat. No.
DM-1802	1	**9.727 000**
DM-1802 UK	1	**9.727 001**

2



2 Digital Stereomicroscopes, DM-143-FBGG

Motic

- Greenough zoom optical system
- Binocular head, 45º inclined with Built-in digital camera CMOS 1/2" chip
- 3MP - 2048x1536 pixels with USB2.0 output
- Widefield eyepieces WF10X/20mm
- 4:1 Zoom ratio, WD=80mm
- Objective magnification range: 1X-4X
- FBGG: Pole type stand with large working base and head holder
- Coarse focusing system with tension adjustment
- 12V/10W incident and transmitted halogen illumination with intensity control
- Power supply 100V-240V (CE)
- Black/White and frosted glass stage plates, blue filter and dust cover
- Motic Images Plus 2.0 for PC & Mac
- Calibration slide

Type	PK	Cat. No.
DM-143-FBGG-C	1	**9.727 011**
DM-143-FBGG-C UK	1	**9.727 012**

3



3 USB-Hand held microscope with integrated 2 megapixels camera, D-EL1 ecoline

Motic

- With integrated LED illumination and Motic application software
- Sensor CMOS 1/3"
- 2 Megapixel with USB 2.0 output
- Illumination 8-LED in ring formation with 2-step brightness control
- Power Direct from computer through USB2 connection
- Focus Soft-grip focus wheel
- Direct capture button
- 2 Step First Magnification 10X-50X. Second magnification at 200X (depending on screen size)
- Motic EcoLine Tool application software

Calibration slide and metal stand included.

Type	PK	Cat. No.
D-EL1 ecoline	1	**9.727 034**

E & OE.

Digital CMOS Microscope Cameras MOTICAM for all purpose

NEW!

Motic

- Compact design with USB 2.0 output (cable attachable)
- Chip size: 1/4"CMOS (MC 1), 1/3"CMOS (MC 1SP/2), 1/2"CMOS (MC 3), 1/2.5"CMOS (MC 5),
- Progressive Scan, TWAIN-interface
- Supplied with two variable diameter eyepiece couplers, focusable macro lens, macrotube,
- Motic 4-dot calibration slide, Software Motic Images Plus 2.0 for PC (MI) and MAC
- Operation system: Windows XP and higher, Mac OSX

1



6.253 608

Type	Description	PK	Cat. No.
MOTICAM 1	1MP (max. 800x600px)	1	**6.253 608** 1
MOTICAM 1SP	1,3MP (max. 1280x1024px)	1	**6.253 609**
MOTICAM 2	2MP (max. 1600x2000px)	1	**6.253 610**
MOTICAM 3	3MP (max. 2048x1536px)	1	**6.253 611**
MOTICAM 5	5MP (max. 2592x1944px)	1	**6.253 612**

2 3 WiFi Digital Microscopy Moticam X

NEW!

Motic

The Moticam X is the first WiFi Microscope Camera for wireless image transmission. With every Android and iOS hardware (tablet, smartphone), it is now possible to obtain microscopic image results freely and to share with others. This results e.g. for the work in the class composits completely new possibilities.

- Attachable digital C-mount camera
- Sensor: CMOS
- Live resolution: 1.3MP (1280x1024)
- Optical calculation: 1/3"
- Output: WiFi
- Focusable lens: 12mm
- 2 variable diameter eyepiece adaptors
- Macrotube for specimens observation
- Motica 4-dot calibration slide
- USB power supply
- Motic Images Plus 2.0 for PC and MAC
- Operation system: Windows XP and higher, Mac OSX, Android ansd iOS

2



3



Description	PK	Cat. No.
Moticam X	1	**9.727 022**

4 Digital Microscope Camera Moticam 580

NEW!

Motic

CMOS-camera, suited for educational purpose and applications in routine laboratories. Pictures can be safed directly on the SD card. Dual-observation by directly connecting the camera on a Monitor or beamer with fast live image transmisssion.

- Sensor: CMOS
- Live resolution: 800x600 pixels USB (1280x960 extrapolated)
- Still resolution: 5.0Mpixels onto SD card
- Optical calculation: 1/2.5"
- Output: USB 2.0, HDMI 1080P, RCA and SD card slot
- Focusable lens: 12mm
- 2 variable diameter eyepiece adapters
- Macrotube for specimen observation
- Motic Images Plus 2.0 for PC and MAC
- Motic 4-dot calibration slide
- Operation system: Windows XP and higher, Mac OSX
- Power supply 100V-240V (CE)
- Remote control

4



Type	PK	Cat. No.
Moticam 580	1	**6.253 613**

1



1 High resolution digital CCD Microscope Camera Pro Series, Moticam Pro 285A

Motic

For scientific applications
- C/CS mount
- ICX285AQ 2/3" CCD Color
- 1.4MP - 1360x1024 pixels
- USB 2.0 output
- Pixel size 6.45 x 6.45µm
- On-board 4-frame image buffer
- TTL port
- Moticam Pro software CD (Motic Images Advance 3.2, MIDevice, TWAIN, SDK)
- Motic Images Plus 2.0
- Schott BG-40 filter
- USB-cable, calibration slide

Type	PK	Cat. No.
MC Pro 285A	1	**6.240 242**

2



6.236 825

Cold light sources

Schott Fiber Optics

For work area illumination in microscopy, clinical diagnostics, dental technology, photography or mineralogy. Cold light sources filter out heat-producing, infra-red radiation. Visible light with a high and constant intensity is directed to the specimen via flexible light guides. The specimen is not subjected to heat. Compact, easy to use and maintenance-free. The light source base unit is cooled by a low-noise fan with air vented at the rear of the casing. Can be used with special accessories in clean rooms.

KL 200 LED - compact, save energy and cost-effective
20W halogen equivalent LED with continuous dimming. Convection cooling for silent and vibration-free operation. Max. light intensity: 50lm incl. wide-range power supply with international plug system.
KL 1500 LED - economy
The brightness is equivalent to a 150W halogen cold light source. Max. lighting intensity: 380lm
KL 2500 LCD - professional
Professional cold light source with 24V/250W halogen elipsoid reflector lamp and variable brightness control dial with 5 click-stop positions for reproducible setting. Light remains constant irrespective of power supply fluctuations (±15%). Max. lighting intensity: 1300lm

Light exit angle:	Approx. 70° without focussing attachment, approx. 20° with focussing attachment
Supply requirement	
KL 300 LED, KL 1500 LED:	100-240V, 50/60Hz
KL 2500 LCD:	230V, 50/60Hz, safety class II.

Type	Light colour K	Width mm	Depth mm	Height mm	PK	Cat. No.
KL 300 LED	5600	106	114	59	1	**6.253 748**
KL 1500 LED	6000	220	113	137	1	**6.236 825**
KL 2500 LCD	3200	200	265	170	1	**9.705 202**

Cold light source, accessories, KL 300 LED/KL 1500 LED/KL 2500 LCD

Schott Fiber Optics

Lens adaptor, split ring illuminator, i.d. 58mm: For Leica M1-M7 microscopes. No adaptor required on Zeiss Stemi 1000 and 200, SV6 and SV11. Supplied directly by Zeiss. Lens adaptor: 4-point ring illuminator and split light illuminator, i.d. 58mm: No adaptor required on Leica GZ6, M8, M10, M12 and MZAPO microscopes.

Description	PK	Cat. No.
Swan-neck, fibre-optic light guide, single, 3.5mm diameter, length 500mm	1	**9.705 221**
Swan-neck, fibre-optic light guide, double, 3.5mm diameter, length 500mm	1	**9.705 220**
Flexible light guide, single, PVC sheathed, 4.5mm diameter, length 600mm	1	**9.705 225**
Flexible light guide, double, PVC sheathed, 4.0 mm dia., length 1000 mm	1	**9.705 226**
6 point ring light, Int. diameter 66mm	1	**9.705 230**
6 point ring light, Int. diameter 58mm	1	**9.705 231**
Focussing attachment and filter set	1	**9.705 170**
Polarisation filter for focussing attachment	1	**9.705 176**
Focussing attachment, without filter, for swan-neck and flexible fibre optic light guides	1	**9.705 175**
Conversion filter for focussing attachment	1	**9.705 177**
Lens adapter I 58 to 66mm	1	**9.705 272**

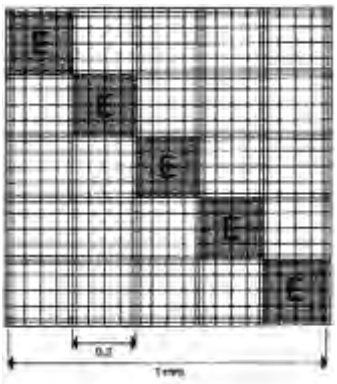
1 Counting chamber, Improved Neubauer

BRAND

With double ruling. Without snap-on clips. Calibratable.
Cell depth 0.1mm. Counting grid with 9 large squares each 1 mm². The 4 large squares in the corners for counting leucocytes are each subdivided into 16 squares with a side length of 0.25mm. The large square in the middle is subdivided into 25 squares each with a side length of 0.2mm. Each of these is further subdivided into 16 smaller squares each with a side length of 0.05 mm and an area of 0.0025mm². The 5 group squares marked with an 'E' are used to count thrombocytes and erythrocytes. All group squares have triple boundary lines on each side. CE-marked according to IVD 98/79 EG.

Type	PK	Cat. No.
Counting chamber, Improved Neubauer	1	**9.161 078**

1



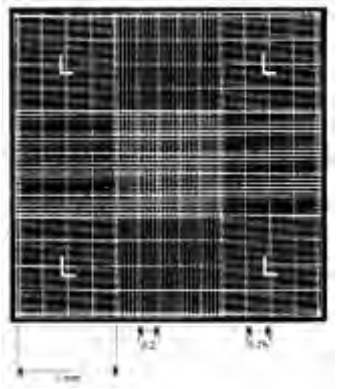
2 Counting chamber, Improved Neubauer, bright line

BRAND

Bright line. With double ruling. Without snap-on clips. Calibratable. Same counting grid as the Improved Neubauer cell, but with rhodium coated chamber base. Rulings are engraved into the Rhodium layer and appear bright under normal microscope settings. By altering the contrast it is possible to reverse the image under the microscope to make the rulings appear brighter or darker as required.
CE-marked according to IVD 98/79 EG.

Type	PK	Cat. No.
Counting chamber, Improved Neubauer, bright line	1	**9.161 079**

2



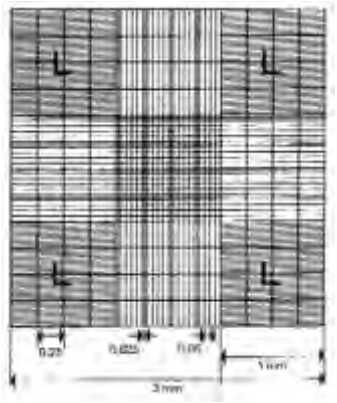
3 Counting chamber, Neubauer

BRAND

With double ruling. Without snap-on clips. Calibratable.
Cell depth 0.1mm. Same ruling as Improved Neubauer, but the large square in the centre is divided into 16 squares each with a side length of 0.2mm. Unlike the more modern improved Neubauer counting chambers, the counting area of each group square is limited by the outermost of the triple border lines.
CE-marked according to IVD 98/79 EG.

Type	PK	Cat. No.
Counting chamber, Neubauer	1	**9.161 086**

3

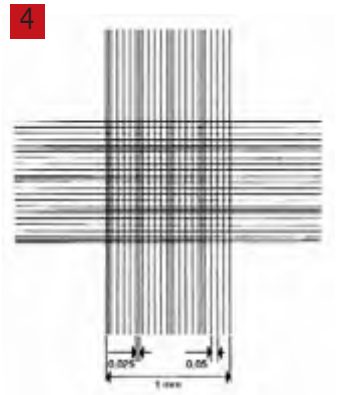


4 Counting chamber, Thoma ruling

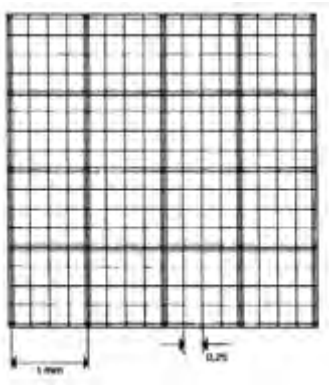
Double ruling. Without snap-on clips. Calibratable. Cell depth 0.1mm. Grid is the same as the grid in the centre of large square in the Neubauer chamber. The area of the small square is 0.0025mm². Since the large outer squares are not included, the Thoma system is only used to count thrombocytes and erythrocytes.
CE-marked according to IVD 98/79 EG.

Type	PK	Cat. No.
Counting chamber, Thoma ruling	1	**9.161 080**

4



1



1 Counting chamber, Fuchs-Rosenthal

With double ruling. Without snap-on clips. Calibratable.
Cell depth 0.2mm. Grid has 16 x large 1 mm² squares. Each square is divided into 16 smaller squares each with a side length of 0.25mm and an area of 0.0625mm². These counting chambers are commonly used to count cells in cerebrospinal fluid. CE-marked according to IVD 98/79 EG.

Type	PK	Cat. No.
Counting chamber, Fuchs-Rosenthal	1	**9.161 098**

2



2 Hand tally counter

Use for counting blood cells, bacterial colonies, drops of liquid, or any repetitive event. Tallies up to 9999. Features a quick-reset knob, lens window for easy reading, and finger ring for a secure grip. Sturdy, chrome-finished, metal housing.
Dimensions: 46mm diameter x 41mm W.

Description	PK	Cat. No.
Hand tally counter	1	**6.237 971**

3



3 Economy Counters

Mechanical, benchtop counters are ideal for determining the number of cells, counting parts, etc. Use with blood cell labels provided or insert your own. Each key records up to 999 count strokes. A totalising window keeps track of the total number of strokes made on all keys; a bell rings at every 100 total counts reached.

Description	Width mm	Length mm	Depth mm	PK	Cat. No.
6-key Economy Counter	76	250	56	1	**9.521 801**
9-key Economy Counter	76	320	56	1	**9.521 802**

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

Motic®
MORE THAN MICROSCOPY

E & OE.

1 Scalpels, disposable Cutfix®

Sterile. For cleaner, smoother, more accurate incisions. *B. Braun*

Type	PK	Cat. No.
10	10	**9.409 804**
11	10	**9.409 805**
12	10	**9.409 806**
15	10	**9.409 807**
20	10	**9.409 808**
21	10	**9.409 809**
22	10	**9.409 810**
23	10	**9.409 813**
24	10	**9.409 814**

1



2 3 4 Aesculap® Safety scalpel

NEW!

- Reducing the risk of infections caused by cuts and stab wounds suffered during handover, take-over and disposal of scalpels
- Safe locking of the blade for disposal
- Designed according to the requirements of the German norm TRBA 250

B. Braun

Type	PK	Cat. No.
10	10	**9.160 480**
11	10	**7.656 993**
12	10	**9.160 481**
13	10	**9.160 482**
15	10	**9.160 483**
15-1	10	**9.160 484**
15-C	10	**9.160 485**
18	10	**9.160 486**
19	10	**9.160 487**
20	10	**9.160 488**
21	10	**9.160 489**
22	10	**9.160 490**
23	10	**9.160 491**
24	10	**9.160 492**
25	10	**9.160 493**
36	10	**9.160 494**

3



4



2



5 6 8 Scalpel handles, stainless

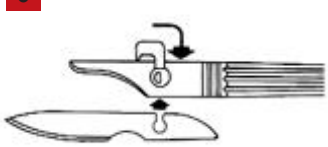
For interchangeable, disposable blades using the BAYHA interlocking system. Blades insert into the side of the handle. Not suitable for sterile processing. *Bayha*

Type	Length mm	PK	Cat. No.
1, non-rusting	130	1	**9.409 841**
4, non-rusting	160	1	**9.409 844**
5, hollow handle, non-rusting	150	1	**9.409 845**
6, plastic grip	160	1	**9.409 846** 7

5



6



7



9.409 846

8



1 Scalpel blades, non-sterile

For scalpel handles using the BAYHA interlocking system.
Sterile scalpel blades are available on request, except Cat. No. 9.409 930.

Bayha

Type	PK	Cat. No.
11	12	**9.409 911**
15	12	**9.409 915**
16	12	**9.409 916**
18	12	**9.409 918**
19	12	**9.409 919**
20	12	**9.409 920**
21	12	**9.409 921**
22	12	**9.409 922**
23	12	**9.409 923**
24	12	**9.409 924**
26	12	**9.409 926**
27	12	**9.409 927**
28	12	**9.409 928**
29	12	**9.409 929**
Special scalpel blade acuate	12	**9.409 930** 2

1



2



9.409 930

3



4



5



3 4 5 Dissecting knives

Wironit CrNi 18/12. Fine pattern. With metal handle.
Choice of rounded, or pointed blade profile.

Hammacher

Type	Length mm	Length*	PK	Cat. No.
Rounded	135	30	1	**9.160 534**
Pointed	135	30	1	**9.160 535**
Rounded	150	20	1	**9.160 536**
Pointed	150	20	1	**9.160 537**
Rounded	130	15	1	**9.160 533**
Pointed	130	15	1	**9.160 543**

* Blade length (mm)

6



6 Dissecting needles

Wironit. CrNi 18/12. Length 50mm.

Hammacher

Description	PK	Cat. No.
Lancet-shaped	1	**9.160 040**
Straight, sharp	1	**9.160 030**
Curved, sharp	1	**9.160 035**
Semi-lancet	10	**9.160 036**
Spatula	10	**9.160 037**

7



8



9



7 8 9 Dissecting needles

With plastic or metal handle.
Length 140mm.

Hammacher

Type	Description	PK	Cat. No.
Plastic	Pointed, straight	1	**9.160 070**
Plastic	Pointed, curved	1	**9.160 072**
Plastic	Lancet shaped	1	**9.160 075**
Metal	Pointed, straight	1	**9.160 090**
Metal	Pointed, curved	1	**9.160 092**
Metal	Lancet shaped	1	**9.160 095**

E & OE.

Dissecting needle holder

Wironit CrNi 18/12. *Hammacher*

Type	Length mm	PK	Cat. No.
Wironit shaft with plastic handle	239	1	**9.160 020** 1
Aluminium shaft with plastic handle	239	1	**9.160 022** 2
Aluminium handle	170	1	**9.160 025** 3

1



9.160 020

2



9.160 022

3



9.160 025

4 Blood lancets Solofix®, sterile

For single use. Sharp, flexible lancet made of V2A supra steel. Optimal insertion depth 3.8mm. *B. Braun*

Type	PK	Cat. No.
Solofix®	200	**9.409 820**

4



5 Dissecting set No. 1, small

Corrosion-free instruments with satin finish, enclosed in an imitation leather case.
Dissecting set comprises of the following:

Scalpel, pointed 35mm long
Dissecting needle
Lancet
Forceps 105mm long
Scissors, straight 115mm long
Section lifter

Type	PK	Cat. No.
Dissecting set I, small	1	**9.160 014**

5



6 Microscopic set, large

Corrosion-free instruments with satin finish, enclosed in an imitation leather case.
Dissecting set comprises of the following:

Metal scalpel, sharp 35mm long
Razor knife
Section lifter 45 x 8mm
Dissecting needle pointed
Dissecting needle lancet
Dissecting probe curved
Splinter forceps 105mm long
Microscope scissors, straight 110mm long
Microscope scissors, curved 110mm long

Type	PK	Cat. No.
Microscopic set, large	1	**9.160 012**

6



7 Dissecting set No. III

Corrosion-free instruments with satin finish, enclosed in an imitation leather case.
Dissecting set comprises of the following:

Incision scissors 130mm long
Scissors pointed 110mm long
Splinter forceps 130mm long
Dissecting forceps 130mm long
Metal scalpel 30mm long
Metal scalpel 40mm long
Metal scalpel 35mm long
Cartilage knife
Double-ended button probe 1mm diameter
Double-ended button probe 2mm diameter
Dissecting needle pointed
Dissecting needle lancet
Dissecting probe curved

Type	PK	Cat. No.
Dissecting set II - large	1	**9.160 013**

7



Forceps and scissors please see page 123.

1



1 Dissecting set for students

Hammacher

Comprises:
1 x scalpel handle No. 3
5 x sterile, disposable scalpel blades for above
1 pair of preparation scissors
1 pair of fine, sharp forceps
1 x lancet needle
1 x dissection needle

Type	PK	Cat. No.
HSO 130-00	1	**9.160 200**



E & OE.

1 LLG-Slides

Made of Soda-lime-glass. According to ISO 8037/I with CE-mark, manufactured in compliance with Directive 98/79 EC (IVD). With colour-coded writing patch as outlined below. Size approx. 76mm x 26mm. Nominal thickness 1.0mm. Ready-to-use, pre-cleaned. Packed in boxes of 50 slides.

1



Description	Edge finish	PK	Cat. No.
Without frosted area	Cut	50	**9.160 800**
With frosted area	Cut	50	**9.160 801**
With frosted area	Ground 90°	50	**9.160 802**
Without frosted area	Ground 45°	50	**9.160 803**
With frosted area white	Cut	50	**9.160 804**
With frosted area blue	Cut	50	**9.160 805**
With frosted area pink	Cut	50	**9.160 806**
With frosted area yellow	Cut	50	**9.160 807**
With frosted area green	Cut	50	**9.160 808**
With frosted area orange	Cut	50	**9.160 809**
With frosted area violet	Cut	50	**9.160 810**
With frosted area white	Ground 45°	50	**9.160 811**
With frosted area blue	Ground 45°	50	**9.160 812**
With frosted area pink	Ground 45°	50	**9.160 813**
With frosted area yellow	Ground 45°	50	**9.160 814**
With frosted area green	Ground 45°	50	**9.160 815**
With frosted area orange	Ground 45°	50	**9.160 816**
With frosted area violet	Ground 45°	50	**9.160 817**

2 LLG-Adhesive microscope slides

Made of Soda-lime-glass, according to ISO 8037/I with CE-mark, manufactured in compliance with Directive 98/79 EC (IVD). With frosted white writing patch, positive charged. Size approx. 76mm x 26mm, nominal thickness 1.0mm. Ready-to-use, pre-cleaned. In foil-packed plastic boxes of 72 slides.

2



Description	Edge finish	PK	Cat. No.
With frosted area white, (+) positive charged	Ground 90°	72	**9.160 818**
With frosted area white, (+) positive charged	Ground 45°	72	**9.160 819**

3 LLG-Slide dispenser

Slide dispenser can dispense 91 slides, individually. By turning the knob, one slide is dispensed. Only dry slides should be inserted into the storage magazine. With transparent, removable upper section for easy viewing of remaining slides and clean storage.

3



Type	PK	Cat. No.
Dispenser	1	**9.161 000**

Not suitable for microscope slides Cat. No. 9.160 800 and 9.160 801.

4 Microscope slides

According to ISO 8037/I. Prewashed and polished. Nominal thickness 1mm. *Menzel*
Size 76 x 26mm. Also available with 20mm, frosted, writing patch at one end.

4



Description	Edge finish	Type	PK	Cat. No.
Extra white	Cut	Without frosted end	50	**9.161 110**
Extra white	Cut	With frosted end	50	**9.161 145**
Extra white	Ground 45°	Without frosted end	50	**9.161 120**
Pure white	Cut	Without frosted end	50	**9.161 130**
Pure white	Ground 45°	Without frosted end	50	**9.161 140**
Pure white	Ground 90°	Without frosted end	50	**9.161 141**



1 Microscope slides with cavities

Extra white glass, 90° ground edges. Dimensions: 76mm x 26mm x 1.2mm to 1.5 mm, with cavities approx. 15mm to 18mm diameter and approx. 0.6 to 0.8 depth. *Menzel*

Number of cavities	PK	Cat. No.
1	1	**9.161 151**



2 Superfrost® Plus adhesive microscope slides

Size: 75mm x 25mm x 1.0mm. Ground edges 90°, white SuperFrost marking area. A new application method provides the surface of a slide with a permanent positive charge. Electrostatic attraction binds fresh frozen tissue sections and cytology preparations. Also available with blue, yellow or green SuperFrost marking area. *Menzel*

Type	Colour	PK	Cat. No.
SuperFrost® Plus	White	72	**9.161 155**



3 Superfrost® slides

According to ISO 8037/I. With colour-coded writing patch as outlined below. Size 76mm x 26mm. Nominal thickness 1.0mm. With cut or ground edges. With approx. 0.013mm thick coating which prevents slides sticking together and being scratched. *Menzel*

Edge finish	Colour	PK	Cat. No.
Cut	white	50	**9.161 161**
Cut	blue	50	**9.161 162**
Cut	pink	50	**9.161 163**
Cut	yellow	50	**9.161 164**
Cut	green	50	**9.161 165**
Ground 45°	white	50	**9.161 171**
Ground 45°	blue	50	**9.161 172**
Ground 45°	pink	50	**9.161 173**
Ground 45°	yellow	50	**9.161 174**
Ground 45°	green	50	**9.161 175**



4 Microscope slide or paper strip holder

Clear. Plastic. With slanting grooves for storing 10 single or double slides. Also suitable for paper strips. Front storage area has space for drying slides.

Internal dimensions (W x D x H) mm	PK	Cat. No.
250 x 50 x 30	1	**9.161 208**

E & OE.

1 2 Microscope slide Lab-Tek™ Chamber Slide™ System, PS

Thermo Scientific

Chamber slides eliminate the need for cell transfer prior to visualisation/staining. Upper structure can be removed when culturing is complete. Useful for viral and mycoplasma testing, chromosome studies, toxicity tests and immunocytology. Sterile. CE marked.
The chemically coated growth surface of the Lab-Tek™II-CC² Chamber Slide System mimics polylysine and provides binding sites optimal for fastidious cells (e.g. neurons).
Material chamber: Polystyrene

Lab-Tek™: Sealant: Non-toxic medical grade silicone.
Lab-Tek II™: Sealant, biocompatible acrylic adhesive.
Lab-Tek II - CC²: modified glass slide, chemically coated to mimic polylysine.





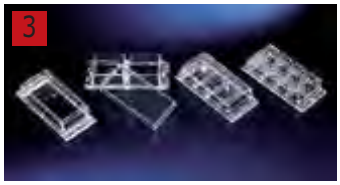
Type	No. of chambers	Material	Working volume ml	Culture surface cm²	PK	Cat. No.
Lab-Tek™	1	Glass	2.5-4.5	9.4	16	**6.222 960**
Lab-Tek™	1	Permanox™	2.5-4.5	9.4	16	**7.624 247**
Lab-Tek™	2	Glass	1.2-2.0	4.2	16	**6.223 053**
Lab-Tek™	2	Permanox™	1.2-2.0	4.2	16	**7.605 528**
Lab-Tek™	4	Glass	0.5-0.9	1.8	16	**6.802 871**
Lab-Tek™	4	Permanox™	0.5-0.9	1.8	16	**6.222 163**
Lab-Tek™	8	Glass	0.2-0.4	0.8	16	**6.201 671**
Lab-Tek™	8	Permanox™	0.2-0.4	0.8	16	**7.607 926**
Lab-Tek™	16	Glass	0.1-0.2	0.4	16	**4.009 111**
Lab-Tek II™	1	Glass	2.0-4.5	8.6	16	**6.308 526**
Lab-Tek II™	2	Glass	1.0-2.0	4.0	16	**6.306 834**
Lab-Tek II™	4	Glass	0.5-1.0	1.7	16	**6.900 035**
Lab-Tek II™	8	Glass	0.2-0.5	0.7	16	**6.900 034**
Lab-Tek II - CC²	1	modif. Glass	2.0-4.5	8.6	16	**4.009 173**
Lab-Tek II - CC²	2	modif. Glass	1.0-2.0	4.0	16	**6.803 005**
Lab-Tek II - CC²	4	modif. Glass	0.5-1.0	1.7	16	**6.802 939**
Lab-Tek II - CC²	8	modif. Glass	0.2-0.5	0.7	16	**6.222 543**

3 Chambered Coverglass Lab-Tek™ und Lab-Tek™ II, PS, sterile

Thermo Scientific

Excellent for confocal image analysis and optimal for high power inverted microscopic viewing. Serile, CE marked.
Material chamber: Polystyrene
Material slide: Glass

Lab-Tek™: connection between the chamber (s) and slides from non-toxic, medical silicone.
Lab-Tek™ II: connection between the chamber (s) and slides of biocompatible acrylic adhesive.
Medium chamber is not removable.



Type	No. of chambers	Material	Working volume ml	Culture surface cm²	PK	Cat. No.
Lab-Tek™	1	Glass	2.2-4.5	9.4	16	**6.900 669**
Lab-Tek™	2	Glass	1.2-2.0	4.2	16	**6.801 580**
Lab-Tek™	4	Glass	0.5-0.9	1.8	16	**6.201 895**
Lab-Tek™	8	Glass	0.2-0.4	0.8	16	**7.652 828**
Lab-Tek™ II	1	Glass	2.0-4.5	8.6	16	**6.803 674**
Lab-Tek™ II	2	Glass	1.0-2.0	4.0	16	**6.803 675**
Lab-Tek™ II	4	Glass	0.5-1.0	1.7	16	**6.803 676**
Lab-Tek™ II	8	Glass	0.2-0.5	0.7	16	**6.226 901**

4 Chamber slides with numbered grids Quick-Read

- high-quality acrylic slides
- contains 10 numbered counting chamber with grids
- volume of each chamber 6.3µl



Type	Capacity µl	PK	Cat. No.
Quick-Read	6.3	100	**7.930 074**



1 Diagnostic slides without adhesion coating

Menzel

Type	Description	Diam. mm	Colour	PK	Cat. No.
Epoxy	1 cavity	8.0	Blue	100	**9.161 181**
Epoxy	3 cavities	14.0	Black	100	**9.161 182**
Epoxy	8 cavities	6.0	Black	100	**9.161 183**
Epoxy	10 cavities	6.7	Black	100	**9.161 184**
Epoxy	12 cavities	5.0	White	100	**9.161 185**
PTFE	1 cavity	8.0	Blue	100	**9.161 186**
PTFE	3 cavities	14.0	Black	100	**9.161 187**
PTFE	8 cavities	6.0	Black	100	**9.161 188**
PTFE	10 cavities	6.7	Black	100	**9.161 189**
PTFE	12 cavities	5.0	White	100	**9.161 190**



2 Diagnostic slides

Menzel

Type	Description	Diam. mm	Colour	PK	Cat. No.
PTFE	12 cavities	5	White	100	**9.161 200**



3 Staining blocks

Moulded glass. With hemispherical cavity, 32mm diameter and 40mm x 40mm glass cover plate.

Colour	PK	Cat. No.
Clear	1	**9.163 285**
Black	1	**9.163 286**



4 Cavity tiles, porcelain

Rectangular, white, glazed, with cavities as outlined below. *Haldenwanger*

Number of cavities	Int. bore diam. mm	Cavity depth mm	Width mm	Length mm	Height mm	PK	Cat. No.
6	36	11	80	115	12.0	1	**9.253 406**
12	20	3	85	119	6.0	1	**9.253 412**



5 Prepared Slides

Prepared microscope slides for education and studies.

Type	PK	Cat. No.
Fishes, frogs and other ambhibians	1	**9.151 850**
Lizard snakes and birds	1	**9.151 851**
Animal reproduction	1	**9.151 852**
Bacteria simple organisms	1	**9.151 854**
Tropical plants	1	**9.151 855**
Plant reproduction and propagation	1	**9.151 856**
Structure of vegetable plants	1	**9.151 857**
Cell development and reproduction	1	**9.151 858**
Nanoplankton	1	**9.151 859**
Human body, normal tissues Part 1	1	**9.151 860**
Human body, normal tissues Part 2	1	**9.151 861**
The human body pathological tissues part 1	1	**9.151 862**
The human body pathological tissues Part 2	1	**9.151 863**
Animal and human parasites	1	**9.151 864**
Life in the ground	1	**9.151 866**
Animals and plants damaged by the environment	1	**9.151 868**
Set for teaching science	1	**9.151 869**
Set for teaching biology part 1	1	**9.151 870**
Set for teaching biology part 2	1	**9.151 871**

E & OE.

1 LLG-Cover slips

Made of borosilicate glass 3.3, in accordance with DIN ISO 8255/I with CE-mark, manufactured in compliance with the Directive 98/79 EC (IVD). In plastic hinged lid boxes, shrink wrapped in aluminium protective foil.



Width mm	Length mm	Thickness mm	PK	Cat. No.
18	18	0.13-0.16	200	**9.160 822**
20	20	0.13-0.16	200	**9.160 823**
22	22	0.13-0.16	200	**9.160 824**
24	24	0.13-0.16	200	**9.160 825**
32	24	0.13-0.16	100	**9.160 827**
40	24	0.13-0.16	100	**9.160 828**
50	24	0.13-0.16	100	**9.160 829**
60	24	0.13-0.16	100	**9.160 830**
50	24	0.16-0.19	100	**9.160 831**

2 Square cover slips

Made of clear white glass. Accurate cutting free of flaws and blisters. *Menzel*
Thickness 0.13mm to 0.16mm.
Further thicknesses are available on request.



Width mm	Length mm	PK	Cat. No.
15	15	200	**9.161 015**
18	18	200	**9.161 018**
20	20	200	**9.161 020**
22	22	200	**9.161 022**
24	24	200	**9.161 024**
26	21	100	**9.161 021**
32	24	100	**9.161 032**
40	24	100	**9.161 040**
50	24	100	**9.161 050**
60	24	100	**9.161 060**

3 Haemacytometer cover glasses

Officially calibrated, optically parallel cut. CE-marked. *Menzel*
Nominal thickness 0.4mm.



Width mm	Length mm	PK	Cat. No.
26	20	10	**9.161 070**
22	22	10	**9.161 072**
24	24	10	**9.161 074**

4 Circular cover slips

Made of clear white glass. Accurate cutting free of flaws and blisters. *Menzel*
Thickness 0.13mm to 0.16mm.
Diameters as indicated. Further sizes and thicknesses are available on request.



Diam. mm	PK	Cat. No.
10	100	**9.161 063**
12	100	**9.161 064**
13	100	**9.161 065**
14	100	**9.161 066**
15	100	**9.161 061**
18	100	**9.161 062**

5 LLG-Cover glass forceps, self-locking

Stainless steel 4301



Length mm	Form	PK	Cat. No.
105	Straight	1	**9.160 380**
105	Curved	1	**9.160 381**

1



1 LLG-Cover glass forceps, Type Kühne.

Stainless steel 4301

Length mm	Form	PK	Cat. No.
115	curved	1	**9.160 386**
130	curved	1	**9.160 387**
145	curved	1	**9.160 388**
115	straight	1	**9.160 391**
130	straight	1	**9.160 392**
145	straight	1	**9.160 393**

2

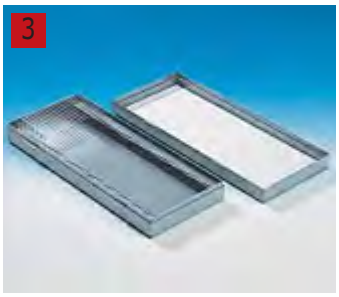


2 Microscope slide boxes

PP. For storing or shipping 5 thick or 10 thin slides. Sturdy design. Screw cap with fitting for sealing wire tag. When cap is open the slides protrude approximately 10mm so they can be removed easily. *Kartell*

Int. diam. mm	Height mm	PK	Cat. No.
45	90	1	**9.161 395**

3



3 Microscope slide boxes

PS. High impact. For 76mm x 26mm slides. Numbered slots in base. Index card in lid. *Kartell*

To hold microscope slides	Width mm	Length mm	Height mm	PK	Cat. No.
25	96	120	35	1	**9.161 380**
50	97	230	35	1	**9.161 381**
100	187	230	35	1	**9.161 382**

4



4 Slide boxes

To hold 50 slides 76mm x 26mm.
Clear and durable storage system - Easy to use.
Dimensions: 172mm x 83mm x 31mm.

- High-grade polystyrene construction
- Archive numbering system in the base
- Freezer-resistant, max. -40°C
- Stackable
- Colour coded
- Dustproof
- Virtually unbreakable

Colour	PK	Cat. No.
White	1	**9.161 361**
Blue	1	**9.161 362**
Green	1	**9.161 363**
Red	1	**9.161 364**
Yellow	1	**9.161 365**
Purple	1	**9.161 366**
Orange	1	**9.161 367**
Mint	1	**9.161 368**
Black	1	**9.161 369**

5



5 LLG-Slide wallet

Cardboard. For 20 slides size 76mm x 26mm. With numbered positions, gatefold front cover and white backboard.

Dimensions mm	PK	Cat. No.
192 x 292 x 11	1	**9.161 290**

E & OE.

1 Microscope slide folders

Cardbord. Available with, or without, gatefold cover. For 76mm x 26mm slides as outlined below.

To hold microscope slides	Cover type	PK	Cat. No.
20	without	1	**9.161 230**
20	with	1	**9.161 235**

1



2 3 20- and 30-place Cardboard Slide Trays

Features thumb cut for easy slide removal. *Heathrow Scientific*

Cardboard slide trays hold standard slides (76mm x 26mm and 3 x 1"). The horizontal compartments are recessed to protect the specimens when the cover is closed. Features thumb cut for easy slide removal.

To hold microscope slides	Size	Colour	PK	Cat. No.
20	208 x 341 x 9mm	black	1	**9.161 295**
30	281 x 328 x 10mm	black	1	**9.161 296**
20	208 x 341 x 9mm	blue	1	**9.161 297**
20	208 x 341 x 9mm	green	1	**9.161 298**

2



3

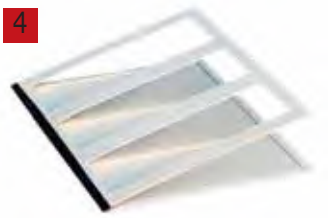


4 Microscope slide folder, Munich type

Cardboard. For 76mm x 26 mm slides.

To hold microscope slides	PK	Cat. No.
24	1	**9.161 250**

4



5 Microscope slide tray without lid

Cardboard. For 76mm x 26mm slides.

To hold microscope slides	PK	Cat. No.
20	1	**9.161 260**

Trays for other sizes of slide are available on request.

5



6 20-Place Slide Tray Rack, ABS

Holds safely five of the 20-place slide trays. Ideal for microbiology, histology and pathology fields. Matching clasps provide area for identification labels and doubles as a handle. Place rack in refrigerator for those needed cold samples. Includes five ABS clasps. Stackable. Dimensions (L x W x H): 226mm x 340mm x 125mm *Heathrow Scientific*

Description	PK	Cat. No.
20-Place Slide Tray Rack for 5 Slide trays	1	**9.161 299**

6



1



1 Slide storage box

Dense fibreboard covered with imitation leather. Hinged lid with locking clips. Holds slides 76mm x 26mm slides as outlined below.

To hold microscope slides	Cover type	PK	Cat. No.
100	With	1	**9.161 210**
50	With	1	**9.161 215**

2



2 Slide storage box

Plastic. Hinged lid with locking clips. Holds slides 76mm x 26mm slides as outlined below.

To hold microscope slides	Cover type	PK	Cat. No.
100	with	1	**9.161 211**

3



4



3 4 Durable microscope slide boxes

Colour-coded for easy identification. Slide boxes are perfect for storage or transportation of standard size slides (76mm x 26mm). With cork lining. Stackable. Each 100 place box is secured with a rust-resistant nickel-plated clasp and hinge pin. The 50 place box is secured by a thumb-latch lock mechanism. Each slot is numbered to correspond to the slide inventory sheet on the inside cover of the box. *Heathrow Scientific*

To hold microscope slides	Colour	Dimensions (W x D x H) mm	PK	Cat. No.
50	Blue	209 x 86 x 35	1	**9.161 300**
100	White	208 x 175 x 34	1	**7.079 563**
100	Blue	208 x 175 x 34	1	**9.161 284**
100	Green	208 x 175 x 34	1	**9.161 285**
100	Red	208 x 175 x 34	1	**9.161 286**
100	Black	208 x 175 x 34	1	**9.161 287**
100	Yellow	208 x 175 x 34	1	**9.161 288**

5



5 LLG-Slide mailers

Manufactured from high density polypropylene, for shipping, storing or staining slides.
Flat mailers can hold 1, 2, 3 or 5 standard (up to 76mm x 26mm) slides securely.
- Light weight and flat
- With marking area and "Top" printed on top surface
- With large, easy-to secure snaps.
- Slotted channels inside mailer keep slides safely separated

To hold microscope slides	PK	Cat. No.
1	10	**9.161 291**
2	10	**9.161 292**
3	10	**9.161 293**
5	10	**9.161 294**

1 Slide mailers

For transporting 76mm x 26mm specimen slides, as outlined below.

To hold microscope slides	Cover type	PK	Cat. No.
2	Without	1	**9.161 270**
6	Without	1	**9.161 272**



2 Slide mailers

Strong protection for 76mm x 26mm specimen slides during transportation. Each slide has its own compartment with support bars at 55mm centres to protect subject matter from being scratched. Particularly useful for cytological and geological specimens. *Kartell*

Description	Material	Width mm	Length mm	Height mm	PK	Cat. No.
1	PE	51	99	6	1	**9.161 281**
2	HD-PE	70	84	6	1	**9.161 282**
3	HD-PE	84	97	6	1	**9.161 283**



3 Slide Mailers

Ideal for shipping, storing, or staining slides. These polypropylene containers hold five standard slides (75mm x 25mm and 3 x 1"). Inside wall features slotted channels to keep slides separated and to make removal easier. Close securely to keep slides safe. Dimensions: 43mm x 24mm x 88mm. *Heathrow Scientific*

Colour	PK	Cat. No.
natural	25	**6.242 062**
red, yellow, blue, purple, orange	25	**9.409 662**



4 Staining jar, PMP (TPX®)

Supplied with 2 lids, one complete lid for use providing evaporation-free storage of staining liquids, the other lid with an opening to allow the handle of accessory staining rack 9.161 341 to be inserted. Note: Xylene can cause etching after 2 days at room temperature. *Kartell*

Width mm	Length mm	Height mm	PK	Cat. No.
80	100	70	1	**9.161 340**



5 Staining rack

For use with staining jar 9.161 340. PP, with horizontal tray, holds 20 slides. *Kartell*

Width mm	Length mm	Height mm	PK	Cat. No.
20	86	700	1	**9.161 341**





1 LLG-Staining jars, soda-lime-glass

The Schiefferdecker Staining Jar is suitable for holding 76mm x 26mm slides horizontally.
This staining jar has 10 grooves which can accommodate 20 slides back-to-back.
The Hellendahl Staining Jar is suitable for holding 76mm x 26mm slides vertically.
This staining jar has 8 grooves which can accommodate 18 slides back-to-back.
The "Macro" Staining Jar is suitable for holding 20 slides with 76mm x 26mm (please order rack separately).
This Stainless Steel rack for "Macro" has 20 grooves which can accommodate 20 single slides.
Each staining jar is supplied with a glass lid.

Type	Width mm	Length mm	Height mm	PK	Cat. No.
Schiefferdecker Staining Jar	68	88	50.15 (with lid)	1	**9.163 250**
Hellendahl Staining Jar	61	63	102 (with lid)	1	**9.163 251**
"Macro" Staining Jar	88	105	78 (with lid)	1	**9.163 252**
Rack, Stainless Steel, for "Macro" jar				1	**9.163 253**



2 Staining rack, Glass

Glass. Holds microscope slides 76mm x 26mm to 50mm. (Fits trough 9.163 281 not supplied).
An accessory wire lifting handle is available.

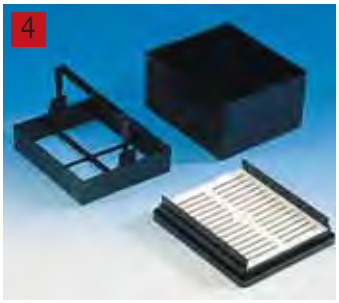
Type	Width mm	Length mm	Height mm	PK	Cat. No.
Staining rack	30	85	45	1	**9.163 280**
Wire handle				1	**9.163 284**



3 Trough

Glass. Accepts one staining rack 9.163 280 (not supplied).

Width mm	Length mm	Height mm	PK	Cat. No.
85	105	70	1	**9.163 281**



4 Staining trough with rack

POM. Accepts 25 slides 76mm x 26mm. *BRAND*
Tightly fitting lid provides good protection against evaporation. Insert rack with folding handle.

To hold microscope slides	Width mm	Length mm	Height mm	PK	Cat. No.
25	88	98	52	1	**9.161 370**



5 Disposable Staining Slide Tray

Stain, rinse, and dry your slides on a single working tray. Made of a polypropylene and polyethylene blend, this rugged staining tray is an economical alternative to metal versions offering a clean and fresh working surface area every time. *Heathrow Scientific*
Up to eight slides fit comfortably onto the base and the deep well holds liquid waste up to 38ml.
Two convenient pour spouts make it easy to dispose of unwanted liquid waste.
Unique dark lid protects slides when used with light sensitive applications.
Supplied with 4 Base Trays and 1 Lid.

To hold microscope slides	Length mm	Width mm	Height mm	PK	Cat. No.
8	305	127	29.5	1	**9.161 400**

E & OE.

1 Staining jar, PMP (TPX®), Schiefferdecker pattern

Accepts 20 slides 76mm x 26mm (10 pairs back to back). Transparent. *Kartell*
Complete with lid.
Note: Xylene can cause etching after 2 days at room temperature.

Width mm	Length mm	Height mm	PK	Cat. No.
70	86	51	1	**9.161 352**



2 Staining jar, PMP (TPX®), Hellendahl pattern

Accepts 16 slides 76mm x 26mm (8 pairs back to back). Transparent, with grooves. *Kartell*
Complete with lid.
Note: Xylene can cause etching after 2 days at room temperature.

Width mm	Length mm	Height mm	PK	Cat. No.
57	57	90	1	**9.161 350**



3 Staining jar

Coplin pattern. Glass.

Diam. mm	Height mm	PK	Cat. No.
45	105	1	**9.163 283**



4 Staining cylinders

Soda lime glass. With drop-on cover.

Type	Diam. mm	Width mm	Length mm	Height mm	PK	Cat. No.
Round	40			85	1	**9.163 273**
Oval		25	40	85	1	**9.163 274**
Rectangular		20	40	85	1	**9.163 275**



5 Staining jar, PP

Coplin pattern. With screw cap. For batch staining of 10 microscope slides, 76mm x 26mm. *VITLAB*

Height mm	Diam. mm	PK	Cat. No.
94	50	1	**9.161 386**



6 Drying pads Grade 556Z

For retaining specimen visibility (50 sheets). *GE Healthcare*

Width mm	Length mm	PK	Cat. No.
37	100	1	**9.069 003**





1 Lens cleaning tissues, 105 series

For the safe removal of surface moisture and grease from lenses and other optical surfaces. Chemically pure and free from silicones and other additives. *GE Healthcare*

Width mm	Length mm	PK	Cat. No.
100	150	625	**9.056 887**
200	300	100	**9.056 888**



2 Tissue Float Bath 1052

Special bath to stretch and dry cut tissue samples embedded in wax, in histological, chemical, clinical and bacteriological laboratories. Temperature range from approx. 5°C above ambient to approx. +80°C. Precise temperature regulation, consistently ±0.5°C, ensures evenly stretched cuttings which are clearly visible in the black anodized bath. The cuttings are carefully dried on the warmed rim of the bath which is also black anodized. Comfortable and safe working due to low bath height of 100mm.
Bath interior made of black anodised aluminium. Housing in powder-coated aluminium. A control thermometer is fixed to rim of the bath within a stainless steel holder. Tested according to the German Equipment Safety Law, with CE mark. *GFL*

Specification

Temperature range:	up to +80°C
Interior dimensions (Dia. x H):	200 x 60mm
Exterior dimensions (Dia. x H):	280 x 100mm
Supply requirement:	230V 50/60Hz, 0.3 kW (alternative voltages are available - details on request)
Weight:	2kg

Type	PK	Cat. No.
Tissue Float Bath 1052	1	**9.905 952**
Black anodised aluminium dust cover, 1950	1	**9.905 951**



3 Tissue-embedding wax, PARAPLAST®

Granules for embedding tissue. PARAPLAST® PLUS additionally contains dimethyl sulphoxide which improves speed and penetration into tissue samples.
Melting point: 55 - 57°C

Type	Capacity kg	PK	Cat. No.
PARAPLAST®	1	1	**9.170 015**
PARAPLAST® PLUS	1	1	**9.170 020**

E & OE.

1 Histofluid mounting medium

NEW!

Marienfeld



Histofluid is a water-clear adhesive of acrylic resins dissolved in xylene.
It hardens fast and due to its optical properties suits perfectly well for embedding microscopic preparations. Shortly after having covered a preparation it can already be examined and filed.
Histofluid may also be used to firmly lock and seal bottle caps.
Further advantages are:

- long storing or temperature changes do not cause fissures or deformations in Histofluid layers
- does not turn yellowish when being exposed to UV-radiation
- does not fluoresce
- does not form bubbles
- even sensitive colorations are preserved due to its acid number = 0
- refractive index of 1.5 (nD 20°C) is adjusted to the microscope slide and cover glass
- water-repellent and dissolves in e.g. xylene, acetone, chloroform, dioxan and toluol
- can be stored in sealed bottles for an unlimited period
- filled into special bottles designed for hazardous materials and bearing the UN code

Due to its solvent contents Histofluid is inflammable and, therefore, considered as hazardous. So it has to be especially packed and shipped according to the international transport regulations. Before ordering please carefully check your country's import regulations and ensure a smooth transport according to the IMO (International Maritime Organization). Any cost that might arise additionally for documents, reloading, returns etc. will be at your expense.

Description	Capacity ml	PK	Cat. No.
Histofluid mounting medium	500	1	**9.160 899**

2 Canada balsam bottle



Goldschmidt pattern. Clear glass. For microscopy examinations.
Ground joint maximises useful life of contents.

Capacity g	PK	Cat. No.
30	1	**6.070 616**
60	1	**6.053 546**

3 Microscope slide drying bench, MH 6616

Electrothermal

Accepts up to 50 slides 26mm x 76mm. With built-in energy regulator for temperatures up to 100°C. Speeds up slide preparation. Slides can be placed in any position:
- On storage bars
- Against storage bars
- Flat

Heating area: 702cm²
Dimensions (WxDxH): 180mm x 390mm x 95mm
Supply requirement: 220V, 150W

Type	PK	Cat. No.
Microscope slide drying bench, MH 6616	1	**9.770 106**
Spare heating element	1	**9.770 108**



1 2 Precision refractometers, basic model

Simple and precise optical instruments to analyse liquids and their solid contents. Models are equipped with an automatic temperature compensation device (ATC). Supplied with a plastic box and comfortable leather-type case.

Type	For	Measuring range	Accuracy	PK	Cat. No.
RGA/ATC	Alcohol	0 - 80% Vol	1% Vol	1	**9.801 256**
RBB/ATC	Wine	0 - 25% Vol 0 - 22° Be' 0 - 40% Brix	0,2% Vol 0,2° Be' 0,2% Brix	1	**9.801 255**
RBO/ATC	Wine	0 - 140° Oe 0 - 25° Babo 0 - 32% Brix	1° Oe 0,2° Babo 0,2% Brix	1	**9.801 254**
RMB/ATC	Wine	0 - 25% Vol 0 - 20° Be'	0,2% Vol 0,2° Be'	1	**9.801 253**
RMA/ATC	Wine	0 - 25% Vol 0 - 40% Brix	0,2% Vol 0,2% Brix	1	**9.801 252**
RPC/ATC	Freezing point batteries	-50° - 0°C 1,10 - 1,40	5°C 0,1	1	**9.801 251**
RCS/ATC	Salinity	0 - 28%	0,2%	1	**9.801 250**
RSM/ATC	Salinity	0 - 100‰	1‰	1	**9.801 249**
RCZ/ATC		0 - 32% Brix	0,2%	1	**9.801 200**
RTS		0 - 90% Brix	0,2%	1	**9.801 201**
RPI/ATC	Salinity	0 - 12 g/dl 1,000 - 1,050 sg 1,330 - 1,3600 nD	0,2 g/dl 0,002 sg 0,00025 nD	1	**9.801 202**
RBC/ATC		0 - 10% Brix	0,1%	1	**9.801 241**
RLC/ATC		0 - 18% Brix	0,1%	1	**9.801 242**
RFC/ATC		28 - 62% Brix	0,2%	1	**9.801 244**
RPD/ATC		45 - 82% Brix	0,5%	1	**9.801 245**
RPU		0 - 80% Brix	1%	1	**9.801 246**
RTS/ATC	Honey and jam	58 - 90% Brix 38 - 43° Be' 17 - 27 Wasser	0,5% Brix 0,5° Be' 1% water	1	**9.801 247**

1



2



Manual hand-held refractometers

Precision instruments for quick daily use.
Various scales and functions ensure there is a suitable refractometer for every application area.

A. Krüss Optronic

Type	Measuring range	Accuracy	PK	Cat. No.
HRKFZ1	Anti freeze: 50-0 °C Battery acid: 1.10-1.30 g/cm³	Ethylene-Propylene: 5%, Battery acid: 0.01	1	**7.603 129**
HRN32	0-32% Brix	0.2% Brix	1	**9.801 121** 3
HR181	0-18% Brix	0.1% Brix	1	**9.801 123** 4
HRN82	45-82% Brix	0.2 %Brix	1	**9.801 124**
HR27-100	1000-1070 d2020, 0-100‰ Salinity	0.001 d2020, 1‰ Salinity	1	**9.801 127**
HRH30	12-30% water content in honey	0.1% water	1	**9.801 130**
HRT32	0-32% Brix	0.2% Brix	1	**9.801 142**
HRN20	0-20% Brix	0.2% Brix	1	**9.801 149**
HR900	0-90% Brix	0.2% Brix	1	**9.801 150** 5
HR901	1333-1517 nD	0.0005 nD	1	**9.801 151**

3



9.801 121

4



9.801 123

5



9.801 150

Refractometers, hand-held, precision

Atago

For simple, manual measurement of concentrations and refractive indices of liquids. Hand-held, precision refractometers with focussing eyepiece, soft rubber eyecups (to reduce straylight ingress, also spectacle lenses do not slip off and are not scratched), case and conversion tables.
Hand-held refractometers cannot be fitted with a thermostatic controller and so measurements have to be temperature compensated.
ATC: Automatic temperature compensation. Temperature compensation scale: Compensation values can be read from the thermometer in the hinged prism cover and have to be checked against the readings taken. Thermometer on the prism cover displays measuring temperature and/or direct compensation values. Compensation values must be checked against readings taken. Occasional resetting to the actual measuring temperature can be achieved by turning an adjustment screw.

Type	For	Measuring range	Accuracy	PK	Cat. No.
Master-T20		0,0 - 20,0% Brix	0,1 % Brix	1	**9.801 301** 1
Master-T		0,0 - 33,0% Brix	0,2 % Brix	1	**9.801 306**
Master-4T		45,0 - 82,0% Brix	0,2 % Brix	1	**9.801 351**
HSR-500	Sugar	0,0 - 90,0% Brix	0,2 % Brix	1	**9.801 312** 2
R-5000	Refractive index	1,333 - 1,520 nD	0,001 nD	1	**9.801 313**
HHR-2N	Honey	12,0 - 30,0% Brix	0,1 % Brix	1	**9.801 333** 3
Master-BR	Freezing point coolant			1	**9.801 348**
	Ethylene glycol	0 - 70%, 0 ... -50°C			
	Propylene glycol	0 - 70%, 0 ... -50°C			
Master-S/Mill-Alpha	Salinity	0,0 - 100,0% 1,000 - 1,070 g/ml	0,001 g/ml	1	**9.801 359**

1



9.801 301

2



9.801 312

3



9.801 333

4 Digital Refractometer HI 96801

Hanna

Portable digital Refractometer measures the refractive index to determine the % Brix of sugar in aqueous solutions.
Wide range : 0 to 85% Brix , can be used for various applications.
Automatic temperature compensation, % Brix and temperature are displayed simultaneously.
Quick and precise measurements. Easy Calibration with distilled or deionized water.
Supplied with 9V battery and instruction manual.

Specifications

Measuring range:	0 to 85% Brix
Resolution:	0.1% Brix
Measuring accuracy:	±0.2% Brix
Temperature compensation range:	10 to 40°C
Dimensions:	192 x 102 x 67mm
Weight:	300g
Power supply:	9V (9.012 923 Battery)

Type	Measuring range	PK	Cat. No.
HI 96801	0 to 85% Brix	1	**9.801 185**

4



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1 Digital hand-held refractometer DR101-60

NEW!

A. Krüss Optronic

As an entry-level model in digital refractometry, the DR101-60 covers many areas of application where the wide measurement range of the DR201-95 is not required.
It offers excellent value for money, in terms of both procurement and operation.
Calibration is also with distilled water. The waterproof case allows the DR101-60 to be rinsed under running water.
This digital handheld refractometer also has an automatic temperature compensation feature, of course.

Specifications	**DR101-60**
Temperature compensation:	10°C - 40°C
Dimensions:	110mm x 62mm x 32mm
Weight:	160g
Power supply:	1.5V DC battery

Type	Measuring range	Accuracy	Graduations	PK	Cat. No.
DR101-60	1.330-1.4419 nD 0.0-60.0% Brix	0.0005 nD 0.1 %Brix	0.0001nD 0.5 %Brix	1	**9.801 117**

2



6.230 350

Digital hand-held refractometers DR201-95/ DR-201-95OE

A. Krüss Optronic

DR201-95 and DR201-95OE are compact digital hand-held refractometers, which eliminate the problem of reading errors by users. Handling is fast and very easy, distilled water is used for calibration.
Thanks to several scales and a broad measuring range, the device is almost always suitable.
For wine-growers, a device equipped with a special Oechsle-scale is available.
DR301-95 offers 2 additional user-defined scales and can be connected to a computer.
Specialties: optional temperature compensation feature and upper and lower tolerance alarm.

Specifications	**DR201-95 | DR201-95OE | DR301-95**
Temperature measurement:	0-40°C | 0-40°C | 5-40°C
Temperature accuracy:	0.5°C
Temperature compensation:	10-40°C | 10-40°C | 5-40°C
Dimensions:	130x80x40 | 130x80x40 | 180x100x40mm
Weight:	200 | 200 | 500g
Power supply:	1.5V battery | 1.5V battery | 9V battery, AC adapter

3



6.236 921

Type	Measuring range	Accuracy	Graduations	PK	Cat. No.
DR201-95	1.3330-1.5318 nD 0-95 % Brix	0.0003 nD 0.2 % Brix	0.0001 nD 0.1 % Brix	1	**6.230 350** 2
DR201-95 OE	0-250° Oechsle 0-95 % Brix	1° Oechsle 0.2 % Brix	1° Oechsle 0.1 % Brix	1	**9.801 116**
DR301-95	1.3330-1.5318nD 0-95% Brix	0.00015 nD 0.1 % Brix	0.0001 nD 0.1 % Brix	1	**6.236 921** 3

4



4 Digital Hand-held Pocket Refractometer PAL-1, PAL-2, PAL-3, PAL-RI, PAL-Alpha, PAL-BX/RI

Atago

For measurement of various high concentration samples such as jam, marmalade, jelly, honey and concentrated juice. Ingress Protection class IP 65 means that they can be cleaned under running water. Easily calibrated since "zero-setting" (calibration) is achieved using water.

Specifications

Resolution:	Brix 0.1%
Measurement accuracy:	Brix ±0.2%
Measurement temperature	10 to 60°C (Automatic Temperature Compensation)
Ambient operating temperature:	10 to 40°C
Ingress protection class:	IP65 dust- and waterproof
Power supply:	2 x AAA Batteries (incl.)
Dimensions:	55 x 31 x 109mm
Weight:	100g

Type	Measuring range	PK	Cat. No.
PAL-1	0.0 - 53.0 Brix	1	**9.801 375**
PAL-2	45.0 - 93.0 Brix	1	**9.801 381**
PAL-3	0.0 - 93.0 Brix	1	**9.801 382**
PAL-RI	1.3306 - 1.5284 nD	1	**9.801 383**
PAL-Alpha	0.0 - 85.0 Brix	1	**9.801 362**
PAL-BX/RI	0.0 - 93.0 Brix, 1.3306 - 1.5284 nD	1	**6.231 591**

E & OE.

1 Digital Hand-held Pocket Refractometer DR series

NEW!

ebro

With factory calibration certificate according to EN ISO IEC 12025:2005.
The devices comes with an automatic temperature compensation (ATC; model dependent) and measures the sample temperature between +5°C and +60°C.
The waterproof (protection class IP 65) 1- or 2- channel devices are used in the fields of Food and Beverage (alcohol sugar, salt and starch content), the environmental area (sea water) and in the industrial sector (glycol/coolant concentration). Operation is extremely simple and a zero point check is easily done by the user with distilled water.
The handy devices are provided with a one and a half digit digital display and the included 2 x AAA (LR03) batteries typically last for 10.000 measurement values. The prism dish contains up to 0.3ml.

1



Specifications

Operating temperature:	+5°C to +40°C
Automatic temperature compensation:	ICUMSA (depending on model)
Protection class:	IP 65 (waterproof)
Power supply:	3V 2 x AAA (LR03)
Dimensions (WxDxH):	54mm x 115mm x 30mm
Weight:	85g (without batteries)

Type	For	Measuring range	PK	Cat. No.
DR-620	Brix Salinity	0 - 54 Brix 0 - 28 sg	1	**9.801 420**
DR-22	Salinity	0 - 28 sg	1	**9.801 422**

2 Digital refractometers

Atago

Type PR-32α
Can be used to measure fruit juices, soft drinks, diluted soluble oils, aqueous cleaning solutions, etc.
Type PR-101α
Applications include measuring fruit juices, lemonade, coffee, iluted soluble oils and anti-freeze solutions.
Type PR-201α
It can be used for accurately measuring jams, concetrated fruit juices, coolants and similar products.
Type PR-301α
Especially suited to measuring jellies, liquid cane sugar,etc.
Type PET-109
This model is used for simply determining the concentration of ethyl alcohol, which is used in foods and for cleaning, cooling and other purposes.
Type PR-RI
A new Refractive Index model has been added to the popular long-selling "Palette Series". It is suitable for measuring the refractive indices of liquid samples in pharmaceutical and chemical products. Ambient temperature: 10 to 40°C.

2



Specifications (all types):

Measurement time:	3 seconds (Type PET-109, Measurement time: 2 seconds)
Sample volume:	0.1ml
Power supply:	9V battery
Dimensions:	170 x 90 x 40mm
Weight:	300g

Type	Measuring range	Graduations	Accuracy	Working Temp. range °C	PK	Cat. No.
PR-32α	0,0 - 32,0 % Brix	0,1 % Brix	0,1 % Brix	5,0 - 40,0	1	**9.801 376**
PR 101α	0,0 - 45,0 % Brix	0,1 % Brix	0,2 % Brix	5,0 - 40,0	1	**9.801 377**
PR-201α	0,0 - 60,0 % Brix	0,1 % Brix	0,1 % Brix	10,0 - 40,0	1	**9.801 378**
PR-301α	45,0 - 90,0 % Brix	0,1 % Brix	0,1 % Brix	10,0 - 40,0	1	**9.801 379**
PET-109	0,0 - 45,0 % (w / w)	0,1 % (w / w)	0,5 % (w / w)	10,0 - 35,0	1	**9.801 344**
PR-RI	1,3306 - 1,4436 nD	-	± 0,0002 nD / 20°C	5,0 - 45,0	1	**9.801 369**

1



1 Digital Refractometer for Sodium Chloride Measurement HI 96821

NEW!

Hanna

Portable digital Refractometer to determine Sodium Chloride concentration in aqueous solutions used in Food preparation. NaCL concentration of the solution can be displayed in 4 different ranges g/100 g, g/100 ml, specific gravity and °Baumé.
Automatic temperature compensation, NaCL concentration and Temperature are displayed simultaneously.
Fast and reliable measurements, a small sample size of some drops is is sufficient.
Easy calibration with distilled or deionized water. Instrument is supplied with battery.

Specifications

Temperature Compensation:	+10 to +40°C
Dimensions (WxDxH):	192 x 102 x 67mm
Weight:	300g
Power supply:	9 Volt battery

Type	Measuring range	Accuracy	Graduations	PK	Cat. No.
HI 96821	0.0 - 28.0g/100g	±0.2g/100g	0.1g/100g	1	**7.627 062**
	0.0 - 34.0g/100ml	±0.2g/100ml	0.1g/100ml		
	1.000 - 1.216sg	±0.002sg	0.001sg		
	0.0 - 26.0°Baume	±0.2 °Baume	0.1°Baume		

2



2 Digital Refractometer RX-5000/RX-5000Alpha/RX-5000Alpha Plus

Atago

The RX-5000, RX-5000 Alpha and RX-5000Alpha Plus are reliable and cost effective instruments with a measurement accuracy of ±0.03% Brix and ±0.00004nD. An excellent alternative to traditional Abbe refractometers and essential to any QC/QA lab. Equipped with 60 programmable user scales and 4 level password protection feature.
RX-5000 is designed to connect to an external circulating waterbath. RX-5000 Alpha and RX-5000Alpha Plus are equipped with a Peltier thermo module. RX-5000Alpha Plus has the highest accuracy of the RX series. All refractometers can be connected with an optional printer.

Specifications

Measurement range:	0.00 to 95.00% Brix, 1.3270 to 1.5800nD
Resolution:	0.01 % Brix, 0.00001nD
Accuracy	
RX-5000/RX-5000Alpha:	0.03% Brix, 0.00004nD
RX-5000Alpha Plus:	0.01% Brix, 0.00002nD
Working temperature:	5 to 60°C
Input voltage:	AC 100-240V, 50/60Hz
Output voltage:	DC, 6A for refractometer, DC 6.5V, 1.5A for printer
Dimensions:	370 x 260 x 140mm
Weight:	6.4kg

Type	PK	Cat. No.
RX-5000	1	**9.801 373**
RX-5000Alpha	1	**9.801 374**
RX-5000Alpha Plus	1	**9.801 386**

3



3 Digital bench refractometer, Smart-1

Atago

The Smart-1 is an automatic refractometer with an extra-wide measurement range.
This model measures low-concentration samples, e.g. soup, medium-concentration samples e.g. sauce or ketchup, and high-concentration (Brix) samples e.g. jam, marmalade or honey within a food factory.
In addition the Smart-1 can be used to control the concentration of a variety of industrial solutions, including water-soluble cutting oil, cleaning solutions and glycol anti-freeze.

Specifications

Measurement range:	0.00 to 95.00% Brix
Readabilty:	0.1% Brix
Measurement accuracy:	±0.05% Brix
Temperature compensation range:	+5.00 to +40.00°C
Interface:	RS232C
Ingress protection class:	IP64 (except a.c. adapter)
Supply requirement:	100-240 V 50/60Hz a.c.
Dimensions and weight:	12 x 27 x 9cm, 2.0kg
a.c. adapter:	10.5 x 17.5 x 4cm, 0.7kg

Type	PK	Cat. No.
SMART-1	1	**9.801 390**

E & OE.

1 Digital desk refractometers



A. Krüss Optronic

The DR6000 refractometers work with hardly any service and are very quiet, good for long-term work in the lab. Very easy to operate due to an intuitive touch screen.
Optional connections to printer, PC or network provide highest flexibility. High precision through integrated peltier thermostat (T-model). Flow measurement cells enable continuous measuring (F-model).
The devices are used wherever a substance in watery solutions has to be measured.
Areas of usage: beverage, chemistry, pharma, food, paper, sewerage, textile, petrochemistry, cosmetics.

Specifications

Interface:	RS-232, USB, Ethernet
Temperature measurement:	5 to 90°C
Temperature resolution:	0.1°C
Temperature measurement accuracy:	0.05°C (0.1°C T-models)
Measurement mode:	Single, interval
Scales:	7 default, custom
Protection class:	IP 65
Power supply:	90-260V, 56/60Hz, 60W

Type	Measuring range	Accuracy	Graduations	PK	Cat. No.
DR6000	1.3200-1.5800 nD 0-95% Brix	0.0001 nD 0.1 % Brix	0.0001 nD 0.1 % Brix	1	**6.239 384**
DR6000-T	1.3200-1.5800 nD 0-95 % Brix	0.0001 nD 0.1 % Brix	0.0001 nD 0.1 % Brix	1	**6.237 965**
DR6000-TF	1.3200-1.5800 nD 0-95 % Brix	0.0001 nD 0.1 % Brix	0.0001 nD 0.1 % Brix	1	**9.801 101**
DR6100-T	1.3200-1.700 nD 0-95% Brix	0.0001 nD 0.1 % Brix	0.0001 nD 0.1 % Brix	1	**6.241 690**
DR6100-TF	1.3200-1.700 nD 0-95% Brix	0.0001 nD 0.1 % Brix	0.0001 nD 0.1 % Brix	1	**6.235 892**
DR6200-T	1.32000-1.58000 nD 0-95 % Brix	0.00002 nD 0.02 % Brix	0.00002 nD 0.01 % Brix	1	**9.801 102**
DR6200-TF	1.32000-1.58000 nD 0-95 % Brix	0.00002 nD 0.02 % Brix	0.00002 nD 0.01 % Brix	1	**9.801 103**
DR6300-T	1.32000-1.70000 nD 0-95 % Brix	0.00002 nD 0.02 % Brix	0.00002 nD 0.01 % Brix	1	**9.801 104**
DR6300-TF	1.32000-1.70000 nD 0-95 % Brix	0.00002 nD 0.02 % Brix	0.00002 nD 0.01 % Brix	1	**9.801 105**

2 Adjustable Electronic Peltier Thermostat PT 31



A. Krüss Optronic

This electronic water-bath thermostat with Peltier element is a versatile, high-performance instrument. In one application, it can be used to set the correct refractometer temperature. It is extremely robust, compact and easy to operate. Thanks to its small footprint it does not take up valuable space in the laboratory.

Specifications

Temperature range:	8 to 40°C, adjustable
Accuracy of temperature:	±0.2°C
Resolution:	0.1°C
Pump performance:	20 l/h
Max. pump pressure:	2000 Pa
Cooling power:	15 W
Heating power:	30 W
Power supply:	115-230 V a.c.
Dimensions (WxDxH):	80 x 140 x 210mm
Weight:	1.5kg

Type	PK	Cat. No.
PT31	1	**9.841 515**

1



1 Abbe Refractometer Model RMT

Exacta Optech

Laboratory refractometer for precisely measuring liquids, solids, semi-liquids and powders. Optical refraction index and Brix scale reading system, with an excellent boundary line brightness and contrast. Prism with large windows, equipped with movable shrouds to keep out light. Focussable eyepiece.

Standard accessories: Calibrating glass prism, thermometer, dust cover, mono-bromonaphtalene standard (bottle), calibrating screw driver, wooden box.

Specifications

Range:	1.300 to 1.700nD 0 to 95% Brix
Precision:	0.001 nD 0.2% Brix
Manual temperature compensation:	0 to 70°C

Type	PK	Cat. No.
RMT	1	**9.801 257**

2



2 Abbe refractometer AR4

A. Krüss Optronic

Classic refractometer for solids and liquids. Coloration and clouding scarcely influence the measuring results. Handling is simple and the device can easily be calibrated through calibration plates (included). LED illumination (guarantees extremely long life), digital thermometer, optional flow measurement cell and thermostat connections.
Specialty: adjustable scales, temperature-controlled prisms.

Specifications

Thermometer:	digital -40 to 120°C
Illumination	Scale lighting, LED light (590nm) for measuring prism
Dimensions	140x100x270mm
Weight	4.4kg
Power supply	110V/220V, switchable

Type	Accuracy	Measuring range	Graduations	PK	Cat. No.
AR4	0.0002 nD 0.1 % Brix	1.3000-1.7000nD 0-95 % Brix	0.0005 nD 0.1 % Brix	1	**9.801 110**

3



3 Abbe Refractometer Model RMI

Exacta Optech

High-precision refractometer suitable for measuring high temperature liquids, solids, semiliquids and powders. Optical refraction index and Brix scale reading system, with an excellent boundary line brightness and contrast due to the low voltage lighting system. Large sized prism (6cm²) with movable shrouds. Focussable eyepiece.

Standard accessories: Calibrating glass prism, thermometer, 6V-5W lamps (2 inc.), dust cover, mono-bromonaphtalene standard (bottle), stabilised mains adapter, calibrating screw driver.

Specifications

Range:	1.300 to 1.700nD 0 to 95% Brix
Precision:	0.001nD 0.2% Brix
Manual temperature compensation:	0 to 100°C

Type	PK	Cat. No.
RMI	1	**9.801 258**

E & OE.

1 Digital Abbe refractometer, DR-A1

1



Atago

Very simple operation, where only the refraction boundary line has to be moved to the measurement cross hairs. The refractometer displays measurements directly (as a refractive index or in Brix (%)) in digits together with temperature.
Measurements can be taken easily by anyone using this refractometer without taking an analogue scale reading in advance. Dispersive value can not be measured using this refractometer.

Specifications

Measurement range:	1.3000 - 1.7100nD 0.0 - 95.0Brix
Resolution:	0.0001nD 0.1%Brix
Accuracy:	0.0002nD 0.1%Brix
Temperature range:	0 to 50.0°C
Power supply:	a.c. adapter (100 to 240V 50/60Hz)
Dimensions:	130 x 290 x 310mm
Weight:	6.0kg

Type	PK	Cat. No.
DR-A1	1	**9.801 325**

2 Abbe refractometers, NAR-1T series/NAR-2T

2



Atago

Type NAR-1T-Liquid
The Abbe Rerfactometer for liquid sample measurement only. It has the Refractive Index Scale and the Brix scale, and it comes with D-line (589nm) light source. Calibration can be achieved using distilled water.

Type NAR-1T Solid
Abbe Refractometer for solid sample measurement (it can also be used to measure liquid samples). It has the Refractive Index Scale and the BRIX scale, and it comes with D-line (589nm) light source.

Type NAR-2T
Designed for use with substances requiring measurement at high temperature.

Type	Measuring range	Graduations	Accuracy	Working Temp. range °C	PK	Cat. No.
NAR-1T Liquid	1,3000 - 1,7000 nD 0,0 - 95,0 % Brix	0,001 nD 0,5 % Brix	±0,0002 nD ±0,1 % Brix	0,0 - 50	1	**6.231 748**
NAR-1T Solid	1,3000 - 1,7000 nD 0,0 - 95,0 % Brix	0,001 nD 0,5 % Brix	±0,0002 nD ±0,1 % Brix	0,0 - 50	1	**6.228 976**
NAR-2T	1,3000 - 1,7000 nD 0,0 - 95,0 % Brix	0,001 nD 0,5 % Brix	±0,0002 nD ±0,1 % Brix	0,0 - 120	1	**9.801 317**

3 Polarimeter Polax-2L

3



Atago

The Polax-2L (manually-operating meter with digital indicator) is widely used in the sugar, pharmaceutical, chemical, perfume and educational industries. It can accurately measure the angle of rotation (or the value in the international standard sugar scale) with easy operation.

Specifications

Angle of rotation:	-179.95 to +180°
International standard sugar scale:	-130 to +130°Z
Minimum unit displayed	
Angle of rotation:	0.05°
International standard sugar scale:	0.1°Z
Measurement accuracy	
Angle of rotation:	±0.10°
Measurement temperature range:	5 to 40°C
Observation tubes:	1 x 200mm and 1 x 100mm
Power supply:	100-240V, 50/60Hz a.c.
Power consumption:	40 VA
Dimensions:	43 x 22 x 30cm
Weight:	11.5kg

Type	PK	Cat. No.
Polax-2L	1	**9.801 398**

1



1 Automatic Economical Polarimeter P3000-Serie

NEW!

A. Krüss Optronic

It measures samples in just 1 second, regardless of the rotation angle, saving much time over measurement with conventional polarimeters. The P3000 is operated fully automatically with an intuitive touchscreen. Measured values can be displayed as optical rolation angles or in the ICUMSA international sugar scale, and can be printed out with the printer interface. The P3000 offers unbeatable value for money for all applications where measurement accuracy to 2 decimal points is sufficient.

Specifications

Measuring method:	Optical rotation, int. sugar scale
Measuring range:	±90° ±259°Z
Measuring units:	Angle [°, °Z]
Resolution:	0.01° 0.01°Z
Accuracy:	±0.01° ±0.01°Z
Reproducibility:	0.01°
Measuring time:	±90° 1 s
Light source:	1 LED with filter
Wavelength:	589nm
Wavelength selection:	1 fixed wavelength
Max. length of tube:	220mm
Sensitivity:	min 0.1 % (OD3)
Calibration:	Automatic (menu-driven)
Display:	LCD 3.5" colour display
Operation:	Touchscreen
Interfaces:	RS-232
Operating voltage:	100-250V, 50/60Hz
Temperature measurement:	0 to 99.9°C
Temperature resolution:	0.1°C
Accuracy of temperature control:	±0.2°C
Temperature reading point:	Tube

Type	PK	Cat. No.
P3000	1	**9.801 190**

2



2 Polarimeter AP-300

Atago

Model AP-300 is generally used in pharmaceutical, perfume, cosmetic, industrial, chemical, and food factories and is the optimal unit for measuring angle of rotation. In addition, the built-in International Sugar Scale is widely used in sugar refineries. The AP-300 has a manual calibration facility which allows the user to compensate for any differences to standard liquids and measurement values by other standard instruments.

Specifications:

Measurement range	
Angle of Rotation:	-89.99 to 89.99°
International sugar scale:	-130.00 to +130.00
Minimum Indication	
Angle of Rotation:	0.1°
International sugar scale:	0.01°Z
Measurement accuracy	
Angle of Rotation:	±0.01°
International sugar scale:	±0.03°Z
Observation tubes:	1 x 200mm and 1x 100mm
Dimensions:	48.5 x 28.5 x 17.5cm
Weight:	11.5kg

Type	PK	Cat. No.
AP-300	1	**6.227 906**

3



3 Hand spectroscopes

A. Krüss Optronic

Handy and precise. Ideal for demonstrations in schools and for:
- Viewing/observation of emission and absorption spectra
- Control of the wavelength spectra of gas emission lamps

Type	Features	PK	Cat. No.
1501	with adjustable split	1	**9.841 501**
1504	with adjustable split and wavelength scale	1	**9.841 504**

E & OE.

1 Spectrophotometer Models 6300 VIS/6305 UV-VIS

Jenway

Models 6300 and 6305 are general purpose visible and UV/Visible range spectrophotometers which are suited to a wide range of applications in education and quality control.

- Simple operation
- Versatile sampling system
- G.L.P. compliant
- Full interfacing capability
- Simple keypad and operating protocols designed to enable reliable operation by unskilled operators
- LCD gives simultaneously readout of wavelength and photometric result
- Error messages, prompts, mode indication and a choice of concentration units are presented in an easily understood format
- Cuvette holder allow 10mm to 100mm cells

Supplied with: Mains lead, pack 100 disposable cuvettes, 10 x 10mm cell holder, PC Application Software on CD-ROM and operating instructions.

Various accessories e.g. sipper pump, cells, cell holders, cuvettes and lamps available on request.

Specifications

Wavelength	
Range:	198 to 1000nm (6305) 320 to 1000nm (6300)
Resolution:	1nm
Accuracy:	±2nm
Bandwidth:	8nm, 6nm over UV range
Transmittance	
Range:	0 to 199.9%
Resolution:	0.1%
Stray light:	<0.5% at 340 & 220nm
Accuracy:	±1%
Absorbance	
Range:	-0.300 to 1.999A
Resolution:	0.001A
Concentration	
Range:	-300 to 1999
Resolution:	0.1/1
Units:	ppm, mg/l, g/l, M, blank %
Outputs:	analogue (0 to 1999mV d.c.) RS232 serial port
Light Source:	Xenon flash lamp module (6305) Tungsten halogen (6300)
Dimensions (WxDxH):	365 x 272 x 160mm
Weight:	6kg
Supply requirements:	230V/50Hz

Type	PK	Cat. No.
6300 VIS	1	**9.775 412**
6305 UV-VIS	1	**9.775 411**

1



2 Accessories for Spectrophotometer Model 6300/6305

Jenway

Description	PK	Cat. No.
Adjustable path length cuvette holder for 10mm to 100mm cuvettes	1	**9.775 430**

2



Spectrophotometer Models 7300 VIS/7305 UV-VIS

Jenway

Models 7300 and 7305 use icon driven software and have an improved navigation system for easy and intuitive usability.
These instruments have measurement modes for absorbance, % transmittance and concentration.
The 7300 and 7305 are easy to use and are ideal for use in education and general QC laboratories.
- Small footprint
- Autologging capabilities
- Press to read xenon lamp (7305)
- PC software included
- 3 year warranty

Supplied with: Mains lead, pack 100 disposable cuvettes, 10mm x 10mm cell holder, PC Application Software on CD-ROM and operating instructions.

Accessories available include an automatic 8 cell changer, peltier, sipper pump, combined sipper peltier pump, adjustable path length cuvette holders and micro-cuvette holders. Cuvettes and lamps available on request.

Specifications

Wavelength	
Range:	320 to 1000nm (7300) 198 to 1000nm (7305)
Resolution:	1nm
Accuracy:	±2nm
Bandwidth:	5nm
Transmittance	
Range:	0 to 199.9%
Resolution:	0.1%
Stray light:	<0.5%T
Accuracy:	±1%
Absorbance	
Range:	-0.300 to 2.500A
Resolution:	0.001A
Concentration:	
Range:	-300 to 9999
Resolution:	Selectable 1/0.1/0.01/0.001
Units:	no units, %, ppm, EBC, SRM, mEq/l, mEq, M, mM, µM, nM, U, U/l, U/ml, g/l, mg/l, µg/l, ng/l, g/dl, mg/dl, µg/dl, mg/ml, µg/ml, ng/ml, µg/µl, ng/µl, mol/l, mmol/l
Outputs:	Analogue (0 to 1999mV d.c.) RS232 serial port optional integrated printer
Light Source:	Tungsten halogen (7300) Xenon lamp (7305)
Dimensions (WxDxH):	275 x 400 x 220mm
Weight:	6kg
Supply requirements:	230V/50Hz

Type	PK	Cat. No.
7300 VIS	1	**9.775 440** 1
7305 UV-VIS	1	**9.775 441**

1



9.775 440

E & OE.

1 Spectrophotometers, 6700 series

Jenway

A range of three split-beam instruments:
Type 6700: Visible range scanning (320nm to 1100nm with 4nm spectral band width)
Type 6705: UV/Visible range scanning (190nm to 1100nm with 4nm spectral band width)
Type 6715: UV/Visible range scanning (190nm to 1100nm with 1.5nm spectral band width)

Modes of operation: Photometrics, Kinetics, Quantitation, Multiwavelength analysis and Spectral scanning.

Featuring:
- Fast scanning rate of 1500nm/minute with data collection at 0.1nm intervals
- Up to 20 point calibration for Quantitative analysis
- Multiwavelength mode for DNA/RNA analysis
- Secure Multi-User Operation, full password protection
- Colour (TFT) LCD with Touch-Screen Interface and sealed QWheel™Control
- Full post scan analysis (Peak/Valley pick, Peak Ratios, Area, Zoom, Wavelength table, Derivatives, Smoothing)
- Removable SD/Multi-Media Memory Card, up to 2GB available
- Plug-In Accessory Modules including 6 cell changer, Peltier devices for temperature controlled measurements and sipper systems for high throughput analysis. A full range of cuvette and test tube holders are available.

Pharos PC Software, giving full instrument control and data transfer.

Type	Description	PK	Cat. No.
6700	Spectrophotometer with single cuvette holder	1	**9.775 416**
6705	Spectrophotometer with single cuvette holder	1	**9.775 420**
6715	Spectrophotometer with single cuvette holder	1	**9.775 424**
for all types	Sample chamber with automatic 8-cell	1	**6.253 506**
for all types	Sample chamber with water heated automatic six- cell changer module fitted	1	**6.236 532**
for all types	Sample chamber with sipper Peltier module fitted	1	**6.236 533**
for all types	Sample chamber with Peltier module fitted	1	**7.900 098**
for all types	10 to 100mm adjustable path length cuvette holder	1	**9.775 430**
for all types	Printer, incl. 1 roll paper	1	**9.775 434**
for all types	Sample chamber with sipper module fitted	1	**9.775 435**
for all types	Test tube holder for 10mm square cuvettes, 16mm and 24mm diameter tubes	1	**9.775 436**

1



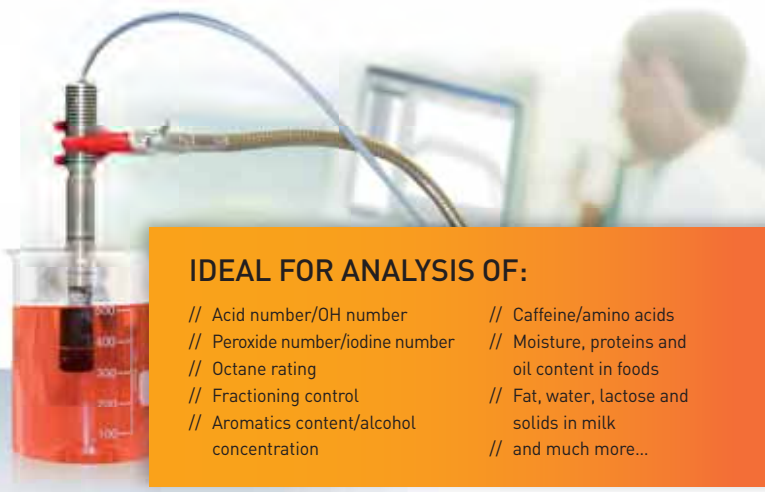
Save time and energy

WITH OPTICAL IMMERSION PROBES FOR UV/VIS/NIR SPECTROSCOPY

Carrying out qualitative and quantitative product analysis as well as determining chemical and physical values, usually requires individual samples to be taken and measured in a laboratory.
Using optical immersion probes for laboratory application allows the measurement to be carried out directly in the sample and also with little sample volume. This not only saves time and energy, it also allows real time monitoring of a reaction.

For an overview of optical laboratory immersion probes, application notes and detailed information, please visit:
www.myLABprobe.com

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IDEAL FOR ANALYSIS OF:

// Acid number/OH number
// Peroxide number/iodine number
// Octane rating
// Fractioning control
// Aromatics content/alcohol concentration
// Caffeine/amino acids
// Moisture, proteins and oil content in foods
// Fat, water, lactose and solids in milk
// and much more...

Spectrophotometer Models 7310/7315

Jenway

Models 7310 and 7315 use icon driven software and have an improved navigation system for easy and intuitive usability. These instrument have measurement modes for absorbance, % transmittance, concentration, scanning, kinetics and quantitation. The 7310 and 7315 are easy to use and are ideal for routine testing in clinical, veterinary, pharmaceutical and QC laboratories.

- Small footprint
- Autologging capabilities
- Press to read xenon lamp (7315)
- Result and method storage to USB memory stick
- PC software included
- 3 year warranty

Supplied with: Mains lead, pack 100 disposable cuvettes, 10 x 10mm cell holder, 2GB USB memory stick, interface cable, PC Application Software on CD-ROM and operating instructions.

Accessories available include an automatic 8 cell changer, peltier, sipper pump, combined sipper peltier pump, adjustable path length cuvette holders and micro-cuvette holders. Cuvettes and lamps are available on request.

Specifications

Wavelength	
Range:	320 to 1000nm (7310) 198 to 1000nm (7315)
Resolution:	1nm
Accuracy:	±2nm
Bandwidth:	5nm
Transmittance	
Range:	0 to 199.9%
Resolution:	0.1%
Stray light:	<0.5%T
Accuracy:	±1%
Absorbance:	-0.3 to 2.500
Concentration:	-300 to 9999
Resolution:	Selectable 1, 0.1, 0.01 or 0.001
Calibration:	Blank with a single standard or factor
Quantitation:	-300 to 9999
Resolution:	Selectable 1, 0.1, 0.01 or 0.001
Calibration:	Blank with up to 6 standards
Curve fit algorithms:	Linear regression, interpolation, quadratic, quadratic through zero or linear regression through zero
Kinetics display:	Graphical rate of change, initial and final absorbance/%T and calculated concentration value against standard and factor
Spectrum:	320 to 1000nm (7310) 198 to 1000nm (7315)
Scan Data Internal:	1, 2 or 5nm selectable
Analysis:	Absorbance and wavelength of peaks and troughs
Outputs:	USB, analogue and serial RS232 optional integrated printer
Supply requirements:	230V/50Hz

Type	PK	Cat. No.
7310	1	**9.775 442** 1
7315	1	**9.775 443** 2

1



9.775 442

2



9.775 443

E & OE.

1 photoLab® 6000 series for VIS and UV-VIS

WTW

Whether for water analysis, food and beverage or education and research applications, the photoLab® 6000 series is universally applicable and offers complete photometric functionality at an outstanding price: performance ratio and precision.
Fast, routine measurement, as well as complex spectral analytics can be performed easily, supported by function keys F1-F4.
The on-screen user guide almost replaces the operating manual.
The photoLab® meters and the WTW Online-system IQ Sensornet are interactively connected with the easy IQ-LabLink procedure for easy data referencing.

Routine Measurement:
- more than 200 methods for routine parameters
- barcode recognition for more than 150 cell and reagent test kits
- direct methods such as SAC at 436 and 254nm, Chlorophyll, Ammoniak e.g.

Spectral Analysis:
- absorbance spectra
- kinetics
- multi wavelength measurement (e.g. for the wine industry)
- User defined methods and profiles
- Comprehensive programming options for multiwavelength- and lab analytics
- PC software pHotoLab® Data spectral and application packages for brewing optional
- enhanced AQA with user administration for environmental analytics and industrial needs
- IQ-LabLink for easy data referencing with WTW-Online System IQ Sensornet
- update and data exchange via USB stick
- interfaces: USB-A, USB-B, RS232
- optional direct printing to PDF file
- extensive testing routines and optical testing equipment (optional)
- 4nm band pass
- wavelength accuracy/reproducability: 1nm/0.5nm
- photometric reproducibility t ±0.002 E @ 1 E (or better)
- photometric accuracy 0.003 for < 0.600E, 0.5% of result for 0.600 to 2.000E
- approx. 4 MB storage for 1000 measurement values and spectral data sets
- weight: 4 kg (allows onsite usage with car battery and optional WTW adapter cable)

Type	Description	PK	Cat. No.
photoLab® 6100 VIS	340-1100nm for VIS range with Tungsten halogen lamp	1	**6.232 685**
photoLab® 6600 UV-VIS	190-1100nm for UV-VIS range with Xenon flash lamp	1	**6.234 159**
photoLab® Brew	Application package brewery analysis for the photoLab® 6000 Series	1	**9.920 080**
photoLab® Data spectral	PC software for data management of photoLab® 6000 Series	1	**9.920 081**

1



Spectrophotometer UviLine

SI Analytics GmbH

UviLine 9100 for measurements at VIS-range from 320nm to 1100nm
UviLine 9400 for measurements at UV-VIS-range from 190nm to 1100nm
Wide performance range
- measurements of absorbance, transmission and concentration up to 8 standards
- multi-wavelength e.g. for measurements of DNA/RNA or the determination of protein according to Warburg-Christian
- spectra scan with online graphic and various evaluation functions
- kinetics (short and long term measurements)

Easy accessible accessories are available on request:
Quick-lock system requires no tools.
- 10mm cell holder (standard)
- 10mm cell holder (water thermostatable)
- 10mm cell holder (peltier thermostatable from 15 - 40°C)
- cell holder from 10mm up to 100mm
- sipper (incl. flow trough cell)
- automatic 5+1 cell changer

Peltier cell holder, sipper and 5+1 cell changer can be fully controlled from the software.
Modern Interfaces
- USB A interface fort the connection of USB-sticks, keyboard or printer. More than 1 device can be conncected at the same time using a USB-hub.
- RS232 and USB-(B)-interfaces for the PC connection.

Specifications:

Technigue:	Single beam
Wavelength accuracy:	±1 nm
Wavelength repeatability:	< ±0.5 nm
Photometric range:	-3.3 to 3.3A
Photometric accuracy:	±0.003A (from 0- 0.3 A); 0.5 % from 0.3 to 2.5A
Photometric linearity:	< 1% at 2 A between 340 to 900nm
Stray Light:	< 0.1% at 340 and 400nm
Display:	Back graphic display with 320 x 240 signs
Data storage:	1000 values; for spectra and cinetics appr. 4 MB
Interfaces:	1 x USB master 1 x USB-slave, 1 x RS232-C
Power supply:	100 - 260V, 50/60Hz
Temperature range:	Operating temp. + 10°C to 35°C, Storage: - 25°C to 65°C
Dimensions (W x H x D):	404 x 197 x 314mm
Weight:	3.7kg without power supply

Type	Description	PK	Cat. No.
UviLine 9100	Single beam spectro photometer, 4nm with a measuring range from 320 - 1100nm	1	**9.775 450** 1
UviLine 9400	Single beam spectro photometer, 4nm with a measuring range from 190 - 1100nm	1	**9.775 451** 2
SZ 2100	5+1 cell changer, controlled from UviLine	1	**6.251 233**
SZ 2110	Cell holder Single, 10 - 100mm	1	**6.240 323**
SZ 2130	Cell holder Single, 10mm, (included in delivery of all UviLines)	1	**9.775 452**
SZ 2140	Cell holder Single 10mm, water thermostatable	1	**7.628 259**
SZ 2150	Sipper controlled from UviLine	1	**6.242 634**
SZ 2160	Cell holder Single 10mm, Peltier thermostatable	1	**9.775 453**

Extensive accesories on request!

1



9.775 450

2



9.775 451

E & OE.

1 2 Spectrophotometer Genova Plus, for Life Science

NEW!

Jenway

The Genova Plus is a UV/visible spectrophotometer dedicated to life science analysis. This spectrophotometer allows the measurement of DNA concentration dsDNA, ssDNA, RNA, Oligonucleotides, 260/ 280, 260/ 230, Variable ratio., with an optional correction at 320nm.The Genova Plus is pre-programmed with Bradford, Lowry, Biuret, BCA and Direct UV methods for protein analysis. The Genova Plus has an OD measurement mode enabling users to measure optical density at 600nm for cell harvesting. The purity scan across the entire wavelength range from 198nm to 1000nm displays any distorted peaks enabling impurities to be easily identified. With the touch of a button the Genova plus can be converted to a standard spectrophotometer for basic scanning, quantification, kinetics and multi-wavelength operations. 2 in 1 Spectrophotometer.

- Improved navigation system for easy and intuitive usability
- Improved optics
- Pre-programmed for DNA/RNA analysis
- DNA purity scan across entire wavelength range
- Protein methods pre-loaded
- Standard spectrophotometer functions
- Press to read xenon lamp
- Icon driven software
- Small footprint
- Save methods and results to USB memory stick
- 3 year warranty including xenon lamp

Supplied with: Single micro-cuvette holder, 4GB USB memory stick, instruction manual and universal power supply.

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Specifications:

Wavelength

Range:	198 to 1000nm
Wavelength repeatability:	±0.5nm
Resolution:	1nm
Accuracy:	±2nm
Spectral bandwidth:	5nm
Scan interval:	1, 2 and 5nm

Photometrics

Absorbance Range:	-0.300 to 2.500A
Transmittance Range:	0 to 199.9%T
Photometric Accuracy:	±1%T, ±0.01A at 1.000 Absorbance

Concentration/Quantitation

Range:	-300 to 9999
Resolution:	Selectable 1/0.1/0.01/0.001
Outputs:	USB, Analogue, RS-232, internal printer (optional)
Dimensions (WxDxH):	275mm x 400mm x 220mm
Weight:	6kg

Type	PK	Cat. No.
Life Science Analyser Genova Plus	1	**9.775 160**

Accessories for Spectrophotometer Genova Plus

NEW!

Jenway

Description	PK	Cat. No.
Internal printer	1	**9.775 434**
TrayCell for ultra-micro sample volumes	1	**9.775 438**
Micro-cuvette holder with reduced aperture	1	**9.775 437**
10x10mm path length cuvette holder	1	**9.775 161** 3
10x100mm path length cuvette holder	1	**9.775 430** 4
16/24mm test tube holder	1	**9.775 436**
Water heated 10x10mm path length cuvette holder	1	**9.775 162**
8 cell automatic turret	1	**6.254 445** 5
Sipper pump	1	**9.775 163**
Peltier pump	1	**6.254 430**
Combined Sipper/Peltier	1	**9.775 164** 6
Dust cover	1	**9.775 165**
4GB USB memory stick	1	**9.775 166**
Paper roll for printer	1	**9.775 167**

3



9.775 161

4



9.775 430

5



6254 445

6



9.775 164

Further spectrophotometers please see page 1095.

1



2



1 2 Spectrophotometer Genova Nano

NEW!

Jenway

The Genova Nano micro-volume spectrophotometer measures small sample volumes as low as 0.5µl with a high degree of accuracy, reproducibility and speed. It has the ability to measure small sample volumes, conserves precious samples, reduces the need for dilutions and eliminates the requirement for cuvettes. Cleaning is quick and simple; wiping the read heads with a microfiber cloth removes all trace of the sample, allowing faster change over between samples and therefore increasing sample throughput.

3 in 1 Spectrophotometer
Standard Spectrophotometer with all the functions of the 7315. With measurement modes for photometrics, concentration, multi-wavelength, spectrum scanning, quantitation and kinetics.
Life Science Spectrophotometer with all the functions of the Genova plus. Additional measurement modes for the measurement of nucleic acid purity, protein assays, nucleic acid concentration and optical density of cell cultures add to the flexibility of the Genova Nano.
Micro-volume Spectrophotometer: Making measurements easier, quicker and less strenuous for 0.2 to 0.5 µl samples.

- Micro-volume, life science and standard spectrophotometer in one
- Ideal for DNA, RNA and Protein measurements
- Only 0.5µl sample volume required
- Purity scan over entire wavelength range, 198 to 1000nm
- Detects DNA concentrations as low as 2ng/µl
- Easy and quick to clean
- Results are reproducible, accurate and easily obtained
- Method and result saving to USB memory stick
- 3 year warranty including Xenon lamp

Specifications

Wavelength	
Range:	198 to 1000nm
Accuracy:	±2nm
Spectral Bandwidth:	5nm
Path Length:	0.2 or 0.5mm (auto-ranging)
Photometrics	
Absorbance Range:	15 to 125A (10mm equivalent)
Absorbance Accuracy:	±2% at 260nm
Absorbance Precision:	<0.005A between 0 and 1A (at 260nm and 0.5mm)
Concentration/Quantitation	
Maximum Concentration:	6000ng/µl (dsDNA) (at 0.2mm)
Detection Limit:	2ng/µl (dsDNA) (at 0.5mm)
Measurement Time:	<6.5 seconds
Minimum Sample Size:	0.5µl (at 0.2mm) 1.0µl (at 0.5mm)
Maximum Sample Size:	5µl (in Nano mode)
DNA measurement modes:	dsDNA, ssDNA, RNA, Oligonucleotides, 260/280, 260/230, Variable ratio
Protein measurement modes:	BCA, Bradford, Lowry, Biuret, Direct UV
Dimensions (WxDxH):	275 x 400 x 220mm
Weight:	7.7kg

Type	PK	Cat. No.
Genova Nano	1	**9.775 171**

3



3 Micro Volume Analysis TrayCell

Hellma Analytics

Fibre-Optic Micro Measuring Cell. Accessory for standard spectrophotometer for droplet analysis.
Sample volume 0.5µl to 10µl.

Typical applications are:
- nucleic acid analysis.
- determination of the incorporation frequency of fluorescent dye labels (FOI).
- protein analysis (A280, BCA, Lowry etc.).
- all UV/Vis analysis utilising wavelength range 190nm to 1100nm.
- material: SUPRASIL® quartz.

Please state the required cell centre height (8.5mm, 15mm or 20mm) when placing your order! TrayCell is supplied as standard with caps for both 0.2mm and 1mm light path. Additional light path of 0.1mm and 2mm are available.

Path length	Description	Capacity	Height	Centre height	PK	Cat. No.
mm		µl	mm	mm		
0,2 / 1	TrayCell	0,5 to 10	68.5 / 75 / 80	8.5 / 15 / 20	1	**6.224 913**
0,2 / 1	TrayCell	0,5 to 10	53 / 59.5 / 64.5	8.5 / 15 / 20	1	**6.230 433**

E & OE.

1 Caps for TrayCell



Hellma Analytics

Traditional spectrophotometrical analysis of nucleic acids is carried out in 10mm cuvettes. Modern drop analysis uses light paths of 1mm and 0.2mm and it is thus not necessary to dilute the sample. In applications with very high or very low DNA concentrations these light paths are often no longer sufficient. When using the TrayCell from Hellma Analytics simply adjust the light path by exchanging the cap. Cap with integrated mirror to change the light path.

Path length mm	PK	Cat. No.
2	1	**9.145 705**
0,1	1	**9.145 706**
1	1	**6.224 914**
0,2	1	**6.224 915**

2 Photometer BioPhotometer plus



Eppendorf AG

The BioPhotometer plus, a compact UV/Vis photometer, is optimized for use in molecular biology, biochemistry and cell biology labs.

The photometer provides instant access to 32 routine methods, of which 9 methods are freely programmable. Measurements as well as calculations of results are performed at the press of a button. The results of the analysis and all accompanying data are available at a glance. This guarantees safe and error-free operation. In addition to its low weight, the photometer is small, yet extremely sturdy due to a robust metal housing, which allows for easy transport and cleaning.
The BioPhotometer plus is designed for use with cuvettes such as the Eppendorf UVette®, but is also optimized for measurement of small volumes through the use of microliter cells.
Fast and reliable analysis of nucleic acids and proteins, cell density measurements, determination of incorporation rates of fluorescent dyes in biomolecules, absorption measurement of single wavelengths, and endpoint detection for cell biological and biochemical assays.

Product features:
- 9 wavelengths suitable for the common methods in molecular biological, biochemical and cell biological labs
- Preprogrammed methods for quantification of nucleic acids and proteins as well as incorporation rate of fluorescent dyes
- Assays at 340nm, 405nm, and 490nm are user defined for highest flexibility
- Automatic calculation of dilution factors
- Measurement of single wavelengths without any calculation
- Storage of the last 100 results and all corresponding data
- Simple user guidance for error-free operation
- Compact design and robust housing
- No pre-warming required
- Stand-alone unit without need for PC connection
- Xenon flash lamp with long lifetime and high light intensity

Type	PK	Cat. No.
BioPhotometer plus	1	**9.776 608**

Accessories for BioPhotometer plus

Eppendorf AG

Description	PK	Cat. No.
Secondary UV-VIS filter	1	**9.776 604**
Thermo printer DPU 414, incl. power adapter for 230V and printer cable	1	**9.776 601**
Thermo printer paper (pk. 5 rolls)	5	**9.776 609**
UVettes, 80 x individually wrapped, disposable cells for direct use in BioPhotometer	80	**9.409 392**
UVette routine pack, Eppendorf Quality	200	**9.409 398**
Adapter for photometers/spectrophotometers with beam centre height of 8.5mm	1	**9.409 393**
Adapter for photometers/spectrophotometers with beam centre height of 10mm	1	**9.409 394**
Adapter for photometers/spectrophotometers with beam centre height of 15mm	1	**9.409 395**
Adapter for photometers/spectrophotometers with beam centre height of 20mm	1	**9.409 399**
Adapter for photometers/spectrophotometers with beam centre height of GeneQuant I/II	1	**9.409 396**
Starter kit, 80 x UVettes + 1 universal adapter for photometers/spectrophotometers with beam centre height of 15mm, convertible	1	**9.409 397**

1



1 Flame Photometer PFP7

Jenway

- Industrial analysis
- Low temperature
- Incl. Na, K, Ca, Ba und Li filters
- Electronic flame failure detection
- Fine & coarse sensitivity controls
- Operates on propane, butane, natural gas or L.P.G. supplies

Fitted with automatic flame failure detection for user safety, making it ideal for use in clinical, industrial and educational applications.

Supplied with: Fitted with electronic flame fail safe and supplied with Na, K, Li, Ba and Ca filters, connecting hoses and clips, compressor plug, drain trap, fuses and operating/service instructions

Specifications

Ranges:	0 to 199.9ppm
Limits of detection	
Na/K:	< 0.2ppm
Li:	< 0.25ppm
Ca:	< 15ppm
Ba:	< 30ppm
Reproducibility:	< 1%/Coefficient of Variation for 20 consecutive samples using 10ppm Na set to read 50
Linearity:	Better than 2% when concentration of 3ppm Na/K and 5ppm Li are set to read 100
Specificity:	Interference from Na, K and Li equal in concentration to test element will be < 0.5%
Recorder o/p:	Nominal 1.00V for a reading of 100.0
Electrical:	90 - 125V or 190 - 250V 50/60 Hz
Air:	Moisture and oil free 6 l/min at 1 Kg/cm² (14psi)
Fuel:	Propane, Butane, natural gas or L.P.G.
Size:	420 x 360 x 300mm
Weight:	8kg
Supply requirements:	230V, 50Hz

Type	PK	Cat. No.
PFP7	1	**9.309 409**

2



2 Accessories to Flame Photometer PFP7

Jenway

Please Note:
These products will only operate with the correct type of air compressor and gas regulator as specified below.

It is recommended that the filters listed below are factory fitted at the time of ordering - please specify.

Description	PK	Cat. No.
Air compressor	1	**9.309 410**
Butane regulator	1	**9.309 411**
Propane regulator	1	**9.309 412**
Natural gas regulator	1	**9.309 413**
Ca filter	1	**9.309 414**
Li filter	1	**9.309 415**
Ba filter	1	**9.309 416**
Dilutor (230V 50 Hz)	1	**9.309 417**
Water separator (small)	1	**9.309 419**
Water separator (large)	1	**9.309 420**
Dust cover	1	**9.309 421**
Minor spares kit	1	**9.309 423**
Major spares kit	1	**9.309 424**
Industrial standard 1000 ppm K	1	**9.309 425**
Industrial standard 1000 ppm Li	1	**9.309 426**
Industrial standard 3000 ppm Ba	1	**9.309 427**
Industrial standard 1000 ppm Na	1	**9.309 428**
Industrial standard 1000 ppm Ca	1	**9.309 429**

E & OE.

Calibration - Qualification of spectrophotometers with the certified reference materials from Hellma Analytics

Hellma Analytics

To maintain constant good measurement results, a regular review of the accuracy of the spectrophotometer is required. With the use of certified reference materials from Hellma Analytics, you make sure that your equipment qualifications meet the requirements of the pharmacopoeias and fulfill your internal quality requirements, at the same time you reach the international comparability of your measurement results. The certified reference materials (calibration standards) of the DIN EN ISO 17025 accredited Hellma Analytics calibration laboratory are traceable to the primary standards of NIST (National Institute of Standards and Technology) and meet the requirements of the major pharmacopoeias (e.g. EP, DAB, USP).

Your benefits:
- High quality of the measurement results
- International comparability of measurement results
- Meeting the requirements of the major pharmacopoeias (EP, DAB, USP)
- Results traceable to NIST primary standards
- 30 years warranty*on the reference materials

Scope of delivery:
- Certified reference materials (Calibration Standards) in quality storage box
- DAkkS Calibration Certificate (DIN 17025)
- Handling guidelines

*by regular recertification of the reference materials in the Hellma Analytics calibration laboratory.

3 Certified reference materials for qualifying spectrophotometer as a complete set

Glass Filters: For testing spectrophotometers. Photometric accuracy and wavelength accuracy in the visible spectral region. *Hellma Analytics*

Liquid Filters: For testing spectrophotometers according to European Pharmacopoeia, wavelength accuracy, photometric accuracy, stray light behaviour, resolution.

Type	Description	Capacity	Material	Wave-length nm	PK	Cat. No.
666.000	Complete Set Glass Filters	666-F1 666-F2 666-F3 666-F4 666-F0	Holmium Oxide Glass Filter Neutral Density Glass Filter NG 11 Neutral Density Glass Filter NG 5 Neutral Density Glass Filter NG 4 Empty Filter Mount	279, 361, 453, 536, 638 440; 465; 546,1; 590; 635 440; 465; 546,1; 590; 635 440; 465; 546,1; 590; 635	1	**9.190 973** 1
667.003-UV	Complete Set Liquid Filters	667.100-UV 667.200-UV 667.305-UV 667-UV5	Potassium Chloride + blank Toluene in Hexane + blank Potassium Dichromate in HClO4 + blank Holmium Perchlorate in Perchloric Acid	198, 200 (zertifiziert) 266, 269 235, 257, 313, 350, 430 241,15; 287,15; 361,5; 536,3	1	**9.190 980** 2

Filters also available individually.

1



9.190 973

2



9.190 980

3

DAkkS
Deutsche Akkreditierungsstelle
D-K-18752-01-00

Check for stray light *Hellma Analytics*

Type	Description	Wave-length nm	PK	Cat. No.
667.100-UV	Calibration set according to European Pharmacopoeia, contains filter UV1, UV12		1	**6.228 184**
667-UV1	Liquid filter UV1, Potassium chloride	198 - 385	1	**9.190 981**
667-UV12	Reference filter UV12, purified water	-	1	**9.190 982**

Check for spectral resolution

Hellma Analytics

Type	Description	Wave-length nm	PK	Cat. No.	
667.200-UV	Calibration set according to European Pharmacopoeia, contains filter UV6, UV9		1	**6.240 535**	1
667-UV6	Liquid filter UV6, Toluene in n-hexane	266, 269	1	**9.190 983**	
667-UV9	Reference filter UV9, n-hexane	-	1	**6.231 555**	



6.240 535

Check for photometric accuracy

Hellma Analytics

Type	Description	Wave-length nm	PK	Cat. No.	
667.305-UV	Calibration set according to European Pharmacopoeia, contains filter UV60, UV600, UV14		1	**7.626 372**	2
667-UV60	Liquid filter UV60, Potassium dichromate 60mg/l	235 - 350	1	**6.240 039**	
667-UV600	Liquid filter UV600, Potassium dichromate 600mg/l	430	1	**9.190 984**	
667-UV14	Reference filter UV14, Perchloric acid	-	1	**6.240 040**	
666-F7	Glass filter F7, Didymium	270 - 340	1	**7.612 486**	3
666-F2	Neutral density glass filter F2, 0.25 absorbance	440 - 635	1	**6.801 867**	4
666-F3	Neutral density glass filter F3, 0.5 absorbance	440 - 635	1	**6.801 332**	5
666-F4	Neutral density glass filter F4, 1.0 absorbance	440 - 635	1	**6.801 868**	6



7.626 372



7.612 486



6.801 867



6.801 332



6.801 868

Check the wavelength accuracy

Hellma Analytics

Type	Description	Wave-length nm	PK	Cat. No.	
667-UV5	Liquid filter UV5, Holmium oxide in Perchloric acid	240 - 650	1	**6.227 666**	7
666-F1	Glass filter F1, Holmium oxide	279 - 638	1	**6.201 067**	8
666-F7	Glass filter F7, Didymium	329 - 875	1	**7.612 486**	9



6.227 666



6.201 067



7.612 486

Cells for Absorption Measurement, UV- Range

Wavelength Range: 200nm - 2500nm
Optical material: Quartz SUPRASIL®

Hellma Analytics

Type	Path length mm	Capacity µl	Description	External dimensions (W x D x H) mm	internal width (mm) / aperture (mm x mm/Ø)	Centre height mm	PK	Cat. No.
macro	100	35000	PTFE lid	12,5 x 102,5 x 45	9,5		1	**6.088 125**
macro	10	3500	PTFE lid	12,5 x 12,5 x 45	9,5		1	**9.144 210** 1
macro	1	350	Glass-lid	12,5 x 3,5 x 45	9,5		1	**9.144 201**
macro	20	7000	PTFE lid	12,5 x 22,5 x 45	9,5		1	**9.144 220**
macro	2	700	Glass-lid	12,5 x 4,5 x 45	9,5		1	**9.144 202**
macro	40	14000	PTFE lid	12,5 x 42,5 x 45	9,5		1	**9.144 240**
macro	50	17500	PTFE lid	12,5 x 52,5 x 45	9,5		1	**9.144 250**
macro	5	1750	PTFE lid	12,5 x 7,5 x 45	9,5		1	**9.144 205**
macro	100	35000	2 PTFE stopper	12,5 x 102,5 x 46	9,5		1	**6.200 921**
macro	10	3500	PTFE stopper	12,5 x 12,5 x 46	9,5		1	**9.144 610** 2
macro	1	350	PTFE stopper	12,5 x 3,5 x 52	9,5		1	**9.144 601**
macro	20	7000	PTFE stopper	12,5 x 22,5 x 45	9,5		1	**9.144 620**
macro	2	700	PTFE stopper	12,5 x 4,5 x 52	9,5		1	**9.144 602**
macro	50	17500	2 PTFE stopper	12,5 x 52,5 x 46	9,5		1	**9.144 650**
macro	5	1750	PTFE stopper	12,5 x 7,5 x 46	9,5		1	**9.144 605**
macro	10	3500	Screw cap **	12,5 x 12,5 x 56	9,5		1	**6.801 219**
macro	10	3500	Pipe-Ø 8mm, nozzle length 80mm	12,5 x 12,5 x 40	9,5		1	**6.222 584**
semi-micro	10	1400	PTFE lid	12,5 x 12,5 x 45	4		1	**9.144 460**
semi-micro	50	7000	PTFE lid	12,5 x 52,5 x 45	4		1	**9.144 465**
semi-micro	10	1400	PTFE lid *	12,5 x 12,5 x 45	4		1	**9.144 490**
semi-micro	10	1000	PTFE lid	12,5 x 12,5 x 45	4	15.2	1	**6.250 017**
semi-micro	10	1000	PTFE lid *	12,5 x 12,5 x 45	4	15.2	1	**6.800 224**
semi-micro	10	1400	PTFE stopper	12,5 x 12,5 x 46	4		1	**9.144 730**
semi-micro	10	1400	PTFE stopper *	12,5 x 12,5 x 46	4		1	**9.144 372** 3
semi-micro	10	1400	Screw cap **	12,5 x 12,5 x 56	4		1	**6.076 639**
semi-micro	10	1500	PTFE stopper ***	12,5 x 12,5 x 49,5	4		1	**6.080 235**
micro	10	700	PTFE lid	12,5 x 12,5 x 45	2		1	**9.144 751**
micro	10	700	PTFE lid *	12,5 x 12,5 x 45	2		1	**9.144 756** 4
micro	10	500	PTFE lid	12,5 x 12,5 x 45	2	15.2	1	**6.084 722**
micro	10	500	PTFE lid *	12,5 x 12,5 x 45	2	15.2	1	**6.076 641**
micro	10	400	PTFE lid	12,5 x 12,5 x 40	2		1	**9.144 758**
micro	10	400	PTFE lid *	12,5 x 12,5 x 40	2		1	**9.144 385**
ultramicro	10	180	PE stopper	12,5 x 12,5 x 45	8 x 2	15.0	1	**9.190 969**
ultramicro	10	180	PE stopper	12,5 x 12,5 x 45	8 x 2	8.5	1	**9.190 966**
ultramicro	10	120	PE stopper	12,5 x 12,5 x 45	5 x 2	15.0	1	**9.190 968**
ultramicro	10	120	PE stopper	12,5 x 12,5 x 45	5 x 2	8.5	1	**9.190 965**
ultramicro	10	70	PE stopper	12,5 x 12,5 x 45	2,5 x 2	15.0	1	**9.190 967**
ultramicro	10	70	PE stopper	12,5 x 12,5 x 45	2,5 x 2	8.5	1	**9.190 964**
ultramicro	10	70	PE stopper	12,5 x 12,5 x 45	Ø 2,5	15.0	1	**9.144 098** 5
ultramicro	10	70	PE stopper	12,5 x 12,5 x 45	Ø 2,5	8.5	1	**9.144 104**
ultramicro	10	40	PE stopper	12,5 x 12,5 x 45		15.0	1	**9.144 099**
ultramicro	10	40	PE stopper	12,5 x 12,5 x 45		8.5	1	**9.144 103**
ultramicro	10	10	open at the top, with pipette tip	12,5 x 12,5 x 40	Ø 0,8	15.0	1	**9.144 156** 6
ultramicro	10	10	open at the top, with pipette tip	12,5 x 12,5 x 40	Ø 0,8	8.5	1	**9.144 157**

* black side walls and base
**with silicone rubber seal and with ISO thread GL 14
***for magnetic stirring bars

1

9.144 210

2

9.144 610

3

9.144 372

4

9.144 756

5

9.144 098

6

9.144 156

Cells for Fluorescence Measurement, Vis-Range

Hellma Analytics

Wavelength Range:
260nm - 2500nm
320 nm - 2500 nm
360 nm - 2500 nm

Optical material:
HOQ 310H **(UV)**
Pecial optical glass **(OS)**
Optical glass **(OG)**

Type	optical material	Path length mm	Capacity µl	Description	External dimensions (W x D x H) mm	internal width mm	PK	Cat. No.
large cuvette	OG	20 ± 0,2	6000	Large cuvette, glass lid	25 x 25 x 22,5	20	1	**7.637 932**
large cuvette	OG	30 ± 0,2	22500	Large cuvette, glass lid	35 x 35 x 32,5	30	1	**9.144 375**
large cuvette	OG	40 ± 0,2	56000	Large cuvette, glass lid	45 x 45 x 42,5	40	1	**9.144 376**
large cuvette	OG	50 ± 0,2	88000	Large cuvette, glass lid	55 x 55 x 52,5	50	1	**6.088 668**
macro	UV	10 (± 0,05)	3500		12,5 x 12,5 x 45	9,5	1	**9.144 301**
macro	OS	1	350	Glass coverslip	12,5 x 3,5 x 45	9,5	1	**9.144 101**
macro	OS	2	700	Glass coverslip	12,5 x 4,5 x 45	9,5	1	**9.144 102**
macro	OS	2	700	PTFE stopper	12,5 x 4,5 x 52	9,5	1	**9.144 502**
macro	OS	5	1750	PTFE lid	12,5 x 7,5 x 45	9,5	1	**9.144 105**
macro	OS	10	3500	PTFE lid	12,5 x 12,5 x 45	9,5	1	**9.144 110**
macro	OS	10	3500	PTFE stopper	12,5 x 12,5 x 46	9,5	1	**9.144 510**
macro	OS	20	7000	PTFE lid	12,5 x 22,5 x 45	9,5	1	**9.144 120**
macro	OS	40	14000	PTFE lid	12,5 x 42,5 x 45	9,5	1	**9.144 140**
macro	OS	50	17500	PTFE lid	12,5 x 52,5 x 45	9,5	1	**9.144 150**
macro	OS	50	17500	2 PTFE stopper	12,5 x 52,5 x 46	9,5	1	**9.144 550**
macro	OG	10	3500		12,5 x 12,5 x 45	9,5	1	**9.144 300**
macro	OG	20	7000		12,5 x 22,5 x 45	9,5	1	**9.144 302**
macro	OG	40	14000		12,5 x 42,5 x 45	9,5	1	**9.144 340**
macro	OG	50	17500		12,5 x 52,5 x 45	9,5	1	**9.144 350**
macro	OG	50	22500	PTFE lid	23,6 x 55 x 40	18,5	1	**6.091 137** 1
semi-micro	OS	10	1400	PTFE lid *	12,5 x 12,5 x 45	4	1	**9.144 480**
semi-micro	UV	10 (± 0,05)	1400		12,5 x 12,5 x 45	4	1	**9.144 361**
semi-micro	OS	10	1400	PTFE lid	12,5 x 12,5 x 45	4	1	**9.144 410**
semi-micro	OS	10	1400	PTFE stopper	12,5 x 12,5 x 46	4	1	**9.144 710**
semi-micro	OS	50	7000	PTFE lid	12,5 x 52,5 x 45	4	1	**9.144 450**
semi-micro	OG	10	1400		12,5 x 12,5 x 45	4	1	**9.144 360** 2
micro	OS	10	700	PTFE lid *	12,5 x 12,5 x 45	2	1	**9.144 755**
micro	OS	10	700	PTFE lid	12,5 x 12,5 x 45	2	1	**9.144 750**

* black side walls and base

1



6.091 137

2



9.144 360

3



6.800 243

Cells for Absorption Measurement, NIR- Range

NEW!

300 Wavelength Range: 200nm - 3500nm
Optical material: Quartz SUPRASIL®

Hellma Analytics

Type	Path length mm	Capacity µl	Description	External dimensions (W x D x H) mm	internal width mm	PK	Cat. No.
macro	1	700	PTFE-stopper	23,6 x 3,5 x 47,5	18,5	1	**6.200 777**
macro	2	1400	2 PTFE-stopper	23,6 x 4,5 x 47,5	18,5	1	**6.800 243** 3
macro	10	7000	2 PTFE-stopper	23,6 x 12,5 x 47,5	18,5	1	**6.052 409**
macro	1	350	glass coverslip	12,5 x 3,5 x 45	9,5	1	**6.302 993**
macro	2	700	PTFE-stopper	12,5 x 4,5 x 52	9,5	1	**6.238 168**
macro	10	3500	PTFE-lid	12,5 x 12,5 x 45	9,5	1	**6.086 375**
macro	10	3500	PTFE-stopper	12,5 x 12,5 x 46	9,5	1	**6.052 763**

Cells for Absorption Measurement, Flow-Through Measurement, UV- Range

NEW!

Wavelength Range: 200nm - 2500nm
Optical material: Quartz SUPRASIL®

Hellma Analytics

Type	Path length mm	Capacity µl	Description	External dimensions (W x D x H) mm	internal width mm	Centre height mm	PK	Cat. No.
macro	10	3200	Supply and outlet tubes	12,5 x 12,5 x 45	33 x 9,5		1	**6.056 433**
macro	1	260	Supply and outlet tubes	12,5 x 3,5 x 45	20 x 9		1	**7.920 095**
macro	10	2600	Supply and outlet tubes	12,5 x 12,5 x 45	20 x 9		1	**6.073 105**
macro	10	750	Supply and outlet tubes	12,5 x 12,5 x 45	11 x 6,5	15.0	1	**6.201 457**
macro	10	750	Supply and outlet tubes	12,5 x 12,5 x 38,5	11 x 6,5	8.5	1	**6.072 360**
semi-micro	10	1500	Supply and outlet tubes	12,5 x 12,5 x 48	36 x 4		1	**6.072 285**
semi-micro	10	450	Supply and outlet tubes	12,5 x 12,5 x 45	11 x 4	15.0	1	**6.051 845**
semi-micro	10	450	Supply and outlet tubes	12,5 x 12,5 x 38	11 x 4	8.5	1	**6.059 056**
semi-micro	50	2250	Supply and outlet tubes	12,5 x 52,5 x 45	11 x 4	15.0	1	**6.080 156** 1
semi-micro	50	2250	Supply and outlet tubes	12,5 x 52,5 x 38,5	11 x 4	8.5	1	**6.242 811**
semi-micro	5	195	2 screw terminals *	12,5 x 12,5 x 35	11 x 3,5	15.0	1	**6.059 697**
semi-micro	5	195	2 screw terminals *	12,5 x 12,5 x 35	11 x 3,5	8.5	1	**6.300 696**
semi-micro	10	390	2 screw terminals *	12,5 x 12,5 x 35	11 x 3,5	15.0	1	**9.144 667** 2
semi-micro	10	390	2 screw terminals *	12,5 x 12,5 x 35	11 x 3,5	8.5	1	**9.144 666**
semi-micro	50	1950	2 screw terminals *	12,5 x 52,5 x 35	11 x 3,5	15.0	1	**6.231 336**
semi-micro	50	1950	2 screw terminals *	12,5 x 52,5 x 35	11 x 3,5	8.5	1	**6.242 812**
micro	10	80	2 screw terminals *	12,5 x 12,5 x 35	Ø 3	15.0	1	**6.300 086**
micro	10	80	2 screw terminals *	12,5 x 12,5 x 35	Ø 3	8.5	1	**7.601 951**
micro	10	80	Supply and outlet tubes	12,5 x 12,5 x 45	Ø 3	15.0	1	**6.802 496**
micro	10	80	Supply and outlet tubes	12,5 x 12,5 x 38,5	Ø 3	8.5	1	**6.059 972**
micro	50	370	Supply and outlet tubes	12,5 x 52,5 x 45	Ø 3	15.0	1	**7.616 257**
micro	50	370	Supply and outlet tubes	12,5 x 52,5 x 38,5	Ø 3	8.5	1	**7.654 694**
micro	10	160	2 screw terminals *	12,5 x 12,5 x 35	8 x 2	15.0	1	**6.053 838**
micro	10	160	2 screw terminals *	12,5 x 12,5 x 35	8 x 2	8.5	1	**6.058 130**
micro	1	120	Supply and outlet tubes	12,5 x 12,5 x 35	17,5 x 6,5		1	**6.052 902**
micro	2	240	Supply and outlet tubes	12,5 x 12,5 x 35	17,5 x 6,5		1	**6.201 456**
micro	0,1	6	2 screw terminals *	12,5 x 12,5 x 35	17,5 x 3,5		1	**9.144 660**
micro	0,2	12	2 screw terminals *	12,5 x 12,5 x 35	17,5 x 3,5		1	**6.206 587**
micro	0,5	31	2 screw terminals *	12,5 x 12,5 x 35	17,5 x 3,5		1	**9.144 662**
micro	1	62	2 screw terminals *	12,5 x 12,5 x 35	17,5 x 3,5		1	**9.144 664** 3
micro	2	124	2 screw terminals *	12,5 x 12,5 x 35	17,5 x 3,5		1	**9.144 663**

* M 6 x 1 and FEP tubes (outside diameter 1.9mm, inner diameter 1.1mm, length 500mm)

1



6.080 156

2



9.144 667

3



9.144 664



Cells for Fluorescence Measurement, UV-Range

Wavelength Range: 200nm - 3500nm
Optical material: Quartz SUPRASIL®

Hellma Analytics

Type	Path length mm	Description	External dimensions (W x D x H) mm	internal width (mm) / aperture (mm x mm/Ø)	Centre height mm	PK	Cat. No.	
macro	5 x 5	5 window	6,9 x 6,9 x 33,5	5		1	**6.200 894**	
macro	5 x 5	5 window	7,5 x 7,5 x 45	5		1	**6.075 980**	
macro	10 x 10	PTFE lid, 4 window	12,5 x 12,5 x 45	10		1	**9.144 761**	
macro	10 x 10	PTFE stopper, 4 window	12,5 x 12,5 x 46	10		1	**9.144 771**	
macro	10 x 10	PTFE stopper, 4 window	12,5 x 12,5 x 49,5	10		1	**6.204 497**	
macro	10 x 10	clip ***	12,5 x 12,5 x 40	10		1	**6.302 645**	
macro	10 x 10 Tol. ± 0,2	clip ***	12,5 x 12,5 x 40	10		1	**6.801 662**	
macro	10 x 10	screw cap *	12,5 x 12,5 x 56	10		1	**6.055 271**	1
macro	10 x 20	PTFE lid, 4 window	12,5 x 22,5 x 45	10		1	**7.638 526**	
macro		PTFE stopper, triangle cuvette, 3 window	12,4 x 12,4 x 46	10		1	**9.144 772**	
semi-micro	10 x 4	PTFE lid	12,5 x 12,5 x 45	4	20.0	1	**6.093 874**	
semi-micro	10 x 4	PTFE lid	12,5 x 12,5 x 45	4		1	**9.144 781**	2
semi-micro	10 x 4	PTFE stopper	12,5 x 12,5 x 46	4		1	**9.144 791**	3
semi-micro	10 x 4	screw cap *	12,5 x 12,5 x 56	4		1	**6.222 630**	
semi-micro	10 x 4	PTFE stopper **	12,5 x 12,5 x 49,5	4		1	**6.080 511**	4
micro	10 x 2	PTFE stopper	12,5 x 12,5 x 40	2		1	**9.144 759**	
micro	10 x 2	PTFE lid	12,5 x 12,5 x 45	2	20.0	1	**6.081 483**	5
micro	10 x 2	PTFE lid	12,5 x 12,5 x 45	2		1	**9.144 801**	
ultramicro	3 x 3	PE stopper, 3 window	12,5 x 12,5 x 45	5 x 3	15.0	1	**9.144 391**	6
ultramicro	3 x 3	PE stopper, 3 window	12,5 x 12,5 x 45	5 x 3	8.5	1	**9.144 390**	
ultramicro	10 x 2	PE stopper, 3 window	12,5 x 12,5 x 45	5 x 2	15.0	1	**6.051 579**	
ultramicro	10 x 2	PE stopper, 3 window	12,5 x 12,5 x 45	5 x 2	8.5	1	**6.510 380**	
ultramicro	10 x 2	PE stopper, 3 window	12,5 x 12,5 x 45	5 x 2	15.0	1	**6.801 237**	
ultramicro	10 x 2	PE stopper, 3 window	12,5 x 12,5 x 45	5 x 2	8.5	1	**9.144 392**	
ultramicro	1,5 x 1,5	PE stopper, 3 window	12,5 x 12,5 x 45	5 x 1,5	15.0	1	**6.250 225**	
ultramicro	1,5 x 1,5	PE stopper, 3 window	12,5 x 12,5 x 45	5 x 1,5	8.5	1	**7.606 579**	
ultramicro	5 x 5	PTFE stopper, 5 window	7,5 x 7,5 x 46	5		1	**7.200 073**	
ultramicro	3 x 3	5 window	5,4 x 5,4 x 21	3		1	**9.144 811**	

* with silicone rubber seal and with ISO thread GL 14
**for magnetic stirrers
***Connection Ø 8 mm, length 80 mm spigot

1

6.055 271

2

9.144 781

3

9.144 791

4

6.080 511

5

6.081 483

6

9.144 391

Cells for Fluorescence Measurement, Vis-Range

NEW!

Wavelength Range: 320nm - 2500nm
Optical material: Special optical glass

Hellma Analytics

Type	Path length mm	Capacity µl	Description	External dimensions (W x D x H) mm	internal width mm	PK	Cat. No.	
macro	10 x 10	3500	PTFE-lid	12,5 x 12,5 x 45	10	1	**9.144 760**	7
macro	10 x 10	3500	PTFE-stopper	12,5 x 12,5 x 46	10	1	**9.144 770**	8
semi-micro	10 x 4	1400	PTFE-lid	12,5 x 12,5 x 45	4	1	**9.144 780**	

7

9.144 760

8

9.144 770

E & OE.

Cells for light scattering measurements, UV-range

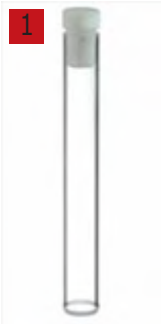
NEW!

Wavelength: 200nm - 2500nm
Optical material: SUPRASIL®

Hellma Analytics

Type	Capacity µl	Description	External dimensions (H x Ø) mm	Internal dimensions (H x Ø) mm	PK	Cat. No.
scatter measurement	2800	PTFE-stopper	75 x 10	74 x 8	1	**6.302 852** 1
scatter measurement	2800	PTFE-stopper, outer cylinder fire-polished	75 x 10	74 x 8	1	**6.073 106**
scatter measurement	14000	PTFE-stopper	75 x 20	74 x 18	1	**6.255 204** 2
scatter measurement	22000	PTFE-stopper	75 x 25	73 x 22.6	1	**6.251 060** 3
scatter measurement	22000	PTFE-stopper, outer cylinder fire-polished	75 x 25	73 x 22.6	1	**9.144 971**

1



6.302 852

2



6.255 204

3



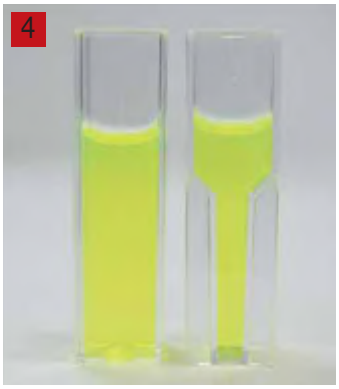
6.251 060

4 LLG-Disposable plastic cells, PS

The new generation of cuvettes with clearly improved, photometric properties. The new optimized shape and narrow wall thickness of the cuvettes provides increased heat transfer resulting in more constant sample temperatures during photometric measuremens.

- Cavity sorted
- Glass clear polystyrene (PS)
- Applicable wavelength range 340nm to 900nm
- Very low variation of extinction values
- Excellent optical transmission range
- Path length 10mm
- Overall dimensions 12.5mm x 12.5mm x 45mm
- Styrofoam racks: 100 cuvettes in a styrofoam box with cover

4



Description	Capacity ml	Path length mm	Material	Operating range nm	PK	Cat. No.
Macro	4.0	10.0	PS	340 to 900	100	**9.406 011**
Semi-micro	1.6	10.0	PS	340 to 900	100	**9.406 012**

5 Disposable cuvettes

Disposable cuvettes for spectroscopy, in optical-quality PS and UV grade PMMA with optical windows for optimum transmittance when using wavelengths from 340nm to 800nm (PS) and from 280nm to 800nm (PMMA). Moulding and quality control determine the reproducibility of cuvettes. Kartell cuvettes are strictly controlled and varations should be within the range ±1% absorption. This is the vital when batch analysis is being undertaken. Dust proof packaging: 100 pcs in expanded polystrene box with lid, 5 boxes in inner carton and 12 inner cartons (60 boxes) per case.

Kartell

5



Description	Path length mm	Material	Capacity ml	PK	Cat. No.
Standard cuvettes	10.0	PS	4.5	100	**9.406 431**
Semi-micro cuvettes, low form	10.0	PS	1.5	100	**9.406 432**
Semi-micro cuvettes, high form	10.0	PS	2.5	100	**9.406 433**
Standard cuvettes, 4 clear faces	10.0	PS	4.5	100	**9.406 434**
Standard cuvettes	10.0	PMMA	4.5	100	**9.406 435**
Semi-micro cuvettes, high form	10.0	PMMA	2.5	100	**9.406 436**
Semi-micro cuvettes, low form	10.0	PMMA	1.5	100	**9.406 437**
Standard cuvettes, 4 clear faces	10.0	PMMA	4.5	100	**9.406 438**

For further cuvettes, please see page 1105.



1 Accessories for standard and semi-micro cuvettes

Kartell

Description	Material	PK	Cat. No.
Disposable stirrer	PS	100	**9.406 439**
Caps for cuvettes	PE-LD	1000	**9.406 440**
Cuvette holder for 12 cuvettes	PE	1	**9.406 441**



2 Macro and semi micro cuvettes

BRAND

Sorted by mould cavity number. PMMA or PS.
What does "sorted by mould cavity number" mean? Injection moulds which produce 8 cells in one cycle have 8 cavities. For serial analysis only cells with the same cavity number should be used, to minimise cell-to-cell variation.
Quality characteristics:
- Minimal extinction value variation.
- Optically perfect transmission range
- Recessed window, to protect against scratches
- Arrow head marking shows the direction of transmission.

Advantages to user:
- Ideal for kinetics measurements
- 1000 cells from the same cavity in each pack
- Practical packaging: clear, re-closable.

Polymethylmethacrylate (PMMA) cuvettes
Typical operating range: from 300nm to 900nm.
Standard deviation at 320nm ±0.004 extinction units.

Polystyrene (PS) cuvettes
Typical operative range: from 340nm to 900nm.
Standard deviation at 360nm ≤ ±0.005 extinction units.

Dimensions: 12.5mm x 12.5mm x 45mm
Window: Macro cell 10mm x 35mm
Semi micro cell 4.5mm x 23mm

Description	Path length mm	Material	Volume ml	Operating range nm	PK	Cat. No.
Macro	10.0	PMMA	2.5 to 4.5	300 to 900	100	**9.406 111**
Semi-micro	10.0	PMMA	1.5 to 3.0	300 to 900	100	**9.406 115**
Macro	10.0	PS	2.5 to 4.5	340 to 900	100	**9.406 110**
Semi-micro	10.0	PS	1.5 to 3.0	340 to 900	100	**9.406 114**



E & OE.

1 Plastic disposable UV-Cuvettes for the UV/VIS range



BRAND

UV-transparent plastic Brand cuvettes replace fragile glass or quartz cuvettes in many applications that were previously beyond the range of plastic cuvettes. Designed for single use, they eliminate time-consuming washing, and the cross-contamination risk associated with washing and re-using cuvettes. Their very high chemical resistance allows use with most polar solvents, acids and alkalis (e.g. Acetone, Butanone, DMF, hydrochloric acid). The UV-uvette micro has a working range from 220nm - sample volumes as small as 70 µl are sufficient.
The UV-Cuvette is also available in macro and semi-macro sizes for applications from 220nm to 900nm.

- Specially designed for photometric determination of proteins, ssDNA, dsDNA, TNA and oligonucleotides in the UV range.
- Ideally suited for measurements at 260 nm, 280 nm and in the visible range.
- Two different centre heights (8.5 mm and 15 mm) allow use in most commercial spectrophotometers without adapters (for more information please visit the Brand website, www.brand.de).
- Round caps provide a tight seal and allow storage of samples at -20°C.
- Coloured caps are available for easy sample identification.
- Grouped by mould cavity number to minimize extinction value variation.
- Recessed windows protect against scratching.
- Arrow indicates optical path orientation.

Description	Path length mm	Capacity µl	Operating range nm	PK	Cat. No.
UV micro cuvette (centre height 8.5 mm)	10,0	70 to 850	220 to 900	100	**9.406 120**
UV micro cuvette (centre height 8.5 mm)	10,0	70 to 850	220 to 900	500	**9.406 121**
UV micro cuvette (centre height 15 mm)	10,0	70 to 550	220 to 900	100	**9.406 122**
UV micro cuvette (centre height 15 mm)	10,0	70 to 550	220 to 900	500	**9.406 123**
Cap for UV micro cuvette, blue				100	**9.406 124**
Cap for UV micro cuvette, yellow				100	**9.406 125**
Cap for UV micro cuvette, green				100	**9.406 126**
Cap for UV micro cuvette, orange				100	**9.406 127**
UV macro cuvette	10,0	2.5ml to 4.5ml	220 to 900	100	**9.406 119**
UV semi-micro cuvette	10,0	1.5 to 3.0ml	220 to 900	100	**9.406 118**

2 3 UV cuvette UVette®





Eppendorf AG

The plastic material of the UVettes provides a transparency range of 220nm to 1600nm. It is possible to carry out measurements in the UV range as well as the entire VIS range. Pipetting can be monitored clearly through the crystal-clear plastic and is always completely bubble-free, even the minute 50µl sample volume. The design of the cuvette incorporates a funnel-shaped base, which prevents the capillary effect, and ensures that the liquids constantly remain in the centre of the measuring area.

Product features:

- Suitable for measuring small volumes, min. 50µl
- Individually blister-packed for sterile work
- DNA-/RNase- and protein-free
- Choice of two optical path lengths: 2mm and 10mm
- UV- and VIS-transparent between 220nm and 1600nm
- Volume markings at 500µl and 1000µl
- Total transparent material with outstanding surface properties
- Optimal filling guaranteed by tapered cuvette base
- Recessed optical window prevents scratches
- Self-standing design
- Marking possible on frosted gripping surface
- Optimal use in BioPhotometer and in most common spectrophotometers, using adapters.

Description	Path length mm	PK	Cat. No.
UVettes, 80 x individually wrapped, disposable cells for direct use in BioPhotometer	2 and 10	80	**9.409 392**
UVette routine pack, Eppendorf Quality	2 and 10	200	**9.409 398**
Adapter for photometers/spectrophotometers with beam centre height of 8.5 mm		1	**9.409 393**
Adapter for photometers/spectrophotometers with beam centre height of 10 mm		1	**9.409 394**
Adapter for photometers/spectrophotometers with beam centre height of 15 mm		1	**9.409 395**
Adapter for photometers/spectrophotometers with beam centre height of GeneQuant I/II		1	**9.409 396**
Starter kit, 80 x UVettes + 1 universal adapter for photometers/spectrophotometers with beam centre height of 15 mm, convertible		1	**9.409 397**

1



1 HELLMANEX® III liquid

Hellma Analytics

Cleaning:
HELLMANEX® III is an alkaline liquid concentrate used for the highly effective cleaning of glass or silica cells and other sensitive optical components. Laboratory equipment made of glass, quartz, sapphire and porcelain can also be cleaned using the solution.

Characteristics:
Hellmanex® III significantly reduces the surface tension of water. The removal of dirt particles is also assured by the good wetting action of a Hellmanex® III aqueous solution, whilst its high emulsifying and dispersing capabilities prevent the re-deposition of the loosened particles. Special surface-active substances facilitate the residue-free rinsing of the optical components once they have been cleaned.

Cleaning and Dilution:
The optimal dilution depends on several factors, such as the hardness of the water, the degree and type of contamination, the temperature, etc. The use of demineralised water improves the cleaning characteristics.

Available in 1.3kg PE-bottle.

The following treatments have been proven at a **concentration (vol%) 0.5 to 2** in practice:

Temperature°C	**Time minutes**
20-25	120-180
30-35	30-40
50-60 (quarz only)	10-15
70-80 (quarz only)	< 5

Type	Capacity Litres	PK	Cat. No.
HELLMANEX® III	1	1	**9.190 985**

2



2 Cuvette rack

BRAND

Grey. PP. 16 numbered positions.
Autoclavable (121°C).

Width mm	Length mm	Height mm	PK	Cat. No.
70	210	38	1	**9.145 020**

3



3 Cell box, PP

Heathrow Scientific

Holds up to 12 cells with a 10mm light path. Box features a hinged lid with secure clasp and a removable insert for easy cleaning. The height of the lid will accommodate the tallest of spectrophotometer cells, even those with covers or stoppers (maximum 51mm). Stackable. Autoclavable.

Length mm	Width mm	Height mm	PK	Cat. No.
115	121	60	1	**9.406 451**

E & OE.

Disinfection 1116
for surfaces 1116
for Instruments 1119
Screen cleaners 1125
Compressed air spray 1126

Cleaning implements 1127
Wipes, cloths 1127
Brushes 1134
Draining racks 1136

Ultrasonic cleaners 1138
Instruments 1138
Ultrasonic cleaners 1149

Washers, disinfectors 1150
Instruments 1150
Accessories 1152

Steam sterilisers - Autoclaves 1153
Instruments 1153
Accessories 1160

1



9.413 216

LLG-Dispenser system for moist cloths Wiper Bowl® Safe & Clean

The economical "building block solution" for thorough disinfection and cleaning of sensitive areas in the medical and foodstuff industries. Can be filled with all commercial disinfectant and cleaning agents.
The fine perforated structure of Multitex® moist cloths ensures an even distribution of the surface disinfectant. These moist towels are also ideally suited to the cleaning of grossly soiled surfaces. Easy handling thanks to tear-off perforation. After cleaning the lid can be closed and the tissues stay moistured for more than 30 days ensuring a constant cleaning and disinfection performance.

LLG Dispenser bin Wiper Bowl® Safe & Clean:
Empty. For 1 roll Multitex® DR. Made of plastic, dia. approx. 21cm, resealable and reusable.

LLG-Cleaning tissues Multitex® DR:
Viscose fleece for Wiper Bowl® Safe & Clean dispenser bucket.
White, fine, tear-resistant, absorbent and lint free.
Dimensions: 300mm x 320mm.
1 roll of 90 tissues
Please order separately.

2



9.413 215

Type	PK	Cat. No.
LLG-Dispener bin	1	**9.413 216** 1
LLG-Cleaning tissues Multitex® DR	1	**9.413 215** 2

3



3 HBV Tissues Meliseptol®

Ready to use, alcoholic disinfectant tissues, 13.5cm x 22cm. *B. Braun*

Type	PK	Cat. No.
100 cloths, dispenser	100	**9.191 272**
100 cloths, refill pack	100	**6.800 451**

4



4 Disinfection tissues, Pursept®-A Xpress

Pursept®-A Xpress disinfection tissues are useful for rapid disinfection and cleaning of work surfaces and instruments (e.g., liquid handling instruments). It works in only 15 seconds - even before the surface dries. DGHM tested and RKI compliant. Skin tolerance dermatologically tested. For RKI compliant use, thoroughly wipe the surface to be disinfected with Pursept®-A Xpress disinfection tissues. Be sure to wipe everything completely. The surface should remain moist during the entire working time. *BRAND*

Dimensions	135 x 225mm
Contents per cloth (approx.):	1027mg ethanol, 0.56mg N-alkyl aminopropyl glycine; auxiliary agents.
Microbiological power/application concentration:	
Surface disinfection:	
Bacteria and fungi with little organic burden with mechanics to DGHM/VAH:	15secs.
Limited virucidal efficacy* (incl. HIV, HBV, HCV):	15secs.
Effectiveness against TbB:	30secs.
Chemico-physical data of the solution:	
Liquid:	colourless, transparent
Density:	approx. 0.9g/cm³
pH value:	approx. 7.5
Tissues:	FCC-bleached (oxidation bleach), bio-degradable

Pack size	PK	Cat. No.
Dispensing box of 150 tissues	1	**9.413 040**
Refill pack of 150 tissues	1	**9.413 041**

*Tested according to standard DGHM methods of surface disinfection. Latest version:9/1/2001
**As recommended by the Robert-Koch-Institute (RKI), Bundesgesundheitsblatt 01/2004

1 Spray disinfectant Meliseptol®



For targeted spray disinfection of small surfaces and equipment. *B. Braun*
- Ready-to-use alcoholic solution
- Effective against bacteria incl. T.B., -B, fungi, lipophilic viruses including Hepatitis-B and HIV, rotaviruses
- Pleasant odour
- Dries thoroughly without residue
- Effective within 5mins.
- 250ml bottle for propellant-free, spray disinfection of hard-to-reach areas. Overhead use also possible.

Use disinfectants safely. Always read the label and product information before use.

Type	Capacity ml	PK	Cat. No.
Hand spray bottle	250	1	**9.191 262**
Hand spray bottle without spray head*	1000	1	**9.191 263**
Spray head for 1L hand spray bottle		1	**9.191 268**
Jerrycan	5000	1	**9.191 265**

*Spray head for 1000ml hand spray bottle - please order separately.

2 Disinfectant foam Meliseptol® foam pure



Foam for rapid disinfection of small surfaces. Good material compatibility even with alcohol-sensitive materials, eg plastic surfaces, medical devices, acrylic glass, examination tables. *B. Braun*

Type	Capacity ml	PK	Cat. No.
Foam spray bottle	750	1	**9.191 271**
Canister	5000	1	**9.191 288**

3 Meliseptol® rapid, fast acting spray disinfectant



Meliseptol® rapid is a fast acting, ready-to-use disinfectant for medical equipment such as treatment chairs, operating theatre equipment and hospital beds. *B. Braun*

Meliseptol® rapid works within 1 min. as a bactericide, tuberculocide, fungicide (incl. mould fungi) and inactivates Hepatitis-B, HIV, rotaviruses, adeno and vaccinia viruses. Free from aldehydes and alkyl amines.

Type	Capacity ml	PK	Cat. No.
Spray bottle	250	1	**9.191 036**
Dosing bottle	250	1	**9.191 037**
Hand spray bottle without spray head*	1000	1	**9.191 038**
Spray head for 1000ml hand spray bottle		1	**9.191 268**
Jerrycan	5000	1	**9.191 040**

*For spray bottle 1000ml - please order spray head separately.

4 Spray disinfectant neoform® MED rapid



NEW!

Rapid disinfectant for medical devices, ready-for-use solution. Bactericidal, yeasticidal, tuberculocidal, active against enveloped viruses. Alcoholic spray for disinfection medical devices. VAH listed and registered in the IHO virucidal list.

Type	Capacity ml	PK	Cat. No.
neoform® MED rapid	750	1	**6.253 344**

5 Surface disinfectant neoform® MED AF



NEW!

Aldehyde-free disinfectant cleaner for medical devices, liquid concentrate. Bactericidal, yeasticidal, tuberculocidal, active against enveloped viruses. For cleaning and disinfection of medical devices and medical equipment. Application by rub/wipe-method, via rotating brushes or spraying devices. VAH listed and registered in the IHO virucidal list.

Type	Capacity ml	PK	Cat. No.
neoform® MED AF	5000	1	**6.258 229**

1



1 Surface disinfection concentrate, Pursept® AF

BRAND

For alcohol-resistant worktops and equipment surfaces in microbiological and medical laboratories. Cleans and disinfects floors, walls and equipment in one operating cycle.
Effective against bacteria, fungi and viruses, in particular Hep.-B and HIV. Tested and certified in accordance with the guidelines of the DGHM (German Hygiene and Microbiology Society). Particularly gentle on surfaces, kind to skin and has a pleasant, fresh fragrance. Use disinfectants safely. Always read the label and product information before use.

Contents per 100g:	12.5g didecyl dimethyl ammonium chloride < 5% NTA, <5% non-ionic surfactants, auxiliary agent 1.5g (aminopropyl)-lauryl amine, auxiliary materials
Microbiological power/application concentration Surface disinfection:	
Bacteria and fungi in acc. with DGHM:	0.25% (2.5g/l)/4 hrs. 0.5% (5g/l)/60 min. 1% (10g/l)/30 min. 2%/15 min.
Limited virucidal efficacy* (incl. HIV, HBV, HCV):	1% (10g/l)/15 min.
Inactivating human rotaviruses:	0.25% (2.5g/l)/2 mins.
Concentration for TbB:	2% (20g/l)/60 mins.
Physico-chemical data:	
Liquid:	
Density:	clear, green
pH value (1%):	approx. 1g/ml approx. 10

Type	Capacity Litres	PK	Cat. No.
Bottle	2	1	**9.192 569**
Jerrycan	5	1	**9.192 570**

Gloves ovens please see page 213.

2



2 Surface disinfection Pursept®-A Xpress

BRAND

Pursept®-A Xpress is a ready-to-use preparation for rapid disinfection and cleaning of surfaces and instruments (e.g., liquid handling instruments). It works in only 15 secs. - even before the surface dries. DGHM tested and RKI compliant. Dermatologically tested for skin tolerance. For RKI compliant use, apply Pursept®-A Xpress full strength to a disposable cloth. Then thoroughly wipe off the area to be disinfected with the wet cloth. Be sure to wipe everything completely. The surface should remain moist during the entire working time.
Use disinfectants safely. Always read the label and product information before use.

Contents per 100g:	55g ethanol, 0.03g N-alkyl aminopropyl glycine; auxiliary agents.
Microbiological power/application concentration:	
Surface disinfection:	
Bacteria and fungi with little organic burden with mechanics acc. to DGHM/VAH* directives:	15secs.
Limited virucidal efficacy** (incl. HIV, HBV, HCV):	15secs.
Effectiveness against TbB:	30secs.
Physico-chemical data:	
Liquid:	colourless, transparent
Density:	approx. 0.9g/cm³
pH value:	approx. 7.5

Type	Capacity Litres	PK	Cat. No.
Pump spray bottle (without cap)	1	1	**9.192 567**
Jerrycan	5	1	**9.192 568**
Spray cap		1	**9.192 566**

*Tested according to standard DGHM methods of surface disinfection. Latest version: 9/1/2001
**As recommended by the Robert-Koch-Institute (RKI), Bundesgesundheitsblatt 01/2004

E & OE.



deconex®

Swiss Quality

Analytically pure laboratory glassware with deconex®

Residues? Incorrect analytical results? Avoid this risk by using professional deconex® cleaner.

deconex® - the optimal solution

	Application			
Your work is	↓ analytical	↓ preparative	↓ microbiological	↓ petrochemical
Automated cleaning				
The standard solution for the efficient cleaning:				
deconex® 22 LIQ-x Liquid, alkaline cleaner. No phosphates, chlorine or surfactants. NTA- and EDTA-free. Outstanding dispersing power.	●	○	●	○
deconex® 25 ORGANACID Phosphate-free neutraliser on the basis of organic acid.				
The power solution for high-performance processes:				
deconex® 24 LIQ Surfactant-free cleaner for particularly stubborn residues. NTA- and EDTA-free. Contains active chlorine.	○	●	●	●
deconex® 26 MINERALACID Liquid neutralising agent on the basis of inorganic acid.				
deconex® 22 HPF-x Liquid, highly alkaline cleaner. No phosphates, chlorine or surfactants. NTA- and EDTA-free.	○	●	●	●
deconex® 26 PLUS Liquid, acidic cleaner.				
Manual cleaning				
deconex® 12 PA-x Mild alkaline cleaner. Chlorine-free. High swelling capacity to combat stubborn residues. Also suitable for delicate equipment. NTA- and EDTA-free.	●	○	○	○
deconex® 15 PF-x Phosphate-, chlorine-, NTA- and EDTA-free cleaner. Versatile.	●	●	●	○

deconex® - Next generation cleaners

Think about tomorrow today and use natural resources with care!

Borer Chemie AG is an innovative company that invests heavily in research and development. Our stated aim is to implement optimised processes and the most modern formulations to provide our customers with perfect cleaning results.
We take care to make our products environmentally friendly and to ensure they also offer users added value with respect to safety at work. Our formulations comply with the latest directives and regulations; all of our products are EDTA and NTA-free (classified with R40).

1



9.192 920

Laboratory cleaner deconex® LABCLEAN

Borer Chemie AG

Acidic, ready-to-use cleaner for dissolving lime deposits and for eliminating other acid-soluble residues. Especially suitable for washbasins, heating and thermostat baths, and ultrasonic systems. Also the outer surfaces of laboratory devices can be cleaned. With a trickle-down effect that reduces surface recontamination. Not suitable for aluminium, tin, zinc, marble, limestone or non acid-resistant types of enamel. Chlorine-free. Phosphate-free. Easily biodegradable.

Capacity l	Description	PK	Cat. No.	
0.50	Bottle, empty, incl. spray head*	1	**9.192 922**	
1.00	Bottle	1	**9.192 920**	1
5.00	Canister	1	**9.192 921**	

*spray nozzle fits only for 0.5 l bottle

2



9.192 949

Laboratory glass cleaner deconex® 12 PA-x

Borer Chemie AG

Liquid, mildly alkaline concentrate for manual cleaning of laboratory glassware. Versatile use. Active against stubborn residues due to excellent emulsifying and dispersing capabilities. Suitable for soaking and in ultrasonic baths. NTA-free.

Capacity kg	Type	PK	Cat. No.	
1.3	12 PA-x, liquid	1	**9.192 948**	
7.0	12 PA-x, liquid	1	**9.192 949**	2
14.0	12 PA-x, liquid	1	**9.192 950**	

3



9.192 893

Laboratory glass cleaner, deconex® 15 PF-x, liquid, phosphate free

Borer Chemie AG

Alkaline cleaning concentrate for manual use. Universally applicable. Suitable for soaking and ultrasonic baths, as well as for pipette washing machines. Phosphate-free, excellent for phosphate-critical applications, e.g. in environmental and water laboratories. High performance cleaning without discharging phosphates into the waste water. Chlorine-free. Easily biodegradable. Perfect results even at low concentration.

Capacity kg	Type	PK	Cat. No.	
1.0	15 PF-x, liquid	1	**9.192 892**	
5.0	15 PF-x, liquid	1	**9.192 893**	3
10.0	15 PF-x, liquid	1	**9.192 894**	
28.0	15 PF-x, liquid	1	**9.192 895**	

4



6.238 630

Laboratory glass cleaner, deconex® 22 LIQ-x/deconex® 22 PF

Borer Chemie AG

Alkaline cleaning concentrate for the automated cleaning of laboratory equipment. Universally applicable. Specially recommended for the residue-free cleaning of laboratory glass and other laboratory utensils. High cleaning performance without chlorine, surfactants or phosphates.

Capacity kg	Type	PK	Cat. No.	
6.0	22 LIQ-x, liquid	1	**6.238 630**	4
12.0	22 LIQ-x, liquid	1	**9.192 946**	
30.0	22 LIQ-x, liquid	1	**9.192 947**	
10.0	22, PF, powder	1	**9.192 907**	

E & OE.

Laboratory glass cleaner deconex® 22 HPF-x

Strongly alkaline, special cleaning concentrate for automated cleaning. Suitable for the universal application in laboratories; also for the effective cleaning of animal cages. *Borer Chemie AG*
Phosphate-free. Chlorine-free. Surfactant-free. High performance against persistent residues or dried-on soils without discharging phosphates and surfactants into the waste water. The ecological solution for the professional cleaning.

Capacity kg	Type	PK	Cat. No.
1.3	22 HPF-x, liquid	1	**9.192 896**
6.0	22 HPF-x, liquid	1	**9.192 897** 1
12.0	22 HPF-x, liquid	1	**9.192 898**
30.0	22 HPF-x, liquid	1	**9.192 899**

1

9.192 897

Laboratory glass, deconex® 24 LIQ/deconex® 24 FORTE

Strongly alkaline, special cleaning concentrate with active chlorine for automated cleaning. Universally applicable. Particularly suitable against persistent residues and soils. Surfactant-free. *Borer Chemie AG*

Capacity kg	Type	PK	Cat. No.
7.0	24 LIQ, liquid	1	**9.192 932** 2
14.0	24 LIQ, liquid	1	**9.192 908**
35.0	24 LIQ, liquid	1	**9.192 909**
10.0	24 FORTE, powder	1	**9.192 910**

2

9.192 932

Laboratory glass, deconex® 25 ORGANACID

Acidic agent for neutralising carried over alkaline residues. For automated cleaning; shortens the rinsing cycles and reduces rinse water consumption. Can also be used for pre-cleaning or for cleaning, e.g. against lime deposits. Suitable for aluminium and sensitive materials. Chlorine-free. Surfactant-free. Phosphate-free. *Borer Chemie AG*

Capacity kg	Type	PK	Cat. No.
5.0	25 ORGANACID, liquid	1	**9.192 911** 3
10.0	25 ORGANACID, liquid	1	**9.192 912**
25.0	25 ORGANACID, liquid	1	**9.192 913**

3

9.192 911

Laboratory glass, deconex® 26 MINERALACID/deconex® 26 PLUS

Acidic agent for neutralising carried over alkaline residues. For automated cleaning; shortens the rinsing cycles and reduces rinse water consumption. Can also be used for pre-cleaning or for cleaning, e.g. for removing acid soluble residues. Ideally suitable for chromium steel. Chlorine-free. Surfactant-free. *Borer Chemie AG*
deconex® 26 PLUS is also highly effective in cleaning of animal cages and animal drinking bottles.

Capacity kg	Type	PK	Cat. No.
5.0	26 MINERALACID, liquid	1	**9.192 914** 4
10.0	26 MINERALACID, liquid	1	**9.192 915**
25.0	26 MINERALACID, liquid	1	**9.192 916**
7.0	26 PLUS, liquid	1	**9.192 917**
12.0	26 PLUS, liquid	1	**9.192 918**
35.0	26 PLUS, liquid	1	**9.192 919**

4

9.192 914

5 Instrument disinfectant and cleaner, Helipur®

For use on instruments and laboratory equipment made of metal, glass and ceramics. *B. Braun*
- Effective against bacteria incl. T.B.-B, fungi, lipophilic viruses including Hepatitis B and HIV, adeno and vaccinia viruses
- Disinfection and cleaning in one single operation; contaminated instruments are placed directly in the standard solution. No prior or subsequent manual cleaning is necessary.
- DGHM (German Hygiene and Microbiology Society) listed.

Application concentration: 1.5% reaction time 60 min = 15ml in 1L water

Type	Capacity ml	PK	Cat. No.
Carboy	5000	1	**9.191 255**

5


1



1 Disinfectant for temperature-sensitive materials, Helipur® H plus N

B. Braun

Liquid concentrate for disinfecting flexible endoscopes, anaesthetic accessories, rubber and plastic items.
- Also suitable for disinfecting metal, glass and ceramics
- Effective against bacteria incl. T.B.-B, spores, fungi, lipophilic viruses including Hepatitis-B and HIV, coxackie, adeno and vaccinia viruses
- Can also be used in ultrasonic baths
- Formaldehyde free
- Material compatability reports are available from leading manufacturers.

Use disinfectants safely. Always read the label and product information before use.

Application concentration: 1.5% reaction time 60mins. = 15ml in 1L water
1.0 % reaction time 60 mins. = 10 ml in 1 L water

Type	Capacity ml	PK	Cat. No.
Dosing bottle	1000	1	**9.191 277**
Jerrycan	5000	1	**9.191 278**

2



2 Instrument disinfection, Mucocit® T

BRAND

A fresh fragranced solution with exceptional cleaning power and disinfection in only 5 minutes due to the Active-Power-PLUS formula. Ideal for sensitive instruments, thanks to a unique material tolerance. Mucocit® T is used for manual instrument cleaning in a soaking or ultrasonic bath. Use disinfectants safely. Always read the label and product information before use.

Contents per 100g:	3.9g didecyl-dimethyl-ammonium chloride, 4.5g alkylpropylendiamine-1.5-bisguanidiniumacetate, 2g bis(-aminopropyl)-laurylamine, 2.8g laurylpropylenediamine, 5-15% non-ionic tenside surfactants, auxiliary agents.
Microbiological power/application concentration:	
DGHM/VAH*bacteria and fungi as well as tuberculocide and myobactericide with high organic stress:	1%/60 min., 2%/30 min., 3%/15 min.
Limited virucidal efficacy** (incl. HIV, HBV, HCV):	1%/5 min.
Inactivation of rotaviruses:	2%/5 min.
Physico-chemical data:	
Liquid:	blue, transparent
Density:	approx. 1g/ml
dpH value (1%):	approx. 10

Type	Capacity Litres	PK	Cat. No.
Bottle	2	1	**9.192 550**
Jerrycan	5	1	**9.192 551**

*Tested according to standard DGHM methods of surface disinfection. Latest version: 9/1/2001
**As recommended by the Robert-Koch-Institute (RKI), Bundesgesundheitsblatt 01/2004

3



3 Special cleaner, neodisher® LaboClean A 8

Alkaline intensive detergent for the automated cleaning of laboratory glassware and other utensils for laboratories, powder.

Universally applicable, with excellent cleaning performance and dirt carrying ability. Removes blood, serum, food residues, pharmaceuticals, paints, varnishes, gelatine and other organic residues. Free of surfactants.

Type	Capacity kg	PK	Cat. No.
Bottle	1	1	**9.192 404**
Bucket	10	1	**9.192 403**
Bucket	25	1	**9.192 401**

E & OE.

1 Special cleaner, neodisher® LaboClean GK

Mildly alkaline detergent for the automated cleaning of laboratory glassware and other utensils for laboratories, powder.

Especially for the automated cleaning of glassware for cell and tissue cultures, in the field of microbiology and nuclear medicine as well as in isotope laboratories. Removes residues of culture media, residues of cell and tissue cultures, radioactive contamination, organic colour and pigment contamination. Easy to rinse off. Free of surfactants.

Type	Capacity kg	PK	Cat. No.
Bucket	10	1	**9.192 415**

1



2 Special cleaner, neodisher® LaboClean LA

Highly alkaline intensive detergent for the automated cleaning of laboratory glassware and other utensils for laboratories, powder.

With a highly emulsifying, dispersing and defoaming action. Especially suitable for the removal of fat, oil, resins and paraffin.

Type	Capacity kg	PK	Cat. No.
Bucket	3	1	**9.192 418**
Bucket	25	1	**9.192 417**

2



3 Special cleaner, neodisher® MA

Alkaline detergent for the automated reprocessing of thermostable and thermolabile instruments, powder.

Excellent cleaning action and material compatibility. Free of oxidising agents.

Type	Capacity kg	PK	Cat. No.
Bottle	1	1	**9.192 406**
Bucket	10	1	**9.192 405**

3



4 Special cleaner, neodisher® LaboClean UW

Mildly alkaline detergent for the automated cleaning of laboratory glassware and other utensils for laboratories, powder.

Especially suitable for the automated cleaning of laboratory glassware and utensils in water analysis laboratories, in serological institutes and in the phosphates industry, where residues of phosphorous compounds would be adulterate analysis results. Free of phosphates.

Type	Capacity kg	PK	Cat. No.
Bucket	10	1	**9.192 445**

4



5 Special cleaner, neodisher® LaboClean F

Highly alkaline intensive detergent for the automated cleaning of laboratory glassware and other utensils for laboratories, powder.

With excellent cleaning performance. Especially suitable for the removal of resins, organic colourants and residues of felt-tip pens. Good complexing and dispersing action. Free of phosphates and surfactants.

Type	Capacity kg	PK	Cat. No.
Tubs	3	1	**9.192 387**
Bucket	25	1	**9.192 410**

5



1



1 Special cleaner, neodisher® FA

"Classical" alkaline detergent for the automated reprocessing of thermostabile and thermolabile instruments, liquid concentrate.

Excellent cleaning action and material compatibility. Free of surfactants and oxidising agents.

Type	Capacity	PK	Cat. No.
Canister	5 l	1	**9.192 435**
Canister	10 l	1	**9.192 431**
Canister	25 kg	1	**9.192 434**

2



2 Special cleaner neodisher® LaboClean FLA

Alkaline intensive detergent for the automated cleaning of laboratory glassware and other utensils for laboratories, liquid concentrate.

Universally applicable. With excellent cleaning performance. Removes stubborn oily and other organic residues. Free of surfactants, phosphorous compounds and oxidising agents.

Type	Capacity	PK	Cat. No.
Canister	5 l	1	**9.192 446**
Canister	10 l	1	**9.192 447**
Canister	25 kg	1	**9.192 448**

3



3 Special cleaner, neodisher® LaboClean FT

Alkaline detergent for the automated cleaning of laboratory glassware and other utensils for laboratories, liquid concentrate.

Especially suitable for the residue-free cleaning of pharmacy glass bottles, infusion flasks, glassware for cell and tissue culture as well as utensils for microbiology and nuclear medicine. Removes residues of culture media, blood, proteins, radioactive contamination, residues of cell and tissue cultures as well as other organic residues. With oxidation action, free of surfactants.

Type	Capacity kg	PK	Cat. No.
Canister	12	1	**9.192 436**
Canister	25	1	**9.192 437**

4



4 Special cleaner neodisher® N

Acidic neutralising agent and detergent for the automated cleaning of laboratory glassware and other utensils for laboratories, liquid concentrate.

For neutralising carried over alkaline residues as well as for the acidic pre-cleaning resp. cleaning of laboratory glassware. Lime and other acid-soluble residues are removed. Easy to rinse off. Based on phosphoric acid. Free of surfactants.

Type	Capacity	PK	Cat. No.
Bottle	1 l	1	**9.192 422**
Canister	5 l	1	**9.192 421**
Canister	12 kg	1	**9.192 420**
Canister	25 kg	1	**9.192 423**

5



6



5 6 Special cleaner neodisher® Z

Acidic neutralsing agent and detergent for the automated cleaning of laboratory glassware and other utensils for laboratories, liquid concentrate.

For neutralising carried over alkaline residues as well as for removing acid-soluble residues in laboratories where residues of phosphates, nitrogen or surfactants would adulterate analysis results and where particular material compability is necessary. Based on organic acids. Free of surfactants and phosphates.

Type	Capacity Litres	PK	Cat. No.
Bottle	1	1	**9.192 426**
Canister	5	1	**9.192 425**
Canister	10	1	**9.192 427**
Canister	20	1	**9.192 428**

E & OE.

1 Special cleaner neodisher® LM 3 for pipettes

Alkaline cleaner for the manual cleaning and pre-cleaning of laboratory glassware as well as for the cleaning of pipettes and viscometers in special washers, liquid concentrate.

Especially suitable for the cleaning of laboratory glassware in water, phosphates and metal laboratories and in laboratories where enzymatic and serological analyses are conducted. Also suitable for automated cleaning. Low foam. Free of phosphates.

Type	Capacity Litres	PK	Cat. No.
Bottle	1	1	**9.192 442**
Canister	10	1	**9.192 441**

For glass pipettes - please see page 887.

1



2 Special cleaner, neodisher® MediClean forte

Alkaline universal detergent for the automated and manual reprocessing of thermostable and thermolabile instruments, liquid concentrate.

Excellent material compatibility, universally applicable. Residues of dried-on and denaturated blood are reliably removed. Prevents re-deposition of protein residues. Contains alkalis and surfactants.

Capacity	Capacity Litres	PK	Cat. No.
Canister	5	1	**6.228 020**

2



3 Universal cleaner, Mucasol®

High performance, alkaline cleaning concentrate in liquid form for soaking and ultrasonic cleaning baths. *BRAND*
Suitable for use on laboratory equipment and intruments made of glass, porcelain, plastic, rubber and metal. Items are cleaned in ~ 10 - 30mins, without mechanical help. An alternative to chromosulphuric acid mixtures, free from chlorine and caustic alkalines, non-toxic, non-corrosive and is biodegradable. Zinc and non-anodized aluminium items should not be immersed in Mucasol® for long periods as corrosion may occur. Also suitable for wiping down surfaces.

Contents:	>30% phosphates, <5% anionic surfactants, amphoteric surfactants, complexing agents, corrosion inhibitors, auxiliary agents
Application concentration:	
In ultrasonic baths:	0.2% to 2% (1.4ml/l to 14ml/l)
In soaking baths:	0.7% to 3% (5ml/l to 22ml/l)
Physico-chemical data:	
Liquid:	light green, transparent
Density:	approx. 1.4g/ml
pH value (0.7%):	approx. 11.5
pH value (3%):	approx. 11.7

Type	Capacity Litres	PK	Cat. No.
Bottle	2	1	**9.192 501**
Jerrycan	5	1	**9.192 507**

3



Skin protection - please see page 234.

4 5 Cleaning Office, technical cleaning cloths with alcohol

Moist, non-woven cloths in a re-sealable dispensing pack. For the cleaning of, and caring for, all office equipment. With antistatic and disinfectant action.
Dimensions: 138mm x 190mm
Shelf life: unopened, 30 months without loss of quality

Pack size	PK	Cat. No.
Dispensing pack of 100 tissues	1	**9.190 977**
Refill pack of 100 tissues	1	**9.190 976**

4



5



1



1 Screen cleaner

For cleaning and caring for glass and plastic screens, glass panels, mirrors and lenses of copiers and microfiche readers as well as hoods and plexiglas components. For the easy removal of dirt, grease and nicotine. With antistatic agent. Spray bottle without propellant.

Type	Capacity ml	PK	Cat. No.
Screen cleaner	200	1	**9.190 975**
Refill bottle	1000	1	**9.190 974**

2



2 Dust remover spray DRUCKLUFT 67

Compressed air spray for contact-free removal of dust and dirt in hard-to-reach places using the capillary tube nozzles attached. Safe, clean, oil-free. Acc. to Aerosol policy 75/324/EWG no danger of inflammation or explosion when using as intended. DRUCKLUFT 67 contains pure and dry compressed gas and is very efficient.

Examples of use:
photography, precision electronics, watchmaking, cameras, medical technology, microscopy, research.

Pressure: 4.2 bar (20°C)
Density: 1.00g/cm³ (20°C)

Capacity ml	PK	Cat. No.
200	1	**9.412 800**
400	1	**9.412 801**

3



3 Dust remover spray Druckluft 67 SUPER

Spray for the contact-free removal of dust and dirt from hard-to-reach places. For highest safety also for devices under electric tension. Acc. to Aerosol policy 75/324/EWG no danger of inflammation or explosion even in the presence of ignition sources. DRUCKLUFT 67 SUPER contains pure and efficient compressed gas. Especially suitable for work under electric tension and for ex-use.

Examples of use:
photography, precision electronics, watchmaking, cameras, medical technology, microscopy.

Pressure: 4.6 bar (20°C)
Density: 1.17g/cm³ (20°C)
Gas volume: 400ml can produces 116L gas at 20°C and 1bar.

Type	Capacity ml	PK	Cat. No.
Spray can	400	1	**9.412 805**

Label solvent - please see page 157.

E & OE.

1 LLG-Laboratory and hygienic tissues, 2-ply, 150 wipes

Laboratory and hygienic tissues
- contains 150 white, double-ply tissues, 210mm x 220mm
- highly absorbent and ultra-soft
- for sensitive application areas

Carton of 30 boxes with **150 wipes**

High quality holder, plated - please order separately.

Pack size	PK	Cat. No.
Carton of 30 boxes with 150 wipes	30	**9.413 220**
Holder for LLG-Laboratory and hygienic tissues	1	**6.254 918**

1



2 3 Facial Tissues Kleenex®, 2-ply, 100 wipes

Convenient tissues, well-known for comfort and performance. Very soft and absorbent. The leading brand. Hygienic and economical. Individually self-dispensing tissues, ready for use at any time. 100% fresh cellulose, 2-ply, white. FSC-certified. *Kimberly-Clark*

Pack size	PK	Cat. No.
Box of 100 tissues	1	**9.413 014**

2



3



4 Precision wipes, KIMTECH SCIENCE*, 1-ply

Tissue wiping cloth for precise, critical cleaning in the electronic, optic and precision mechanics industries, lint-free, highly absorbent and strong, even when wet. 1-ply, white. *Kimberly-Clark*

Pack size	PK	Cat. No.
Box of 196 wipes, 300 x 300mm	1	**9.413 020**
Box of 280 wipes, 110 x 210mm	1	**9.413 021**

4



5 Laboratory wipes, KIMTECH SCIENCE*, 2-ply

Tissue wiping cloth for professional use in laboratories. Highly absorbent and soft for wiping up small amounts of liquid and for cleaning pipettes and microscope slides. Chemical resistant and chemically neutral. 2-ply, white. *Kimberly-Clark*

Pack size	PK	Cat. No.
Box of 100 wipes (200mm x 210mm)	1	**9.413 017**
Box of 200 wipes (205mm x 200mm)	1	**9.413 015**

5



6 Cleaning wipes, KIMTECH*Process Wiper, cloths

Blue, super strong, robust, lint-free, PP reusable wiping cloths, ideal for residue-free wet cleaning with cleaning agents and solvents as well as wiping up oil and grease. Folded into quarters, embossed. Sold in packs of 12 bags containing 35 cloths. *Kimberly-Clark*

Width mm	Length mm	Colour	PK	Cat. No.
490	380	blue	12	**9.413 070**

6



7 Cleaning cloths, KIMTECH* 7505

Soft and gentle, yet strong. White, embossed, sterilisable. Individual cloths 32cm x 38cm. Hydronit*material. *Kimberly-Clark*

Pack size	PK	Cat. No.
Bag of 50 cloths	1	**9.413 033**

7



1



1 Microfibre cloths WYPALL*

Kimberly-Clark

- Lifts and traps dirt from surfaces for fast and efficient cleaning
- No chemicals required, helps reduce annual cleaning cost
- Absorbs & retains up to 8 times its weight in liquid efficient cleaning
- Can be washed up to 300 times for better cost control
- Available in 4 different colours, enables task segragation and helps to reduce cross contamination
- Green cloth has smooth texture for glass and mirror cleaning

Sold in packs of 4 bags containing 6 cloths.

Colour	PK	Cat. No.
Yellow	6	**9.413 081**
Blue	6	**9.413 082**
Red	6	**9.413 086**
Green	6	**9.413 083**

2



2 Wipes, WYPALL*L 30

Kimberly-Clark

AIRFLEX*fabric. Strong and fast absorbing wipes for general purpose use, especially for oil and grease. High tensile strength in wet conditions for rapid cleaning.

Type	Nr. of wipes	Width mm	Length mm	PK	Cat. No.
Large roll, blue	500	235	380	1	**9.413 054**
Large roll, blue	500	330	380	1	**9.413 044**
Centre feed Roll, white	6 x 300	205	380	6	**9.413 091**

Washing-up gloves please see page 217.

3



3 LLG-Laboratory tissues, roll, 102 sheets 3-ply

Roll with 102 sheets (220 x 260mm).
- strong when wet
- absorbent
- low lint

Type	PK	Cat. No.
roll of 102 tissues	2	**9.413 224**
roll of 102 tissues (advantage pack)	28	**9.413 225**

4



4 Laboratory tissues, roll , 2-ply

Kimberly-Clark

Particularly absorbent, white, 2-ply, perforated, embossed tissue.
Dimensions 270 x 230mm.

Type	Pack size	PK	Cat. No.
SCOTT® EXQUISTA	Rolls of 150 tissues	2	**9.413 078**

5



5 Cleaning wipes, KIMTECH*Process Wiper, roll

Kimberly-Clark

Super strong, robust, reusable lint-free PP wipes. Ideal for residue-free wet cleaning of smooth surfaces with cleaning agents and solvents and for wiping up oil and grease.
Perforated large roll, embossed, blue, 500 cloths per roll.

Width mm	Length mm	Colour	PK	Cat. No.
340	380	blue	1	**9.413 065**

E & OE.

1 Wipes, Wypall*L 40

Perforated, blue Airflex*material. Bulky wipes with excellent absorption capacity and wet strength. For cleaning-up large spillages and suitable for most surfaces. Comparable in quality to a 4-ply tissue product.

Kimberly-Clark

Type	Material	No. of wipers	Width mm	Length mm	PK	Cat. No.
Large roll, blue	AIRFLEX*	750	330	380	1	**9.413 046**
Large roll, white	cellulose/latex 82 g/m²	750	315	340	1	**9.413 094**
Large roll, white	cellulose/latex 57 g/m²	950	315	340	1	**9.413 095**

1



2 Cleaning wipes, WYPALL*X 60, tear-resistant

Hydroknit*material.

Kimberly-Clark

The general purpose, extended use, wipe range. Every Wypall*X cloth absorbs liquid rapidly and is puncture and cut-resistant. Extremely hard-wearing and reliable, with excellent tear resistance, even under wet conditions.
The unique Hydroknit*fabric structure used for Wypall*X ensures that these cloths provide long lasting, economical cleaning and wiping across a range of possible applications.

Pack size	Width mm	Length mm	PK	Cat. No.
Large roll (white) of 750 tissues	380	410	1	**9.413 036**
10 boxes (white) of 126 tissues	230	425	10	**9.413 035**
Individual cloths (folded in Z shape), 12 bags of 76 tissues	365	315	12	**9.413 034**
Centre-feed, Barrel Roll (blue) of 150 tissues, textured	245	420	1	**9.413 019**

2



Dispensing systems

Wall and floor dispensing units for small and large rolls.

Kimberly-Clark

For	Width mm	Depth mm	Height mm	Colour	Material	PK	Cat. No.
Wall, for small rolls 260 mm wide	320	150	150	white	plastic	1	**9.413 043** 3
Floor, for large rolls 490 mm wide	515	300	330	blue	Metal	1	**9.413 047** 4

3



9.413 043

4



9.413 047

1



1 Portable floor stand

For large rolls.
With refuse sack.
Metal, blue.

Kimberly-Clark

Type	Width mm	Length mm	Height mm	PK	Cat. No.
Wide	500	740	1090	1	**9.413 055**

2



2 Cleaning wipes, Wypall*L 10 - RCS

Cut down consumption of wiping cloths by up to 40% with the revolutionary Roll Control System from Kimberly-Clark, which is extremely economical to use. The controlled tear-off system prevents waste caused by tearing off overly long strips of paper. A fresh, clean towel is available at any time. The risk of cross contamination is reduced thanks to optimised hygiene. The circular dispenser has no sharp edges or metal parts liable to rust.

Kimberly-Clark

Wypall*L 10 cleaning wipes - RCS
Soft, absorbent wipes. The roll control system enables you to tear off individual towels. 100% recycled Airflex*Material. Perforated, 1-ply, 6 rolls containing 630 sheets, 18.5cm x 38cm, white.

Dispenser for Roll Control System
Dispenser casing for Roll Control System (RCS), plastic, grey transparent.
Dimensions (H x W x D): 305mm x 260mm x 240mm

Type	PK	Cat. No.
WYPALL* L 10 cleaning wipes - RCS	6	**9.413 018**
Roll Control System (RCS)	1	**9.413 013**

5 Hand towels, KLEENEX® Ultra

The new way to get more value for money; tissues made of extremely soft, Airflex*material. So economical, they can be used in any situation.

Kimberly-Clark

Description	Width mm	Length mm	Pack size	PK	Cat. No.
Hand towels, ultra-white, 2-ply	215	415	Clip of 94 tissues	1	**9.413 051**
Hand towels, ultra-white, 2-ply	215	315	30 clips of 124 tissues	30	**9.413 060** 3
Hand towels, ultra-white, 3-ply	215	315	Clip of 96 tissues	1	**9.413 057**
Hand towels, ultra-white, 3-ply	215	415	Clip of 72 tissues	1	**9.413 050** 4

3



9.413 060

4



9.413 050

5

FSC

6



6 Hand Towels, Scott® Performance

Made of highly absorbent, Airflex*material. These rapidly absorbing hand towels are very effective for drying hands due to high moisture absorbency and good wet strength.
1-ply, 70 % recycled material.

Kimberly-Clark

Colour	Pack size	PK	Cat. No.
White	Pack of 180 towels, 215mm x 315mm	1	**9.413 048**
Blue	Pack of 180 towels, 215mm x 315mm	1	**9.413 052**

E & OE.

1 Dispenser AQUARIUS*

NEW!

Kimberly-Clark

In food services, with ever tightening regulations and increasing publicity about food safety, an investment in Aqua® Dispensers may reduce the risk of cross-contamination.
In healthcare, simple measures, like improving the way we wash and dry our hands can help to combat unpleasant and costly healthcare related infections.
- Durable ABS plastic, impact resistant
- Easily topped up and refilled at any time, no need to run out
- High capacity for constant availability and reduced maintenance
- Dispenses famous branded products, high user preference

Type	Width mm	Height mm	Depth mm	PK	Cat. No.
AQUARIUS*	265	399	140	1	**9.412 981**

1



2 Towels, Scott® Plus

Kimberly-Clark

Airflex* material, ultra-white, 1-ply x 35g/m².

Type	Pack size	PK	Cat. No.
Small - cross-folded, 247 x 230 mm	boxes of 180 towels	20	**9.413 108**

2



3 4 Towels, Scott® Excellent Plus

Kimberly-Clark

Airflex* material, ultra-white, 2-ply. SCOTT® Hand Towels are renowned for their reliability, consistent performance and in-use value. Made from AIRFLEX*Highly Absorbent Fabric, they offer an effective and economical solution to your hand drying requirements. The towels are folded and interleaved so that when they are dispensed they provide an individual towel that is ready for use and has been touched only by the user. The system is hygienic and helps to reduce wastage. FSC-certified.

Type	Pack size	PK	Cat. No.
Small - cross-folded, 247 x 230mm	Boxes of 180 towels	20	**9.413 106**
Medium - cross-folded, 250 x 330mm	Boxes of 110 towels	20	**9.413 107**

3



4

FSC

5 LLG-Cellulose tissue in stacking layers

- Unbleached or highly bleached
- Dimensions: 400mm x 600mm
- Pack quantity: 1 x 5kg

Type	PK	Cat. No.
unbleached	1	**9.413 210**
high bleached	1	**9.413 211**

5



6 Askina Brauncel cellulose swabs

B. Braun

Non-sterile. Size 40mm x 50mm. In rolls of 500. Soft, perforated design, easy to tear off. Extremely absorbent and strong.

Type	PK	Cat. No.
Cellulose swabs	500	**9.413 101**
Dispenser	1	**9.413 102**

6





1 Cotton wool

Meets requirements of German Pharmacopeia.
100% viscose.
Medical cotton wool for home use and general hygiene.

Type	Capacity g	PK	Cat. No.
Cotton wool	100	1	**9.413 152**

Surface protector - please see page 178

Chemical Sorbents

3M Deutschland

The sorbents have a high performance. Due to their new microfibre structure, they provide very high absorbing capacities. The light and absorbent material is easy to use and committed to absorb quickly and store the liquid. The absorbed liquid can be extracted, to be used again or to be disposed of separately. The optimal combination of features such as light weight, low volume, very high absorbance, easy handling and low sorbent disposal weight significantly reduces disposal costs in comparison to conventional binding materials. To reduce the final waste content, the used sorbets can be burnt.

Can be used to absorb a variety of lab chemicals:
- acids, such as acetic acid, hydrofluoric acid, phosphoric acid, nitric acid, hydrochloric acid, sulphuric acid
- alkalis, such as sodium hydroxide, potassium hydroxide
- hydrazine: N_2H_4
- hydrogen peroxide

Type	Description	Dimensions (W x D) mm	Absorption*, litres	PK	Cat. No.	
PF 2001	Multi-Format	15.2m x 12cm	37	1	**9.264 101**	2
P 110	Wipes	33cm x 28cm	0.25	50	**9.264 102**	3
P 300	Pillows	28cm x 18cm	2	16	**9.264 103**	4

*Capacity per piece



9.264 101



9.264 102



9.264 103

E & OE.

1 Disposable spill kit SKH-MINI emergency kit

A fully disposable spill kit to clean up small chemical spills quickly, easily and without risk of injuries. *Brady*

- Highly visible green colour.
- The autoclavable disposal bag is heat resistant up to 145°C and therefore guarantees a safe disposal of laboratory waste.
- Adsorbs chemicals, dangerous liquids, water & oil based fluids.
- Suited for spills up to 1.7L.
- The specially designed disposable brush is intended to sweep up any broken glass or debris allowing a safe clean up without risk of injuries.
- Thanks to the compact design, the SKH-MINI can easily be placed in areas where spills are most likely to happen.
- Protective gloves are powder free, have roughened fingertips, increased tear resistance and a good chemical resistance for more safety.

1



Contents:
2 pads 41cm x 51cm
1 pair of disposable chemical protective gloves
1 autoclavable disposal bag
1 disposable brush
1 multilingual instruction guide

Type	PK	Cat. No.
SKH-MINI-Set	1	**9.404 080**

Chemical sorbents emergency kits

Each kit has the optimal combination of different sorbents. *3M Deutschland*
Quick and safe aid for accidental spillages of almost all hazardous liquids.

Type	Size	Absorption*, litres	Capacity	PK	Cat. No.
SK5	7 x 40 x 28cm	approx. 5	10 wipes, 1 pillow, 1 waste bag	1	**9.264 104** 2
SK26	40 x 63cm	approx. 26	10 wipes, 5 pillows, 5 mini socks, 2 waste bags	1	**9.264 105** 3
SK75	53 x 78 x 32cm	approx. 75	100 wipes, 12 pillows, 8 mini socks, 5 waste bags	1	**9.264 106** 4

*Capacity per kit

2



9.264 104

3



9.264 105

4



9.264 106

Brushes, natural bristle

1



9.019 010

3



9.019 030

5



9.019 070

2



9.019 005

4



9.019 035

6



9.019 110

Type	Diam. mm	Length mm	PK	Cat. No.	
Pipette brush	5	480	1	**9.019 010**	1
Pipe cleaner	4	150	100	**9.019 005**	2
Reagent bottle brush with wool tip	10	190	1	**9.019 020**	
Reagent bottle brush with head bundle	10	250	1	**9.019 030**	3
Reagent bottle brush with wool tip	15	280	1	**9.019 035**	4
Reagent bottle brush with wool tip	30	270	1	**9.019 040**	
Erlenmeyer flask and bottle brush with head bundle	50	340	1	**9.019 050**	
Erlenmeyer flask and bottle brush with head bundle	63	470	1	**9.019 060**	
Beaker brush with wooden handle	85	390	1	**9.019 070**	5
Beaker brush with wooden handle	85	430	1	**9.019 080**	
Beaker brush with wooden handle	80	430	1	**9.019 090**	
Beaker brush with extra long wooden handle	80	630	1	**9.019 092**	
Rinsing brush**	60	220	1	**9.019 110**	6
Set *			1	**9.019 002**	
Burette brush with 1m long wire handle	30	1000	1	**9.019 100**	

* Set consisting of order numbers 9.019 010, 9.019 020, 9.019 030, 9.019 040, 9.019 050, 9.019 060, 9.019 070, 9.019 080, 9.019 090 and 9.019 092.
**Nylon

Cleaning brushes

Perlon®. Upper part is made from cotton - Cat.-No. 6.235 964 *Isolab*
Pack of 10.

Description	Length mm	For	PK	Cat. No.	
Brush head 12 x 80mm	120	Narrow tubes	10	**6.235 965**	9
Brush head 25mm x 110mm	120	Tubes	10	**6.235 964**	
Brush head 40 x 100mm	120	Flasks	10	**4.008 502**	7
Brush head 50mm x 120mm	200	Medium flasks	10	**6.235 963**	
Brush head 70mm x 150mm	300	Large flasks	10	**6.235 962**	
Brush with swivel head, head 21mm x 44mm x 24mm	330	vessels with NS 29/32 or diam. 24 mm	10	**6.242 423**	10
Brush head 20mm x 120mm	650	burettes and tubing	10	**6.235 961**	8

7



4.008 502

8



6.235 961

9



6.235 965

10



6.242 423

1 Flexible bottle brush

For round and Erlenmeyer flasks from 500ml to 5000ml with NS 29 or wider neck . Comprises replaceable, flexible head with short, stiff bristles on a long wooden handle. Total length approx. 420mm.

Type	PK	Cat. No.
Bottle brush with head locking pin	1	**9.019 150**
Spare brush head	1	**9.019 152**



2 Hair brushes, oval

Black goat hair. In metal mounts on round wood handle.

Size	Diam. mm	PK	Cat. No.
0	6	1	**9.172 025**
1	7	1	**9.172 026**
2	8	1	**9.172 027**



3 Hair brushes, broad

Bear bristle. Blunt head. Flat stem.

Width mm	Wall thickness mm	Hair length mm	PK	Cat. No.
12.5	3.9	16	1	**9.172 042**
19.0	3.9	18	1	**9.172 043**
25.4	4.1	22	1	**9.172 044**



4 Red marten-hair brushes

Silver ferrule. Black enamelled round handle.

Size	Hair length mm	PK	Cat. No.
0	8	1	**9.172 050**
1	9	1	**9.172 051**
2	11	1	**9.172 052**
3	13	1	**9.172 053**
4	15	1	**9.172 054**
5	18	1	**9.172 055**
6	19	1	**9.172 056**



1



1 Brush set, water-colour

Water-colour brushes, round, fine hair blend.
Pack of one each: sizes 2/0, 0, 1, 2, 3 , 4.

Type	PK	Cat. No.
Brush set, water-colour	1	**9.172 060**

2



2 Brush set, silk painting

Silk painting brush set, comprising of one each - round tip, sizes 1, 4, 8; textured brush size 18.

Type	PK	Cat. No.
Brush set, silk painting	1	**9.172 062**

3



3 Brush set

Comprising of one each - round sizes 0, 4 and 6, flat sizes 6 and 10.

Type	PK	Cat. No.
Brush set	1	**9.172 063**

4



4 Brush set

Comprising one each size 3 round and pointed, size 0 flat and pointed and size 1 wide hair brushes.

Type	PK	Cat. No.
Brush set	1	**9.172 061**

5



5 Brush bag

Empty, imitation leather bag, for 8 brushes.

Type	PK	Cat. No.
Brush bag	1	**9.172 064**

6



6 Draining racks, PE-coated wire

PE-coated wire.
Wall or bench mounting.
With drip channel and plastic covered feet.
Dimensions (L x W x H): 420mm x 160mm x 610mm.

Description	PK	Cat. No.
For 60 reagent bottles and 5 flasks	1	**9.003 305**
For 24 reagent bottles and 20 flasks	1	**9.003 320**

7



7 Draining rack, PS

Wall mounting, with wide draining trough. Pegs can be inserted as required. Peg holes are sealed at the rear to prevent water leakage penetrating the wall behind. *Kartell*
Supplied with 72 pegs (15mm diameter, 95mm long), 11 small pegs (6mm diameter, 95mm long) drain tubing and fittings for wall mounting.
Dimensions (L x W x H): 450 x 63 x 110mm

Rods 95 x 15mm Quantity	Rods 95 x 6mm Quantity	Description	PK	Cat. No.
72	11	Draining rack, wallmount possible	1	**9.003 240**
	11	Place supports	11	**9.003 032**
72		Place supports	72	**9.003 033**

E & OE.

1 Draining rack LaboPlast®, PVC

Wall mounting. Perforated with holes to take interchangeable pegs as indicated. Supplied complete with wall-mounting screws and dowels, PVC outlet channel and drainage connection.

Bürkle



Rods 60 x 6 mm Quantity	Rods 100 x 10 mm Quantity	Rods 150 x 12 mm Quantity	Width mm	Height mm	PK	Cat. No.
5	26	2	400	400	1	**9.003 374**
10	39	4	500	500	1	**9.003 375**
15	56	6	600	600	1	**9.003 376**

Draining Rack, ABS

Laboratory space is always in high demand making the small footprint of the Scienceware® Lab-Aire® II Drying Racks a practical solution for drying and storing fragile, frequently used labware. Benchtop Dryers lets you place your dryer wherever it will be most convenient and a sturdy base provides excellent balance and support. Wallmount dryers keep labware up off the bench and out of the way as it dries. Easily installs on walls or standard pegboard using molded-in tabs with key hole openings. Hardware not included.

Bel-Art Products

- Rugged ABS plastic will never corrode and easily wipes clean
- Drip/storage trays have scalloped wells to hold long thin labware
- 3 different sizes of pegs can be moved and repositioned to hold a variety of labware including beakers, flasks, bottles, test tubes and cylinders
- With drain



9.003 301



9.003 306

Rods 76 mm Quantity	Rods 310 mm Quantity	Rods 127 mm Quantity	Width mm	Height mm	Depth mm	Description	PK	Cat. No.
6	7	6	375	240	127	Wallmount possible	1	**9.003 301** 2
12	14	12	375	390	178		1	**9.003 302**
18	21	18	375	594	127	Wallmount possible	1	**9.003 303**
12	14	12	375	417	127	Wallmount possible	1	**9.003 304**
18	21	18	375	570	178		1	**9.003 306** 3

SONOREX
SONOPULS
SONOCOOL
SONOSHAKE

Chemical agents
TICKOPUR + STAMMOPUR



High-power ultrasonic baths and homogenisers in laboratories

- Cleaning and Disinfecting
- Homogenizing
- Emulsifying
- Degassing
- Sample preparation

60 years of experience in ultrasond technology

www.bandelin.com

Ultrasonic baths Sonorex

Sonorex Super ultrasonic baths *Bandelin*

These devices work at 35kHz and have PZT transducers for maximum cleaning power. SweepTec for permanent sound field oscillation ensures even and gentle cleaning®. Integrated heating is available. Power information: High ultrasonic peak power and HF-power 230V, 50/60Hz, or 115V. All models are spill-proof with stainless steel tanks (RK 102H hard-chromium plated) and outer cases, drip proof.

Sonorex Digitec ultrasonic baths

Modern digital ultrasonic baths. These devices work at 35kHz and have PZT transducers for maximum cleaning power. SweepTec for permanent sound field oscillation ensures even and gentle cleaning®. Optional with heater 20-80°C, thermostatically adjustable, with LED-display for target value and actual value of temperature. Optical signal in case of excess temperature. 4 sizes are spray-proof with stainless steel tanks and outer cases. All devices are available with infrared interface.

Sonorex Technik - welded tanks.

Capacities up to 245L and internal tank length up to 1000mm. Frequency 40kHz. From RM 110 UH upwards 25kHz are possible.

Sonorex ultrasonic pipette cleaner.

Automatic ultrasonic cleaning and rinsing of pipettes or other glassware.

All units are CE marked.

1 Ultrasonic baths, Sonorex Super

- Type RK 102 H and above supplied with outlet, 1 to 15 min. timer and continuous operation. *Bandelin*
- Type H with heating adjustable from 30 to 80°C, 230V~, or 115V~.
- Types RK 106, RK 1028 C and RK 1040 are ideal for sieve cleaning.

Type	Internal dimensions (W x D x H) mm	Capacity L	Ultra-sonic power W	HF peak power W_{eff}	Heating power W	PK	Cat. No.
RK 31	190 x 85 x 60	0.90	240	30		1	**9.877 021**
RK 52	150 x 140 x 100	1.80	240	60		1	**9.877 052**
RK 52 H	150 x 140 x 100	1.80	240	60	140	1	**9.877 051**
RK 100	240 x 140 x 100	3.00	320	80		1	**9.877 100**
RK 100 H	240 x 140 x 100	3.00	320	80	140	1	**9.877 101**
RK 102 H	240 x 140 x 100	3.00	480	120	140	1	**9.877 103**
RK 103 H	240 x 140 x 150	4.00	560	140	200	1	**9.877 114**
RK 106*	130 x 240*	5.60	480	120		1	**9.877 106**
RK 156	500 x 140 x 100	6.00	640	160		1	**9.877 156**
RK 156 BH	500 x 140 x 150	9.00	860	215	600	1	**9.877 155**
RK 255 H	300 x 150 x 150	5.50	640	160	280	1	**9.877 256**
RK 510	300 x 240 x 150	9.70	640	160		1	**9.877 510**
RK 510 H	300 x 240 x 150	9.70	640	160	400	1	**9.877 511**
RK 512 H	300 x 240 x 200	13.00	860	215	400	1	**9.877 512**
RK 514	325 x 300 x 150	13.50	860	215		1	**9.877 540**
RK 514 H	325 x 300 x 150	13.50	860	215	600	1	**9.877 516**
RK 514 BH	325 x 300 x 200	18.70	860	215	600	1	**9.877 515**
RK 1028	500 x 300 x 200	28.00	1200	300		1	**9.877 537**
RK 1028 H	500 x 300 x 200	28.00	1200	300	1300	1	**9.877 529**
RK 1028 C	500 x 300 x 300	45.00	2000	500		1	**9.877 528**
RK 1040*	195 x 500*	39.50	1200	300		1	**9.877 108**
RK 1050	600 x 500 x 200	58.00	2400	600		1	**9.877 551**

* Ø x D

1



1



1 Ultrasonic baths SONOREX DIGITEC/SONOREX DIGIPLUS

Bandelin

4-step "plug and clean" operation - heater range 20 to 80°C, thermostatically adjustable, with LED display for target and actual temperature values - optical signal in case of overtemperature - timer for countdown and continuous operation -Degas: adjustable pulse sound level for removing unwanted air bubbles, with LCD display indicator - spray-proofed, stainless steel housing, protection class: IP33 - SweepTec® for permanent frequency oscillation - 230V~ 50/60Hz, or 115V~.

DL-Models additionally with power setting 20 to 100%.

Type	Int. tank dims. (W x D x H)	Capacity	Ultra-sonic power	HF peak power	Heating power	PK	Cat. No.
	mm	L	W	W eff	W		
DT 31	190 x 85 x 60	0.9	240	30		1	**9.877 830**
DT 31 H	190 x 85 x 60	0.9	240	30	70	1	**9.877 831**
DT 52	150 x 140 x 100	1.8	240	60		1	**9.877 832**
DT 52 H	150 x 140 x 100	1.8	240	60	140	1	**9.877 833**
DT 100	240 x 140 x 100	3.0	320	80		1	**9.877 834**
DT 100 H	240 x 140 x 100	3.0	320	80	140	1	**9.877 835**
DT 102 H	240 x 140 x 100	3.0	480	120	140	1	**9.877 836**
DT 103 H	240 x 140 x 150	4.0	560	140	200	1	**9.877 837**
DT 156	500 x 140 x 100	6.0	640	160		1	**9.877 838**
DT 255	300 x 150 x 150	5.5	640	160		1	**9.877 839**
DT 255 H	300 x 150 x 150	5.5	640	160	280	1	**9.877 840**
DT 510	300 x 240 x 150	9.7	640	160		1	**9.877 841**
DT 510 H	300 x 240 x 150	9.7	640	160	400	1	**9.877 842**
DT 106	Ø 240, 130 Tief	5.6	480	120		1	**9.877 848**
DT 156 BH	500 x 140 x 150	9.0	860	215	600	1	**9.877 849**
DT 512 H	300 x 240 x 200	13.0	860	215	400	1	**9.877 850**
DT 514	325 x 300 x 150	13.5	860	215		1	**9.877 851**
DT 514 H	325 x 300 x 150	13.5	860	215	600	1	**9.877 852**
DT 514 BH	325 x 300 x 200	18.7	860	215	600	1	**9.877 853**
DT 1028	500 x 300 x 200	28.0	1200	300		1	**9.877 854**
DT 1028 H	500 x 300 x 200	28.0	1200	300	1300	1	**9.877 855**
DT 1028 CH	500 x 300 x 300	45.0	1200	300	1450	1	**9.877 857**
DT 1050 CH	600 x 500 x 300	90.0	2400	600	1950	1	**9.877 860**
DL 102 H	240 x 140 x 100	3.0	480	120	140	1	**9.877 865**
DL 156 BH	500 x 140 x 150	9.0	860	215	600	1	**9.877 866**
DL 255 H	300 x 150 x 150	5.5	640	160	280	1	**9.877 867**
DL 510 H	300 x 240 x 150	9.7	640	160	400	1	**9.877 868**
DL 512 H	300 x 240 x 200	13.0	860	215	400	1	**9.877 869**
DL 514 BH	325 x 300 x 200	18.7	860	215	600	1	**9.877 870**
DL 1028 H	500 x 300 x 200	28.0	1200	300	1300	1	**9.877 871**

2



9.877 862

Ultrasonic baths Sonorex Digitec DT ... F - Basic equipment

Bandelin

Flat ultrasonic baths with fast degassing and for sample preparation
- Sample preparation in laboratory flasks
- Fast degassing of samples at the push of the button
- Homogenizing
- Same power density in all ultrasonic baths
- Reproducibility of results in the different bath sizes
- Uniform sonication of samples irrespective of size and arrangement of the flasks.

Items supplied:
DT 510 F - flask holder GL 510 F and 250ml Tickopur TR 3
DT 1028 F - 2 x flask holder GL 510 F and 250ml Tickopur TR 3.

3



9.877 863

Spring clamps EK are necessary to fix the laboratory flasks quickly and easily to the flask holder GL.

Type	Int. tank dims. (W x D x H)	Capacity	Ultra-sonic power	HF peak power	PK	Cat. No.
	mm	L	W	W eff		
DT 510 F	300 x 240 x 65	4.30	560	140	1	**9.877 862** 2
DT 1028 F	500 x 300 x 65	9.50	1280	320	1	**9.877 863** 3

E & OE.

1 SONOSHAKE Ultrasonic bath with shaking platform


1

Bandelin

Consisting of:
Ultrasonic bath Sonorex Digitec DT 1028 F
- especially for sonification of samples in laboratory flasks and for rapid degassing
- low-profile, ultrasonic bath with stainless steel tank, inner dimensions 500mm x 300mm x 65mm (L x W x D)
- housing made of stainless steel, protected against spray, 535mm x 325mm x 205mm (L x W x H)
- outlet: G½ ball valve
- ultrasonic power 1280W
- HF power 320W
- working frequency 35kHz
- Current consumption 1.4A

Shaking device SA 1028
- analogue setting of time and shaking frequency
- reciprocating motion: settings in 4 steps possible of up to 200/min
- constant amplitude of 20mm independent of loading
- rack easy to remove - easy mounting of the laboratory clamps EK 10-250 (separately to order)
- footprint approx. 410mm x 280mm (L x W)
- Holds 36 x 10ml, 36 x 25ml, 18 × 50ml, 12 x 100ml or 10 x 250ml flasks

- Bench space required for Sonoshake approx. 850mm x 360mm (L x W)

The Sonoshake can be used either as an ultrasonic bath for sample preparation, a shaking device SA1028 only, or both combined.

Type	PK	Cat. No.
SONOSHAKE	1	**9.877 864**
SA 1028	1	**9.877 650**

2 Flask Holder for SONOREX DIGITEC DT...F Ultrasonic Baths


2

Stainless steel. Flask Clips EK required.

Bandelin

Type	For bath type	PK	Cat. No.
GL 510 F*	DT 510 F, DT 1028 F	1	**9.877 579**

* in DT 1028 F fit 2 pieces.

3 Suspension baskets for Sonorex ultrasonic baths


3

Stainless steel.

Bandelin

Optimal ultrasonic wave transmission. Items to be cleaned should not be placed on the bottom of the tank.

Type	For bath type	Length mm	Height mm	Width mm	PK	Cat. No.
K 08	RK/DT 31 / H	65	170	50	1	**9.877 630**
K 1 C	RK/DT 52 / 52 H	110	120	40	1	**9.877 631**
K 3 C	RK/DT 100 / 100 H / 100 SH / 102 H / 102 H-RC	110	200	40	1	**9.877 633**
K 3 CL	RK/DT 103 H	110	200	40	1	**9.877 632**
K 6*	RK/DT 106	215	215	50	1	**9.877 634**
K 6 L	RK/DT 156	100	460	50	1	**9.877 636**
K 6 BL	RK/DT 156 BH	100	460	50	1	**9.877 637**
K 5 C	RK/DT 255 H / 255 H-RC	110	260	40	1	**9.877 635**
K 10	RK/DT 510 / 510 H / 510 H-RC	195	250	50	1	**9.877 697**
K 10 B	RK/DT 512 H / 512 CH	195	250	50	1	**9.877 700**
K 14	RK/DT 514 / H	245	275	50	1	**9.877 694**
K 14 B	RK/DT 514 BH / 514 H-RC	245	275	50	1	**9.877 701**
K 28	RK 1028/H / DT 1028 / H	245	455	50	1	**9.877 698**
K 28 C	RK/DT 1028 CH	245	455	50	1	**9.877 702**
K 50	RK/DT 1050	450	545	50	1	**9.877 699**
K 50 C	RK/DT 1050 CH	450	545	50	1	**9.877 703**

*round, adjustable.

1



1 Handle adjusters, GV 3 and GV 10, for Sonorex insert baskets

Bandelin

The immersion depth of the baskets can be continuously adjusted using the handle adjuster prevents laboratory flasks from floating, tipping over or becoming flooded. Quick and easy attachment to insert baskets or utensil holders (except GH 1).
1 pair.

Type	For baskets	PK	Cat. No.
GV 3	K 1 C, K 3 C, K 3 CL, K 5 CL, K 6 L, K 6 BL	1	**9.877 720**
GV 10	K 10, K 10 B, K 14, K 14 B, K 28, K 28 C, GH 10, GH 28	1	**9.877 721**

2



2 Flask Clips for Sonorex insert baskets

Bandelin

Stainless steel. Suitable for insert baskets and instrument holders with mesh size up to 12.5mm x 12.5mm and for glass holder GL for DT...F. Essential for the attachment of laboratory flasks.

Type	PK	Cat. No.
EK 10 for insert baskets up to 31 mm dia.	1	**9.877 651**
EK 25 for insert baskets up to 42 mm dia.	1	**9.877 653**
EK 50 for insert baskets up to 52 mm dia.	1	**9.877 655**
EK 100 for insert baskets up to 65 mm dia.	1	**9.877 657**
EK 250 for insert baskets up to 85 mm dia.	1	**9.877 658**

3



3 Lids for Sonorex ultrasonic baths

Bandelin

Stainless steel.
For covering bath tanks, as outlined below.

Type	For bath type	PK	Cat. No.
D 08	RK/DT 31 / H	1	**9.877 597**
D 52	RK/DT 52 / 52 H	1	**9.877 601**
D 100	RK/DT 100 H / 102 H /102 H-RC / 103 H	1	**9.877 603**
D 6	RK/DT 106	1	**9.877 606**
D 156	RK/DT 156 BH	1	**9.877 602**
D 255	RK/DT 255 H / 255 H-RC	1	**9.877 605**
D 510	RK/DT 510 / 510 H / 510 H-RC / 512 H	1	**9.877 610**
D 514	RK/DT 514 / 514 H / 514 BH / 514 BH-RC	1	**9.877 604**
D 1028	RK 1028/H / DT 1028 H	1	**9.877 607**
D 1028C	RK/DT 1028 CH	1	**9.877 600**
D 1050 C	RK 050 CH / DT 1050 CH	1	**9.877 608**

4



4 Positioning lids for Sonorex ultrasonic baths

Bandelin

Stainless steel.
For supporting inset beakers.

Type	For bath type	PK	Cat. No.
DE 08	RK/DT 31 / H	1	**9.877 621**
DE 52	RK/DT 52 / 52H / 52H-RC	1	**9.877 611**
DE 100	RK/DT 100 H / 102 H / 103 H	1	**9.877 613**
DE 6	RK/DT 106	1	**9.877 616**
DE 156	RK/DT 156 BH / 156 BH-RC	1	**9.877 612**
DE 255	RK/DT 255 H / 255 H-RC	1	**9.877 615**
DE 510	RK/DT 510 / 510 H / 512 H	1	**9.877 620**
DE 514	RK/DT 514 H / 514 BH / 514 BH-RC	1	**9.877 614**
ES 4	RK 1028/H/CH, DT 1028 / H/CH, RK 1050 / DT 1050 CH	1	**9.877 617**

5



5 Sonorex insert beakers

Bandelin

For positioning lids and beaker holders.
SD 06, PD 06, EB 05: with retaining ring
SD 05, KB 04, SD 04: with retaining ring, only for DE 08
SD 09: with retaining ring

Type	Material	Capacity ml	Diam. mm	Height mm	PK	Cat. No.
SD 04	Glass	400	76	110	1	**9.877 624**
SD 05	Glass	600	76	150	1	**9.877 645**
SD 06*	Glass	600	84	125	1	**9.877 622**
SD 09	Glass	1000	91	180	1	**9.877 623**
EB 05*	Stainless steel	600	87	120	1	**9.877 626**
KB 04	Plastic	400	76	110	1	**9.877 644**
PD 06*	Plastic	600	86	125	1	**9.877 628**

* with lid.

E & OE.

1 Inset baskets for SONOREX insert beakers

Mesh aperture 1mm x 1mm. *Bandelin*

Type	For	Material	Int. diam. mm	PK	Cat. No.
PD 04	Inset beakers	Plastic	60	1	**9.877 643**
KD 0*	Inset beakers	Stainless steel	75	1	**9.877 642**

*not for SD 04, SD 05 and KB 04

1



2 Insert basket accessories for Sonorex ultrasonic baths

Perforated plastic. *Bandelin*
For cleaning sensitive components.

Type	For bath type	Internal dimensions (W x D x H) mm	PK	Cat. No.
PK 1 C	RK 52 / H, DT 52 / H	90 x 90 x 66	1	**9.877 661**
PK 3 C	RK 103 H / CH, DT 103 H	90 x 187 x 56	1	**9.877 666**
PK 2 C	RK 100 H, RK 102 H / CH DT 100 / H, DT 102 H / H-RC	115 x 195 x 88	1	**9.877 664**
K 5 P	RK 255 / H, DT 255 / H	96 x 254 x 130	1	**9.877 667**

2



3 Ultrasonic baths, Sonorex Technik

Modular range - with 6 standard tank capacities in 4 versions (without heating, without ultrasonic on request). For cleaning and rinsing. With integrated ultrasonic generator. *Bandelin*
Frequencies: 25kHz (models up to RM 110) or 40kHz (rest of range). For 220-240V, 50/60Hz (RM 110: 210 UH, 400V, 3ph. 50/60Hz, Cekon plug 16A). With 2mm thick, stainless steel V 4A, 1.457, welded tank. With overflow, drainage outlet and timer up to 15 mins. or can be set for continuous operation. With adjustable heating 30 to 80°C.

Type	Int. tank dims. (W x D x H) mm	Capacity L	Ultra-sonic power W	HF peak power W_{eff}	Heating power W	PK	Cat. No.
RM 16 UH	325 x 275 x 200	13	1200	1 x 300	800	1	**9.877 570**
RM 40 UH	480 x 300 x 300	30	2000	1 x 500	1250	1	**9.877 571**
RM 75 UH	580 x 500 x 300	60	4000	1 x 1000	1950	1	**9.877 572**
RM 110 UH	600 x 450 x 450	110	4000	1 x 1000	4800	1	**9.877 573**
RM 180 UH	1000 x 500 x 400	160	4000	2 x 1000	7200	1	**9.877 575**
RM 210 UH	750 x 650 x 500	210	4000	2 x 1000	7200	1	**9.877 577**

3



4 Accessories for Sonorex Technik ultrasonic baths

Stainless steel. Insert baskets and lids for Technik models. Lids protect against evaporation and reduce operating noise.Baskets for hanging in bath tanks as outlined below. *Bandelin*

Type	Description	For bath type	Internal dimensions (W x D x H) mm	PK	Cat. No.
MK 16B	basket	RM 16 UH	275 x 245 x 50	1	**9.877 680**
MK 40B	basket	RM 40 UH	430 x 240 x 50	1	**9.877 681**
MK 75B	basket	RM 75 UH	530 x 445 x 50	1	**9.877 682**
MK 110	basket	RM 110 UH	530 x 410 x 90	1	**9.877 683**
MK 180	basket	RM 180 UH	930 x 460 x 90	1	**9.877 684**
MK 210	basket	RM 210 UH	680 x 610 x 90	1	**9.877 685**
MD 16	Lid	RM 16 UH		1	**9.877 582**
MD 40	Lid	RM 40 UH		1	**9.877 583**
MD 75	Lid	RM 75 UH		1	**9.877 584**
MD 110	Lid	RM 110 UH		1	**9.877 585**
MD 180	Lid	RM 180 UH		1	**9.877 586**
MD 210	Lid	RM 210 UH		1	**9.877 587**

4



1



1 Insert tubs for Sonorex ultrasonic baths

Unperforated plastic, with cover. For cleaning with aggressive liquids. *Bandelin*

Type	For bath type	Internal dimensions (W x D x H) mm	PK	Cat. No.
KW 3	RK/DT 102 H / 102 H-RC / 103 H / 100 / H	195 x 115 x 88	1	**9.877 800**
KW 5	RK/DT 255 H/-RC	154 x 96 x 130	1	**9.877 801**
KW 14	RK/DT 514/H	280 x 215 x 145	1	**9.877 802**
KW 14 B	RK/DT 514 BH-/-RC	275 x 210 x 195	1	**9.877 803**
KW 28-0	RK 1028/H, DT 1028 H/CH	437 x 230 x 155	1	**9.877 804**
KW 50-0	RK 1050	517 x 445 x 184	1	**9.877 806**
KW 50 B-0	RK/DT 1050 CH	520 x 445 x 284	1	**9.877 717**

Ultrasonic bath Sonorex Super ultrasonic bath RK 106

NEW!

For 1 test sieve with 200 mm diameter *Bandelin*

- Tank: stainless steel
- Housing: stainless steel drip-proof
- Outlet: ball valve, right side
- Degree of protection: IP 32
- Timer: 1-15 min and ∞

Type	Description	PK	Cat. No.
RK 106	Ultrasonic bath for 1 test sieve EU-Plug	1	**9.877 106**
RK 106	Ultrasonic bath for 1 test sieve UK-Plug	1	**9.877 105**
RK 106	Ultrasonic bath for 1 test sieve CH-Plug	1	**9.877 107**
D 6	Lid for RK 106	1	**9.877 606**
SH 7	Sieve holder	1	**9.877 784**

2



2 Ultrasonic bath Sonorex Super ultrasonic bath RK 106

NEW!

For 5 test sieves with 200 mm diameter *Bandelin*

- Tank: stainless steel
- Housing: stainless steel drip-proof
- Handles: on sides
- Degree of protection: IP 32
- Timer: 1-15 min and ∞

Type	Description	PK	Cat. No.
RK 1028 C	Ultrasonic bath for 5 test sieves EU-Plug	1	**9.877 528**
RK 1028 C	Ultrasonic bath for 5 test sieves UK-Plug	1	**9.877 538**
RK 1028 C	Ultrasonic bath for 5 test sieves CH-Plug	1	**9.877 539**
D 1028 C	Lid for RK 1028 C	1	**9.877 600**
SH 28 C	Siev holder	1	**9.877 746**

3



3 Utensil and test sieve holder for Sonorex ultrasonic baths

Instrument and test sieve holder. *Bandelin*
9.877 781: Holder for 1L glass flasks, 105mm diameter. GH 1
9.877 784: Sieve holder SH 7 for test sieve 200mm diameter.
GH 10/28 instrument holders, stainless steel, mesh size 12.5mm x 12.5mm

Type	For bath type	Dimensions (W x D) mm	PK	Cat. No.
GH 1	RK/DT 52, RK/DT 100 / H, RK 103 H, RK/DT 102 H / H-RC, DT 103 H	129 x 117	1	**9.877 781**
SH 7	RK/DT 106	-	1	**9.877 784**
GH 10	RK/DT 510 / 510 H / H-RC	260 x 200	1	**9.877 731**
GH 10 B	RK 512 H/CH, DT 512 H	260 x 200	1	**9.877 735**
GH 28	RK 1028/H, DT 1028 H/CH, RK 1040	455 x 250	1	**9.877 733**
SH 28 C	RK/DT 1028 C / 1028 CH		1	**9.877 746**

Sieves please see page 557.

E & OE.

1 High-power ultrasonic cleaning unit SONOREX SUPER RK 1028 CH

Bandelin



Specifications:

Inner tank dimensions (WxDxH):	500mm x 300mm x 300mm
Transducers:	8 PZT-broad beam transducers
Capacity:	45L
Filling volume for cleaning:	30L
Ultrasonic power:	1200W
HF power:	300W$_{eff}$
Heating power:	1450W
Current consumption:	7.7A
Leakage current:	0.5mA
Protection rating:	< IP 32
Exterior dimensions (WxDxH): (without handles and drain tap)	540mm x 340mm x 500mm
Weight:	net 23.7kg gross 27.2kg

Type	HF peak power W $_{eff}$	Ultra-sonic power W	PK	Cat. No.
RK 1028 CH	300	1200	1	**9.877 530**

Accessories for Sonorex SUPER RK 1028 CH

Bandelin

Accessories:
Insert basket K 28 C, stainless steel, 455mm x 245mm x 50mm, mesh size 5mm x 5mm.
Insert basket stainless steel, int. 470mm x 270mm x 215mm.
For 6 breathing masks: K 28 CA
For 3 full-face masks: K 28 CV
Insert tub KW 28-0 plastic, non-perforated, with lid, int. 437mm x 230mm x 155mm.
lid D 1028 C stainless steel.

For cleaning small parts:
Beaker holder ES 4 stainless steel, for positioning of up to 4 beakers:
SD 06 glass - 600ml
EB 05 stainless steel - 600ml
PD 06 plastic - 600ml
Insert sieve basket
Fits into beakers:
KD 0 stainless steel, diameter 75mm
PD 04 plastic, diameter 60mm

Type	Description	PK	Cat. No.
K 28 C	Insert basket	1	**9.877 702**
K 28 CA	Insert basket	1	**9.877 712**
K 28 CV	Insert basket	1	**9.877 713**
KW 28-0	Insert tub	1	**9.877 804**
D 1028 C	Lid	1	**9.877 600**
SD 06	Beaker, glass	1	**9.877 622**
ES 4	Beaker holder	1	**9.877 617**
EB 05	Beaker, stainless steel	1	**9.877 626**
PD 06	Beaker, plastic	1	**9.877 628**
KD 0	Beaker, stainless steel	1	**9.877 642**
PD 04	Beaker, plastic	1	**9.877 643**

Caution.
Do not use combustible, acidic cleaning agents or chemicals containing chloride ions like household cleaners. Do not place any items on the tank bottom, neither baskets nor beakers.

1



1 Ultrasonic cleaning bath SONOREX SUPER RK 1050 CH

Bandelin

Specifications:

Int. tank dimensions (WxDxH):	600mm x 500mm x 300mm
Volume:	90L
Working volume:	60L
Ultrasonic output max.:	2400W
HF-output:	600W$_{eff}$
Heating power:	1950W
Current consumption:	11.1A
Leakage current:	< 0.5mA
Protection rating:	IP32
Exterior dimensions (WxDxH): (without handles and drain tap)	530 x 540 x 640mm
Weight:	net 37kg gross 67kg

Type	HF peak power W $_{eff}$	Ultra-sonic power W	PK	Cat. No.
RK 1050 CH	600	2400	1	**9.877 552**

Accessories for SONOREX SUPER RK 1050 CH

Bandelin

Accessories

Insert basket K 50 C stainless steel, 545mm x 450mm x 50mm, mesh size 5mm x 5mm.
Insert basket stainless steel, int. 540mm x 445mm x 240mm, mesh size 12.5mm x 12.5mm.
For 9 breathing masks: K 50 CA
For 6 full-face masks: K 50 CV
Insert bowl KW 50 B-0 for the use of aggressive liquids, plastic, non-perforated, with lid, int. 520mm x 445mm x 284mm.
Lid D 1050 C stainless steel.

For cleaning small parts:

Beaker holder ES 4 stainless steel, for positioning of up to 4 beakers:
SD 06 glass - 600ml
EB 05 stainless steel - 600ml
PD 06 plastic - 600ml
Inset sieve basket
Fits into beakers:
KD 0 stainless steel, diameter 75mm
PD 04 plastic, diameter 60mm

Type	Description	PK	Cat. No.
D 1050 C	Lid	1	**9.877 608**
K 50 C	Insert basket	1	**9.877 703**
K 50 CA	Insert basket	1	**9.877 715**
K 50 CV	Insert basket	1	**9.877 716**
KW 50 B-0	Insert tub	1	**9.877 717**
SD 06	Beaker, glass	1	**9.877 622**
ES 4	Insert support	1	**9.877 617**
EB 05	Beaker, stainless steel	1	**9.877 626**
PD 06	Beaker, plastic	1	**9.877 628**
KD 0	Beaker, stainless steel	1	**9.877 642**
PD 04	Beaker, plastic	1	**9.877 643**

Caution.
Do not use combustible, acidic cleaning agents or chemicals containing chloride ions like household cleaners. Do not place any items on the tank bottom, neither baskets nor beakers.

1 Ready-to-operate set BactoSonic® 14.2

Ultrasonic special unit for a gentle removal of biofilms. *Bandelin*

Consisting of:

Unit BS 14:	scientifically proven description of the procedure
Transport containers:	IB 5, PP, 0.52 l - 2 pcs IB 6, PP, 0.6 l - 2 pcs IB 10, PP, 1.0 - 1 piece IB 18, PP, 1.8 l - 1 piece IB 20, PP, 2.0 l - 1 piece
Container carriers for transport containers:	BT 5, PC, for 2 pcs IB 5 BT 6, PC, for 2 pcs IB 6 BT 10, PC, for 1 piece IB 10 BT 18, PC, for 1 piece IB 18
Utensil holder for transport containers:	GH 14, stainless steel, for 3 pcs IB 20
Frame for foil test:	FT 14
Contact liquid:	TICKOPUR TR 3 - 250 ml (concentrate)

Type	PK	Cat. No.
BactoSonic® 14.2	1	**9.650 290**

1



2 Accessories for BactoSonic® 14.2

Bandelin

Type	For	PK	Cat. No.
BT 5	IB 5	1	**9.650 311**
BT 6	IB 6	1	**9.650 312**
BT 10	IB 10	1	**9.650 313**
BT 18	IB 18	1	**9.650 314**

2



Transport containers, PP

Bandelin

Type	Dimensions mm	Capacity L	PK	Cat. No.	
IB 5	145 x 110 x 67	0.5	5	**9.650 291**	3
IB 6	dia. 142 x 68	0.6	5	**9.650 292**	4
IB 10	278 x 115 x 60	1.0	5	**9.650 293**	5
IB 18	208 x 143 x 94	1.8	5	**9.650 294**	6
IB 20	135 x 102 x 282	2.0	5	**9.650 295**	7

3



9.650 291

4



9.650 292

5



9.650 293

6



9.650 294

7



9.650 295

8 Ready-to-operate set SONOCOOL® 255

For medical and laboratory range. *Bandelin*

Consisting of:

Ultrasonic unit SC 255:	with cooling
Sample holder PH 255-11:	for 11 beakers SD 01.2
Lid D 255 G:	made of glass
Beaker SD 01.2:	20 pieces, 100ml, made of glass, tall shape, without spout; inner diameter 44mm, 80mm high
Contact liquid:	TICKOPUR TR 3 - 250 ml (concentrate)

Type	PK	Cat. No.
SONOCOOL® 255	1	**9.650 300**

8



Accessories for ultrasonic device SONOCOOL® 255

Bandelin

Type	Description	PK	Cat. No.
PH 255-11	Sample holder for 11 beakers SD 01.2	1	**9.650 303** 1
SD 01.2	Beakers of 100 ml, glass, without spout, inside dia. 44mm, height 80mm	10	**9.650 304**
PH 255-1	Sample holder for 1 Box IB 18	1	**9.650 305** 2
IB 18	Implant box IB 18 1.80 liter	5	**9.650 294**
PH 255-2	Sample holder for 2 beakers SD 06	1	**9.650 306** 3
SD 06	Beakers, glass, 600 ml, Ø 84 mm, 125 mm, with no cover, insert ring	1	**9.877 622**
DG 255 G	Lid made of glass	1	**9.650 307** 4
SCH 255	Hose connection for connecting a pump	1	**9.650 308**

1



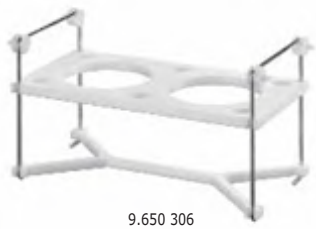
9.650 303

2



9.650 305

3



9.650 306

4



9.650 307

5



5 Pipette rinsers, PE-HD

Kartell

For easy and gentle cleaning of pipettes using the repetitive siphon principle. The complete rinsing system comprises rinser, soaking jar and pipette basket. Water flow should be adjusted to approx. 2 litres/min. Please order soaking jar and pipette basket separately.

For pipette length mm	Capacity Litres	Int. diam. mm	Height mm	PK	Cat. No.
460	13	150	740	1	**9.409 238**
600	17	150	1000	1	**9.409 239**

6



9.877 911

Ultrasonic pipette cleaner PR 140 C, Sonorex

Bandelin

Offers ultrasonic cleaning and rinsing in the same container - without chromosulphuric acid - with water soluble cleaning concentrates. For pipettes, burettes and other glass instruments up to 755mm long. 230V~, 50/60Hz or 115V~.

Specifications

Overall height:	1130mm
Area required (W x L):	255mm x 335mm
Ultrasonic output max.:	860W
HF power:	215W$_{eff}$
Timer:	1 to 15 min. and continuous operation
Effective capacity:	13.9L
Effective cleaning depth:	765mm

Type	Description	PK	Cat. No.
PR 140 C	Complete set, with plastic basket, stainless steel lid, 5 litres of Tickopur R 33 mildly alkaline cleaning concentrate	1	**9.877 911** 6
AR 140 C	3-way valve, metal	1	**9.877 912**
AR 140 CP-1	3-way valve, plastic	1	**9.877 915**
D 140	Stainless steel lid	1	**9.877 914**

E & OE.

1 Tickopur - Stammopur



Bandelin

Concentrates for Sonorex ultrasonic cleaning baths. Enhances cavitation, cleans intensively, kind to most materials and free from chloride. For use hot or cold.

Tickopur TR 3. Special cleaner, concentrate. Properties: weakly acid pH 3.0 at 1%, dosage 1% to 5%, based on citric acid, without phosphate For: steel, stainless steel, non-ferrous, precious and light metals, glass, ceramics, plastics, rubber. Removes: mineral residues, corrosion, grease, oils, waxes, pigments, drilling, grinding, polishing and lapping residues

Tickopur R 27.* Special cleaner, concentrate. Properties: acid pH 1.9 at 1% solution, dosage 1 to 5%. For: glass, steel, rubber, plastic, precious metals, ceramics. Removes: rust, lime scale, mineral residues, silicate, phosphate, cement, urine scale, etc.

Tickopur R 30. Neutral cleaner, concentrate. Properties: neutral, pH 7% dosage 1% to 5%. For: glass, steel, nonferrous metals, aluminium, rubber, optical components, test sieves. Removes: grease, oils, dust, protein, wax, silicone films, etc.

Tickopur R 33. Universal cleaner, concentrate. Properties: mildly alkaline pH 9.9 at 1%, dosage 1% to 5%.
For: glass, metal, ceramics, plastic, rubber
Removes: grease, oils, wax, silicone films, protein, ink residue, etc.

Tickopur RW 77. Special cleaner with ammonia, concentrate. Properties: mildly alkaline, pH 9.9 at 1%, dosage 5% to 10%. For: steel, stainless steel, non-ferrous metals, glass, plastics, optical components. Removes: grease, oils, wax, lubricants, silicone films, grinding, polishing and soldering agents, etc., slightly anti-oxidizing.

Tickopur J 80 U. Anti-oxidant with corrosion preventer, ready for use. Properties: acidic, pH 2, for use in glass and plastic beakers only. For: non-ferrous metals, alloys, copper, electron microscope screens. Removes: oxide and sulphide layers, flux, anti-oxidizing.

Stammopur 24. *Disinfection and cleaning concentrate. For intensive cleaning and disinfection - VAH-certified-bactericidal, tuberculocidal, yeasticidal virucidal against BVDV, Vaccinia, HBV, HCV, HIV. Effectiveness report against H5N1. Free from aldehydes, chlorine and phenol. Application 1% to 2%, mildly alkaline, pH 9.4 (1%). With corrosion prevention. Highly compatible with most materials.

Type	Capacity Litres	PK	Cat. No.
TICKOPUR TR 3	1	1	**6.802 927**
TICKOPUR TR 3	2	1	**6.301 466**
TICKOPUR TR 3	5	1	**6.802 537**
TICKOPUR R 27*	1	1	**9.192 761**
TICKOPUR R 27*	2	1	**9.192 762**
TICKOPUR R 27*	5	1	**9.192 765**
TICKOPUR R 30	1	1	**9.192 641**
TICKOPUR R 30	2	1	**9.192 646**
TICKOPUR R 30	5	1	**9.192 642**
TICKOPUR R 33	1	1	**9.192 601**
TICKOPUR R 33	2	1	**9.192 602**
TICKOPUR R 33	5	1	**9.192 605**
TICKOPUR RW 77	1	1	**9.192 611**
TICKOPUR RW 77	2	1	**9.192 612**
TICKOPUR RW 77	5	1	**9.192 615**
TICKOPUR J 80 U	1	1	**9.192 751**
TICKOPUR J 80 U	2	1	**9.192 752**
TICKOPUR J 80 U	5	1	**9.192 755**
STAMMOPUR 24*	2	1	**9.192 711**
STAMMOPUR 24*	5	1	**9.192 712**
STAMMOPUR 24*	25	1	**9.192 714**

* Transport regulations for dangerous goods have to be observed.

Sparkling performance

Miele Professional and Duran®
A cooperation with crystal clear benefits
- Analytically clean reprocessing
- Guaranteed safe results
- Gentle cleaning
- Ecological

Because high-quality materials deserve professional treatment.



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DURAN GROUP

Miele
PROFESSIONAL

Applications for disinfectors

Miele

Disinfectors G 7883/G 7893/PG 8535:

Wide mouth bottles:	Upper basket O 188/1 (9.803 775) 2 x AK 12 (9.803 729) 4 x A 14 (9.803 721) Lower basket U 874/1 (9.803 776) 1 x E 109 (9.803 727) 1 x E 110 (9.803 728)
Test tubes:	Upper basket O 188/1 (9.803 775) Lower basket U 874/1 (9.803 776) E 103/1 (9.803 717) E 104/1 (9.803 730) E 105/1 (9.803 731) E 139/1 (9.803 743)

Disinfector G 7883:

Narrow mouth bottles:	Injector carriage E 329 (9.803 735)
Narrow and wide mouth bottles:	Injector carriage E 340 (9.803 724) 1 x AK 12 (9.803 729) 2 x A 14 (9.803 721) 1 x E 109 (9.803 732)

Disinfectors G 7893/PG 8535:

Narrow mouth bottles:	Injector carriage E 414 TA (9.803 732)
Narrow and wide mouth bottles:	Injector carriage E 385 TA (9.803 723) 1 x AK 12 (9.803 729) 2 x A 14 (9.803 721) 1 x E 109 (9.803 727)

1 Washer-disinfector G 7883/G 7893

Miele

Professional basic solution for everyday laboratory glass cleaning tasks in industry, environmental and research laboratories.



- Freestanding/underbench unit
- H: 850mm (820mm as underbench unit), W: 600mm, D: 600mm
- Multitronic Novo Plus controls with 10 programmes
- Water circulation pump, Q max. 400L/min
- Integral dispenser pump for process chemicals (neutralising agent)
- Option: 1 connection for external liquid dispensing system (alkaline detergent)
- Convertible to single-phase power operation
- Capacity per batch: e.g. 39 narrow-necked vessels or 116 pipettes or 1600 test tubes

Model G7893 with Drying Plus: Integral hot-air drying

Specifications

Connection for dosing pump:	DOS-C 60 liq. detergent (please order separately)
Dimensions (WxDxH):	600mm x 600mm x 850mm (820mm w/o top cover- built-in use)

Type	Description	PK	Cat. No.
G 7883	White cabinet, steam condenser (heat exchanger)	1	**6.801 635**
G 7883	White cabinet, steam condenser (heat exchanger), serial interface	1	**6.222 275**
G 7883	Stainless steel cabinet, steam condenser (heat exchanger)	1	**9.803 702**
G 7883	Stainless steel cabinet, steam condenser (heat exchanger), serial interface	1	**6.250 491**
G 7893	Stainless steel cabinet, steam condenser (atomised spray), serial interface	1	**6.231 039**



1 Washer-disinfector PG 8535

Miele

Compact high-tech lab washer with freely programmable controls for the reprocessing of glassware in research and production as well as in all analytical and prep areas including microbiology and biotechnology.

Innovative product features
- Network process documentation interface
- Magnetic strip for automatic mobile unit recognition
- Spray arm sensing
- Measures conductivity of wash liquor
- Ultrasound dispenser volume control
- Drying with optimum air circuit and HEPA Class EU 13 filter

- Built-under/freestanding unit without lid
- H 820mm, B 900mm, T 700mm
- Freely programmable Profitronic+ controls
- 2 dishwashing levels (upper and lower baskets)
- 3-phase connection for short programme cycles
- 3 connections for cold, hot and demineralised water
- 2 integrated dispenser pump for process chemicals (alkaline detergent/neutralising agent)
- 2 additional dispenser pumps possible
- Drawer with 2 supply containers, 5L each
- Integrated drying unit
- Batch capacity: 37 narrow-necked glasses or 96 pipettes or 1600 test tubes

Type	Description	PK	Cat. No.
PG 8535	Stainless-steel panelling	1	**9.803 890**
DE-CS7	Stainless-steel lid	1	**6.401 199**
ML/2	Magnetic strip for automatic mobile unit recognition	1	**9.803 766**

Accessories for Mielabor washing and disinfecting machines

Miele

Type	Description	PK	Cat. No.
O 188/2	Upper basket, front side open	1	**9.803 775** 2
AK 12	Insert for beakers, wide-mouth jars	1	**9.803 729** 4
E 103/1	Insert for reagent bottles	1	**9.803 717** 5
E 104/1	Insert for reagent bottles	1	**9.803 730**
E 105/1	Insert for reagent bottles	1	**9.803 731**
A 14	Lid 1/2, for insert AK 12	1	**9.803 721**
E 109	Insert 1/2, for 21 beakers up to 250ml	1	**9.803 727**
E 110	Insert 1/2, for 10 beakers 250 to 600ml	1	**9.803 728**
E 329	Injector carriage 1/1, with 39 nozzles	1	**9.803 735**
U 874/1	Lower basket, empty	1	**9.803 776** 3
E 385 TA	Injector carriage, 1/2-sided injector flushing with 16 nozzles, 1/2 free for e.g. beakers, wide-mouth jars AK 12. With drying	1	**9.803 723** 6
E 340	Injector carriage, 1/2	1	**9.803 724**
E 414 TA	Injector carriage, injector flushing with 37 nozzles. With drying	1	**9.803 732** 7
E 139/1	Insert 1/4 for reagent bottles 12 x 200mm	1	**9.803 743**



9.803 775



9.803 776



9.803 729



9.803 717



9.803 723



9.803 732

Note: We can supply products from the entire Miele laboratory range, on request.

1 2 CERTOCLAV-EL 12L/18L tabletop autoclave

CertoClav

The CertoClav EL laboratory autoclave is ready to start after only a few moments thanks to its simple operation. Its versatility and compact construction make the CertoClav -EL laboratory autoclave almost indispensable for research, development and medical applications.

Control and operation
It would be difficult to imagine a workplace without a CertoClav EL after just a few days thanks to its single-button operation and its reliability. The thermostat and the 2-stage control valve ensure that operations and processes are precise. Culture media preparations, quality checks and autoclave processes can be carried out simply and quickly. The precision thermometer and precision pressure gauge with maximum indicator ensures faultless results for all applications. The sterilisations chamber is easy to open and close, simply turn the cover and remove.

For your safety
The CertoClav 4-fold safety system: the overpressure valve, the safety interlock preventing opening under pressure, the safety control valve and the overpressure safety opening enable operation without any hazards.

Including accessories
Stable instrument panel, with 3 feeds and minimum water level indicator

Standards and conformity marks
GS from TÜV Rheinland in accordance with EN 61010 - 1:2001, EN 61010 - 2:040:2005
Expert reports on microbiological and germicidal effectiveness

1



2



Operating temperature/pressure:	maximum 3 bar = 43.5 psi Stage 1: 125°C = 1.4 bar/20.3 psi Stage 2: 140°C = 2.7 bar/39.1 psi
*** Special valve:**	Stage 1: 115°C = 0.7 bar/10.1 psi Stage2: 121°C = 1.1 bar/ 15.9 psi
Thermal output:	1900 W
Heater:	integrated in floor/not exposed
Mains connection:	230V ±10 %/50-60Hz
Air evacuation:	free steam flow process
Water connection:	no water connection necessary
Housing:	Aluminium

Type	Capacity Litres	Diam. mm	Int. height mm	PK	Cat. No.
EL 12L GS	12	240	260	1	**9.842 013**
EL 18L GS	18	240	400	1	**9.842 014**

*CertoClav EL 12 and CertoClav EL 18L delivery with valve temperature 125/140°C or 115°/121C. Please regard by your order.

1



1 CERTOCLAV MultiControl 12L /18L tabletop autoclaves

CertoClav

Practical, maintenance-free microprocessor-controlled laboratory autoclave with fractionated venting process. Its versatility and compact construction make the CertoClav MC laboratory autoclave almost indispensable for research, development and medical applications.

Control and operation
The MultiControl controller makes autoclaving child's play and saves valuable employee time.
One press of a button ensures rapid sequences using 2 permanent programs (138°C/5 min 125°C/15 min) for sterilisation of preparation culture media. The CertoClav MultiControl automatically monitors the process parameters and reports a successful conclusion. Employees no longer have to observe the process. On top of this, complex sequences and long-term cycles of 6 seconds up to 1 week can be implemented using 7 freely definable programs - ideal for material testing and research. With integrated cycle counter and EEPROM Constant Memory. Including RS 232 interface for data evaluation. The sterilisation chamber is easy to open and close, simply turn the cover and remove.

For your safety
The CertoClav 4-fold safety system: the overpressure valve, the safety interlock preventing opening under pressure, safety control valve and the overpressure safety opening enable operation without any hazards.

Including accessories
Stable instrument panel, with 3 feeds and minimum water level indicator

Standards and conformity marks
GS from TÜV Rheinland in accordance with EN 61010 - 1:2001, EN 61010 - 2:040:2005
Expert reports on microbiological and germicidal effectiveness

Temperature:	programmable from room temp. up to 140°C
Thermal output:	1900 W
Heater:	integrated in floor/not exposed
Mains connection:	230 V ±10 %/50 Hz.
Operating pressure:	max. 3 bar/4.5 psi
Venting:	fractionated venting process
Water connection:	no water connection necessary
Housing:	Aluminium

Type	Capacity Litres	Diam. mm	Int. height mm	PK	Cat. No.
Certoclav MultiControl	12	240	260	1	**9.842 018**
Certoclav MultiControl	18	240	400	1	**9.842 017**

2



2 Accessories for portable autoclave CertoClav EL and MultiControl

now with lager diameter for more loading capacity, stackable for all 18l model

Description	PK	Cat. No.
Wire basket with handle, Ø 225 x 170mm	1	**9.842 025**



- Tested an tried in research-, analysis- and quality-laboratories, as well as in universities and industrial labs.
- Universally applicable in microbiology, food processing industry, materials testing, training, medicine and pharmacology.
- Wide area of uses, such as sterilization, culture media preparation, vapor resistance testing or refuse neutralisation.
- For over 40 years, the reliable solution for your lab.

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CERTOCLAV®
Convenient for daily use.

E & OE.

1 Portable autoclaves without heating

For pressurised steam sterilisation. Up to 3 bar, 143°C. 4 bar version available on request. Chamber and lid made of stainless. Temperature indication by enclosed-scale thermometer.

Type	Ext. diam. mm	Height mm	Int. diam. mm	Int. height mm	PK	Cat. No.
LaS-3-20	400	590	260	400	1	**9.842 061**


1

Automatic autoclave AH

NEW!

Raypa

This autoclave is microprocessor controlled and monitored with 5 sterilisation programmes of which 4 are fixed and 1 is freely selectable.
- Operating temperature range 100°C to 135°C
- RS 232 interface
- Fully automatic functions
- With water reservoir, pre-vacuum and drying
- Case and lid shrouding are AISI 304 stainless steel
- Sterilisation chamber, lid and sealing system are AISI 316 stainless steel
- Electrical heating with protected heating elements
- Safety pressure valve
- Safety thermostat
- Automatic steam venting controlled by microprocessor
- Manual valves for emptying the sterilisation chamber and for draining steam
- Equipped with mesh stand on the chamber base and trays
- Supply requirements: 230V 16A single phase


2

9.851 888

Type	Capacity Litres	Chamber diam. x depth mm	Rating W	Width mm	Length mm	Height mm	PK	Cat. No.
AH-21 S2 DRY	21	250 x 430	2000	680	590	425	1	**9.851 899**
AHS DRY	75	400 x 600	3200	830	760	630	1	**9.851 888** 2

Automatic autoclaves, AES series

NEW!

Raypa

These autoclaves are microprocessor controlled and monitored with 10 sterilisation programmes of which 4 are fixed and 6 are freely selectable.
- Operating temperature range 105°C to 139°C
- Agar modus (40°C to 80°C)
- Timer
- Programmable auto-start (24h)
- Fully automatic functions
- Case and lid shrouding are AISI 304 stainless steel
- Sterilisation chamber, lid and sealing system are AISI 316 stainless steel
- Electrical heating with protected heating elements in the interior of the chamber
- Safety pressure valve
- Safety thermostat
- Automatic steam venting controlled by microprocessor
- Manual valves for emptying the sterilisation chamber and for draining steam
- Equipped with mesh stand on the chamber base and trays
- **Supply requirements:**

AES-28 and AES-75: 230 V 16 A single phase
AES-110 and AES-150: 380 V + Neutral (3-phase)


3

9.851 894

Type	Capacity Litres	Chamber diam. x depth mm	Rating W	Width mm	Length mm	Height mm	PK	Cat. No.
AES-12	12	250 x 270	1000	49	500	520	1	**9.851 893**
AES-28	28	300 x 400	2000	510	560	1010	1	**9.851 894** 3
AES-75	75	400 x 600	3200	620	730	1090	1	**9.851 895**
AES-110	110	400 x 850	4500	630	730	1330	1	**9.851 896**
AES-150	150	500 x 750	6000	760	850	1310	1	**9.851 897**

On request also available with vacuum and drying.

4 Thermoprinter for Automatic autoclaves AH/AES series

Printer with plain paper reel prints the programme i.d., cycle number, temperature, date and time of each sterilisation. Also prints any errors or warning messages. If everything has proceeded correctly by the end of the sterilisation cycle, the following message is printed: **Sterilisation O.K.**

Type	PK	Cat. No.
Thermoprinter	1	**9.851 871**


4

1



1 Accessory baskets for Automatic autoclaves, AES series

Type	For	Diam. mm	Height mm	Baskets per autoclave	PK	Cat. No.
Mesh basket	AE / AES 12	225	215	1	1	**9.851 885**
Mesh basket	AE / AES 28	280	200	2	1	**9.851 872**
Mesh basket	AE / AES 75 - 110	380	260	2 / 3	1	**9.851 873**
Mesh basket	AE / AES 150	475	360	2	1	**9.851 875**
Solid basket	AE / AES 12	225	215	1	1	**9.851 886**
Solid basket	AE / AES 28	280	200	2	1	**9.851 876**
Solid basket	AE / AES 75 - 110	380	260	2 / 3	1	**9.851 877**
Solid basket	AE / AES 150	475	360	2	1	**9.851 879**

2



2 Laboratory autoclaves B-line

NEW!

Tuttnauer

- Extensive features and equipment varieties cover all applications used in research institutes, universities and the pharmaceutical, biotechnological, chemical and food industry. The autoclaves are adapted for
- Sterilization of liquids in combination with different cooling systems
- Sterilization of pipettes and glass
- Sterilization of wrapped/unwrapped instruments
- Sterilization of (biohazard) waste
- Preparation of nutrient media

Features
- EL = horizontal loading
- ELV = vertical loading
- High precision control system for perfect sterilization results
- Password protection for user access control
- Independent temperature and pressure monitoring
- Cycle information recovery in the case of power failure or cycle interruption
- Fail Alert - Indicates cycle failure or interruption
- Door Alert - Indicates the door is unlocked
- RS232 interface
- Pulsative heating-up
- Validation port

Options available
- Fast cooling technology for rapid cooling of liquids
- Fast cooling technology and ventilator to reduce cooling time additionally
- Vacuum pump to evacuate residual air
- Exhaust air filtration
- Lifting device to elevate/to lower heavy sterilzation goods
- Printer to document the performed cycle
- ADMC software allows complete control and monitoring of the autoclave
- Other on request

Type	Chamber diam. x depth mm	Capacity litres	Dimensions (W x D x H) mm	PK	Cat. No.
2540 ELV-B	250 x 400	23	495 x 335 x 645	1	**9.842 811**
3150 ELV-B	310 x 500	40	580 x 415 x 780	1	**9.842 813**
3170 ELV-B	310 x 700	55	580 x 415 x 960	1	**9.842 814**
3850 ELV-B	380 x 490	62	650 x 500 x 745	1	**9.842 815**
3870 ELV-B	380 x 690	85	650 x 500 x 925	1	**9.842 817**
5050 ELV-B	500 x 500	110	880 x 700 x 780	1	**9.842 819**
5075 ELV-B	500 x 750	160	880 x 700 x 1010	1	**9.842 820**
2540 EL-B	250 x 420	23	510 x 545 x 365	1	**9.842 801**
3150 EL-B	310 x 500	40	600 x 695 x 450	1	**9.842 803**
3850 EL-B	380 x 510	62	660 x 695 x 525	1	**9.842 804**
3870 EL-B	380 x 690	85	660 x 875 x 525	1	**9.842 806**
5050 EL-B	500 x 500	110	880 x 767 x 700	1	**9.842 808**
5075 EL-B	500 x 750	160	880 x 967 x 700	1	**9.842 809**

E & OE.

1 Laboratory autoclaves D-line

NEW!

Tuttnauer

The new D-line from tuttnauer represents a further stage of the well-known EL and ELV B-line. The features of the laboratory autoclave line are specifically designed for most common laboratory applications and can be used for the sterilzation of liquids, instruments, glass, waste and for the preparation of nutrient media.

Features
- EL = horizontal loading
- ELV = vertical loading
- Stores the last 200 cycles in built-in memory
- Option: second flexible Pt 100 probe
- 30 Identification Codes and Passwords for access level control
- The controller and software comply with the 21 CFR part 11 standard
- Filter replacement notifications based on the number of cycles
- Data archiving via USB interface
- Double sterilization time monitoring
- In/Out test (enables technicians to check each system component separately)
- Sterilization temperature range up 110°C to 136°C
- Optional Disinfection/Isothermal Temperature range from 60°C to 105°C
- Optional Independent Recording for cross-checking cycle measurements
- F_0 software control

Options available
- Fast cooling technology for rapid cooling of liquids
- Fast cooling technology and ventilator to reduce cooling time additionally
- Vacuum pump to evacuate residual air
- Exhaust air filtration
- Lifting device to elevate/to lower heavy sterilzation goods
- Printer to document the performed cycle
- ADMC software allows complete control and monitoring of the autoclave
- Other on request

Type	Chamber diam. x depth mm	Capacity litres	Dimensions (W x D x H) mm	PK	Cat. No.
2840 ELV-D	280 x 400	28	540 x 450 x 975	1	**9.842 812**
3850 ELV-D	380 x 490	72	730 x 550 x 850	1	**9.842 816**
3870 ELV-D	380 x 690	94	730 x 550 x 1000	1	**9.842 818**
5075 ELV-D	500 x 750	160	870 x 750 x 1010	1	**9.842 821**
2840 EL-D	280 x 400	28	530 x 630 x 400	1	**9.842 802**
3850 EL-D	380 x 490	72	720 x 750 x 530	1	**9.842 805**
3870 EL-D	380 x 690	94	720 x 940 x 540	1	**9.842 807**
5075 EL-D	500 x 750	160	855 x 1120 x 805	1	**9.842 810**

1



1



2



1 2 Steam sterilizers (autoclaves), HG series

HMC-EUROPE GmbH

- fully automatic, microprocessor controlled
- 12 standard programmes installed
- timer-controlled, night programme
- overnight sterilization does not heat up the laboratory
- agar programme with thermostatic heating for agar production
- liquids programme with removal temperature of 95°C
- low feed water consumption
- electronic pressure switch, pressure and temperature control
- exhaust reservoir for condensate this prevents fogging and unpleasant odours
- drain valve for easy cleaning of sterilization chamber
- bottom plate for baskets and cans
- air-cooling at the press of a button
- lid-opening and lid-closing by press-button
- mounted on wheels, cleaning is possible even under the autoclave
- safety: electromechanical safety sealing system, relief vent, low water switch, overpressure safety device, overheat protection power supply cut-out, audible and visual error alarms.
- with USB port
- Loadmaster lifting device available on request

Models with special equipment:
HGS 113/HGS 133: steam generator, automatical water feeding, water cooling
HGD 113/HGD133: steam generator, automatical water feeding, water cooling, vacuum pump

Specifications

Automatic start:	1 minute to 7 days, Night programme
Time of sterilization:	1 to 300mins.
Power supply:	220-240V a.c.
Sealing:	at the push of a button, fully automatic
Boiler material:	SUS304 (rust resistant, stainless steel)

Type	Capacity Litres	Chamber Dimensions (dia. x H) mm	External dimensions (W x D x H) mm	Working Temp. range °C	Pressure bar	Rating W	Weight kg	PK	Cat. No.
HG 50	50	364 x 482	455 x 691 x 890	105 to 135	2.5	3000	62	1	**9.842 410**
HG 80	80	364 x 730	455 x 691 x 1030	105 to 135	2.5	3800	73	1	**9.842 411**
HG 113	108	500 x 552	686 x 870 x 930	105 to 135	2.5	4700	137	1	**9.842 412**
HG 133	129	500 x 656	686 x 870 x 1034	105 to 135	2.5	6200	145	1	**9.842 413**
HGS 113	113	500 x 576	686 x 870 x 930	105 to 135	2.5	6800	153	1	**9.842 414**
HGS 133	133	500 x 680	686 x 870 x 1034	105 to 135	2.5	7100	161	1	**9.842 415**
HGD 113	113	500 x 576	686 x 870 x 930	105 to 135	2.5	8400	184	1	**9.842 416**
HGD 133	133	500 x 680	686 x 870 x 1034	105 to 135	2.5	8700	192	1	**9.842 417**

3 4 5 Accessories for HG series steam sterilisers

Description	Dimensions (dia. x H) mm	PK	Cat. No.
Flexible temperature sensor		1	**9.842 420**
Automatic water supply		1	**9.842 421**
Exhaust air filter for sterilisation		1	**9.842 422**
Stainless steel sterilising basket	338 x 220	1	**9.842 423**
Stainless steel sterilising basket with bottom	338 x 220	1	**9.842 424**
Stainless steel sterilising can	330 x 185	1	**9.842 425**
Process documentation software, Segosoft®		1	**9.842 426**

Further acessories for models 113 and 133 available on request.

3



4



5



E & OE.

HMC
EUROPE
Sterilization technology

Autoclaves for microbiology

Affordable quality
with maximum comfort

Chamber sizes from
16 to 150 litres chamber volume



STERILIZING
SIMPLY
AND WELL

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1



1 Steam sterilizers (autoclaves), HV series

NEW!

HMC-EUROPE GmbH

Sterilizing simply and well.
Single-wall, vertical steam sterilizers, equipped with a newly developed safety lock. Fully automatic, microprocessor controlled. Programmable. Preset programs, simplest selectable, programmable, parameters (temperature, time, exhaust) variable.
Liquid program according to TRB 402 and EN61010-2 (flex sensor required).
AGAR program warming cycle. Night program: feed in the evening and found sterilized at the next morning. Steam condenser as standard. Mounted on castors. No connection to water-/steam supply or -disposal necessary.

Type	Capacity Litres	Internal dimensions (Ø x H) mm	External dimensions (W x D x H) mm	Working Temp. range °C	Rating W	Weight kg	PK	Cat. No.
HV-L25	25	240 x 550	480 x 950 x 460	105 to 126	1500	41	1	**7.980 025**
HV-L50	50	300 x 710	510 x 1040 x 530	105 to 135	2000	57	1	**6.232 481**
HV-L85	85	420 x 615	660 x 1000 x 650	105 to 128	3000	71	1	**9.842 418**
HV-L110	110	420 x 795	660 x 1000 x 650	105 to 123	4000	81	1	**6.254 337**

Accessories for HV series steam sterilisers

NEW!

HMC-EUROPE GmbH

Description	Dimensions (dia. x H) mm	PK	Cat. No.
Flexible temperature sensor		1	**7.980 024**
Integrated printer		1	**9.842 427**
Air cooling		1	**9.842 428**
Exhaust-air filtration		1	**9.842 429**
Stainless steel sterilising basket for HV-25	218 x 260	1	**7.980 027**
Stainless steel sterilising basket with bottom for HV-25	218 x 260	1	**9.842 430**
Stainless steel sterilising can for HV-25	210 x 255	1	**9.842 431**
Stainless steel sterilising basket for HV-50	280 x 225	1	**6.232 482**
Stainless steel sterilising basket with bottom for HV-50	280 x 225	1	**9.842 432**
Stainless steel sterilising can for HV-50	270 x 220	1	**9.842 433**

Further accessories for Models HV-85 and HV-110 available on request.

2



2 Autoclave deodorant Anabac®

interscience

Laboratories are very concerned about hygiene, cleanliness and comfort in the workplace. Try Anabac® autoclave deodorant balls to improve the working environment in the laboratory. These autoclave deodorant balls bring a discrete scent that speaks of cleanliness.

Type	Description	PK	Cat. No.
Classic	Mint and eucalyptus fragrance	100	**6.228 599**
Poma	Apple fragrance	100	**6.231 161**
Citrus	Lemon fragrance	100	**6.231 720**
Floral	Flower fragrance	100	**7.626 764**
Peach	Peach fragrance	100	**7.626 766**

3



3 Indicator tape for steam, hot air and gas sterilisation

Crepe paper, adhesive. With heat-sensitive dyes. Colour changes according to DIN EN ISO 11140-1. Rolls of 50m.

With	Width mm	Figure	PK	Cat. No.
Steam indicator, lead free	18	a	1	**9.140 787**
Steam indicator, lead free	24	a	1	**9.140 788**
Steam indicator	19	b	1	**9.140 784**
Steam indicator	25	b	1	**9.140 789**
Steam indicator, strongly adhesive, for non-woven fabric	19	c	1	**9.140 790**
Steam indicator, strongly adhesive, for non-woven fabric	25	c	1	**9.140 791**
Ethylene oxide indicator	19	d	1	**9.140 792**
Hot air indicator	19	e	1	**6.240 223**

E & OE.

1 Polysteribox® sterilisation containers



Ritter GmbH

The PolySteribox® from Ritter Medical for sterilisation of instruments, storage and transportation of sterile goods is a secure solution in line with the requirements of validated processes a ecting sterile goods. The PolySteribox® is available in 4 different standardized sizes (SH, M, L and XL) which are suitable for all current sterilisation automats. PolySteribox is producted out of a transparent, dimensionally stable and high temperature resistant (up to 150 degrees celcius) material. It is therefore suitable for autoclave vacuum sterilisation at 121°C or 134°C depending on the sterilisation method recommended by relevant authorities such as the Robert Koch Institute in Germany. In addition the PolySteribox can be used for plasma sterilisation (STEARRAD®) as well as for gas sterilisation (formaldehyde and ethylene oxide) at a maximum of 65°C. Lid and bottom close hermetically and include a built-in bacteria barrier. For your convenience Ritter o ers two kinds of PTFE filter sets: a permanent/life-time lter or an annual filter which needs to be changed once a year. The patented interlocking system is compatible within all different models and prevents from accidental opening of the box. The boxes are space-saving and easy to stack, therefore they are wellsuited for storage of sterile goods.

Type	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	PK	Cat. No.
Polysteribox® SH	177 x 76 x 45	208 x 111 x 54	1	**9.284 265**
Polysteribox® M	155 x 123 x 32	184 x 144 x 59	1	**9.284 266**
Polysteribox® L	261 x 164 x 65	290 x 183 x 74	1	**9.284 267**
Polysteribox® XL	465 x 95 x 55	498 x 118 x 63	1	**9.284 268**

2 Accessories for Polysteribox®



Ritter GmbH

Description	PK	Cat. No.
Filter set S/SH	1	**9.284 281**
Filter set M	1	**9.284 282**
Filter set L/XL	1	**9.284 283**
Silicone positioning mat for box S, SH	1	**9.284 288**
Silicone positioning mat for box L	1	**9.284 292**
Silicone positioning mat for box M	1	**9.284 293**
Safety seals	1000	**9.284 285**
Sterilisation seal for box S	1000	**9.284 286**
Sterilisation seal for box SH, M, L	1000	**9.284 287**
Stainer for the Polysteribox L	1	**9.284 294**

Disposal bags - please see page 247.

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1



1 Air Flow Tester

Dräger

In many fields, such as mining or industry, it is very important to detect even the smallest air flows, in order to quickly and reliably evaluate the possible diffusion of dangerous substances. With the air flow test tubes, the source, direction and speed of the air flow are visible immediately.

Type	PK	Cat. No.
Air Flow Tester (Set with blower ball and 10 flow test tubes)	1	**6.054 581**
Blower Ball	1	**6.200 206**
Flow test tubes	10	**6.076 362**

2



9.110 236

Gas sampling tubes, glass

Lenz

Made of DURAN® tubing. To DIN 12473. With 2.5mm bore stopcocks . Stopcocks are provided with elastic key retainers. With, or without, sampling connections.
PU protective coating available on request.

Capacity ml	Length*	External body diam. mm	Type	PK	Cat. No.
150	155	42	Without sampling connections	1	**9.110 215**
350	200	54	Without sampling connections	1	**9.110 220**
500	220	65	Without sampling connections	1	**9.110 225**
1000	260	85	Without sampling connections	1	**9.110 230**
150	155	42	With sampling connections, GL 14	1	**6.243 069**
350	200	54	With sampling connections, GL 14	1	**9.110 236** 2
500	220	65	With sampling connections, GL 14	1	**9.110 237**
1000	260	85	With sampling connections, GL 14	1	**7.623 930**

* Body length (mm)

3



3 Dräger Sampling Tubes

Dräger

Using the Dräger activated charcoal tubes or silica gel tubes, hazardous substances in the air are collected using a suitable medium via adsorption or chemisorption. The sample is then analysed in the laboratory by means of various analytical methods such as gas chromatography (GC), high performance liquid chromatography (HPLC), UV-VIS photometry, or IR spectroscopy.

Description	Type	PK	Cat. No.
Charcoal tubes	BiA	10	**9.620 414**
Charcoal tubes	G	10	**9.620 415**
Charcoal tubes	B/G	10	**9.620 416**
Silica gel tubes	BiA	10	**9.620 417**
Silica gel tubes	G	10	**9.620 418**
Silica gel tubes	B/G	10	**9.620 419**
Isocyanate sampling set incl. analysis		1	**6.070 187**
Diffusion sampler ORSA 5		5	**6.050 155**
Diffusion sampler ORSA 25		25	**6.080 611**

1 Dräger Tubes®



Dräger

The Dräger Tubes® measuring system is the safe method for measuring pollutants in the soil, water and air. More than 500 substances can be measured in varying concentrations.
The long-established principle of Dräger Tubes® is still the same. A defined volume of gas/air must be pumped through the sampling tube. This can be achieved by using the Accuro® gas pump. On contact with the substance under test the reagent system contained in the tube reacts and displays a colour. The strength of the concentration of the substance is shown by the length of the colour band displayed and can be read directly from the scale. The Dräger-Tubes® sampling system provides accuracy, economy, efficiency, quick and easy handling. Over 250 tubes are available on request for all substances and measuring fields. Further sampling devices, diffusion tubes for long-term measurements as well as sampling systems with activated carbon tubes, ORSA collector and TDS thermodesorption tubes are also available.

Type	Measuring range	PK	Cat. No.
Accuro gas pump		1	**9.620 410**
Gas pump set accuro (incl. bag a. E-Set)		1	**9.620 411**
Acetone 100/b tubes	100 to 12000 ppm	10	**9.620 421**
Alcohol 25/a tubes	25 to 5000 ppm	10	**9.620 423**
Ammonia 2/a tubes	2 to 30 ppm	10	**9.620 404**
Ammonia 5/a tubes	5 to 700 ppm	10	**9.620 405**
Ammonia 5/b tubes	5 to 100 ppm	10	**9.620 424**
Petroleum hydrocarbons 10/a tubes	10 to 300 ppm	10	**9.620 426**
Benzene 0.5/a tubes	0.5 to 10 ppm	10	**9.620 406**
Benzene 0.5/c tubes	0.5 to 10 ppm	5	**9.620 427**
Chlorine 0.2/a tubes	0.2 to 3 ppm	10	**9.620 407**
Formaldehyde 0.2/a tubes	0.2 to 5 ppm	10	**9.620 429**
Carbon dioxide 100/a tubes	100 to 3000 ppm	10	**9.620 408**
Carbon dioxide 5/a	5 to 60 Vol.%	10	**6.050 554**
Carbon monoxide 2/a tubes	2 to 60 ppm	10	**9.620 432**
Carbon monoxide 5/c tubes	8 to 700 ppm	10	**9.620 409**
Nitrous fumes 0.5/a tubes	0.5 to 10 ppm	10	**9.620 433**
Ozone 0.05/b tubes	0.05 to 0.7 ppm	10	**9.620 434**
Perchloroethylene 2/a tubes	2 to 300 ppm	10	**9.620 436**
Phenol 1/b tubes	1 to 20 ppm	10	**9.620 437**
Hydrogen phosphide 0.01/a tubes	0.01 to 1 ppm	10	**9.620 438**
Mercury vapour 0.1/b tubes	0.05 to 2 mg/m³	10	**9.620 439**
Hydrochloric acid 1/a tubes	1 to 10 ppm	10	**9.620 413**
Hydrochloric acid/nitric acid 1/a tubes	1 to 10/15 ppm	10	**9.620 441**
Oxygen 5%/c	5 to 23 Vol.% 10	10	**9.620 448**
Sulphur dioxide 0.5/a tubes	0.5 to 25 ppm	10	**9.620 420**
Carbon disulphide3/a tubes	3 to 95 ppm	10	**9.620 442**
Hydrogen sulfide 0.2%/a	0.2 to 7 Vol.%	10	**6.088 166**
Hydrogen sulphide 1/d tubes	1 to 200ppm	10	**9.620 443**
Hydrogen sulfide 100/a	100 to 2000 ppm	10	**6.050 553**
Hydrogen sulphide 5/b tubes	5 to 60 ppm	10	**9.620 425**
Toluene 5/b tubes	5 to 300 ppm	10	**9.620 446**
Trichloroethylene 2/a tubes	20 to 250 ppm	10	**9.620 447**
Hydrogen sulfide 1/c	1 to 20ppm	10	**6.052 630**
Hydrogen sulfide 0,5/a	0.5 to 15ppm	10	**6.304 822**
Acetic Acid 5/a	5 to 20ppm	10	**6.900 409**
Acid 0.5/a	0.5-100 ppm	10	**9.620 449**

Dräger Aerotest Alpha

NEW!

Dräger

The Dräger Aerotest Alpha allows the quality of breathing air supplied by a compressor or compressed gas cylinder to be determined. Use of the test system performs a reliable check in accordance with the breathing air standard EN 12 021.

Dräger Aerotest Alpha
comprising of 1 pressure reducer, measuring device for 4 tubes, impactor adapter, coupling, barbed nipple, stopwatch, tube opener Dräger TO 7000, bubble test hose, pack of 5 sintered filters, instruction for use, transport case (black)

Dräger Aerotest Alpha, with Dräger Tubes:
Dräger Aerotest Alpha
+ box of 10 Dräger Oil Impactors,
+ box of 10 Dräger-Tubes carbon dioxide (CO_2) 100/a-P,
+ box of 10 Dräger-Tubes carbon monoxide (CO) 5/a-P,
+ box of 10 Dräger-Tubes water vapor (H_2O) 20/a-P

Specifications

Dimensions of carrying case (L x W x H)	350 x 300 x 85 mm
Weight, including contents	approx. 3.0 kg
Max. supply pressure	15 bar
Supply pressure (set on delivery)	3.0 bar
Pressure gauge	0.3 to 15 bar
Connection for compressed air supply	barbed nipple 9 mm
Flow rate	0.2 and 4.0 l/min

Description	PK	Cat. No.
Dräger Aerotest Alpha	1	**6.241 227**
Dräger Aerotest Alpha, with Dräger Tubes	1	**7.629 381** 1
Oil-impactor	10	**6.241 225**
Carbon monoxide 5/a-P	10	**6.801 977**
Carbon dioxide 100/a-P	10	**6.801 978**
Water Vapor 5/a-P	10	**6.087 703**
Water vapour 20/a-p	10	**6.801 979**

1



7.629 381

E & OE.

Automatic tube pump Dräger X-act® 5000

NEW!

Dräger

The automatic tube pump Dräger X-act® 5000 is the first all-in-one solution designed for measurements with Dräger short-term tubes and for sampling tubes and systems. Ease of operation and a high degree of reliability compliment the measurement and sampling of gases, vapors and aerosols.

- New Pump Concept
- Simplicity of Operation, even with protection gloves
- Automatic Transfer of Measurement Parameters with barcode reader
- Measurement in Technical Gases
- Direct Settings for Sampling
- Simple and intuitive menu structure

Specifications

Short-term measurements	
Number of strokes	adjustable, 1 to 199 strokes
Stroke volume	100ml
Sample taking	
Flow rate range:	0.1 to 2.0 L/min Resolution 0.1 to 1.0 L/min: 0.1 L/min ±5 % Resolution 1.0 to 2.0 L/min: 0.2 L/min ±5 %
Sampling time:	adjustable, up to 12 hours, depending on flow rate Resolution in steps of 15 minutes (default) or 1 minute
Display:	two parts: segment and matrix
Menu languages	Danish, Dutch, English, Finnish, French, German, Italian, Norwegian, Polish, Spanish, Swedish
Dimensions (H x W x D)	approx.. 175mm x 230mm x 108mm
Weight (without battery pack)	approx. 1.6kg
Ambient Conditions	
Temperature during storage:	-20°C to 55°C
Temperature during operation:	5°C to 40°C
Humidity:	0 to 95% r. h., non-condensing
Pressure	700 to 1300 hPa

Description	PK	Cat. No.
Dräger X-act 5000, shoulder strap without power supply	1	**9.620 470** 1
Rechargeable Battery NiMH, T4	1	**9.620 471**
Alkaline Battery Pack, T4 without Batteries (6 batteries required)	1	**9.620 472**
Alkaline Battery Dräger X-act 5000	1	**9.620 473**
Wall-Wart Charger 100 240 VAC (worldwide)	1	**9.620 474**
Car Charger 12 / 24 V	1	**9.620 475**

1



9.620 470

1



1 Laboratory purification plants to determine the biodegradability

e.g. for the Coupled Units Test in acc. with OECD 303 A, complete. *Behr*
optional:
- Dentrification step with pump and stirrers
- Oxygen control, consisting of:
Oxygen measuring unit for preliminary sedimentation with a voltage output for switching the air supply on and off behrotest® GWS 200 limit switch. Operating capacity 0 to 200%, corresponds to 0 to 19.9 mg/l
Vessels made of borosilicate glass 3.3

Type	Description	PK	Cat. No.
KA 1	Laboratory purification plant, complete	1	**9.920 600**
KA 1/SR	Laboratory purification plant, complete, with oxygen entry control	1	**9.920 605**
KLD 4	Laboratory purification plant, complete, with dentrification step	1	**9.920 602**
KLD 4/SR	Laboratory purification plant, complete, with dentrification step and oxygen entry control	1	**9.920 606**
KLD 4/N	Like KLD 4, with continual sludge recirculation	1	**9.920 598**
KLD 4N/SR	Like KLD 4/SR, with continual sludge recirculation	1	**9.920 599**

2



2 Equipment to determine anaerobic digestion

The complete equipment consists of: *Behr*
- Tempering bath with thermostat for 6 eudiometer units incl. clamping device for eudiometer tubes
- 6 eudiometer units with laboratory bottles, 500ml, eudiometer tubes with graduation, stopcock and connecting tube and levelling bulb

Specifications

Dims (WxDxH):	850 x 330 x 360 mm
Weight:	16 kg

Type	Description	PK	Cat. No.
FH 6	Tempering bath made of PVC incl. thermostat for 6 eudiometer units	1	**9.843 850**
FH 10	Eudiometer unit.Eudiometer tube, laboratory and levelling bottle	1	**9.843 851**
RM 6	Series magnetic stirrer, for use in water bath to stir 6 bottles, each with 500 ml, including separate control unit	1	**9.843 852**

E & OE.

behrotest ® column elution unit for the elution of soil samples

Behr

Column elution unit:
Column elution unit in acc. with the LUA recommendation with 4-channel hose pump with controllable speed. The unit consists of:
- Assembly stand for the system
- Controllable 4-channel hose pump with fixed speed
- Storage vessel, 20 l
- 4 elution columns, internal diameter 6 cm, 32 cm long, with 2 screwed joints (GL 45, with PTFE inserts) for simple filling of the columns
- 4 collection bottles for the column eluate, 2 l, with screwed joint (GL 45) and deaeration
- Supply tube made of TYGON and PVC, with non-return valve in the supply to the column
- PTFE tubes between columns and collection vessels
- Flow rate 0.003 to 35 ml/min
- Range of speed 2 to 100 min^{-1}
- Simultaneous control of all 4 channels

behrotest® silica sand:
for column elution unit, grain size 1 to 2 mm in acc. with DIN V 19736, 1000 g bottle

behrotest® silica wool:
for column elution unit, 100 g bag



9.843 741

Type	Description	PK	Cat. No.
SEB 32 R	Column elution unit B	1	**9.843 741** 1
QS-SEB	Silica sand for column elution unit	1	**9.843 744**
QW-SEB	Fibreglass for column elution unit	1	**9.843 745**
GS 950	Glass column 60mm x 320mm	1	**9.843 925**

2 behrotest® waste water mixers

Behr

behrotest ® homogenizers
With transportable sample vessels
Homogenizers for pre-treatment, splitting and homogenization of heterogeneous water samples in accordance with the quality assurance and quality control standards for wastewater examinations.
The vessels of the homogenizers are protected against damage in the yolk type frame and can be carried easily by the two handles. They can be filled at the sampling location by a flattened inlet connection. Capacities from 2 to 25 l permit extraction and collection of multiple samples. Exact measurement of the sample quantities due to graduation.
Subsequently, the transport rack is just placed on the magnetic stirrer in the laboratory or in the sampling vehicle and the homogenizer is immediately ready for use. The speed of the magnetic stirrer can be adjusted by a controller.
The user can thus comply with the specified cone height in all cases. Oxygen is thus prevented from entering the samples. Dosed extraction of the homogenized sample via PTFE spindle stopcock.
12V, with adapter for mains connection.



Type	Description	PK	Cat. No.
QMR 2	Capacity 2 l	1	**9.920 639**
QMR 5	Capacity 5 l	1	**9.920 640**
QMR 10	Capacity 10 l	1	**9.920 641**
QMR 15	Capacity 15 l	1	**9.920 642**
QMR 20	Capacity 20 l	1	**9.920 643**
QMR 25	Capacity 25 l	1	**9.920 644**

3 Distillation unit FBA

Determination of the inorganic total fluoride

Behr

FBA distillation unit
behrotest® distillation unit to determine inorganically bound total fluoride
In highly contaminated inorganic wastewater with a fluoride ionic concentration greater than 0.2 mg/l determination of the inorganic bound total fluoride takes place after digestion and distillation. The behrotest® distillation unit combines all components required for distillation on a stable laboratory stand. The unit is also suitable for larger analysis series due to the heating control system.
The single components are:
Distillation equipment made of borosilicate glass for acid steam distillation, contact thermometer, heating mantles for distillation flasks and volumetric flasks.



Type	Description	PK	Cat. No.
FBA	Distillation unit for total fluoride	1	**9.843 806**



1 Extraction unit EX 1000

Determination of hydrocarbon EX 1000 extraction unit
The PFL sampling bottle is ideal for direct extraction in terms of ISO 9377-2. With its solid glass stopper, in addition it offers a decisive advantage in handling and safety.
The funnel separator facilitates the separation of the organic phase. The individual functional parts of the separator can be easily separated. The user can thus transfer the organic phase quickly and simply in one step to the clean-up column. In addition the individual functional parts are particularly easy to clean.

Type	Description	PK	Cat. No.
EX 1000	Extraction unit	1	**9.843 800**



2 behrotest® compact equipment for elution of solid matters

Behr

Percolation equipment to jointly examine the elution behaviour of inorganic and organic substances in solid matters. Including hose pump with 2 channels and 2 different pump tubes for a flow rate of 0.25-12 ml/min. and 0.66-33 ml/min. (Other pump tubes upon request).
Complete equipment, consisting of
- Percolation columns with pre-filters on sturdy stands
- Storage bottle with cap and tube
- Tube
- Eluate lead made of PTFE
- Storage vessel made of glass, cap with ventilation tube

Type	Description	PK	Cat. No.
KEB 101	Complete equipment, elution of solid matters for one sample w/ GS 101 glass column. Incl. two-channel hose pump and 2 tubes for different flow rates	1	**9.843 931**
KEBE 101	Supplementary equipment, elution of solid matters for one sample w/ GS 101 glass column. Incl. two-channel hose pump and 2 tubes for different flow rates	1	**9.843 932**
GS 101	Glass column, 90 x 500 x 5 mm, thread GL 100	1	**9.843 928**
SRR	Tube set, 4 pump tubes made of Tygon, flow rate of 0.25 - 12 ml/min	1	**9.843 929**
SVV	Tube set, 4 pump tubes made of Tygon, flow rate 0.66 - 33 ml/min	1	**9.843 930**



3 CUS 2 clean-up-station

Behr

The behrotest® clean-up column with glass frit corresponds exactly to the provisions of ISO 9377-2.
The practical twin stand provides safe support for two complete clean-up units with dropping funnel, clean-up columns and Kuderna-Danish flasks. Thus, the complete clean-up procedure can be carried out for two samples simultaneously - without delays due to time-consuming equipment or sample manipulation.
Clean-up-Station, supplied as: stand, 2 graduated round, bottom flasks, 100ml, 2 columns with grade 2 frits

Type	Description	PK	Cat. No.
CUS 2	Clean-up-Station	1	**9.843 801**



4 KOSTA 2 nitrogen station

Behr

The two-stage concentration of the organic phase is concluded by reducing the extract down to less than 1 ml under a mild nitrogen flow.
In the behrotest® nitrogen station, a distributor leads the nitrogen flow via two individually adjustable tubes into the Kuderna-Danish flasks. Thus, two samples can be reduced simultaneously in accordance with ISO 9377-2.

Type	Description	PK	Cat. No.
Kosta 2	Nitrogen station	1	**9.843 802**

E & OE.

1 Lovibond® water testing equipment

Single-parameter and multi-parameters kits, including for chlorine and pH *Tintometer*

The Lovibond® product range contains a large selection of single and multi-parameter water testing equipment. Each kit is a complete, portable system that guarantees accurate water tests and contains all of the colour discs, reagents, accessory parts and detailed instructions necessary for the respective tests ensuring that reliable results may be obtained. The table below illustrates the most popular water testing kits. In addition, kits can also be created in accordance with specific user requirements on request.

All test apparatus for parameters listed against individual kits are supplied.



Type	Description	For	Measuring range	Accessories	PK	Cat. No.
AF 112E	Chlorine - free, chlorine combined	chlorine	0.02 to 0.3mg/l Cl_2	comparator, colour disc	1	**9.947 203**
AF 112A	Chlorine - free, chlorine combined, tot	chlorine	0.1 to 1.0mg/l Cl_2	comparator, colour disc	1	**9.947 204**
AF 112B	Chlorine - free, chlorine combined, tot	chlorine	0.2 to 4.0mg/l Cl_2	comparator, colour disc	1	**9.947 205**
AF 116A	Chlorine & pH	chlorine pH value	0.1 to 1 mg/l Cl_2 6.8 to 8.4 pH	comparator, colour disc	1	**9.922 315**
AF 116B	Chlorine & pH	Chlorine pH value	0.2 to 4 mg/l Cl_2 6.8 to 8.4 pH	comparator, colour disc	1	**9.947 208**
AF 357	Drinking water	Chloride Chlorine Fluoride tot. hardness Hazen pH value	0 to 5000 mg/l Cl 0.02 to 0.3 & 0.2 to 4 mg/l Cl_2 0 to 1.6 mg/l F 0 to 500 mg/l $CaCO_3$ 10 to 90 mg Pt/l 6 to 8.4 pH	Tablet count. method nessleriser, colour disc nessleriser, colour disc Tablet count. method comparator, colour disc comparator, colour disc	1	**9.947 209**

Colorimeters, Lovibond® PFXi series

NEW!

Tintometer

The PFXi series of spectrophotometric colorimeters introduces a unique concept in liquid colour control: RCMSi technology (Remote Calibration & Maintenance Service via internet).
Users can benefit from the capability for remote calibration and servicing via the internet - eliminating any costs and time delays associated with servicing and guaranteeing compliance with standards. The PFXi range is supplied with a full range of colour scales for specific markets including, but not limited to, Petroleum, Edible Oils, Pharmaceuticals, Brewing and Honey. Users can upgrade scales remotely at any time. Every PFXi is supplied with colour control software for data analysis (LAN & USB cable provided). Optical glass cells, a certified glass calibration filter, a spare lamp and user instructions included. The PFXi-880 and -995 series are available with an optional integrated heater unit (this is not available for the PFXi-195). This is a critical feature when dealing with materials such as fats and waxes where temperature needs to be maintained at a constant temperature +10°C above the "Cloud Point" of the material.
Please Note: CIE values and spectral data readings are standard on all the instruments listed below.



9.947 280

Type	For	Colour scale	PK	Cat. No.
PFXi-195/1	Chemicals & Industrial Oils	Pt-Co/Hazen/APHA, Gardner, Iodine	1	**9.947 280** 2
PFXi-195/2	Petroleum Oils & Waxes	Saybolt, ASTM Color, Pt-Co/Hazen/APHA	1	**9.947 281**
PFXi-195/4	Beers, Malts & Caramels	EBC (CIE & 430nm), ASBC (CIE & 430nm), Series 52	1	**9.947 282**
PFXi-195/5	Pharmaceutical Solutions	European & US Pharmacopoeia, Pt-Co/Hazen/APHA	1	**9.947 283**
PFXi-880/L	Oils and Fats	RYBN colour	1	**9.947 284**
PFXi-880/P	Fuels and Waxes	Saybolt, ASTM Color, IP Units	1	**9.947 285**
PFXi-995	Transparent Samples	AOCS-Tintometer®, Gardner, Saybolt, Kreiss, Hess-Ives, Hunter Lab, Iodine colour, ASTM Color, Pt-Co/Hazen/APHA	1	**9.947 286**
PFXi-995/P	Petroleum Oils and Waxes	Saybolt Colour, ASTM Colour, Pt-Co/Hazen/APHA Colour, Gardner Colour, Lovibond® RYBN, IP Units, CIE Values, Spectral Data	1	**9.947 287**

1



1 Visual Colorimeter, Lovibond® Tintometer Model F

Tintometer

- Individually housed glass colour standards
- Prismatic optical system for accurate and repeatable colour matching
- Standardised and diffused tungsten-halogen light source
- Replacement inserts simplify cleaning and maintain interior whiteness

The Model F is a versatile visual colorimeter for measuring the colour of liquids, solids, powders and pastes in terms of Lovibond units. The user simultaneously compares the colour of light that is either transmitted through or reflected from the sample with that transmitted through a series of glass colour filters in 3 primary colours - red, blue and yellow. The slides are adjusted until a visual colour match is found for the light from the sample and the colour is then expressed in Lovibond RYBN units.

The Model F is supplied with a complete set of Lovibond coloured glass filters (Red 0.1 to 70; Yellow 0.1 to 70; Blue 0.1 to 40; Neutral 0.1 to 3.0), a sample chamber insert for easy cleaning, fused glass cells (one each of 1" and 5¼"), accessories and instructions. An optional solid sample accessory pack is available for measuring light-reflecting products. Includes a 12 Volt a.c. power pack switchable to suit 110/220/Volt supply.

Description	PK	Cat. No.
Tintometer Model F	1	**9.947 340**

Each instrument is supplied with optical cuvettes of the appropriate path length for the individual colour scales, calibration filter, spare lamp and operating instructions.

Accessories for visual Colorimeter, Lovibond® Tintometer Model F

Tintometer

Description	PK	Cat. No.
1/2" optical glass cell	1	**9.947 341**
1" optical glass cell	1	**9.947 342**
5 1/4" optical glass cell	1	**9.947 343**
Replacement sample chamber insert for Model F	3	**9.947 346**
Accessory pack for solid sample measurement	1	**9.947 347**

2



2 Lovibond® Nessleriser Systems, Pt-Co/Hazen/APHA Scale

Tintometer

For colour grading of clear, light yellow liquids such as clear oils, chemicals, petrochemicals and water. Each system covers a set measuring range and includes:

- A visual comparator instrument with a long path length, ensuring good sensitivity and accuracy when grading pale coloured samples.
- A selection of Pt-Co/APHA colour standards; stable-coloured glass filters in test discs, which have been precalibrated to give direct Pt-Co Colour readings over set measuring ranges.
- A standardised bench-top light source to ensure constant and uniform lighting conditions for colour matching and therefore consistent and accurate readings.
- Nessler cylinders of the appropriate path length.

Model	Apparatus included
AF 329:	Nessleriser 2150 with Daylight 2000 Lighting Unit and 113mm (50ml) Nessler cylinders, Nessleriser 2250 upgrade with 250mm Nessler cylinders, Pt-Co discs CAA (0 to 30mg Pt/l) CAB (30 to 70mg Pt/l), NSB (70 to 250mg Pt/l), stand for using Nessleriser with natural light.
AF 325:	Nessleriser 2150 with Daylight 2000 Lighting Unit and 113 mm (50ml) Nessler cylinders, Pt-Co discs NSH (10 to 90mg Pt/l), NSB (70 to 250mg Pt/l), stand for using Nessleriser with natural light.
AF 328:	Nessleriser 2250 with Daylight 2000 Lighting Unit and 250mm Nessler cylinders, Pt-Co discs CAA (0 to 30mg Pt/l), CAB (30 to 70mg Pt/l), stand for using Nessleriser with natural light.

Type	Pt-Co range	PK	Cat. No.
AF 329	0 - 250 mg Pt/l	1	**9.947 334**
AF 325	10 - 250 mg Pt/l	1	**9.947 335**
AF 328	0 - 70 mg Pt/l	1	**9.947 336**

E & OE.

Nessler Tube, without spout, borosilicate 3.3

NEW!

NORMAX - Fabrica

Description	Capacity ml	Dimensions (dia. x H) mm	PK	Cat. No.	
Nessler Tube, without spout, tall form, graduated at 50 ml	50	20 x 300	1	**9.170 621**	2
Nessler Tube, without spout, tall form, graduated at 100 ml	100	24 x 375	1	**9.170 622**	
Nessler Tube, without spout, short form, graduated at 50 ml	50	25 x 175	1	**9.170 623**	1
Nessler Tube, without spout, short form, graduated at 100 ml	100	32 x 200	1	**9.170 624**	

1



9.170 623

2



9.170 621

Test kits, *VISOCOLOR*®

MACHEREY-NAGEL

***VISOCOLOR*® *HE* Ammonium.** Highly sensitive test kit for testing of ammonium.
Measuring range (scale gradation):
0.0/0.02/0.04/0.07/0.10/0.15/0.20/0.30/0.40/0.50mg/l NH_4^+

***VISOCOLOR*® *ECO* Nitrate.** Test kit for Nitrate testing.
Measuring range (scale gradation): 0/1/3/5/10/20/30/50/70/90/120mg/l NO_3^-
This test kit is qualified for the analysis of seawater.

***VISOCOLOR*® *ECO* Nitrite.** Test kit for Nitrite testing.
Measuring range (scale gradation): 0.0/0.02/0.03/0.05/0.07/0.1/0.2/0.3/0.5mg/l NO_2^-
This method is qualified for the analysis of seawater.

***VISOCOLOR*® *alpha* pH 5 to 9.** Test kit for the pH analysis.
Measuring range (scale gradation): pH 5.0/5.5/6.0/6.5/7.0/7.5/8.0/8.5/9.0
This test kit is qualified for the analysis of seawater.

***VISOCOLOR*® *HE* Phosphate.** Highly sensitive test kit for Phosphate analysis.
Measuring range (scale gradation): 0.0/0.05/0.10/0.15/0.20/0.3/0.4/0.6/0.8/1.0mg/l P
This test kit is qualified for the analysis of seawater.

***VISOCOLOR*® *HE* Oxygen SA 10.** Test kit for the titrimetric analysis of dissolved oxygen in water according to DIN EN 25 813.
Measuring range: 1 syringe filling is enough for testing 0.2 to 10.0mg/l O_2. 1 scale line = 0.2mg/l O_2
Contents: sufficient for 100 tests with an average oxygen content of 9.0 mg/l
This test kit is qualified for the analysis of seawater.

***VISOCOLOR*® *HE* Carbonate hardness C 20.** Test kit for carbonate hardness in water as well as for the partial alkalinity. Dual range test kit for carbonate hardness (=m-value) as well as the partial alkalinity (=p-value).
Measuring range: 1 syringe filling is enough for testing 0.5 to 20.0°d and /or 0.2 to 7.0mmol/l H^+.
This test kit is qualified for the analysis of seawater.

***VISOCOLOR*® *alpha* Total Hardness.** Test kit for total hardness.
Reaction basis: Titration
Measuring range: 1 drop = 1°d
Contents: sufficient reagents for 100 tests with an average hardness of 10°d.
This test kit is qualified for the analysis of seawater after dilution (1+29).

3



9.304 581

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9.304 570

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9.304 583

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9.304 569

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9.304 585

Type	For	PK	Cat. No.	
VISOCOLOR® *HE* Ammonium	110 tests	1	**9.304 581**	3
VISOCOLOR® *ECO* Nitrate	110 tests	1	**9.304 565**	
VISOCOLOR® *ECO* Nitrite	120 tests	1	**9.304 582**	
VISOCOLOR® *alpha* pH 5.0-9.0	200 tests	1	**9.304 570**	4
VISOCOLOR® *HE* Phosphate	300 tests	1	**9.304 583**	5
VISOCOLOR® *HE* Oxygen SA 10	100 tests	1	**9.304 569**	6
VISOCOLOR® *HE* Carbonate hardness C 20	200 tests	1	**9.304 585**	7
VISOCOLOR® *alpha* Total hardness	100 tests	1	**9.304 586**	

VISOCOLOR® reagent case and photometer

1



9.304 587

***VISOCOLOR*® *ECO* reagent case** *MACHEREY-NAGEL*
For mobile use with test instructions for visual determination, analytical accessories and the following tests:
Ammonium 0.2 - 3mg/L NH_4^+/Carbonate Hardness 1 drop = 1.25°e/total hardness 1 drop = 1.25°e/Nitrate 1 - 120mg/L NO_3^- /Nitrite 0.02 - 0.5mg/L NO_2^-/pH 4.0 - 9.0/Phosphate 0.2 - 5mg/L P

***VISOCOLOR*® reagent case for soil analysis**
The *VISOCOLOR*® reagent case for soil analysis is the perfect companion for economical, fast and convenient soil analysis, both in the field or in your laboratory, including the following tests:
QUANTOFIX® test strips: Ammonium 10 - 400mg/L NH_4^+/Nitrate/Nitrite 10 - 500mg/L NO_3^-/1 - 80mg/L NO_2^- /***VISOCOLOR*® *ECO* test kits:** Potassium 2 - 15mg/L K^+/***VISOCOLOR*® *HE* test kits:** pH 4.0 - 10.0/Phosphate 1.0 - 20.0mg/L P/**pH-Fix test strip:** pH 2.0 - 9.0

2



9.304 588

***VISOCOLOR*® reagent case "Environmental analysis"**
Reagent case with photometer PF-12 incl. instrument manual, *VISCOLOR*® *ECO* tests instructions as well as tests instructions for titration test kits, analytical accessoires and the following tests: Ammonium 15 0.5 - 15mg/L NH_4^+/Iron 0.04 - 1.0mg/L Fe/Nitrate 1 - 120mg/L NO_3^-/Nitrite 0.02 - 0.5mg/L NO_2^-/Phosphate 0.2 - 5mg/L P/pH 4.0 - 9.0
***VISOCOLOR*® *HE* test kits:** Carbonate hardness C 20: 0.6 - 25.0°e/Total hardness H 20 F 0.6 - 25.0°e

VISOCOLOR® SCHOOL reagent case
The VISCOLOR SCHOOL reagent case is especially designed for schools and caters to the needs of both students and teachers. All reagents are approved to be used in schools in Germany (GUV - SR 2004 directive) and can be disposed of easily just down the drain without any harm to the environment.
Ammonium 0.2 - 3 mg/L NH4+, Nitrate 1 - 90 mg/L NO3-, Nitrite 0.02 - 0.5 mg/L NO2-, Phosphate 0.5 - 15 mg/L P, pH pH 4.0 - 9.0, Total hardness 1 drop = 17.8 mg/L CaCO3

3



9.304 573

Compact PF-12 photometer for laboratories, complete in kit with manual, rechargeable batteries and battery charger.

Light source: Tungstenlamp
Detector: Silicon photo-element
Display: Backlit graphic display, 64 x 128 pixels
Operation: Display user guidance, plastic foil keyboard
Test selection via test number or parameter lists
12 languages (de, en, fr, es, it, nl, hu, pl, pt, cz, id, si)
Accuracy: ±1%
Long-term stability: < 0.002A/h
Interface: USB 2.0
Power supply: Via USB power supply, standard or rechargeable batteries
Dimensions: 215 x 100 x 65mm
Weight: 0.7kg

4



9.304 590

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6.252 729

Type	PK	Cat. No.	
VISOCOLOR® *ECO* Analysis kit	1	**9.304 587**	1
VISOCOLOR® soil kit, incl. manual	1	**9.304 588**	2
VISOCOLOR® Environmental analysis	1	**9.304 573**	3
VISOCOLOR® *SCHOOL* Analysis kit	1	**6.252 729**	5
PF-12 portable photometer for laboratories	1	**9.304 590**	4

List price for one package, volume discount at 10 packages.

E & OE.

1 QUANTOFIX® test strips

For semi-quantitative determinations. Strips 6mm wide x 95mm long.
Supplied in packs of 100 strips.

MACHEREY-NAGEL

1



For	Measuring range	PK	Cat. No.
Aluminium*	0 to 500mg/l Al^{3+}	100	**9.130 401**
Ammonia*	0 to 400mg/l NH_4^+	100	**9.130 414**
Arsenic 10*	0 to 0.5mg/l $As^{3+/5+}$	100	**9.130 416**
Arsenic 50*	0 to 3.0mg/l $As^{3+/5+}$	100	**9.130 415**
Arsenic Sensitive*	0 to 0.5mg/l $As^{3+/5+}$	100	**9.130 440**
Ascorbic acid	0 to 2000mg/l Vitamin C	100	**9.130 402**
Calcium**	0 to 100mg/l Ca^{2+}	60	**9.130 417**
Carbonate hardness	0 to 20 °d	100	**9.130 418**
Chlorine*	0 to 100mg/l Cl_2	100	**9.130 419**
Chlorine Sensitive CE***	0 to 10mg/l Cl_2	100	**4.005 102**
Chloride	0 to 3000mg/l Cl^-	100	**9.130 420**
Chromate*	0 to 100mg/l CrO_4^{2-}	100	**9.130 403**
Cyanide*	0 to 30mg/l CN^-	100	**9.130 421**
EDTA	0 to 400mg/l EDTA	100	**9.130 432**
Formaldehyde*	0 to 200mg/l HCHO	100	**9.130 422**
Total Iron 1000	0 to 1000mg/l $Fe^{2+/3+}$	100	**6.243 754**
Total Iron 100	0 to 100mg/l $Fe^{2+/3+}$	100	**9.130 439**
Glutaraldehyde CE***	0 to 2.5 %	100	**9.130 438**
Potassium*	0 to 1500mg/l K^+	100	**9.130 423**
Cobalt	0 to 1000mg/l Co^{2+}	100	**9.130 406**
Copper	0 to 300mg/l Cu^{2+}	100	**9.130 407**
Concentration of cooling lubricants	0 to 200mmol/l KOH	100	**9.130 433**
Molybdate*	0 to 250mg/l Mo^{6+}	100	**9.130 424**
Nickel	0 to 1000mg/l Ni^{2+}	100	**9.130 408**
Nitrate/Nitrite	0 to 500mg/l NO_3^-, 1 to 80mg/l NO_2^-	100	**9.130 409**
Nitrite	0 to 80mg/l NO_2^-	100	**9.130 410**
Nitrite 3000	0 to 3000mg/l NO_2^-	100	**9.130 425**
Nitrite/pH	0 to 80mg/l NO_2^-, pH 6.0 to 9.6	100	**6.227 796**
Peracetic acid 50 CE***	0 to 50 mg/l PAA	100	**6.238 574**
Peracetic acid 500 CE***	0 to 500 mg/l PAA	100	**9.130 436**
Peracetic acid 2000 CE***	0 to 2000 mg/l PAA	100	**9.130 437**
Peroxide 25	0 to 25mg/l H_2O_2	100	**9.130 427**
Peroxide 100 CE***	0 to 100mg/l H_2O_2	100	**9.130 411**
Peroxide 1000	0 to 1000 mg/l H_2O_2	100	**9.130 426**
Phosphate*	0 to 100mg/l PO_4^{3-}	100	**9.130 428**
Quaternary ammonium compounds	0 to 1000mg/l Benzalkonium chloride	100	**9.130 434**
Sulphate	<200 to >1600 mg/l SO_4^{2-}	100	**9.130 429**
Sulphite	0 to 1000mg/l SO_3^{2-}	100	**9.130 412**
Zinc*	0 to 100mg/l Zn^{2+}	100	**9.130 430**
Tin	0 to 500mg/l Sn^{2+}	100	**9.130 413**
Multistick for aquarists, total hardness	0 to 25°d	100	**9.130 431**

* Test strips with reagent
**Box with 60 test strips and reagent
***CE-marked according to the directive for medical products 93/42/EWG.

1



2



1 2 MERCKOQUANT® test strips

Merck

For	Measuring range	PK	Cat. No.
Aluminium	10 to 250 mg/l Al^{3+}	100	**9.129 901**
Ammonia	10 to 400 mg/l NH_4^+	100	**9.129 902**
Ascorbic acid	50 to 2000 mg/l	100	**9.129 904**
Lead	20 to 500 mg/l Pb	100	**9.129 905**
Calcium	10 to 100 mg/l Ca^{2+}	60	**9.129 907**
Chromate	3 to 100 mg/l CrO_4^{2-}	100	**9.129 909**
Cobalt	10 to 1000 mg/l Co^{2+}	100	**9.129 911**
Cyanide	1 to 30 mg/l CN^-	100	**9.129 912**
Iron	3 to 500 mg/l $Fe^{2+/3+}$	100	**9.129 913**
Formaldehyde	10 to 100 mg/l HCHO	100	**9.129 914**
Total hardness	5 to 25 °dH	100	**9.129 916**
Total hardness	3 to 21 °dH	100	**9.129 918**
Total hardness	3 to 21°dH	1000	**9.129 919**
Total hardness	4 to 21 °dH	5000	**9.129 921**
Potassium	250 to 1500 mg/l K	100	**9.129 924**
Copper	10 to 300 mg/l Cu^{2+}	100	**9.129 923**
Manganese	2 to 100 mg/l Mn	100	**9.129 926**
Molybdenum	5 to 250 mg/l Mo^{6+}	100	**9.129 927**
Nickel	10 to 500 mg/l Ni^{2+}	100	**9.129 928**
Nitrate	10 to 500 mg/l NO_3^-,	100	**9.129 931**
Nitrite	2 to 80 mg/l NO_2^-	100	**9.129 932**
Nitrite	0.1 to 3 mg/l NO_2^-	100	**9.129 933**
Peracetic acid	5 to 50 mg/l	100	**9.129 943**
Peroxide	0.5 to 25 mg/l H_2O_2	100	**9.129 934**
Sulphate	200 to 1600 mg/l SO_4^{2-}	100	**9.129 937**
Sulphite	10 to 400 mg/l SO_3^{2-}	100	**9.129 938**
Tin	10 to 200 mg/l Sn^{2+}	50	**9.129 942**

3



3 Water hardness test strips, AQUADUR®

For determining water hardness. Supplied in boxes of 100 strips.
Colour change from green to red.

MACHEREY-NAGEL

Scale gradation °d*	PK	Cat. No.
<3 / >5 / >10 / >15 / >20 / >25	100	**9.130 393**
<3 / >4 / >7 / >14 / >21	100	**9.130 394**
<3 / >4 / >8.4 / >14	100	**9.130 400**

* German units. Multiply by 1.25 to convert to UK units (°e), and by 10 for US units (mg/l $CaCO_3$)
Test strips are also available as individually sealed test strips or as test cards.

E & OE.

1 2 Photometers AL100

AQUALYTIC

The AQUALYTIC® AL100 Photometers are designed for analysis of different parameters in drinking water, industrial process water and waste water. With a total of more then 30 different types, instruments are available for routine testing as well as for special applications.
The AL100 uses high quality interference filters with long-life LEDs as a light source without any moving parts in a transparent sample chamber. The units supply accurate, reproducible results very quickly. Other major advantages include ease of operation, ergonomic design, compact dimensions and safe handling. Provided with calibration and software-based adjustment options the AL100 is suitable for use as a testing instrument. The tests are conducted using either AQUALYTIC® tablet reagents with long-term stability and a shelf life of 5 or 10 years, VARIO powder reagents or using liquid reagents.

2



- Optics: High-quality Interference Filters
- Wavelength accuracy: ±1 nm.
- Power supply: 4 micro batteries (AAA), capacity approx. 17 hours or 5000 tests.
- Automatic switch-off.
- LCD Display (backlit on keypress).
- Internal ring memory for 16 data sets.
- Dimensions (L x W x H): 155 x 75 x 35 mm.

Supplied in a plastic carrying case, with reagents for 100 tests, batteries and round glass vials with lid.

Optional: IRiM - infrared interface module for data transfer to computer or printer.

Description	Measuring range	PK	Cat. No.
Ammonium	0.02 - 1.0 mg/l	1	**9.699 280**
Chlorine	0.01 - 6.0 mg/l	1	**7.627 340**
Chlorine dioxide	0.02 - 11 mg/l	1	**9.699 281**
Iron	0.02 - 1.0 mg/l	1	**9.699 282**
Copper	0.05 - 5.0 mg/l	1	**9.699 283**
Manganese LR	0.2 - 4.0 mg/l	1	**9.699 284**
Phosphate	0.05 - 4.0 mg/l	1	**9.699 285**
Silicon dioxide	0.05 - 4.0 mg/l	1	**9.699 286**
2 in 1 Chlorine /pH	0.01 - 6.0 mg/l* / 6.5 - 8.4 pH	1	**9.699 287**
3 in 1 Chlorine LR / Chlorine HR / Chlorine dioxide	0.01 - 6.0 mg/l / 5 - 200 mg/l / 0.05 - 11 mg/l	1	**9.699 288**
5 in 1 Chlorine / pH / Cyanuric acid / Alkalinity-M / Calcium hardness	0.01 - 6.0 mg/l* / 6.5 - 8.4 pH / 0 - 160 mg/l Cys / 5 - 200 mg/l $CaCO_3$ (TA); 0 - 500 mg/l $CaCO_3$ (CaH)	1	**9.699 289**
Reference standard kit Chlorine	0.2 / 1.0 mg/l	1	**7.627 352**
Reference standard kit Chlorine	1.0 / 4.0 mg/l	1	**9.699 290**
Reference standard kit pH	7.45 pH	1	**9.699 291**
Infrared data transfer module IRiM		1	**9.699 247**

*Delivery without reagents for measuring range 0.1 - 10 mg/l Cl_2.

1





1 Photometer system AL400

AQUALYTIC

With the modern design of the AL400 we have succeeded in combining the mobility of a portable photometer with the characteristics of a modern laboratory photometer.
This new unit covers all the important parameters of water analysis, from aluminium to zinc. The high level of accuracy of Aqualytic® reagents and the user-friendly nature of the instrument guarantee rapid and reliable analysis of your water samples. Depending on the application, the unit will operate with tablet reagents, powder reagents, liquid reagents or tube tests (16/13mm).
The AL400 operates with 6 interference filters and uses long-life LED's as a light-source. No moving parts are involved. The AL400 has a memory, in which up to 1000 data sets can be stored. The optional infra-red interface (IRIM = infra-red interface module) enables data to be transmitted to a computer or printer (RS232/USB).

Highlights:
- easy to use
- backlit display
- more then 110 pre-programmed methods
- automatic wavelength selection
- user Interface in English, German, French, Spanish, Italian, Portuguese (BR), Polish and Indonesian.
- Storage of 1000 data sets
- More than 35 user-defined methods possible
- Infrared Interface
- Waterproof Housing
- Mobile
- CE marked

Supplied with:
The instrument is supplied complete and ready-to-use incl. 4 batteries, 3 vials diam. 24 mm, 3 vials diam. 16 mm, 1 adapter each for 16 mm and 13 mm vials, carrying case with water resistance foam, but without reagents.

Specifications

Optics:	High-quality Interference Filters
Power Supply:	4 batteries (1.5V Mignon AA/LR6)
Operation time:	approx. 26 hours; continuous operation or 3500 tests
Dimensions (WxDxH):	approx. 210 x 95 x 45mm (unit) approx. 395 x 295 x 106mm (case)
Wavelengths:	530/ 560/ 610/ 430/ 580/ 660 nm

Type	Description	PK	Cat. No.
Photometer AL400		1	**9.699 235**
Verification standard kit		1	**9.699 246**
Set of 12 round cuvettes with cap	24 mm dia.	1	**9.699 231**
Set of 10 round cuvettes with cap	16 mm dia.	1	**9.699 240**
Adapter, grey	for 16mm dia. cuvettes	1	**9.699 226**
Adapter, black	for 16mm dia. cuvettes	1	**9.699 227**
Adapter, grey	for 13mm dia. cuvettes	1	**9.699 228**
Adapter, black	for 13mm dia. cuvettes	1	**9.699 229**
Sealing ring for cuvette	24mm dia.	12	**9.699 243**
Plastic funnel with handle		1	**9.699 244**
Stirring rod, plastic	13 cm long	1	**9.699 266**
Cleaning brush	10 cm long	1	**9.699 267**
Infrared data transfer module IRiM		1	**9.699 247**



2 Waste Water Set-Up AL400

NEW!

AQUALYTIC

Waste Water Set-Up including Photometer AL400 with standard accessory, thermoreactor AL125, Infra-red data transmission module IRiM, tube stand, membrane filter set, instruction manual, guarantee sheet and reagents for the following parameters:
COD 0 - 150 mg/l and 0 - 1500 mg/l, Ammonia 1 - 50 mg/l N, Nitrate 1 - 30 mg/l N Nitrite LR 0.01 - 0.3 mg/l N, Nitrogen 5 - 150 mg/l N, Phosphate 0.02 - 1 mg/l P/0.06 - 3.5 mg/l PO_4

Type	PK	Cat. No.
Waste Water Set-Up AL400	1	**9.699 236**

E & OE.

Photometer system AL450

AQUALYTIC

With Dual Beam Technology. The AL450 is a modern, microprocessor-controlled photometer with ergonomically designed keypad and large-format graphic display. It is equipped with a wide range of pre-programmed methods (e.g. ammonia, COD, phosphate) based on the proven range of Aqualytic® tablet reagents, liquid reagents, vial tests and powder reagents. The calibration and software-supported control options mean that the unit is also suitable for use as a testing instrument. The seven standard rechargeable batteries (supplied) ensure easy mobile use.

Advantages
- wide range of pre-programmed methods
- large, graphics display
- RS232 interface
- suitable for use with standard rechargeable batteries
- updates for new methods and languages via the Internet
- 1000 data set memory
- custom method recall is also possible

Comprises: AL450, ready-to-use incl. 7 x rechargeable batteries and battery charger for 100 - 240V, 3 each 24mm and 16mm cuvettes, 16mm cuvette adapter, 3 x syringes, 1 x 100ml plastic beaker and case with waterproof insert.
Without reagents.

Verification Standard Kit: The verification standard kit for the AL450 is designed to reassure the user about the accuracy and the reliability of the results. The shelf life of the standard kit is two years from the date of production, provided that storage and use are in accordance with the instructions provided. Measurements are taken in mAbs.

1



9.699 230

2



6.226 018

Specifications

Optics:	Dual-Beam Technology, High-quality Interference Filters
Measuring time:	approx. 10 seconds
Power supply:	7 Ni-MH-battery pack (1.5V AA), charged in the unit using external power pack
Dimensions (HxWxD):	70mm x 265mm x 195mm
Ambient operating conditions:	up to max 90% humidity (non condensing), approx. 5 to 40°C
Approval:	CE
Wavelengths:	430/ 530/ 560/ 580/ 610/ 660nm

Type	Description	PK	Cat. No.	
Photometer AL450		1	**9.699 230**	1
Set of 12 round cuvettes with cap	24mm dia.	12	**9.699 231**	
Set of 10 round cuvettes with cap	16mm dia.	10	**9.699 240**	
Adapter	for round vials, 16mm dia.	1	**9.699 264**	
CSB reactor AL125	with 24 apertures	1	**9.920 204**	
Verification standard kit		1	**6.226 018**	2
Mains adapter TR15RA150 Level V	for Multi/Pool/Turbi, incl.4 adapter	1	**9.699 273**	

3 Cuvettes for photometers

NEW!

AQUALYTIC

Type	Description	PK	Cat. No.
Set of 12 round cuvettes with cap	24 mm dia.	1	**9.699 231**
Set of 10 round cuvettes with cap	16 mm dia.	1	**9.699 240**
Set of 5 round cuvettes with cap	24 mm dia.	5	**6.230 635**

3



Handheld photometers pHotoFlex® series, with/without pH and turbidity measurement

WTW

Handheld photometers for use in a wide range of areas such as process control, mobile water testing or wine industry. Easy operation with menu driven, user guidance.
- Smart cuvette adapter: holds 28mm or 16mm round cuvettes with height 91 to 104mm; to be used with a variety of different test types
- Optics: LED's with filters, accuracy < 2nm, 436nm, 517nm, 557nm, 594nm, 610nm, 690nm
- Concentration, Absorption, Transmission
- Methods can be downloaded from the Internet
- 35 (pHotoFlex®) 100 user defined routines
- 100 (pHotoFlex® STD)/1000 data sets, RS 232 interface
- pH range: pH 0 to 16.00 (±0.01) for DIN standard combination electrodes
- incl. calibration interval and calibration protocol
- Batteries: 4 button cells

Optional: LabStation with rechargeable batttery and power plug, GLP-compliant software LSdata for simplified laboratory evaluation and operation, charging function; accu and power supply separately. LSdata is also available as stand-alone package.

pHotoFlex® (R) STD
Water Analysis purley w/o pH- and turbidity measurement for standard parameters

pHotoFlex® pH
Such as basic version of pHotoFlex STD plus full electrochemical pH-and ORP measurement via electrodes. This allows also the measurement of the parameters NH_3 and CO_2.
- pH 0 ... 16.00 (±0.01) for Standard-DIN pH-electrodes with automatic temperature compensation ATC and automatic buffer recognition
- Calibration intervall setting and calibration record

pHotoFlex® Turb:
Generally as pHotoFlex® (R) STD, with additional turbidity measurement:
- IR light source acc. DIN 27027 /ISO 7027
- Measuring range: 0 to 1100 NTU/FNU
- Resolution: 0 to 9.99 NTU: 0.01; 10 to 99 NTU: 0.1; 100 to 1100 NTU: 1NTU
- Accuracy: 0.01 NTU or 2% of measured value
- 3 point calibration
- Standard set with traceable AMCO® Standards (0.02 - 10 - 1000 NTU)

Complete pHotoFlex® Sets:
The mobile laboratory: smart with integrated lab table to hold instrument, cuvettes, beaker and stand for pH electrode. Complete sets with:
- pH electrode SenTix 41 with technical buffers
- 1 adjustable Pipette with 5ml volume for pHotoFlex® models
- Calibration standard kit for pHotoFlex® Turb and Turb® 40 IR/T

pHotoFlex® pH Set:
Field case with pHotoFlex®, table insert, pH electrode Sentix® 41 and stand, TEC buffer, 5ml variable pipette, and accessories, PC cable and LSdata software.

pHotoFlex® Turb Set:
Field case with pHotoFlex® Turb, table insert, pH electrode Sentix® 41 and stand, TEC buffer, 5ml variable pipette, and accessories, PC cable and LSdata software.

Type	PK	Cat. No.	
pHotoFlex® STD	1	**9.923 624**	
pHotoFlex® pH	1	**9.923 625**	1
pHotoFlex® Turb	1	**9.923 626**	
pHotoFlex® pH Set	1	**9.923 601**	2
pHotoFlex® Turb/Set	1	**9.923 602**	

1



9.923 625

2



9.923 601

E & OE.

1 Photometer pHotoLab® S6 and S12 - Filter photometer

WTW

High-precision, laboratory photometers with multilevel AQA/IQC functions. Feature easy operation, GLP-conforming documentation, simultaneous turbidity compensation: open cover, place cell, measure! Automatic selftest and zeroing of the optical systems during start up. Graphics display with instructions. AutoSelect for cuvettes recognition via barcode; all necessary settings automatically of more than 150 programmed methods with automatic cuvette detection. Unique barcode-support for 10, 20 und 50 mm cuvette for high quality and economic reagent test kits. The RS232 interface transfers data to the user's PC. With real time clock and memory (incl. date/time) for 500 (S6) or 1000 (S12) data records. To be used with 16mm round cells and rectangular cells (only S12) 10, 20 and 50mm path length. Autozeroing. CE, UL, CUL tested.

photoLab® S6
With 6 interference filters for 340/445/525/550/605/690nm ±2nm. For routine applications with round cuvettes in waste water analysis.

photoLab® S12
With 12 interference filters ±2nm. Wavelength according to S6 with additional filters for 410/500/565/620/665/820nm. All test kits can be used (round cuvettes and reagent test kits), 50 user defined methods, Kinetic functions.

Type	Description	PK	Cat. No.
photoLab® S6	Mains version, 220V European plug	1	**9.923 631**
photoLab® S6-A	Rechargeable battery version, 220V European plug	1	**9.923 632**
photoLab® S12	Mains version, 220V European plug	1	**9.923 635**
photoLab® S12-A	Rechargeable battery version, 220V European plug	1	**9.923 636**
LP 6/12	Spare lamp for S6, S12	1	**9.923 638**
LPSpektral	Spare lamp, Spektral	1	**9.923 639**

1





1 Photometer photoLab® and pHotoFlex®, stored test programs

WTW

A: Stored in photoLab® S6, S12, photoLab® 6000 Serie and photoLab® Spektral
B: Stored in photoLab® S12, photoLab® 6000 Serie and photoLab® Spektral
C: Stored in pHotoFlex® STD, pHotoFlex® pH and pHotoFlex® Turb
D: Stored in photoLab® 6000 series

Reagent-free tests:
Cu - copper plating bath, 690nm, 820nm - copper plating bath - B
CrO_3 - chromium plating bath - chromium plating bath - B
Ni - nickel plating bath - nickel plating bath - B
HZ - Hazen colour - Hazen colour - B
IFZ - iodine number, 340nm, 455nm - iodine number - B
m-1 (DFZ) - colouring - FB445 - B, C
m-1 (DFZ) - colouring - FB525 - A, C
m-1 (DFZ) - colouring - FB620 - B, C
FAU - turbidity 620 - T620 - B
E - extinction - extinction - A, B, C
SAK - Spectral absorption coefficient at 254 and 436nm photoLab® 6100 VIS (436nm) and photoLab® 6600 UV-VIS (254/436nm)

Further tests on demand, range information is based on max. range and can also be smaller for pHotoFlex®.

Type	Description	For	Measuring range mg / l	No. of determinations	PK	Cat. No.
14831	Ag, Silver	B, C	0,25 - 3,00	100	1	**9.920 905**
14825	Al, Aluminium	B, C	0,02 - 1,20	300	1	**9.920 906**
14821	Au, Gold	B, C	0,50 - 12,00	80	1	**9.920 907**
14839	B, Boron	B	0,05 - 0,80	60	1	**9.920 908**
14555	COD-O_2, COD	A, C	500 - 10000 mg/l	25	1	**9.920 879**
14560	COD-O_2, COD	A	4,0 - 40,0 mg/l	25	1	**9.920 880**
14690	COD-O_2, COD	A, C	50 - 500 mg/l	25	1	**9.920 934**
14691	COD-O_2, COD	A, C	300 - 3500 mg/l	25	1	**9.920 935**
14895	COD-O_2, COD	A, C	15 - 300 mg/l	25	1	**9.920 936**
C3/25	COD-O_2, COD	A, C	10 - 150 mg/l	25	1	**9.920 956**
C4/25	COD-O_2, COD	A, C	25 - 1500 mg/l	25	1	**9.920 957**
14551	C_6H_5OH, Phenol	B, C	0,10 - 2,50	25	1	**9.920 893**
14815	Ca, Calcium	B, C	5,00 - 160,00	100	1	**9.920 909**
14834	Cd, Cadmium	A, C	0,025 - 1,00	25	1	**9.920 873**
01745	Cd, Cadmium	A, C	0,002 - 0,50	55	1	**9.920 946**
00595	Cl_2, Free chlorine	A, C	0,03 - 6,00	200	1	**9.920 949**
00597	Cl_2, Free + total chlorine	A, C	0,03 - 6,00	200	1	**9.920 950**
00599	Cl_2, Free + total chlorine	B	0,01 - 6,00	200	1	**9.920 951**
Cl-3 TP	Cl_2, Total chloride	C, D	0,00 - 2,00	100	1	**9.920 864**
14730	Cl, Chloride	A, C	5,00 - 125,00	25	1	**9.920 910**
14897	Cl, Chloride	B, C	2,50 - 250,00	100	1	**9.920 911**
14561	CN, Cyanide	A, C	0,01 - 0,50	25	1	**9.920 881**
09701	CN, Cyanide	B, C	0,002 - 0,5	100	1	**9.920 914**
14552	Cr, Chromate (Chromium)	A, C	0,05 - 2,00	25	1	**9.920 875**
14758	Cr, Chromate (Chromium)	B	0,01 - 3,00	250	1	**9.920 915**
Cu-1 TP	Cu, Copper	C, D	0,00 - 5,00	100	1	**9.920 862**
14553	Cu, Copper	A, C	0,05 - 8,00	25	1	**9.920 887**
14767	Cu, Copper	B, C	0,02 - 6,00	250	1	**9.920 916**
14549	Fe, Iron	A, C	0,05 - 4,00	25	1	**9.920 883**
14761	Fe, Iron	B, C	0,005 - 5,00	1000	1	**9.920 917**
14896	Fe, Iron	C	1,00 - 50,00	25	1	**9.920 918**
00809	F, Fluoride	A,C	0,10 - 1,80	25	25	**9.920 966**
00961	GH, total hardness / Ca	A, C	5,00 - 215,00	25	1	**9.920 919**
14500	HCHO, Formaldehyde	C	0,10 - 8,00	25	1	**9.920 885**
14678	HCHO, Formaldehyde	A, B	0,02 - 8,00	100	1	**9.920 921**
14779	HS, Hydrogen sulphide	B	0,02 - 1,50	220	1	**9.920 922**
14562	K, Potassium	A, C	5,0 - 50,0	25	1	**9.920 886**
00815	Mg, Magnesium	A, C	5,0 - 75,0	25	1	**9.920 953**
14770	Mn, Manganese	B, C	0,01 - 10,0	500	1	**9.920 924**
19252	Mo, Molybdenum	B	0,5 - 45,0	100	1	**9.920 964**
Mo-1 TP	Mo, Molybdenum	C, D	0,0 - 35,0	100	1	**9.920 965**
00816	Mn, Manganese	A, C	0,10 - 5,00	25	1	**9.920 963**
09711	N_2H_4, Hydrazine	B	0,005 - 2,00	100	1	**9.920 983**
00860	Molybdate	B, C	0,02 - 1,00	25	1	**6.225 979**
14537	N_{total}, Totale Nitrogen	A, C	0,5 - 15,0	25	1	**9.920 897**
14763	N_{total}, Totale Nitrogen	A	10,0 - 150,0	25	1	**9.920 926**

Further tests on next page.

Photometer photoLab® and photoFlex®, stored test protocols

WTW

Type	Description	For	Unit	No. of determinations	PK	Cat. No.
14544	NH_4-N, Ammonium	A, C	0,5 - 16,0	25	1	**9.920 927**
14559	NH_4-N, Ammonium	A	4,0 - 80,0	25	1	**9.920 928**
14752	NH_4-N, Ammonium	B, C	0,01 - 3,00	500	1	**9.920 929**
A6/25	NH_4-N, Ammonium	A, C	0,20 - 8,00	25	1	**9.920 958**
14554	Ni, Nickel	A, C	0,10 - 6,00	25	1	**9.920 888**
14785	Ni, Nickel	B, C	0,02 - 5,00	250	1	**9.920 930**
14776/1	NO_2-N, Nitrite	B, C	0,005 - 1,00 mg/l	1000	1	**9.920 931**
N5/25	NO_2-N, Nitrite	A, C	0,010 - 0,700 mg/l	25	1	**9.920 960**
14542	NO_3-N, Nitrate	A, C	0,5 - 18,0 mg/l	25	1	**9.920 890**
14556	NO_3-N, Nitrate	B, C	0,10 - 3,00 mg/l	25	1	**9.920 891**
14773	NO_3-N, Nitrate	B	0,2 - 20,0 mg/l	100	1	**9.920 932**
14764	NO_3-N, Nitrate	A	1,0 - 50,0 mg/l	25	1	**9.920 933**
14942	NO_3-N, Nitrate	B, C	0,2 - 17,0 mg/l	50	1	**9.920 870**
N2/25	NO_3-N, Nitrate	A	0,5 - 25,0 mg/l	25	1	**9.920 959**
14694	O_2, Oxygen	A	0,5 - 12,0 mg/l	25	1	**9.920 925**
00607/1	O_3, Ozone	B, C	0,010 - 4,0 mg/l	200	1	**9.920 952**
01744	pH	A	6,4 - 8,6 pH	280	1	**9.920 945**
14833	Pb, Lead	A	0,10 - 5,00 mg/l	25	1	**9.920 872**
14546	PO_4-P, Phosphate	A, C	0,5 - 25,0 mg/l	25	1	**9.920 896**
14842	PO_4-P, Phosphate	B	0,5 - 30,0 mg/l	400	1	**9.920 939**
14848	PO_4-P, Phosphate	B, C	0,01 - 5,00 mg/l	420	1	**9.920 940**
00616	PO_4-P, Phosphate	A, C	3,0 - 100,0 mg/l	25	1	**9.920 954**
00798	PO_4-P, Phosphate	B, C	1,0 - 100,0 mg/l	100	1	**9.920 955**
P6/25	PO_4-P, Phosphate	A, C	0,05 - 5,00 mg/l	25	1	**9.920 961**
P7/25	PO_4-P, Phosphate	A, C	0,5 - 25 mg/l	25	1	**9.920 962**
14683	RH, Residual hardness	A	0,50 - 5,00 mg/l Ca	25	1	**9.920 941**
14794	Si, Silicate	B, C	0,005 - 5,00 mg/l	300	1	**9.920 942**
00857	Si, Silicate	B, C	0,5 - 500,0 mg/l	100	1	**9.920 868**
14622	Sn, Tin	B	0,10 - 2,50 mg/l	25	1	**9.920 943**
14394	SO_3, Sulfite	B	1,0 - 20,0 mg/l	25	1	**9.920 900**
01746	SO_3, Sulfite	B	1,0 - 60,0 mg/l	150	1	**9.920 948**
14564	SO_4, Sulfate	A	100 - 1000 mg/l	25	1	**9.920 899**
14791	SO_4, Sulfate	B	25 - 300 mg/l	200	1	**9.920 944**
14548	SO_4, Sulfate	A, C	5 - 250 mg/l	25	1	**9.920 898**
14697	Ten-A, Surfactants anionic	B, C	0,05 - 2,00	25	1	**9.920 904**
14566	Zn, Zinc	A, C	0,20 - 5,00 mg/l	25	1	**9.920 901**
14832	Zn, Zinc	B	0,05 - 2,50 mg/l	90	1	**9.920 902**
00861	Zn, Zinc	A, C	0,025 - 1,000 mg/l	25	1	**9.920 866**



1



1 photoLab® 6000 series for VIS and UV-VIS

WTW

Whether for water analysis, food and beverage or education and research applications, the photoLab® 6000 series is universally applicable and offers complete photometric functionality at an outstanding price: performance ratio and precision. Fast, routine measurement, as well as complex spectral analytics can be performed easily, supported by function keys F1-F4. The on-screen user guide almost replaces the operating manual. The photoLab® meters and the WTW Online-system IQ Sensornet are interactively connected with the easy IQ-LabLink procedure for easy data referencing.

Routine Measurement:
- more than 200 methods for routine parameters
- barcode recognition for more than 150 cell and reagent test kits
- direct methods such as SAC at 436 and 254nm, Chlorophyll, Ammoniak e.g.

Spectral Analysis:
- absorbance spectra
- kinetics
- multi wavelength measurement (e.g. for the wine industry)
- User defined methods and profiles
- Comprehensive programming options for multiwavelength- and lab analytics
- PC software pHotoLab® Data spectral and application packages for brewing optional
- enhanced AQA with user administration for environmental analytics and industrial needs
- IQ-LabLink for easy data referencing with WTW-Online System IQ Sensornet
- update and data exchange via USB stick
- interfaces: USB-A, USB-B, RS232
- optional direct printing to PDF file
- extensive testing routines and optical testing equipment (optional)
- 4nm band pass
- wavelength accuracy/reproducability: 1nm/0.5nm
- photometric reproducibility t ±0.002 E @ 1 E (or better)
- photometric accuracy 0.003 for < 0.600E, 0.5% of result for 0.600 to 2.000E
- approx. 4 MB storage for 1000 measurement values and spectral data sets
- weight: 4 kg (allows onsite usage with car battery and optional WTW adapter cable)

Type	Description	PK	Cat. No.
photoLab® 6100 VIS	340-1100nm for VIS range with Tungsten halogen lamp	1	**6.232 685**
photoLab® 6600 UV-VIS	190-1100nm for UV-VIS range with Xenon flash lamp	1	**6.234 159**
photoLab® Brew	Application package brewery analysis for the photoLab® 6000 Series	1	**9.920 080**
photoLab® Data spectral	PC software for data management of photoLab® 6000 Series	1	**9.920 081**

2



2 Thermoreactor AL125

AQUALYTIC

Chemical digestion of samples is required for the photometric determination of COD, TOC, total chrom, total phosphate and total nitrogen. The required temperatures and reaction time can be selected by using the membrane keypad of the reactor AL125. The unit works at three different temperatures (100/120/150°C) and three pre-set reaction times (30/60/120 minutes). When digestion is complete, the reactor automatically switches off and gives a corresponding LED indication with short beep alarm.
The AL125 reactor is fitted with 24 holes for 16 mm diameter vials.

Specifications

Power supply	230 V/50-60 Hz or 115 V/50-60 Hz (switchable)
Power	550 W
Dimensions	248 x 219 x 171 mm
Weight	3.9 kg
Holes in the aluminium block	24 holes, 16.2 mm ±0.2 mm
Selectable temp.	100/120/150°C
Probe type	Pt100 A class
Temperature stability	±1°C at the Pt100
Selected time	30/60/120/min. and continuous operation (∞)
Heating up	from 20°C to 150°C in 12 min.
Regulation	Microprocessor
Protection against overheating	at the alu block at 190°C
Beeper	max. 88 dB (Piezo Summer)
Environmental conditions	10 - 40°C max. 85 % rel. humidity

Type	Description	PK	Cat. No.
CSB reactor AL125	with 24 borings	1	**9.920 204**

E & OE.

Thermoreactor CR 2200/CR 4200

WTW

CR 2200:
- routine unit for waste water analysis
- Stored programs for all important digestions
- thermoblock with 12 holes for 16mm o.d. reaction tubes
- temperatures: 100°C, 120°C, 148°C and 150°C
- 8 fixed heating programmes: 148°C and 2 hours, 148°C and 20 minutes, 120°C and 30 minutes, 120°C and 60 minutes, 150°C and 120 minutes, 120°C and 120 minutes, 100°C and 60 minutes, 30 minutes
- Automatic temperature switch-off after end of set programs

CR 4200:
- Professional unit for waste water analysis
- 2 thermoblocks with 12 holes each for 16mm o.d. reaction tubes,
- 8 fixed heating programs (as CR2200) and 8 user-defined programs (from room temperature (25°C) to 170°C and 0 to 180 minutes)
- High Temperature Capability
- 2 different programs and and temperates can be used simultaneously (CR 4200 only)
- Automatic temperature switch-off after end of set programs
- Optional: External temperature probe TFK CR

Type	PK	Cat. No.
CR 2200	1	**9.920 806** 1
CR 4200	1	**9.920 808** 2

1



9.920 806

2



9.920 808

3 COD measuring station, AL200 COD Vario

AQUALYTIC

0 to 15.000 mg/L. ISO 15705. This measuring station from AQUALYTIC® allows the accurate, rapid, and economical determination of meaningful waste water COD levels (Chemical Oxygen Demand). Easy operation, even by unskilled operators. Comprises of COD photometer, 25 tube tests covering lower measuring ranges, a reactor block for sample digestion and a tube stand. Waterproof acc. to IP 68, 1 hour at 0.1 meter.

Specifications:

Measurement cycle:	approx. 3 seconds (method dependent)
Display:	LCD readout
Optics:	High-quality Interference Filters
Power:	4 batteries (AA) capacity approx. 53 hours uo 15000 tests (continuous operation with backlit switched off)
Overall WxDxH:	190 x 110 x 55mm
Storage:	16 data sets
Interface:	internal interface for test data transfer

Type	Description	PK	Cat. No.
COD measuring station AL200 COD Vario		1	**9.920 205**
AL200 COD Vario(photometer only)		1	**9.950 531**
COD reactor AL125	with 24 borings	1	**9.920 204**

3



4 COD-Standard cuvette test, 16mm

AQUALYTIC

Due to the chemical properties suitable for various photometers (e.g. Aqualytic, Hach) with 16mm tube diameter.

Description	PK	Cat. No.
0 to 150mg/l O_2	25	**9.950 533**
0 to 1500mg/l O_2	25	**9.950 534**
0 to 15000mg/l O_2	25	**9.950 535**

4



1



9.920 541

COD sample digestion units PA-CSB

Behr

Unit configuration for simultaneous digestion of maximum 6 or 12 COD samples in acc. with ISO, DIN etc.
A digestion unit consists of the following components:
- TRS 300 microprocessor-controlled time and temperature control unit with COD program
- CSB/E Precision heating block for RG 2 reaction vessels
- E/B Insert and yoke type frame for RG 2 reaction vessels
- KW/N Cooling trough with holder and stands for E/B
- RG 2 Reaction vessels
- LK 1 COD air coolers
- LS Air cooler stands for LK COD air coolers

Type	PK	Cat. No.
PA-CSB 6	1	**9.920 540**
PA-CSB 12	1	**9.920 541** 1

2



9.920 543

COD workstations, PB-CSB/M

Behr

For COD determination. Complete workstations for simultaneous determination of maximum 6 or 12 samples in acc. with ISO, DIN etc. Manual metering and titration.
A workstation consists of the following components
- TRS 300 Microprocessor-controlled time and temperature control unit with COD program
- CSB/E Precision heating block for RG 2 reaction vessels
- E/B Insert and yoke type frame for RG 2 reaction vessels
- KW/N Cooling trough with holder and stands for E/B
- SM 12/N Series magnetic stirrer for E 12/B insert/yoke type frame (only for PB-CSB 12/M)
- RG 2 Reaction vessels
- MRST 2 Magnetic stirrer rod set , 12 rods
- SIST 100 Boiling stones , contents 100 g
- LK1 COD Air coolers
- LS Air cooler stand for LK COD air coolers
- PTFE 29 PTFE Collars for LK 1, set of 12 collars
- TS COD Transport stands for E/B insert/yoke type frame
- HTI 1 Manual titration station

Type	PK	Cat. No.
PB-CSB 6/M	1	**9.920 542**
PB-CSB 12/M	1	**9.920 543** 2

3



3 behr COD Heating Blocks

COD acc. to ISO Precision heating blocks with 6, 12 or 24 sample positions. Flat surface heater for even temperature distribution to each sample position. Stainless steel and powder coated steel casing. Extensive insulation provides for inoffensive temperatures of the casing surfaces.
End-to-end grooves in the precision aluminum plate at the bottom of the bores simplify sample handling and provide for exemplary safety of the analyst.
During sample insertion the grooves cause pressure compensation. Thus even the most accurately fitting reaction vessels slip easily into the bores, which is required to effortlessly handle the behr insert and yoke type frames for RG 2 reaction vessels.
When inserting the samples into the hot heating block adherent moisture on the vessel surface evaporates in sudden bursts. The grooves drain off the vapor which otherwise might cause the vessels to jump up and down which might eventually lead to the destruction of the vessels.
In case of one or more vessels overflowing the liquid COD samples discharge through the grooves minimizing the danger of damages inside the block caused by acids.

Type	Description	Rating W	Temp. range °C	PK	Cat. No.
CSB 6 / E	for 6 RG reaction vessels	800	299	1	**9.920 721**
CSB 12 / E	for 12 RG reaction vessels	1500	299	1	**6.510 709**
CSB 24 / E	for 24 RG reaction vessels	2000	299	1	**6.054 780**

E & OE.

1 TRS 300 programmable temperature and time control unit

Programmable control unit for behrotest® digester blocks *Behr*



behr one-button operation for particularly easy and quick programming. Menu navigation in the language of the country. 10 optionally configurable programs for block temperature and digestion time.
The TRS 300 has a special COD program which has already been set by the plant. Therefore in the operation mode „COD" it heats up to a temperature which is 20°C above the set target temperature. After inserting the samples, the 20°C higher target value remains for another 6 minutes. This procedure ensures heating up to 148°C within 10 minutes which is specified by the ISO norm, and at the same time causes extremely high temperature constancy during the subsequent reaction process. The supplied Windows software permits the user to transfer time/temperatures profiles, which are specifically for the application, via the RS232 interface in both directions between one or more units (TRS 300) and a PC. Temperature data can also be transmitted from the unit to the PC via the RS232 interface while operating. The user can save them if necessary and print them out as graphics. Integrated safety function switches the connected units off if there is a short-circuit and an interruption of the temperature sensor.

Type	Description	PK	Cat. No.
TRS 300	Temperature and control unit	1	**6.229 909**

Accessories for determining the COD

NEW!

Behr

Type	Description	PK	Cat. No.
DOS 10	Universal dispensor	1	**9.920 711**
DOS 50	Universal dispensor	1	**9.920 712**
DIT 50	Burette with digital display	1	**9.843 765**
E 6/B	Insert-/top-frame for CSB 6 E	1	**9.920 701**
E 12/B	Insert-/top-frame for CSB 12 E	1	**6.052 520**
E 12/BV	Insert-/top-frame for CSB 24 E	1	**6.089 904**
RG 1	Reaction vessel with NS 29, 175 ml volume, 100 ml scale mark	1	**6.060 786**
RG 2	Reaction vessel with vessel adapters, NS 29 and 100 ml scale mark, with PVDF collar	1	**6.060 787**
SIST 100	Boiling stones, contens 100g	1	**9.920 710**
LK 1	COD air cooler	1	**6.060 788**
TS 12 CSB	Vessel holding frame for sample rack insert E 6/B, E 12/B, E 12/BV	1	**6.052 521**
PTFE 29	PTFE sleeves for RFK 2	12	**9.920 715**
MRST 2	Magnetic agitator bar set for RG, pack of 12	12	**6.086 631**
UK 12/400	Recirculation cooler 380 W	1	**7.980 214**
UK 12/600	Recirculation cooler 580 W	1	**9.920 735**
UK 12/1000	Recirculation cooler 980 W	1	**9.920 565**
UK 12/2000	Recirculation cooler 1900 W	1	**9.920 523**

2 behrotest ® HTI 1 manual titration station

The HTI 1 manual titration station consists of *Behr*
- a burette with digital display and
- a magnetic stirrer with a precisely fitting holder for COD reaction vessels. A screen serves as a neutral background and allows the user to determine the colour change at the end of the titration precisely. He/she will therefore always carry out titration under similar visual conditions. This improves the precision and the reproducibility of the results.

The precise positioning of the reaction vessels in the holder on the top of the magnetic stirrer also contributes to this. The angled wing of the screen protects against lateral dazzling light.



Specifications

Voltage	230 VAC/ 115 VAC
Frequency	50/60 Hz
Weight	approx. 3.5 kg
Dimensions in mm (WxDxH)	approx. 330 x 200 x 600

Type	Description	PK	Cat. No.
HTI	Manual titration station	1	**9.920 730**

3 COD cooling trough

The cooling trough prevents the overheating of the COD samples during the critical addition of sulphuric acid. In addition, it is used to cool the samples after the heating phase. *Behr*



Type	Description	PK	Cat. No.
KW 6 /N	Cooling trough for E 6/B insert frame	1	**9.920 706**
KW 12/N	Cooling trough for 2 E 12/B insert frame	1	**6.052 519**
KW 24/N	Cooling trough for E 12/BV insert frame	1	**6.089 903**
LS 6	Stands for 6 COD air coolers	1	**9.920 723**
LS 12	Stands for 12 COD air coolers	1	**6.051 958**

COD magnetic stirrer

The continuously adjustable COD series magnetic stirrer with 12 stirring points is used to mix the samples during the metering process. Due to its watertight casing and also its external power supply and control, it is suitable for use under water. *Behr*

Type	Description	PK	Cat. No.
SM/12N	Series magnetic stirrer for E 12/B insert	1	**6.055 561**



1 COD metering funnel

COD metering funnels, placed on top of the COD reaction vessels, simplify the addition of sulphuric acid to several samples simultaneously.
COD metering funnel together with a cooling trough and a series magnetic stirrer increase the safety and offer considerable relief to the user when determining the COD. *Behr*

Type	Description	PK	Cat. No.
DT 30	metering funnel, 30 ml, for sulphuric acid	1	**9.920 713**



2 HCl-absorber

To expel chloride, e.g. when determining the COD of sea water. *Behr*

Type	Description	PK	Cat. No.
HCL 29	HCL absorber to expel chloride	1	**6.060 789**



3 Reagent metering unit

NEW!

Metering unit to automate and accelerate the metering of potassium chromate solution and sulphuric acid when preparing COD samples. Metering in a maximum of 12 samples simultaneously. *Behr*
Connection to direct activation of the 12-position magnetic stirrer SM 12/P.
Metering in optimal time intervals: The metering of sulphuric acid is carried out in several processes, the samples are thus constantly cooled and stirred. This method accelerates the preparation of samples and at the same time prevents non-standard overheating of the samples during addition.
Safety for the user: Due to the automatic addition of reagent there is no risk at any time of coming into contact with chemicals.
Practice-oriented and user friendly software: The complete programming of the behr DS 20 is very easy to use and user-friendly with the Windows user interface

Type	Description	PK	Cat. No.
DS 20	for up to 12 samples, incl. burettes and cooling trough	1	**9.920 747**



4 Automatic metering and titration unit DT 20

Metering: *Behr*
Metering in optimal time intervals: The metering of sulphuric acid is carried out in several processes, the samples are thus constantly cooled and stirred. This method accelerates the preparation of samples and at the same time prevents non-standard overheating of the samples during addition.
Titration:
Instead of the commonly known over-titration, the behr-specific dynamic titration guarantees the exact end-point recognition, even in the case of the typical COD edge steepness, and thus particularly accurate test results

Type	Description	PK	Cat. No.
DT 20	Automatic metering and titration	1	**9.920 748**

E & OE.

1 B.O.D. auto-check measurement systems, OxiTop®

In accordance with DIN EN 1899 H55. *WTW*

Modular and mercury-free B.O.D. systems for practical, daily operation. The system is TÜV/GS tested. With no mechanical moving parts the programme-controlled, Inductive Stirring System is durable and does not require any type of maintenance. The magnetically coupled stirring bars are periodically speeded up to, or slowed down from the minimum to the maximum stirring speed respectively. A controlled "catching device" forces the stirrer bars into the magnetic field and synchronises them with the stirring speed. An optimal gas exchange for BOD determinations is therefore guaranteed in the sample bottle. The mercury-free, OxiTop measuring system works manometrically with a pressure sensor and 2-digit digital display.

- Large measuring range with overflow indicator
- Auto Temp function - intelligent temperature monitoring for automatic start under the best possible conditions
- Automatic zero setting at start
- Integral memory - daily readings no longer required
- Battery powered with typical running time of 2 years.

system comprises:
B.O.D. measuring units with inductive stirring system and OxiTop® measuring system, ready for use in thermostatic cabinets and incubators with amber sample bottles 600ml, stirring bars, stirring bar remover, sodium hydroxide pellets, rubber sleeves, 164ml and 432ml overflow measuring flasks, chart paper block and nitrification inhibitor. Any conventional manometric B.O.D. system can be converted to the OxiTop® system. Various conversion kits are available for this - details on request.

IS 6 and IS 12:

Number of stirring positions:	6 or 12
Speed:	180 to 450 rpm.
Safety class:	3, IEC 1010
Protection system:	IP 30 DIN 40050
Supply requirements:	Far range mains adapter 100 to 240 V, 50/60 Hz

OxiTop-System:

Instrument range:	0 to 50 digits (display units)
Operating pressure range:	500 to 1100 hPa
Display accuracy:	±1 digit (±3.55 hPa)
Safety class:	3, IEC 1010
Protection system:	IP 54 DIN 40050

Type	Description	PK	Cat. No.
OxiTop® IS 6	for 6-place	1	**9.920 000**
OxiTop® IS 12	for 12-place	1	**9.920 001**
OxiTop® IS 12-6	generally as OxiTop® IS 12, but with 6 OxiTop® measuring systems, suitable for expansion to 12 measuring units	1	**9.920 003**

1





1 B.O.D. auto-check measurement systems, OxiTop® Control

In accordance with DIN EN 1899 H55. *WTW*

OxiTop® Measuring System with infra-red communication between measuring head Oxitop C and the Controller Oxitop Control 100.
Sample administration for up to 100 parallel samples and automatic sample ID. The display presents a clear view of the whole sample management and process with indication of the process step. The display function means that manual identification or labelling is no longer necessary. The two operating modes included, " Routine B.O.D." and "Standard B.O.D." fulfil standard requirements and additional demands such as calculation and statistics. GLP-compliant documentation with testing agent monitoring is included. It is not possible to switch samples. The progress of individual sample procedures is stored in the measuring head with 180 to 360 data records. Each measuring system independently implements a temperature-controlled start using the integral AutoTemp function. The measuring positions can be called up at any time using the controller and their measurements loaded into the controller's memory (even through the closed insulating glass door or cover of the thermostatic cabinets and OxiTop® boxes). B.O.D. evaluation and curve construction is carried out in the controller. Data output to PC is possible via the RS 232 interfaces. OxiTop® Control can be expanded as required using extension sets. The inductive stirring system corresponds with OxiTop® (see previous page).

Complete system comprises:
OxiTop® B.O.D. controller, OxiTop®-C measuring heads (each battery operated) and inductive stirring system, ready for use in OxiTop® thermostatic cabinets and incubators. Controller inludes graphics display, sample management for up to 100 measuring positions, amber sample bottles 600 ml, stirring bars, stirring bar remover, sodium hydroxide pellets, rubber sleeves, 164ml and 432ml overflow measuring flasks, chart paper block and nitrification inhibitor.

Controller OxiTop® OC 100:

Measuring ranges:	0 to 40/80/200/400/800/2000/4000mg/L B.O.D.
Safety class:	3, IEC 1010
Protection system:	IP 42 DIN 40050.
OxiTop®-C measuring head:	
Measurement principle:	manometric, by means of a pressure sensor
Operating pressure range:	500 to 1350 hPa
Accuracy:	±1 % Meas. value ±1 hPa
Resolution:	1 hPa (corresponds with 0.7 % of the B.O.D. measuring range)
Display:	LED pilot lamp
Safety class:	3, IEC 1010
Protection system:	IP 54 DIN 40050

Type	Description	PK	Cat. No.
OxiTop® Control 6	for 6-place	1	**9.920 010**
OxiTop® Control 12	for 12-place	1	**9.920 011**

1



E & OE.

1 BOD-Measurement-System AL606



AQUALYTIC

The sensor system AL606 is a 6-sample system which allows precise measurement of BOD, based on the manometric principle. Manometric respirometers relate oxygen uptake to the change in pressure caused by oxygen consumption, while maintaining a constant volume. Thanks to modern, integral pressure sensors, it is no longer necessary to use mercury for pressure measurement.
In addition to the BOD unit for measurement and recording of BOD levels, the AL606 BOD measuring system includes sample bottles, measuring sensors, non-wearing inductive stirring system, overflow measuring flasks for exact sample volumes, nitrification inhibitor and potassium hydroxide as an absorbent.

System comprises:
- Aqualytic AL606, complete with 6 sensors, control unit and batteries
- magnetic, inductive stirring system with power supply
- 6 sample bottles
- 6 adapter caps and 6 stirring bars
- 1 overflow flask, 157ml
- 1 overflow flask, 248ml
- 1 x 50 ml bottle potassium hydroxide solution
- 1 x 50 ml bottle nitrification inhibitor
- 1 user manual

Specifications

Measuring principle:	manometric, electronic pressure sensor
Ranges:	0 to 40, 0 to 80, 0 to 200, 0 to 400, 0 to 800, 0 to 2000, 0 to 4000mg/l O_2
Measurement period:	User-selectable, between 1 and 28 days
Power supply:	3 x 1.5V alkaline batteries, size "C"
Protection class:	IP 54 (Sensor)
Approval:	CE
Interface:	RS232 for printer or PC
Clock:	Real time
Application:	BOD5/ BODF/ OECD301F

Type	Description	PK	Cat. No.
BOD AL606	6 positions, complete with accessories	1	**9.699 238**
BOD AL612	12 positions, complete with accessories	1	**9.699 239**
BOD sample bottle	Amber glass, 500 ml, 6 bottles	6	**9.303 436**
Tubing		1	**9.303 437**
Potassium hydroxide solution	45 %, 50 ml	1	**9.303 438**
Nitrification inhibitor (N-ATH)	50 ml	1	**9.303 433**

2 Controlled temperature cabinet, OxiTop® Box



WTW

With temperature regulated forced air circulation.
Benchtop model with transparent, hinged cover. can be used with various accessories, including OxiTop® IS, OxiTop® Control and IS 602. With interior power supply socket to allow operation of stirrers etc. within the chamber. Corrosion-resistant housing made of stainless steel or plastic. Temperature control is maintained using forced air circulation refrigeration unit. Cross flow ventilation provides uniform temperature distribution. Overtemperature protection, automatic defrosting and condensate evaporation are also provided, to maximise system efficiency. Stability at 20°C ±0.5°C. A special storage rack is provided for methylene blue samples. Also suitable for "BOD dilution" samples.

Dimensions (WxDxH):	425 x 600x 375 mm
Weight:	approx. 30 kg
Supply requirements:	230 V 50 Hz (+10 %, -15 %) 200 W.

Type	PK	Cat. No.
OxiTop® Box	1	**9.920 025**

1



1 Controlled temperature cabinets BOD

WTW

To maintain samples at the same temperature during incubation, there is a need for an controlled temperature cabinet. WTW offers a choice of cabinet with temperature range adjustable from 10°C to 40°C (temperature stability ±0.5°C), power supply 230 V 50Hz. For stirring the samples there is a supply socket for a mixer inside the cabinet. Depending on the size of the samples there is max. space for 2 to 4 shelves. So up to 48 standard BOD samples, 4 x type IS 12 or 8 x IS 6-Var stirring platforms can be accommodated. For special applications the larger Model TS 1006-i is required, having enough space between the shelves for 1.5 litre bottles. Models TS 606/2-i and TS 606/4-i with separate glass door are designed for use with the larger OxiTop® Control system, allowing the digital readout to be viewed through the glass.

Specifications

Temperature range:	+10°C to +40°C
Settable resolution:	1°C
Ambient temperature:	+10°C to +32°C (Climate class SN)
Storage:	-25°C to +65°C

Type	For	PK	Cat. No.
TS 606/2-i	2 BOD OxiTop® units	1	**9.926 304**
TS 606/3-i	3 BOD OxiTop® units	1	**9.926 305**
TS 606/4-i	4 BOD OxiTop® units	1	**9.926 308**
TS 1006-i	4 BOD OxiTop® units	1	**9.926 311**

2 Thermostatic cabinets

AQUALYTIC

The incubators from AQUALYTIC® are designed for continuous tempering for different applications, mainly for the determination of BOD, the storage of wastewater samples, and the determination of enzymatic activity.
The temperature range is +2°C up to +40°C and can be regulated in steps of 0.1°C.
Temperature tolerance is defined with ±1°C respectively ±0.5°C (at 20°C) and is specified to a stirred 500 ml sample in the middle of the cabinet.
The interior of the cabinets is equipped with sockets for connecting stirrers.
All cabinets are available with insulated glass door or standard metal door.

Specifications

Coolant:	R134a
Fan:	Axial, delivery rate 320m³/h
Power supply:	230V/50Hz

Description	Capacity L	PK	Cat. No.
With metal door	135	1	**9.699 040**
With metal door	195	1	**9.699 042**
With metal door	280	1	**9.699 044**
With metal door	395	1	**9.699 038**
With glass door	140	1	**9.699 041**
With glass door	195	1	**9.699 043**
With glass door	280	1	**9.699 045**
With glass door	395	1	**9.699 039**

2



E & OE.

1 Bottles (Karlsruhe bottles) with stoppers

The special bottle neck of the Karlsruhe bottles absorbs the water which is displaced by the stopper of the electrode. This construction guarantees clean working and ensures at the same time that the test results are not adulterated by unwanted entry of oxygen into the samples. *Behr*

Capacity ml	Length*	PK	Cat. No.
100	20	1	**9.920 514**
100	60	1	**9.920 515**
250	20	1	**9.920 513**
250	60	1	**9.920 509**

* Stopper handle length (mm)

1



2 BOD meters Type KF 12, accessory funnel bottle

Karlsruher BOD bottle with NS19 conical ground joint. *WTW*

Type	PK	Cat. No.
Karlsruher BOD bottle, 250ml	1	**9.304 170**

2



3 Dissolved oxygen bottles, Winkler pattern

Winkler pattern. Soda-lime glass.
For determination of dissolved oxygen in water. The measured capacity is specified to ±0.01ml. With white labelling area. Solid, bevelled glass stopper, secured with an accessory spring clip. Each bottle is adjusted to the relevant stopper. Stoppers and bottles are therefore not interchangeable. Each bottle and its stopper is marked with a unique, matching identification number.

Nominal capacity ml	NS	Snap-on clip	PK	Cat. No.
100 to 150	14/23	9.304 050	1	**9.304 038**
250 to 300	19/26	9.304 051	1	**9.304 048**

3



4 Spring clips for oxygen bottles according to Winkler

For bottles ml	PK	Cat. No.
100 - 150	1	**9.304 050**
250 - 300	1	**9.304 051**

4




1


2

1 2 Sedimentation cones, glass

Imhoff pattern. DIN 12672. Borosilicate glass 3.3. *BRAND*
Graduations and inscriptions in contrasting white enamel. Ring mark at 1000ml.

Graduations, ml:	Subivisions ml/Tolerance ±ml:
0 to 2	0.1/0.1
2 to 10	0.5/0.5
10 to 40	1/1
40 to 100	2/2
100 to 1000	50/10

Type	Grad. ml	PK	Cat. No.
Without stopcock	up to 100*	1	**9.304 262**
With stopcock	up to 100*	1	**9.304 272**
Without stopcock	up to 1000	1	**9.304 273**

* No subdivisions from 100 to 1000 ml.


3

3 Sedimentation cone, plastic

Imhoff pattern. DIN 12672. SAN. Transparent SAN (Styrene acrylonitrile). With screw cap for draining the contents. Temperature-resistant up to max. 85°C. *Kartell*

Graduations, ml:	Subdivisions, ml
0 to 2	0.1
2 to 10	0.5
10 to 40	1
40 to 100	2
100 to 1000	50

Type	Grad. ml	PK	Cat. No.
With screw cap	up to 1000	1	**9.304 280**


4

4 Sedimentation cones, accessory stand

Acrylic/PP. To hold two Imhoff sedimentation cones. Compact and easy to transport even when fully loaded. *Kartell*

Width mm	Length mm	Height mm	PK	Cat. No.
150	300	300	1	**9.304 281**


5

Sedimentation cones, accessory holders

Imhoff pattern, solid grey PVC. Stable design. *Behr*

For	PK	Cat. No.
2 Imhoff funnels without stopcock	1	**9.882 101**
4 Imhoff funnels without stopcock	1	**9.882 102**
2 Imhoff funnels with stopcock	1	**9.882 103** 5
4 Imhoff funnels with stopcock	1	**9.882 104**

9.882 103

1 Flocculation tester AL30

NEW!

AQUALYTIC

- Portable
- Continuously variable stirring speed
- Timer feature
- Height adjustment of the stirring blades during operation
- Central lamp for easy observation

Specifications

Stirring places:	4
Speed control:	20 - 40 - 50 - 100 - 120rpm
Timer:	0 to 30min (continuous)
Power Supply:	100V-240V/50-60Hz

Type	PK	Cat. No.
AL30	1	**9.699 301**
Bag for transport	1	**9.699 302**

1



3 Flocculation testers

Stuart

For flocculation tests of water and waste water.
- choice of 2- or 6-bank models
- digital speed display
- two adjustable speed presets
- accurate and reproducible speeds
- diffused base illumination with black background
- accepts beakers up to 1000ml.

Adjustable speed range 25 to 250rpm. Dimensions (H x W x D): 460 x 320 x 220mm (two-bank model) 460 x 750 x 220mm (six-bank model). For 230 V 50 Hz, single phase supplies. Supplied with rotor blades but without beakers.
With BioCote silver based antimicrobial protection.

Type	Description	PK	Cat. No.
SW5	Flocculation tester, 2-bank	1	**9.951 491** 2
SW6	Flocculation tester, 6-bank	1	**9.951 492**

2



9.951 491

3

BioCote

Accessories for flocculation testers

Stuart

Coagulant injector for SW6 flocculator only. For simultaneous injection of coagulant or reagents in six sample beakers.

Type	Description	PK	Cat. No.
SW6/2	Coagulant injector for flocculator	1	**9.951 493**



1 Turbidity meter AL250T-IR

AQUALYTIC

With infrared light source.
Highlights:
- measuring ranges from 0.01 to 1100NTU (autorange)
- measurement with infrared light at an angle of 90°
- measurement of coloured liquids
- easy operation
- 600 tests between battery charges

The compact Aqualytic® infrared turbidity meter AL250T-IR is designed to allow fast, precise on-site testing. The unit measures the scattered light at an angle of 90°, as stipulated in EN ISO 7027.
The wide measuring range from 0.01 to 1100 TE/F = NTU = FNU permits use of the unit for various media, ranging from drinking water to waste water.
As infrared light is used for measurement, the unit can be used to test both coloured and colourless liquids.
The standards required for calibration of the unit are also supplied. A second adjustment mode allows alternative adjustment with user-defined turbidity standards.

Package contents:
AL250T-IR turbidity meter as described above, complete with 4 turbidity standards <0.1, 20, 200 and 800NTU, battery and test vial, in case.

Specifications:

Measurement cycle:	approx. 9 seconds
Display/Function:	LCD
Optics:	temperature-compensated LED and photosensor amplifier in water proof sample chamber
Keypad:	4 key polycarbonate membrane
Measuring range:	0.01 to 1100NTU (autorange)
Resolution:	0.01 to 9.99NTU = 0.01NTU 10.0 to 99.9NTU = 0.1NTU 100 to 1100NTU = 1NTU
Accuracy:	±2.5% of measuring value or ±0.01 NTU (0 to 500 NTU) ±5% (500 to 1100NTU)
Housing:	ABS
Dimensions (L x W x H):	190 x 110 x 55mm
Weight (Basis unit):	approx. 0.4kg
Ambient	
Temperature:	0 to 40°C
Humidity (rel.):	30 to 90% R.H.
Test equipment suitability:	Software supported user adjustment with T-CAL-standards (see accessories)
CE-conformity:	DIN EN 50081-1, VDE 0839 part 81-1: 1993-03, DIN EN 50082-2, VDE 0839 part 82-2: 1996-02

Type	PK	Cat. No.
AL250T-IR	1	**9.920 203**

Accessories for turbidity meter AL250T-IR/AL450T-IR

AQUALYTIC

Description	PK	Cat. No.
Set of 12 empty sample vials, diam. 24 mm	1	**6.223 191**
Set of turbidity standards T-CAL (<0.1, 20, 200, 800 NTU)	1	**9.920 493**

E & OE.

1 Turbidity Meter HI 98713-02

NEW!

Hanna

Optical system of the meter, the infrared LED, assures long term stabilty and minimizes stray light and colour interferences. Instrument meets the requirements of the ISO 7027 method and provides reliable and accurate measurements even on low turbidity values. Very wide range from the 0.00 to 1000 FNU. Meter can be used for various applications from drinking water to waste water. Automatic 2/3/4-point calibration with the supplied Calibration standards (<0.1, 15, 100, 750 FNU). Calibration data can be ckecked at any time by simply pressing a button (GLP features). Up to 200 measurements can be logged and tranfered later to PC via USB interface.
Supplied with: Meter HI 98713-02, carrying case, 5 sample cuvets and caps, 4 calibration standards, cuvette cleaning cloth, batteries and 12 VDC adapter,

Specifications:

Measuring range:	0.00 to 9.99; 10.0 to 99.9; 100 to 1000 FNU
Accuracy:	±2% of readung plus 0.1 FNU
Calibration:	2-, 3- or 4-point calibration
Logging Capacity:	200 records
PC Interface:	USB or RS 232
Power supply:	4 x 1.5V alkaline batteries or 12VDC Adapter

Type	PK	Cat. No.
HI 98713-02	1	**9.922 810**

1



2 Complete compact extraction systems

Behr

Complete compact extraction systems with stand, heating module, mount, hoses and glassware (round-bottom reaction flask, extractor, Dimroth condenser for extraction).
Infinitely variable heating regulation.
- practical stand for holding the condensers securely between extractions
- extractor sizes from 30 ml to 1000 ml
- the use of extractors with a stopcock does away with the need for any additional distillation after extraction
- Condensers with screwed- on tubing nipples

Type	Description	PK	Cat. No.
KEX 30	Compact system for 30ml Soxhlet extraction	1	**9.843 777**
KEX 100	Compact system for 100ml Soxhlet extraction	1	**9.843 778**
KEX 60	Compact system for 60ml Soxhlet extraction	1	**9.843 835**
KEX 30 F	Compact system for 30ml extraction with stopcock	1	**9.843 836**
KEX 60 F	Compact system for 60ml extraction with stopcock	1	**9.843 837**
KEX 100 F	Compact system for 100ml extraction with stopcock	1	**9.843 786**
KEX 250 F	Compact system for 250ml extraction with stopcock	1	**9.843 779**
KEX 500 F	Compact system for 500ml extraction with stopcock	1	**9.843 838**
KEX 1000 F	Compact system for 1000ml Soxhlet extraction	1	**9.843 839**

2



Extraction apparatus, Soxhlet, DURAN® tubing

Lenz

Made of DURAN® tubing, flask DURAN®. Soxhlet-pattern. The siphon is protected by the vapour tube. Compact design: with NS 29/32 flask connections. Please order separately: condenser, extractor top pipe and round-bottom flask.

Extraction apparatus, Soxhlet-pattern. With Dimroth condenser and round-bottom flask. Made of Duran® tubing.

Extractor ml	Condenser NS	Round bottom flasks Capacity ml	PK	Cat. No.
30	29/32	100	1	**9.043 001**
70	34/35	100	1	**9.043 002**
100	45/40	250	1	**9.043 003** 3
150	45/40	250	1	**9.043 004**
200	45/40	250	1	**9.043 008**
250	45/40	500	1	**9.043 005**
300	60/46	500	1	**9.043 009**
500	60/46	1000	1	**9.043 006**
1000	71/51	2000	1	**9.043 007**

3



9.043 003



1 Serial Extraction Apparatus behrotest® for Soxhlet-/Fat-Extraction

Behr

behrotest® serial heaters are the economical and user-friendly solution for the classic Soxhlet or fat extraction:
- energy for each sample position is individually adjustable
- cooling water distributor ensures even cooling at all sample positions
- practical stand for holding the condensers securely between extractions
- mounts for holding the extraction spacers after removing the sample vessels
- S models: The extractors with stopcock do away with the need for any additional distillation after extraction
- comes with Euro Schuko and UK wallpower supply

Type	Type	Capacity ml	PK	Cat. No.
R 304	Serial hotplate system, soxhlet, 4-position	30	1	**9.043 030**
R 306	Serial hotplate system, soxhlet, 6-position	30	1	**9.043 031**
R 304 S	Serial hotplate system, soxhlet, 4-position, with stop-cock	30	1	**9.043 035**
R 306 S	Serial hotplate system, soxhlet, 6-position, with stop-cock	30	1	**9.043 036**
R 604	Serial hotplate system, soxhlet, 4-position	60	1	**9.043 037**
R 606	Serial hotplate system, soxhlet, 6-position	60	1	**9.043 038**
R 604 S	Serial hotplate system, soxhlet, 4-position, with stop-cock	60	1	**9.043 039**
R 606 S	Serial hotplate system, soxhlet, 6-position, with stop-cock	60	1	**9.043 040**
R 104 S	Serial hotplate system, soxhlet, 4-position, with stop-cock	100	1	**9.043 029**
R 106 S	Serial hotplate system, soxhlet, 6-position, with stop-cock	100	1	**9.043 028**
R 108 S	Serial hotplate system, soxhlet, 8-position, with stop-cock	100	1	**9.043 041**
R 254 S	Serial hotplate system, soxhlet, 4-position, with stop-cock	250	1	**9.043 042**
R 256 S	Serial hotplate system, soxhlet, 6-position, with stop-cock	250	1	**9.043 043**



2 Hydrolysis/crude fibre separation set , behrotest

Behr

behrotest® Hydrolysis apparatus, complete with:
- Serial heating unit with individually adjustable heating places
- Cooling water distribution with condenser rack and hoses
- Beakers (600ml), cold fingers

Type	Description	PK	Cat. No.
EXR 6	Hydrolysis/crude fibre separation unit, 6 sample positions	1	**9.843 827**
EXR 4	Hydrolysis/crude fibre separation unit, 4 sample positions	1	**9.843 828**

Complete Compact Extraction System

Behr

Compact Extraction System in accordance with Twisselmann
Complete compact extraction system with stand, heating module, mount, hoses and glassware (round-bottom reaction flask, extractor, Dimroth condenser for extraction).

Type	Description	PK	Cat. No.
KEX 100 T	Compact system for Twisselmann extraction	1	**9.843 824**

E & OE.

1 LLG-Extraction thimbles, cellulose

In box of 25 units.



Diam. mm	Length mm	PK	Cat. No.
19	90	25	**9.045 705**
20	80	25	**9.045 701**
22	80	25	**9.045 700**
25	100	25	**9.045 709**
26	60	25	**9.045 707**
28	80	25	**9.045 711**
30	80	25	**9.045 708**
33	80	25	**9.045 702**
33	94	25	**9.045 703**
33	100	25	**9.045 704**
33	118	25	**9.045 706**
43	123	25	**9.045 710**

2 Extraction and filter thimbles Grade 603

Manufactured in pure cellulose according to DIN 12449. *GE Healthcare*



Diam. mm	Length mm	Standard extractor capacity ml	For	PK	Cat. No.
22	80	30	Büchi (1)	25	**9.043 901**
25	80			25	**9.043 909**
25	100	70	Büchi (1)	25	**9.043 902**
26	60			25	**9.043 910**
33	80		Gerhardt (2) / Foss Tecator (3)	25	**9.043 907**
33	90			25	**9.043 911**
33	94	100	Büchi (1)	25	**9.043 903**
33	100			25	**9.043 916**
33	118			25	**9.043 904**
33	130			25	**9.043 917**
33	205	250		25	**9.043 905**
35	150			25	**9.043 915**
40	85			25	**9.043 918**
43	123		Büchi (1)	25	**9.043 950**
44	230			25	**9.043 906**

3 4 Extraction thimbles

Cellulose. Supplied in packs of 25. Dimensions given are nominal internal diameter x external length in mm. *GE Healthcare*





Type	Int. diam. mm	Length mm	PK	Cat. No.
Single	10	50	25	**9.951 335**
Single	18	55	25	**9.951 336**
Single	19	90	25	**9.951 337**
Single	22	80	25	**9.951 338**
Single	25	80	25	**9.951 339**
Single	25	100	25	**9.951 340**
Single *	26	60	25	**9.951 341**
Single	28	80	25	**9.951 342**
Single	28	100	25	**9.951 343**
Single	28	120	25	**9.951 344**
Single	30	80	25	**9.951 345**
Single	30	100	25	**9.951 346**
Single	33	80	25	**9.951 347**
Single	33	94	25	**9.951 348**
Single	33	100	25	**9.951 349**
Single	33	118	25	**9.951 350**
Single	37	130	25	**9.951 351**
Single	41	123	25	**9.951 352**
Single	43	123	25	**9.951 353**
Single	60	180	25	**9.951 354**
Double	22	80	25	**9.951 355**
Double	33	80	25	**9.951 356**

*Fits Soxtec™ extractor

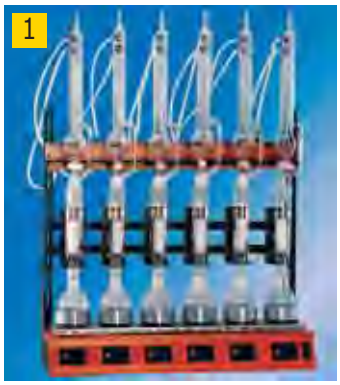
5 Stands for Extraction Thimbles

NEW!

Behr



Type	Description	PK	Cat. No.
RIP 4	for 4 extraction thimbles	1	**9.843 949**
RIP 6	for 6 extraction thimbles	1	**9.843 950**



1 behrotest® Multi-sample Extractors for Twisselmann Extraction

Economical and user-friendly units for extraction in accordance with Twisselmann: *Behr*
- each sample position is individually adjustable
- cooling water distributor ensures an even cooling at all sample positions
- practical stand for holding the condensers securely between the extractions
- mounts for holding the spacers after the removal of the sample containers

Type	Description	PK	Cat. No.
R 104 T	Multi-sample extractor for an extraction in accordance with Twisselmann, complete for 4 samples	1	**9.843 825**
R 106 T	Multi-sample extractor for an extraction in accordance with Twisselmann, complete for 6 samples	1	**9.843 826**



2 Extraction Unit for the Randall Method

Manual apparatus for hot extraction according to Randall. Several times faster than a customary Soxhlet extraction. Incl. 1 set of extraction thimbles, 100 ml. *Behr*
- Optimal safety thanks to screw-fastened extraction units

Multiple position extraction units:
- Every extraction thimble with sample can be independently adjusted
- The user can lower and raise all the extraction units into/out of the heating chamber with a single lever
- Every heating position has a separate temperature control

Specifications

Dimensions (H x W x D, cm):	approx. 81 x 55 x 63
Weight, kg:	approx. 32
Voltage:	230V 50Hz a.c.
Power consumption:	Max. 1500W

Type	Description	PK	Cat. No.
E1	One sample position	1	**9.843 923**
E4	Four individually adjustable sample positions	1	**9.843 922**
E6	Six individually adjustable sample positions	1	**9.843 924**
EX 75 HS	Extraction thimbles for the EB 75 reaction flask	25	**9.843 926**
EB 75	Reaction flask	1	**9.843 927**



9.843 844

Exhaust Device, borosilicate

- Filter mountings, 400 ml, with thread *Behr*
- PP funnels with thread
- Slotted sieve plate with 2 gaskets
- Stainless steel rack
- Water jet pump

Type	Description	PK	Cat. No.
FU 4	Filtration unit, 4 places	1	**9.843 844** 3
FU 6	Filtration unit, 6 places	1	**9.843 845**

Extraction apparatus, Soxhlet - please see page 623.



9.843 833

Filtration Device for Crude Fibre separation

NEW!

e.g. to determine the raw fibre content according to EN ISO6865 *Behr*

Type	Description	PK	Cat. No.
SC 4	Filtration unit, 4 places	1	**9.843 833** 4
SC 6	Filtration unit, 6 places	1	**9.843 834**

E & OE.

InKjel M manually adjustable infrared digestion system

Behr

Rapid digestion system with manually adjustable energy control and direct heating of the samples through high-quality quartz radiators (1500W).
- Quartz infra-red radiators peak at 830°C within 1 min.

Particularly uniform heating at all sample positions
All InKjel systems are fitted completely with multi-level consoles, fume extraction unit, sample rack and glass digestion vessels.

Configurations available:
- 6 sample vessels each 250ml
- 12 sample vessels each 100ml
- 12 sample vessels each 250ml
- 4 sample vessels each 500ml
- 4 sample vessels each 750ml



9.843 770

Type	For	PK	Cat. No.
InKjel 1210 M	12 sample vessels each 100ml	1	**9.843 757**
InKjel 625 M	6 sample vessels each 250ml	1	**9.843 770** 1
InKjel 1225 M	12 sample vessels each 250ml	1	**9.843 771**
InKjel 450 M	4 sample vessels each 500ml	1	**9.843 768**
InKjel 475 M	4 sample vessels each 750ml	1	**9.843 769**

InKjel P infrared digestion system with 10 freely configurable programmes

Behr

Rapid digestion system with 10 freely configurable programmes for power and digestion time and direct heating of the samples through high-quality quartz radiators (1500W).
- Quartz infra-red radiators peak at 830°C within 1 min.
- Particularly uniform heating at all sample positions
- The supplied Windows software permits the user to transfer time/temperatures profiles, which are specifically for the application, via the RS232 interface in both directions between one or more units and a PC.
- A library with common applications is already included on the CD.

All InKjel systems are fitted completely with multi-level consoles, fume extraction unit, sample rack and glass digestion vessels.

Configurations available:
- 6 sample vessels each 250ml
- 12 sample vessels each 100ml
- 12 sample vessels each 250ml
- 4 sample vessels each 500ml
- 4 sample vessels each 750ml



6.233 440

Type	For	PK	Cat. No.
InKjel 1210 P	12 sample vessels each 100ml	1	**9.843 756**
InKjel 625 P	6 sample vessels each 250ml	1	**9.843 760**
InKjel 1225 P	12 sample vessels each 250ml	1	**6.233 440** 2
InKjel 450 P	4 sample vessels each 500ml	1	**9.843 758**
InKjel 475 P	4 sample vessels each 750ml	1	**9.843 759**

Accessories for infrared rapid sample digestors

Behr

Type	Description	PK	Cat. No.
KT 1	Catalyst tablets	1000	**9.843 767**
KT 2	Catalyst tablets	1000	**9.843 773**
KT 3	Catalyst tablets	1000	**9.843 752**
AFS	Antifoam tablets	1000	**9.843 753**
SIST 100	Boiling stones, contens 100g	1	**9.920 710**
WP	Nitrogen-free weighing boats	100	**9.843 754**
SR 3i	Sample vessel, 250ml, for InKjel	1	**9.843 766**
SR 4	Sample vessel	1	**9.843 750**
SR 5	Sample vessel	1	**9.843 751**
KJ 500	Sample vessel, 500ml, for InKjel	1	**9.843 775**
KJ 750	Sample vessel, 750ml, for InKjel	1	**9.843 776**



1 Standard Kjeldahl block digestion systems K 8, K 12 and K 20

NEW!

Behr

Block digestion systems with high-quality corrosion-resistant block housing made of stainless steel. With 8, 12 or 20 sample slots for standard Kjeldahl digestion vessels with a volume of 250 ml. High-efficiency heating and extraction hood with exhaust collector.
- behr single-knob control for particularly easy and fast programming.
- Menu navigation in national language.
- 10 freely configurable programs for block temperature and digestion time.
- Applications can be saved.
- USB interface.
- The Windows software supplied enables the user to bidirectionally transfer application-specific time/temperature profiles between one or several units and a PC via the interface.
- The removable inspection door on the insertion rack enables the progress of the digestion to be observed.

Complete systems with digestion vessels, rack and extraction hood.

Type	Description	PK	Cat. No.
K 8	with 8 sample slots, for digestion vesselswith a volume of 250 ml	1	**9.843 900**
K 12	with 12 sample slots, for digestion vesselswith a volume of 250 ml	1	**9.843 901**
K 20	with 20 sample slots, for digestion vesselswith a volume of 250 ml	1	**9.843 902**



2 Micro Kjeldahl block digestion systems K 6, K 24 and K 40

NEW!

Behr

Block digestion systems with high-quality corrosion-resistant block housing made of stainless steel. With 16, 24 or 40 sample slots for micro Kjeldahl digestion vessels with a volume of 100 ml. High-efficiency heating and extraction hood with exhaust collector.
- behr single-knob control for particularly easy and fast programming.
- Menu navigation in national language.
- 10 freely configurable programs for block temperature and digestion time.
- Applications can be saved.
- USB interface.
- The Windows software supplied enables the user to bidirectionally transfer application-specific time/temperature profiles between one or several units and a PC via the interface.
- The removable inspection door on the insertion rack enables the progress of the digestion to be observed.

Complete systems with digestion vessels, rack and extraction hood.

Type	Description	PK	Cat. No.
K 16	with 16 sample slots, for digestion vesselswith a volume of 100 ml	1	**9.843 903**
K 24	with 24 sample slots, for digestion vesselswith a volume of 100 ml	1	**9.843 904**
K 40	with 40 sample slots, for digestion vesselswith a volume of 100 ml	1	**9.843 905**



1 behrosog 3 Scrubber

Behr

- Infinitely variable throughput
- Transparent protective shield for safe operation of the unit
- Exterior manual control elements with easy access prevent the analyst from touching hot glass parts
- Acid resistant diaphragm pump



Type	Description	PK	Cat. No.
behrosog 3	Scrubber with suction pump (40 l/min), cooling stage, neutralisation stage and drip catcher	1	**9.920 584**
ACS	Additional cooling for behrosog 3	1	**9.920 585**

Steam Distillation Unit S

Behr

- Exemplary safety and reliability
- Robust casing of polyurethane
- Distillation time approx.. 3 mins. per sample
- Detection limit 0.1 mg N
- Recovery rate >99.5%
- Reproducibility ±1%
- Steam generating capacity adjustable from 40% - 100%
- Extremely simple, menu-controlled operation of the programmable units via one single operating element (behr one-button operation)
- Programmable reaction time
- Serial interface (RS232)
- Filling level monitoring for can set
- Practical quick clamping device equally suited for the "left-handed" analyst



9.843 813



9.843 803

Type	Description	PK	Cat. No.
S 1	Steam distillation unit, partly automated with automatic addition of NaOH	1	**9.843 814**
S 2	Steam distillation unit, partly automated with automatic addition of NaOH and H2O	1	**9.843 813** 2
KAS 20	Can set for S 1 and S 2	1	**6.236 005**
S 3	Steam distillation unit, partly automated, like S2 with automatic extraction of the sample residues and with 10 programs	1	**9.843 815**
KAS 30	Set of 3 canisters (20 l each) for S 3, incl. float switch	1	**9.843 816**
S 4	Steam distillation unit, fully automatic, like S 3 with automatic extraction H3BO3 of the sample residues and with 99 programs	1	**9.843 817**
S 5	Steam distillation with automatic addition of NaOH, H2O and H3BO3 with automatic extraction of the sample residues, with 99 programs and a connection option for external titrator	1	**9.843 803** 3
KAS 40	Set of 4 x 20 l containers for S 4, incl. float switch	1	**9.843 818**
TB 1	Titration module for connection to steam distillation unit S 5	1	**9.843 832**

1



1 Steam distillation unit D1 and D2

Behr

- Alcohol
- Volatile acid contents
- Fermentation process (beer, etc.)
- Ammonium chloride in liquorice products

Distillation units for determining alcohol and volatile acid content in wine and other alcoholic drinks. Complete glassware, with volumetric flasks and pycnometer. Because of its rapidity, the behr D 1 and D 2 are especially suitable for high sample throughputs.
The supplied Windows software permits the user to transfer distillation parameters, which are specifically for the application, via the RS232 interface in both directions between one or more units and a PC. A library with common applications is already included on the CD. Data can also be transmitted from the unit to the PC via the RS232 interface while operating. The user can save them if necessary and print them out as graphics.

Type	Description	PK	Cat. No.
D1	for determining alcohol content, distillation into a pycnometer	1	**9.843 830**
D2	for determining Volatile acid content, distillation into an erlenmeyer flask 500 ml	1	**9.843 831**

2



2 Compact systems for sulphur dioxide determination, KSO/SO

Behr

For determination of sulphur dioxide (total SO_2), 2 absorption units per sample. With base unit, heating mantle, mounting frame and glassware, including 500ml reaction flasks. Systems with adsorption units or other flask sizes on request.

Type	Description	PK	Cat. No.
KSO 2	Complete compact sytem	1	**9.920 546**
SO 2-6	Sytem for 6 working units	1	**9.920 547**

3



3 Compact system for determination of water content

Behr

Compact system for determination of water content by azeotropic distillation.
Suitable for non-homogeneous and irregularly shaped food such as dried fruit and vegetables, Sauerkraut etc.
With base stand, heating mantle, mounting frame and glassware.

Type	PK	Cat. No.
KWA 500	1	**9.920 548**

4



9.843 780

Compact distillation apparatus

Behr

Complete compact system for sample preparation for cyanide determination according to the standards. With base frame, heating unit, fl ow meter(s), mountin(s), hoses and glassware.

Type	Description	PK	Cat. No.
KTC	for distillation during determination of total cyanide	1	**9.843 780** 4
KLFC	for air condensing of easily separated cyanide, 1-place	1	**9.843 781**
KLFC 2	for air condensing of easily separated cyanide, 2-place	1	**9.843 782**

E & OE.

Compact digestion and separation systems

With magnetic stirrer for cyanide determination. *Behr*
Complete, compact systems for cyanide determination. With integral magnetic stirrer, suspended absorption vessel and dropping funnel for reagent additions, the installation corresponds with the draft document for the new statt dessen: DIN/EN/ISO methods.
With base stand, heating mantle, magnetic stirrer, flow meter, clamps, tubing and glassware.



9.700 410

Type	Description	PK	Cat. No.
KTC-MR	Compact digestion and separation systems	1	**9.700 410** 1
KLFC-MR	Magnetic stirrer for the determination of free cyanide	1	**9.700 411**

2 Micro II centrifuge, dairy testing

For determining fat levels in milk and dairy products. Microprocessor-controlled with time and temperature preselection. Heater, brake, locking lid, digital time and temperature display. *Gerber*
With steel housing 430 x 460 x 280mm.



Type	PK	Cat. No.
With rotor for 8 butyrometers	1	**9.112 580**
With rotor for 12 butyrometers	1	**9.112 579**

3 Universal centrifuge, dairy testing

Multi-purpose centrifuge for dairy laboratories. With four pre-programmed speeds for: *Gerber*
- Gerber: 350xg
- Solubility in milk powder: 164xg
- Roese-Gottlieb (Mojonnier): 80 xg
- Speed range 200 to 1300rpm

Microprocessor controller with LED display for speed, run time, temperature and error messages. With steel housing, locking lid, automatic brake and imbalance detector. External dimensions (WxDxH) 640 x 450 x 640 mm. For 230 V 50/60 Hz a.c. Accessory chamber heating available. Without rotor.



Type	PK	Cat. No.
Universal Gerber Centrifuge without heating, 230 V, 50/60 Hz	1	**9.112 581**
Universal Gerber Centrifuge with heating, 230 V, 50/60 Hz	1	**9.112 595**

4 Rotor for Universal dairy centrifuge

Stainless steel. *Gerber*



Type	PK	Cat. No.
Rotor with 12 places, for stainless steel inserts as indicated	1	**9.112 584**
Insert for butyrometer	1	**9.112 585**
Insert for ADPI solubility tubes	1	**9.112 586**
Insert for Mojonnier tubes	1	**9.112 587**
Swing-out rotor with 36 inserts, complete	1	**9.112 583**

5 Butyrometer water bath

Robust white-coated stainless steel bath to hold 12 butyrometers, adjustable temperature with LED display, with stainless steel heating element. For 230V supplies, 500W. *Gerber*



Type	PK	Cat. No.
Butyrometer water bath	1	**9.112 591**

Accessories for Butyrometer water bath

Gerber

Type	PK	Cat. No.
PP stand, for 12 butyrometers	1	**9.112 592**
Shaking cover for above	1	**9.112 593**
Cover, stainless steel, 12 openings for Butyrometer on stand 9.112 592	1	**9.112 594**

1



1 Butyrometers, DURAN®

DURAN® glass, to ISO.

Gerber

Description	PK	Cat. No.
Milk butyrometer, volumetric method 0 to 6%:0.1	1	**9.112 588**
Milk/Skimmed milk butyrometer, Kehe, volumetric method 0 to 4%:0.05	1	**9.112 565**
Skimmed milk butyrometer, Siegfeld, volumetric method 0 to 0.5%:0.02	1	**9.112 566**
Cream butyrometer, Koehler, volumetric method 5 ml, 0 to 40 %:0.5	1	**9.112 567**
Cream butyrometer, Koehler, volumetric method 5 ml, 0 to 70 %:0.5	1	**9.112 568**
Milk powder butyrometer, Teichert, gravimetric method 2.5 g, 0 to 35%:0.5	1	**9.112 569**
Cream butyrometer, Roeder, gravimetric method 5 g, 0 to 50%:0.5	1	**9.112 570**
Cream butyrometer, Roeder, gravimetric method 5 g, 0 to 35 to 65%:0.5	1	**9.112 571**
Cheese butyrometer van Gulik/DIN, gravimetric method 3 g, 0-40%:0.5, with stoppers and beakers	1	**9.112 572**
Rubber stopper, Gerbal M, for volumetric method butyrometers	1	**9.112 573**
Key for Gerbal M stopper	1	**9.112 574**
Rubber stopper 30/17x22 mm, large, single conical with hole for gravimetric method	1	**9.112 575**
Rubber stopper 15/10x13 mm, small, single conical without hole for gravimetric method	1	**9.112 576**
Glass beaker for Roeder cream butyrometer	1	**9.112 577**
Glass beaker for cheese butyrometer	1	**9.112 578**

2



2 Milk Butyrometer, borosilicate glass

Milk Butyrometer Original Gerber with frosted label on bulb, plain neck, without stopper, for milk quantities of 10.73-11ml. All instruments manufactured according to ISO-standard 488, grad. 0.2, Gerber Code 10-AF

Gerber

Description	PK	Cat. No.
Milk-Butyrometer Original Gerber Standard 0-14 %	1	**6.236 845**

3



3 Accessories for glass butyrometers

DURAN® glass, to ISO.

Gerber

Type	PK	Cat. No.
Milk pipettes 11 ml	1	**9.112 589**
Milk pipettes 10.75 ml	1	**9.112 603**
Amyl alcohol pipette 1 ml	1	**9.112 604**
Tilt measure for 1 ml amyl alcohol, with rubber stopper, without bottle	1	**9.112 590**
Milk syringe, exchangeable barrel, 11 ml	1	**9.112 605**
Sulphuric acid pipette 10 ml	1	**9.112 607**
Tilt measure for 10 ml sulphuric acid, with rubber stopper, without bottle	1	**9.112 608**
Cream pipette 5 ml	1	**9.112 609**
Water pipette 5 ml	1	**9.112 610**
Cream syringe, exchangeable barrel, 5 ml	1	**9.112 611**

1 Mono Water Stills without storage tank

GFL

Models 2001/2 and 2001/4 without storage tank, capacity 2L and 4L/hr., for bench mounting. Low-gas, bacteria and pyrogen free distillate, in conformity with DAB requirements and international pharmacopoeia regulations. Conductivity of distillate approx. 2.3µs/cm at 25°C. Evaporator, condenser (cooler) with baffle and heating element made of stainless steel. Evaporator is easily accessible by lifting out the condenser. Degassing of carbon dioxide through vent in the condenser. Main switch with pilot lamp on the front of the unit. Housing electrostatically powder-coated with epoxy resin. Cooling water inlet and outlet*on the right-hand side of the unit.
Water connection: cooling water inlet ½ inch (12.7mm i.d.), cooling water outlet ½ inch* (12.7mm i.d.). Thermometer to display the temperature of the cooling water. Distillate withdrawal through drain tube on the front of the unit. Economical energy consumption by distilling the heated cooling water. Thermostatic low water cut-off, to protect the heating element in case of low water. Power connection through mains connection cable with German shock-proof type (Schuko) plug, for 230V 50/60Hz (other voltages are available - details on request).

*Tubing for water inlet and outlet can be supplied as accessory items.



Type	Output	Water consumption	Dimensions (W x D x H)	Power	Weight	PK	Cat. No.
	L / hr.	approx. L / hr.	mm	W	g		
2001/2	2	20	280 x 250 x 490	2000	7500	1	**9.910 600**
2001/4	4	40	280 x 250 x 490	3000	7500	1	**9.910 601**

2 Mono Water Stills with storage tank

GFL

Models with storage tank; 2002 (4 litres), 2004 (8 litres), 2008 (16 litres) and 2012 (24 litres) Models with storage tank, suitable for bench and wall mounting.
Low-gas, bacteria- and pyrogen-free distillate, in conformity with DAB requirements and international pharmacopoeia regulations. Conductivity of distillate approx. 2.3µs/cm at 25°C. Evaporator with baffle is easily accessible by lifting the lid. Evaporator, condenser (cooling coil) positioned in the storage tank, storage tank for distillate and heating element are of stainless steel. Storage tank for distillate holds double the hourly capacity of the unit. Water supply through a built-in solenoid valve with connection for mains pressure water tubing, ½ inch* (12.7 mm i.d.), cooling water pressure required: > 3 bar to max. 7 bar. After turning on the main switch the solenoid valve opens the water supply and closes it once the storage tank is full, thus avoiding unnecessary waste of water. Economical energy consumption by distilling the heated cooling water. Cooling water outlet with ¾ inch (19 mm i.d.) tubing connection. Water that has not been condensed flows off through the cooling water outlet*. The evaporator is drained via a tap on the right-hand side of the unit. Automatic indication when cleaning required. Degassing of carbon dioxide through vent in the top. An electronic level switch switches the still off when the storage tank is full and restarts it automatically when distillate is withdrawn. Distillate withdrawal through a tap on the front of the unit. Thermostatic low water cut-off, to protect the heating element in case of low water. Main switch and pilot lamps on the front of the unit. Double-walled housing, outer housing made of electrolytically galvanized sheet steel, electrostatically powder-coated with epoxy resin. Power connection through connection cable; 2 and 4 litre units have German shock-proof type (Schuko) plug.

*Tubing for water inlet and outlet can be supplied as accessory items.

Type	Output	Water consumption	Dimensions (W x D x H)	Power	Voltage	Weight	PK	Cat. No.
	L / hr.	approx. L / hr.	mm	W	50/60 Hz	kg		
2002	2	30	540 x 290 x 420	1500	230V	15.40	1	**9.910 602**
2004	4	48	620 x 330 x 460	3000	230V	20.20	1	**9.910 604**
2008	8	72	780 x 410 x 540	6000	400V*	30.70	1	**9.910 608**
2012	12	198	780 x 410 x 670	9000	400V*	43.00	1	**9.910 612**

* 400V/3/N/PE/three-phase current
Other voltages available - details on request.





1 Double Distillation Stills

GFL

Double distillation stills, models 2102, 2104 and 2108, suitable for bench and wall mounting. Low-gas, bacteria- and pyrogen-free distillate, in conformity with DAB requirements and international pharmacopoeia regulations. Conductivity of mono-distillate approx. 2.2µs/cm at 25°C, conductivity of bi-distillate approx. 1.6µs/cm at 25°C. Evaporator and baffle of the mono stage are easily accessible by lifting the condensers. Evaporator, condensers (coolers) 1st stage and heating element made of stainless steel, 2nd stage including baffle made of DURAN® Borosilicate glass 3.3. Water supply through built-in, solenoid valve with ½ inch* (12.7 mm i.d.) tubing connection for mains water inlet, required cooling water pressure: > 3 bar to max. 7 bar. After switching on the power, the solenoid valve opens the water supply. Cooling water outlet with ¾ inch* (19 mm i.d.) tubing connection. Water that has not been condensed flows off through the cooling water outlet*.
Distillate withdrawal: stop valve made of Borosilicate glass 3.3 with PTFE plunger for mono distillate, outlet with dustproof shield made of Borosilicate glass 3.3 for bi-distillate. Low energy consumption achieved by distilling the heated cooling water. Low water cut-off: float switch and thermostatic overtemperature cut-out. Automatic indication for cleaning. Degassing of carbon dioxide through vent on the condensers. Two-part housing made of electrolytically galvanized sheet steel, electrostatically powder-coated with epoxy resin; upper part easily removable through quick-release catches. Mains switch and pilot lamps to monitor both distillation stages are on the front of the unit. Power connection through connection cable.

*Tubing for water inlet and outlet can be supplied as accessory items.

Type	Output	Water consumption	Dimensions (W x D x H)	Power	Voltage	Weight	PK	Cat. No.
	L / hr.	approx. L / hr.	mm	W	50/60 Hz	kg		
2102	2	72	500 x 260 x 470	3500	230V	18.00	1	**9.910 642**
2104	4	120	550 x 280 x 570	6500	400V*	23.00	1	**9.910 644**
2108	8	198	700 x 390 x 700	11500	400V*	39.00	1	**9.910 648**

* 400V/3/N/PE/three-phase current
Other voltages available - details on request.



2 Mono/Double Distillation Glass Water Stills

GFL

Mono Water Stills: models 2202, 2204, 2208 for 2, 4 and 8 litres/hr, Bi Distillation Stills: models 2302, 2304 for 2 and 4 litres /hr, fully automatic. Suitable for bench and wall mounting. Low-gas, bacteria- and pyrogen-free distillate, in conformity with DAB requirements and international pharmacopoeia regulations. Conductivity of mono-distillate approx. 2.2µs/cm at 25°C, conductivity of bi-distillate approx. 1.6µs/cm at 25°C. Minimal metal ion content in the distillate. Evaporators, condensers and overflows made of DURAN®/Borosilicate glass 3.3. Condensers with dribble guard. Quartz sleeved heating element. Condensers are kept sterile by steam. Water supplied through built-in solenoid valve with connection for ½ inch* (12.7mm i.d.) mains water pressure tubing, required water pressure >3 bar up to max. 7 bar. After the main switch is switched on, the solenoid valve opens to start the water supply. Cooling water outlet with ½ inch* (12.7mm i.d.) tubing connection . Water that has not been condensed flows out through the cooling water outlet*. Low energy consumption through distilling the heated cooling water. Distillate withdrawal at the right-hand side of the unit through tubing connection*. Electronic level control during the whole distillation process. Water level control in the condenser has automatic power cut-off in the event of water shortage. Electronic impurity detector starts automatic water change to rinse and clean the condenser. Degassing of carbon dioxide through vents on the condenser. Main and function switches as well as pilot lamps for monitoring are on the front of the unit. Housing made of electrolytically galvanized sheet steel, electrostatically powder-coated with epoxy resin. Visible distillation process through easily removable, unbreakable front screen that does not steam up. Power connection through connection cable (models 2202, 2204 and 2302 with German shock-proof type (Schuko) plug.

*Tubing for water inlet and outlet can be supplied as accessory items.

Technical Specification
Dimensions (WxDxH)
2202/2204: 650 x 200 x 390mm
2208/2302/2304: 650 x 365 x 390mm

Type	Output	Water consumption	Power	Voltage	Weight	PK	Cat. No.
	L / hr.	approx. L / hr.	W	50/60 Hz	kg		
2202 (Mono)	2	48	1500	230V	16.00	1	**9.910 672**
2204 (Mono)	4	96	3000	230V	17.00	1	**9.910 673**
2208 (Mono)	8	144	6000	400V*	24.00	1	**9.910 674**
2302 (Bi)	2	96	2900	230V	24.00	1	**9.910 675**
2304 (Bi)	4	144	5800	400V*	24.00	1	**9.910 676**

* 400V/3/N/PE/three-phase current
Other voltages available - details on request.

1 2 Accessories for water stills

Dechlorite Filter 2904 *GFL*

For all GFL water stills. Eliminates chlorine particles in the mains water, added by the local water suppliers. Complete with connections for ½ inch (12.7mm i.d.) pressure tubing, including first filter charge. The charge should be changed every six months. Tubing for the water inlet and outlet are not included as standard.

Spare Filling 2905

Spare filter charge for Dechlorite Filter 2904.

Phosphate Cartridge 2906

For all GFL water stills. Prevents limescale formation in the condenser by phosphatising the supply water. Can be used from 4-15°dH (German hardness). Complete with connections for ½ inch (12.7mm i.d.) pressure tubing, including first filling. The filling should be replaced according to consumption. Tubing for the water inlet and outlet are not included as standard.

Spare Filling 2907

Spare Filling for Phosphate Cartridge 2906.

Separate Water Supply 2901/2902/2903

To feed the evaporator with softened or desalinated water (pressure >1 bar) and the cooling coil (pressure >3 bar) with phosphate-treated, or standard mains water. Efficiency of the still is reduced by approx. 10 to 15%. **2901** for Water Stills 2002 to 2012, **2902** for Glass Water Stills, **2903** for Water Stills 2102 to 2108. Tubing for the water inlet and outlet are available as accessories.

Level Control Switch 2908/2910

To control the water level in external reservoirs for Water Stills. To switch off power and water when the external reservoir is full (not included as standard). **2908** for Glass Water Stills 2202 to 2208, 2302 and 2304. **2910** for Water Stills 2004 to 2012 and 2102 to 2108.

Type	Description	PK	Cat. No.
2904	Dechlorite filter	1	**9.910 664**
2905	Spare filling for dechlorite filter	1	**9.910 665**
2906	Phosphate cartidge	1	**9.910 666**
2907	Spare filling for phosphate cartidge	1	**9.910 667**
2901	Separate water supply for water stills 2002 to 2012	1	**9.910 661**
2902	Separate water supply for glass water stills	1	**9.910 662**
2903	Separate water supply for water stills 2102 to 2108	1	**9.910 663**
2908	Level control switch for an external storage tank for glass water stills 2202-2208 and 2302 and 2304	1	**9.910 668**
2910	Level control switch for an external storage tank for Water Stills 2004 to 2012 and 2102 to 2108	1	**9.910 669**

Other accessories such as pre-filter, wall brackets, hose sets, separate water supply with solenoid valve and heating with thermostat for the internal storage tank on request.





Deioniser, behropur®

behropur® mixed-bed ion exchangers deliver de-ionized water according to Grade 3 of the ISO 3696 standard, -Water for analytical laboratory use;
Specification and test methods.
The resins inside the behropur® ion exchangers are of certified quality.
The completely equal distribution of water inside the ion exchanger leads to the maximum utilization of the exchange capacity of the unit. Thus the user benefits from very low conductance water throughout the life cycle of each exchanger charge.

Behr

1



1 Deioniser, behropur®

Behr

Heavy-walled, robust and practical mixed bed deioniser in blue polyethylene with free flow output to the reservoir. Also ideal for the post desalination of reverse osmosis systems or for aquariums.

- Can be directly connected to the water supply and is immediately ready for operation.
- Automatic venting as water is supplied from below.
- Minimal risk of contamination due to slotted filter in the raw water inlet.
- Nozzles are durable and easy to clean. Highly resistant to abrasion or shocks.
- Extremely sturdy, heavy-duty nozzle welding by the manufacturer's own welding process.
- Resistivity meter fitted.
- B5 and B10 can also be used as wall mounted devices (wall mounting included).
- Also available with water quality cut-out and solenoid valve which engages if specified limits are exceeded and reservoir level control.
- Resistivity control available directly on the unit or remotely at any location.

Output data:

Model	**B5/B10**
Cation exchange capacity*at 10°dH:	500 L/1000 L
Flow max.:	50/100 L/hr.
Dia.:	16/21 cm
Height:	53/63 cm

Type	Description	PK	Cat. No.
B5	unpressurised, complete with resistivity meter	1	**9.882 114**
B10	unpressurised, complete with resistivity meter	1	**9.882 115**
B5Z	dual cartridge for unpressurised	1	**9.882 116**
B10Z	dual cartridge for unpressurised	1	**9.882 117**
B5A	unpressurised, resistivity meter with water quality cut-out and solenoid valve	1	**9.882 118**
B10A	unpressurised, resistivity meter with water quality cut-out and solenoid valve	1	**9.882 119**

* Limiting value 20 µS

2



2 Deionisers, pressure-resistant, behropur®

Behr

Compact and secure mixed bed deionisers for small to medium-sized volumes of ultra pure water. Ideal for feeding laboratory washing machines, general requirements in the laboratory, low level consumption in industry and for post-treatment desalination of the output from reverse osmosis systems.

- Optimal utilisation of the deioniser due to totally uniform water distribution in the resin chamber.
- Can be connected directly to the raw water mains without a pressure reducer.
- Back pressure resistant.
- Also available with water quality cut-out and solenoid valve, which engages if specified limits are exceeded, and reservoir level control.
- Resistivity control available directly on the unit or remotely at any location.

Performance data:

Model	**B10dN/B22dN/B45dN**
Cation exchange capacity at 10°dH:	1200 L/2400 L/5500 L
Flow max.:	300/500/800 L/hr
Dia.:	21/21/26 cm
Height incl. LF:	68/112/125 cm
Height, cartridge only:	55/98/110 cm

Type	Description	PK	Cat. No.
B10dN	Pressure-resistant mixed bed unit, with resistivity meter	1	**9.882 120**
B10dNZ	Dual cartridge for pressure-resistant mixed bed unit B10dN	1	**9.882 123**
B10dNA	Pressure-resistant mixed bed unit, with resistivity meter	1	**9.882 126**
B22dN	Pressure-resistant mixed bed unit, with resistivity meter	1	**9.882 121**
B22dNZ	Dual cartridge for pressure-resistant mixed bed unit	1	**9.882 124**
B22dNA	Pressure-resistant mixed bed unit stivity, meter with water quality cut-out	1	**9.882 127**
B45dN	Pressure-resistant mixed bed unit, with resistivity meter	1	**9.882 122**
B45dNZ	Dual cartridge for pressure-resistant mixed bed unit B45dN	1	**9.882 125**
B45dNA	Pressure-resistant mixed bed unit, meter with water quality cut-out	1	**9.882 128**

* Limit value 20 µS/cm

E & OE.

1 Mixed-bed ion exchanger made of stainless steel



Behr

Standard cartridge made of V4A stainless steel for general purpose application: To supply laboratory glassware washers, for general laboratory maintenance and for small industrial consumers.
For subsequent demineralization of reverse osmosis systems.
- pressure resistant to 10 bar
- optimum exploitation of the ion exchanger capacity due to absolute uniform water distribution in the unit
- flow rates up to 700 litres/hour
- the unique behropur® jet nozzle system distributes the raw water over the entire resin bed. This ensures an optimum exchange capacity and quality
- can be connected to the raw water network directly and without a pressure reducer
- resistant to alternating pressure
- hard rubber collars vulcanized to the base and top of the unit offer effective protection
- convenient transport thanks to the handles embedded into the top part of the unit
- conductivity is controlled directly on the unit (installed measuring equipment) or with remote location meter
- Also available with shut-off when the limit value is reached and limit control

E28d Pressure resistant mixed-bed unit made of V4A special alloy, permanent pressure resistant to 10 bar, complete with conductivity meter
E40d Pressure resistant mixed-bed unit made of V4A special alloy, permanent pressure resistant to 10 bar, complete with conductivity meter
E28dZ Pressure resistant mixed-bed unit made of V4A special alloy, permanent pressure resistant to 10 bar, spare cartridge
E40dZ Pressure resistant mixed-bed unit made of V4A special alloy, permanent pressure resistant to 10 bar, spare cartridge
E28dA Pressure resistant mixed-bed unit made of V4A special alloy, permanent pressure resistant to 10 bar, conductivity meter with limit switch and electrovalve
E40dA Pressure resistant mixed-bed unit made of nylon, permanent pressure resistant to 8 bar, conductivity meter with limit switch and electrovalve

Specifications	**E 28/E 40 d**
Exchange capacity*at 10°dH	2800 litres/4000 litres
Flow max. litres/hour	500/700
Diameter in cm	24/24
Height incl. LF in cm	74/84
Height of cartridge only in cm	60/70

Type	PK	Cat. No.
E28d	1	**9.915 730**
E40d	1	**9.915 731**
E28dZ	1	**9.915 732**
E40dZ	1	**9.915 733**
E28dA	1	**9.915 734**
E40dA	1	**9.915 735**

* Limit value 20 µS/cm

2 Filter for behropur® mixed-bed ion exchanger



Behr

Filter for pressure-resistant behropur® mixed-bed ion exchangers. Transparent casing. Once added to the ion exchanger, it completely retains even the finest particles and protects your high-quality equipment. Due to the transparent casing of the FG 130, you can see the state of the filter insert at any time and at a glance.
Depending on the requirements, you can use a universal filter (5µ) or a carbon filter (20µ). Downstream filters may only be used on pressure-resistant behropur® ion exchangers. Pressure-free exchangers are destroyed by the counter pressure. It could also subsequently result in expensive damage.

FG 130 behropur® filter housing for filter inserts with a length of 5". Transparent casing made of PP. Connections ¾", maximum operating pressure 8bar, max. temp. 50°C

FE 130 behropur® filter insert, PP, 5µ, length 5", max. pressure 6bar, max. temp. 80°C

AF 130 behropur® filter insert, carbon, 20, length 5", max. pressure 6bar, max. temp. 50°C

Type	PK	Cat. No.
FG 130	1	**9.915 736**
FE 130	1	**9.915 737**
AF 130	1	**9.915 738**

12. Environmental-, soil-, water-, food analysis
Water purification/Pure and ultra-pure water

1 Deionisers, SG stainless steel (V4A)

Siemens AG

High quality, (V4A) stainless steel deionisers, pressure-resistant to 10bar. Excellent build quality ensures long working life, components in contact with the ion-exchange resin made of stainless steel. Optimised water distribution flow throughout the cartridge.

Without Conductivity meter, please order separately.

Larger deionisers are also available on request.

Type	Output L / hr.	Diam. mm	Height mm	Weight kg	PK	Cat. No.
Spare cartridge for SG 2000 SK	450	240	405	16	1	**9.914 442**
Spare cartridge for SG 2800 SK	800	240	570	22	1	**9.914 452**
Spare cartridge for SG 4500 SK	1000	240	800	33	1	**9.914 437**
Spare cartridge for SG 6200 SK	1000	240	1020	46	1	**9.914 432**
Spare cartridge for SG 2000	450	240	405	16	1	**9.914 512**
Spare cartridge for SG 2800	800	240	570	22	1	**9.914 509**
Spare cartridge for SG 4500	1000	240	800	33	1	**9.914 506**
Spare cartridge for SG 6200	1000	240	1120	46	1	**9.914 587**

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2



2 Conductivity meters

Siemens AG

Model P 2/30 Sk
With analogue display 0 to 30µS/cm and connector coupling. With integrated cell (c=0.2).

Model P2/30
With analogue display 0 to 30µS/cm and threaded connections. With integrated cell (c=0.2).

Model LFW 200
With digital display 0.1 to 199.9µS/cm. With potential free switching contact, malfunction alarm indicator, connections for solenoid valve, K = 0.2 cell with or without temperature compensation (Pt 500) and reservoir float switch with external indication. Designed for wall mounting. Dimensions (Wx D x H): 200 x 60 x 120mm. Cell not included. Please order separately.

Model P1/50 WA
With analogue display, measuring range 0 to 50µS/cm, potential free switching contact (value free selectable), for wall mounting. Cell not included. Please order separately.

Type	PK	Cat. No.
P 2/30 Sk	1	**9.914 460**
P 2/30	1	**9.914 516**
LFW 200	1	**9.914 517**
P1/50 WA	1	**9.914 518**
Scew-in cell, 1/2'', c=0.2, 3m cable for P1/50 WA/LFW 200	1	**6.057 070**

E & OE.

1 Ultrapure water system, arium® pro

NEW!

Sartorius

ASTM Typ1 water purification system for the high-end user. Whether for routine analysis or critical applications where reagent-grade water is required, the system consistently supplies high quality that is perfect for your applications. arium® pro features a convincing innovative design, quality and ease of use. From the intuitive menu navigation to the operator friendly setup, all units in the arium® pro series feature ultra easy operation and ultra high flexibility for producing laboratory-grade purified water. arium® pro UV and pro VF water purification systems are also optionally available with an integrated TOC monitor for regularly checking the organic water constituents in product water. The TOC can be measured manually or automatically as required.

Areas of Application
- Atomic absorption (AA)
- Ion exchange chromatography (IC)
- High performance liquid chromatography (HPLC)
- Polymerase chain reaction (PCR)
- Inductively coupled plasma mass spectrometry (ICP-MS)
- Preparing cell culture media
- Protein purification
- Manufacturing reagents
- Preparing buffers and media
- Rinsing glass vessels

Features
- Innovative glass operator interface with touch function
- Integrated TOC measurement (optional)
- Volume- and time-controlled dispensing
- Freely adjustable flow rates up to 2 L/min
- Conductivity measurement for feed and product water
- Integrated monitoring of water consumption
- Data logging on SD card and printer or PC
- Activatable PIN code for basic configurations
- Service and alarm functions supported by graphic displays
- Intelligent alarm system
- Compact design

Specifications
Product Water Quality

Resistivity:	18.2 MΩ x cm
TOC (at 50ppb feed water):	
arium® pro DI/UF:	≤ 5ppb*
arium® pro UV/VF:	< 2ppb*
Endotoxin at arium® pro UF/VF:	< 0.001 EU/ml
Particles (at 0.2µm):	< 1/ml
Bacteria (CFU/1000ml):	< 1
Flow rate (at 2 bar without final filter)	
arium® pro DI/UV:	up to 2 L/min
arium® pro UF/VF:	up to 1.7 L/min

Type	Description	PK	Cat. No.
arium® pro DI-T	standard	1	**9.914 548**
arium® pro UV-T	with UV-lamp, for chromatographic applications	1	**9.914 549**
arium® pro UF-T	with ultra filter, for cell culture applications	1	**9.914 550**
arium® pro VF-T	with ultra filter and UV-lamp, for standard, cell culture and chromatographic applications	1	**9.914 553**

*Values may vary depending on the quality of the feed water, the amount of contamination contained in the feed water, and/or the type of cartridge in use.

1



1 Pure water purification systems Pacific TII

NEW!

Thermo Scientific

The Thermo Scientific Barnstead Pacific TII water purification systems support daily requirements from 20Litres to 200Litres Type 2 water using tap water as feed source. A 30L, 60L, or 100L polyethylene reservoir is required to store and dispense the pure water.
Applications include routine laboratory work: lab glassware rinsing, supplying autoclaves, water baths, incubators and ultrapure water purification systems, preparing and diluting media, buffers and reagents.

Product features:

Multiple options for Type 2 water

Five system options with permeate flows of 3L/hr, 7L/hr, 12L/hr, 20L/hr, or 40L/hr. Future system upgrades accommodate greater capacities to meet growing water demands. Space-saving design permits benchtop installation or wall mounting with integrated mounting bracket.

Operational reliability

Microprocessor controlled for automatic operation with continuous monitoring of all critical parameters. Automatic return to "operating" mode ensures recirculation during standstill periods. Optional UV lamp prevents biological contamination.

Easy-to-operate

Resistivity/conductivity clearly displayed on large back-lit control panel that tilts for optimum viewing. Status of current operating mode clearly indicating "production", "stand-by", "cleaning" modes. Reservoir fill-level shown as %. System parameters are code-protected to prevent accidental changes to set points.

GLP-Compliant documentation

Optional printer connects to RS-232 port for data recording and traceability. Cell constant of 0.01cm^{-1} ensures precise conductivity measurements. Temperature compensation for the conductivity measurement has an accuracy of ±0.1°C (in conformity with USP 645).

Optional hand dispenser with flexible circulating line for dispensing water in a distance of up to 3 m. The kit contains a 0.2 µm end filter.

Pure water Specifications

Operating pressure:	2 to 6bar
Temperature:	+2°C to +35°C
Permeate conductivity:	0.067 to 0.1µS/cm (at <30ppm CO_2 in feeding water)
Permeate resistance at 25°C:	15 to 10MΩ.cm
Removal bacteria, Pyrogens:	>99%
TOC value:	<30ppb
Interface:	RS 232

Specifications

Power supply:	90-240V/50-60Hz
Dimensions (WxDxH):	372 x 330 x 613mm
Feedwater connector:	Tubing 1.5m with 8mm o.d. and R¾" inner thread
Wastewater connector:	¼" or 8mm o.d., tubing 2m, pressureless drain
Power Consumption:	0.08kW

Type	Permeate L/hr	PK	Cat. No.
Pacific TII 3	3	1	**9.535 536**
Pacific TII 3 (UV)	3	1	**9.535 541**
Pacific TII 7	7	1	**9.535 537**
Pacific TII 7 (UV)	7	1	**9.535 542**
Pacific TII 12	12	1	**9.535 538**
Pacific TII 12 (UV)	12	1	**9.535 543**
Pacific TII 20	20	1	**9.535 539**
Pacific TII 20 (UV)	20	1	**9.535 544**
Pacific TII 40	40	1	**9.535 540**
Pacific TII 40 (UV)	40	1	**9.535 545**

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E & OE.

1 Pure water purification system Pacific RO

NEW!

Thermo Scientific

The Thermo Scientific Barnstead Pacific RO water purification systems are modularly designed laboratory reverse osmosis system for the production of 20L to 200L pure water from tap water. Applications include routine laboratory work: lab glassware rinsing, supplying autoclaves, water baths and incubators, preparing an diluting buffers and reagents. A 30L, 60L, or 100L polyethylene reservoir is required to store and dispense the permeate water.
Product features: Space-saving design allows system to sit on the laboratory bench or be mounted on the wall. Simple system upgrade accommodates future pure water capacity requirements.
Reliable operation: Microprocessor control offers automatic operation with continual monitoring of all important parameters. Required filling level of the reservoir can be customized. Automatic return to operating mode ensures recirculation during periods of standstill.
Easy-to-operate clear display: Resistivity/conductivity clearly displayed on large back-lit control panel that tilts for optimum viewing. Status of current operating mode clearly indicates "production", "stand-by", "cleaning" modes. Reservoir fill-level shown as %.
Integrated feed water monitoring: Good quality feed water is a prerequisite for high purity water and extends cartridge service life.
GLP-compliant documentation: Real-time clock records system errors and faults. Ongoing data storage collects four weeks information displayed in clear text. Operating system is code-protected to prevent unauthorized changes to system settings. RS-232 interface with adjustable sender interval allows for customized timing of data transmission of measured values and faults to a PC or data printer. Cell constant of 0.16cm^{-1} ensures precise conductivity measurements.
Pacific RO pretreatment: Two 10in. (25.4cm) cartridge filter housings with a 5µm prefilter and activated carbon to prevent entry of particles >5µm and high concentrations of free chlorine includes hardness stabilizer cartridge which binds calcium and prevents its precipitation.
Worry-free pure water storage: Reservoir are constructed of pigment-free polyethylene. Conical bottom allows for easy cleaning, disinfecting and complete emptying.

Optional hand dispenser with flexible circulating line for dispensing water in a distance of up to 3 m. The kit contains a 0.2 µm end filter.

Pure water specifications

Operating pressure:	2 to 6bar
Removal bacteria and particles:	99%
Removal anorganic components:	98%

Specifications

Power supply:	90-240 V/50 Hz, rubber connector 1.8m
Dimensions (WxDxH):	372 x 330 x 603mm
Feedwater connector:	Tubing 1.5m with 8mm o.d. and R¾" inner thread
Wastewater connector:	¼" or 8mm o.d., tubing 2m, pressureless drain
Power consumption:	0.1kW

Type	Permeate L/hr	PK	Cat. No.
Pacific RO 3	3	1	**9.535 531**
Pacific RO 7	7	1	**9.535 532**
Pacific RO 12	12	1	**9.535 533**
Pacific RO 20	20	1	**9.535 534**
Pacific RO 40	40	1	**9.535 535**



Accessories for pure water purification system Pacific TII/RO

NEW!

Thermo Scientific

Type	PK	Cat. No.
Pretreatment complete with prefilter and hardness stabilization	1	**9.535 978**
5µm prefilter and activated carbon 10 inch cartridge	1	**9.535 951**
Hardness stabilization for treatment	1	**9.535 957**
Filter set	1	**9.535 980**
UV Lamp for UV models	1	**9.535 979**

1 Reservoirs for pure water purification system Pacific TII/RO

NEW!

Thermo Scientific

For safely and convenient storage of high purity water
- Large opening for easy and effective cleaning
- Vent filter with CO_2 absorber to prevent conductivity increases from drawn-in CO_2
- Sterile overflow to prevent microorganisms from entering and contaminating reservoir water
- Constructed with inert materials opaque to light
- Recirculation pump protects high purity water from bacterial growth during standstill while maintaining a low conductivity value
- Simple and space-efficient wall mounting
- Conical bottom outlet for complete emptying
- Allows complete draining and efficient cleaning and disinfection

Capacity litres	Diam. mm	Height mm	PK	Cat. No.
30	380	602	1	**9.535 929**
30*	380	602	1	**9.535 928**
60	380	916	1	**9.535 933**
60*	380	916	1	**9.535 932**
100	380	1255	1	**9.535 937**
100*	380	1255	1	**9.535 936**

*with pressure pump

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Accessories for reservoirs pure water purification system Pacific TII/RO

NEW!

Thermo Scientific

Type	PK	Cat. No.
Sterile tank overflow	1	**9.535 922**
CO_2 absorber and sterile vent filter	1	**9.535 923**
Sterile vent filter	1	**9.535 924**
UV lamp for tank	1	**9.535 994**
UV lamp assembly for tank	1	**9.535 925**
Wall mounting bracket for 30L reservoir	1	**9.535 926**
Wall mounting bracket for 60L reservoir	1	**9.535 927**

E & OE.

Ultrapure water purification systems GenPure, ASTM I

NEW!

Thermo Scientific

The Thermo Scientific Barnstead GenPure systems deliver ultrapure 18.2 MΩ.cm water from pretreated feed water for the most demanding and sensitive applications.
Applications include molecular biology and microbiology, cell and tissue culture, PCR, DNA sequencing, electrophoresis and analytical chemistry: HPLC, GC, GC-MS, ICP-MS, AA, IC, TOC measurements. GenPure systems product water quality exceeds international standards ASTM Type I, ISO 3696 Grade1, ASTM D1193 and CLSI-CLRW.

Product features:

Flexibility of water dispensing is guaranteed through three different GenPure versions: the standard version with a fixed outlet, the GenPure Pro with an attached flexible dispenser and the GenPure xCAD models with a remote dispenser, which can be either bench or wall mounted. The ergonomically designed controller tilts for the ease-of-use and better visibility. It has a four line alpha-numeric display.

Online TOC measurement with UV intensity monitoring: real-time TOC monitoring allows for measurement of organic substances present in the water. Continuous monitoring of UV intensity removes the risk of false TOC values due to diminished UV intensity. Fault message alerts user when the UV lamp intensity is no longer sufficient for accurate TOC measurements

UV Photo-oxidation 185/254 nm: high performance UV assembly reliably reduces the content of microorganisms and their metabolites

Measurement of conductivity/resistivity: conductivity cells are carefully calibrated prior to each measurement via built-in reference resistance with cell constants at 0.01cm-1cm. Temperature measurements are made by platinum chip sensor with ±0.1°C accuracy. An additional cell monitors feed water conductivity and prevents the user when it drops below the set value.

Quick-connect cartridge replacement: aquastop quick-connect capability enables cartridge replacement within seconds even mid-operation

Exact dosing: electronic dosing for fully automatic volume control of 0.01L-65L with <0.5% accuracy

GLP-compliant documentation: real-time clock and code-protected operating system prevents unauthorized changes to system settings. RS-232 interface with adjustable send - interval for safe data transfer of all measured data, faults, date and time to a PC or log printer. Digital microprocessor control automatically monitors and stores faults from the last four weeks. USP-compliant conductivity measurement with temperature compensation can be switched on or off.

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9.535 875

2



9.535 887

Ultrapure water Specifications ASTM Typ I

Flow rate, max.:	Up to 2L/min
Operating pressure:	2 to 6bar
Temperature:	2°C to 35°C
Conductivity:	0.055µS/cm
Resistance at 25°C:	18.2MΩxcm
TOC value in ppb (Models with UV):	1 - 5
TOC value in ppb (Models without UV):	< 10
Endotoxins*in cfu/ml (Models with UF):	< 0.001
RNase*in ng/ml (Models with UF):	0.01
DNase*in pg/µl (Models with UF):	4
Bacterial content:	<1cfu/ml
Particles >0.2µm/mL:	< 1
Dimensions (WxDxH):	372 x 330 x 615mm
Dimensions xCAD (WxDxH):	260 x 530 x 725mm
Feedwater connector:	¾" o.d.
Drainwater connector:	¼"
Power Consumption:	0.1 kW
Power supply:	90-240V/50-60Hz

Type	Description	PK	Cat. No.
GenPure	AAS, IC, ICP, Standard buffer	1	**9.535 875** 1
GenPure UF	Micro- and molecular biology, PCR, IVF	1	**9.535 876**
GenPure UV	Trace analysis, HPLC, ICP-MS, IC	1	**9.535 878**
GenPure UF/UV	Molecular biology, PCR, DNS, IVF, monoclonal antibodies, cell culture	1	**9.535 877**
GenPure UV-TOC	Trace analysis, HPLC, ICP-MS, IC, TOC analysis	1	**9.535 879**
GenPure UV-TOC/UF	Molecular biology, PCR, DNS, IVF, monoclonal antibodies, cell culture	1	**9.535 880**
GenPure Pro	AAS, IC, ICP, Standard buffer	1	**9.535 887** 2
GenPure Pro UF	Micro- and molecular biology, PCR, IVF	1	**9.535 888**
GenPure Pro UV	Trace analysis, HPLC, ICP-MS, IC	1	**9.535 890**
GenPure Pro UV/UF	Molecular biology, PCR, DNS, IVF, monoclonal antibodies, cell culture	1	**9.535 889**
GenPure Pro UV-TOC	Trace analysis, HPLC, ICP-MS, IC, TOC analysis	1	**9.535 891**
GenPure Pro UV-TOC/UF	Molecular biology, PCR, DNS, IVF, monoclonal antibodies, cell culture	1	**9.535 892**

UF=with ultra filtration, UV=with UV photo oxidation 185/254nm, UV-TOC=with UV photo oxidation 185/254nm and TOC display, UV-TOC/UF=with UV photo oxidation 185/254nm, TOC display and ultra filtration

*depending on feed water quality

Accessories for Ultrapure water purification system GenPure/GenPure Pro/GenPure xCad

Thermo Scientific

Description	PK	Cat. No.
Ultrapure water filter set	1	**9.535 971**
Sterile filter 0.2µm	1	**9.535 961**
UV replacement lamp	1	**9.535 969**
Disinfection cartridge	1	**6.243 959**
Disinfection granules	12	**6.243 960**
Data printer	1	**9.535 974**
xCAD client, wall, radius: 0.8m, 1.2l/min, inlet: 3m	1	**9.535 874**
xCAD client, bench, radius: 0.8m, 1.2l/min, inlet: 3m	1	**9.535 897**
Hand dispenser with 3m flexible circulation tubing , end filter: 0.2µm	1	**9.535 898**

1 Remote Dispenser xCad plus for Ultrapure water purification systems GenPure

Thermo Scientific

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Type	Description	PK	Cat. No.
GenPure xCAD Plus (bench)	AAS, IC, ICP, Standard buffer	1	**9.535 810**
GenPure xCAD Plus UV (bench)	Trace analysis, HPLC, ICP-MS, IC	1	**9.535 811**
GenPure xCAD Plus UF (bench)	Micro- and molecular biology, PCR, IVF	1	**9.535 812**
GenPure xCAD Plus UV/UF (bench)	Molecular biology, PCR, DNS, IVF, monoclonal antibodies, cell culture	1	**9.535 813**
GenPure xCAD Plus UV-TOC (bench)	Trace analysis, HPLC, ICP-MS, IC, TOC analysis	1	**9.535 814**
GenPure xCAD Plus UV/UF TOC (bench)	Molecular biology, PCR, DNS, IVF, monoclonal antibodies, cell culture	1	**9.535 815**
GenPure xCAD Plus (wall)	AAS, IC, ICP, Standard buffer	1	**9.535 816**
GenPure xCAD Plus UV (wall)	Trace analysis, HPLC, ICP-MS, IC	1	**9.535 817**
GenPure xCAD Plus UF (wall)	Micro- and molecular biology, PCR, IVF	1	**9.535 818**
GenPure xCAD Plus UV/UF(wall)	Molecular biology, PCR, DNS, IVF, monoclonal antibodies, cell culture	1	**9.535 819**
GenPure xCAD Plus UV-TOC (wall)	Trace analysis, HPLC, ICP-MS, IC, TOC analysis	1	**9.535 872**
GenPure xCAD Plus UV/UF TOC (wall)	Molecular biology, PCR, DNS, IVF, monoclonal antibodies, cell culture	1	**9.535 873**

UF=with ultra filtration, UV=with UV photo oxidation 185/254nm, UV-TOC=with UV photo oxidation 185/254nm and TOC display, UV-TOC/UF=with UV photo oxidation 185/254nm, TOC display and ultra filtration

E & OE.

Ultrapure water purification system MicroPure, ASTM I

NEW!

Thermo Scientific

Thermo Scientific Barnstead MicroPure ultrapure water purification systems
The Thermo Scientific Barnstead MicroPure systems deliver ultrapure 18.2 MΩ.cm water from pretreated feed. The "micro-sized" compact and reliable systems were designed for laboratories that require up to 15L/day of ultrapure water for applications such as HPLC or other instrumental analyses, sample preparation, glassware rinsing, or molecular biology work in which endotoxins and/or nucleases would interfere.

Product features:

Smart features

- Backlit display tilts for easy viewing
- Variable speed dispensing
- Optional integrated 6L feed water reservoir so you can place the system without direct access to a water line
- Feed water quality monitoring
- Good feed water quality leads to consistently ultrapure water and a longer cartridge life time

Smart design

- Recirculation pump prevents bacterial growth during standstill and allows for constant monitoring of all system functions leading to the immediate display of fault messages if a problem is detected
- Systems ship fully equipped with pressure reducer, ultrapure cartridge and 0.2µm sterile filter

Superior filters

- Ultrafilter is flushed automatically to assure the highest retention of endotoxins and nucleases, which produces a long two year lifetime
- Validated 0.2µm final filter with folded membrane can be sterilized up to 5 times

Specifications

Flow rate, max.:	1L/min
Operating pressure:	2 to 6bar
Temperature:	+2°C to +35°C
	0.055µS/cm
Resistance at 25°C:	18.2 MΩxcm
TOC value (models with UV):	1 to 5ppb
TOC value (models without UV):	< 10ppb
Bacterial content:	<1cfu/ml
Particles >0.2µM/mL:	<1
Endotoxins (Models with UF):	<0.001cfu/ml
Power consumption:	0.06kW
Feedwater connector:	8mm o.d.
Power supply:	90-240V, 50/60Hz, automatic voltage regulation to 24 V
Dimensions (WxDxH):	305 x 300 x 545 mm
Dimensions models with reservoir (WxDxH):	305 x 400 x 545 mm

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9.535 827

Type	Description	PK	Cat. No.
MicroPure Standard	AAS, IC, ICP, Standard buffer	1	**9.535 823**
MicroPure UF	Micro- and molecular biology, PCR, IVF	1	**9.535 824**
MicroPure UV	Trace analysis, HPLC, ICP-MS, IC	1	**9.535 826**
MicroPure UF/UV	Molecular biology, PCR, DNS, IVF, monoclonal antibodies, cell culture	1	**9.535 825**
MicroPure Standard-ST	AAS, IC, ICP, Standard buffer	1	**9.535 827** 1
MicroPure UF-ST	Micro- and molecular biology, PCR, IVF	1	**9.535 828**
MicroPure UV-ST	Trace analysis, HPLC, ICP-MS, IC	1	**9.535 830**
MicroPure UF/UV-ST	Molecular biology, PCR, DNS, IVF, monoclonal antibodies, cell culture	1	**9.535 829**

Accessories for Ultra pure water system MicroPure

NEW!

Thermo Scientific

Description	PK	Cat. No.
Ultra pure filter set	1	**9.535 963**
Sterile filter 0.2µm	1	**9.535 961**
UV replacement lamp	1	**9.535 960**
Disinfectant cartridge	1	**9.535 968**
Disinfectant granules	1	**6.243 960**
Wall mounting bracket	1	**9.535 976**

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Pure- and Ultrapure water purification system Smart2Pure, ASTM I and II

NEW!

Thermo Scientific

The Thermo Scientific Barnstead Smart2Pure system is a compact system which converts tap water to into both ASTM Type I and II water. The Smart2Pure 3 and 6 feature a built-in 6L reservoir to store the Type II water. The Smart2Pure 12 offers the choice of a 30L or 60L reservoir for customizable storage capacity.

Product features:
Powerful performance
Based on your requirements, choose from capacities of 3L/hr, 6L/hr or 12L/hr
Lasting economy
Water purification progresses through independent cartridges with Aquastop quick connects for fast replacement
Module 1 - Combination of pretreatment and the reverse osmosis membrane
Module 2 - Polishing cartridge contains high-quality ultrapure resin for consistent purity and long cartridge life
Easy-to-operate
Dispensing is easy and features variable speed to control flow. The display can be tilted for optimal reading. Optional UV bulb and UF ultrafilter to customize ultrapure water
Placement options
Position on laboratory bench or mount it on the wall
Smart integrated 6L reservoir for the Smart2Pure 3 and 6
Constructed with pigment-free materials, conical bottom outlet allows for complete draining and efficient cleaning and disinfection.
Smart2Pure 12 offers reservoir options, either 30L or 60L
Large opening for easy and effective cleaning by hand. Sterile venting filter/reservoir overflow protects against contamination by microorganisms. Optional CO_2 absorber prevents TOC value increases from drawn-in CO_2. Polyethylene reservoir is opaque to light. Recirculation pump protects the high purity water from bacterial growth during standstills and maintains the low conductivity value. Wall-mount optional for simple space-savings. Conical bottom outlet allows for complete draining and efficient cleaning and disinfection.
- Optional hand dispenser with flexible circulating line for dispensing water in a distance of up to 3 m. The kit contains a 0.2 µm end filter.

Ultrapure water Specifications ASTM Typ I

Flow rate:	1.0l/min
Flow rate UF-models:	0.6l/min
Conductivity:	0.055µS/cm
Resistance at 25°C:	18.2MΩxcm
TOC value:	<10ppb
TOC values UV-models:	1 to 5ppb
Endotoxins UF-models:	0.005EU/ml
Bacterial content:	<1KbE/ml
Particles >0.2µM/ml:	<1

Pure water Specifications ASTM Typ II

Permeate flow rate at 15°C:	
Smart2Pure 3:	3 l/h
Smart2Pure 6:	6 l/h
Smart2Pure 12:	12 l/h
Permeate conductivity:	0.067 to 0.1µS/cm
Permeate resistance at 15°C:	15 to 10MΩxcm

Specifications

Power supply:	90-240V/Hz
Dimensions (WxDxH):	305 x 400 x 545mm
Feedwater connector:	¾ inch
Drain connection:	¼ inch

Type	Description	PK	Cat. No.
Smart2Pure 3	AAS, IC, ICP, Standard buffer	1	**9.535 860**
Smart2Pure 3 UF	Micro- and molecular biology, PCR, IVF	1	**9.535 861**
Smart2Pure 3 UV	Trace analysis, HPLC, ICP-MS, IC	1	**9.535 862**
Smart2Pure 3 UF/UV	Molecular biology, PCR, DNS, IVF, monoclonal antibodies, cell culture	1	**9.535 863**
Smart2Pure 6	AAS, IC, ICP, Standard buffer	1	**9.535 864**
Smart2Pure 6 UF	Micro- and molecular biology, PCR, IVF	1	**9.535 865**
Smart2Pure 6 UV	Trace analysis, HPLC, ICP-MS, IC	1	**9.535 866**
Smart2Pure 6 UF/UV	Molecular biology, PCR, DNS, IVF, monoclonal antibodies, cell culture	1	**9.535 867**
Smart2Pure 12	AAS, IC, ICP, Standard buffer	1	**9.535 868**
Smart2Pure 12 UF	Micro- and molecular biology, PCR, IVF	1	**9.535 869**
Smart2Pure 12 UV	Trace analysis, HPLC, ICP-MS, IC	1	**9.535 870**
Smart2Pure 12 UF/UV	Molecular biology, PCR, DNS, IVF, monoclonal antibodies, cell culture	1	**9.535 871**

E & OE.

Accessories for pure and ultrapure purification systems Smart2Pure

NEW!

Thermo Scientific

Description	PK	Cat. No.
Wall mounting bracket	1	**9.535 976**
Ultrapure water cartridge	1	**9.535 966**
UV replacement lamp	1	**9.535 960**
Sterile filter, 0.2µm for direct removal/device	1	**9.535 961**
Reservoir vent filter	1	**9.535 986**
Disinfection granules	1	**6.243 960**
Pretreatment Pack for Smart2Pure 3	1	**9.535 970**
Pretreatment Pack for Smart2Pure 6	1	**9.535 972**
Pretreatment Pack for Smart2Pure 12	1	**9.535 973**
CO_2 adsorber and sterile venting filter for Smart2Pure 12	1	**9.535 923**
UV immersion lamp for tank for Smart2Pure 12	1	**9.535 925**
Smart2Pure 12 Tank 30 l	1	**9.535 931**
Smart2Pure 12 Tank 60 l	1	**9.535 935**
Wall mounting bracket for Smart2Pure 12 30L reservoir	1	**9.535 926**
Wall mounting bracket for Smart2Pure 12 60L reservoir	1	**9.535 927**

1 Reverse osmosis systems, Ultra Clear™ RO EDI

Siemens AG

The well-proven Ultra Clear™ RO range has been enhanced to peak water quality level in the plus series by adding electronic deionisation cells: accessory deionisers for removing inorganic materials from the output are therefore no longer required.

- Resistance up to 18.2 megohm (0.06µS/cm)
- TOC < 3 to 5ppb at RO cell output (if feed water < 100ppb)
- Micro-organism reduction > 99%
- Typical pure water quality < 0.06µS

In all Ultra Clear™ RO systems the quality of the feed and output water will be shown on the display.

Specifications

Connections:	Permeate, concentrate, raw water: 8/6 mm/R ¾"
Rating:	200/300W
Dimensions (WxDxH):	340 x 420 x 520mm
Colloidal index (SDI):	< 3
Supply water pressure:	2 to 6 bar (0 to 5 bar Ultra Clear™ RO EDI 10)

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Type	Pure water output at 15°C L / hr.	Weight kg	PK	Cat. No.
Ultra Clear™ RO EDI 10	10	20	1	**9.914 620**
Ultra Clear™ RO EDI 20	20	32	1	**9.914 621**
Ultra Clear™ RO EDI 40	40	33	1	**9.914 622**
Ultra Clear™ RO EDI 55	55	35	1	**9.914 623**

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1 Reverse osmosis system, Ultra Clear™ RO

Siemens AG

Eleven models with outputs from 10 to 350 l/hr that provide pure water supplies from 50 to 7000 litres per day. The application of low- energy- membranes ensures an efficient and economical operation.

Features:
- pure water treatment for simple analysis, laboratory rinsing machines, autoclaves, up to ultrapure water systems
- germ/pyrogen retention rate >99%
- modern, maintenance-friendly design
- modular flushing for long service life
- complete, connection-ready system; fittings allow supply tanks to be expanded if required (e.g. Ultra Clear™ RO supply tanks with 30, 60 and 80 litre capacities)
- conductivity monitor e.g. for downstream ion exchanger possible
- menu-driven controller, RS232 interface
- Ultra Clear™ RO DI: includes post-treatment module for residual desalination of permeate Entrance- and Product water quality will be shown on the display.

Specifications

Connections:	permeate, concentrate, raw water: R ¾"
Salt retention rate, normal:	99%
Residual conductivity, Ultra Clear™ RO DI:	< 0.1S/cm
Power requirement:	200W (Ultra Clear™ RO 200: 550 W)
Input conductivity:	<2000µS
Blocking index SDI:	<3
Dimensions (WxDxH):	340 x 420 x 520mm (Ultra Clear™ RO 200: H= 1350mm)
Supply water pressure:	2 to 6bar (0 to 5bar Ultra Clear™ RO 10/Ultra Clear™ RO DI 10)

Type	Pure water output at 15°C L / hr.	Weight kg	PK	Cat. No.
Ultra Clear™ RO 10	10	22	1	**9.914 653**
Ultra Clear™ RO DI 10	10	23	1	**9.914 654**
Ultra Clear™ RO 20	20	30	1	**9.914 610**
Ultra Clear™ RO DI 20	20	26	1	**9.914 656**
Ultra Clear™ RO 40	40	35	1	**9.914 611**
Ultra Clear™ RO DI 40	40	28	1	**9.914 658**
Ultra Clear™ RO 60	60	40	1	**9.914 612**
Ultra Clear™ RO 100	100	33	1	**9.914 661**

2



2 Accessories for ultra pure water systems Ultra Clear™ RO

Siemens AG

Type	For	Change interval	PK	Cat. No.
Pre-treatment module AMB*	all sytems Ultra Clear™ RO	every 6 months***	1	**9.914 524**
Pre-treatment module VMD	Ultra Clear™ RO DI 10-40	every 3 months***	1	**9.914 520**
RO membrane	Ultra Clear™ RO 10 Ultra Clear™ RO 10 DI	every 2 to 3 years	1	**9.914 515**
RO module**	Ultra Clear™ RO DI 20-40 Ultra Clear™ RO 20-200	every 2 to 3 years	1	**9.914 519**

*Ultra Clear™ RO 200: 2 pre-treatment module AMB
**number depending on the size of the system
***Interval of exchanges depends on raw water quality and throughput

1 Ultra pure water systems, Ultra Clear™

Siemens AG

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The Ultra Clear™ series is a user-friendly ultra-pure water system which is available in 12 different versions - for each application there is the right system. The units are modular and can be upgraded with UV-Oxidation or Ultra-filtration accessories. The Ultra Clear™ system can be mounted on the wall without any accessories - a wall bracket is included. Requirements for AAS, HPLC, IC, ICP/MS, cell cultures, micro biology and TOC- Analytic etc. have not only been fulfilled but significantly exceeded, depending on the unit. The Ultra Clear is a bench top system, the Integra a space saving, under-bench installation. Ultra Clear™ (Integra) UV and Ultra Clear™ (Integra) UV UF are available with TOC- Monitoring (TM-version) and UV- intensity measurement

- programmable microprocessor control system with keypad, plain text display, resistance or conductance display with temperature compensation
- additional pressure reducing valve is not required
- input and output conductivity levels given, together with entry of limits
- internal sterile filtration filter 0.1µm, 1000cm², and additional disinfection
- circulation mode programmable (intermittent/non-stop)
- very quiet (under 40dB)
- easy module change by quick-connector coupling system
- supply requirements: 100-240V 50/60Hz

Specifications:

Ultra-pure water output up to L/min:	2
Resistance at 25°C Megohm:	18.2
Conductivity at 25°C µS/cm:	0.055
Bacteria KbE/ml:	<1
Particle >0.1µm amount/ml:	<1
Dimensions (WxDxH):	340 x 320 x 540mm

Type	TOC value	Endotoxin content EU/ml	PK	Cat. No.
Ultra Clear™	5 - 10 ppb	-	1	**9.914 497**
Ultra Clear™ UV	<1 ppb	-	1	**9.914 496**
Ultra Clear™ Integra UV	<1 ppb	-	1	**9.914 473**
Ultra Clear™ UF	5 - 10 ppb	<0,001	1	**9.914 498**
Ultra Clear™ UV UF	<1 ppb	<0,001	1	**9.914 495**
Ultra Clear™ Integra UV UF	<1 ppb	<0,001	1	**9.914 475**
Ultra Clear™ UV TM*	<1 ppb	-	1	**9.914 476**
Ultra Clear™ Integra UV TM*	<1 ppb	-	1	**9.914 477**
Ultra Clear™ UV UF TM*	<1 ppb	<0,001	1	**9.914 478**
Ultra Clear™ Integra UV UF TM*	<1 ppb	<0,001	1	**9.914 479**

* pure water system with TOC-Monitoring

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1 Ultra pure water system, Ultra Clear™ TWF

Siemens AG

The Ultra Clear™ TWF is an ultra-pure water system which accommodates almost any option that can be directly connected to the drinking water mains system - with an output of up to 2 l/min. UV oxidation, ultra-filtration and TOC monitoring can be integrated into all UV models. Permeate can be easily tapped directly from the tank for simple flushing purposes and a separate flushing machine can also be operated. Typical system applications: AAS, IC, GC, HPLC, TOC analysis, cell and tissue cultures, DNA sequencing, in-vitro fertilisation, PCR, and much more.

- microprocessor control with clear text display, resistance and conductivity display temperature compensated
- conductivity control with limit value entries for permeate and purest water
- sterile filter 0.1µm
- circulation mode with day and night programme to condition individual components during night-time periods
- simple module changing with pluggable connector system featuring "Aqua-Stop"
- supply requirements 220 V 50Hz, other voltages available without extra charge

Specifications*:

Ultra-pure water rating:	up to 2L/min
Resistance at 25°C:	18.2Megohm
Conductivity at 25°C:	0.055µS/cm
Bacteria:	<1KbE/ml
Particle >0.1 to 1µm:	<1 count/ml
Permeate rating:	<10 l/h
Input conductivity:	<1000µS/cm
Power requirement:	50W
Silt density index SDI:	<3
Dimensions (WxDxH):	560 x 320 x 530mm

Type	TOC value	Endotoxin content EU/ml	PK	Cat. No.
Ultra Clear™ TWF	5 to 10 ppb	-	1	**9.914 643**
Ultra Clear™ TWF UV	<1 ppb	-	1	**9.914 644**
Ultra Clear™ TWF UV TM + TOC Monitor	<1 ppb	-	1	**9.914 645**
Ultra Clear™ TWF UF	5 to 10 ppb	0.001	1	**9.914 646**
Ultra Clear™ TWF UV UF	<1 ppb	0.001	1	**9.914 647**
Ultra Clear™ TWF UV UF TM + TOC Monitor	<1 ppb	0.001	1	**9.914 648**

* For supply water conductivity < 1000 µS/cm
Available with 30l, 60l or 80l tank.

Ultra Clear TWF pure water systems, accessories

Type	Change interval	PK	Cat. No.
Pre-treatment module AMB	every 6 months	1	**9.914 524**
Post-treatment module MF III D	1 to 2 x a year	1	**9.914 521**
Sterile filter 0.1 µm	every 6 months	1	**9.914 522**
Sterile filter 0.2 µm	every 6 months	1	**9.914 525**
UV-spare lamp UC (for systems with TM only)	1 to 2 x a year	1	**9.114 526**
UV-spare lamp UC (for systems without TM only)	1 to 2 x a year	1	**9.914 523**
RO-Module	every 2 to 3 years	1	**9.914 519**
CO2 trap CT1 incl. Vent filter (spare cartridge)	1 x a year	1	**9.914 527**
Vent filter VF1 (spare cartridge)	1 x a year	1	**9.914 528**
UV-submersion light UV-SL 1	1 x a year	1	**9.914 529**

2



2 Ultra Clear water systems, accessories

Siemens AG

Type	Change interval	PK	Cat. No.
Pre-treatment module VMD	1 to 2 x per year	1	**9.914 520**
Pre-treatment module DTO	1 to 2 x per year	1	**9.914 513**
Post-treatment module MF III D	1 to 2 x per year	1	**9.914 521**
Post-treatment module ILT	1 to 2 x per year	1	**9.914 514**
Sterile filter 0.1 µm, 1000 cm²	every 6 months	1	**9.914 522**
Desinfection kit (3-pack)		1	**6.234 666**
UV-light (for systems without TM)	1 x per year	1	**9.914 523**
UV-light (for systems with TM)	1 x per year	1	**9.114 526**
Ultrafiltration module Preventor 5000	every 2 years	1	**6.234 665**

Genomics 1226
PCR 1226
DNA-Electrophoresis 1239
Gel-Documentation 1244
Filtration, Concentration 1248

Proteomics 1251
ELISA 1251
Protein-Electrophoresis 1260
Blotting 1262
Purification 1265
Analysis 1268

Microbiology 1273
Cultivation 1273
Incubation 1295
Cell disruption 1310
Filtration 1319
Analysis 1328
Tubes and racks 1330

Cell Culture 1336
Cultivation 1336
Filtration 1349
Aspirators 1351
Instruments 1354
Safety Cabinets 1360

LLG-PCR Tubes and Plates, PP

- Premium quality
- Produced in a cleanroom environment
- RNase-, DNase-, Human DNA- and Pyrogen-free
- Virgin Polypropylene
- Compatible with all major thermal cyclers

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1 2 LLG-PCR tubes with attached lids, PP

- Individual tubes
- Compatible with all major thermal cyclers
- 0.2ml or 0.5ml
- Maximum tube capacity: 0.25ml or 0.6ml when closed
- Individual attached flat or domed snap caps
- Consistent wall thickness for uniform heat transfer
- Cap design ensures fit and helps reduce sample evaporation
- Virgin polypropylene, certified RNase, DNase and endotoxin free

Description	PK	Cat. No.
0.2ml, single, flat cap	1000	**9.407 501**
0.2ml, single, domed cap	1000	**9.407 502**
0.5ml, single, flat cap	1000	**9.407 504**
0.5ml, single, domed cap	1000	**9.407 505**

3 4 LLG-PCR-Tubes, 8 Strips with attached individual caps, PP

- for 0.2 ml Thermal cycler blocks
- with flat or domed cap
- made of high quality polypropylene, RNase-, DNase- and Endotoxin free

Description	PK	Cat. No.
8 PCR tube strips with individually attached flat snap caps	250	**9.407 515**
8 PCR tube strips with individually attached domed ultra clear snap caps	250	**9.407 516**

3



9.407 515

4



9.407 516

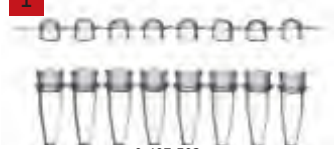
E & OE.

LLG-PCR-Tubes, 8 Strips, PP

- For 0.2ml thermal cycler blocks
- Detached cap strips can be used as individual tubes when cut
- With domed or flat caps
- Consistent wall thickness for uniform heat transfer
- Contamination-free opening
- Cap strips provide tight seal during all PCR cycles
- Easy-to-use
- Maximum tube capacity: 0.25 ml when closed
- Highly transparent cap makes them ideal for qPCR
- Virgin polypropylene, certified RNase, DNase and endotoxin free

Description	PK	Cat. No.	
8 PCR tube strips plus detached cap strips, domed caps	250	**9.407 503**	1
8 PCR tube strips plus detached cap strips, flat caps	250	**9.407 514**	2
8 PCR detached cap strips, flat caps	120	**6.254 729**	
8 PCR detached cap strips, domed caps	120	**9.407 522**	

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9.407 503

2



9.407 514

PCR Tubes attached cap, PP

BRAND has significantly expanded its product range of extra-thin-wall disposable products, which were specially developed to satisfy the demands of PCR applications. *BRAND*

Quality features
- Suitable for use in common thermal cyclers.
- PP, extra-thin uniform wall thicknesses to provide the optimal thermal transfer and short cycle times.
- Manufactured under the most modern cleanroom conditions.
- DNase-, DNA- and RNase-free.
- Autoclavable at 121°C (2 bar), acc. DIN EN 285
- qPCR: Products which are suitable for Real Time PCR (qPCR).

Description	PK	Cat. No.	
0.2 ml, single, clear, domed cap	1000	**9.409 370**	3
0.2 ml, single, pink, flat cap	1000	**9.409 280**	
0.2 ml, single, yellow, flat cap	1000	**9.409 281**	
0.2 ml, single, green, flat cap	1000	**9.409 282**	
0.2 ml, single, blue, flat cap	1000	**9.409 283**	
0.2 ml, single, clear, flat cap	1000	**9.409 371**	
0.5 ml, single, pink, flat cap	1000	**9.409 284**	
0.5 ml, single, yellow, flat cap	1000	**9.409 285**	
0.5 ml, single, blue, flat cap	1000	**9.409 287**	
0.5 ml, single, green, flat cap	1000	**9.409 286**	
0.5 ml, single, clear, flat cap	1000	**9.409 372**	4

3



9.409 370

4



9.409 372

PCR tubes strips , PP, with attached individual caps

The strips of 8 PCR tubes with attached, flat individual caps provide an ideal protection against contamination. The highly transparent cap makes them ideal for a quantitative Real Time PCR. Available in Standard (0.2ml) or Low Volume (0.15ml). *BRAND*

Capacity ml	Type	Colour	PK	Cat. No.	
0.15	Low Profile	transparent	120	**9.409 377**	5
0.20	Standard	transparent	120	**6.228 560**	6

5



9.409 377

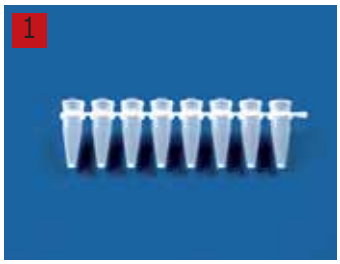
6



6.228 560

White PCR products for Real Time PCR

The use of real-time PCR (qPCR) is becoming increasingly widespread. The new line of white PCR products by BRAND offers significantly better results in this application than transparent tubes or plates. The different products in this line are uniformly colored with TiO2 (titanium dioxide), so that in combination with the smooth surfaces, the optimum reflection of the fluorescence signal is provided. *BRAND*



1 Strips of 8 PCR tubes, white

PP, white for qPCR. 8 connected 0.2ml tubes. Separate, flat lids are available in strips of 8. They are easy to open and close without tools. The tubes have a holding strap at one end, and the cover strips on each lid have a small lip on the side for careful, contamination-free opening. *BRAND*

Description	PK	Cat. No.
Strips 8 PCR tubes without lid	125	**7.654 202**
Strips of 8 caps, flat	125	**6.230 345**



2 PCR tube strips with hinged cap strips attached

Eight 0.2 ml PCR tubes joined together in a strip with attached, hinged 8-cap strips. PP. The hinged, domed cap makes opening and closing the tubes with one hand easier. Easy-to-use, secure closure. Madein pure, virgin polypropylene, free from RNase-, DNase- and DNA. Autoclavable (121°C). *BRAND*

Type	PK	Cat. No.
Colourless	125	**9.409 373**



3 Strips of 8-/12- PCR tubes plus detached cap strips, PP, autoclavable

PP. Strips of 8 or 12 connected PCR tubes (0.2ml). Cap strips consisting of 8 or 12 domed caps (available separately) provide tight seal during all PCR cycles, thus protecting samples from cross-contamination. The tubes have a holding strap at one end, and the cover strips on each lid have a small lip on the side for careful, contamination-free opening. Consistent tube wall thickness allows rapid heat transfer along the entire exterior tube surface. Made of pure, virgin polypropylene, free from RNase-, DNase- and DNA. Autoclavable (121°C). *BRAND*

Description	Colour	PK	Cat. No.
8 PCR tube strips, without caps	transparent	125	**9.409 374**
8 PCR tube strips, without caps	pink	125	**9.409 620**
8 PCR tube strips, without caps	yellow	125	**9.409 621**
8 PCR tube strips, without caps	green	125	**9.409 622**
8 PCR tube strips, without caps	blue	125	**9.409 623**
8 PCR cap strips, domed	transparent	125	**9.409 375**
8 PCR cap strips, domed	pink	125	**9.409 624**
8 PCR cap strips, domed	yellow	125	**9.409 625**
8 PCR cap strips, domed	green	125	**9.409 626**
8 PCR cap strips, domed	blue	125	**9.409 627**
8 PCR tube strips, with separate flat caps	clear	250	**4.007 894**
8 PCR tube strips, with separate domed caps	clear	250	**4.007 895**
12 PCR tube strips, without caps	transparent	125	**9.409 628**
12 PCR tube strips, without caps	pink	125	**9.409 629**
12 PCR tube strips, without caps	yellow	125	**9.409 630**
12 PCR tube strips, without caps	green	125	**9.409 631**
12 PCR tube strips, without caps	blue	125	**9.409 632**
12 PCR cap strips, domed	transparent	125	**9.409 633**
12 PCR cap strips, domed	pink	125	**9.409 634**
12 PCR cap strips, domed	yellow	125	**9.409 635**
12 PCR cap strips, domed	green	125	**9.409 636**
12 PCR cap strips, domed	blue	125	**9.409 637**

E & OE.

1 DNA LoBind Tubes

Eppendorf AG

- less than 1% loss of DNA/RNA at low concentrations and critical conditions (high salt, short DNA-fragments)
- no surface coating, e.g. silicone
- free of DNA, DNase, RNase and PCR inhibitors (PCR clean)
- novel PP, manufactured under optimized conditions
- available as 0.5ml, 1.5ml and 2.0ml Safe-Lock tubes
- highly transparent
- excellent centrifugation durability (up to 18000xg)



Capacity ml	PK	Cat. No.
0.5	250	**9.409 324**
1.5	250	**9.409 326**
2.0	250	**9.409 327**

2 Protein LoBind Tubes

Eppendorf AG

- minimum protein loss (less than 3%, BSA 1µg/ml)
- no surface coating, e.g. silicone
- free of DNA, DNase, RNase and PCR inhibitors (PCR clean)
- novel PP manufactured under optimized conditions
- available as 0.5ml, 1.5ml and 2.0ml Safe-Lock tubes
- highly transparent
- excellent centrifugation durability (up to 18000xg)



Capacity ml	PK	Cat. No.
0.5	100	**9.409 328**
1.5	100	**9.409 329**
2.0	100	**9.409 330**

LLG-96-well PCR Plates, PP

- cut-away corner for orientation
- clear well bottom for sample visibility, with V-Bottom
- compatible with leading thermal cyclers
- consistent wall thickness for uniform heat transfer
- holes in the skirt for easy handling
- virgin polypropylene, certified RNase, DNase and endotoxin free



9.407 507



6.238 061

Description	Capacity µl	PK	Cat. No.
96 Well Skirted PCR Plate, low profile, PP	200	25	**9.407 507** 3
96 Well Non-Skirted PCR Plate, PP	300	25	**6.238 061** 4

PCR-plates for precise analyses

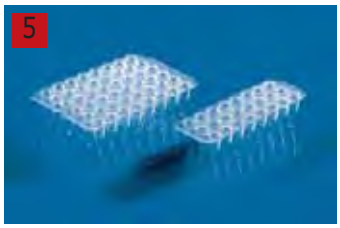
BRAND

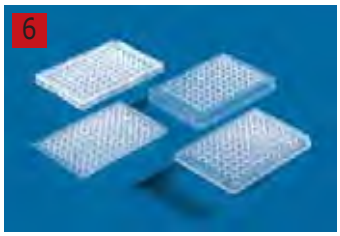
Ultra-thin wall design facilitates rapid and steady heat transfer. Smooth interior tube surface minimises binding of enzymes and nucleic acids. Raised rims of wells protect against cross-contamination and provide tight seal particularly in combination with BRAND´s new sealing mats.

5 6 PCR Plates 24/48 and 96 well, PP

BRAND

0.2ml wells. The 24 /48 well plates reduce material costs and allow work on a compact PCR plate even with small sample throughputs. The 96-well plates are standard in PCR applications. Different variants make the best use in the most common thermal cyclers. Suitable for the qPCR (quantitative Real Time PCR)





Description	PK	Cat. No.
24-well PCR plates, non skirted*	40	**6.229 655**
48-well PCR plates, non skirted*	20	**9.409 368**
96-well PCR plates, non skirted*	50	**9.409 381**
96-well PCR plates, semi skirted**	50	**9.409 383**
96-well PCR plates, fully skirted	50	**9.409 378**

*alphanumeric coding embossed and stamped in blue
**not suitable for qPCR



1 24 and 48 well PCR-Plates, white, for real-time PCR

White, PP. Suitable for qPCR. 0.2ml tubes. *BRAND*

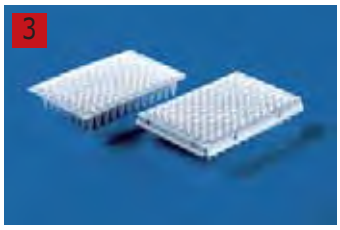
no. of wells	Description	PK	Cat. No.
24	non skirted	40	**4.007 901**
48	non skirted	20	**4.007 902**



2 LLG-384-well PCR plates, PP

- maximum well volume: 40µl
- working well volume: 25µl
- cut-away corners for plate orientation
- fully skirted for use with automated systems
- holes in the skirt for easy handling
- compatible with all leading 384 block thermal cyclers
- high temperature tolerance (-196°C to + 120°C)
- virgin polypropylene, certified RNase, DNase and endotoxin free

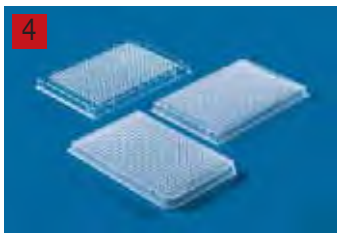
Description	Capacity µl	PK	Cat. No.
384 Well Skirted PCR Plate, thin wall, PP	40	50	**9.407 500**



3 96 well PCR-Plates, white

White, PP. Suitable for qPCR. *BRAND*

Description	Capacity ml	PK	Cat. No.
non skirted	0.20	50	**4.007 896**
semi skirted	0.20	50	**4.007 897**
Low Profile, for LightCycler® 480 (Roche®), semi skirted	0.15	50	**4.007 899**
Low Profile, for LightCycler® 480 (Roche®), semi skirted, incl. films	0.15	50	**4.007 900**

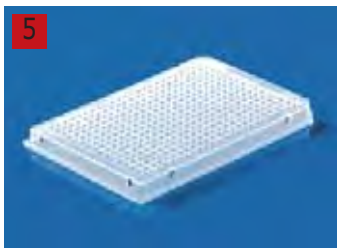


4 PCR Plates384-well

The 40µl wells can hold sample volumes of 2µl to 30µl. This helps to reduce reagents costs and shortens cycle times. The plates can be filled using conventional multichannel pipettes or automated systems. *BRAND*

Description	PK	Cat. No.
384-well PCR plate, fully skirted, PP	50	**9.409 391**
384-well PCR plate, fully skirted, PP*	50	**9.409 306**
384-well PCR plate, fully skirted, rigid plate	50	**9.409 307**

* suitable for qPCR (quantitative Real Time PCR)



5 384 well PCR-Plates, white, for real-time PCR

White, PP. Suitable for qPCR. 0.03ml tubes. *BRAND*

Description	PK	Cat. No.
fully skirted, for LightCycler® 480 (Roche®)	50	**4.007 898**



6 Rack of 96 for 0.65 ml or 1.2 ml tubes and accessories

Non-sterile, for use with robots . *BRAND*
Tubes and rack are autoclavable at 121°C (2 bar), acc. DIN EN 285. Cover mat/strips (TPE) not autoclavable. Tubes, racks, and lids can withstand temperatures as low as -80°C. The seal of the tubes is pressure-tested. Thanks to the stable connection between the mounting plate and the racks, the stackable ANSI/SLAS racks are especially well-suited for use with robots and other automated dispensing systems. Coded tubes (A1 - H12) and rack sides suitable for barcode labels simplify sample organization. (Not available in the USA)

Description	Material	PK	Cat. No.
Rack with lid for 0.65 ml tubes, empty	PP	50	**4.007 903**
Rack with lid for 1.2 ml tubes, empty	PP	50	**6.240 089**
Rack with lid with 96 coded 0.65 ml tubes	PP	50	**4.007 904**
Rack with lid with 96 coded 1.2 ml tubes	PP	50	**4.007 905**
Refill unit of 96 coded 0.65 ml tubes	PP	50	**4.007 906**
Refill unit of 96 coded 1.2 ml tubes	PP	50	**4.007 907**
Single 0.65 ml tube without coding	PP	5000	**4.007 908**
Single 1.2 ml tube without coding	PP	5000	**6.237 017**
Strip of 8 lids, piercable	TPE	1000	**6.237 016**
Cover mat for 96 tubes, piercable	TPE	100	**4.007 909**

E & OE.

LLG-PCR adhesive film and foil

For use in cyclers with screw-down or clip-down lids. With end tabs

PCR Film: Clear film allows both the visual inspection of samples and fluorescence measurements.
PCR Foil: Easy to pierce, no residue of adhesive on the pipette tips.
QPCR Foil: Adhesive seal optically clear, peelable, for QPCR and fluorescence applications.

Description	Temp. range °C	PK	Cat. No.
PCR film	-20 to +120	100	**6.238 132** 1
PCR foil	-80 to +150	100	**9.407 506** 2
QPCR foil	-40 to +120	50	**6.240 725**

1



6.238 132

2



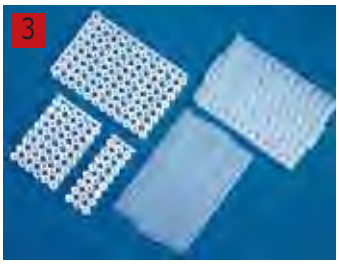
9.407 506

3 PCR Sealing Mats

PCR sealing mats have been designed to fit BRAND PCR plates exactly and reduce evaporation losses by up to 75% compared to conventional systems. They are characterised by their high flexibility, tight sealing, autoclavability and are easily pierced by pipette tips. *BRAND*

Description	Material	PK	Cat. No.
Sealing mat for 24-well PCR plates	TPE	10	**9.409 369**
Sealing mat for 48-well PCR plates	TPE	10	**6.230 903**
Sealing mat for 96-well PCR plates	TPE	5	**9.409 384**
Sealing mat for 96-well PCR plates	Silicone	10	**9.409 360**
Sealing mat for 384-well PCR plates	Silicone	10	**9.409 311**

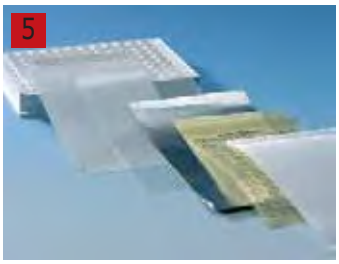
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5 Sealing Films, Self-adhesive

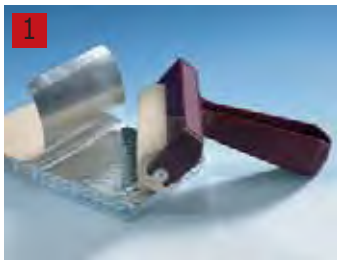
In case the microplates, PCR- and Deepwellplates need not only to be covered, but also securely sealed, self-adhesive sealing films are available. These film sheets can be easily applied on the plates and removed also without the use of expensive equipment.
They are available in different versions and are especially well-suited for storage or cell- and tissue-culture. *BRAND*

5



Application	Description	Material	PK	Cat. No.
ELISA, PCR	single film	polypropylene	100	**9.409 386**
ELISA; Real Time PCR	single film, highly transparent	polyester	100	**4.000 237**
Cold storage	roll with 100 sheets	aluminium	100	**9.409 387**
Cold storage	single film	aluminium	100	**6.223 125**
Storage	single film, DMSO-resistant	polypropylene	100	**9.408 983**
Sealing foil, gas-permeable, non-sterile	single film, gas-permeable	rayon	100	**9.407 620**
Cell- and tissue culture	single film, gas-permeable, sterile	rayon	50	**6.224 223**
Automation	single film	PE/PP	50	**4.000 389**
Storage, fluorescence measurement	single film	vinyl	50	**4.000 390**
Luminescence measurement	single film	vinyl	50	**4.000 391**

1



1 Roller for sealing films

The self-adhesive films can be securely and easily applied with a roller. The hard rubber roller ensures that the film is attached to the plate with a uniform pressure. The rugged handle with comfort-grip lessens fatigue.

BRAND

Type	PK	Cat. No.
Roller for sealing films	1	**4.000 392**

2



2 AccuSeal Semi-Automated Plate Sealer

Labnet

- Accepts a wide range of microplates and heat seals
- User-friendly control system
- Large digital display shows all operating parameters
- Adjustable sealing temperature: 100°C to 190°C, or no heat
- Precise temperature, timing and pressure for consistent sealing

Specifications

Dimensions (WxDxH):	171mm x 324mm x 362mm
Weight:	12kg
Sealing Temperature:	Off, 100 to 190°C (increments of 1.0°C)
Temperature Accuracy:	±1.0°C
Temperature Uniformity:	±1.0°C
Sealing Time:	0.5 to 10 sec (incements of 0.1 sec)
Compatible Plate Materials:	PP (Polypropylene), PS (Polystyrene), PE (Polyethylene)
Compatible Plate Types:	Standard Assay Plates, Deep-Well Storage plates, PCR Plates (Non-Skirted, Semi-Skirted, Full-Skirted)
Maximum Plate Height:	45mm
Compatible Sealing Film Types:	Foil Polypropylene laminate, Clear Polyester-polypropylene laminate, Clear polymer, Thin clear polymer, Foil-laminate, Foil

Type	Description	PK	Cat. No.
AccuSeal	includes adapters for standard and deepwell microplates, 230V	1	**9.595 290**
AccuSeal	adapter for sealing PCR plates	1	**9.595 291**

3



3 PCR Rack, 96 Well

NEW!

Isolab

- Manufactured from high density polypropylene which is fully autoclavable. Excellent rack for "before" and "after" PCR sampling.
- This rack can be used alone or inserted in the workstation.
- This working/storage rack is designed to accommodate 96 pieces 0.2ml PCR tubes or strips of 8 and 12 tubes.
- Tube wells are easly identified with alphanumeric,embossed numbers and letters.
- Translucent clear cover protects the tubes from dustand has a non-slip surface to allow safe storage of multiple racks.

For tubes ml	Dimensions (W x D x H) mm	PK	Cat. No.
0.2	125 x 88 x 31	1	**6.255 804**

4



4 96-Well PCR Rack, PP

Removable hinged lid lies flat. Perfect for pre- or post-PCR sampling. Sturdy polypropylene rack accommodates individual 0.2ml tubes or strips of 8 or 12 tubes. Tube wells are easily identified with embossed numbers and letters. Dimensions (L x W x H): 130 x 98 x 33mm. Autoclavable.

Heathrow Scientific

Colour	PK	Cat. No.
blue, green, pink, yellow, orange	5	**9.409 661**

E & OE.

1 40/168-well PCR Rack, PP

NEW!

Heathrow Scientific

Removable hinged lid fits both sides. Flip this polypropylene reversible rack to the size of tubes you need. PCR side of the rack has 168 wells that hold 0.2ml tubes. The wells accommodate 8- or 12-tube strips or individual tubes. The opposite side of the rack has 40 wells that hold 0.5ml tubes. Both sides of the rack have 12 wells for 1.5ml tubes. Dimensions (L x W x H): 206 x 131 x 54mm. Autoclavable.



Colour	PK	Cat. No.
blue, green, purple, yellow, orange	5	**9.409 660**

2 PCR® Transfer Tray, PP

Heathrow Scientific

Handy when using with thermal cyclers. A time-saver for anyone working with individual 0.2ml tubes or strips of 8 or 12 tubes. Moving the 0.2ml tubes to the thermal cycler is super-simple with this tray: Just use handles to lift and carry. Transfer tray is a thin strip of plastic designed to rest perfectly over a 96-well tube rack. Made out of high-impact polypropylene. Assorted colors: blue, green, purple, yellow, and orange. Dimensions (L x W x H): 114mm x 74mm x 11mm.



Colour	PK	Cat. No.
blue, green, purple, yellow, orange	5	**6.241 495**

3 PCR box and PCR rack

BRAND

The rack can be fitted into the box. Together, they create an ideal workstation for 0.2 ml PCR tubes, available in individual, 8-tube strip and 12 tube strip or 96-well plate formats.
The box with transparent lid can be stacked to save space and is temperature resistant from -80 to +121°C.
Assorted colours (red, yellow, purple, green, blue).



Description	PK	Cat. No.
PCR-Box /-Rack	5	**9.409 379**

4 PCR Mini cooler, PP

BRAND

With transparent lid.
For protecting samples prior to warming. The mini PCR cooler keeps samples at 4°C for approx. 3 hours. The insulating gel changes from violet to pink at 7°C. Suitable for 0.2 ml single vessels, 8-strips, 12-strips as well as 96-well PCR plates.



Description	PK	Cat. No.
PCR Mini cooler	2	**6.228 848**

5 6 PCR-Coolers

Eppendorf AG

The PCR-Cooler acts as a thermochromic temperature self-indicator: pink or light-blue (depending on the model chosen) when temperature exceeds +7°C, violet or dark blue when ice-cold.

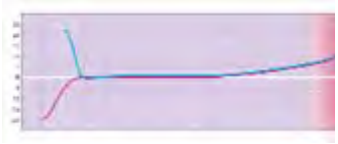
Description

The new Eppendorf PCR-Cooler reliably maintains a sample temperature of 0°C*for over an hour, changing colour when the temperature exceeds +7°C. Better than an ice bath, PCR-Cooler is simple to handle, space-saving and contamination-free, making it the perfect preparation for PCR reactions. The temperature of single tubes is indicated by the colour of the respective individual apertures. Furthermore, samples are prevented from freezing by the specially developed cone contour. Eppendorf PCR-Cooler: the cooling unit in the universal 96-well format for 0.2ml and 0.5ml PCR tubes, for tube strips, plates and for individual tubes. The Eppendorf PCR-Cooler is a compact, innovative solution for protecting, transporting and storing sensitive samples and obviously also ideal for safely stopping reactions.

Application note.

By changing colour from violet to pink or dark blue to light blue, the PCR-Cooler shows when the temperature has exceeded +7°C. The crucial factor for sample cooling is the well colour in the PCR-Cooler.





Description	PK	Cat. No.
PCR-Cooler, 0.2ml starter set (1 x pink, 1 x blue)	1	**9.283 576**
PCR-Cooler, 0.2ml pink	1	**9.283 577**
PCR-Cooler, 0.2ml blue	1	**9.283 578**
PCR tubes, 0.2ml, transparent	1000	**9.283 579**
twin.tec PCR Plate 96 semi-skirted, transparent	25	**9.283 595**
twin.tec PCR Plate 384 skirted, transparent	25	**9.283 596**

* With 2 hours precooling at -20°C.

1



1 Thermal Cycler MultiGene™ Mini

Labnet

MultiGene Mini is a compact and lightweight thermal cycler. This cycler is packed with features typically found only on larger thermal cyclers. Excellent accuracy and uniformity combine with fast ramping rates to provide quality results. An algorithm calculates sample temperature, based on volume, to control heating and cooling of the block. This means that samples reach programmed temperatures quickly, without any overshoot or lagging. Powerful Peltier units provide ramping rates as fast as 5°C/second.

Specifications:

Max. number of programmes:	99
Block capacities:	25 x 0.2ml tubes or 16 x 0.5ml tubes
Heated lid temperature	105°C
Max. heat/cool rate	5°C per sec/ 4°C per sec
Temp range/ uniformity:	4°C to 99°C
Dimensions (WxDxH):	218mm x 285mm x 178mm
Weight:	3.2kg
Supply requirements:	230V, 50/60Hz*

Description	PK	Cat. No.
MultiGene Mini Personal Thermal Cycler with 18 x 0.5 ml tube block	1	**9.595 341**
MultiGene™ Mini Personal with 24 x 0.2 ml tube block	1	**9.595 316**

*120V available on request

2



2 Thermal Cycler MultiGene™ OptiMax

NEW!

Labnet

The Thermal Cycler MultiGene™ OptiMax replaces the MultiGene™ Gradient and therefore includes the same approved features like easy handling and reliability.

Improved features:

- Individual temperature setting for each block
- Faster speeds
- No condensation after overnight cooling at 4°C
- With TM Calculator for the determination of the melting point
- With PC Viewer for viewing the actual temerature profiles in real time
- With USB and RS232 interface
- 6-segment block temperature control with user able to select 6-segment temperatures independently, array in 4 x 4 well format
- Temperature and time increments/decrements
- Password protected programs

Specifications:

Sample capacity:	1 x 96 well plate, 12 x strip tubes (8 x 0.2ml), 96 x 0.2ml tubes
Programmable temperature range:	+4°C to +99.9°C
Temperature control:	Calculated or block
Temperature accuracy/uniformity:	±0.5°C/±0.5°C
Heating/cooling method:	Peltier
Max. heating/cooling rate:	±4°C/±3°C per second
Temperature range of 6-segment blocks:	+30°C to +99°C (can be set independently)
Maximum temperature difference between 6-segment blocks:	±24°C
Programmable lid temperature:	+60°C to +65°C, +100°C to +115°C
Program memory:	200 complete programs
User program folders:	50 sets
Dimensions (WxDxH):	240 x 420 x 250mm
Weight:	9kg
Supply requirements:	240V, 50/60 Hz*

Type	PK	Cat. No.
MultiGene™ OptiMax	1	**9.595 319**

*120V available on request

E & OE.

1 Thermal cyclers biostep® ³PRIMEBASE/³PRIMEX/³PRIMEG

NEW!

1

Techne



Personal Thermal cycler - find space on any laboratory bench
- Approved cycler with new design
- With and without gradient function
- Gradient upgrade from ³PRIMEX to ³PRIMEG
- 3.5" colour touch screen with graphical display
- Fast heating and cooling rates
- Height-adjustable and heatable lid, temperature from 100°C to 115°C, with ON/OFF switch and automatic switch off against overheating
- 1.000 programs storable
- Password protected
- Auto-Restart
- USB port
- 4 years warranty for the Prime Thermal cycler

Specifications

Block temperature:	+4°C to +100°C
Temperature gradient (only ³PRIMEG or ³PRIMEX with upgrade):	+30°C to +80°C
Max. Gradient:	+14°C
Block uniformity at 55°C:	<±0.3°C
Max. Heating rate:	3.0°C/s
Dimensions (WxDxH):	210mm x 350mm x 180mm

Type	Description	PK	Cat. No.
³PRIMEBASE	incl. block for 18 x 0.5ml tubes	1	**9.595 501**
³PRIMEBASE	incl. block for 24 x 0.2ml tubes	1	**9.595 502**
³PRIMEX	incl. block for 30 x 0.5ml tubes	1	**9.595 503**
³PRIMEX	incl. block for 48 x 0.2ml tubes	1	**9.595 504**
³PRIME gradient upgrade	Gradient upgrade from ³PRIMEX to ³PRIMEG	1	**9.595 505**
³PRIMEG	incl. block for 30 x 0.5ml tubes	1	**9.595 506**
³PRIMEG	incl. block for 48 x 0.2ml tubes	1	**9.595 507**

Purchase of this instrument conveys a limited non-transferable immunity for the purchaser's own internal research and development and applied fields other than human in vitro diagnostics under non-real-time thermal cycler patents of Applied Biosystems LLC.

2 Thermal cyclers biostep® PRIME/ PRIMEG

NEW!

2

Techne



High throughput Thermal cycler - perfect for a high sample throughput
- Approved cycler with new design
- With and without gradient function
- Gradient upgrade from PRIME to PRIMEG
- now available with combination block for 33 x 0.2 ml and 33 x 0.5 ml PCR tubes
- 5.7" colour touch screen with graphical display
- fast heating and cooling rates
- height-adjustable and heatable lid, temperature from 100°C to 115°C, with ON/OFF switch and automatic switch off against overheating
- 1.000 programs storable
- Password protected
- Auto-Restart
- USB port
- 4 years warranty for the Prime Thermal cycler

Specifications

Block temperature:	+4°C to +100°C
Temperature gradient (PRIME only with upgrade):	+30°C to +80°C
Max. Gradient:	+29°C
Block uniformity at 55°C:	<±0.3°C
Max. Heating rate:	3.4°C/s
Dimensions (WxDxH):	240mm x 420mm x 240mm

Type	Description	PK	Cat. No.
PRIME	incl. block for 60 x 0.5ml tubes	1	**9.595 508**
PRIME	incl. block for 96 x 0.2ml tubes and 96well PCR plates	1	**9.595 509**
PRIME	incl. combination block for 33 x 0.2ml and 33 x 0.5 tubes	1	**9.595 513**
PRIME gradient upgrade	Gradient upgrade from PRIME to PRIMEG	1	**9.595 510**
PRIMEG	incl. block for 60 x 0.5ml tubes	1	**9.595 511**
PRIMEG	incl. block for 96 x 0.2ml tubes and 96well PCR plates	1	**9.595 512**
PRIMEG	incl. combination block for 33 x 0.2ml and 33 x 0.5 tubes	1	**9.595 514**

Purchase of this instrument conveys a limited non-transferable immunity for the purchaser's own internal research and development and applied fields other than human in vitro diagnostics under non-real-time thermal cycler patents of Applied Biosystems LLC.

1



1 PCR-Instrument Mylab MiniCube PCR

NEW!

Rapid PCR machine that ensures protection against over- and under-shoooting of the temperature and at the same time cycles the temperature 4-5 times faster than a standard PCR machine. The MiniCube PCR is an ultra-rapid small PCR instrument based upon two heat blocks mounted on a linear stage. The motorized stage moves the heat blocks back and forth and allows you to do a two stage PCR and complete a 35 cycles PCR reaction in about 15 minutes in standard mode.
The MyLab MiniCube PCR is intended to be used for rapid test of PCR protocols or sample preparation procedures where the scientist "just wants to know if DNA was extracted" or "just wants to know if the newly added change hampers the PCR reaction". The system is also ideal for educational institutions where a full PCR experiment including setup, PCR amplification and gel electrophoresis has to be completed within the time frame of a 45 minute class. Very small size of only 12.5 x 12.5 x 12.5cm and is controlled by a USB cable to PC, Mac or Linux computer.

Specifications

Block capacity:	16 x 0.2ml PCR tubes
Temperature range:	RT to +115°C
Temperature control:	±0.2°C
External infra-red thermo sensor*:	±0.2°C
Heating rate:	10°C and 20°C per second
Cooling rate in air stream:	approx. 10°C per second

Description	PK	Cat. No.
MiniCube PCR	1	**9.407 550**

*for monitoring the temperature in the PCR solution

2



9.584 774

UV sterilisation cabinets

Cleaver Scientific

These UV Sterilisation Cabinets provide a convenient area for setting up PCR reactions in a nucleic acid free environment thus limiting PCR reaction contamination. Acting effectively as a low cost alternative to a clean room, the powerful UV lights on the cabinets denature nucleic acids in 5 to 30 minutes making them unsuitable for amplification. The cabinet incorporates safety features to prevent user exposure to UV light. The UV lights themselves are timer controlled and there are safety switches on the cabinets doors which turn off the UV lights when opened.

Specifications	**Maxi/Mini**
UV Lights:	4 x 15W
White Lights:	15
Dimensions (H x W x D):	770 x 560 x 420mm/510 x 560 x 350mm
Weight:	19kg/12kg

3



9.584 775

Type	Description	PK	Cat. No.
CSL-UVCAB	UV sterilisation cabinets Maxi, with timer, four UV lights and white light, no Tray	1	**9.584 774** 2
CSL-UVCABMINI	UV sterilisation cabinets Mini, with timer, UV light and white light, no Tray	1	**9.584 775** 3

4



4 UV/PCR cabinet UVT-B-AR

NEW!

Grant

Economy bench-top model for protection against contamination during a variety of DNA/RNA procedures.
- UV surface irradiation, via single 25 W 254 nm open UV lamp
- Patented high intensity UV air cleaner, 25 m3/hour cleaner-recirculator continuous air flow with 1cm UV irradiation distance
- UVlamp in the upper hood disinfects the working area, inactivating DNA/RNA fragments during 15-30 min of exposure
- UV exposure control, 24 hour digital timer
- Convenient, easy to use digital timer for accurate control of UV exposure
- White lamp provides local illumination of the workplace to optimise visual control during operations
- Shock proof glass panels, metal framework and stainless steel work surface
- Automatic switch-off of open UV light when door opened
- Contains an integral power socket

Type	PK	Cat. No.
UVT-B-AR	1	**9.721 070**

E & OE.

1 PCR Cabinets Type Airstream® SCR/PCR

Active PCR Cabinet with built-in UV Decontamination and true vertical laminar airflow. *Esco*

- Average Airflow Velocity (adjustable): 0.3m/s
- HEPA filter with Prefilter
- The air cleanliness within the work zone is better than ISO Class 5
- Sentinel-Microprocessor maintains steady blower speed (only 0.9m and 1.2m models)
- Hinged polycarbonate front window
- Tempered glass side panel
- ISOCIDE™ antimicrobial coating on all painted surfaces minimizes contamination.
- Fluorescent lighting provides superior illumination of the work zone
- Build-in UV lamp with timer
- Pass-through ports in the back wall

More options, support stands on request.

1



Type	Size	External dimensions (W x D x H) mm	PK	Cat. No.
Airstream® SCR-2A1	0.6 m	730 x 617 x 950	1	**7.939 129**
Airstream® PCR-3A1	0.9 m	1035 x 617 x 950	1	**7.939 127**
Airstream® PCR-4A1	1.2 m	1340 x 617 x 950	1	**7.939 128**

2 FTA® Cards

FTA Classic Cards *GE Healthcare*
Four sample areas for storage of up to 4 x 125µl whole blood or 4 x 75µl plant homogenate per card. Convenient for multiple applications of the same specimen or collection of multiple animal or plant samples. Also available in Indicating (pink) FTA format.

FTA Mini Card
Two sample areas for storage of up to 2 x 125µl whole blood or 2 x 75µl plant homogenate per card. Convenient for protocols that require different locations for testing and archiving samples. Also available in Indicating (pink) FTA format.

FTA Micro Card
One sample area for storage of up to 125µl whole blood or 75µl plant homogenate per card. Recommended when only one sample is needed. Also available in Indicating (pink) FTA format.

FTA Gene Card
Three sample areas in a card frame for storage of up to 3 x 75µl whole blood or 3 x 50µl plant homogenate per card. Can be run in most automatic dispensing/pipetting systems when used with the FTA Gene Card Tray.

Indicating FTA Cards:
With colour indicator that changes from pink to white when sample is applied. useful for colourless samples.

2



Type	Description	PK	Cat. No.
FTA Classic Card	sample area 125µl / total 500µl	100	**9.971 708**
Indicating FTA Classic Card	sample area 125µl / total 500µl	100	**9.971 709**
FTA Mini Card	sample area 125µl / total 250µl	100	**9.971 710**
Indicating FTA Mini Card	sample area 125µl / total 250µl	100	**9.971 711**
FTA Micro Card	sample area 125µl / total 125µl	100	**9.971 712**
Indicating FTA Micro Card	sample area 125µl / total 125µl	100	**9.971 713**
FTA Gene Card	sample area 75µl / total 225µl	100	**9.971 714**

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9.971 718

FTA Card Accessories

GE Healthcare

FTA Purification Reagent
Removes haem, PCR inhibitors, and other potential contaminants to ensure superior quality DNA for downstream analysis.

FTA Gene Card Tray
Holds two FTA Gene Cards for use in automatic liquid handling systems.

Sterile Foam Tipped Applicator
Easy-to-use applicator for the noninvasive collection and transfer of buccal cells to FTA Cards.

Harris Micro Punches, Disposable Uni-Core Punches and Cutting Mat
For the precise sample disc removal from FTA Cards. The 1.2mm punches are recommended for use with whole blood and samples with high DNA content. The 2.0mm punches are recommended for use with buccal cells, plasmids, and samples with lower DNA content.

Multi-Barrier Pouches
For transporting or storing FTA Cards. Protects cards from environmental contamination. Tamper-evident seals maintain sample security for forensic samples. A resealable pouch is also available when multiple access to FTA cards is needed.

FTA Card Mailer
A rigid protective card mailer for transporting FTA Cards without biohazard labelling.

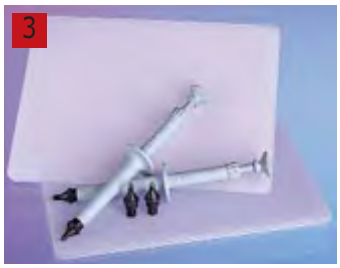
Storage Desiccant Packets
Ensure that FTA Cards remain dry during transport or storage. Contains indicator that changes colour to verify moisture adsorption.

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9.971 719

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9.971 725

Description	PK	Cat. No.	
FTA Purification Reagent, 500 ml	1	**9.971 718**	1
FTA Gene Card Trays	20	**9.971 721**	
Sterile Foam Tipped Applicator Swabs	100	**9.971 719**	2
Omniswab	100	**9.971 732**	
Harris Micro Punch 1.2 mm (with Mat)	1	**9.971 725**	3
Harris Micro Punch 1.2 mm Tip	1	**9.971 726**	
Harris UniCore 1.2 mm Punch (with Mat)	4	**9.971 730**	
Harris Micro Punch 2.0 mm (with Mat)	1	**9.971 727**	
Harris Micro Punch 2.0 mm Tip	1	**9.971 728**	
Harris UniCore 2.0 mm Punch (with Mat)	4	**9.971 731**	
Replacement Cutting Mat	1	**9.971 729**	
Multi-Barrier Pouch, Large (for Classic Cards)	100	**9.971 733**	
FTA Card Mailer	50	**9.971 724**	
Desiccant (1 gm)	1000	**9.971 720**	

4



4 CloneSaver™ Cards

GE Healthcare

- 96-well format for high throughput applications
- Stabilize BAC and plasmid DNA in one easy step from bacterial culture, resuspended colony, glycerol stock or purified plasmid DNA
- Clones can be rapidly screened by PCR without need for minipreps
- Plasmid DNA on Clone SaverCards is stable at room temperature for at least 4 years (real-time data)
- DNA is easily accessible for downstream applications such as transformations and PCR

Description	PK	Cat. No.
CloneSaver Resealable Multi-Barrier Pouch	50	**9.971 715**
CloneSaver Cards in 96-well Format	5	**9.971 716**
CloneSaver Starter Kit	1	**9.971 717**

E & OE.

1 Gel electrophoresis tank Battery Gel

1



Cleaver Scientific

The MSBGEL battery mini-gel is designed specifically with safety and cost in mind as no power supply is necessary.

Supplied with:
MSBGEL: Battery operated horizontal gel 6 x 7.5cm, 2 x 8 sample combs, casting gates, two 9 volt batteries.

Specifications

Gel dimensions (W x L):	6 x 7.5cm
Unit dimensions (W x L x H):	11 x 17 x 3.5cm
Max. sample capacity:	32 samples
Buffer volume:	50ml

Type	Description	PK	Cat. No.
MSBGEL	BatteryGel	1	**9.584 690**
MSBG-1-8	Comb 8 sample, 1mm	1	**9.584 692**
MSBG-1-16	Comb 16 sample, 1mm	1	**9.584 693**

2 Gel electrophoresis tank MiniRapide

2



Cleaver Scientific

The miniRapide is a completely self contained system designed for quick checks of samples. Gel casting, running and analysis are all performed in the same ultra compact unit. Buffer and gel volumes have been kept to a minimum and the parallel electrode arrangement allows ultra efficient current transfer, enabling resolution to be completed within 30 minutes. The UV transparent base allows direct viewing on a UV Transilluminator with no need for time consuming transfer and potential gel damage. Dual comb slots allow the loading of up to 40 samples per gel while multichannel pipette compatible combs further enhance the speed and convenience.

Supplied with: miniRapide, 10 x 8cm, 2 x 8 sample combs 1.5mm, electrodes and casting dams.

Specifications

Gel dimensions (W x L):	10 x 8cm
Unit dimensions (W x L x H):	15 x 15 x 4cm
Max. sample capacity:	40 samples
Buffer volume:	50ml

Type	Description	Sample volume µl	PK	Cat. No.
FMMS10	miniRapide		1	**9.584 680**
FMMS-8-1	Comb 8 sample, 1mm	40	1	**9.584 681**
FMMS-16-1	Comb 16 sample, 1mm	15	1	**9.584 682**
FMMS-20MC-1*	Comb 20 sample MC, 1mm	10	1	**9.584 683**
FMMS-8-1.5	Comb 8 sample, 1.5mm	60	1	**9.584 684**
FMMS-16-1.5	Comb 16 sample, 1.5mm	23	1	**9.584 685**
FMMS-20MC-1.5*	Comb 20 sample MC, 1.5mm	15	1	**9.584 686**

* Multichannel compatible.

3 Gel electrophoresis tank MultiSUB Mini DUO

3



Cleaver Scientific

The multiSUB Mini is the smallest unit in the range, designed for low to medium numbers of samples. The small gel size maximises run economy but does not compromise versatility as two tray options are available, 7 x 7cm and 7 x 10cm, and combs ranging from preparative up to 16 samples. Simply by altering the gel tray or comb, this compact unit is capable of resolving up to 64 different samples, prepping 1ml of sample or separating sample bands over a distance of 9cm.

Supplied with: multiSUB Mini, 7 x 7cm & 7 x 10cm UV Tray, 2 x 8 sample combs 1mm, loading guides, electrodes and dams.

Specifications

Gel dimensions (W x L):	7 x 7cm and 7 x 10cm
Unit dimensions (W x L x H):	21 x 9 x 9cm
Max. sample capacity:	7 x 7cm tray, 32 samples 7 x 10cm tray, 64 samples
Buffer volume:	225ml

Type	Description	Sample volume µl	PK	Cat. No.
MSMINIDUO	MultiSUB Mini	25	1	**7.920 043**
MS7-8-1	Comb 8 sample, 1mm	14	1	**9.584 655**
MS7-12MC-1*	Comb 12 sample MC, 1mm	10	1	**6.232 523**
MS7-16-1	Comb 16 sample, 1mm	15	1	**6.227 253**
MS7-8-1.5	Comb 8 sample, 1.5mm	37	1	**6.227 144**
MS7-12MC-1.5*	Comb 12 sample MC, 1.5mm	20	1	**6.233 617**
MS7-16-1.5	Comb 16 sample, 1.5mm	15	1	**9.584 656**

* Multichannel compatible.

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1 Gel electrophoresis tank MultiSUB Midi

Cleaver Scientific

With gel tray options of 10 x 7cm and 10 x 10cm, the multiSUB Midi has been designed for routine horizontal gel electrophoresis. Extending only the width of this unit allows more samples to be resolved per gel than the multiSUB Mini without a significant increase in buffer or gel volumes. A maximum of 100 samples per gel can be resolved making this unit ideal for those routinely checking medium numbers of samples over short to medium gel run lengths.

Supplied with: multiSUB Midi, 10 x 7cm & 10 x 10cm UV Tray, 2 x 16 sample combs, loading guides, electrodes and dams.

Specifications

Gel dimensions (W x Ll):	10 x 7cm and 10 x 10cm
Unit dimensions (W x L x H):	22 x 12.5 x 9cm
Max. sample:	10 x 7cm tray, 50 samples
Capacity:	10 x 10cm tray, 100 samples
Buffer volume:	300ml

Type	Description	Sample volume µl	PK	Cat. No.
MSMIDIDUO	MultiSUB Midi		1	**6.238 115**
MS10-8-1	Comb 8 sample, 1mm	41	1	**9.584 657**
MS10-10MC-1*	Comb 10 sample MC, 1mm	27	1	**9.584 658**
MS10-12-1	Comb 12 sample, 1mm	23	1	**9.584 659**
MS10-16-1	Comb 16 sample, 1mm	16	1	**9.584 660**
MS10-20MC-1*	Comb 20 sample MC, 1mm	14	1	**9.584 661**
MS10-25-1	Comb 25 sample, 1mm	10	1	**9.584 662**

* Multichannel compatible.

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2 3 Gel electrophoresis tank MultiSUB Choice

Cleaver Scientific

Gel size: 15 x 15cm (W x L). This unit is ideal for restriction fragment analysis, sample prep or checking of high number of samples. The multiSUB choice offers a high degree of versatility. Two additional tray options are available: 15 x 7cm and 15 x 10cm.
Gel casting is easy by using casting dams.
- colour coded combs 0.75/1.0 /1.5/2.0mm
- 3, 4 or 6 comb positions for maximum 210 samples
- low buffer volume: 500ml
- injection moulded construction: durable, leakproof environment for complete safety and long life
- simple gel casting by using dams

Supplied with:
MSCHOICE15: MultiSUB Choice, 15 x 15cm UV Tray, 2 x 20 sample combs, loading guides, electrodes and dams.
MSCHOICETRIO: MultiSUB Choice Trio, 15 x 7, 10 & 15cm UV Tray, 2 x 20 sample combs, loading guides, electrodes and dams.
MSCHOICEST20: MultiSUB Choice Stretch 20, 15 x 20cm UV tray, 4 x 28 sample combs, loading guides, electrodes and dams.
MSCHOICEST25: MultiSUB Choice Stretch 25, 15 x 25cm UV tray, 4 x 28 sample combs, loading guides, electrodes and dams.

Specifications

Unit dimensions (w x l x h):	26.5 x 17.5 x 9cm 41 x 17.5 x 9cm (Stretch models)
Max. sample:	15 x 7 cm Tray - 70 Samples 15 x 10 cm Tray - 140 Samples 15 x 15 cm Tray - 210 Samples 15 x 20 cm Tray - 280 Samples 15 x 25 cm Tray - 350 Samples
Buffer volume:	500ml 1000ml (Stretch models)

Type	Description	Sample volume µl	PK	Cat. No.
MSCHOICE15	MultiSUB Choice 15		1	**9.584 651**
MSCHOICETRIO	MultiSUB Choice Trio		1	**6.239 273**
MSCHOICEST20	MultiSUB Choice Stretch 20		1	**9.584 663**
MSCHOICEST25	MultiSUB Choice Stretch 25		1	**9.584 664**
MS15-20-1	Comb 20 sample, 1 mm	21	1	**6.234 451**
MS15-35-1	Comb 35 sample, 1 mm	10	1	**6.238 277**
MS15-18MC-1*	Comb 18 sample MC, 1 mm	11	1	**9.584 665**
MS15-30MC-1*	Comb 30 sample MC, 1 mm	13	1	**6.238 278**
MS15-20-1.5	Comb 20 sample, 1.5 mm	32	1	**6.233 618**
MS15-18MC-1.5*	Comb 18 sample MC, 1.5 mm	17	1	**9.584 667**
MS15-30MC-1.5*	Comb 30 sample MC, 1.5 mm	19	1	**9.584 666**

* Multichannel compatible.

E & OE.

1 Gel electrophoresis tank MultiSUB Maxi DUO/Maxi 25



Cleaver Scientific

The multiSUB Maxi is primarily designed for resolution of high numbers of samples such as from Cloning or PCR. The multiSUB Maxi allows ultra high-resolution separations over extended runs. Tray sizes correspond to standard blotter sizes. It also allows easy sample transfer onto a membrane for further analysis. Four gel tray sizes are available: 20 x 10cm, 20 x 15cm, 20 x 20cm and 20 x 25cm.
Multichannel pipette compatible combs up to 40 sample facilitate speed loading of up to 440 samples per gel.
50 sample combs allow maximum sample capacity of 550 samples per gel.

Supplied with:
MSMAXIDUO: multiSUB Maxi, 20 x 10 and 20 x 20cm UV Tray, 2 x 20 sample, 1mm thick combs, casting dams, electrodes and loading guides.
MSMAXI25: multiSUB Maxi, 20 x 25cm UV Tray, 2 x 20 sample, 1mm thick combs, casting dams, electrodes and loading guides.

Technical specifications

Gel dimensions (w x l):	10 x 7cm and 10 x 10cm
Unit dimensions (w x l x h):	22 x 12.5 x 9cm
Max. sample:	10 x 7cm tray, 50 samples
Capacity:	10 x 10cm tray, 100 samples
Buffer volume:	300ml

Type	Description	Sample volume µl	PK	Cat. No.
MSMAXIDUO	MultiSUB Maxi DUO		1	**9.584 670**
MSMAXI25	MultiSUB Maxi 25		1	**9.584 671**
MS20-20MC-1*	Comb 20 sample MC, 1mm	27	1	**9.584 672**
MS20-30-1	Comb 30 sample, 1mm	17	1	**9.584 673**
MS20-40MC-1*	Comb 40 sample MC, 1mm	11	1	**9.584 674**
MS20-50-1	Comb 50 sample, 1mm	10	1	**9.584 675**
MS20-20MC-1.5*	Comb 20 sample MC, 1.5mm	41	1	**9.584 676**
MS20-30-1.5	Comb 30 sample, 1.5mm	26	1	**9.584 677**

* Multichannel compatible.

2 3 Gel electrophoresis tank MultiSUB midi-96





Cleaver Scientific

The multiSUB Midi 96 Gel System is ideal for high throughput electrophoresis of PCR products or samples containing a small number of DNA bands. Its 10 x 12cm (W x L) gel dimensions and 96-well comb block format correspond to the standard micro plate configuration, with additional lanes for markers. Two different types of comb are available: one which has 8 wells and one additional lane for DNA markers and one which has 8 wells and 2 additional lanes for markers. The offset layout of the wells allows a maximum run length of 1.8cm per well, resulting in improved separation. multiSUB Midi 96 can accommodate samples from a 96-well plate; samples can be loaded directly using 8-channel pipettes. As with all multiSUB units, leak-proof casting is simplified using the supplied casting dams while their ultra-compact size minimises buffer usage and bench space requirements. MSMIDI96 Stretch Systems are also available for those users requiring an extended run length per well of up to 3.6cm.

Supplied with:
MSMIDI96: Multi Sub Midi96, UV tray, Comb block with 12 x 8 sample, 1mm thick combs, electrodes and casting dams.
MSMIDI96ST: Multi Sub Midi96 STRETCH, UV tray, Comb block with 12 x 8 sample, 1mm thick combs, electrodes and casting dams.

Technical specifications	**MSMIDI96/MSMIDI96ST**
Gel dimensions (W x L):	10 x 12cm/10 x 24cm
Unit dimensions (WxDxH):	22 x 12.5 x 9cm/46.5 x 12.5 x 8cm
Max. sample capacity:	96 samples plus 1 or 2 marker lanes
Buffer volume:	300ml/700ml

Type	Description	PK	Cat. No.
MSMIDI96	MultiSub Midi96	1	**9.584 720**
MSMIDI96-8-1.5-CB*	Comb 8 sample MC + 1 Marker, 1.5mm thick COMB BLOCK	1	**9.584 721**
MSMIDI96-8-1/2M-CB*	Comb 8 sample MC + 2 Marker, 1mm thick COMB BLOCK	1	**9.584 722**
MSMIDI96-8-1.5/2M-CB*	Comb 8 sample MC + 2 Marker, 1.5mm thick COMB BLOCK	1	**9.584 723**
MSMIDI96ST	MultiSub Midi96 STRETCH	1	**9.584 724**
MSMIDI96ST-8-1.5-CB*	STRETCH Comb 8 sample MC + 1 Marker, 1.5mm thick COMB BLOCK	1	**9.584 725**
MSMIDI96ST-8-1/2M-CB*	STRETCH Comb 8 sample MC + 2 Marker, 1mm thick COMB BLOCK	1	**9.584 726**
MSMIDI96ST-8-1.5/2M-CB*	STRETCH Comb 8 sample MC + 2 Marker, 1.5mm thick COMB BLOCK	1	**9.584 727**

* Multichannel compatible.

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2



1 2 Real-time horizontal gel electrophoresis system runVIEW

NEW!

Cleaver Scientific

- Vversatile, self-contained system on the market for real-time horizontal gel electrophoresis
- System includes everything except chemicals and reagents to run horizontal SYBR- and EtBr-stained gels in real-time
- Combines the flexibility and high resolution capability of the MSCHOICE system with the time- and space saving convenience of having the power supply and gel illuminator integrated within one highly compact bench top unit
- Optional dark room with 12.1 megapixel digital camera fits directly over the base unit and gel tank to allow gels to be imaged either as bands migrate in real-time or at the end of the electrophoresis run
- Includes accessories for standard gel electrophoresis and for size fractionation and simplified real-time gel free DNA band extraction and purification
- runVIEW Gel System with bluVIEW Lid Design: Orange spectral emission filter with condensation-free viewing panel.
- Extractor fan in the bluVIEW lid eliminates condensation to optimise DNA visualisation and resolution during electrophoresis.

Included Double-sided Combs: 2x 1-sample/2-sample preparatory; 2x 4-sample preparatory/16-sample combs; 4x 20- /28- sample multichannel compatible screening. Comb Thickness: 1mm. Extra-thick 2x 4- and 2x 6-sample 3mm preparatory combs are also included.

Specifications

runVIEW Viewing Dock

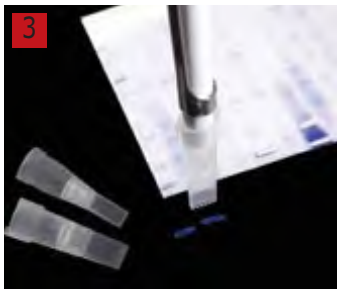
Blue Light Wavelength:	470nm
Voltage/Resolution:	25-150V/1V
Current/Resolution:	300mA/1mA
Power:	30W
Timer:	1 to 999 min (with alarm)
Dimensions (WxDxH):	29.3 x 22.0 x 8.0cm
Power supply:	100-240V, 50/60Hz

runVIEW Gel System

Gel Dimensions (W X L):	15 x 7cm, 15 x 10cm and 15 x 15cm
Unit dimensions (W X D X H):	26.5 x 17.5 x 9.0cm
Buffer volume:	500ml

Type	Description	PK	Cat. No.
CSL-RVMSCHOICE7	runVIEW system complete with 15 x 7cm gel tray, 1 set of casting dams and 8 double-sided combs	1	**9.584 764**
CSL-RVMSCHOICE10	runVIEW system complete with 15 x 10cm gel tray, 1 set of casting dams and 8 double-sided combs	1	**9.584 765**
CSL-RVMSCHOICE15	runVIEW system complete with 15 x 15cm gel tray, 1 set of casting dams and 8 double-sided combs	1	**7.920 135**
CSL-RVMSCHOICETRIO	runVIEW system complete with 15 x 7, 15 x 10 and 15 x 15cm gel trays, 3 sets of casting dams and 8 double-sided combs	1	**9.584 766**
CSL-RVBSBVLID	runVIEW base station and bluVIEW lid	1	**9.584 767**
CSL-RVGELDOC	runVIEW gel documentation hood with 12,1MP camera	1	**9.584 768**

3



3 Disposable Gel Excision Tips GelX

NEW!

Cleaver Scientific

Widely acclaimed as an excellent tool for gene cloning, Cleaver Scientific GelX disposable gel excision tips offer a unique and convenient way to excise nucleic acid and protein bands from gels. GelX tips allow completely safe and contamination free removal of the gel band of interest without the need to handle potentially dangerous scalpels. The gel band is neatly extracted and contained in the tip, when it is then dispensed into a tube for further analysis. Once used, the tip is ejected for disposal.

- Eliminates scalpel damage to transilluminator or gel tray
- Designed for removing bands from agarose and protein gels
- One-handed operation
- Push button gel and tip release mechanism
- Fits standard 1000µl pipettes
- Autoclavable, and DNase and RNase free
- Sterile versions also available

Type	Dimensions mm	Description	PK	Cat. No.
CSL-GELX4	4 x 1	1 bag	250	**6.237 751**
CSL-GELX4RACK	4 x 1	5 racks à 48 pieces	240	**6.237 752**
CSL-GELX6.5	6.5 x 1	1 bag	240	**7.900 620**
CSL-GELX6.5RACK	6.5 x 1	5 racks à 48 pieces	250	**9.584 699**

E & OE.

1 Power supply nanoPAC-300 Mini for gel electrophoresis tanks

NEW!



Cleaver Scientific

The nanoPAC-300 is capable of running all Cleaver Scientific horizontal multiSUB™ systems and vertical omniPAGE mini gel systems.
- Maximum constant current output of 400mA
- Constant voltage up to 300V
- Adjustable in 1V and 1mA increments
- Two parallel outputs
- Continuous run or timed setting up to 999 minutes
- Automatic safety shutdown
- Alarm function
- Easy-to-clean polycarbonate housing
- 3-digit LED display

Type	Supply requirements	Rating W	PK	Cat. No.
nanoPAC-300 Mini	300V / 400mA	60	1	**6.253 368**

Further power supplies please see page 1262.

2 Agarose for gel electrophoresis

NEW!



Cleaver Scientific

AG agaroses are suitable for routine analysis of nucleic acids. They combine tensile strength with low electroendosmotic effects to achieve high resolving power for a wide size range of nucleic acid fragments.
AG agaroses are also very environmentally friendly, beeing manufactured by a process which excludes organic solvents.
Low melting point agarose is available (please enquire).

Type	Capacity g	PK	Cat. No.
CSL-AG100	100	1	**9.584 695**
CSL-AG500	500	1	**9.584 696**
CSL-AG1000	2 x 500	1	**9.584 697**
CSL-AG2000	4 x 500	1	**9.584 790**
CSL-AG5000	10 x 500	1	**9.584 791**
CSL-AG10KG	20 x 500	1	**9.584 792**
CSL-AG20KG	40 x 500	1	**9.584 793**

3 SAROGOLD®



Extra-strong foil. PVC-based. Good barrier properties protects the user against contact with dangerous substances (e.g. ethidium bromide or contaminated isotopes) from the sealed material and it is therefore suitable for covering sequencing gels in Electrophoresis applications.
Ideal characteristics for use:
- does not stick, easy to unravel
- with cutter
- non-flammable
- self-extinguishing
- microwaveable

Specifications

Film thickness:	11.5µm
Permeability in the visible area:	90%
UV-filtering:	300Å
IR-permeability:	88%
Width:	300mm
Length:	300m

Type	PK	Cat. No.
SAROGOLD®	1	**9.106 460**

1



1 UV lamps

- Filtered and unfiltered*UV lamps with different wave lengths and power levels for a broad range of applications
- Models with wave length selector suited for multiple applications

Further models on request.

Note: please order lamp holder separately.

Type	Description	Filter size mm	Tubes W	Wave-length nm	PK	Cat. No.
BVL-115.L	Single wavelength	295 x 66	1 x 15	365	1	**9.971 936**
BVL-215.G	UV sterilization lamp*	-	2 x 15	254	1	**9.971 915**
BVL-208.G	UV sterilization lamp*	-	2 x 8	254	1	**9.971 935**
BVL-4.LC	wavelength selector	70 x 48	2 x 1 x 4	365 / 254	1	**9.971 917**
BVL-6.LC	wavelength selector	145 x 48	2 x 1 x 6	365 / 254	1	**9.971 918**
BVL-8.LM	wavelength selector	220 x 48	2 x 1 x 8	365 / 312	1	**9.971 937**

2



2 Lamp holder for UV lamps

Type	For Type	PK	Cat. No.
SVL-6	BVL-4, BVL-8, BVL-6	1	**9.971 921**
SVL-30	BVL-115, BVL-215	1	**9.971 922**

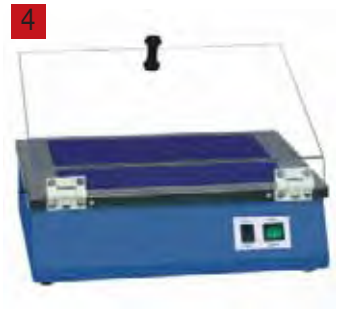
3



3 Handle for UV lamps

Type	For Type	Mounting	PK	Cat. No.
SMU	BVL-4, BVL-8, BVL-6	clip	1	**9.971 938**
SMA	BVL-4, BVL-8, BVL-6	handle	1	**6.230 416**

4



4 Compact UV transilluminators

- Compact design (34 x 28cm)
- Metal housing, with stainless steel filter frame and "long life" filter
- Modern technology, highest quality manufacture
- Single or dual wavelength models available
- BECXF models have intensity selector (Hi/Lo)

Type	Description	Filter size mm	Tubes W	Wave-length nm	PK	Cat. No.
BECXF-20.M	Hi / Lo Intensity	200 x 200	6 x 8	312	1	**9.971 910**
BECXF-26.M	Hi / Lo Intensity	210 x 260	6 x 8	312	1	**9.971 911**
BTCP-20.LM	Multi-band	200 x 200	5 x 8 / 6 x 8	365 / 312	1	**9.971 912**
BTCP-20.MC	Multi-band	200 x 200	6 x 8 / 5 x 8	312 / 254	1	**9.971 913**
BTCP-26.LM	Multi-band	210 x 260	5 x 8 / 6 x 8	365 / 312	1	**9.971 914**

5



5 UV transilluminators

Standard features include a high/low intensity safety switch and an efficient starter that allows each of the six 8W UV tubes to energise quickly without flickering, while special filter glass minimises unwanted background light. All of these features maximise contrast and sensitivity, allowing even the faintest fluorescent gels to be viewed. Two dual wavelength models offer added flexibility and convenience.

Cleaver Scientific

Type	Filter size mm	Wave-length nm	Tubes	PK	Cat. No.
CSLUVTS254	210 x 210	254	6 x 8W	1	**9.584 770**
CSLUVTS312	210 x 210	312	6 x 8W	1	**6.231 832**
CSLUVTS365	210 x 210	365	6 x 8W	1	**9.584 771**
CSLUVTSDUO	210 x 210	254/365	6 x 8W	1	**9.584 772**
CSLUVTSDUO312	210 x 210	254/312	6 x 8W	1	**9.584 773**

6



6 Blue-LED-Transilluminators

UV protection shield optional.
Intensity setting 10 to 100%

biostep GmbH

Type	Wave-length nm	Filter size mm	Tubes	PK	Cat. No.
BST-20G-D2R	470	200 x 200	LED Matrix 504	1	**4.007 023**
BST-30G-D4R	470	230 x 300	LED Matrix 756	1	**4.007 024**

1 UV transilluminators - Professional Line

- high intensity output for high UV intensities
- metal housing, with stainless steel filter frame and "long life" filter
- modern technology, highest quality manufacture
- intensity selector (Hi/Lo)
- integral UV safety screen
- top dimensions: 47 x 33cm

Type	Description	Filter size mm	Tubes W	Wave-length nm	PK	Cat. No.
BETXF-20.M	Hi/Lo Intensity	200 x 200	6 x 15	312	1	**9.971 906**
BETXF-26.M	Hi/Lo Intensity	210 x 260	6 x 15	312	1	**9.971 907**

1



2 UV transilluminators ENDURO™

NEW!

Labnet

The ENDURO™ UV Transilluminators represent a great new imaging product true to ENDURO™ name. These UV transilluminators have been designed for rugged use and durability with exceptional performance. The use of UV Black Glass minimizes the striping effect seen on many UV transilluminators. This provides a more uniform background for gel imaging. Conventional UV shields leak some UV (~8%), but the Enduro UV transilluminators allow no leakage.

- Compact size with 210mm x 260mm viewing area
- Available in single or dual wavelength models
- Unique heavy duty hinge design can be held in place at any angle for gel cutting
- UV shield fully protects user from UV light
- Uniform UV Black Glass provides improved imaging contrast

Type	Filter size mm	Tubes W	Wave-length nm	PK	Cat. No.
U1001	210 x 260	6 x 8	302	1	**9.595 345**
U1002	210 x 260	5 x 8 / 6 x 8	302 / 365	1	**9.595 346**

2



3 Spare tubes for UV instruments

NEW!

Vilber Lourmat GmbH

Type	Tubes W	Wave-length nm	PK	Cat. No.
T-4.C	4	254	1	**6.230 463**
T-4.L	4	365	1	**6.230 464**
T-6.C	6	254	1	**6.230 465**
T-6.L	6	365	1	**6.224 405**
T-8.M	8	312	1	**6.225 934**
T-8.C	8	254	1	**6.242 036**
T-8.L	8	365	1	**6.240 332**
T-15.M	15	312	1	**6.232 337**
T-15.C	15	254	1	**6.237 967**
T-15.L	15	365	1	**6.228 209**

3

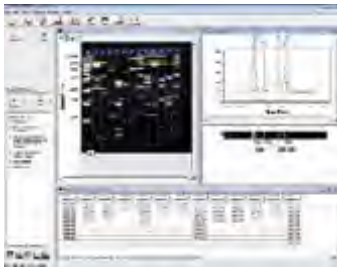




1



2



1 2 Gel documentation system microDOC with UV-Transilluminator

Cleaver Scientific

Recently upgraded with a new 12.1 megapixel digital CMOS camera to guarantee superb resolution, the microDOC is the researcher's choice for a simple ultra-compact gel documentation system that meets constraints in both budget and space within the laboratory. A large 8" TFT screen enables images, including agarose and fluorescent gels, colorimetric gels, autoradiography film and blotting membrane, to be captured in colour, clearly and easily. The system is computer-free and supplied with a 4GB storage card and 58mm ethidium bromide filter as standard, while an optional SYBR filter is also available. Files are saved onto the 4GB storage card in RAW, TIFF-RGB and JPEG formats and may be transferred to computer for analysis with the highly recommended TotalLab™ 1D software.

microDOC BASIC: The microDOC BASIC is a simple low-cost system comprising a lift-off dark room hood and 12.1 megapixel digital camera, through which the gel is viewed directly. This system can be supplied with optional TotalLab 1D Analysis Software and any one of the 21 x 21cm transilluminators (please enquire).

TotalLab™ 1D software: is supplied only as part of a complete package with each of the microDOC and transilluminator options. Its main functions include: lane creation, background subtraction, band detection, profile deconvolution, and molecular size, pI and quantity calibration. More sophisticated TotalLab™ Quant and Phoretix standalone software options are available for 1D applications that require band matching, array, colony counting and image ToolBox functionalities.

Camera:
- File Format Design rule for Camera File system, DPOF (version 1.1) compliant
- Focus-Area Selection AF mode and manual focus are available
- Hood (excludes MicroDOC Basic/1D models)
- Multi-Power Source For camera, Inner light lamp, TFT screen
- Safety Door Switch Automatically disconnects UV transilluminator, while opening the chamber door during operation
- with Video and Audio Input

Printer (option): The Mitsubishi P93 is a high speed, high resolution thermal printer that is perfectly suited to printing images directly from the microDOC. Connected to the microDOC by a BNC cable, the Mitsubishi P93 prints 325dpi images, up to 133 x 99mm in size. Thermal printer paper is also available.

Specifications Camera:

Effective Pixels:	approx. 12.1 megapixels
Type CMOS:	CMOS 1/1.7", approx. 12.1 million pixels
Lens:	6.1 (W) - 30.5 (T) mm (35mm film equivalent: 28 (W) - 140 (T) mm)
Maximum Aperture:	f/1.8 (W) - f/2.8 (T)
Image Resolution:	640 x 480 up to 4.000 x 3.000
Data Type Still images:	Exif 2.3(JPEG), RAW (CR2)
Movies:	MOV (Image data: H264 ; Audio data: Linear PCM (stereo))
Filter:	Ethidium Bromide or SYBR Green (58mm)
Inner White Light:	2x 3W white light LED (excl. MDOC Basic Models)
Monitor:	8" TFT liquid crystal screen
Display Format:	960 x 234mm
Luminance:	350 cd/mm
Display Mode:	NTSC/PAL mode switchable
Chamber Dimension (WxDxH):	290 x 220 x 320mm
Rated Voltages:	110 - 220V
Weight Approx.	6.1 kg

Description	PK	Cat. No.
Compact Gel documentation system	1	**6.231 823**
microDOC with UV-Transilluminator 312nm	1	**9.584 755**
microDOC with UV-Transilluminator 254/312nm	1	**9.584 756**
microDOC with UV-Transilluminator 254/365nm	1	**9.584 757**
microDOC basic system with lift-off dark room hood and camera only	1	**9.584 758**
Compact Gel documentation system*	1	**9.584 759**
microDOC with UV-Transilluminator 312nm*	1	**9.584 760**
microDOC with UV-Transilluminator 254/312nm*	1	**9.584 761**
microDOC with UV-Transilluminator 254/365nm*	1	**9.584 762**
microDOC basic system with lift-off dark room hood and camera only*	1	**9.584 763**

* incl.Analysis Software TotalLab1D.

E & OE.

1 Gel documentation system Doc-Print VX2

Vilber Lourmat

- Compact, PC-independent gel documentation system
- Robust and durable
- Easy handling, even with wet gloves
- Large TFT display, excellently readable
- Context-sensitive task buttons, quick-shot button
- Highly-sensitive scientific camera for high imaging quality (1.4 MP/12-Bit)

All models with the following standard components:
- Sensitive CCD camera, zoom, UV spectral filter, hood
- Control unit with integrated display and USB ports
- Free PC analysis software

1



Type	Description	PK	Cat. No.
DP VX2	With standard components	1	**7.930 022**
DP VX2-P	With standard components and thermal printer	1	**7.930 023**
DP VX2-20.M	With standard components and transilluminator BECXF-20.M	1	**9.971 928**
DP VX2-P-20.M	With standard components, thermal printer and transilluminator	1	**9.971 929**

2 Gel documentation system DP-1100

Vilber Lourmat

- PC-independent gel documentation system with compact, high-quality darkroom made of metal
- Robust and durable
- Easiest handling, even with wet gloves
- Large TFT display, excellently readable
- Context-sensitive task buttons, quick-shot button
- Highly-sensitive scientific camera for high imaging quality (1.4 MP/12-Bit)

All models with the following standard components:
- Sensitive CCD camera, zoom, UV spectral filter
- Darkroom with filter wheel, integrated, completely extendable transilluminator BECXF-26.M with automated UV security switch
- Control unit with integrated display and USB ports
- Free PC analysis software

2



Type	Description	PK	Cat. No.
DP-1100	With standard components	1	**9.971 930**
DP-1100-P	With standard components and thermal printer	1	**7.930 095**



1



2



9.776 623

1 Vacuum concentrator, Concentrator plus™

NEW!

Eppendorf AG

The new Concentrator plus features a new LCD display and user-friendly control panel with clearly labeled function keys.
The new Concentrator plus from Eppendorf is available in two configurations:
- Complete system with an integrated service-free diaphragm pump
- Basic concentrator for connecting to an existing vacuum.

The Concentrator's heating technology optimises the evaporation process. No matter which configuration you choose, you're assured of quick and efficient-yet gentle-vacuum concentration of your samples (e.g. DNA/RNA, proteins). The complete system includes a vapour condenser that purifies the exhaust air by up to 85%. This serves as protection against unpleasant vapours.

Specifications	**Complete system/Basic device**
Max. power consumption:	350W/150W
Dimensions (WxDxH):	33cm x 58cm x 29cm/33cm x 37cm x 23cm
Weight:	31kg/17kg
Vacuum:	20hPa (20mbar)
Fixed rotation speed:	1.400rpm
Tube sizes:	0.2ml - 50ml
Capacity:	max. 144 tubes 2 microplates

Description	PK	Cat. No.
Complete system with integr. membrane vacuum pump and 48 x 1.5ml / 2.0ml fixed angle rotor	1	**9.776 620**
Complete system with integr. membrane vacuum pump, with connection for external units	1	**9.776 621**
Complete system with integr. membrane vacuum pump, w/o rotor	1	**9.776 622**
Single unit with 48 x 1.5ml / 2.0ml fixed angle rotor	1	**9.776 623** 2
Rotor F-35-6-30 for 6 x 15ml Falcon tubes	1	**9.776 624**

3



9.776 490

Rotors for Concentrator plus

Eppendorf AG

Type	Description	PK	Cat. No.
A-2-VC	for 2 x 96 tubes 0.2ml (128 x 86 x 27 mm)	1	**9.776 496**
F-45-8-17	for 8 tubes 15ml (Falcon) (17 x 120mm)	1	**9.776 490** 3
F-45-48-11	for 48 tubes 1.5/2.0ml (11 x 41/11 x 47mm)	1	**9.776 465**

Accessories for Concentrator Plus

Eppendorf AG

Description	PK	Cat. No.
Kit for upgrading from basic concentrator to complete system	1	**9.776 533**
Spacer for using fixed angle rotors in sandwich mode	1	**9.776 534**
CombiSlide® Adapter	1	**9.776 451**
Adapter, 0.5ml reaction tube and 0.6ml microtainer	6	**9.776 488**
Adapter for 0.2ml PCR tubes, for F-45-24-11	6	**9.776 504**
Work tray for 96 x 0.2ml PCR tubes	10	**9.283 623**
Frame for work tray	5	**9.283 624**

E & OE.

1 Rotational-Vacuum-Concentrator SpeedDry 2-18 CDplus Package

NEW!

Christ

The Mini-Concentrator from CHRIST: inexpensive and compact table-top unit for smaller sample volumes, e.g. for gentle concentration of DNA/RNA, proteins in ethanol/methanol/water solutions and similar analytical steps.

- Simple operation with the push of a button: interface CDplus, automatic sequence for start and stop, vacuum on and off depending on rotor, automatic aeration, therefore samples are prevented from spitting.
- Magnetic drive system with speed control: centrifugal force eliminates bumping and foaming, no rotating parts outside the rotor chamber.
- Fast evaporation: high energy input through electrical heating of rotor chamber, cam be set in 1°C intervals from room temperature to +60°C, large cross-section for optimized vapour transport to vacuum pump.
- Useful for water and solvent containing samples: basic SpeedDry system comes with durable glass cover, stainless steel rotor chamber, chemically resistant sealings, anodized rotors.
- Broadest range of rotors, large sample capacities.

Equipped with vacuum hose DN16, connection cable to vacuum pump and one rotor for 24 tubes 1.5/2.2ml - further rotors available as accessories, see list below.

Required for operation: chemically resistant diaphragm pump (final vacuum <10mbar, suction capacity approx. 2m³/h) and connecting pieces DN16. (e.g. type MZ 2C, manufacturer VACUUBRAND).

1



Type	PK	Cat. No.
RVC 2-18 Package	1	**9.883 154**
Membrane pump MZ 2C NT, two-step certification, 200-230 V/50-60 Hz, 100-115V/ 50-60Hz, 120 V/ 60Hz	1	**9.880 927**

Rotors for RVC 2-18 CDplus

NEW!

Christ

Description	PK	Cat. No.
Aluminium angle rotor 40 x 0.25/0.5ml	1	**9.883 161**
Aluminium angle rotor 30 x 0.5/0.75ml	1	**9.883 162**
Aluminium angle rotor 24 x 1.5/2.2ml	1	**6.203 603** 2
Aluminium angle rotor 18 x 4/7ml	1	**6.203 604**
Aluminium angle rotor 12 x 10/15ml	1	**9.883 163**
Aluminium angle rotor 6 x 50ml	1	**9.883 164**
Aluminium angle rotor 6 x 50ml (FALCON)	1	**9.883 165**
Distance ring, aluminium black anodized, 20mm high	1	**6.252 163**

2



6.203 603

3 Rotational-Vacuum-Concentrator SpeedDry 2-25 CDplus Package

NEW!

Christ

The Midi-Concentrator from Christ: all-purpose table-top system for routine concentration works of larger samples volumes. Suitable for typical solvents: e.g. acetonitrile, acetone, chloroform, dioxane, methylenchloride, ethanol, hexane, methanol, TFA, water.

- Simple operation with the push of a button: interface CDplus, automatic sequence for start and stop, vacuum on and off depending on rotor, automatic aeration, therefore samples are prevented from spitting.
- Magnetic drive system with speed control: centrifugal force eliminates bumping and foaming, no rotating parts outside the rotor chamber.
- Vacuum measurement and control.
- ramp programming function for vacuum and temperature.
- Fast evaporation: high energy input through electrical heating of rotor chamber, cam be set in 1°C intervals from room temperature to +80°C, large cross-section for optimized vapour transport to vacuum pump.
- Useful for water and solvent containing samples: basic SpeedDry system comes with durable glass cover, stainless steel rotor chamber, chemically resistant sealings, anodized rotors.
- Broadest range of rotors, large sample capacities.
- Cold trap for improved, faster evaporation results and solvent recovery.

Equipped with cold trap (volume 2 litres, temperature -50°C), solvent-resistant glass lid with vacuum hose DN16 and one rotor for 24 tubes 10/15 ml, further rotors available as accessories, see list below.

Required for operation: chemically resistant diaphragm pump (final vacuum <10 mbar, suction capacity approx. 2 m³/h) and connecting pieces DN16. (e.g. type MZ 2C, manufacturer VACUUBRAND).

3



Type	PK	Cat. No.
RVC 2-25 CDplus Package	1	**9.883 155**
Chemistry vaccum system MZ 2C NT AK+EK with KF DN 16, Certification, 200-230 V/50-60 Hz, 100-115 V/50-60 Hz, 120V/60 Hz	1	**9.880 928**

1



7.510 456

Rotors for RVC 2-25 CDplus

NEW!

Christ

Description	PK	Cat. No.
Aluminium angle rotor 54 x 0.5/0.75ml	1	**9.883 169**
Aluminium angle rotor 36 x 1.5/2.2ml	1	**7.510 456** 1
Aluminium angle rotor 48 x 5/7ml	1	**9.883 170**
Aluminium angle rotor 36 x 8/10ml	1	**9.883 171**
Aluminium angle rotor 24 x 10/15ml	1	**9.883 168**
Aluminium angle rotor 12 x 30ml	1	**9.883 172**
Aluminium angle rotor 8 x 50ml (FALCON)	1	**9.883 173**
Aluminium angle rotor 8 x 50ml	1	**9.883 174**
Aluminium angle rotor 6 x 100ml	1	**9.883 175**
Aluminium swing-out rotor 2 x microtiter plate	1	**7.510 455**
Aluminium swing-out rotor 2 x deepwell plate	1	**9.883 176**
Distance ring, aluminium black anodized, 20mm high	1	**6.252 163**



E & OE.

Brandplates® - A complete premium-quality line - for every application!

Microplates for Immunoassays (non-sterile)
Diagnosis of disease, pregnancy or verification of doping substances - many analyses in the modern laboratory are performed with immunological assays in microplates. They are characterized by their high specificity and provide the opportunity to detect the lowest concentrations of defined substances in complex liquids like e.g. blood serum.

immunoGrade™
Optimized for the immobilization of IgG, highest binding capacity for molecules with mixed hydrophilic and hydrophobic regions. The surface of choice for the majority of standard ELISAs.
hydroGrade™
Strongly hydrophilic, high affinity to hydrophilic molecules like e.g., glycoproteins and peptides, antibodies with predominantly hydrophilic regions and nucleic acids.
lipoGrade™
Strongly hydrophobic (lipophilic), immobilization of biomolecules with predominantly hydrophobic regions. An alternative to the immunoGrade™ surface for the immobilization of molecules, like e.g. lipoproteins or peptides.

Colours, wells and shapes:
- 96- and 384-well format
- standard or transparent bottom
- transparent, white or black
- Various well bottom shapes: U-, V-, F-, C-bottom for 96-well format
- clearly distinguishable via color code: blue embossed alphanumeric coding for 96-well standard plates.
- free from endotoxins (< 0.01 EU/ml), DNase, DNA, RNase, non-cytotoxic (according to ISO 10993)
- ANSI/SLAS format
- without lid

1 ImmunoGrade™

PS, non-sterile. Optimized for the immobilization of IgG, standard ELISA assay. *BRAND*



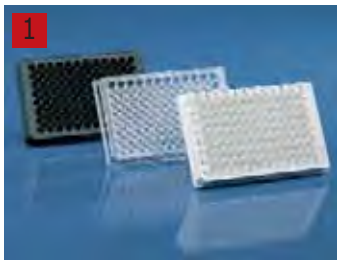
Description	Bottom shape/ Well volume µl	PK	Cat. No.
96-well, transparent	U / 330	100	**4.000 275**
96-well, transparent	V / 360	100	**4.000 276**
96-well, transparent	F / 350	100	**4.000 277**
96-well, transparent	C / 350	100	**4.000 278**
96-well, white	U / 330	100	**4.000 279**
96-well, white	C / 350	100	**4.000 280**
96-well, black	U / 330	100	**4.000 281**
96-well, black	C / 350	100	**7.635 711**
96-well, black / transparent	F / 330	100	**4.000 282**
384-well, transparent	F / 100	50	**4.000 283**
384-well, white	F / 100	50	**4.000 284**
384-well, black	F / 100	50	**4.000 285**

2 hydroGrade™

PS, non-sterile. Hydrophilic. For solid phase with hydrophilic molecules and liquid phase with hydrophobic molecules, resp. *BRAND*



Description	Bottom shape/ Well volume µl	PK	Cat. No.
96-well, transparent	U / 330	100	**4.000 286**
96-well, transparent	F / 350	100	**4.000 287**
96-well, transparent	C / 350	100	**4.000 288**
96-well, white	U / 330	100	**4.000 289**
96-well, white	C / 350	100	**4.000 290**
96-well, black	U / 330	100	**4.000 291**
96-well, black	C / 350	100	**4.000 292**
384-well, transparent	F / 100	50	**4.000 293**
384-well, white	F / 100	50	**4.000 294**
384-well, black	F / 100	50	**4.000 295**



1 lipoGrade™

PS, non-sterile. Lipophilic/hydrophobic. For solid phase with hydrophobic molecules and liquid phase with hydrophilic molecules, respectively. *BRAND*

Description	Bottom shape/ Well volume µl	PK	Cat. No.
96-well, transparent	U / 330	100	**4.000 296**
96-well, transparent	V / 360	100	**4.000 297**
96-well, transparent	F / 350	100	**4.000 298**
96-well, transparent	C / 350	100	**4.000 299**
96-well, white	U / 330	100	**4.000 300**
96-well, white	C / 350	100	**4.000 301**
96-well, black	U / 330	100	**4.000 302**
96-well, black	C / 350	100	**4.000 303**
96-well, white / transparent	F / 330	100	**4.000 304**
96-well, black / transparent	F / 330	100	**4.000 305**
384-well, transparent	F / 100	50	**4.000 306**
384-well, white	F / 100	50	**4.000 307**
384-well, black	F / 100	50	**4.000 308**
384-well, hite / transparent	F / 120	50	**4.000 312**
384-well, black / transparent	F / 120	50	**4.000 313**



2 Lids for BRANDplates® microplates

To protect samples, reaction batches or cell cultures from both contamination and evaporation, compatible lids are available for all Brandplates® microplates. The lids are made of crystal-clear polystyrene. They are optimally matched to the corresponding Brandplates® microplates, so that plates with lids can also be stacked. The cut-corner sets the orientation of the lid. For 96-well standard plates, lids with condensation rings are also available. *BRAND*

Description	Height mm	PK	Cat. No.
for 96-well standard plates*	8.0	100	**4.000 363**
for 96-well standard plates	8.0	100	**4.000 364**
for 96-well plates with transp. bottom and for 384-well plates	4.5	50	**4.000 365**
for 1536-well plates	5.5	50	**4.000 366**

*with condensation rings



3 Strip plates 12xF8 Brandplates

BRANDplates® microplates have ideal optical characteristics and are manufactured according to ANSI and SBS standards. They are available as 96-well standard plates as well as strip plates with immunoGrade™ and pureGrade™ surfaces - for greater flexibility and optimal results. *BRAND*

immunoGrade™ high binding capacity (highbinding), ideal for IgG and molecules with hydrophobic and hydrophilic regions
pureGrade™ medium binding capacity (medium-binding), somewhat more hydrophobic than immunoGrade™

These offer high flexibility. Use only as many wells as necessary. Two variants are available:

Strip plates without grid: for processing 12 strips of 8 wells each. Individual strip can be removed from the frame and reinserted. The strips are not divisible.

Strip plates with grid: likewise for 12 strips of 8 wells each. Individual strips are removable from the plate and can be reinserted. The strips can be divided into 8 individual vessels and can be inserted individually into the frame plate.

Capacity µl	Type	Description	PK	Cat. No.
360	pureGrade™	without grid, not splittable	100	**4.007 910**
350	pureGrade™	with grid, splittable	100	**4.007 911**
360	immunoGrade™	without grid, not splittable	100	**4.007 912**
350	immunoGrade™	with grid, splittable	100	**4.007 913**

E & OE.

Brandplates® - A complete premium-quality line - for every application!

Modern research methods require high-quality disposables. Brandplates®, the new generation of microplates from Brand, can be used in all important fields of life science.
Brandplates® microplates are available with nine different surfaces. The new product line covers a multitude of standard applications (e.g. homogenous assays, screenings) as well as applications in the fields of immunology
and cell culture technique.

Get yourself familiar with the new range by using the Brandplates® selection guide under www.brand.de.

Non-treated (sterile or non-sterile)
Non-treated PS microplates are used in the most diversified application fields, like e.g. homogenous standard assays and extensive screening assays. The hydrophobic characteristics of untreated PS are often of use in performing theses applications! The new Brandplates® range contains two types of non-treated microplates:

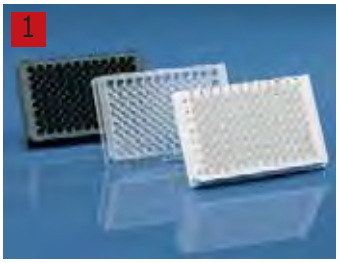
pureGrade™
Non-treated, non-sterile surface. The standard plate for most applications. Particularly applicable for homogenous assays, screening, and in the field of storage.

pureGrade™ S
Non-treated surface, sterile. Sterilized via ß-radiation. Especially suited for bacteriological assays.

Colors, wells and shapes:
- 96-, 384- and 1536-well format
- standard or transparent bottom
- transparent, white or black
- different well bottom shapes: U-, V-, F-, C-bottom for 96-well format
- clearly distinguishable via color code: grey embossed alphanumeric coding for 96-well standard plates in white or black.
- free from endotoxins (< 0.01 EU/ml), DNase, DNA, RNase, non-cytotoxic (according to ISO 10993)
- **non-sterile Products without lid, please order separately**
- **sterile Products comply with ISO 11137 and AAMI guidelines. A SAL of 10^{-6} is reached. Supplied individually wrapped with lid.**
- **ANSI/SLAS format**

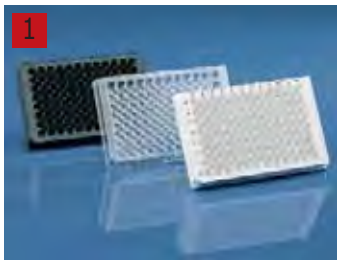
1 pureGrade™

PS. Non-treated, non-sterile. *BRAND*
For homogenous assays, screenings, storage, etc.



Description	Bottom shape/ Well volume µl	PK	Cat. No.
96-well, transparent	U / 330	100	**4.000 238**
96-well, transparent	V / 360	100	**6.233 851**
96-well, transparent	F / 350	100	**6.231 785**
96-well, transparent	C / 350	100	**4.000 239**
96-well, white	U / 330	100	**4.000 240**
96-well, white	F / 350	100	**6.233 548**
96-well, black	U / 330	100	**4.000 241**
96-well, black	F / 350	100	**6.233 756**
96-well, white / transparent	F / 330	100	**4.000 242**
96-well, black / transparent	F / 330	100	**4.000 243**
96-well, UV-transparent*	F / 350	50	**9.408 976**
384-well, transparent	F / 100	50	**4.000 244**
384-well, white	F / 100	50	**4.000 245**
384-well, black	F / 100	50	**4.000 246**
384-well, white / transparent	F / 120	50	**4.000 250**
384-well, black / transparent	F / 120	50	**4.000 251**
1536-well, transparent	F / 10	50	**4.000 253**
1536-well, white	F / 10	50	**4.000 254**
1536-well, black	F / 10	50	**4.000 255**

*slightly hydrophilized, not available in USA and Japan



1 pureGrade™ S

PS. Non-treated, sterile. *BRAND*
For bacteriological assays, screenings, storage, etc.

Description	Bottom shape/ Well volume µl	PK	Cat. No.
96-well, transparent	U / 330	50	**4.000 256**
96-well, transparent	V / 360	50	**4.000 257**
96-well, transparent	F / 350	50	**6.233 912**
96-well, transparent	C / 350	50	**4.000 258**
96-well, white	F / 350	50	**4.000 259**
96-well, black	F / 350	50	**4.000 260**
96-well, white / transparent	F / 330	50	**4.000 261**
96-well, black / transparent	F / 330	50	**4.000 262**
384-well, transparent	F / 100	50	**4.000 263**
384-well, white	F / 100	50	**4.000 264**
384-well, black	F / 100	50	**4.000 265**
384-well, white / tranpsarent	F / 120	50	**4.000 269**
384-well, black / transparent	F / 120	50	**4.000 270**
1536-well, transparent	F / 10	50	**4.000 272**
1536-well, white	F / 10	50	**4.000 273**
1536-well, black	F / 10	50	**4.000 274**



2 96 Well Optical Bottom Plates, PS

- Nunclon™Ä, Poly-D-Lysine or Collagen I surfaces for cell culture *Thermo Scientific*
- Non-treated plates are optimised for scintillation counting
- White or black upper structure with polymer bottom plates combine the optical clarity of virgin crystalline polystyrene with optimal surface for a wide range of HTS applications
- Working volume range: 50 - 200µl/well

Surface	Colour	Sterile	Description	PK	Cat. No.
Non-treated	White	no	without lid	30	**6.231 847**
Non-treated	Black	no	without lid	30	**6.901 329**



3 C96 MicroWell™ Plates, PS

- C-shaped bottom for optimal washing and liquid retrieval *Thermo Scientific*
- FluoroNunc™ for fluorescence based immuno assays with minimal auto-fluorescence
- MaxiSorp™ and PolySorp™ for quantitative and qualitative solid phase immuno assays
- Working volume range: 50 - 250µl/ well

Surface	Colour	Sterile	Description	PK	Cat. No.
MaxiSorp™	White	no*	without lid	60	**6.079 678**
MaxiSorp™	Clear	no	without lid	60	**9.390 553**
MaxiSorp™	Clear	no**	without lid	60	**9.390 554**
PolySorp™	Clear	no	without lid	60	**4.008 687**
PolySorp™	White	no*	without lid	60	**6.300 669**
PolySorp™	Clear	no	without lid	60	**9.390 557**

* certified.
**FluoroNunc™



4 F96 Immuno™ Plates, PS

Clear, white or black plates with excellent optical clarity and flat bottom wells. *Thermo Scientific*
MaxiSorp™, MediSorp™, MultiSorp™ und PolySorp™ are optimal for solid phase immuno assays.
Material plates: Polystyrene
Total volume µl/well: 400

Surface	Colour	Sterile	Description	PK	Cat. No.
Non-treated	Clear	no	without lid	180	**6.222 441**
Non-treated	White	no	without lid	180	**6.201 514**
Non-treated	Black	no	without lid	180	**6.228 233**
MediSorp™	Clear	no	without lid	60	**4.008 649**
MultiSorp™	Clear	no	without lid	60	**4.008 650**
MaxiSorp™	Clear	no	without lid	60	**9.390 550**
MaxiSorp™	Clear	no	without lid	60	**9.390 551**
PolySorp™	Clear	no	without lid	60	**9.390 555**
Non-treated	Clear	no	without lid	180	**4.008 780**
PolySorp™	Clear	no	without lid	180	**4.008 802**
MaxiSorp™	Clear	no	without lid	180	**4.009 010**
MaxiSorp™	Clear	no	without lid	180	**6.301 671**
Non-treated	Clear	no	with lid	160	**7.603 959**
Non-treated	Clear	no	without lid	60	**9.390 514**

E & OE.

1 U96 MicroWell™/Immuno™ Plates, PS

Thermo Scientific

Clear plates with excellent optical quality and round well bottom. Nunclon™Δ surface optimized for cell based assays and sterile non-treated versions for bacteriological applications. MaxiSorp™ und PolySorp™ suitable for solid phase immuno assays.
Material plates: Polystyrene
Total volume µl/well: 300



Surface	Colour	Sterile	Description	PK	Cat. No.
Nunclon™Δ	Clear	yes*	with lid	50	**9.407 471**
Non-treated	Clear	yes	without lid	50	**9.390 511**
Non-treated	Clear	yes	with lid	160	**4.009 009**
Non-treated	Clear	nein	without lid	180	**9.390 510**
MaxiSorp™	Clear	nein	without lid	60	**9.390 552**
PolySorp™	Clear	nein	without lid	60	**9.390 556**

* certified.

2 V96 MicroWell™ Plates, PS

Thermo Scientific

Clear plates with V-shaped well bottom for maximized sample recovery. The wells have raised rims and lids are supplied with rings, which prevent cross contamination.
Applications include: antibiotic screens, serological tests, storing and screening compounds and DNA libraries.
Material plates: Polystyrene
Total volume µl/well: 300



Surface	Colour	Sterile	Description	PK	Cat. No.
Non-treated	Clear	yes	with cap	50	**4.008 606**
Non-treated	Clear	yes	without cap	50	**9.390 513**
Non-treated	Clear	no	without cap	180	**9.390 512**

3 Lids for 96-well and 384-well Plates

Thermo Scientific

Lids in various versions made of clear, strong polystyrene with notches for quick orientation. Reduce water loss due to lower evaporation. 96-well lids feature individual condensation rings.



Height mm	With	Sterile	PK	Cat. No.
7.90	Evaporation barrier	no	100	**9.407 480**
7.90	Evaporation barrier	yes	50	**9.407 481**
7.90	Evaporation barrier	yes	60	**6.802 229**
8.34	-	yes	60	**4.008 599**
8.34	-	no	60	**6.206 034**

Evaporation barrier is a rim around the inside edge of the lid.

LLG Deep well plates, PP

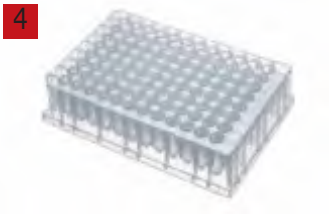
- produced in a cleanroom environment
- RNase-, DNase-, Human DNA- and Pyrogen-free
- virgin Polypropylene
- choice of well-types

LLG Deep well plates, 96 well, PP

- Cut-away corner for orientation
- Resistant to DMSO and low temperatures (-196°C)
- Autoclavable (121°C)
- Virgin polypropylene, certified RNase, DNase and endotoxin free

Description	Capacity µl	Colour	PK	Cat. No.
96 Well Storage Plate, round caps, with V-Bottom	800	transparent	50	**9.407 508** 4
96 Deep Well Storage Plate, round caps, with U-Bottom	1200	transparent	50	**9.407 509** 5
96 Deep Well Storage Plate, square caps, with U-Bottom	2200	transparent	50	**9.407 511** 6

4



9.407 508

5



9.407 509

6



9.407 511

E & OE.

1

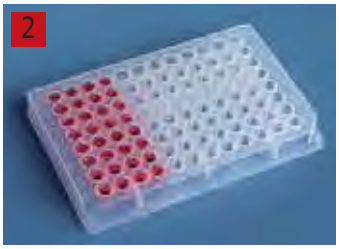


1 LLG-Deep well plates, 384-well, PP

- 384 square wells
- pyramidal well bottom for optimal sample retrieval
- raised rims for optimal sealing and reduced risk of cross-contamination
- raised rims on the corners to protect edges of seals
- chemical resistant (e.g. against DMSO, Phenol, Chloroform)
- autoclavable (121°C)
- Virgin polypropylene, certified RNase, DNase and endotoxin free

Description	Capacity µl	PK	Cat. No.
384 Well Storage Plate, with V Bottom	120	50	**9.407 510**
384 Well Storage Plate, with V Bottom	300	50	**9.407 512**

2



2 Microtitration plates and sealing films

Compatible with most microtitration plate centrifuges. *BRAND*

- For volumes up to 330µl
- U-bottom wells
- Autoclavable at +121°C
- High chemical resistance (e.g. phenol, chloroform, DMSO).
- Recessed hollows between the wells minimize contamination.
- Raised rings (rims) around the orifice of each well for easy sealing using self-adhesive sealing films.
- Plates can be sealed with self-adhesive, alphanumerically coded, DMSO-resistant, sealing film (cross-cut).

Type	PK	Cat. No.
Microtitration plate, U-Bottom, volume 330µl	100	**9.408 970**
DMSO-resistant sealing film	100	**9.408 983**
Sealing film, self-adhesive, PP	100	**9.409 386**
Sealing film, self-adhesive, Al	100	**9.409 387**

Also suitable are the self-adhesive sealing film of PP or of Aluminium.

3



3 Deep well plates and sealing mats

Developed for a range of uses, e.g. High-Throughput Screening (HTS), general analysis which requires a master reservoir plate, cell and tissue culture, sample storage, etc. Deep well plates can be used with all leading robotic systems and other autosampling devices. *BRAND*

Properties:
- Capacities: 96 well: 0.5ml, 1.1ml, (1ml with lid), 1.2ml or 2.2ml (2ml with lid), 384 well: 0.3ml
- U-bottom wells
- Low-Profile and Standard
- 96 well: 12 x 8 array, 384 well: 24 x 16 array
- High chemically-resistant polypropylene (e.g.: against DMSO, phenol, chloroform)
- ANSI/SLAS format
- Alphanumeric well coding
- Plates suitable for freezing down to -80°C (PP) or -20°C (PS)
- One notched corner ensures correct orientation.
- Stackable
- DNA, RNase, DNAse -free

Description	PK	Cat. No.
Deep well plate, 1.2 ml, 96 well, PP, non-sterile, low profile	50	**4.007 852**
Deep well plate, 0.3 ml, 384 well, PP, non-sterile, standard	48	**9.407 622**
Deep well plate, 0.5 ml, 96 well, PP, non-sterile, standard	48	**9.407 618**
Deep well plate, 1.1 ml, 96 well, PP, non-sterile, standard	24	**9.407 614**
Deep well plate, 1.1 ml, 96 well, PS, non-sterile, standard	32	**9.407 619**
Deep well plate, 2.2 ml, 96 well, PP, non-sterile, standard	24	**9.407 615**

4



4 LLG-Sealing mats for Deep well plates, 96-well

- autoclavable
- not-piercable, not DMSO resistant
- alphanumeric grid
- thermoplastic elastomer
- flexible with end tabs
- with round or angled nodules

Description	For	PK	Cat. No.
with round nodules for 96 round well plates	9.407 508 / 9.407 509	50	**9.407 513**
with angled nodules for 96 angled well plates	9.407 511	50	**9.407 517**

E & OE.

1 Sealing mats

Cover mats reduce the maximum volume of wells, but improve sealing and reduce sample evaporation. Adhesive sealing films can also be used.

BRAND



Description	PK	Cat. No.
Cover mat for 0.3 ml 384-well plates (standard), silicone, non-sterile	50	**9.407 623**
Cover mat for 0.5 ml 96-well plates (standard), PP, non-sterile	50	**9.407 621**
Cover mat for 1.1 ml 96-well plates (standard), mod. PE, non-sterile	24	**9.407 616**
Cover mat for 1.2 ml 96-well plates (low profile), TPE, non-sterile	50	**4.007 853**
Cover mat for 2.2 ml 96-well plates (standard), EVA, non-sterile	24	**9.407 617**
Sealing foil, gas-permeable, non-sterile	100	**9.407 620**

2 3 Deep-well plate system, riplate®

NEW!

Deepwell-plates Riplate®

Ritter GmbH

Within the range of deepwell-plates Riplate® is part of many branded kits. Not only regarding compatibility but also in terms of material properties riplate® can be applied in various applications.

Riplate® 1ml Standard in Multifunction
Raised wells reduce the risk of cross-contamination and increase the security of hot sealing or sealing with adhesive foils. Riplate® 1ml is ideal for use in a thermocycler or for defrosting of samples in a hot-water bath. The U-shaped well bottom reduces the death-volume.

Riplate® square wells For a Maximum in Capacity
Riplate® SW have been developed for optimal use of capacity when it comes to sample storage. Due to the SBS-format the outside dimensions of Riplate® are given. Form follows function: the construction of cavities is crucial for a maximum absorption of liquids.

Riplate® medio Saves 50% of Storage Capacity
Due to the compact construction of Riplate® medio less than 50% stacking size is needed. Higher well rims allow an airtight closure or sealing of Riplate® medio. The alphanumeric marking allows registration and identification of single assays.

Riplate® 384 Optimized for Smaller Volumes
Available in PS and PP for automated screening and storage systems. Alphanumeric marking for identification of samples. Round cavities for reduced capillary forces. With flat well-bottom - ideal for microscopic and optical applications.

Field of application: screening, sample storage et al. Ritter Riplate® systems are in line with the SBS-standard and are suitalbe for automation systems with corresponding closing- and sealing-mechanism.





Type	PK	Cat. No.
Deep-well PS - 1ml, U-shaped well-bottom	20	**9.284 250**
Deep-well PP - 1ml, U-shaped well-bottom	20	**9.284 251**
Cap mat for Deep well 1ml, shore 85	160	**9.284 253**
Square-well 96, PP - 2ml, U-shaped well-bottom	20	**9.284 252**
Square-well 48, PP - 5ml, V-shaped well-bottom	20	**9.284 260**
Square-well24, PP - 10ml, V-shaped well-bottom	20	**7.635 031**
Cap mat for Square well 96, 2ml	160	**9.284 255**
Cap mat for Square well 24, 10ml	20	**9.284 264**
384-well Plate PP	100	**9.284 256**
384-well Plate PS, clear	100	**9.284 257**
384-well Plate PS, white	100	**9.284 258**
384-well Plate PS, black	100	**9.284 259**
Deep-well PP - 1.0ml medio	20	**9.284 295**
Deep-well PP - 0.5ml medio	20	**9.284 296**
Square-well 96, PP - 2ml, sterile	10	**9.284 297**
Square-well 48, PP - 5ml, sterile	10	**9.284 298**
Square-well24, PP - 10ml, sterile	10	**9.284 299**

4 Sealing Tapes for MultiWell Plates

Effectively seals all microplate formats for storage, PCR, microscopy, culture and protection. Pre-cut, plate-sized sheets.

Thermo Scientific

Type 1) General use, PCR, storage, photo-sensitive samples
Type 2) Cell Culture, sterile applications
Type 3) Microscopy, good optics, low auto-fluorescence, DMSO compatible
Type 4) Breathable, cell culture



Type	Material	Glue	Sterile	Colour	PK	Cat. No.
1)	Aluminium	Silicone	no	Silver	100	**6.250 417**
2)	Polyester	Acrylic	yes	Clear	800	**9.407 482**
3)	Polyolefin	Acrylate	no	Clear	100	**6.223 248**
4)	Rayon	Acrylate	yes	White	50	**4.008 574**

1



1 Microplate replicators

Simple, inexpensive aid for transferring small volumes of inoculum from microplates to other microplates of the same format or solid supports. A choice of three configurations of stainless steel pins is offered, 48, 96 or 384 pin, precision-aligned for accurate transfer. Each pin transfers approximately 1µl. The whole replicator is autoclavable. Supplied with anodised aluminium storage tray, which also serves as an ethanol container. Overall dimensions (WxDxH): 112 x 76 x 102mm .

Type	PK	Cat. No.
Replicator/384 pins	1	**9.951 731**
Replicator/96 pins	1	**9.951 732**
Replicator/48 pins	1	**9.951 733**

2



2 Immuno™ Washers

NEW!

Thermo Scientific

- Easy-to-use
- Allow for a flexible washing procedure
- Uniform and efficient washing
- Very robust and reliable
- Rack included (not autoclavable)
- Adjustable to all well shapes
- Autoclavable at 121°C
- No electrical connections
- for tubing with 6mm bore

Description	PK	Cat. No.
Nunc-Immuno™ Wash 8	1	**6.302 667**
Nunc-Immuno™ Wash 12	1	**6.700 069**

3



3 Manual Microplate washer Type 200

Mikura

The 200 Series Washer - very user-friendly manual washer.
The user can choose to process the plate either in its storage position - on top of the pump unit, or down on the benchtop.
- quiet and reliable operation in a compact modular format.
- accurate dispensing and low residual volumes.
- adjustable dispense pressure.
- filtered pump inlet and silenced outlet.
- fully autoclavable, metal free fluid path.
- colour coding for easy maintenance and system modularity.
- extremely easy to clean, small footprint, compact in storage.
- 8 or 12 way wash heads, optional aspirate probes and fill manifolds.
- optional head designs for paper disc washing.
- 12V d.c. remote power supply for piece of mind and added safety.
- CE Marked.

Technical specification

Operating voltage/Hz:	100-240V 50/60Hz a.c.
Max current requirement:	12VA
Dispense reservoir:	2 litre bottle
Waste reservoir:	2 litre bottle
Weight of pump unit:	3.0kg
Weight of complete system:	4.8kg
Dimensions, WxDxH: (with reservoirs)	250 x 300 x 250mm

Type	PK	Cat. No.
8 Channel Washer complete	1	**4.006 931**
12 Channel Washer complete	1	**4.006 932**

E & OE.

1 Microplate Washer, Autura 1000



Mikura

Autura 1000 is a unique processor for the fully automated washing and filling of both, 96 and 384 well microplates, including deep well formats. It is designed to achieve a fast and reliable microplate processing with high precision and repeatability, whilst allowing the user a multitude of individual adjustment possibilities.

- Accurate dispensing precision and low residual volumes.
- Optional aerosol protection cover.
- Unique open construction for easy integration with robotic systems.- Plate sweep for the lowest residual volumes.
- Up to 25 user programmable wash protocols.
- Liquid level sensing in all reservoirs with audible and visual warning system.
- Extremely easy to clean and maintain.
- Autura accommodates all variants of 96 and 384 well microplates.
- Optional automatic rinse through wash head at set intervals.
- Internal RS232 port ensures Autura's robotic integration.
- USB port for remote computer interface.
- Remote control software available.

Additional features:
- Easy exchange of wash heads.
- Heads availability in 8, 12, 16 and 24 concentric tip configurations.
- Easy to read back illuminated full alpha numeric display.
- Autura operates on 12V DC, supplied via an external switch mode power supply, thus enhancing operational safety.
- Separate dispense and aspirate channels reduce the possibility of cross contamination.
- Aerosol cover available as option.
- Compact design.
- CE marked.

Specification

Operating voltage/Hz:	100-240V AC 50/60Hz
Max. Current requirement:	52VA
Dispense reservoir:	Up to 2 x 2L
Waste reservoir:	2L
Residual volume:	3µl per well typical action or 1µl per well with sweep
Precision:	CV = ±3% 300µl
Dispensing volume:	25µl to 1500µl in 25µl increments
Speed:	2.5mins*
Weight of complete system:	6.2kg
Dimensions of complete system (WxDxH):	230mm x 480mm x 320mm

Type	PK	Cat. No.
8 channel washer (96 well plates)	1	**4.006 927**
12 channel washer (96 well plates)	1	**4.006 928**
16 channel washer (96 well plates)	1	**9.951 950**
24 channel washer (96 well plates)	1	**9.951 951**
16 channel washer (384 well plates)	1	**9.951 952**
24 channel washer (384 well plates)	1	**9.951 953**

* to complete a 3 wash cycle using a double row 12 port head, 350µl/well, 96-well plate



1 Gel electrophoresis tank omniPAGE Mini

Cleaver Scientific

The preferred unit for routine mini protein electrophoresis, the omniPAGE mini is constructed using the latest injection moulding manufacturing techniques. This gives a high quality, low cost product with unsurpassed finish, durability and strength. The unit incorporates a sealing system which is compatible with all major types of 8 x 10cm and 10 x 10cm precast gel. Gel casting and running utilise the same insert, no transfer of glass plates during gel casting is necessary. The insert contains the option of sliding clamps or just one screw per clamping bar side allowing very rapid set up of both hand cast and precast gels. Ultra soft silicone seals and pressure bars which surround the glass plates guarantee leak proof gel casting. 2mm thick glass plates prevent breakage and have bonded spacers for convenience. Accessory electro blotting and tube gel modules are available which use the same outer tank and lid.

Supplied with:
CVS10D: omniPAGE Mini, 10 x 10cm Dual, 2 sets of Glass Plates, electrodes, 1mm thick bonded Spacers, 2 x 12 sample, 1mm thick combs. CLAMP VERSION.
CVS10DSYS: as CVS10D additionally with caster

Technical specifications

Gel dimensions (W x L):	7.5 x 8cm
Unit dimensions (WxDxH):	19 x 13 x 15cm
Max. sample capacity:	80 samples, 20 samples per gel
Buffer volume:	min. 250ml; max 1200ml

Type	Description	Sample volume µl	PK	Cat. No.
CVS10D	omniPage Mini		1	**9.584 652**
CVS10CBS	Complete system for Mini Vertical 10 x 10cm		1	**6.229 038**
CVS10DSYS	omniPage Mini incl. caster		1	**9.584 654**
VS10NG	Notched Glass Plates 2mm		2	**6.229 282**
VS10PGS0.75	Plain Glass Plates with 0.75mm Bonded Spacers		2	**9.584 730**
VS10PGS1	Plain Glass Plates with 1mm Bonded Spacers		2	**6.230 607**
VS10PGS1.5	Plain Glass Plates with 1.5mm Bonded Spacers		2	**9.584 731**
VS10-12-0.75	Comb 12 sample, 0.75mm	25	1	**9.584 732**
VS10-16MC-0.75*	Comb 16 sample MC, 0.75mm	20	1	**9.584 733**
VS10-8MC-1*	Comb 8 sample MC, 1mm	60	1	**6.232 797**
VS10-10-1	Comb 10 sample, 1mm	40	1	**6.232 290**
VS10-12-1	Comb 12 sample, 1mm	35	1	**6.232 176**
VS10-16MC-1*	Comb 16 sample MC, 1mm	25	1	**6.229 039**
VS10-20-1	Comb 20 sample, 1mm	20	1	**6.232 291**
VS10-12-1.5	Comb 12 sample, 1.5mm	50	1	**9.584 734**
VS10-16MC-1.5*	Comb 16 sample MC, 1.5mm	40	1	**9.584 735**

* Multichannel compatible.

E & OE.

1 Gel electrophoresis tank omniPAGE Maxi



Cleaver Scientific

For 1 to 4 Gels, Gel size 16 x 17.5cm. OmniPage Maxi is the preferred unit for maxi protein electrophoresis. Gel casting and running utilise the same insert, no transfer of glass plates during the gel casting is necessary. 4 mm thick glass plates prevent breakage and have bonded spacers for convenience. Electroblotting and tube gel modules are available which use the same outer tank and lid.
- colour coded combs 0.75 to 1.0 and/or 1.5 to 2.0mm
- low buffer volume, 1200ml up to maximum 5600ml
- easy gel casting with casting base
- up to four gels for maximum 192 samples (48 samples/gel)

Supplied with:
VS20D: omniPAGE Maxi, 20 x 20cm Dual with Glass Plates with bonded 1mm thick spacers, 2x 24 sample combs, cooling pack, electrodes and dummy plate.
VS20DSYS: omniPAGE Maxi, 20 x 20cm Dual with Glass Plates with bonded 1mm thick spacers, 2x 24 sample combs, cooling pack, electrodes, dummy plate and Casting Base.

Specifications

Gel dimensions (W x L):	16 x 17.5cm
Unit dimensions (WxDxH):	26 x 16 x 28cm
Max. sample capacity:	192 samples, 48 samples per gel
Buffer volume:	min. 1200ml; max. 5600ml

Type	Description	Sample volume µl	PK	Cat. No.
VS20D	omniPAGE Maxi		1	**9.584 653**
VS20DSYS	omniPAGE Maxi and Casting Base		1	**9.584 736**
VS20NG	20 x 20cm Notched Glass Plates 4mm thick (pk/2)		2	**6.232 288**
VS20PGS1	20 x 20cm Plain Glass Plates with 1mm Bonded Spacers (pk/2)		2	**6.232 289**
VS20PGS1.5	20 x 20cm Plain Glass Plates with 1.5mm Bonded Spacers (pk/2)		2	**9.584 737**
VS20-18MC-1*	Comb 18 sample MC, 1mm	50	1	**6.232 630**
VS20-24-1	Comb 24 sample, 1mm	40	1	**9.584 738**
VS20-36MC-1*	Comb 36 sample MC, 1mm	25	1	**9.584 739**
VS20-48-1	Comb 48 sample, 1mm	20	1	**9.584 740**
VS20-18MC-1.5*	Comb 18 sample MC, 1.5mm	80	1	**9.584 741**
VS20-24-1.5	Comb 24 sample, 1.5mm	60	1	**9.584 742**

* Multichannel compatible.

2 Gel electrophoresis tank VS20 Wave Maxi

NEW!



Cleaver Scientific

The new VS20 WAVE Maxi System is Cleaver Scientific's latest product innovation for large-format vertical gel electrophoresis. Designed to perform a variety of separations, including first- and second-dimension SDS-PAGE, native, preparative, gradient and high-resolution nucleic acid electrophoresis, plus capillary tube gel IEF and electroblotting, the VS20 WAVE is one of the most versatile maxi vertical systems available.
By introducing innovative, new vertical screw-clamp technology within the PAGE insert only four screws are now necessary to secure as many 20x20cm gels. This gives the VS20 WAVE Maxi the selective advantage of a much faster set up speed compared to competitor products whose traditional clamping confi gurations require as many as 24 screws to secure just two glass plates. In addition, the WAVE's vertical screw-clamp configuration distributes pressure evenly along the height of the gel rather than in the centre to eliminate plate bowing and gel compression, but still maintains a leak-proof seal during casting; while the ergonomic wave-like design of the PAGE insert aids both handling and set up. Whatever your requirements are the WAVE can be made to meet them. Regardless of whether it is running 2 or 4 gels, electroblotting, and IEF using capillary tube gels or IPG strips, all of these techniques may be performed using the same omni-purpose unit while retaining the benefits of large format electrophoresis, such as extended separation distances, greater sample throughput and superior resolution.

VS20WAVESYS incl. VS20 WAVE Maxi, Glass plates, 2 x 24 well combs, cooling coil, casting base
VS20WAVESYS-CU incl. VS20 WAVE Maxi, 20 x 20cm Dual, 2 sets of Glass Plates, 1mm thick bonded spacers, 2 x 24 sample, 1mm thick combs, cooling coil, dummy plate, caster, external casting upstand

Type	PK	Cat. No.
VS20WAVESYS	1	**9.584 795**
VS20WAVESYS-CU	1	**9.584 796**

1



1 Gel electrophoresis package omniPAGE TETRAD Mini-Set

NEW!

The gel electrophoresis tank OmniPAGE Mini is suitable for parallel treatment of up to 4 gels with 20 samples each. The tank is easy to handle, especially leak proof and
guarantees an efficient cooling. For self-cast gels and all major types of 8 x 10cm and 10 x 10cm precast gels.
Supplied with:
- omniPAGE Mini, 10 x 10cm Dual
- 1x CVS10DIRM Sliding Clamp PAGE insert
- 1x CVS10EXCASTER External Casting Upstand
- 1x VS10TANK Tank
- 1x VS10LID Lid
- 1x VS10DP Dummy plate
- 1x CSL-CAB Electrophoresis cables black and red (pack of 2)
- 2x VS10PGS1 Plain glass plates with 1mm bonded spacer (pack of 2)
- 2x VS10NG Notched glass plates (pack of 2)
- 2x VS10NGS1 Notched glass plates with 1mm bonded spacer (pack of 2)
- 4x VS10-12-1 = 2x 12 sample combs, 1mm thick
- 1x VS10DCAST Casting base with casting mat

Type	PK	Cat. No.
omniPAGE TETRAD Mini-Set	1	**7.930 246**

Power supplies for gel electrophoresis tanks

- microprocessor controlled
- constant voltage or current

Supply requirements	Description	Rating W	PK	Cat. No.
300V / 400mA	no programs, 2 outputs, LED display	60	1	**9.584 803** 2
300 V / 700 mA	no programs, 4 outputs, LED display, stackable	150	1	**4.006 960** 3
500 V / 800mA	30 programs, 4 outputs, LCD display, stackable	300	1	**9.584 804**
300 V / 3000 mA	30 programs, 4 outputs, LCD display, stackable	300	1	**4.006 961** 4
500 V / 600 mA	10 programs, 4 outputs, LED display, stackable	300	1	**4.006 962**

2



9.584 803

3



4.006 960

4



4.006 961

5



6.229 381

Semi Dry Blotters

Cleaver Scientific

These Semi Dry Blotters offer rapid transfer times for DNA, RNA and protein blotting; typically 15 to 30 minutes. All units can be used for all types of blotting: western, southern and northern via uncomplicated buffer and set up procedures and are compatible with gel thicknesses from 0.25 up to 10mm without the need for additional equipment. Each unit is compatible with their respective omniPAGE vertical gel system. Semi Dry Blotting has the added benefit of economic transfers due to very low buffer volumes - typically only a few millilitres of buffer are required per transfer. These Semi-Dry Blotters utilise a screw down lid, which secures the blot sandwich and allows complete control of pressure ensuring even transfer. The electrodes, comprising platinum coated anode and stainless steel cathode, will exhibit practically no corrosion and so provide many years of trouble free use. Uniform heat dispersion across the blot sandwich ensures stable transfer times and no heat induced sample loss or transfer distortions. Being translucent, it allows viewing of the blot sandwich to ensure correct positioning and transfer is occurring correctly. Electrode plates are fully separated to prevent arching or damage.

Type	Description	Dimensions (W x D x H) mm	Capacity Buffer ml	Qty. Blots	Dimensions Blots cm	PK	Cat. No.
SD10	Semi Dry Mini, 10 x 10cm System	160 x 160 x 70	5	1	8 x 8,5	1	**9.584 753**
SD20	Semi Dry Maxi, 20 x 20cm System	260 x 260 x 70	20	1 2 4	16 x 17,5 16 x 8,5 8 x 8,5	1	**6.229 381** 5
SD33	Semi Dry Maxi Plus, 33 x 45cm System	33 x 45 x 70	75	1 2 5 10 20	33 x 45 26 x 20 16 x 17,5 16 x 8,5 8 x 8,5	1	**6.239 745**
SD50	Semi Dry Maxi Blotter 20 x 50cm System	26 x 56 x 70	50	1 2 2 6 13	20 x 50 16 x 17,5 26 x 20 16 x 8,5 8 x 8,5	1	**9.584 754**

1 Gel blotting paper



GB 003, GB 005. *GE Healthcare*
High purity. Very absorbent. Easy to use.
Suitable for all protein and nucleic acid blotting techniques.

Type	Length mm	Width mm	Wall thickness mm	PK	Cat. No.
GB 003	200	200	0.8	100	**9.057 077**
GB 003	300	600	0.8	25	**9.057 067**
GB 003	580	600	0.8	50	**9.057 078**
GB 005	200	200	1.2	25	**9.057 079**
GB 005	580	580	1.2	25	**9.057 075**

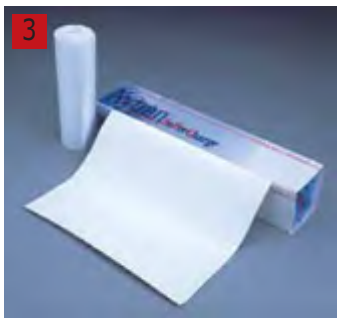
2 Transfer membranes Nytran® N



Neutral nylon membranes. *GE Healthcare*
For DNA/RNA transfers. Very low background. For chemiluminescence detection and multiple hybridisations.

Dimensions mm	Pore size µm	PK	Cat. No.
200 x 200	0.20	10	**9.057 105**
300 x 3 m	0.20	1	**9.057 107**
200 x 200	0.45	10	**9.057 115**
200 x 3m reel	0.45	1	**9.057 116**
300 x 3m reel	0.45	1	**9.057 117**

3 Transfer membranes Nytran® SuperCharge



Positively charged nylon membranes. *GE Healthcare*
For DNA/RNA transfers and multiple hybridisations.

Dimensions mm	Pore size µm	PK	Cat. No.
82 dia.	0.45	50	**9.057 120**
132 dia.	0.45	50	**9.057 122**
100 x 150	0.45	10	**9.057 123**
150 x 200	0.45	10	**9.057 124**
200 x 200	0.45	10	**9.057 125**
200 x 3m reel	0.45	1	**9.057 126**
300 x 3m reel	0.45	1	**9.057 127**

4 Western transfer pads fastPADS

NEW!



fastPADS are specially formulated western transfer pads which use leftover PAGE buffer or distilled water to perform rapid high-intensity transfers in standard electroblotters and semidry systems. fastPADS utilise a proprietary form of Towbin buffer that dramatically increases transfer speed, but without the excessive heat generation that may compromise transfers, particularly of native proteins. *Cleaver Scientific*

- Rapid assembly: gelmembrane sandwich set up within a couple of minutes, followed by 15' transfer
- Economical: reuses PAGE buffer regardless of type (TrisGlycine, MOPS, MES, HEPES etc.)
- Environmentally friendly with little waste
- Optimised with 0.2µm PVDF which has very high protein binding capacity and is very robust

Type	Description	PK	Cat. No.
CSL-FPADS	excl. PVDF	10	**9.584 776**
CSL-FPADSPVDF	incl. 0.2µm PVDF	10	**9.584 777**

Transfer membranes Westran®

PVDF membranes for protein transfers. *GE Healthcare*
Westran S are for protein microsequencing and for protein transfers.
Westran Clear Signal are for a very low backgrounds when using the Western-Blot method.

Type	Width mm	Length mm	Pore size µm	PK	Cat. No.
Westran S	200	200	0.20	10	**9.057 130**
Westran S	260	3100	0.20	1	**9.057 131**
Westran Clear Signal	200	200	0.45	10	**9.057 132**
Westran Clear Signal	300	3000	0.45	1	**9.057 133**

1



1 Transfer membranes Protran®

Pure nitrocellulose with extreme mechanical stability - gives excellent useability. For protein transfer and DNA/RNA transfer techniques. Optimum signal/background ratio. *GE Healthcare*

Dimensions mm	Pore size µm	PK	Cat. No.
82 dia.	0.45	50	**9.057 091**
132 dia.	0.45	25	**9.057 092**
200 x 200	0.45	25	**9.057 093**
300 x 600	0.45	5	**9.057 094**
300 x 3000	0.45	1	**9.057 095**
82 dia.	0.20	50	**9.057 096**
200 x 200	0.20	25	**9.057 098**
300 x 600	0.20	5	**9.057 099**
300 x 3000	0.20	1	**9.057 100**
300 x 3000	0.10	1	**9.058 360**

2



2 Transfer membranes Optitran®

Webbing reinforced nitrocellulose.
High mechanical stability for multiple hybridisations. *GE Healthcare*

Type	Width mm	Length mm	Pore size µm	PK	Cat. No.
BA-S 85	82	82	0.45	50	**9.057 081**
BA-S 83	200	200	0.20	25	**9.057 088**
BA-S 85	200	200	0.45	25	**9.057 083**
BA-S 83	3000	300	0.20	1	**9.057 090**
BA-S 85	3000	300	0.45	1	**9.057 085**
BA-S 83	82	82	0.20	50	**9.057 086**

3

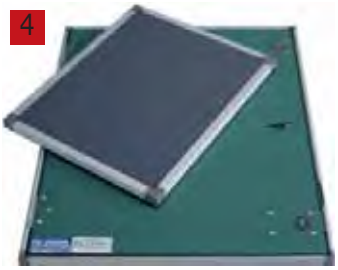


3 Storage boxes, PE-HD with tightly closing PE-LD lid

PE-HD. With tightly closing PE-LD lid. Suitable for cold storage rooms and refrigerators. Temperature range/withstands temperatures (without mechanical stress) from -40 to +95°C. Stackable. Acid and chemical resistant. Food safe.
Colour: natural.

Capacity L	Width mm	Length mm	Height mm	PK	Cat. No.
0.50	103	103	64	1	**9.033 270**
1.00	103	103	127	1	**9.033 275**
1.00	103	208	64	1	**9.033 280**
1.50	103	208	94	1	**9.033 285**
2.00	103	255	94	1	**9.033 286**
2.00	208	208	64	1	**9.033 287**
3.20	208	208	94	1	**9.033 288**

4



4 X-Ray cassettes

Standard design with lead lining and snap fit lid.
- easy to open, easy to close with gentle pressure.
- firm, consistent support for films through special shaping:
base pre-formed with convex profile.
- flexible, pure aluminium base (Absorption 1.2mm A\leq value)
flim processed in frames:
- Aluminium base coated in impact-resistant paint
- Anodised aluminium frame
- Elastic foam for film protection
- Specifically designed for audioradiography at 70°C
Use our reinforcement films in the blue sensitivity range with these X-Ray cassettes.

Format mm	PK	Cat. No.
180 x 240	1	**9.106 580**
240 x 300	1	**9.106 581**
200 x 400	1	**9.106 582**
356 x 432	1	**9.106 583**

Accessories for X-Ray cassettes

Reinforcement films Universal B 1
$CaWo_4$, blue.

Format mm	PK	Cat. No.
180 x 240	2	**9.106 570**
240 x 300	2	**9.106 571**
200 x 400	2	**9.106 572**
356 x 432	2	**9.106 574**

E & OE.

1 Centrifugal concentrators, Vivaspin 2

Sartorius

This 2 ml volume unit combines the rapidity of the classic Vivaspin products with reduced internal surface and membrane areas for superior recoveries from very dilute solutions.
With a choice of suitable membranes (PES, CTA, Hydrosart) Vivaspin 2 provides the highest flexibility for process optimisation.
Vivaspin 2 guarantees maximum sample recovery either by reverse centrifuging into the concentrate recovery cap or by directly pipetting the concentrate from the deadstop pocket built into the bottom of the concentrator.

Membrane surface:	1.2cm²
Max. rcf.:	8000 x g
Hold-up volume:	< 10µl

1



2 Centrifugal concentrators, Vivaspin 2

Membrane: polyethersulphone

Sartorius

MWCO	PK	Cat. No.
3000	25	**9.049 861**
5000	25	**9.049 760**
10000	25	**9.049 761**
30000	25	**9.049 762**
50000	25	**9.049 763**
100000	25	**9.049 764**
3000	100	**9.049 862**
5000	100	**9.049 777**
10000	100	**9.049 778**
30000	100	**9.049 779**
50000	100	**9.049 780**
100000	100	**9.049 781**

2



3 Vivaspin 6

Sartorius

Vivaspin 6ml concentrators have been developed to offer increased volume flexibility and performance. Vivaspin 6 can process an impressive 6ml in either swing-out buckets or fixed angle rotors accepting standard 15ml conical bottom test tubes.
The Vivaspin 6 features twin vertical membranes for unparalleled filtration speeds and 100x plus concentrations.

Membrane area:	2.5cm²
Max. centrifugal force:	10000 x g
Dead volume:	< 10µl

3



4 Centrifugal concentrators, Vivaspin 6

Membrane: polyethersulphone

Sartorius

MWCO	PK	Cat. No.
5000	25	**9.049 765**
10000	25	**9.049 766**
30000	25	**9.049 767**
50000	25	**9.049 768**
100000	25	**9.049 769**
0.2 µm	25	**9.049 770**
5000	100	**9.049 782**
10000	100	**9.049 783**
30000	100	**9.049 784**
50000	100	**9.049 785**
100000	100	**9.049 786**
0.2 µm	100	**9.049 787**
Starter kit (5 ea. 5K to 100K)	25	**9.049 753**

4



5 Vivaspin 20

Vivaspin 20ml centrifugal concentrators have been developed to offer increased volume flexibility and performance. *Sartorius*
Vivaspin 20 handles up to 20ml in swing bucket centrifuges and 14ml in 25° fixed angle rotors accepting 50ml centrifuge tubes. Featuring twin vertical membranes for unparalleled filtration speeds the Vivaspin 20 can achieve 100x plus concentrations. Remaining volume is easy to read off the printed scale on the side of the concentrator and the modified dead stop pocket further simplifies direct pipette recovery of the final concentrate.



Membrane area:	6.0cm²
Max. centrifugal force:	8000xg
Dead volume:	< 20µl



1 Centrifugal concentrators, Vivaspin 20

Membrane: polyethersulphone *Sartorius*

MWCO	PK	Cat. No.
3000	12	**9.049 855**
5000	12	**9.049 771**
10000	12	**9.049 772**
30000	12	**9.049 773**
50000	12	**9.049 774**
100000	12	**9.049 775**
300000	12	**9.049 857**
1000000	12	**9.049 858**
0.2 µm	12	**9.049 776**
3000	48	**9.049 856**
5000	48	**9.049 788**
10000	48	**9.049 789**
30000	48	**9.049 790**
50000	48	**9.049 791**
100000	48	**9.049 792**
300000	48	**9.049 859**
1000000	48	**9.049 860**
0.2 µm	48	**9.049 793**
Starter kit (2 ea. 5K to 0.2 µm)	12	**9.049 754**



2 Centrifugal concentrators, Vivaspin 500

Vivaspin 500µl unit with 2.2ml sample carrier tube can be used in a fixed angle rotor. The vertical, built-in membrane guarantees minimal membrane fouling and provides rapid sample concentration. Low protein adsorption gives minimal sample loss. *Sartorius*

Membrane surface:	0.5cm²
Max. rcf.:	15000 x g
Hold-up volume:	< 5µl



3 Centrifugal concentrators, Vivaspin 500

Membrane: polyethersulphone *Sartorius*

MWCO	PK	Cat. No.
3000	25	**9.049 863**
5000	25	**9.049 755**
10000	25	**9.049 756**
30000	25	**9.049 757**
50000	25	**9.049 758**
100000	25	**9.049 759**
Starter kit (5 ea. 5K to 100K)	25	**9.049 750**
3000	100	**9.049 864**
5000	100	**9.049 850**
10000	100	**9.049 851**
30000	100	**9.049 852**
50000	100	**9.049 853**
100000	100	**9.049 854**

E & OE.

1 2 Crossflow filter units Vivaflow 50 and Vivaflow 200

NEW!

Sartorius

Thin channel, crossflow filter units with 50cm²/200cm² filter areas for capacities between 100ml/500ml and 5L. This system provides high crossflow rates at minimum pumping pressure and does not require additional fittings for scale-up.
VivaFlow 50 is easy to operate with a flow restrictor and, optionally, a pressure indicator. Modular construction with luer connections allows interlocking of units in series for easy scale-up. Recovery rates are maximised due to optimised recirculation volume and by use of low adsorption materials. Disposable.
For greater volumes, VivaFlow 200 is available with a filter area of 200cm² and includes pressure indicator, flow restrictor, filtrate tubing and connectors.
Membrane: polyethersulphone

MWCO	Description	PK	Cat. No.
3.000	Vivaflow 50	2	**6.240 542**
5.000	Vivaflow 50	2	**9.049 742**
10.000	Vivaflow 50	2	**9.049 743**
30.000	Vivaflow 50	2	**9.049 744**
50.000	Vivaflow 50	2	**9.049 745**
100.000	Vivaflow 50	2	**9.049 746**
0,2 µm	Vivaflow 50	2	**9.049 747**

Accessories available on request.
Vivaflow 50 modules include filtrate tube, size 16 peristaltic tubing, flow restrictor and fittings.
Vivaflow 200 modules include pressure indicator, flow restrictor and size 16 pvc peristaltic tubing and fittings.

1



2



3 Centrifugal filtration units, Centrisart I

Sartorius

Centrisart I is a ready to use unit for small volume centrifugal ultrafiltration to separate proteins from low molecular weight substances in biological samples.

Typical applications include:
- Drug binding studies
- Determination of metabolites in serum
- Protein removal from blood samples
- Cleaning of liposomes (virus removal)

Type	PK	Cat. No.
Centrisart 5,000 MWCO CTA	12	**9.054 671**
Centrisart 10,000 MWCO CTA	12	**9.054 672**
Centrisart 20,000 MWCO CTA	12	**9.054 673**
Centrisart 100,000 MWCO PES	12	**9.054 674**
Starter pack (3 units each of 5K, 10K, 20K, 100K)	12	**9.054 675**

CTA = Cellulose tri-acetate
PES = Polyethersulphone

3



Densitometer DEN-1/DEN-1B

NEW!

Grant

Compact and efficient benchtop densitometers for measuring turbidity of cell suspensions in a variety of life science applications.
The densitometers are designed and factory calibrated to measure turbidity in the range of 0.3 to 5.0 McFarland units (DEN-1) 0.00 to 6.00 McFarland units (DEN-1B) with a small standard deviation. If required, they can deliver a wider measurement range (up to 15.00 McFarland units), but with a greater standard deviation.

Applications: Life science-typical applications include determining concentration of cells (bacterial and yeast cells) in the fermentation process, detecting the susceptibility of micro-organisms to antibiotics, identifying micro-organisms with various test systems, and measuring optical density at fixed wavelength. The DEN-1B can be operated on mains or battery.

Specifications

Light source:	light diode
Wavelength:	565nm ±15nm
Measuring range DEN-1:	0.3 to 15.0McF
Measuring range DEN-1B:	0.00 to 15.00McF
Standard deviation at 3.00 McF units:	±0.1McF
Precision:	±3%
Measurement time:	1sec
Tubes diameter, external:	18mm
Tube diameter with D16 adapter (included):	16mm
Sample volume:	≥2ml
Dimensions (WxDxH):	165 x 115 x 75mm
Power supply:	12V (DEN-1B additionally 3 x AAA batteries)

Type	Description	PK	Cat. No.	
DEN-1		1	**6.234 576**	1
DEN-1B		1	**9.721 057**	2
DEN MCF STDS	Set of 5 reference standards (0.5/1.0/2.0/3.0/4.0)	1	**6.237 141**	
DEN MCF 18 STDS	Set of 5 reference standards (diam. 18mm)	1	**9.721 068**	

1



6.234 576

2



9.721 057

E & OE.

1 2 Spectrophotometer Genova Plus, for Life Science

NEW!

Jenway

The Genova Plus is a UV/visible spectrophotometer dedicated to life science analysis. This spectrophotometer allows the measurement of DNA concentration dsDNA, ssDNA, RNA, Oligonucleotides, 260/ 280, 260/ 230, Variable ratio., with an optional correction at 320nm.The Genova Plus is pre-programmed with Bradford, Lowry, Biuret, BCA and Direct UV methods for protein analysis. The Genova Plus has an OD measurement mode enabling users to measure optical density at 600nm for cell harvesting. The purity scan across the entire wavelength range from 198nm to 1000nm displays any distorted peaks enabling impurities to be easily identified. With the touch of a button the Genova plus can be converted to a standard spectrophotometer for basic scanning, quantification, kinetics and multi-wavelength operations. 2 in 1 Spectrophotometer.

- Improved navigation system for easy and intuitive usability
- Improved optics
- Pre-programmed for DNA/RNA analysis
- DNA purity scan across entire wavelength range
- Protein methods pre-loaded
- Standard spectrophotometer functions
- Press to read xenon lamp
- Icon driven software
- Small footprint
- Save methods and results to USB memory stick
- 3 year warranty including xenon lamp

Supplied with: Single micro-cuvette holder, 4GB USB memory stick, instruction manual and universal power supply.

Specifications

Wavelength	
Range:	198 to 1000nm
Wavelength repeatability:	±0.5nm
Resolution:	1nm
Accuracy:	±2nm
Spectral bandwidth:	5nm
Scan interval:	1, 2 and 5nm
Photometrics	
Absorbance Range:	-0.300 to 2.500A
Transmittance Range:	0 to 199.9%T
Photometric Accuracy:	±1%T, ±0.01A at 1.000 Absorbance
Concentration/Quantitation	
Range:	-300 to 9999
Resolution:	Selectable 1/0.1/0.01/0.001
Outputs:	USB, Analogue, RS-232, internal printer (optional)
Dimensions (WxDxH):	275mm x 400mm x 220mm
Weight:	6kg

Type	PK	Cat. No.
Life Science Analyser Genova Plus	1	**9.775 160**

1



2



Further spectrophotometer please see page 1094.

1



2



1 2 Spectrophotometer Genova Nano

NEW!

Jenway

The Genova Nano micro-volume spectrophotometer measures small sample volumes as low as 0.5µl with a high degree of accuracy, reproducibility and speed. It has the ability to measure small sample volumes, conserves precious samples, reduces the need for dilutions and eliminates the requirement for cuvettes. Cleaning is quick and simple; wiping the read heads with a microfiber cloth removes all trace of the sample, allowing faster change over between samples and therefore increasing sample throughput.

3 in 1 Spectrophotometer
Standard Spectrophotometer with all the functions of the 7315. With measurement modes for photometrics, concentration, multi-wavelength, spectrum scanning, quantitation and kinetics.
Life Science Spectrophotometer with all the functions of the Genova plus. Additional measurement modes for the measurement of nucleic acid purity, protein assays, nucleic acid concentration and optical density of cell cultures add to the flexibility of the Genova Nano.
Micro-volume Spectrophotometer: Making measurements easier, quicker and less strenuous for 0.2 to 0.5 µl samples.

- Micro-volume, life science and standard spectrophotometer in one
- Ideal for DNA, RNA and Protein measurements
- Only 0.5µl sample volume required
- Purity scan over entire wavelength range, 198 to 1000nm
- Detects DNA concentrations as low as 2ng/µl
- Easy and quick to clean
- Results are reproducible, accurate and easily obtained
- Method and result saving to USB memory stick
- 3 year warranty including Xenon lamp

Specifications

Wavelength	
Range:	198 to 1000nm
Accuracy:	±2nm
Spectral Bandwidth:	5nm
Path Length:	0.2 or 0.5mm (auto-ranging)
Photometrics	
Absorbance Range:	15 to 125A (10mm equivalent)
Absorbance Accuracy:	±2% at 260nm
Absorbance Precision:	<0.005A between 0 and 1A (at 260nm and 0.5mm)
Concentration/Quantitation	
Maximum Concentration:	6000ng/µl (dsDNA) (at 0.2mm)
Detection Limit:	2ng/µl (dsDNA) (at 0.5mm)
Measurement Time:	<6.5 seconds
Minimum Sample Size:	0.5µl (at 0.2mm) 1.0µl (at 0.5mm)
Maximum Sample Size:	5µl (in Nano mode)
DNA measurement modes:	dsDNA, ssDNA, RNA, Oligonucleotides, 260/280, 260/230, Variable ratio
Protein measurement modes:	BCA, Bradford, Lowry, Biuret, Direct UV
Dimensions (WxDxH):	275 x 400 x 220mm
Weight:	7.7kg

Type	PK	Cat. No.
Genova Nano	1	**9.775 171**

3



3 Micro Volume Analysis TrayCell

Hellma Analytics

Fibre-Optic Micro Measuring Cell. Accessory for standard spectrophotometer for droplet analysis.
Sample volume 0.5µl to 10µl.

Typical applications are:
- nucleic acid analysis.
- determination of the incorporation frequency of fluorescent dye labels (FOI).
- protein analysis (A280, BCA, Lowry etc.).
- all UV/Vis analysis utilising wavelength range 190nm to 1100nm.
- material: SUPRASIL® quartz.

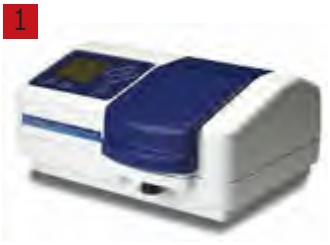
Please state the required cell centre height (8.5mm, 15mm or 20mm) when placing your order! TrayCell is supplied as standard with caps for both 0.2mm and 1mm light path. Additional light path of 0.1mm and 2mm are available.

Path length	Description	Capacity	Height	Centre height	PK	Cat. No.
mm		µl	mm	mm		
0,2 / 1	TrayCell	0,5 to 10	68.5 / 75 / 80	8.5 / 15 / 20	1	**6.224 913**
0,2 / 1	TrayCell	0,5 to 10	53 / 59.5 / 64.5	8.5 / 15 / 20	1	**6.230 433**

E & OE.

1 Spectrophotometer Models 6300 VIS/6305 UV-VIS

Jenway



Models 6300 and 6305 are general purpose visible and UV/Visible range spectrophotometers which are suited to a wide range of applications in education and quality control.

- Simple operation
- Versatile sampling system
- G.L.P. compliant
- Full interfacing capability
- Simple keypad and operating protocols designed to enable reliable operation by unskilled operators
- LCD gives simultaneously readout of wavelength and photometric result
- Error messages, prompts, mode indication and a choice of concentration units are presented in an easily understood format
- Cuvette holder allow 10mm to 100mm cells

Supplied with: Mains lead, pack 100 disposable cuvettes, 10 x 10mm cell holder, PC Application Software on CD-ROM and operating instructions.

Various accessories e.g. sipper pump, cells, cell holders, cuvettes and lamps available on request.

Specifications

Wavelength	
Range:	198 to 1000nm (6305) 320 to 1000nm (6300)
Resolution:	1nm
Accuracy:	±2nm
Bandwidth:	8nm, 6nm over UV range
Transmittance	
Range:	0 to 199.9%
Resolution:	0.1%
Stray light:	<0.5% at 340 & 220nm
Accuracy:	±1%
Absorbance	
Range:	-0.300 to 1.999A
Resolution:	0.001A
Concentration	
Range:	-300 to 1999
Resolution:	0.1/1
Units:	ppm, mg/l, g/l, M, blank %
Outputs:	analogue (0 to 1999mV d.c.) RS232 serial port
Light Source:	Xenon flash lamp module (6305) Tungsten halogen (6300)
Dimensions (WxDxH):	365 x 272 x 160mm
Weight:	6kg
Supply requirements:	230V/50Hz

Type	PK	Cat. No.
6300 VIS	1	**9.775 412**
6305 UV-VIS	1	**9.775 411**

1



1 Photometer BioPhotometer plus

Eppendorf AG

The BioPhotometer plus, a compact UV/Vis photometer, is optimized for use in molecular biology, biochemistry and cell biology labs.
The photometer provides instant access to 32 routine methods, of which 9 methods are freely programmable. Measurements as well as calculations of results are performed at the press of a button.
The results of the analysis and all accompanying data are available at a glance.
This guarantees safe and error-free operation. In addition to its low weight, the photometer is small, yet extremely sturdy due to a robust metal housing, which allows for easy transport and cleaning. The BioPhotometer plus is designed for use with cuvettes such as the Eppendorf UVette®, but is also optimized for measurement of small volumes through the use of microliter cells. Fast and reliable analysis of nucleic acids and proteins, cell density measurements, determination of incorporation rates of fluorescent dyes in iomolecules, absorption measurement of single wavelengths, and endpoint detection for cell biological and biochemical assays.

Product features:
- 9 wavelengths suitable for the common methods in molecular biological, biochemical and cell biological labs
- Preprogrammed methods for quantification of nucleic acids and proteins as well as incorporation rate of fluorescent dyes
- Assays at 340nm, 405nm, and 490nm are user defined for highest flexibility
- Automatic calculation of dilution factors
- Measurement of single wavelengths without any calculation
- Storage of the last 100 results and all corresponding data
- Simple user guidance for error-free operation
- Compact design and robust housing
- No pre-warming required
- Stand-alone unit without need for PC connection
- Xenon flash lamp with long lifetime and high light intensity

Type	PK	Cat. No.
BioPhotometer plus	1	**9.776 608**

2



2 LLG-Disposable plastic cells, PS

The new generation of cuvettes with clearly improved, photometric properties. The new optimized shape and narrow wall thickness of the cuvettes provides increased heat transfer resulting in more constant sample temperatures during photometric measuremens.

- Cavity sorted
- Glass clear polystyrene (PS)
- Applicable wavelength range 340nm to 900nm
- Very low variation of extinction values
- Excellent optical transmission range
- Path length 10mm
- Overall dimensions 12.5mm x 12.5mm x 45mm
- Styrofoam racks: 100 cuvettes in a styrofoam box with cover

Description	Capacity ml	Path length mm	Material	Operating range nm	PK	Cat. No.
Macro	4.0	10.0	PS	340 to 900	100	**9.406 011**
Semi-micro	1.6	10.0	PS	340 to 900	100	**9.406 012**

Further cuvettes please see page 1106.

E & OE.

1 Plastic disposable UV-Cuvettes for the UV/VIS range



BRAND

UV-transparent plastic Brand cuvettes replace fragile glass or quartz cuvettes in many applications that were previously beyond the range of plastic cuvettes. Designed for single use, they eliminate time-consuming washing, and the cross-contamination risk associated with washing and re-using cuvettes. Their very high chemical resistance allows use with most polar solvents, acids and alkalis (e.g. Acetone, Butanone, DMF, hydrochloric acid). The UV-uvette micro has a working range from 220nm - sample volumes as small as 70 µl are sufficient.
The UV-Cuvette is also available in macro and semi-macro sizes for applications from 220nm to 900nm.

- Specially designed for photometric determination of proteins, ssDNA, dsDNA, TNA and oligonucleotides in the UV range.
- Ideally suited for measurements at 260 nm, 280 nm and in the visible range.
- Two different centre heights (8.5 mm and 15 mm) allow use in most commercial spectrophotometers without adapters (for more information please visit the Brand website, www.brand.de).
- Round caps provide a tight seal and allow storage of samples at -20°C.
- Coloured caps are available for easy sample identification.
- Grouped by mould cavity number to minimize extinction value variation.
- Recessed windows protect against scratching.
- Arrow indicates optical path orientation.

Description	Path length mm	Capacity µl	Operating range nm	PK	Cat. No.
UV micro cuvette (centre height 8.5 mm)	10,0	70 to 850	220 to 900	100	**9.406 120**
UV micro cuvette (centre height 8.5 mm)	10,0	70 to 850	220 to 900	500	**9.406 121**
UV micro cuvette (centre height 15 mm)	10,0	70 to 550	220 to 900	100	**9.406 122**
UV micro cuvette (centre height 15 mm)	10,0	70 to 550	220 to 900	500	**9.406 123**
Cap for UV micro cuvette, blue				100	**9.406 124**
Cap for UV micro cuvette, yellow				100	**9.406 125**
Cap for UV micro cuvette, green				100	**9.406 126**
Cap for UV micro cuvette, orange				100	**9.406 127**
UV macro cuvette	10,0	2.5ml to 4.5ml	220 to 900	100	**9.406 119**
UV semi-micro cuvette	10,0	1.5 to 3.0ml	220 to 900	100	**9.406 118**

2 3 UV cuvette UVette®





Eppendorf AG

The plastic material of the UVettes provides a transparency range of 220nm to 1600nm. It is possible to carry out measurements in the UV range as well as the entire VIS range. Pipetting can be monitored clearly through the crystal-clear plastic and is always completely bubble-free, even the minute 50µl sample volume. The design of the cuvette incorporates a funnel-shaped base, which prevents the capillary effect, and ensures that the liquids constantly remain in the centre of the measuring area.

Product features:

- Suitable for measuring small volumes, min. 50µl
- Individually blister-packed for sterile work
- DNA-/RNase- and protein-free
- Choice of two optical path lengths: 2mm and 10mm
- UV- and VIS-transparent between 220nm and 1600nm
- Volume markings at 500µl and 1000µl
- Total transparent material with outstanding surface properties
- Optimal filling guaranteed by tapered cuvette base
- Recessed optical window prevents scratches
- Self-standing design
- Marking possible on frosted gripping surface
- Optimal use in BioPhotometer and in most common spectrophotometers, using adapters.

Description	Path length mm	PK	Cat. No.
UVettes, 80 x individually wrapped, disposable cells for direct use in BioPhotometer	2 and 10	80	**9.409 392**
UVette routine pack, Eppendorf Quality	2 and 10	200	**9.409 398**
Adapter for photometers/spectrophotometers with beam centre height of 8.5 mm		1	**9.409 393**
Adapter for photometers/spectrophotometers with beam centre height of 10 mm		1	**9.409 394**
Adapter for photometers/spectrophotometers with beam centre height of 15 mm		1	**9.409 395**
Adapter for photometers/spectrophotometers with beam centre height of GeneQuant I/II		1	**9.409 396**
Starter kit, 80 x UVettes + 1 universal adapter for photometers/spectrophotometers with beam centre height of 15 mm, convertible		1	**9.409 397**

Further Cells please see our chapter 10



1 LLG-Petri dishes, Soda-lime glass

NEW!

Diam. mm	Height mm	PK	Cat. No.
40	12	1	**9.170 570**
60	15	1	**9.170 571**
80	15	1	**9.170 572**
90	15	1	**9.170 575**
100	10	1	**9.170 573**
100	15	1	**9.170 574**
100	20	1	**9.170 576**
120	20	1	**9.170 577**
150	25	1	**9.170 578**
180	30	1	**9.170 579**
200	30	1	**9.170 580**
200	50	1	**9.170 581**



2 Petri dishes, Soda-lime glass

Steriplan®. Hydrolytical class 3. *DURAN Group*

Diam. mm	Height mm	PK	Cat. No.
40	12	10	**9.170 462**
60	15	10	**9.170 463**
80	15	10	**9.170 464**
100	15	10	**9.170 465**
100	20	10	**9.170 466**
120	20	10	**9.170 467**
150	25	1	**9.170 451**
180	30	1	**9.170 456**
200	30	1	**9.170 460**
200	45	1	**9.170 461**



3 Petri dishes, DUROPLAN®, borosilicate glass 3.3

DURAN®. With lid.Petri dishes are manufactured in a special production process which results in an even media dispersion and a uniform cell growth. Bottom and lid are absolute planar and free from bubbles and cords.
Glass Type I/neutral glass as per USP, EP and JP. Autoclavable. DIN 13132. *DURAN Group*

Diam. mm	Height mm	PK	Cat. No.
60	20	1	**9.170 141**
80	20	1	**9.170 143**
100	15	1	**9.170 146**
100	20	1	**9.170 148**
120	20	1	**9.170 151**
150	30	1	**9.170 153**



4 Petri dishes, PS

Non-sterile. For bacteriology. With or without vents. In light or heavy duty versions.

Dimensions mm	Vents	Description	PK	Cat. No.
35 x 10	With	Light	740	**9.408 035**
60 x 15	With	Light	600	**9.408 040**
94 x 16	Without	Light	480	**9.408 094**
94 x 16	Without	Heavy	480	**9.408 047**
94 x 16	With	Light	480	**9.408 095**
94 x 16	With	Heavy	480	**9.408 045**
100 x 15	With	Light	420	**6.077 283**
95 x 20	With	Light	360	**6.510 005**
145 x 20	With	Light	120	**6.052 085**



5 Petri Dishes, PS

Suitable for culturing of fungi, bacteria and other microorganisms. Contact dish (with grid) useful for sampling in hospital environments (for research use only), as well as in the food science and the pharmaceutical industry. All dishes perform well in automatic dispensers due to complete flatness and uniform height.
Material: Polystyrene *Thermo Scientific*

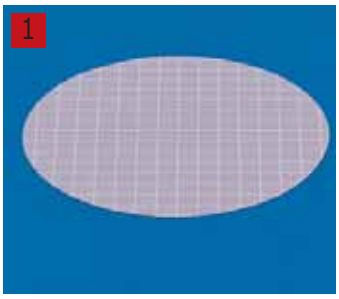
Dimensions mm	Capacity ml	Working volume ml	Culture surface cm²	Sterile	PK	Cat. No.
145 x 21	250.0	35	145.0	no	180	**6.201 672**
140 x 20	250.0	35	145.0	yes	80	**4.008 582**
100 x 15	68.0	12.5	58.0	yes	320	**6.223 201**
67 x 15*	7.7	7.7	25.0	yes	396	**6.052 163**

* contact bowl.

E & OE.

1 Membrane filters Type 13005/13006, series

Cellulose nitrate. Grey membranes (black after wetting) with white grid. For detection of yeasts and moulds, particle analysis and microscopy. *Sartorius*

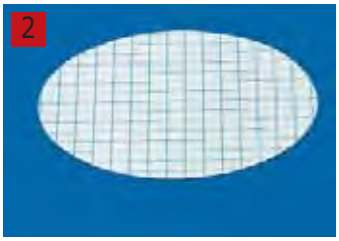


Type	Pore size µm	Diam. mm	Description	PK	Cat. No.
13005	0.65	47	sterile	100	**9.054 122**
13006	0.45	47	sterile	100	**9.054 132**
13006	0.45	50	sterile	100	**9.054 133**
13006	0.45	50	non-sterile	100	**9.054 139**

Other types available on request.

2 Membrane filters, gridded Type 13806

Cellulose nitrate. Sterile, individually packed. Green with dark green grid. Optimal contrast to light or white bacteria colonies when colony counting. *Sartorius*



Type	Pore size µm	Diam. mm	PK	Cat. No.
13806	0.45	47	100	**9.054 202**
13806	0.45	50	100	**9.054 203**

3 Nutrient pads

Sterile, dehydrated culture media pads in petri dishes. Once they are moistened with 3.0ml to 3.5ml of sterile and demineralised (or distilled) water they are ready-to-use immediately. All Nutrient Pad sets are supplied with the appropriate membrane filters, which are also individually sterile packed. Shelf life of the NPS 18 to 24 months at room temperature. Alternative nutrient media are available on request. *Sartorius*



Type	For	Colour	Pore size µm	PK	Cat. No.
Azide	Enterococci	Green / green	0.45	100	**9.055 006**
Endo	E. coli + Coliforms	White / green	0.45	100	**9.055 008**
Caso	Colony count	Green / green	0.45	100	**9.055 017**
Standard TTC	Colony count	Green / green	0.45	100	**9.055 010**
Tergitol TTC	E. coli + Coliforms	White / green	0.45	100	**9.055 011**
Chapman	Staphylococci	White / green	0.45	100	**9.055 032**
Wort	Yeasts and moulds	Grey / white	0.65	100	**9.055 013**
ECD	E. coli	White / green	0.45	100	**9.055 025**
VLB S7-S	Pediococci and Lactobacilli	White / green	0.45	100	**9.055 014**
Caso	Colony count	Green / green	0.45	100	**9.055 018**
Glucose-Tryptone	thermophilic spore formers, mesophilic bacteria	White / green	0.45	100	**9.055 020**
M-FC	E. coli + Coliforms	White / green	0.45	100	**9.055 022**
Tomato juice	Leuconostocoenos	Green / green	0.45	100	**9.055 026**
Lysin	wild yeasts	Grey / white	0.65	100	**9.055 015**
Sabouraud	Yeast + mould	Grey / green	0.65	100	**9.055 023**
Mac Conkey	Enterobacteria	White / green	0.45	100	**9.055 027**
Cetrimide	Pseudomonas	White / green	0.45	100	**9.055 031**
Schaufus Pottinger	Yeast + mould	White / green	0.65	100	**9.055 034**
Yeast extract	Colony count	Green / green	0.45	100	**9.055 037**
*Schaufus Pottinger	Yeasts and moulds	White / green	1.20	100	**9.055 028**
Weman	Mesophilic slime-forming bacteria	Green / green	0.45	100	**9.055 019**
Bismuth sulphite	Salmonellae	Green / green	0.45	100	**9.055 012**

* also available in 1.2µm (white/green), 0.8µm (grey/white) and 0.65µm (white/green) versions.



1 Sealing tape PetriSeal/ContainerSeal

NEW!

Heathrow Scientific

An ideal Sealing Tape for Petri Dishes, Microplates, Lids, Caps and other Lab Items.
Tape stretches, conforms and seals the irregular perimeter of microtiter plates and petri dishes. Tape and adhesive resist most solvents and caustic agents.
Seal remains flexible in moderate freezer temperatures and withstands intermittent exposure to 100°C.
Waterproof.

Colour	Width mm	PK	Cat. No.
Blue	13	1	**9.170 057**
Clear	13	1	**9.170 058**
Red	13	1	**9.170 059**
White	13	1	**9.170 060**
Yellow	13	1	**9.170 061**
Red	19	1	**9.170 051**
White	19	1	**9.170 052**
Yellow	19	1	**9.170 053**
Red	25	1	**9.170 054**
White	25	1	**9.170 055**
Yellow	25	1	**9.170 056**



9.908 127

Petri dish holder

Constructed in steel wire, as outloned below. Suitable for dish diameters of 100mm, Internal diameter approx. 102mm, Internal height approx. 230mm. For approx. 10 petri dishes.

Description	PK	Cat. No.
Electropolished, grade 1.4301 stainless steel	1	**9.908 127** 2
White nylon-coated	1	**9.908 128**



3 Petri dish stands, ABS

For 15 petri dishes up to 102mm diameter.

Width mm	Length mm	Height mm	PK	Cat. No.
90	210	210	1	**9.170 100**

E & OE.

1 Anaerobic jars, stainless steel

schuett-biotec



For the cultivation of anaerobic and microaerophilic microorganisms in a defined and rapidly generated gas atmosphere.The requested atmosphere may be reached under ideal conditions by two methods. Either by using chemical gas packs (anaerobe systems) or by manually evacuating the jars with a vacuum pump and flushing with gas afterwards (e.g. with nitrogen), in this case no chemical accessories are needed (except anaerobic jar eco). The jars are made of robust stainless steel or transparent PC.The lids are made of UV-resistant plastic or transparent polycarbonate with two corner valves incl. tube clips for vacuum hoses (5 mm i.d.) and with manometer for exact control of the vacuum or overpressure from -1 to 0.2 bar (except anaerobic jar eco). On request, the lids are available as custom-made versions, e.g. made of other material, without valves and manometer or equipped with high-temperature manometer. The optional racks are made of stainless steel providing holders for comfortable operation of the anaerobe systems.

Methods for reaching anaerobic conditions:
3 x times evacuating and filling gas, flushing with gas for 5 minutes and chemical gas production (GasPacks) for Anaerobic jars "small", "standard", "large" and "chrystal". For Anaerobic jar "eco" flushing with gas for 5 minutes.

Type	To hold dishes quantity	Int. diam. mm	Int. height mm	Capacity litres	Figure	PK	Cat. No.
Anaerobic jar "small"*	10 (60 to 100mm dia.)	120	170	2	a	1	**9.520 051**
Anaerobic jar "standard"*	15 (60 to 100mm dia.)	120	270	3	b	1	**9.520 056**
Anaerobic jar "large"*	15 (up to 150mm dia.)	175	260	6	c	1	**9.520 050**
Anaerobic jar "eco"**	15 (60 to 100mm dia.)	120	270	3	d	1	**9.520 057**
Anaerobic jar "crystal"***	15 (60 to 100mm dia.)	120	270	3	e	1	**9.520 058**
Rack "small"	10 (60 to 100mm dia.)					1	**9.520 059**
Rack "standard"	15 (60 to 100mm dia.)				f	1	**9.520 053**
Rack "150"	15 (up to 150mm dia.)					1	**9.520 060**
Rack "3 x 60"	45 (60mm dia.)					1	**9.520 061**
Rack "micro"	for multiwell plates					1	**9.520 062**
Test tube holder	for 9 test tubes (18mm dia.)					1	**9.520 063**
GAS-Pack-Kit "anaerobic" (1 x 3.5 l)						10	**9.520 064**
GAS-Pack-Kit "CO2" (1 x 2,5 l)						10	**9.520 065**
GAS-Pack-Kit "microaerophil" (1 x 3,5 l)						10	**9.520 066**
Anaerobiose Indicator (test strip)						100	**9.520 067**

*Stainless steel jar with UV-resistant plastic lid (2 valves, 1 manometer)
**Stainless steel jar with UV-resistant plastic lid (ventilation screw)
***Transparent polycarbonate jar and lid (2 valves, 1 manometer)

4 LLG-Dry swabs, sterile

NEW!

Description	Ext. diam. mm	Length mm	PK	Cat. No.
with Cotton tip and wooden stick, in PP test tube	12	150	600	**9.404 002**
with Rayon tip and plastic stick, in PP test tube	12	150	600	**9.404 003**
with Cotton tip and wooden stick, individually wrapped		150	1000	**9.404 004**
with Rayon tip and plastic stick, in PP test tube, individually wrapped	12	150	150	**9.404 005** 2
with Rayon tip and plastic stick, individually wrapped		150	1000	**9.404 006** 3
with clear Amies medium, Rayon tip and plastic stick, in PP test tube	12	150	150	**9.404 007**
with clear Amies medium with Charcoal, Rayon tip and plastic stick, in PP test tube	12	150	150	**9.404 008**



9.404 005



9.404 006



1



1 Swabs, plain, culture, cotton/wood

Disposable cotton swab on wooden stick. Length 150mm. With labelled outer storage tube. Sterile and individually packed.

Type	PK	Cat. No.
Swabs, plain, culture	300	**9.404 001**

2



2 Cotton Applicator, non-sterile

- according to EN ISO 13485
- for sampling in laboratories
- with drug code (PZN 7469036)

Material	Wall thickness mm	Length mm	Head size	PK	Cat. No.
Wood	2.2	150	4 to 5.5 mm diam.	100	**9.413 160**

3



3 Cotton Applicator, sterile

- according to EN ISO 13485 and conforming to 93/42/EEC, enclosure V for medical products
- sterilised with ETO gas
- individually packed in Peel-Pack
- with drug code (PZN 1407459)

Material	Wall thickness mm	Length mm	Head size	PK	Cat. No.
Wood	2.2	150	Ø 4 to 5.5 mm	100	**9.413 161**

4



5



4 5 Inoculating needles smartPicks®, wood

NEW!

Heathrow Scientific

Available in three lengths and two needle sizes to suit a wide range of application needs. The Mini fits neatly into a 1.5 mL microfuge tube allowing the lid to be closed for full sample transfer/recovery.
- Naturally biodegradable White Birch wood
- Manufactured in an FDA-registered factory and comply with FDA standards for food contact
- Autoclavable and available in semi or needle point styles for delicate operations

Type	Description	PK	Cat. No.
smartPicks® Mini	Semi point, for 1.5ml tubes	2000	**6.257 176**
smartPicks® Mini	Needle point, for 1.5ml tubes	2000	**6.257 177**
smartPicks® Standard	Semi point, single tip	1500	**6.257 178**
smartPicks® Standard	Needle point, single tip	1500	**6.257 179**
smartPicks® Large	Semi point, single tip	500	**6.257 180**
smartPicks® Large	Needle point, single tip	500	**6.257 181**

6



6 LLG- Replicator stamp

The replicator stamp enables the transfer of bacterial or yeast colonies from one culture medium plate to another. To duplicate the colony plates, fix one of the sterile tissues on the stamp with the aluminium ring.
Then press the top side of the colony plate gently onto the stamp.
Use a new plate to produce the duplication.
The replicator stamp is made of plastic (POM). Height: 72mm, Ø: 81mm.
It is suitable for max. 100mm Ø petri dishes. Aluminium ring : Ø: 83mm
Disinfection of the replicator stamp including aluminium ring can be made with ethanol.
The tissues (15 x 15cm) are made of cotton/polyester and can be autoclaved.

Description	PK	Cat. No.
LLG-Replicator stamp	1	**9.055 000**
LLG-Autoclavable tissues	1	**9.055 001**
LLG-Set stamp + 12 tissues	1	**9.055 002**

E & OE.

1 LLG-Inoculation loops, PS, sterile



Inoculation loops "plastic" are made of flexible polystyrene. They have ultra-smooth loops and offer problem free planting and streaking of cultures.
Free of lubricants, oils and electrostatic charges, enabling consistent wetting and complete liquid transfer. Loops do not cut or gouge the agar surface during streaking. Ergonomic design of the loop handle improves grip due to the large handle and assists orientation. When viewed in cross section, the shafts of the loops have a hexagonal shape which creates a handle with six flat surfaces. This design facilitates maximum grip and easy orientation of the loop head. The needle end for colony counting is also a perfect tool for picking off individual isolated colonies. They are also suitable for making stab inoculations into agar slants or tubes of solid culture medium.
Package: 10 bags of 10 pieces

Type	Capacity µl	PK	Cat. No.
Needle / loop	1	100	**9.160 041**
Needle / loop	10	100	**9.160 042**
Loop / loop	1 / 10	100	**9.160 043**

2 LLG-Drigalski spatulas



For easy plating.

Material	Diam. mm	Length mm	Width mm	Figure	PK	Cat. No.
Stainless steel 18/10	4	190	40.0	1	1	**9.197 490**
Wironit, CrNi 18/12, straight	3	150	24.5	2	1	**9.197 496**
Wironit, CrNi 18/12, angular 10°	3	190	45.0	3	1	**9.197 497**
Borosilicate glass 3.3	5	150	30.0	4	1	**9.197 499**
Glass inoculation spreader	5	145	40.5	5	1	**9.520 206**
Stainless steel inoculation spreader	4	185	57.0	6	1	**9.520 205**
PS, sterile	4	174	51.5	7	100	**6.251 768**

3 4 Inoculating Turntable

NEW!

Bel-Art Products





Manually moved turntable creates virtually concentric circles of uniformly spread out bacterial colonies. This turntable can hold various sizes of Petri dishes 60, 90, 100mm.
Ball bearings provide a steady, even, and prolonged spin time resulting in a rapid inoculation step and extended operating life.
Equally allocate bacteria across Petri Dishes with ease
- Ball bearings assure simple and graceful spinning
- Lightweight, non-skid, durable and portable
- Polypropylene construction

Diameter: 127mm
Height: 50mm
Weight: 0.4 kg

Description	PK	Cat. No.
Inoculating Turntable	1	**9.520 530**



1 Petri dish turntables, schütt Petriturn

For uniform inoculation of petri dishes. Easy-to-use.

schütt petriturn-M
With manually operated, heavy turntable for smooth and long-lasting rotation. Double-sided construction accommodates two sizes of petri dish (90mm or 150mm diameter), by inverting the turntable.

schütt petriturn-E
Electrically driven, infinitely adjustable, constant speed rotation from 10 to 120 rpm. Permanent operation, or optionally a footswitch can be connected. 12V d.c., 5W power supply requiring 100 - 240V 50/60Hz (115V optional).

Type	Dimensions mm	Figure	PK	Cat. No.
schuett petriturn-M, manually driven	(Dia. x H) 160 x 45	1	1	**9.520 201**
schuett petriturn-E, electrically driven	(Dia. x H) 160 x 70	2	1	**9.520 200**
Foot pedal for schuett petriturn-E			1	**9.520 203**
Turntable adapter for Petri dishes up to 150mm diameter			1	**9.520 204**
Glass inoculation spreader	(W x D) 180 x 58	3	1	**9.520 206**
Stainless steel inoculation spreader	(W x D) 145 x 40	4	1	**9.520 205**



2 Inoculation loops Wironit

Wironit. CrNi 18/12. *Hammacher*

Diam. mm	Length mm	PK	Cat. No.
1.5	50	1	**9.160 057**
2.0	50	1	**9.160 056**
2.5	50	1	**9.160 058**
4.0	50	1	**9.160 055**
1.5	59	1	**9.160 061**
2.5	59	1	**9.160 062**
4.0	59	1	**9.160 063**



3 Inoculating loops and needles, PS

Radiation-sterilised. Semi-quantitative standard for sample handling, e.g. for diseases of the urinary tract. Surface treated to increase drop adhesion. Reduced contamination risks as product is disposable and does not require flaming. *Thermo Scientific*

Type	Capacity µl	PK	Cat. No.
Blue loop	10	50	**9.405 410**
Colorless loop	1	50	**9.405 401**
Yellow needle	--	50	**9.405 400**

Other colours on request

E & OE.

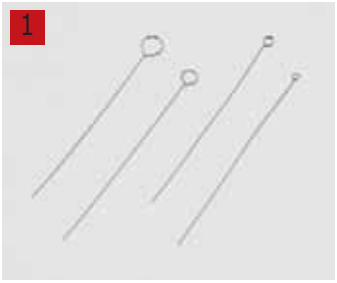
1 2 3 Inoculation loops "metal" and loop stands

Inoculation loops made from stainless steel, special stainless steel wire or platinum-iridium wire (90/10). *schuett-biotec*
Can be heated to red heat.
Length: 60mm. Diameter: 0.5mm.

Inoculation loop holder according to Kolle for 0.3 to 0.7mm wire diameter.

Fixed plastic blocks (autoclavable). Accomodate up to 6 inoculation loop holders at any one time.

Type	Description	Loop diam. mm	PK	Cat. No.
P-I 1	Platinum-iridium	1	1	**9.520 180**
P-I 2	Platinum-iridium	2	1	**9.520 181**
P-I 3	Platinum-iridium	3	1	**9.520 182**
P-I 5	Platinum-iridium	5	1	**9.520 184**
E 1	Stainless steel, special wire	1	10	**9.520 170**
E 2	Stainless steel, special wire	2	10	**9.520 171**
E 3	Stainless steel, special wire	3	10	**9.520 172**
E 5	Stainless steel, special wire	5	10	**9.520 174**
W-1.5	Stainless steel	1.5	10	**9.520 185**
W-2.5	Stainless steel	2.5	10	**9.520 186**
W-4.0	Stainless steel	4.0	10	**6.233 696**
Inoculation loop holder	160 mm long		1	**9.520 178**
Inoculation loop holder	240 mm long		1	**9.160 020**
Inoculation loop stands	(Dia. x H) 80 x 50mm		1	**9.520 190**
Inoculation loop stands	(L x W x H) 180 x 50 x 50mm		1	**9.520 191**







4 Inoculation loops, platiniridium

Platinum-iridium wire 90/10.
0.5mm thick.

Type	Diam. mm	PK	Cat. No.
without glass rod	3	1	**9.160 050**
without glass rod	2	1	**9.160 052**
fused into glass rod	3	1	**9.160 053**
fused into glass rod	2	1	**9.160 054**



5 Platinum-iridium wire

Platinum-iridium 90/10 wire available in different diameters.
Sold per cm.

Diam. mm	PK	Cat. No.
0.2	1	**9.160 702**
0.3	1	**9.160 703**
0.4	1	**9.160 704**
0.5	1	**9.160 705**
0.6	1	**9.160 706**
0.8	1	**9.160 708**
1.0	1	**9.160 710**



Bunsen burners please see page 129.



1 Loop Sterilizer schuett solaris

NEW!

Sterilization of inoculating loops, tweezers and small instruments within seconds. *schuett-biotec*

Sterilize with light!
- No gas, no open flame
- Instant-ready-to-use, no warm-up time, no waiting
- Sterilization temperature 900 to 1300°C
- Touch-free START, with IR- sensor and integrated timer
- Economical, low-cost operation

The schuett solaris is the perfect solution if an open flame should be avoided or gas cartridges etc. are not available. Used with standard electrical power. Reaches the safe working temperature of 900 to 1300°C within the split of a second. No warm-up time, no excess heat, no energy consumption between work cycles. START is generated by an infra-red sensor, which allows for efficient one-handed operation. The integrated timer can be set to 5 or 7 seconds. Pathogenic material is kept inside the sterilization chamber. No spreading, no sooting. Optimal for use in Laminar Flow Cabinets. Working angle adjustment. Robust and sturdy, no parts subject to mechanical wear, ideal for mobile operation in the field.

Specifications

Dimensions (WxDxH):	152 x 195 x 210mm
Weight:	approx. 2500g

Type	PK	Cat. No.
Loop Sterilizer schuett solaris	1	**9.018 741**
Quartz tube with bottom, outer diam. 17mm, length 100 mm	1	**9.018 742**

Further Burners please see page 127

E & OE.

Safety Laboratory Gas Burners Fuego SCS series

NEW!

WLD-TEC

Suitable for all flame related applications in the laboratory. The low profile body facilitates ergonomic operation; the streamlined design reduces air flow disturbances in a clean room workbench. The Fuego SCS series can be operated with foot pedal, button function or touch free IR-Sensor. Made of stainless steel, with fireproof controls.

- SCS Safety Control System with gas safety cut off: Ignition and flame control, temperature monitor, automatic unit switch off, residual heat display, burner head assembly monitor.
- BHC Burner Head Control.
- Removable burner head.
- Tilt mechanism right/left.
- Turbo flame.
- Holding device for 3 inoculation loop holders.
- Nozzles for natural gas, propane/butane gas.
- Approved by DIN-DVGW, approval no. NG2211AS0167.
- Warranty: 2 years.

Fuego SCS basic/ Fuego SCS basic RF: With stainless steel foot pedal, button function, 3 standard programs (without IR-Sensor and graphic display). The foot pedal regulates the burning time either by continuous foot pressure or by start-stop function.

Fuego SCS basic RF: Features as Fuego SCS basic but enables wireless operation due to modern radio foot pedal.

Fuego SCS/Fuego SCS pro: with Double-Click IR-sensor, button function and foot pedal operation. (foot pedal optional). Double-Click IR-sensor: This adjustable safety function ensures that the burner can only be ignited by activating the IR-Sensor twice. Adjustable IR-sensor reaction distance: 5mm to 50mm.
Illuminated graphic display: The animated, self-explanatory and language-less symbol display facilitates a rapid selection of all functions. 6 standard-programs with count down display: 1sec to 2hrs selectable.
The first safety laboratory gas burner with comfort package: Cooling time reminder for inoculation loops, temperature regulation for heating media, gas consumption display for gas cartridges, flexible and individual by selecting user account, acoustic signals as operating aids.
Additional safety assistance: Zero-pressure shut off for a pressureless gas hose. Graphical installation instructions facilitate the initial start-up.

Fuego SCS pro: Features as Fuego SCS, plus battery operation (9hrs), 2 rechargeable batteries (Mignon AA), fast charge function (3hrs) and safety tilt sensor.

Additional accessories are available on request.

1



6.232 207

2



6.231 770

Specifications

Dimensions (WxDxH):	103 x 130 x 49mm
Power supply:	100-240V 50/60Hz
Weight:	700g

Type	PK	Cat. No.	
Fuego SCS basic	1	**6.232 207**	1
Fuego SCS basic RF	1	**6.255 678**	
Fuego SCS	1	**6.231 770**	2
Fuego SCS pro	1	**9.018 584**	
Stainless steel foot pedal	1	**9.018 585**	



1 Culture media bottles DURAN®, glass, cylindrical

Rimless. For use with Kapsenberg caps. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable. *DURAN Group*

Capacity ml	Diam. mm	Height mm	Neck diam. mm	PK	Cat. No.
50	40	107	18	1	**9.010 050**
100	40	150	18	1	**9.010 060**
200	50	175	18	1	**9.010 070**



2 Kapsenberg caps

Aluminium. For the closure of culture tubes, bottles and flasks. *DURAN Group*

For neck dia. mm	PK	Cat. No.
16	1	**9.010 116**
18	1	**9.010 118**



9.010 153

3 Bottles, glass, culture medium for metal caps, DURAN®

Rimless. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable. *DURAN Group*

Capacity ml	Diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
100	50	38	125	1	**9.010 150**
300	70	38	170	1	**9.010 151**
500	83	38	208	1	**9.010 152**
1000	105	38	243	1	**9.010 153**



4 Bottles, glass, culture medium, DURAN®

Rimless. For glass caps. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable. *DURAN Group*

Capacity ml	Diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
300	71	31	169	1	**9.010 130**
500	83	46	204	1	**9.010 135**
1000	105	46	237	1	**9.010 140**



5 Glass caps, DURAN®

Glass Type I/neutral glass as per USP, EP and JP. Autoclavable. *DURAN Group*

For neck dia. mm	PK	Cat. No.
31	1	**9.010 180**
46	1	**9.010 185**

E & OE.

Culture media bottles, glass, DURAN®

Beaded rim. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable. *DURAN Group*

Capacity ml	Diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
100	50	29	115	1	**9.010 224**
300	70	42	168	1	**9.010 239**
500	83	42	207	1	**9.010 244**
1000	105	46	237	1	**9.010 254** 1
2500	150	50	315	1	**9.010 266**
5000	185	54	390	1	**9.010 273**

1



9.010 254

2 Culture flasks, DURAN®, Roux type

DURAN®. Roux type. With fire-polished, offset neck. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable. *DURAN Group*

Capacity ml	Width mm	Length mm	Height mm	PK	Cat. No.
1200	123	275	56	1	**9.010 512**

2



3 Culture flasks, glass DURAN®, straight neck

DURAN®. Erlenmeyer. Straight neck. Suitable for metal caps. Glass Type I/neutral glass as per USP, EP and JP. With retrace code (Batch Identification). Certificate available via the Internet. Autoclavable. *DURAN Group*

Capacity ml	Diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
100	64	38	114	1	**9.010 472**
200	79	38	138	1	**9.010 473**
250	85	38	149	1	**9.010 474**
300	87	38	161	1	**9.010 475**
500	105	38	183	1	**9.010 476**
1000	131	38	229	1	**9.010 477**
2000	166	38	302	1	**9.010 478**

3



4 Erlenmeyer flasks, DURAN®

DURAN®. Straight neck , rimless. For use with Kapsenberg caps. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable. *DURAN Group*

Capacity ml	Diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
100	60	18	120	1	**9.010 080**

4



Disposable baffled flasks - please see page 1347.



1 Culture flasks, Pyrex® borosilicate glass

NEW!

Scilabware

- Manufactured from Pyrex® borosilicate glass
- Erlenmeyer
- Straight neck
- Suitable for metal caps

Capacity ml	Diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
250	148	38	85	10	**9.141 175**
500	183	38	105	5	**9.141 176**
1000	229	38	131	2	**9.141 177**
2000	302	38	166	1	**9.141 178**



9.010 127

Culture flasks, borosilicate glass 3.3

Erlenmeyer. With 3 side baffles. Beaded rim.

Capacity ml	Diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
250	85	34	140	1	**9.010 125**
300	87	34	156	1	**9.010 126**
500	105	34	175	1	**9.010 127** 2
1000	131	42	220	1	**9.010 128**



9.010 123

Culture flasks, borosilicate glass 3.3

Erlenmeyer. With 3 side baffles. Straight neck. Suitable for metal caps.

Capacity ml	Diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
100	64	38	112	1	**9.010 120**
250	85	38	145	1	**9.010 121**
500	105	38	183	1	**9.010 122**
1000	131	38	232	1	**9.010 123** 3

E & OE.

Baffled flasks, Pyrex® borosilicate glass

NEW!

Scilabware

- Manufactured from Pyrex® borosilicate glass
- Exhibits 4 baffle indents to provide optimal and consistant agitation

Capacity ml	Diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
250	82	32	138	5	**9.141 171**
500	101	36	186	5	**9.141 172** 1
1000	129	43	222	2	**9.141 173**
2000	161	49	282	1	**9.141 174**

1



9.141 172

2 Baffled flasks DURAN®

DURAN Group

With GL 45 thread
- Oxygen introduction is often a limiting factor for cell growth.
- Baffled flasks cause a turbulent flow, increase the gas exchange surface and produce a higher oxygen transfer.
- Automated one-step production enables a reproducible and comparable result.
- Complete with membrane screw cap (gas exchange).

Capacity ml	Bottom diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
250	85	30	145	1	**9.141 260**
500	105	30	149	1	**9.141 261**

2



Fernbach baffled flasks, Pyrex® borosilicate glass

NEW!

Scilabware

For use in preparation of cultures.
- Large surface area to volume ratio
- Three laterally integrated baffles, to provide optimal and consistant agitation
- Available in 2 versions: with Delong neck, for use with culture flask caps or with PP screw cap, GL45

Description	Capacity ml	Diam. mm	Neck diam. mm	Height mm	PK	Cat. No.
Delong neck	2800	210	38	230	2	**9.141 169** 3
Screw cap	2800	210	45	230	2	**9.141 170** 4

3



9.141 169

4



5 Erlenmeyer flasks with baffles, PC

Thermo Scientific

Transparent. With baffles indented into the base which increases mixing when trypsinizing and aerating in processes such as cell culture and fermentation. Autoclavable.

Capacity ml	PK	Cat. No.
250	1	**9.140 968**
500	1	**9.140 969**
1000	1	**7.048 662**
2000	1	**7.048 663**

5



Disposable Erlenmeyer flaks - please see page 1347.



1 Sterile stoppers SILICOSEN® and BIO-SILICO®

SILICOSEN® and BIO-SILICO® are specially processed culture plugs in sterile rubber with continuous bubbles for preparation, filling and sterilisation of culture media. Their uniform pore structure and good air permeability make them excellent for the cultivation of aerobic microorganisms.

The choice between SILICOSEN® and BIO-SILICO® culture stoppers depends on the requirements of the application. SILICOSEN® culture stoppers have low water evaporation which makes them particularly suitable for long term cultures. BIO-SILICO® culture stoppers have high air permeability, similar to cotton plugs. Both types are chemically resistant, temperature resistant, liquid repellent and reusable.



9.231 010

Sterile stoppers SILICOSEN® T- and L-Type

Moisture evaporation is minimal, thus there is less drying of the culture medium. *Hirschmann*

Type	NS	Filter diam. top mm	Filter diam. bottom mm	Cylindrical length mm	Cone length mm	PK	Cat. No.
T-10	6-9	10	6	13	17	1	**9.231 010** 2
T-12	9-11	12	9	13	17	1	**9.231 012**
T-15	11-14	15	11	15	20	1	**9.231 015**
T-17	13-16	17	13	10	30	1	**9.231 017**
T-19	15-18	19	15	12	30	1	**9.231 019**
T-22	18-21	22	18	15	30	1	**9.231 022**
T-24	20-23	24	20	20	35	1	**9.231 024**
T-32	22-30	32	22	20	40	1	**9.231 032**
T-42	30-40	42	30	35	55	1	**9.231 042**
T-52	40-50	52	40	40	60	1	**9.231 052**
L-12	9-11	12	9	40	10	1	**9.231 072**
L-17	13-16	17	13	30	20	1	**9.231 077**
L-22	18-21	22	18	30	30	1	**9.231 082**



9.231 120

Sterile stoppers SILICOSEN® C-Type

Superb permeability and fits tight onto the media container due to sealing lip, where importance is placed on mounting quality. Suitable for shaking cultures. *Hirschmann*

Type	NS	Membrane diam. mm	Length mm	PK	Cat. No.
C-20	15-20	16	28	1	**9.231 120** 3
C-30	20-30	26	28	1	**9.231 130**
C-40	30-40	36	28	1	**9.231 140**
C-55	40-50	50	28	1	**9.231 150**



9.231 178

Sterile stoppers SILICOSEN® S-Type

Superb permeability. Suitable for aerobic bacterium cultures and shaking cultures. *Hirschmann*

Type	NS	Top diam. mm	Bottom diam. mm	Cylindrical length mm	Cone length mm	PK	Cat. No.
S-28	17 / 26	28	17	18	27	1	**9.231 178** 4
S-35	24 / 33	35	24	20	30	1	**9.231 185**
S-40	28 / 38	40	28	20	30	1	**9.231 190**

E & OE.

Sterile stoppers BIO-SILICO® N-Type

Cell size is uniform, which provides stable and good permeability. Optimum product for shaking cultures-durability and operability are excellent. *Hirschmann*



9.231 100

Type	NS	Top diam. mm	Bottom diam. mm	Cylindrical length mm	Cone length mm	PK	Cat. No.
N-12	9-11	13	9	13	17	1	**9.231 100** 1
N-15	11-14	16	11	14	22	1	**9.231 101**
N-17	13-16	19	13	15	25	1	**9.231 102**
N-19	15-18	21	15	16	28	1	**9.231 103**
N-22	18-21	24	18	18	30	1	**9.231 104**
N-24	20-23	25	20	20	32	1	**9.231 105**
N-32	22-30	34	22	24	36	1	**9.231 106**
N-42	30-40	44	30	32	46	1	**9.231 107**
N-52	40-50	54	40	36	50	1	**9.231 108**

2 LLG-Cellulose stoppers

Cellulose, 100% chlorine-free bleached.
Ideal for closing test tubes, culture flasks, Erlenmeyer flasks etc.



For inter. diam. mm	PK	Cat. No.
7.5 to 8.5	4000	**9.231 660**
8.5 to 9.5	1000	**9.231 661**
9.5	2000	**9.231 662**
10.5 to 11.5	2000	**9.231 663**
9.5 to 11.5	1000	**9.231 664**
11.5 to 13.5	1000	**9.231 665**
11.5 to 13.0	1000	**9.231 666**
12.5 to 14.5	1000	**9.231 667**
13.0 to 14.5	1000	**9.231 668**
12.0 to 14.0	1000	**9.231 669**
13.5 to 15.5	500	**9.231 670**
17.5 to 18.5	500	**9.231 671**
20.5 to 22.0	400	**9.231 672**
19.0 to 22.5	500	**9.231 673**
27.0 to 32.5	1000	**9.231 674**
29.5 to 31.0	250	**9.231 675**
32.5 to 35.0	100	**9.231 676**
32.0 to 33.0	150	**9.231 677**
30.0 to 32.5	750	**9.231 678**
33.5 to 36.0	150	**9.231 679**
35.5 to 39.5	600	**9.231 680**
37.5 to 41.5	100	**9.231 681**
40.0 to 43.5	100	**9.231 682**
42.0 to 46.5	100	**9.231 683**
47.0 to 48.0	75	**9.231 684**

3 LLG-Test tubes, AR® soda-lime glass

Test tubes with round bottom made out of AR®-Glass. Hydrolytic resistance: Class HGB 3 acc. to ISO 719, Type III acc. to C - USP.



Diam. mm	Height mm	Wall thickness mm	Description	PK	Cat. No.
8	70	0.5	with beaded rim	100	**6.201 034**
10	100	0.5	with beaded rim	100	**6.801 073**
12	100	0.5	with beaded rim	100	**7.607 198**
14	130	0.5	with beaded rim	100	**6.800 620**
16	130	0.6	with beaded rim	100	**6.800 382**
16	160	0.6	with beaded rim	100	**7.600 405**
20	180	0.6	with beaded rim	100	**7.607 778**
25	150	0.9	with beaded rim	50	**6.800 621**
30	200	0.9	with beaded rim	50	**7.600 324**
15	100	1.0	without rim	100	**7.651 872**
16	120	1.0	without rim	100	**7.651 871**
18	130	1.0	without rim	100	**7.652 552**
30	100	1.0	without rim	81	**6.235 823**

Caps and stoppers - please see page 31.



1 Culture tubes, soda glass, with screw cap, not graduated

AR®. soda glass. Wall thickness approx. 1 mm. With PP screw cap with white elastomer seal. Autoclavable (to 121°C).

BRAND

Capacity L	Diam. mm	Height mm	Neck thread GL	Max. rcf x g	PK	Cat. No.
6.5	12	100	14	3000	100	**9.010 032**
10.0	16	100	18	3000	100	**9.010 036**
30.0	18	180	18	1100	100	**7.019 348**
20.0	16	160	18	1800	100	**9.010 037**



2 Culture tubes, Pyrex®, PTFE

NEW!

Scilabware

- Ideal for culture work
- Manufactured from Pyrex® borosilicate glass
- High resistance to attack from water reduces leaching of contaminants which can cause pH changes
- Phenolic screwcaps with inert PTFE lined rubber disc
- Cap can withstand repeated dry heat and steam sterilisation cycles (121°C for 2 hours)

Diam. mm	Height mm	Wall thickness mm	Neck thread mm	PK	Cat. No.
14	100	1.5	13	40	**6.226 022**
16	100	1.8	15	40	**6.226 949**
16	125	1.8	15	40	**6.254 027**
16	160	1.8	15	40	**6.253 961**
18	100	1.8	18	40	**6.258 472**
18	180	1.8	18	40	**6.226 619**
20	100	1.8	20	40	**6.236 081**
20	200	1.8	20	40	**6.231 721**
22	200	1.8	22	40	**6.253 139**
26	100	2.0	25	40	**6.226 950**
26	200	2.0	25	40	**6.228 145**

Culture tubes are not recommended for centrifuge work.
Do not autoclave with a tightly screwed cap, always slacken off. Failure to adopt this procedure may result in tube breakage.

More culture tubes please see page 27 and further.



3 Disposable culture tube, Soda-lime-glass

NEW!

From Soda-lime-glass. Straight rim.

DURAN Group

Capacity ml	Outer diam. mm	Height mm	Wall thickness mm	PK	Cat. No.
6	12.25	75	0.80	500	**6.235 314**
14	15.50	100	0.80	310	**7.200 457**



4 Disposable culture tube, soda-lime glass, with screw cap

NEW!

From Soda-lime glass. With DIN thread and PP1 screw cap

DURAN Group

Capacity ml	Outer diam. mm	Height mm	Wall thickness mm	DIN-Thread GL	PK	Cat. No.
6	12	100	1	14	100	**7.021 547**
12	16	100	1	18	100	**7.021 548**
22	16	160	1	18	100	**7.021 549**
32	18	180	1	18	100	**7.021 550**

E & OE.

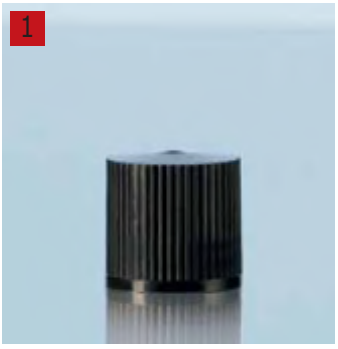
1 Screw cap for culture tubes, PP, with seal

NEW!

With seal from TPE.

DURAN Group

DIN-Thread GL	PK	Cat. No.
14*	100	**6.238 341**
18	100	**6.702 588**


1

2 Tubes, glass, DURAN®, culture, screw cap

DIN thread. Complete with red PBT screw cap with PTFE-faced sealing wad. Thus, it is suitable for the cultivation of microorganisms. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable.

DURAN Group

Diam. mm	Height mm	Neck thread GL	PK	Cat. No.
12	100	14	50	**9.010 012**
13	100	14	50	**9.010 013**
16	150	18	50	**9.010 014**
16	160	18	50	**9.010 016**
18	180	18	50	**9.010 018**
20	150	18	50	**9.010 019**


2

3 Culture tubes, glass DURAN®, small, rimless

To DIN 38411. Rimless. Suitable for use with Kapsenberg caps. Glass Type I/neutral glass as per USP, EP and JP. Autoclavable.

DURAN Group

Diam. mm	Height mm	Wall thickness mm	PK	Cat. No.
16	160	1.0 to 1.2	100	**9.010 046**
18	180	1.0 to 1.2	100	**9.010 048**


3

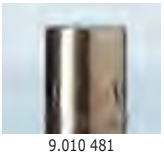
Metal caps

For culture flasks and culture medium bottles.

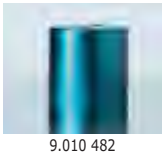
DURAN Group

Material	For neck dia. mm	PK	Cat. No.
Stainless steel	38	1	**9.010 481** 4
Aluminium, anodised blue	38	1	**9.010 482** 5

4


9.010 481

5


9.010 482

6 Metal caps, Erlenmeyer, Aluminium

Anodised in a choice of colours.

schuett-biotec

Special caps for sterile, but not hermetically sealing, closure of culture flasks and media bottles with straight, rimmed or rimless necks as indicated. With nichrome steel springs that clamp onto the outer wall of the container.

Cleaning advice available on request.

For neck dia. mm	Colour	With rim	PK	Cat. No.
37/39	silver	no	10	**9.231 456**
37/39	blue	no	10	**9.231 457**
37/39	red	no	10	**9.231 458**


6

1



1 Metal caps, Labocap without handle

schuett-biotec

For neck dia. mm	Handle	Colour	PK	Cat. No.
9/10	without	blue	100	**9.231 421**
12/13	without	blue	100	**9.231 422**
14/15	without	blue	100	**9.231 423**
15/16	without	blue	100	**9.231 424**
17/18	without	blue	100	**9.231 425**
19/20	without	blue	100	**9.231 426**
21/23	without	blue	100	**9.231 427**
24/26	without	blue	100	**9.231 428**
28/30	without	blue	100	**9.231 429**
9/10	without	red	100	**9.231 441**
12/13	without	red	100	**9.231 442**
14/15	without	red	100	**9.231 443**
15/16	without	red	100	**9.231 444**
17/18	without	red	100	**9.231 445**
19/20	without	red	100	**9.231 446**
21/23	without	red	100	**9.231 447**
24/26	without	red	100	**9.231 448**
28/30	without	red	100	**9.231 449**
12/13	without	yellow	100	**9.231 460**
15/16	without	yellow	100	**9.231 461**
17/18	without	yellow	100	**9.231 462**
19/20	without	yellow	100	**9.231 339**
12/13	without	green	100	**9.231 463**
15/16	without	green	100	**9.231 464**
17/18	without	green	100	**9.231 465**
19/20	without	green	100	**9.231 340**
09/10	without	silver	100	**9.231 369**
12/13	without	silver	100	**9.231 372**
14/15	without	silver	100	**9.231 374**
15/16	without	silver	100	**9.231 375**
17/18	without	silver	100	**9.231 377**
19/20	without	silver	100	**9.231 379**
21/23	without	silver	100	**9.231 381**
24/26	without	silver	100	**9.231 385**
28/30	without	silver	100	**9.231 388**
12/13	without	black	100	**9.231 334**
15/16	without	black	100	**9.231 466**
17/18	without	black	100	**9.231 337**
19/20	without	black	100	**9.231 341**
12/13	without	violet	100	**9.231 335**
15/16	without	violet	100	**9.231 336**
17/18	without	violet	100	**9.231 338**
19/20	without	violet	100	**9.231 342**
12/13	without	brown	100	**9.231 435**
15/16	without	brown	100	**9.231 436**
17/18	without	brown	100	**9.231 437**
19/20	without	brown	100	**9.231 438**

2



2 Metal caps, Labocap with handle, Aluminium

Anodised in a choice of colours. For sterile, but not hermetically sealing, closure of containers. With nichrome steel springs that clamp onto the outer wall of the container. Autoclavable.
Cleaning advice available on request.

schuett-biotec

For neck dia. mm	Handle	Colour	PK	Cat. No.
15/16	with	silver	100	**9.231 345**
17/18	with	silver	100	**9.231 347**
15/16	with	blue	100	**9.231 403**
17/18	with	blue	100	**9.231 404**
15/16	with	red	100	**9.231 413**
17/18	with	red	100	**9.231 414**
15/16	with	yellow	100	**9.231 326**
17/18	with	yellow	100	**9.231 330**
15/16	with	green	100	**9.231 327**
17/18	with	green	100	**9.231 331**
15/16	with	black	100	**9.231 328**
17/18	with	black	100	**9.231 332**
15/16	with	violet	100	**9.231 329**
17/18	with	violet	100	**9.231 333**

E & OE.

1 Aluminium caps, pure aluminium

Matt finish. Without internal clips. Loose-fit caps for sterile, but not hermetically sealing, closure of culture flasks and other containers. Can also be used as open specimen holders. Autoclavable.

schuett-biotec

Int. diam. mm	Height mm	PK	Cat. No.
11	25	100	**9.230 821**
12	25	100	**9.230 822**
13	25	100	**9.230 823**
14	25	100	**9.230 824**
15	25	100	**9.230 825**
16	30	100	**9.230 826**
17	30	100	**9.230 827**
18	30	100	**9.230 828**
20	30	100	**9.230 829**
22	30	100	**9.230 830**
28	30	100	**9.230 831**
32	30	100	**9.230 832**
39	30	10	**9.230 833**
44	40	10	**9.230 834**
48	40	10	**9.230 835**
55	40	10	**9.230 836**
58	40	10	**9.230 837**

1



2 3 Test tube racks, PP

PP. For all common test tube diameters. Very sturdy design. All openings are widely spaced apart to accommodate screw cap tubes. All racks have the same footprint and can be stacked easily when empty. Modified PP with greater density than water makes them ideal for use in water baths. Large marking area (60 x 12mm) for barcode labels and alphanumeric references for clear sample identification. Racks are supplied in three parts for quick and permanent assembly.
Continuous use temperature -20 to +90°C. Autoclavable (121°C). Choice of colours as outlined below.

BRAND

Array	For tubes diam. mm	Length mm	Width mm	Height mm	Colour	PK	Cat. No.
6 x 14	13	265	126	75	White	1	**9.193 240**
6 x 14	13	265	126	75	Blue	1	**9.193 241**
6 x 14	13	265	126	75	Red	1	**9.193 242**
6 x 14	13	265	126	75	Yellow	1	**9.193 243**
5 x 11	16	265	126	75	White	1	**9.193 230**
5 x 11	16	265	126	75	Blue	1	**9.193 231**
5 x 11	16	265	126	75	Red	1	**9.193 232**
5 x 11	16	265	126	75	Yellow	1	**9.193 233**
5 x 11	18	265	126	75	White	1	**9.193 245**
5 x 11	18	265	126	75	Blue	1	**9.193 246**
5 x 11	18	265	126	75	Red	1	**9.193 247**
5 x 11	18	265	126	75	Yellow	1	**9.193 248**
4 x 10	20	265	126	75	White	1	**9.193 250**
4 x 10	20	265	126	75	Blue	1	**9.193 251**
4 x 10	20	265	126	75	Red	1	**9.193 252**
4 x 10	20	265	126	75	Yellow	1	**9.193 253**
4 x 8	25	265	126	88	White	1	**9.193 255**
4 x 8	25	265	126	88	Blue	1	**9.193 256**
4 x 8	25	265	126	88	Red	1	**9.193 257**
4 x 8	25	265	126	88	Yellow	1	**9.193 258**
3 x 7	30	265	126	88	White	1	**9.193 260**
3 x 7	30	265	126	88	Blue	1	**9.193 261**
3 x 7	30	265	126	88	Red	1	**9.193 262**
3 x 7	30	265	126	88	Yellow	1	**9.193 263**

2



3



For further test tubes and racks please see page 27 and further.



Motic®
25
YEARS+
with you

1988

Motic is founded as a hi-tech industry specialized in designing and manufacturing advanced microscopy products

1995-98

Motic consolidates its presence in Europe by opening sales offices in Wetzlar and Barcelona with the aim of offering the best service

2001

Motic opens a sales office in Vancouver (Canada) to match its increasing demand in the American market

2002

The birth of the Moticams turns Motic into one of the leading brand names of digital microscopy products

2003

Motic enters into the high-end market with its popular AE and BA series of inverted and upright microscopes

2013

Motic shows its strength in its 25th birthday by creating new advanced products and introducing Wifi technology

Life always sets out **new challenges**

Our main challenge is to be **with you** for the next 25 years

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1 Digital Dry Bath AccuBlock™ Mini



Labnet

AccuBlock Mini combines digital control, a fast heating microtube block and a convenient AccuRack transfer system, all in an ultra compact footprint. With a temperature range to 100°C which can be set in increments of 0.1°C, AccuBlock Mini is suitable for a range of uses in life science, molecular biology, environmental and industrial laboratories and a variety of applications including incubation, enzyme reactions, immunoassays.

- accepts up to 12 x 1.5ml tapered microcentrifuge tubes
- with thermometer well for temperature confirmation and calibration
- microprocessor controlled heating element
- easy to read 4 digit LCD display
- built in calibration mode allows end users to calibrate the bath as needed

The included AccuRack allows quick loading or unloading of all sample tubes simultaneously. It is self standing and can be used to hold samples while they are prepared for loading. Samples can also be loaded directly into the AccuBlock™ Mini without the AccuRack.

Specifications:

Temperature range:	Ambient +5°C to 100°C, resolution 0.1°C
Temperature uniformity:	±0.1°C
Temperature accuracy:	±0.1°C
Timer:	0 - 19h 59min or continuous
Block material:	Anodized aluminum
Block capacity:	12 x 1.5ml tubes
Dimensions (WxDxH):	140 x 120 x 60mm
Weight:	1.3kg
Supply requirements:	230V 50/60Hz, or 120V 50/60Hz

Type	PK	Cat. No.
AccuBlock™ Mini	1	**9.945 780**

2 AccuBlock™ Digital Dry Baths



Labnet

The user calibration function allows for easy calibration to in-house standards when required. The dry bath is available as a single or dual block model. Interchangeable blocks are available to accommodate a wide variety of tubes, plates and slides. Each dry bath is supplied with a block lifter that enables the user to exchange blocks easily, even when the block is hot.

- precise microprocessor control
- broad temperature range, to 150°C
- large digital display
- easy user calibration
- single and dual block models

Specifications

Temperature range:	Ambient +5 to +150°C
Temperature uniformity:	±0.2°C
Temperature resolution:	±0.3°C
Temperature accuracy:	±0.3°C
Temperature control:	Microprocessor
Block material:	Stainless steel
Dimensions (WxDxH):	200mm x 265mm x 83mm
Weight:	2.2kg
Supply requirements:	230V 50/60Hz, or 120V 50/60Hz

Type	PK	Cat. No.
AccuBlock Digital Dry Bath, single block	1	**6.224 190**
AccuBlock Digital Dry Bath, dual block	1	**6.225 737**

3 Accessories for Digital Dry Baths AccuBlock™



Labnet

Type	PK	Cat. No.
Block, 24 x 1.5ml tubes	1	**6.224 191**
Block, 20 x 2.0ml tubes	1	**6.233 664**
Block, 24 x 0.5ml tubes	1	**6.235 417**
Block, 48 x 0.2ml PCR tubes or 6 x 0.2ml strips	1	**9.945 763**
Block 12 x 15ml centrifuge tubes	1	**9.945 764**
Block 5 x 50ml centrifuge tubes	1	**9.945 765**

1



1 Microtube block thermostat DB-4S for strips

NEW!

Grant

Designed for maintaining constant temperature of samples in tube strips. Aluminium dry block offers excellent stability and uniformity, LCD screen for actual and set time and temperatures. Ideal for PCR analysis.
- Dry block holds 32 x 0.2 ml microtubes or 4 x 0.2 ml strips
- Dry temperature control system maintains clean and aerosol-free environment
- 2-line LCD display clearly indicates both set and actual values for temperature and time

Specifications

Temperature range:	+5 to +100°C
Stability at 37°C:	±0.03°C
Uniformity at 37°C:	±0.12°C
Heat-up times:	25°C to 100°C in 40min 25°C to 60°C in 10min 25°C to 37°C in 4min
Timer:	1min to 96h
Power supply:	230V, 50/60Hz

Type	Dimensions (W x D x H) mm	PK	Cat. No.
DB-4S	140 x 120 x 70	1	**9.721 059**

2



2 Incubators PCH-1/PCH-2/PCH-3

Grant

Personal benchtop cooling/heating dry block for microcentrifuge tubes. The ingenious block construction, combined with the powerful Peltier module, produces very rapid cooling and heating.

Temperature range:	-10 to +100°C
Heat up, amb. to 100°C:	< 10 min
Cool down, 100°C to amb.:	< 12 min
Cool down, amb. to -10°C:	< 11 min

Type	Type	PK	Cat. No.
PCH-1	20 x 0.5ml and 12 x 1.5ml microtubes	1	**9.721 009**
PCH-2	20 x 1.5ml microtubes	1	**9.721 010**
PCH-3	20 x 2.0ml microtubes	1	**9.721 066**

3



3 Microtube block thermostat BTD

NEW!

Grant

Grant´s block heating system BTD with fixed block is designed for rapid and precise heating of microtubes up to 100°C.

- Digital temperature control for optimum precision
- Heating block holds combinations of four microtube sizes simultaneously - up to a total of 49 tubes: 24 x 1.5/2.0 ml, 15 x 0.5 ml, 10 x 0.2 ml
- Flexible tube sizes and rapid heat-up time enables swift change of application
- Convenient integral timer for time-sensitive incubations
- Sturdy, durable, easy-to-clean plastic construction; compact design with small footprint
- 2-line display for simple and precise setting of temperature/time and for monitoring current status during operation

Specifications

Temperature range:	5 to 100°C
Stability at 37°C:	±0.1°C
Uniformity:	±0.2°C
Heat-up times:	25°C to 100°C in 15 min 25°C to 37°C in 4 min
Timer:	1 min to 96 h
Power supply:	230V, 50/60Hz

Type	Power W	Dimensions (W x D x H) mm	PK	Cat. No.
BTD	200	210 x 230 x 110	1	**6.223 310**

E & OE.

1 2 3 Block thermostats, QBA, QBD and QBH series

Grant

For controlled dry heating of test tubes, microplates and Eppendorf tubes in interchangeable aluminium blocks. The following models are available:

QBA
- analogue dial temperature setting
- two models with 1 or 2 removable/interchangeable blocks
- robustly constructed in streamlined coolwall aluminium and chemical-resistant plastic

QBD/QBH2
- Choose from three digital systems with 1, 2 or 4 interchangeable blocks (QBD models) and one digital high-temperature system (QBH2) with 2 blocks
- fast heat-up time and in-block temperature sensing capability using accessory external sensor probe
- built-in timer, programmable delayed start and RS232 output for data monitoring
- requires but does not include interchangeable QB-series blocks

1



2



3



Specifications	**Models QBA1/QBA2**
Temperature range:	5 to 100°C
Stability at 37°C:	±1.0°C
Uniformity	
within the block at 37°C:	±1.0°C
across similar blocks at 37°C:	±1.0°C
Supply requirements:	230V, 50/60Hz, single phase
	Models QBD1/QBD2/QBD4/QBH2
Temperature range:	5 to 130°C, QBH2: 5 to 200°C
Stability at 37°C:	±1.0°C
Uniformity	
within the block at 37°C:	±0.1°C
across similar blocks at 37°C:	±0.2°C
Supply requirements:	230V, 50/60Hz, single phase

Type	Blocks accepted	Power W	Length mm	Width mm	Height mm	PK	Cat. No.
QBA1	1	150	200	230	100	1	**9.852 305**
QBA2	2	300	200	280	100	1	**9.852 306**
QBD1	1	150	200	230	100	1	**9.852 307**
QBD2	2	300	200	280	100	1	**9.852 308**
QBD4	4	600	200	380	100	1	**9.852 309**
QBH2	2	300	200	280	100	1	**9.852 310**

4 Block thermostats, QBA, QBD, QBH series, accessory covers

Grant

Block thermostats, QBA, QBD, QBH series, accessory covers. Transparent polycarbonate. Protect the operator against accidentally touching blocks whilst hot or contamination of samples from splashes. (Not required with QDP-FL mictrotiter blocks).

4



Type	Description	PK	Cat. No.
QDLS	Cover for QBA1 and QBD1	1	**9.852 311**
QDLL	Cover for QBD4	1	**9.852 312**
QDLS	Cover for QBA2, QBD2 and QBH2	1	**9.852 314**

5 Digital block thermostats QB, for QBA, QBD, QBH series

Grant

Accessory blocks for QB series only. Interchangeable. Machined aluminium, (L x W x H) 140 x 50 x 63mm. Holes drilled as indicated.

5



Type	For tubes diam. mm	No.of holes	PK	Cat. No.
QB-10	10 mm	24	1	**9.951 661**
QB-12	12 mm	24	1	**9.951 662**
QB-16	16 mm	12	1	**9.951 663**
QB-18	18 mm	12	1	**9.951 664**
QB-24	24 mm	5	1	**9.951 665**
QB-50	50 ml	4	1	**6.075 814**
QB-H	0.2 ml	56	1	**9.951 666**
QB-E0	0.5 ml	24	1	**9.951 667**
QB-E1	1.5 ml	24	1	**9.951 668**
QB-E2	2.0 ml	24	1	**9.951 669**
QB-0	Massif. Holes are drilled by the user.		1	**9.951 670**

Further blocks available on request.

1



9.852 300

4 Block Heaters, analogue and digital, SBH series

Stuart

- choice of either analogue or digital models
- digital models available with either 130°C or 200°C maximum temperature
- three block model for extra capacity
- dual control models have two blocks with independent temperature control
- uniform and stable block temperatures

Designed for the precise heating of test-tubes, microcentrifuge tubes, cuvettes and microplates.
Range compromises an economical analogue model with easy to use, dial setting and advanced digital models with bright, easy to read, LED display which facilitates setting of the required temperature and also accurate monitoring of the actual temperature.
Excellent temperature stability and uniformity is maintained via sensitive, microprocessor control.
Heats to 100°C in <12 mins.
Supplied complete with block extraction tool but without aluminium blocks which must be ordered separately.
With BioCote, silver-based, antimicrobial protection.

2



9.852 303

Specifications

Temperature stability at 37°C:	±0.1°C
Uniformity within block at 37°C:	±0.1°C
Uniformity within block at 130°C:	±1°C
Electrical supply:	230V 50Hz
	SBH130 // SBH130D // SBH200D
Number of blocks:	2
Temp. range (Ambient):	Amb.+8°C to +130°C // Amb.+8°C to +130°C // Amb.+8°C to +200°C
Display type:	Calibrated knob // LED // LED
Display resolution:	10°C // 1°C // 1°C
Dimensions (WxDxH) mm:	235 x 280 x 115mm
Net weight:	2.1kg // 2.3kg // 2.3kg
Heater power:	300W
	SBH130D/3 // SBH200D/3
Number of blocks:	3
Temp. range (Ambient):	Amb.+8°C to +130°C // Amb.+8°C to +200°C
Display type:	LED
Display resolution:	1°C
Dimensions (WxDxH) mm:	310 x 280 x 115mm
Net weight:	3.2kg
Heater power:	450W
	SBH130DC // SBH200DC
Number of blocks:	2 (independent control)
Temp. range (Ambient):	Amb.+8°C to +130°C // +50°C to +200°C
Display type:	LED
Display resolution:	1°C
Dimensions (WxDxH) mm:	310 x 280 x 115mm
Net weight:	2.9kg
Heater power:	300W

3



6.207 050

4

Type	Description	PK	Cat. No.
SBH130	Block heater, 2 block, analogue, 130°C	1	**9.852 300** 1
SBH130D	Block heater, 2 block, digital, 130°C	1	**9.852 301**
SBH200D	Block heater, 2 block, digital, 200°C	1	**9.852 302**
SBH130D/3	Block heater, 3 block, digital, 130°C	1	**7.624 685**
SBH200D/3	Block heater, 3 block, digital, 200°C	1	**9.852 303** 2
SBH130DC	Block heater, 2 block, digital, dual control, 130°C	1	**6.207 050** 3
SBH200DC	Block heater, 2 block, digital, dual control, 200°C	1	**9.852 315**

5



5 Aluminium blocks SHT for block heaters Stuart SBH series

Supplied singly.

Stuart

Description	PK	Cat. No.
Aluminium block for 20 x 10.5mm Ø tubes	1	**9.951 617**
Aluminium block for 20 x 12.5 mm Ø tubes	1	**9.951 618**
Aluminium block for 12 x 16.5 mm Ø tubes	1	**9.951 619**
Aluminium block for 8 x 19.5 mm Ø tubes	1	**9.951 620**
Aluminium block, solid, for user to drill as required	1	**9.951 621**
Aluminium block for 48 x 0.2 ml centrifuge tubes	1	**9.951 622**
Aluminium block for 20 x 1.5 ml Eppendorf Tubes®	1	**9.951 623**
Aluminium block for 20 x 2.0 ml Eppendorf Tubes®	1	**9.951 624**
Aluminium block for 15 x 10 mm cuvettes.	1	**9.951 625**

*Separations can be removed to take larger cells

BlockThermostats for cooling and heating

The HLC by DITABIS Block Thermostats are used for tem-pering of solutions in closed reaction tubes and plates.They stand out due to their high temperature accuracy as well as their various field of application thanks to over 30 different exchangeable blocks.

Ditabis

1 HeatingBlockThermostat TH 21

NEW!

The basic model with excellent performance

Ditabis

Specifications:

Temperature operation range:	Amb. +3°C to +130°C
Temperature adjustable range:	0°C to +135°C
Accuracy/ resolution:	±0.1°C/0.1°C
Max. heating time:	9.5°C/min
Dimensions (WxDxH):	220 x 330 x 109mm
Capacity:	2 exchangeable blocks*
Weight (with block/blocks):	approx. 3.5kg
Electrical heating power:	350W
Supply requirements:	230 V, 50 Hz
Easy Control:	Timer 19h 59min

Description	PK	Cat. No.
HeatingBlockThermostat TH 21	1	**9.777 214**
HeatingBlockThermostat TH 21 UK	1	**9.777 285**
HeatingBlockThermostat TH 21 CH	1	**9.777 286**

*Exchangeable blocks are not included in delivery.

1



2



2 CoolingBlockThermostat TK 23

NEW!

Cool and heat with double capacity

Ditabis

Specifications:

Temperature operation range:	Amb. -16°C to +90°C
Temperature adjustable range:	-10°C to +95°C
Accuracy/ resolution:	±0.1°C/0.1°C
Max. heating time:	4°C/min
Max. cooling time:	7°C/min
Dimensions (WxDxH):	220 x 330 x 144mm
Capacity:	2 exchangeable blocks*
Weight (with block/blocks):	approx. 7.5kg
Electrical heating/ cooling power:	130W
Supply requirements:	230V, 50Hz
Smart Control:	30 program steps

Description	PK	Cat. No.
CoolingBlockThermostat TK 23	1	**9.777 212**
CoolingBlockThermostat TK 23 UK	1	**9.777 283**
CoolingBlockThermostat TK 23 CH	1	**9.777 284**

*Exchangeable blocks are not included in delivery.

Suitable exchangeable blocks and accessories - please see page 1305.

1



9.816 801

2



9.816 807

Dry Block Heater

NEW!

IKA

Digital block heaters for 1, 2, 3 or 4 aluminium blocks provides precise temperature control in small vessels. Included PT 1000 temperature sensor allows temperature control directly in the sample vessel. It is used with PCR tubes, PCR strips, Greiner tubes, microplates and cuvettes. The block heater is ideal for melting and boiling point determination, enzyme reactions, incubation and activation of cultures, immunoassays, DNA denaturation, culture media tests, coagulation tests, blood-urea-nitrogen determinations and in situ hybridizations.

- Stepless adjustable temperature up to 120°C
- Timer: Countdown, adjustable from 1min to 99h 59min
- Counter: Display of heating time
- Highly versatile with a large number of blocks
- Error code display
- Fixed safety circuit
- Acoustic signal at end of test

Without blocks. Please order separately.

Specifications

Temperature range	RT to +120°C
Display:	LED
Heat control accuracy:	±1K
Connection for ext. temperature sensor:	DIN 12878
Control accuracy with sensor:	±1K
Temperature constancy in medium:	±1K
Temperature stability within the blocks at 37°C:	±0.2°C
Temperature stability within the blocks at 60°C	±0.4°C
Fixed safety circuit:	+140°C
Protection class acc. to DIN EN 60529:	IP 21
Power supply:	220-240V, 50760Hz

Type	Heating power W	Dimensions Set-up plate (W x D) mm	Dimensions (W x D x H) mm	PK	Cat. No.	
Dry Block Heater 1	150	96 x 75	151 x 228 x 73	1	**9.816 801**	1
Dry Block Heater 1 UK	150	96 x 75	151 x 228 x 73	1	**9.816 802**	
Dry Block Heater 1 CH	150	96 x 75	151 x 228 x 73	1	**9.816 803**	
Dry Block Heater 2	250	96 x 152	151 x 304 x 73	1	**9.816 804**	
Dry Block Heater 2 UK	250	96 x 152	151 x 304 x 73	1	**9.816 805**	
Dry Block Heater 2 CH	250	96 x 152	151 x 304 x 73	1	**9.816 806**	
Dry Block Heater 3	300	96 x 227	151 x 380 x 73	1	**9.816 807**	2
Dry Block Heater 3 UK	300	96 x 227	151 x 380 x 73	1	**9.816 808**	
Dry Block Heater 3 CH	300	96 x 227	151 x 380 x 73	1	**9.816 809**	
Dry Block Heater 4	375	96 x 304	151 x 456 x 73	1	**9.816 810**	
Dry Block Heater 4 UK	375	96 x 304	151 x 456 x 73	1	**9.816 811**	
Dry Block Heater 4 CH	375	96 x 304	151 x 456 x 73	1	**9.816 812**	

3



3 Block heater ThermoStat plus

ThermoStat plus product features: *Eppendorf AG*

- Precise temperature control of all commonly used laboratory tubes
- Temperature control range -5°C to 99°C
- Temperature/running time can be programmed individually, up to 4 temperature levels and 4 time phases in succession
- User-friendly operation with no double-function keys
- Remote control by PC and documentation output in accordance with GLP requirements are possible via an RS 232 interface

Accessory features: Interchangeable blocks

- Excellent heat insulation, safe to touch (no direct contact with hot surfaces)
- Interchangeable thermoblocks for 24 x 0.5 ml, 1.5 ml or 2.0 ml microtubes: Each supplied with a work rack and cooling pack for rapid cooling to 0°C (instead of an ice bath)
- Interchangeable thermoblock for microtitration plates of all well forms incl. deep well microplates; Adapter plate for 96 x 0.2 ml PCR tubes for use with the microtitration plate block
- Block with lid for headspace and other laboratory tubes with diameter 11mm to 12mm, height 30mm to 76mm
- CombiBox, interchangeable thermoblock for universal temperature control of various sizes of tubes; can be attached easily, without locking

Type	Description	PK	Cat. No.
ThermStat plus	basic unit without interchangeable thermoblock	1	**9.776 695**

Additional interchangeable thermoblocks are available - details on request

E & OE.

1 Accessories for ThermoStat plus

1



Accessory features: Interchangeable blocks *Eppendorf AG*

- Excellent heat insulation, safe to touch (no direct contact with hot surfaces)
- Interchangeable thermoblocks for 24 x 0.5ml, 1.5ml or 2.0ml microtubes: Each supplied with a work rack and cooling pack for rapid cooling to 0°C (instead of an ice bath)
- Interchangeable thermoblock for microtitration plates of all well forms incl. deep well microplates; Adapter plate for 96 x 0.2ml PCR tubes for use with the microtitration plate block
- Block with lid for headspace and other laboratory tubes with diameter 11mm to 12mm, height 30mm to 76mm
- CombiBox, interchangeable thermoblock for universal temperature control of various sizes of tubes; can be attached easily, without locking

Description	PK	Cat. No.
Interchangeable block for 24 x 0.5ml microtubes, with work rackand cooling pack to 0°C	1	**9.776 673**
Interchangeable block for 24 x 1.5ml microtubes, with work rack and cooling pack to 0°C	1	**9.776 674**
Interchangeable block for 24 x 2ml microtubes, with work rack and cooling pack to 0°C	1	**9.776 675**
Interchangeable block with cover for microtitration and deep well plates	1	**9.776 696**
Adapter plate for 96 x 0.2 ml PCR vessels for use with interchangeable block for microtitration plates	1	**9.776 697**
Interchangeable block CombiBox for various tubes, footprint 13.5 x 9.0 x 6.0 cm (W x D x H)	1	**9.776 698**
Interchangeable block for vessels with 11 to 11.9 mm dia., height 30 to 76 mm	1	**9.776 699**
Interchangeable block for 8 x 15ml Falcon tubes	1	**9.776 687**
Interchangeable block for 4 x 50ml Falcon tubes	1	**9.776 688**
Interchangeable block for 1.5ml - 2ml Cryotubes	1	**9.776 689**
Interchangeable block for 4 x microscope slides	1	**9.776 691**

2 Inca Microplate Incubator

2



The personal microplate incubator for reliable, accurate and long-life operation *Mikura*

- variable temperature control as standard
- temperature or elapsed time display
- built-in timer with buzzer
- accommodates all plate types
- easy microplate location
- quiet and reliable
- minimal footprint
- no maintenance required
- available in various colour combinations
- low voltage for added safety
- ideal for field applications
- CE Marked

Whether a laboratory technician or a diagnostic kit manufacturer the Inca is the natural choice for single microplate incubation. Laboratory bench space is costly. However, with a footprint of just 120mm x 180mm, Inca offers the most economical and advanced technical solution. The use of unique design and advanced electronic temperature control circuitry guarantees an outstanding stable and accurate performance combined with quiet and long operating life.

Specification

Temperature range:	5°C above ambient to 50°C
Accuracy:	>±0.5°C of set temperature
Dimensions (WxDxH):	120 x 180 x 100mm (main unit)
Weight complete system:	920 g
Heater Power:	15 watts
Operating voltage:	100-230V, 50/60Hz a.c.
Power consumption:	1.25A
Power Supply:	12V, 2A, d.c., centre +
Environmental operating temp.:	10°C ... 40°C
Environmental storage temp.:	4°C ... 40°C
Fuse rating:	1.25A T
Display:	3 digit LCD temperature display
Case Material:	ABS

Type	PK	Cat. No.
Personal microplate incubator Inca	1	**4.006 930**

1



1 Thermoshaker PCMT for microtubes and PCR plates

NEW!

Grant

Variable speed, variable temperature heating and cooling thermoshaker with a choice of blocks for microtubes and microplates. The PMCT can cool down to 15°C below ambient temperture.
- Fast heat-up and cooling times
- Temperature setting range +4°C to +100°C
- Temperature control range 15°C below ambient to +100°C
- Shaking speed: 250 to 1400 rpm
- Temperature uniformity ±0.1°C

Choice of 5 interchangable blocks:
- HC18 20 (20 x 0.5ml and 12 x 1.5ml microtubes)
- HC32 (20 x 0.2ml and 12 x 1.5ml microtubes)
- HC24 (24 x 2ml microtubes)
- HC96 (96-well microplate for PCR, 0.2ml)

Block is required. Specify when ordering.

Applications:
- Genetic analyses, extraction of DNA, RNA and further sample preparation
- Biochemical studies of enzymatic reactions and processes
- Extraction of metabolites from cellular material

Type	PK	Cat. No.
PCMT	1	**9.721 050**

2



9.721 052

Accessory blocks for Thermoshaker PCMT

NEW!

Grant

Type	PK	Cat. No.
Block HC24N for 24 x 1.5ml microtubes	1	**9.721 073**
Block HC18 for 20 x 0.5 + 12 x 1.5ml microtubes	1	**9.721 052** 2
Block HC24 for 24 x 2.0ml microtubes	1	**9.721 053**
Block HC32 for 20 x 0.2 + 12 x 1.5ml microtubes	1	**9.721 054**
Block HC96 for 96-well microplates (0.2ml)	1	**9.721 055**

3



3 Microtube thermoshaker PHMT

Grant

The PHMT is a compact and versatile thermoshaker, ideal for applications requiring heating and shaking in microtubes and suitable for use in cold rooms and incubators (operating temperature range 4 to 40°C). It is effectively three instruments in one: a microtube thermoshaker, a compact benchtop incubator without shaking, a microtube shaker without temperature control. By combining the mixing operation with the incubation phase, reaction process times and operator workload are reduced and efficiency of many procedures is increased, resulting in a higher throughput.
- temperature range: ambient plus 5 to 100°C
- uniformity: ±0.1°C
- shaking speed: 250rpm to 1400rpm
- timed shaking operation: 1 min to 96 hours
- rapid heat-up
- continuous or timed operation, with alarm buzzer and automatic switch-off facility
- incl. interchangeable block PSC20 for 20 x 2.0ml microtubes

Type	For	PK	Cat. No.
PHMT-PSC18	20 x 0.5 ml + 12 x 1.5 ml	1	**6.234 725**
PHMT-PSC32	20 x 0.2 ml + 12 x 1.5 ml	1	**9.721 079**
PHMT-PSC24	24 x 2.0 ml	1	**9.721 041**
PHMT-PSC24N	24 x 1.5 ml	1	**9.721 072**
PHMT-PSC96	1 x 96 well	1	**9.721 080**

4



4 Accessory blocks for Microtube thermoshaker PHMT

Grant

Type	PK	Cat. No.
Block PSC18 for 20 x 0.5 + 12 x 1.5/2.0ml microtubes	1	**9.721 036**
Block PSC24 for 24 x 2.0ml microtubes	1	**9.721 042**
Block PSC24N for 24 x 1.5ml microtubes	1	**9.721 071**
Block PSC32 for 20 x 0.2 + 12 x 1.5ml microtubes	1	**9.721 043**
Block PSC96 for 96-well plates (0.2ml)	1	**9.721 044**

1 Microplate thermoshaker PHMP/PHMP-4

Grant

For 96- and 384-well plates. The PHMP is a variable speed, variable temperature microplate shaker incubator with excellent temperature uniformity across the microplate.
The patented heated lid and base which completely cover the plate produce a controlled micro-environment.
This is combined with powerful orbital shaking to produce the maximum yield from your incubations.
- Stability ±0.1ºC, uniformity ±0.2ºC
- Rapid heat-up
- Choice of two models with capacity for 2 microplates (PHMP) or 4 microplates (PHMP-4)
- variable speed: 250rpm to 1200rpm
- 2mm shaking orbit for effective mixing
- temperature range: amb. + 5 to 60°C
- timed operation: 1 min to 100 hours
- for 2 standard 96 or 384-well plates (max. 14mm height)

Type	PK	Cat. No.
PHMP	1	**9.721 033**
PHMP-4	1	**6.227 761**

1



2



2 Shaking Incubators VorTemp™ 56/ 1550

Labnet

VorTemp 56 is supplied with interchangeable platforms for microtubes (56 x 1.5ml tubes, or small tubes with adapters) or microplates (accepts standard and deepwell plates, up to 2.0ml). VorTemp 1550 includes platforms for 8 x 50ml and 18 x 15ml tubes.
The shaker in the VorTemp 56 may be turned off, allowing the unit to be used as a static incubator.
- shake and incubate samples simultaneously
- interchangeable platforms
- broad temperature and speed range
- intelligent control with digital LED display

Specifications

Temperature range	Ambient + 5°C to 99°C
Temperature accuracy	±0.5°C
Speed range	
Vortemp 56	200 to 1200rpm
VorTemp 1550	200 to 900rpm
Motion/orbit	Circular/3mm
Timer	1 to 999 minutes or continuous
Capacity:	
Vortemp 56	56 x 1.5/2.0ml tubes, 4 standard or 2 deep well microplates
VorTemp 1550	18 x 15ml, 8 x 50ml tubes
Dimensions (WxDxH)	
VorTemp 56	23 x 31 x 23cm
VorTemp 1550	26 x 31 x 31cm
Weight	
VorTemp 56	11kg
VorTemp 1550	12kg
Electrical	230V 50Hz or 120V 60Hz

Description	PK	Cat. No.
VorTemp 56	1	**9.945 760**
VorTemp 1550	1	**9.945 761**
Additional platform for microtubes	1	**9.945 762**

ThermoMixers for mixing, cooling and heating

The HLC by DITABIS Thermo Shakers are used for tempering and mixing of solutions in closed reaction tubes and plates. They possess a very large temperature application range as well as manifold programming options.

Ditabis

1 CoolingThermoMixer MKR 13

NEW!

Ditabis

Specifications

Temperature operation range:	Amb. -18°C to +100°C
Temperature adjustable range:	-10°C to +105°C
Accuracy/resolution:	±0.1°C/0.1°C
Max. heating time:	6°C/min
Max. cooling time:	12°C/min
Shaking frequency:	200rpm to 1500rpm
Orbit:	3mm orbital
Dimensions (WxDxH):	220 x 330 x 144mm
Capacity:	1 exchangeable block*
Weight:	9kg
Electrical heating/cooling power:	130W
Supply requirements:	230V, 50Hz
Smart Control:	30 program steps, short mix, interval shaking

Description	PK	Cat. No.
CoolingThermoMixer MKR 13	1	**9.777 200**
CoolingThermoMixer MKR 13 UK	1	**9.777 271**
CoolingThermoMixer MKR 13 CH	1	**9.777 272**

*Exchangeable blocks are not included in delivery.

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2



2 CoolingThermoMixer MKR 23

NEW!

Unique in the world: cooling and mixing with 2 blocks
Save time, space and money by means of double capacity

Ditabis

Specifications:

Temperature operation range:	Amb. -11°C to +70°C
Temperature adjustable range:	0°C to +80°C
Accuracy/ resolution:	±0.3°C/0.1°C
Max. heating time:	3.5°C/min
Max. cooling time:	6.5°C/min
Shaking frequency:	200rpm to 1200rpm
Orbit:	3mm orbital
Dimensions (WxDxH):	220 x 330 x 144mm
Capacity:	2 exchangeable blocks*
Weight (with block/blocks):	approx. 9.5kg
Electrical heating/ cooling power:	200W
Supply requirements:	230V, 50Hz
Smart Control:	30 program steps, short mix, interval shaking

Description	PK	Cat. No.
CoolingThermomixer MKR 23	1	**9.777 202**
CoolingThermomixer MKR 23 UK	1	**9.777 273**
CoolingThermomixer MKR 23 CH	1	**9.777 274**

*Exchangeable blocks are not included in delivery.

E & OE.

HeatingThermoMixer MHR 11/MHR 13

NEW!

Ditabis

Heats 3 times as fast as competitors.
Highest accuracy: max. 0.1°C deviation.

Specifications:

Temperature operation range:	Amb. +3°C to +130°C
Temperature adjustable range:	0°C to +135°C
Accuracy/ resolution:	±0.1°C/0.1°C
Max. heating time:	11.5°C/min
Shaking frequency MHR 11:	80rpm to 1500rpm
Shaking frequency MHR 13:	200rpm to 1500rpm
Orbit:	3mm orbital
Dimensions (WxDxH):	220 x 330 x 109mm
Capacity:	1 exchangeable block*
Weight:	6.5kg
Electrical heating power:	200W
Supply requirements:	230V, 50Hz
Easy Control MHR 11:	Timer 19h 59min, slider for shaking frequency
Smart Control MHR 13:	30 program steps, short mix, interval shaking

Description	PK	Cat. No.	
HeatingThermomixer MHR 11	1	**9.777 208**	1
HeatingThermomixer MHR 11 UK	1	**9.777 279**	
HeatingThermomixer MHR 11 CH	1	**9.777 280**	
HeatingThermomixer MHR 13	1	**9.777 204**	2
HeatingThermomixer MHR 13 UK	1	**9.777 275**	
HeatingThermomixer MHR 13 CH	1	**9.777 276**	

*Exchangeable blocks are not included in delivery.

1



9.777 208

2



9.777 204

HeatingThermoMixer MHR 23/MHL 23

NEW!

Ditabis

Our bestseller: universally applicable
Linear shaking movement for maximum mixing
Unbeatable for very small sample volumes

Specifications:

Temperature operation range:	Amb. +3°C to +130°C
Temperature adjustable range:	0°C to +135°C
Accuracy/ resolution:	±0.1°C/0.1°C
Max. heating time:	9.5°C/min
Shaking frequency MHR 23:	200rpm to 1500rpm
Shaking frequency MHL 23:	200rpm to 1300rpm
Orbit:	3mm orbital
Dimensions (WxDxH):	220 x 330 x 109mm
Capacity:	2 exchangeable blocks*
Weight:	7.0kg
Electrical heating power:	350W
Supply requirements:	230V, 50Hz
Smart Control:	30 program steps, short mix, interval shaking

Description	PK	Cat. No.	
HeatingThermomixer MHR 23	1	**9.777 206**	3
HeatingThermomixer MHR 23 UK	1	**9.777 277**	
HeatingThermomixer MHR 23 CH	1	**9.777 278**	
HeatingThermomixer MHL 23	1	**9.777 210**	4
HeatingThermomixer MHL 23 UK	1	**9.777 281**	
HeatingThermomixer MHL 23 CH	1	**9.777 282**	

*Exchangeable blocks are not included in delivery.

3



9.777 206

4



9.777 210

5 Exchangeable blocks for ThermoMixers and BlockThermostats

NEW!

Ditabis

Type	For	PK	Cat. No.
BM 02	micro tubes, 96 x 0.2ml, conical and 8 tube strips	1	**9.777 120**
BM 05	micro tubes, 38 x 0.5ml, conical	1	**9.777 121**
BM 15	micro tubes, 24 x 1.5ml, conical	1	**9.777 122**
BM 20	micro tubes, 24 x 2.0ml, cylindrical	1	**9.777 123**
BP 12	test tubes, 24 x Ø 12mm, flat bottom, block depth 20mm	1	**9.777 125**
BZ 15	falcon tubes, 14 x 15ml, with insulating lid	1	**9.777 128**
BZ 50	falcon tubes, 6 x 50ml, with insulating lid	1	**9.777 129**
BC 96	PCR plates, 96 well, V bottom	1	**9.777 130**
BV 96	microtiter plates, 96 well, round or V bottom	1	**9.777 132**
BF 96	microtiter plates, 96 well, flat bottom	1	**9.777 133**
BD 96	deep well plates, 96 well, round bottom	1	**9.777 134**
BM 13	cryo vials, 1.5-2.0ml	1	**9.777 149**

5



Accessories for ThermoMixers and BlockThermostats

NEW!

Ditabis

Type	Description	PK	Cat. No.
BI 01	Lid for block insulation	1	**9.777 138**
BT 01	Tempering cover for devices with 1 block, transparent, for high tubes	1	**9.777 142**
BT 02	Tempering cover for devices with 2 blocks, transparent, for high tubes	1	**9.777 143**
BA 24	Anti-condensate plate for 1 block with micro tubes*	1	**9.777 144**
BA 96	Anti-condensate plate for 1 block with PCR and test plates**	1	**9.777 145**
BH 10	Heating lid (200W), connects with cooling devices, for blocks for micro tubes and PCR plates	1	**9.777 146**
BR 05	Assembly rack with stand for 0.5ml tubes	1	**9.777 147**
BR 15	Assembly rack with stand for 1.5ml and 2.0ml tubes	1	**9.777 148**

*for Cat. No. 9.777 120, 9.777 121, 9.777 122, 9.777 123
**for Cat. No. 9.777 130, 9.777 131, 9.777 133, 9.777 132

1



1 Thermomixer compact

Eppendorf AG

- With thermoblock heater for 24 x 1.5ml microtubes. Supplied with a work rack and cooling pack for rapid cooling to 0°C
- very small footprint
- excellent heat insulation, safe to touch
- tubes are securely held
- very quiet during use
- short-mix operation

Description	PK	Cat. No.
Thermomixer compact	1	**9.776 671**

2



2 Thermomixer comfort

Thermomixer product features

Eppendorf AG

- Active counter-cooling expands the range of application
- Improved mixing and incubation capacity
- Basic device is supplied without interchangeable thermoblocks; flexibility is provided by user selection of up to five different accessory interchangeable blocks for 0.5ml, 1.5ml or 2.0ml tubes or microtitration plates in all well formats
- Short-mix function
- Easy to operate
- Programmable; two different programmes with mixing and rest phases

Description	PK	Cat. No.
Thermomixer comfort basic unit without interchangeable thermoblock	1	**9.776 672**

Accessories for Thermomixer comfort

Accessory features: Interchangeable blocks

Eppendorf AG

- excellent heat insulation, safe to touch (no direct contact with hot surfaces)
- interchangeable thermoblocks for 24 x 0.5ml, 1.5ml or 2.0ml microtubes: Each supplied with a work rack and cooling pack for rapid cooling to 0°C (instead of an ice bath)

Description	PK	Cat. No.
Interchangeable block for 24 x 0.5ml microtubes, with work rack and cooling pack to 0°C	1	**9.776 673**
Interchangeable block for 24 x 1.5ml microtubes, with work rack and cooling pack to 0°C	1	**9.776 674**
Interchangeable block for 24 x 2ml microtubes, with work rack and cooling pack to 0°C	1	**9.776 675**
Interchangeable block with cover for microtitration and deep well plates	1	**9.776 696**
Adapter plate for 96 x 0.2ml PCR tubes for use with interchangeable block for microtitration plates	1	**9.776 697**
Interchangeable block for 11mm to 11.9mm diameter tubes, height 30mm to 76mm	1	**9.776 699**
Interchangeable block for 4 x 50ml Falcon-type tubes	1	**9.776 688**
Interchangeable block for 8 x 15ml Falcon-type tubes	1	**9.776 687**
Interchangeable block for 24 Cryotubes	1	**9.776 689**
Interchangeable block for 4 Slides	1	**9.776 691**

E & OE.

1 Shaking Incubator's, SI500/SI505/SI600

Stuart

- Digital LED control panel
- Microprocessor controlled
- Independent control of speed and temperature
- Timer 1 second to 9 days
- Alarm
- Retraceble platform, easier access to the samples

1



Shaking Incubator's, SI500/SI600

Stuart

The SI500 combined shaker and incubator is ideal for scientists doing cell culturing procedures, especially suspension culture applications. It is compact enough to be positioned on the laboratory bench. The platform of both models has a versatile clamping system which secures most sizes and mixtures of flask up to 1 litre capacity for the SI500 and 2 litre capacity for the SI600. Typically, the platform of the SI500 will accommodate the following Erlenmeyer flasks: 12 x 250ml, or 9 x 500ml or 6 x 1000ml. The SI600 will accomodate 6 x 2 l, 9 x 1000 ml or 15 x 500 ml Erlenmeyer flasks. A range of accessory racks are available to hold 1.5ml, 15ml, 30ml and 50ml sample tubes, the angle of the tubes can be adjusted up to 30°. These accessory racks are held to the orbiting platform by a patent pending Magnalock system, allowing quick coupling and de-coupling without tools. Both units also features a USB connection which allows the incubator to be connected to a PC for long term monitoring of the incubator temperature, over night of weekends for example.

2



9.951 612

Specifications

Temperature range:	Amb.+ 5°C to + 60°C
Samples:	adjustable platform or tube racks
Display resolution:	0.1°C
Precision:	±0.5°C at 37°C
Fluctuation:	±0.5°C at 37°C
Variation:	< 0.5°C at 37°C
Speed range:	30 to 300rpm
Timer:	min/sec, hr/min, days/hrs
Platform size	
SI500:	335 x 335mm
SI600:	526 x 390mm
Max. vessel height	
SI500:	250 mm
SI600:	300 mm
Volumen	
SI500:	51 l
SI600:	115 l
Max. load:	10kg
Heater power	
SI500:	250 W
SI600:	400 W
Supply requirements:	230V 50Hz

Type	Amplitude	Internal dimensions (W x D x H)	External dimensions (W x D x H)	Weight	PK	Cat. No.
	mm	mm	mm	kg		
SI500	16.0	422 x 408 x 297	450 x 474 x 522	30.00	1	**9.951 612** 2
SI600	16.0	623 x 465 x 395	675 x 542 x 642	55.00	1	**9.645 351**

Shaking Incubator, SI505

Stuart

The SI505 has been designed specifically to combine a bench top laboratory incubator with the specific mixing action required for microtitre plates. With a tight orbit of 1.5mm and a high speed shaking action between 250rpm and 1250rpm even the smallest of vessels can be adequately mixed.
To minimize sample evaporation the SI505 is supplied with stainless steel water trays, these are strategically placed within the unit to maintain a humidity of up to 80%, thus dramatically reducing sample evaporation over a 24 hour period.

Specifications

Temperature range:	Amb.+7°C to 60°C
Samples:	4 x microplates or 2 x microtube racks
Display resolution:	0.1°C
Precision:	±0.5°C at 37°C
Fluctuation:	±0.5°C at 37°C
Variation:	< 0.6°C at 37°C
Speed range:	250 to1250rpm
Timer:	min/sec, hr/min, days/hrs
Platform size:	220 x 220mm
Max. load:	1kg
Heater power:	200W

Type	Amplitude mm	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
SI505	1.5	307 x 300 x 190	361 x 405 x 430	22.50	1	**9.645 350**



1 Benchtop Incubated Shaker MaxQ 420 HP

NEW!

Thermo Scientific

Thermo Scientific MaxQ 420 HP Benchtop Incubated Orbital Shakers include class-leading temperature uniformity for optimum growth, the highest large-flask capacity for the best value, and durable components for long life. Performing over a wide temperature range of 5ºC above ambient to 80ºC with control of ±0.1ºC it ensures flexibility for a broad range of applications.

- Double-wall, insulated chamber contributes to optimum growth
- Twin blowers and gasketed lid ensure temperature uniformity of ±0.3°C (in flask) creating an ideal environment for temperature sensitive cultures
- Microprocessor functions are calibrated through keypad
- Audible/visual over and under-temperature alarms ensure sample protection
- Clear acrylic lid withstands years of use without cracking or discolouration
- Spill tray, sealed mechanism and control panel, and outside-the-chamber location of electronics ensure that shaker components are not damaged by spills, contributing to long unit life

Specifications

Speed Range:	25rpm to 525rpm
Accuracy:	±1rpm
Orbit Diameter:	2.5cm
Timer Range:	1min to 199h 59min or continuous operation (hold)
Overall Dimensions (WxDxH):	61.7 x 73.7 x 53.1cm
Chamber Dimensions (WxDxH):	54.4 x 53.8 x 32.0cm
Power supply:	230V, 50/60Hz

Type	Description	Temp. range °C	Weight kg	PK	Cat. No.
MaxQ 420 HP	with hood	RT +5 ... +80	83,9	1	**9.721 205**

Platforms for Orbital Shakers 420 MaxQ HP

Thermo Scientific

Description	Size cm	PK	Cat. No.
Universal Platform	457 x 457	1	**4.009 442**
Special Platform with 49x25ml clamps	457 x 457	1	**4.009 446**
Special Platform with 49x50ml clamps	457 x 457	1	**4.009 447**
Special Platform with 25x125ml clamps	457 x 457	1	**4.009 448**
Special Platform with 18x250/300ml clamps	457 x 457	1	**4.009 449**
Special Platform with 16x500ml clamps	457 x 457	1	**4.009 450**
Special Platform with 8x1l clamps	457 x 457	1	**4.009 451**
Special Platform with 6x2l clamps	457 x 457	1	**4.009 452**
Special Platform with 4x4l clamps	457 x 457	1	**4.009 480**
Special Platform with 2x6l clamps	457 x 457	1	**4.009 481**
Special Platform with 4x2.8l clamps	457 x 457	1	**4.009 482**
Special Platform with 36x125ml clamps	457 x 457	1	**4.009 483**
Special Platform with 4x5l clamps	457 x 457	1	**4.009 487**

E & OE.

1 Incubated and Refrigerated Floor Shakers MaxQ HP

NEW!

1



Thermo Scientific

Thermo Scientific MaxQ HP Incubated and Refrigerated Floor Shakers Models provide HEPA filtration for maximum protection from contamination, a directed airflow system for optimum temperature uniformity and ideal growth conditions, even when the units are full, and an ergonomic design for easy access to your product.

- HEPA filtration for maximum protection from contamination
- Crevice-free, stainless steel interior with coved corners for easy cleaning
- At-a-glance monitoring of time, speed, and temperature
- Foot pedal opens lid for hands free operation
- Angled sides, lower front, and convenient platform height ensure a comfortable reach into the chamber
- Thermal pane window provides a large viewing area
- Drain system with valve makes it easy to eliminate liquid, reducing the risk of water borne contamination
- Access port in rear of cabinet allows insertion of probes, CO_2 gassing manifolds or other equipment

Specifications

Speed Range:	25rpm to 525rpm
Accuracy:	±1rpm
Orbit Diameter:	2.5cm
Timer Range:	1min to 199h 59min or continuous operation (hold)
Platform Size (L x W):	74.9cm x 45.7cm
Overall Dimensions (WxDxH):	114.3cm x 76.2cm x 102.6cm
Chamber Dimensions (WxDxH):	87.1cm x 53.6cm x 47.0cm
Power supply:	230V, 50/60Hz

Type	Description	Temp. range °C	Weight kg	PK	Cat. No.
MaxQ 436 HP	incubated	RT +5 ... +60	263.1	1	**9.721 207**
MaxQ 481 HP	refrigerated	+4 ... +60	288.0	1	**9.721 208**

Platforms for Orbital Shakers MaxQ HP

Thermo Scientific

Description	Dimensions mm	PK	Cat. No.
Special Platform with 91x25ml clamps	457 x 749	1	**4.009 453**
Special Platform with 91x50ml clamps	457 x 749	1	**4.009 454**
Special Platform with 40x250/300ml clamps	457 x 749	1	**4.009 455**
Special Platform with 24x500ml clamps	457 x 749	1	**4.009 456**
Special Platform with 15x1l clamps	457 x 749	1	**4.009 457**
Special Platform with 12x2l clamps	457 x 749	1	**4.009 458**
Special Platform with 6x4l clamps	457 x 749	1	**4.009 459**
Special Platform with 4x6l clamps	457 x 749	1	**4.009 460**
Special Platform with 6x2.8l clamps	457 x 749	1	**4.009 461**
Special Platform with 30x250/300ml clamps	457 x 749	1	**4.009 485**
Special Platform with 6x5l clamps	457 x 749	1	**4.009 488**
Special Platform with 61x125ml clamps	457 x 749	1	**9.721 211**

LLG-Micropestles, stainless steel

Polished stainless steel, micropestles. Precisely fitted for Eppendorf Safe-Lock Tubes™, manufactured in one-piece, smooth handle sections, can be disinfected easily. Minimum homogenate displacement due to tapered piston.

For Reaction tubes:
For homogenisation of cells, tissues or foodstuffs/feed samples.
- For tubes with 0.5ml, 1.5ml and 2.0ml
- Can be cooled down to -196°C
- Sterilisable in an autoclave or dry heat at +200°C
- Suitable for PCR applications
- Alternative to single-use plastic pestles
- Perfectly suitable for Eppendorf Safe-Lock Tubes

For Sarstedt tubes:
Primarily used with food analysis with highly processed samples in which little DNA, protein or allergen is present.
- For tubes 13ml (Cat. No. 6.239 124)

For bottle ml	Length mm	PK	Cat. No.	
0.5	94	1	**9.314 500**	1
1.5	124	1	**9.314 501**	2
2.0	120	1	**9.314 502**	3
13.0	190	1	**9.314 503**	4

1

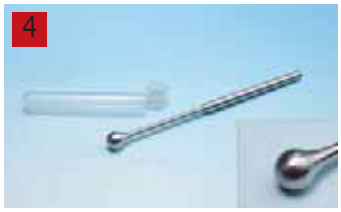
9.314 500

2

9.314 501

3

9.314 502

4

9.314 503

5


5 Micro pestles, CTFE/stainless steel

Reusable, for 500µl and 1.5ml microcentrifuge tubes. Autoclavable CTFE/stainless steel. Suitable for battery-operated drive motor (9.314 496).

Capacity ml	Length*	PK	Cat. No.
0.5	6	1	**9.314 494**
1.5	14	1	**9.314 495**

* Pestle length (cm)

6

9.651 050

8 9 Tissue Grinders System

Kimble Chase

For safety grinding of any cells by minimal temperature rising. Closed System (CS) for minimizing the risk of personal contact with aerosols and sample overflow while grinding.
Optimal contact of grinder and conical sample tube (15 or 50ml) to grind each cell in the best way.
Each unit is gamma sterilized and comes with a fully assembled pestle , conical sample tube (PP), solid top cap (PE-HD) and label.
Type CS1: Tip from glass-filled PP (30%/70%) for standard grinding
Type CS2: Vitrified tip (cast silica) for harder grinding

7

9.651 051

Type	Capacity ml	PK	Cat. No.	
CS 1	15	10	**9.651 050**	6
CS 1	50	10	**9.651 051**	7
CS 2	15	10	**9.651 052**	
CS 2	50	10	**9.651 053**	

8


9


E & OE.

1 EPPI pestle

For resuspending pellets and homogenising within tubes (1.5, 2.0ml, exact fit). *schuett-biotec*
Autoclavable. Suitable for homogeniser/motor drive.

Type	Shaft	Length mm	PK	Cat. No.
Polypropylene EPPI pestle	Ø 4,9	70	10	**9.197 689**



2 Disposable micro pestles, PP

Autoclavable polypropylene. Suitable for battery-operated drive motor (9.314 496). Pestle length 7cm. Supplied with microcentrifuge tubes as outlined below.

Description	PK	Cat. No.
Pestle for 0.5ml with microcentrifuge tubes	100	**9.314 490**
Pestle for 1.5ml with microcentrifuge tubes	100	**9.314 491**
0.5ml pestle	100	**9.314 492**
Pestle for 0.5ml with microcentrifuge tubes*	100	**9.314 498**
Pestle for 1.5ml with microcentrifuge tubes*	100	**9.314 499**

*RNase, DNase and pyrogen free



3 Micro pestles, PTFE, with stainless steel shaft

PTFE. With stainless steel shaft. For 1.5ml microcentrifuge tubes.
Overall length 143mm.

Type	PK	Cat. No.
Flat	1	**9.315 000**
Round	1	**9.315 001**



4 Micro pestles, accessory drive motor

Type	PK	Cat. No.
Complete with two batteries	1	**9.314 496**
Spare pestle adapter	1	**9.314 497**



Homogenisators - please see page 1312.



1 Homogenisers, General Purpose

GPE Scientific Limited

- Clear or ground borosilicate glass mortars with a range from 5.0ml to 55ml capacity
- Choice of borosilicate glass pestles with ground glass working length or serrated PTFE pestles
- Standard Stainless steel rod for use with an electric motor
- Optional Stainless steel handle for manual grinding
- All parts are fully autoclavable

Grinding clearance pestle and mortar for PTFE pestles is 0.076mm to 0.126mm and for glass pestles 0.152mm to 0.254mm.

Order General Purpose range pestles and mortars separately. The pestle and mortars are listed separately, so you can choose either a glass or PTFE pestle for use with the same mortar.

Mortars

Capacity	Mortar L x o.d.	Glass body	PK	Cat. No.
ml	mm			
5	100 x 15	clear	1	**9.164 520**
10	115 x 17	clear	1	**9.164 521**
15	120 x 19	clear	1	**9.164 522**
30	150 x 23	clear	1	**9.164 523**
55	175 x 31	clear	1	**9.164 524**
5	100 x 15	ground	1	**9.164 525**
10	115 x 17	ground	1	**9.164 526**
15	120 x 19	ground	1	**9.164 527**
30	150 x 23	ground	1	**9.164 528**
55	175 x 31	ground	1	**9.164 529**

Pestles

For Mortar	Pestle L x o.d.	Material	PK	Cat. No.
ml	mm			
5	195 x 10	borosilicate glass	1	**9.164 530**
10	215 x 13	borosilicate glass	1	**9.164 531**
15	220 x 15	borosilicate glass	1	**9.164 532**
30	250 x 19	borosilicate glass	1	**9.164 533**
55	295 x 25	borosilicate glass	1	**9.164 534**
5	250 x 10	PTFE*	1	**9.164 535**
10	250 x 13	PTFE*	1	**9.164 536**
15	250 x 15	PTFE*	1	**9.164 537**
30	250 x 19	PTFE*	1	**9.164 538**
55	250 x 25	PTFE*	1	**9.164 539**

*with stainless steel rod

Handle for PTFE pestle for General Purpose homogenisers

Description	PK	Cat. No.
Stainless steel handle for PTFE pestles	1	**9.164 515**



2 Homogenisers, Safe-Seal, borosilicate glass/PTFE

GPE Scientific Limited

Supplied complete with a PTFE pestle, stainless steel handle and borosilicate glass mortar which is stoppered in PTFE to protect against splash back during the grinding process.

Capacity	Pestle L x o.d.	Mortar L x o.d.	PK	Cat. No.
ml	mm	mm		
5	250 x 10	140 x 15	1	**9.164 501**
10	250 x 13	150 x 17	1	**9.164 502**
15	250 x 15	155 x 19	1	**9.164 503**
30	250 x 19	180 x 23	1	**9.164 504**

1 Potter-elvehjem homogenisers, plastic coated

Uniform plastic coated tissue grinders afford an added measure of safety. Fully autoclavable. Stainless steel handle for pestles - please order separately.

GPE Scientific Limited



Capacity	Pestle L x o.d.	Mortar L x o.d.	PK	Cat. No.
ml	mm	mm		
5	250 x 10	100 x 15	2	**9.164 510**
10	250 x 13	115 x 17	2	**9.164 511**
15	250 x 15	120 x 19	2	**9.164 512**
30	250 x 19	150 x 23	2	**9.164 513**
55	250 x 25	175 x 31	2	**9.164 514**

Homogenisers, Handle for Potter-elvehjem

Handle for Potter-elvehjem homogenisers

GPE Scientific Limited

Description	PK	Cat. No.
Stainless steel handle for pestles	1	**9.164 515**

2 Homogenisers, Mini series, borosilicate glass

Manufactured from high quality borosilicate glass this range of mini homogenisers is ideal for micro tissue work. Bodies are clear precision glass. Pestles have ground glass working length. With or without handles. Fully autoclavable.
Grinding clearance pestle and mortar 0.152mm to 0.254mm.

GPE Scientific Limited



Capacity	Pestle L x o.d.	Mortar L x o.d.	Description	PK	Cat. No.
ml	mm	mm			
0.1	75 x 3.65	60 x 9	with handle	1	**9.164 541**
1.0	150 x 5.00	105 x 10	with handle	1	**9.164 542**
3.0	170 x 9.00	115 x 13	with handle	1	**9.164 543**
0.1	75 x 3.65	60 x 9	without handle	1	**9.164 544**
1.0	150 x 5.00	105 x 10	without handle	1	**9.164 545**
3.0	170 x 9.00	115 x 13	without handle	1	**9.164 546**

3 Homogenisers, Griffiths Tube, Borosilicate glass 3.3, small

For grinding bacterial emulsions and tissues, tube 90mm to 95mm long, 18mm o.d. narrowing to ground rounded end. Ground half spherical pestle and mortar ends, ensure perfect grinding.

GPE Scientific Limited



Capacity	Pestle L x o.d.	Mortar L x o.d.	PK	Cat. No.
ml	mm	mm		
5	150 x 12	95 x 18	1	**9.164 550**

4 Homogenisers, Griffiths Tube, Borosilicate glass 3.3, large

Ground pestle and mortar, pestle has projections for coarse grinding. Mortar length 220mm.

GPE Scientific Limited



Capacity	Pestle L x o.d.	Mortar L x o.d.	PK	Cat. No.
ml	mm	mm		
15	305 x 14	225 x 18	1	**9.164 551**

1



1 Duall homogenisers, with glass pestle

With conical and cylindrical area for effective tissue for grinding and also for homogenising. Especially suitable for cellular tissue such as muscle, heart and lungs. The pestle is sufficiently stable to be motor driven. The space between the pestle and mortar is between 0.1mm to 0.15mm. Spare components are available and are completely interchangeable.

Size	Capacity	Pestle L x o.d.	Mortar L x o.d.	PK	Cat. No.
	ml	mm	mm		
20	1	155 x 6	80 x 13	1	**9.651 637**
21	3	207 x 6	120 x 16	1	**9.651 638**
22	5	220 x 8	150 x 18	1	**9.651 639**
23	15	278 x 10	175 x 25	1	**9.651 641**
24	30	310 x 10	215 x 32	1	**9.651 642**
25	50	345 x 16	225 x 38	1	**9.651 643**

2



2 Duall homogenisers, with PTFE pestle

With conical and cylindrical area for effective tissue for homogenising. The PTFE pestle is ideal for soft tissue such as brain or liver. The pestle is suitable for motor drive. The space between the pestle and mortar is between 0.1mm to 0.15mm. Spare components are available and are completely interchangeable.

Size	Capacity	Mortar L x o.d.	Pestle L x o.d.	PK	Cat. No.
	ml	mm	mm		
20	1	155 x 4.5	80 x 13	1	**9.651 656**
21	3	210 x 6	120 x 16	1	**9.651 657**
22	5	228 x 6	150 x 18	1	**9.651 658**
23	15	268 x 6	175 x 25	1	**9.651 659**
24	30	305 x 10	215 x 32	1	**9.651 660**
25	50	330 x 10	225 x 38	1	**9.651 661**

3



3 Homogenisers Potter-Elvehjem, with glass pestle

All-glass. Pestle is suitable for motor drive. The space between the pestle and mortar is between 0.1mm to 0.15mm. Spare components are available and are completely interchangeable.

Size	Capacity	Pestle L x o.d.	Mortar L x o.d.	PK	Cat. No.
	ml	mm	mm		
19	1	145 x 5	95 x 13	1	**9.651 674**
21	5	205 x 6	140 x 16	1	**9.651 675**
22	8	215 x 8	150 x 18	1	**9.651 676**
23	17	265 x 10	175 x 25	1	**9.651 677**
24	45	315 x 10	220 x 32	1	**9.651 678**

4



4 Homogenisers Potter-Elvehjem, with PTFE pestle

With PTFE pestle and glass mortar. Sizes 21 and 24 have notches on the bottom edge of the pestle so that particles can be transported up to the cylindrical part of the mortar for extraction. The space between the pestle and mortar is between 0.1mm to 0.15mm. Spare components are available and are completely interchangeable.

Size	Capacity	Pestle L x o.d.	Mortar L x o.d.	PK	Cat. No.
	ml	mm	mm		
18	0.5	130 x 3	80 x 12	1	**9.651 689**
19	1	154 x 5	95 x 12	1	**9.651 690**
20	3	154 x 5	115 x 12	1	**9.651 691**
21	5	215 x 6	140 x 15	1	**9.651 692**
22	8	212 x 6	150 x 19	1	**9.651 693**
23	17	266 x 6	175 x 25	1	**9.651 694**
24	45	269 x 6	220 x 32	1	**9.651 695**

E & OE.

1 Homogenisers with PTFE or glass pestles



For use with all homogenizer drive-units or for schuett homgen^{plus}. *schuett-biotec*
Homogenizers and pestles provide a precise shape and are consequently separately exchangeable. Clearance between pestle and homogenizer is between 0.18 and 0.23 mm.

Homogenizer with PTFE pestle
Tapered or cylindrical. Shaft made of stainless steel. Inert. Elastic. With smooth, wax-like, moisture-rejecting surface. Resistant against high temperatures. Also available as glass fiber reinforced model. Highly efficient with especially tough tissue.

Homogenizer with glass pestle
Tapered or cylindrical. With robust glass shaft. Ground-glass surface in cylindrical/tapered part. Highly efficient with tough tissue.

Glass mortar Type 1: With flared overflow neck and spout, conical
Glass mortar Type 2: Without flared overflow neck, cylindrical
Glass mortar Type 3: With flared overflow neck and spout, cylindrical
Glass mortar Type 4: Round bottom, with flared overflow neck, without spout, cylindrical

Glass mortar type	Capacity ml	Form	Figure	PK	Cat. No.
1	2	PTFE pestle tapered	3	1	**9.651 850**
1	15	PTFE pestle tapered	3	1	**9.651 851**
1	40	PTFE pestle tapered	3	1	**9.651 852**
2	2	PTFE pestle cylindrical	1	1	**9.651 853**
2	5	PTFE pestle cylindrical	1	1	**9.651 854**
2	10	PTFE pestle cylindrical	1	1	**9.651 855**
3	15	PTFE pestle cylindrical	2	1	**9.651 856**
2	20	PTFE pestle cylindrical	1	1	**9.651 857**
2	30	PTFE pestle cylindrical	1	1	**9.651 858**
3	40	PTFE pestle cylindrical	2	1	**9.651 859**
2	5	PTFE pestle cylindrical*	1	1	**9.651 860**
2	10	PTFE pestle cylindrical*	1	1	**9.651 861**
3	15	PTFE pestle cylindrical*	2	1	**9.651 862**
2	30	PTFE pestle cylindrical*	1	1	**9.651 863**
3	40	PTFE pestle cylindrical*	2	1	**9.651 864**
1	2	Glass pestle, tapered	4	1	**9.651 865**
1	15	Glass pestle, tapered	4	1	**9.651 866**
1	40	Glass pestle, tapered	4	1	**9.651 867**
4	8	Glass pestle, cylindrical	5	1	**9.651 868**
4	15	Glass pestle, cylindrical	5	1	**9.651 869**
3	40	Glass pestle, cylindrical	6	1	**9.651 870**

*glass-fibre reinforced

2 Homogenisers, Round Body, glass



The all-glass Uni-Form range of round body tissue grinders is made from sterilisable heat-resisting glass in capacities 5ml to 55ml. Models are available with rod ends for motor drive, or hollow pestles designed for use with coolants/dry ice.
Bodies are available in clear precision glass or ground glass for more effective homogenisation of tougher tissues.
Grinding clearance pestle and mortar 0.152mm to 0.254mm. *GPE Scientific Limited*

Capacity ml	Pestle L x o.d. mm	Mortar L x o.d. mm	Mortar	Pestle	PK	Cat. No.
5	205 x 10	105 x 15	clear glass	hollow	1	**9.164 660**
10	225 x 13	130 x 17	clear glass	hollow	1	**9.164 661**
15	240 x 15	140 x 19	clear glass	hollow	1	**9.164 662**
30	295 x 19	170 x 23	clear glass	hollow	1	**9.164 663**
55	330 x 25	205 x 31	clear glass	hollow	1	**9.164 664**
5	205 x 10	105 x 15	clear glass	with rod end	1	**9.164 665**
10	225 x 13	130 x 17	clear glass	with rod end	1	**9.164 666**
15	240 x 15	140 x 19	clear glass	with rod end	1	**9.164 667**
30	295 x 19	170 x 23	clear glass	with rod end	1	**9.164 668**
55	330 x 25	205 x 31	clear glass	with rod end	1	**9.164 669**
5	205 x 10	105 x 15	ground glass	hollow	1	**9.164 670**
10	225 x 13	130 x 17	ground glass	hollow	1	**9.164 671**
15	240 x 15	140 x 19	ground glass	hollow	1	**9.164 672**
30	295 x 19	170 x 23	ground glass	hollow	1	**9.164 673**
55	330 x 25	205 x 31	ground glass	hollow	1	**9.164 674**
5	205 x 10	105 x 15	ground glass	with rod end	1	**9.164 675**
10	225 x 13	130 x 17	ground glass	with rod end	1	**9.164 676**
15	240 x 15	140 x 19	ground glass	with rod end	1	**9.164 677**
30	295 x 19	170 x 23	ground glass	with rod end	1	**9.164 678**
55	330 x 25	205 x 31	ground glass	with rod end	1	**9.164 679**



1 Homogenisers, Dounce, glass

GPE Scientific Limited

For fine particle size reductions without damage to cell nuclei. Supplied with interchangeable pestles ground and polished to large' and small' clearances for use in the same tube. Includes 2 larges pestle used for sample preparation and 2 tight pestles for final homogenate.

Capacity	Pestle L x o.d.	Mortar L x o.d.	PK	Cat. No.
ml	mm	mm		
1	117 x 7.5	82 x 12	2	**9.164 690**
7	175 x 13	125 x 17	2	**9.164 691**
15	210 x 15	160 x 19	2	**9.164 692**
40	285 x 25	210 x 31	2	**9.164 693**



2 Homogenisers, Duo-Form, Borosilicate glass 3.3

GPE Scientific Limited

The pestles are conicaly shaped at the tip and cylindrically shaped in the upper part. This combination gives two separate areas, one for initial grinding and a second for final homogenisation.

Capacity	Pestle L x o.d.	Mortar L x o.d.	Mortar	Pestle	PK	Cat. No.
ml	mm	mm				
15	250 x 15	155 x 19	ground	with rod	1	**9.164 680**
15	250 x 15	155 x 19	clear glass	with rod	1	**9.164 681**
15	250 x 15	155 x 19	ground	with handle	1	**9.164 682**
15	250 x 15	155 x 19	clear glass	with handle	1	**9.164 683**



3 Homogenizer, POLYTRON® PT 1200 E

NEW!

Kinematica

This handheld homogenizer is ideal for quick processing of small sample quantities and volumes, for example in Life science or genetic.

Application volume: 0.05 to 250ml
- Soft start prevents splashing of homogenate from sample vessel
- Tip speed up to 12 m/s
- Ergonomic design and various models of dispersing aggregates in Easy-to-Clean design

Applications:
- General homogenization applications (dispersion and emulsification)
- Sample preparation for subsequent extraction of pharmaceutical agents (API)
- Cell disruption, RNA/DNA isolation from tissue
- Dispersion of small quantities from plants, animals or human tissue

Specifications

Application volume:	0.05 to 250ml
Motor input power:	100W
Aggregates:	dia. 3, 5, 7 and 12mm and dia. 20mm X EC-E116 Aggregat
Speed range:	Stepless up to 25.000min^{-1}
Max. viscosity:	6000mPas
Drive Dimensions (L x W x H):	220 x 44 x 55 mm
Weight drive:	440g
Tested to:	EN/IEC 61010, 61326-1

Type	PK	Cat. No.
PT 1200 E, 230V (with EU-plug)	1	**9.571 492**

E & OE.

1 Homogenizer, POLYTRON® PT 2500 E

NEW!

Kinematica

The PT2500 E is the ideal solution for cost-conscious laboratories. It is able to perform a lot of applications.

- Application volume 0.05 to 2500ml
- Soft start prevents splashing of homogenate from sample vessel
- Tip speed up to 32 m/s
- Speed remains constant even when viscosity changes
- Various models of dispersing aggregates in Easy-to-Clean design

Applications:
- General homogenization applications (dispersion and emulsification)
- Formulation of lotions, creams and food
- Production of oil-water emulsions


1

Specifications

Application volume:	0.05 to 2500ml
Motor input power:	500W
Aggregates:	dia. 3, 5, 7 and 12mm and dia. 20mm and 25mm
Speed range:	Stepless up to 30.000min^{-1}
Max. viscosity:	6000mPas
Drive Dimensions (L x W x H):	157 x 76 x 236mm
Tested to:	IEC/EN61326-1/IEC/EN 61000-6-2/EN 61000-6-4 IEC/EN 61010-2-51

Type	PK	Cat. No.
PT-MR 2500 E, 230V/EU package with ST-P11/600, drive holder, vessel holder, safety pos. ring	1	**9.571 494**

Shakers, Disruptor Genie® analog/digital

NEW!

Scientific Industries,

For cell disruption and homogenisation. The patented Disruptor Genie® provides a multi-directional action, which simultaneously agitates and vortexes at high speed, dramatically increasing cell disruption or sample resuspension efficiency.

- Digital model for accurate, repeatable and reproducible results
- Dramatically increased sample disruption efficiency. Ideal for difficult glass bead procedures (Glass beads - please order separately), cell disruption/homogenisation of yeast, bacteria, plant and animal tissues and pellet resuspensions or anything that requires extremely violent, high-speed agitation.
- Patented multi-directional action simultaneously agitates and vortexes at high-speed producing greater yields in less time
- Hands-Free disruption of up to twelve 1.5ml or 2.0ml microtubes with timer from 0 to 15 minutes (Disruptor Genie® analog), 0 to 99 minutes (Disruptor Genie® digital) or continuous operation
- Performance comparable to expensive ultrasonic cell disruptors/homogenisers.
- Suitable for use in cold rooms or incubators
- Remove the microtube holder and attach the supplied pop-off cup for high-speed vortexing of single test tubes

Supplied with: Disruptor Genie + Tube holder for 12 tubes



2

9.730 115


3

6.253 276

Specifications

Speed

Disruptor Genie® analog:	2850rpm
Disruptor Genie® digital:	1000 to 3000rpm
Dimensions (WxDxH):	122 x 165 x 190mm
Weight:	4.3kg
Supply requirements:	220V 50Hz, 250mA

Type	Connector	PK	Cat. No.
Disruptor Genie® analog	EU	1	**9.730 115** 2
Disruptor Genie® analog	UK	1	**9.730 116**
Disruptor Genie® analog	CH	1	**9.730 117**
Disruptor Genie® digital	EU	1	**6.253 276** 3
Disruptor Genie® digital	UK	1	**9.730 118**
Disruptor Genie® digital	CH	1	**9.730 119**

Accessories for Disruptor Genie®

Description	PK	Cat. No.
Microtube Holder for 12 x 1.5 or 2.0ml tubes	1	**6.253 281** 4
0.1mm Disruptor Beads, 375g	1	**9.730 100**
0.5mm Disruptor Beads, 375g	1	**9.730 101**


4

6.253 281



1 Mixer Mill CryoMill

Retsch

The CryoMill is designed for the cryogenic size reduction of materials which cannot be ground at room temperature or whose composition would be changed by it. The grinding jar is cooled before and during the grinding process with liquid nitrogen through an integrated cooling system. Thus the sample is embrittled and its volatile components are preserved. The size reduction principle is the same as that of the well-proven Mixer Mill MM 400. The CryoMill can also be operated without the cooling system which makes it suitable for a wide range of applications.

Features:
- Powerful cryogenic grinding by impact and friction, up to 30 Hz
- Closed LN2-system (autofill) for enhanced safety, avoids any contact of the user with LN2
- Screw-top grinding jars for convenient, leak-proof operation
- Clearly structured user interface, memory for 9 SOPs
- Wide range of accessories including various LN2 feeding systems, jar and ball sizes, adapter racks, materials

Specifications

Feed size	up to 8mm
Ultimate fineness	< 5µm
Charge	max. 1 x 20ml
Adjustable frequency range	3 to 30Hz (180 to 1800rpm.)
Dimensions (WxDxH)	385 x 675 x 370mm
Weight	40kg
Power supply:	100 - 240V, 50/60Hz

Type	PK	Cat. No.
CryoMill	1	**9.739 299**

Please order Autofill, grinding jars and grinding balls separately.



9.739 080

Mixer Mills MM 200/400

Retsch

The mixer mills are true laboratory "all-rounders". They have been developed specially for grinding, homogenising and mixing of small amounts of sample in only a few seconds. They are also perfectly suitable for the disruption of biological cells as well as for DNA/RNA recovery. The MM 400 can also be used for cryogenic and wet grinding.

Features:
- 2 milling stations
- Digital setting of time and vibration intensity
- 9 separate programmes can be stored
- Wide selection of grinding jar sizes and materials
- Self-locking and self-centering, clamping device for grinding jars (MM 400)
- Screw-top grinding jars up to 50ml, especially suitable for wet and cryogenic grinding (MM 400)

Accessories for cryogenic grinding available on request.
Grinding jars and balls please order separately.

Specifications

Feed size*	
MM 200:	up to 6mm
MM 400:	up to 8mm
Ultimate fineness*	
MM 200:	< 10µm
MM 400:	< 5µm
Charge	
MM 200:	max. 2 x 10ml
MM 400:	max. 2 x 20ml
Digital preselection of vibrational frequency	
MM 200:	3 to 25Hz (180 to 1500rpm.)
MM 400:	3 to 30Hz (180 to 1800rpm.)
Power supply:	100 - 240V 50/60Hz

*depending on feed material

Type	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
MM 200	371 x 461 x 266	25.00	1	**9.739 080** 2
MM 400	371 x 461 x 266	26.00	1	**9.739 091**

Further Mills - please see page 534.

E & OE.

1 Homogeniser drive unit, schütt homgen^{plus}

schuett-biotec

For the gentle homogenisation of biological samples or for grinding tough, rigid material which is difficult to break down. Complete with load-compensating drive unit and universal quick-action chuck, transparent Plexiglas cooling jacket and multi-purpose spanner for centring homogenising vessels of varying sizes. Portable, but highly stable and vibration-free due to its triple-post frame construction, and easy to use. Provides high torque, even at the low speed range, ensuring extremely powerful homogenizing. Continuously adjustable speed range: 40rpm to 3000rpm. Provides reproducible homogenising by maintaining constant rotational speed, which is shown on an easy to read, 4-digit LED display. The fast-action clamping chuck with hollow shaft permits rapid and easy replacement of the pestle and allows pestles with longer shafts to be used. We highly recommend using a quick-grip chuck for glass pestles to minimise lateral movement (and therefore strain) of the glass shaft. The cooling jacket incorporates a clamping holder suitable for Eppendorf test tubes and homogenising vessels with outside diameters from 10mm to 40mm. Sample cooling is easily achieved using ice, which can be introduced into the cooling jacket through a screw capped opening. The homogenising vessel moves up and down in conjunction with the cooling jacket platform and is raised and lowered using a lever jack. The long lever facilitates thorough homogenising without much effort.
For 230V 50/60Hz, 300 W single phase supplies (optionally available for 115V 50/60Hz).

We also offer a sterile alternative for use in a glove box and with infectious material. Details on request.

1



Type	External dimensions (W x D x H) mm	PK	Cat. No.
schuett homgen^{plus}, 230 V	300 x 350 x 888	1	**9.651 560**
Quick-change chuck for glass pestle	-	1	**9.651 564**

2 3 Microbiological monitoring of water: MBS I system and membranes

GE Healthcare

The MBS I filtration system is designed for laboratories that handle high numbers of samples for microbiological quality control. It consists of a membrane dispenser, a funnel dispenser, and a 2-place filter AS220 manifold.
AS220 Filtration Manifold and Filtration funnels AS220 is a two-place stainless-steel filtration manifold, which can be joined together (maximum of 3 manifolds).This simple manifold can be used with 47mm or 50mm filtration membranes. AS220 Filtration Manifold and Filtration funnels deliver:- Waste reduction-because PP funnels can be autoclaved up to 20 times

- Time saving-No need to flame in between filtrations
- Easy handing
- Cost saving-20 PP funnels are enough for 1000 analyses
- Reduces cross-contamination

2



3



Description	PK	Cat. No.
2-place vacuum manifold AS 220	1	**6.231 788**
Automatic dispenser for funnels	1	**6.231 860**
Funnels 100 ml, PP, autoclavable	20	**7.616 566**
Funnels 100 ml, ABS, not autoclavable	20	**9.603 290**
Funnels 350 ml, PP, autoclavable	20	**6.801 571**
Autoclaving bags	20	**7.608 012**
Mountig for two Membrane-Butler ES	1	**6.234 184**
Membran-Butler manual	1	**6.225 967**



1 Filter manifold systems, 3- and 6-place

For colony counting when using large number of samples. *Sartorius*
Available with either 100ml or 500ml funnels.

Note:
Stainless steel manifolds only (Combisart) without funnels, for use with suitable adapters, are also available for attachment to all Sartorius vacuum funnels.

Type	Diam. mm	Capacity ml	PK	Cat. No.
3-way stainless steel manifold	50	3 x 100	1	**9.604 222**
6-way stainless steel manifold	50	6 x 100	1	**9.604 223**
3-way stainless steel manifold	50	3 x 500	1	**9.604 226**
6-way stainless steel manifold	50	6 x 500	1	**9.604 224**



2 Stainless steel filter manifold system

Combisart® Multibranch System with modular structure: For microbiological analysis. *Sartorius*
Basic system without outlet for holding all dismountable Sartorius vacuum funnels either completely or by using appropriate adapters

Description	PK	Cat. No.
3-place s/s manifold with sterile venting	1	**9.604 227**
6-place s/s manifold with sterile venting	1	**9.604 228**
Funnel, 100 ml	1	**9.604 210**
Funnel, 500 ml	1	**9.604 211**
Lid, stainless steel for 100ml funnel	1	**9.604 212**
Lid, stainless steel for 500ml funnel	1	**9.604 213**
Silicone lid seal for 100ml funnel	1	**9.604 214**
Silicone lid seal for 500ml funnel	1	**9.604 215**
Base support, stainless steel for mounting a single funnel onto a manifold	1	**9.604 216**



E & OE.

1 Vacuum filtration equipment, GV 025 series

- funnel volume 60ml
- for filter 25mm diameter

GE Healthcare



Type	Filter media	Connection	PK	Cat. No.
GV 025/0	glass frit	rubber stopper	1	**9.603 250**
GV 025/2	glass frit	TC*, EF* 250ml (NS 29)	1	**9.603 252**

*TC = tubing connection
**EF = Erlenmeyer flask

2 Filtering apparatus DURAN®

NEW!

DURAN Group

The DURAN® filtering apparatus is made of high-quality borosilicate glass. Aside from glass, the medium only comes into chemical contact with PTFE. This means that the filtering apparatus can be used to filter virtually any chemical.
Thanks to the PTFE disc holder, fritted glass discs of different porosities can be used in addition to the slit-sieve disc. This creates a wide application scope for filtration using filter paper, membrane filters (47mm) or simply using glass filters. Different porosities are available between 10µm and 160µm, which makes it possible to perform coarse and fine filtration in addition to analytical filtration. Furthermore, the filtering apparatus is suitable for the filtration of HPLC media, testing for bacterial contamination, residue analysis and the filtration of other media.

Properties:
- Removable filter discs ensure easy cleaning
- Slit-sieve disc for mounting filter paper/membrane filter
- Only glass and PTFE come into contact with the medium
- Funnel with scale
- Secure plastic hose connection
- Tried-and-tested DURAN® filtering flask
- All components are available as spare parts



Description	PK	Cat. No.
Filtering apparatus DURAN®	1	**9.052 744**

Filtering apparatus DURAN®, Spare parts

NEW!

DURAN Group

Description	PK	Cat. No.
PTFE adapter disc	1	**9.052 745**
Clamp (anodised aluminium)	1	**9.052 746**
Funnel with 250ml scale	1	**9.052 747**
Head NS 45 / 40	1	**9.052 748**
Filtering flask with NS 45 /40, 1000ml	1	**9.052 749**
Plastic hose connection with silicone seal, straight, GL 14	1	**7.023 754**
Screw connection caps, red, made of PBT, GL 14, aperture bore 9.5mm	1	**9.209 114**
DURAN® glass filter disc, 50mm in diameter, por. 2	1	**9.052 952**
DURAN® slit-sieve disc, diameter 48mm	1	**9.052 901**

3 Filter holders, glass, Type 163

Two compact, glass vacuum filter holders for simple particle testing and clarification of solutions. With glass frit membrane filter support and anodised aluminium clamp.

Sartorius



Type	Volume ml	For Filter size	PK	Cat. No.
glass frit	30	25 mm dia.	1	**9.604 204**
glass frit	250	47/50 mm dia.	1	**9.604 307**



1 Filter holders, Type 16309

Sartorius

For vacuum filtration of particles from solutions. Comprises 250ml, dismountable, top manifold with filter holder and clamp. For 47mm and 50mm diameter filters. Supplied complete with 1L capacity filter flask with ground joint to fit manifold and PP side-arm for safe connection of flexible vacuum tubing.

Type	Capacity ml	Filter size mm	PK	Cat. No.
All-glass unit	250	Ø 47 - 50mm	1	**9.604 076**



2 Vacuum Filtration Equipment GV 050 Series

GE Healthcare

- Funnel Volume 250 ml
- to be used with Ø 47/50 mm membranes and Ø 40 mm pre-filter
- silicone cap and venting nozzle included in scope of supply
- GV 050A-Types equipped with rapid closure clamp

Type	Filter media	Connection	PK	Cat. No.
GV 050/0	glass frit	rubber stopper	1	**9.603 500**
GV 050/1	sieve	rubber stopper	1	**9.603 501**
GV 050/2	glass frit	TC*, EF** 1000 ml (NS 45)	1	**9.603 502**
GV 050/3	sieve	TC*, EF** 1000 ml (NS 45)	1	**9.603 503**

*TC = tubing connection
**EF = Erlenmeyer flask



3 Vacuum filtration Equipment Grade MV 050/0

GE Healthcare

Stainless steel construction, chemically resistant to most aqueous and organic solutions.
- funnel volume 50ml
- for filters with 47mm /50mm diameter and 40mm diameter prefilter

Self sealing, ideal for quick, repeated filtrations

Type	PK	Cat. No.
MV 050A/0*	1	**9.603 520**
MV 050/0	1	**9.603 510**

*With rapid closure clamp

E & OE.

1 Vacuum or pressure filtration apparatus, Typ 16510, PC

Sartorius

For vacuum or pressure filtration up to 2 bar.
For ultra or sterile filtration.
With collecting bottle 250 ml.
For filter 47mm diameter filters.

Type	Volume ml	Filter size mm	PK	Cat. No.
PC filtration apparatus	250	Ø 47mm	1	**9.049 243**



2 Filter holders, vacuum, Type 162. Stainless steel

Sartorius

Specially designed for residue analysis. The stainless steel filter support produces homogeneous distribution of the residues on the membrane filter surface. Easy to use.
For 47mm or 50mm diameter filters.

Type	PK	Cat. No.
Vacuum filter holder, 500ml	1	**9.604 201**
Vacuum filter holder, 100ml	1	**9.604 202**



3 Biosart®100 monitors

Sartorius

Filtration unit for use with a Sartorius vacuum manifold or direct attachment to a special vacuum pump. Biosart® 100 Monitors have been specifically designed for the microbiological testing of pharmaceuticals, food, beverages, water and other liquids. These sterile disposable units with built-in membrane filter and cellulose pad are ready to use. After filtration, just remove the 100ml funnel to convert the Monitor into a petri dish. Culture media for wetting the pad are available in individually sterilised, convenient plastic ampoules. Biosart® 100 Monitors are ready to use filter units designed to fitted onto the receivers of a vacuum manifold.
For use with Biosart® 100 culture media.

Type	Diam. mm	Pore size µm	Colour	PK	Cat. No.
K	47	0.45	White / Black	48	**9.049 300**
K	47	0.45	Grey / White	48	**9.049 315**
ACK Sterile, individually packed	47	0.20	White / Black	48	**9.049 311**
ACK Sterile, individually packed	47	0.45	White / Black	48	**9.049 312**
ACK Sterile, individually packed	47	0.45	Green / Dark green	48	**9.049 313**
ACK Sterile, individually packed	47	0.45	Grey / White	48	**9.049 304**
Adapter for BioSart	55		-	1	**9.049 320**

ACK= individually sterile packed. K= sterile.



4 Filter funnel, Biosart®250

Sartorius

For microbiological and analytical quality assurance in industry. 250ml sterile plastic funnels reduce process time in colony and particle analysis. For use with Sartorius membrane filters and Sartorius cardboard culture plates.
Note: BioSart 250 funnels can also be adapted to fit single filter holders or filtration manifolds.

Type	PK	Cat. No.
BioSart 250 disposable funnel, sterile	50	**9.049 340**
BioSart 250 disposable funnel, sterile, individually packed	50	**9.049 341**





1 Filter Unit with PES-Membrane, Low Profile, sterile

Polyethersulfone-membrane (PES). The ultimate cell and tissue culture media membrane. *Thermo Scientific*
- Graduated
- Lot number, catalogue number, membrane type, pore size and expiration date are printed on filter units, bottle tops and receivers for easy identification and lot traceability
- Ideal for sterilisation of biological and pharmaceutical sterile solutions
- Low protein binding, low extractables, no external wetting agents, fast flow

Capacity ml	Pore size µm	Membrane diam. mm	PK	Cat. No.
115	0.20	50	1	**6.234 424**
115	0.45	50	1	**9.046 020**



2 Nalgene™ Rapid-Flow™ Bottle-Top-Filter

Filters securely screw onto glass media bottles with 33mm or 45mm neck sizes. Allows direct filtration of liquid into sterile glass media bottles. Tight and secure thread connection for vacuum filtration, vacuum tubing to be connected onto tubing adapter of side-arm. Graduated. Sterile, single packed. Certificate of Quality included in each full case. Lot number, catalogue number, membrane type, pore size and expiration date are printed on filter units, bottle tops and receivers for easy identification and lot traceability *Thermo Scientific*

Type	Capacity ml	Pore size µm	Neck thread GL	Membrane diam. mm	PK	Cat. No.
296	150	0.45	33	50	1	**7.048 393**
295	500	0.45	33	75	1	**7.048 389**
296	150	0.45	45	50	1	**7.048 395**
295	500	0.45	45	75	1	**7.048 391**



3 Nalgene™ Rapid-Flow™ Bottle-Top-Filter, sterile, Type 595, 596, 597

Filters securely screw onto glass media bottles with 33mm or 45mm neck sizes. Allows direct filtration of liquid into sterile glass media bottles.
Tight and secure thread connection for vacuum filtration, vacuum tubing to be connected onto tubing adapter of side-arm. Graduated. Certificate of quality included in each full case. Lot number, catalogue number, membrane type, pore size and expiration date are printed on filter units, bottle tops and receivers for easy identification and lot traceability. *Thermo Scientific*

Type	Capacity ml	Neck thread GL	Pore size µm	Membrane diam. mm	PK	Cat. No.
596	150	33	0.20	50	1	**7.048 392**
595	500	33	0.20	75	1	**7.048 388**
597	1000	33	0.20	90	1	**7.048 396**
596	150	45	0.20	50	1	**6.224 312**
595	500	45	0.20	75	1	**7.048 390**
597	1000	45	0.20	90	1	**7.048 397**

E & OE.

1 Filter units with Supor® machV PES Membrane, MF75 ™ Series, Type 565, sterile

Thermo Scientific

Ideal for biological and pharmaceutical sterile filtration. PES membrane features low protein binding, low level of extractables and a high flow rate. Now available in three pore sizes: The best filter units with 0.20µm and 0.45µm pore size and new to the protection of valuable cell cultures from mycoplasma with 0.10µm pore size. Filter top and filtrate bottle are graduated. Vacuum tubing to be connected onto tubing adapter of side arm. Leakproof, sterile screw closure included for storage of sterile filtrate. Sterile, single packed. Certificate of Quality included in each full case. Lot number, catalogue number, membrane type, pore size and expiration date are printed on filter units, bottle tops and receivers for easy identification and lot traceability.



Type	Capacity ml	Pore size µm	Membrane diam. mm	PK	Cat. No.
565	150	0.10	50	1	**9.046 022**
565	250	0.10	50	1	**9.046 024**
565	500	0.10	75	1	**9.046 023**
565	150	0.20	50	1	**6.302 336**
565	250	0.20	50	1	**6.228 218**
565	500	0.20	75	1	**6.227 381**
565	500	0.20	90	1	**6.225 298**
565	1000	0.20	90	1	**6.229 041**
565	150	0.45	50	1	**7.047 785**
565	250	0.45	50	1	**7.047 791**
565	500	0.45	75	1	**7.047 787**
565	500	0.45	90	1	**7.047 793**
565	1000	0.45	90	1	**7.047 789**

2 Filter unit bodies, Type 300

Thermo Scientific

Graduated reusable filtration unit bodies with upper manifolds and lower receivers made of unbreakable polysulphone (PSF). Nominal filtration surface 11cm². With membrane support plate. Without membrane. For filter membrane from 47mm to 50mm.



Type	Manifold capacity ml	Receiver capacity ml	Diam. mm	Height mm	PK	Cat. No.
300	250	250	83	180	1	**9.046 151**
300	500	500	117	230	1	**9.046 152**
300	500	1000	114	293	1	**9.046 153**

3 Vacuum filtration devices bottle-top filters, Type DS0320, PSU

Thermo Scientific

Reusable, PSU filter manifolds for fitting onto bottles with 33mm or 45mm screw neck diameters. Non-toxic. Robust body with removable membrane support plate. Suitable for pressure filtration up to 600mbar and vacuum filtration. With seal, cap and tubing adapter on lower half of the assembly. Autoclavable. Without membrane (47mm or 50mm diameter can be fitted).



Type	Capacity ml	Neck thread GL	PK	Cat. No.
DS0320	250	33	1	**9.059 506**
DS0320	500	33	1	**9.059 508**
DS0320	250	45	1	**9.059 507**
DS0320	500	45	1	**9.059 509**

4 Filter Unit Receivers MF75™ series Type 455, PS, sterile

Thermo Scientific

Easy-to-use ergonomic design. Can be used to store sterilised filtrate. Radiation-sterilised to save you time and minimize contamination. Also handy as presterilised, single-use storage containers. 1-1/2-turn threaded screw closure guarantees a leakproof seal and eliminates pH shift in receivers. Certified. Non pyrogenic, non cytotoxic. Sterile, graduated and leakproof.



Type	Capacity ml	PK	Cat. No.
455	150	1	**7.048 731**
455	250	1	**7.048 732**
455	500	1	**7.048 733**
455	1000	1	**7.048 734**



1 Bottle-top filters, SFCA membrane, Nalgene®

Thermo Scientific

Tissue culture filters for screw fitting onto bottles with 33mm or 45mm neck diameters. With surfactant-free, cellulose acetate membrane (SFCA) and polystyrene (PS) housing. Gamma-irradiated sterile. Pyrogen free. Non cytotoxic. Low-pressure filtration can be carried out directly into a suitable sterile bottle. Caution: Only use sterile bottles authorised for use in low pressure applications. Always wear protective equipment for low pressure procedures. The membrane is characterised by its low protein binding, good throughput rates and minimal clogging with negligible protein loss. Permanent, moulded graduations. Quick-disconnection tubing adaptor with cellulosic vent plug for tubing with an internal diameter of 6mm to 9mm. Lot number, catalogue number, membrane type, pore size and expiration date are printed on filter units, bottle tops and receivers for easy identification and lot traceability.

Capacity ml	Neck thread GL	Pore size µm	Membrane diam. mm	PK	Cat. No.
150	33	0.20	50	1	**9.045 951**
150	33	0.45	50	1	**9.045 952**
150	45	0.20	50	1	**9.045 953**
150	45	0.45	50	1	**9.045 954**
500	33	0.20	75	1	**9.045 956**
500	33	0.45	75	1	**9.045 957**
500	45	0.20	75	1	**9.045 958**
500	45	0.45	75	1	**9.045 959**
1000	33	0.20	90	1	**9.045 961**
1000	45	0.20	90	1	**9.045 963**



2 Filter units, disposable, SFCA-membrane

Thermo Scientific

Single-use, disposable filter units for sterile filtration of media and other reagents, and for other highly sensitive cell culture lines. With polystyrene (PS) upper and lower chambers and surfactant-free, cellulose acetate membranes. Colour code: yellow collar. For cell culture. Gamma-irradiated sterile. Low protein binding, with high throughput rate for proteinaceous solutions and minimal extractables content. Lot number, catalogue number, membrane type, pore size and expiration date are printed on filter units, bottle tops and receivers for easy identification and lot traceability.

Capacity ml	Pore size µm	Membrane diam. mm	PK	Cat. No.
150	0.20	50	1	**9.046 034**
150	0.45	50	1	**9.046 035**
250	0.20	50	1	**9.046 037**
250	0.45	50	1	**9.046 038**
500	0.20	75	1	**9.046 041**
500	0.45	75	1	**9.046 042**
1000	0.20	75	1	**9.046 044**
1000	0.45	75	1	**9.046 045**
500	0.20	90	1	**9.045 975**
500	0.45	90	1	**9.045 976**
1000	0.20	90	1	**9.045 971**
1000	0.45	90	1	**9.045 972**



3 Filter units, disposable, cellulose nitrate membrane

Thermo Scientific

White, cellulose nitrate membrane. Colour code: green. Highest throughput rate for water and aqueous solutions, low extractables content. Surfactant-free. Lot number, catalogue number, membrane type, pore size and expiration date are printed on filter units, bottle tops and receivers for easy identification and lot traceability.

Capacity ml	Pore size µm	Membrane diam. mm	Grid	PK	Cat. No.
150	0.20	50	without	1	**9.046 109**
150	0.45	50	green	1	**9.046 110**
150	0.80	50	black	1	**9.046 111**
250	0.20	50	without	1	**9.046 121**
250	0.45	50	green	1	**9.046 122**
250	0.80	50	black	1	**9.046 123**
500	0.20	75	without	1	**9.046 131**
500	0.45	75	green	1	**9.046 132**
500	0.80	75	black	1	**9.046 133**
1000	0.20	75	without	1	**9.046 141**
1000	0.45	75	green	1	**9.046 142**
1000	0.80	75	black	1	**9.046 143**

E & OE.

1 Filter units, PS, disposable, Type 150, 153, 151, 154, 163, 164, nylon membrane

Thermo Scientific

Single-use, disposable filter units for sterile filtration of media and other reagents, and for other highly sensitive cell culture lines. With polystyrene (PS) upper and lower chambers and nylon membrane. Colour code: red. For cell culture. Gamma-irradiated sterile. Extremely low in extractable substances, no wetting agents. Lot number, catalogue number, membrane type, pore size and expiration date are printed on filter units, bottle tops and receivers for easy identification and lot traceability.



Type	Capacity ml	Pore size µm	Membrane dia. mm	PK	Cat. No.
150	150	0.20	50	1	**9.046 055**
150	150	0.45	50	1	**9.046 056**
153	250	0.20	50	1	**9.046 061**
153	250	0.45	50	1	**9.046 062**
151	500	0.20	75	1	**9.046 064**
151	500	0.45	75	1	**9.046 065**
163	500	0.20	90	1	**9.045 978**
154	1000	0.20	75	1	**9.046 067**
154	1000	0.45	75	1	**9.046 068**
164	1000	0.20	90	1	**9.045 979**

2 Bottle-Top-Filter FastCap™ with PES-Membrane, sterile

Thermo Scientific

Large-Volume Bottle Top Filter, blue PS housing. FastCap™ Bottle Top Filter's universal fit eliminates the need to screw them onto glass media bottles. Filters up to 5L. just place on bottle mouth, apply vacuum and start filtering. Fits bottle necks up to 53mm.



Pore size µm	Diam. mm	PK	Cat. No.
0.20	90	1	**7.055 107**

3 Conical Filter Unit with PES-Membrane, sterile

Thermo Scientific

Polystyrene housing, 0.2µm Supor® machV PES membrane. The optimal choice for small volume tissue culture work. Offers clean, fast filtration of 20ml to 50ml of media or buffers using the Pall Supor® machV PES membrane. This low protein binding unit is non-cytotoxic and non-pyrogenic. Comes assembled with 50ml conical tube and a separate closure. Includes 2 reusable stands in each case. Certified and graduated. Lot number, catalogue number, membrane type, pore size and expiration date are printed on it.



Capacity ml	Pore size µm	Diam. mm	PK	Cat. No.
50	0.20	50	1	**9.046 021**



1



2



1 2 Colony counter eCount™

Heathrow Scientific

Multi-function electronic counter with a Sharpie® pen for marking Petri dishes to prevent missing or double-counting colonies. Light, ergonomic body is balanced for easy manipulation. For easy counting of bacteria and mould fungus colonies.
Counting contol via membrane keys.
- Count up, then count down verification
- Display the total and keep in the memory up to 32 separate counts
- Disable the counter so you can write totals and notes
- Verify each count with either a bleep or LED Flash

Type	PK	Cat. No.
Colony counter eCount™ incl. Sharpie® pen, black, fine-point and stand	1	**9.521 783**
Replacement pens Sharpie® pen, black, fine-point	12	**9.521 787**

3



3 Colony counter, ColonyCount V

NEW!

Gerber

Features:
- ergonomically optimised design
- unique Light Dispose Grating (LDG)
- adjustable background and side lighting
- multifunctional graphical display
- acoustical and optical count signal
- data storage and data management
- great variety of optional accessories

Advantages:
- stressless counting of petri dishes
- consistent illumination of the counting area
- glare-free work
- user-friendly menu guided operation
- intelligent, safe and accurate counting
- complete documentation (GMP)
- adaptable to your needs

Included in delivery: ColonyCount V, high quality magnifying glass with holder, standard marker black, Wolffhügel disc grid 1cm² and 1/9 cm², user guide on CD, adapter for petri dishes ø 90mm, external power supply, Quick Guide.

Optional accessories: Thermo printer for ColonyCount V, Printercable RS232, Memory card 2GB, External counting marker, Adapting elements for different Petri dishes ø 50/60/80/90 mm, Software and cable.

Specifications

Display:	Graphic-display with membrane keyboard
Standard magnifier glass:	2x magnification
Lighting:	LED side and from below (LDG)
Petri dishes:	ø up to 120mm
Nominal voltage:	100-240VAC - 50/60 Hz
Weight:	4.5kg
Warranty:	2 years

Type	PK	Cat. No.
ColonyCount V	1	**9.112 651**

E & OE.

1 Colony Counter SC6+

Stuart

- Pressure sensitive counting
- Average count facility
- Bright white energy saving LED lighting
- With BioCote antimicrobial protection
- Audible confirmation
- Choice of light or dark background
- Connectivity to printer or computer



Touch pressure with felt tip marker on petri dish registers cumulative count on the digital display with confirmation by audible tone (can be turned on or off). The pressure required to register a count can be adjusted to suit each user. Averaging facility calculates average count over multiple plates. Counting results as well as useful statistics including SD can be sent directly to the accessory printer or to a computer via a USB cable supplied. Sub-stage illumination by low energy bright LED's allows glare-free optimum viewing. A switchable black background is provided to enhance viewing of translucent and difficult to see colonies. Supplied with two Wolffhuegel graticules and dish centering adapters to facilitate use with 50mm to 90mm dishes. A choice of magnifiers and a printer are available as optional accessories.

Specifications

Lighting:	White LED array
Digital display:	3 digit LED
Count:	0 to 999
Dimensions (w x d x h):	310mm x 300mm x 140mm
Mass:	1.5kg
Electrical supply:	120 to 230V, 50/60Hz, 70W

Type	PK	Cat. No.
SC6+	1	**9.645 280**

Accessories for Colony Counter SC6+

Stuart

Description	PK	Cat. No.
Accessory printer with power supply	1	**9.950 399**
Magnifiers 1.7x	1	**9.645 281**
Magnifiers 3x	1	**6.223 318**
Wolffhuegel graticule/segmentation discs for colony counter	10	**6.238 272**
Centering adapter	2	**6.242 195**
Protective discs	5	**6.241 644**

2 Colony counter, schütt count

schuett-biotec

Designed for reliable and efficient counting of bacterial colonies and bacteriophage plaques growing on nutrient agar or nutrient discs/filter disks in Petri dishes. Provides ergonomic, relaxed and comfortable operation. For Petri dishes of 60, 90 or 150mm diameter. State-of-the-art, LEDlight, for absolutely glarefree illumination without blinding or stray light. No eyestrain. A so far unknown level of transparency and contrast differentiation with natural colour reproduction of the colonies is obtained. Contrast-disk is provided for counting colonies in light and dark fields when using clear or dark agar. No heating of the samples occurs. The counting impulse is triggered by marking the colonies with an ordinary felt-tip marker pen. The device is equipped with a penholder as well as a 4-digit LED-display (0 to 9999 counts) and a clearly arranged foil keypad for all controls. Average count calculation, data transfer via USB to PC, light intensity, pressure sensitivity and buzzer are adjustable as counting controls.
Items supplied: For 90mm dia. Petri dishes: adapter (transparent) for illumination from below, adapter (black/white) for illumination from side, contrast disc (black), USB-cable, marker-pen with holder.
Overall dimensions (WxDxH): 260 x 250 x 130mm
Height with integral support stand approx. 300mm



For enumeration of more than 50 Petri dishes per day, we recommend: schütt colonyQuant automatic colony counter (sample chamber, PC/laptop, software)

Type	PK	Cat. No.
schuett count colony counter, 100-240 V (Fig. a)	1	**9.521 940**

Accessories for schuett count Colony counter

schuett-biotec

Type	PK	Cat. No.
Magnifier 3 x (100mm dia.)	1	**9.521 941**
Magnifier 6-8 x (60mm dia.)	1	**9.521 942**
LED overhead lamp	1	**9.521 943**
Adapter for Petri dishes, 50 to 60mm dia. (Fig. d)	1	**9.521 944**
Adapter for Petri dishes, 140 to 150mm dia. (Fig. e)	1	**9.521 945**
Spiral-Plater Disc, black/white (Fig. b)	1	**9.521 946**
Wolffhügel Disc, black/white (Fig. b)	1	**9.521 947**
Counting needle (Fig. c)	1	**9.521 948**

1



1 LLG-Microcentrifuge tubes, PP

LLG Microtubes cover standard volumes for a variety of sample tests. They are available in 0.5ml, 1.5ml and 2.0ml volumes. These standard Microtubes withstand high centrifugal forces, are temperature and chemical-resistant and guaranteed against leaks. An innovative and modern new generation of Microtubes with new features. Perfect sealing qualities, excellent chemical stability and optimal construction materials guarantee even better resistance to centrifugal and chemical forces. Easy to open and to close thanks to the improved lid geometry. For visual volume control the 1.5ml tubes are equipped with graduations at 0.5ml, 1.0ml and 1.5ml. The 2.0ml tubes have graduations at 0.5ml, 1.0ml, 1.5ml and 2.0ml. The 0.5ml tubes are without graduations.
Certified DNase-, RNase- and pyrogen free.

Non sterile, clear, in bags. Certified free of DNase, RNase, suitable for microbiology. Guaranteed metal-free. CE-certified for In-Vitro-Diagnostics acc. to 98/79/EG.

Specifications

Autoclavability

Temperature:	121°C (250°F)
Pressure:	1.05 bar or 15 psig (pounds)
Time:	20 min or less

Centrifugation

Fixed angle rotor:	25000xg
Swing out rotor:	70000xg

Volume ml	PK	Cat. No.
0.5	1000	**9.409 023**
1.5	1000	**9.409 024**
2.0	1000	**9.409 025**

2



2 Reaction tubes, PP

Translucent polypropylene (PP), natural colour *Ratiolab*
- tight sealing cap
- safe and easy to be opened and closed

Capacity ml	PK	Cat. No.
0.5	1000	**6.085 184**
1.5	1000	**9.409 310**
2.0	1000	**6.510 856**

3



9.409 301

4



9.409 303

Reaction tubes, with attached lid

PP. High clarity. Frosted marking area and approximate graduations. Tight fitting attached lid provides rak-free seal, yet reopens easily. Uniform lid-thickness ensures trouble-free piercing. Can be centrifuged up to 20000 xg rcf. at 20°C for max. 20min. CE-marked according to IVD 98/79 EG. Autoclavable at 121°C (2bar), acc. DIN EN 285. BIO-CERT® products are sterile, free of endotoxins, DNA, RNase and ATP. *BRAND*

Capacity ml	Diam. mm	Height mm	Description	PK	Cat. No.
1.5	10.75	40.80		500	**9.409 301** 3
2.0	10.70	41.15		500	**9.409 303** 4
1.5	10.75	40.80	BIO-CERT®	450	**7.200 414**

E & OE.

1 2 Reaction tubes CapLock®, PP

TreffLab

The new CapLock® cap closure guarantees optimum tube sealing for all applications. CapLock® tubes provide enhanced sample security and stay safely closed, even in boiling water baths.

- Pyrogen-/RNase-/DNase-free, non-sterile and cleanroom-manufactured ISO Class 8
- moulded in transparent, medical grade, PP
- can be centrifuged up to 30000 x g
- autoclavable: at 1bar, 121°C for 20min
- with labelling area on cap and tube
- high chemical resistance
- graduation for an easy volume identification

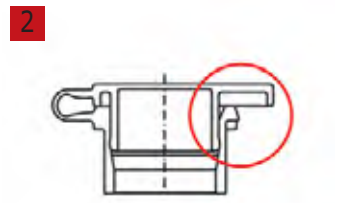
Certificate of Conformity according to DIN EN 10204 2.1

Capacity ml	PK	Cat. No.
1.5	1000	**9.407 700**

1



2



3 Microcentrifuge tubes, PP, with lid closure

NEW!

BRAND

These new 1.5ml microcentrifuge tubes are available with an additional lid closure to achieve especially effective sealing and prevent accidental opening.
- Autoclavable at 121°C and 2 bar (DIN EN 285)
- Centrifugable up to 30.000xg
- Free of RNase, DNase, DNA and endotoxins
- Produced under cleanroom conditions, ISO 14 644-1, Class 8
- Made from high-quality medical-grade polypropylene
- Subdivisions at 0.1, 0.5, 1.0, and 1.5ml
- Frosted labelling surfaces on the lid and tube

Type	PK	Cat. No.
Microcentrifuge tubes with lid closure	1000	**6.257 318**

3



Micro tubes with screw caps

BRAND

Screw cap micro tubes are ideal for storage of serums and blood samples, and for boiling, centrifugation, etc.

Quality features:
- Available in different formats, designs and quality grades.
- Micro tubes of PP and screw caps of PE or PP are precisely matched to ensure a secure seal. Available screw caps: screw cap with sealing cone, screw cap with silicone seal or tamper-evident screw cap with silicone seal.
- Cap inserts for coding, available in a variety of colors.
- Fast opening and closing with 1¼ turn of cap.
- Micro tubes with ring stands (self-standing) can be placed in suitable racks without the use of both hands.
- Micro tubes without ring stand (round bottom) withstands RCF up to 17 000 g at 20°C, for 20 min.
- Dimensions: outer Ø 11 mm, height 47 mm.

4 Micro tubes with attached screw cap with sealing cone, non-sterile

NEW!

BRAND

PP, ungraduated, screw cap PE. Operating range: -90°C to +100°C. Available separately: colored cap inserts (PP) for identification.
Pack of 1000.

Capacity ml	Description	PK	Cat. No.
0.5	self-standing	1000	**6.701 485**
1.5	self-standing	1000	**7.079 677**
1.5	round-bottom	1000	**7.300 156**
2.0	self-standing	1000	**7.300 197**
2.0	round-bottom	1000	**7.510 076**

4



1



1 Micro tubes with attached screw cap with silicone seal, non-sterile

NEW!

PP, graduated, screw cap PP. Frosted marking area. Operating range: -196°C to +121°C. Autoclavable at 121°C (2 bar), acc. DIN EN 285. Available separately: colored cap inserts (PP) for identification.
Pack of 1000.

BRAND

Capacity ml	Grad. ml	Description	PK	Cat. No.
0.5		self-standing	1000	**6.802 474**
1.5	1.00	self-standing	1000	**7.070 048**
1.5	1.00	round-bottom	1000	**7.076 849**
2.0	1.20	self-standing	1000	**7.300 124**
2.0	1.40	round-bottom	1000	**7.300 580**

2



2 Colored cap inserts (PP) for reaction tubes

NEW!

BRAND

Colour	PK	Cat. No.
white	500	**7.079 716**
blue	500	**7.059 689**
red	500	**7.079 676**
green	500	**7.059 690**
yellow	500	**7.059 691**

3



3 Micro tubes, bulk screw cap (PP) with silicone seal

NEW!

PP, graduated, screw cap PP. Frosted marking area. Operating range: -196°C to +121°C. Autoclavable at 121°C (2 bar), acc. DIN EN 285. Sterile: DNA, DNase and RNase-free, endotoxin-free, non-mutagenic, non-toxic. Available separately: colored screw caps and colored cap inserts
Pack of 1000.

BRAND

Capacity ml	Description	PK	Cat. No.
0.5	self-standing, sterile with lid	500	**6.401 078**
1.5	self-standing, sterile with lid	500	**4.000 236**
1.5	round-bottom, sterile with lid	500	**7.300 006**
2.0	self-standing, sterile with lid	500	**7.602 492**
2.0	round-bottom, sterile with lid	500	**7.612 290**
0.5	self-standing, unsterile without lid	1000	**4.000 234**
1.5	self-standing, unsterile without lid	1000	**6.801 871**
1.5	round-bottom, unsterile without lid	1000	**6.802 032**
2.0	self-standing, unsterile without lid	1000	**6.401 135**
2.0	round-bottom, unsterile without lid	1000	**6.401 081**
	lid, unsterile, white	1000	**6.901 915**
	lid, unsterile, blue	1000	**4.000 235**
	lid, unsterile, red	1000	**6.801 872**
	lid, unsterile, green	1000	**6.401 082**
	lid, unsterile, yellow	1000	**6.401 134**

1 2 Safe-lock reaction tubes, PP

Eppendorf AG

- A small clasp on the patented cap locking device clips onto the rim of the tube
- Autoclavable when open (121°C, 20min.)
- Can be opened and closed easily with one hand
- With frosted labelling area.
- The clasp on the cap prevents the lid springing open accidentally (e.g. when heating)
- Excellent mechanical stability for centrifugation
- Graduated
- Safe-lock reaction vessels are also available in Eppendorf Biopur® Quality
- 0.5ml and 1.5ml capacity Safe-lock reaction vessels can be centrifuged up to 30 000 x g



Capacity ml	Colour	PK	Cat. No.
0.5	Transparent	500	**9.409 320**
0.5	Yellow	500	**9.409 354**
0.5	Red	500	**9.409 355**
0.5	Blue	500	**9.409 352**
0.5	Green	500	**9.409 353**
0.5	Amber	500	**9.409 356**
1.5	Transparent	1000	**9.409 331**
1.5	Yellow	1000	**9.409 332**
1.5	Red	1000	**9.409 333**
1.5	Blue	1000	**9.409 334**
1.5	Green	1000	**9.409 335**
1.5	Amber	1000	**9.409 336**
2.0	Transparent	1000	**9.409 341**
2.0	Yellow	1000	**9.409 342**
2.0	Red	1000	**9.409 343**
2.0	Blue	1000	**9.409 344**
2.0	Green	1000	**9.409 345**
2.0	Amber	1000	**9.409 346**
0.5	Assorted colours	500	**9.409 357**
1.5	Assorted colours	1000	**9.409 358**
2.0	Assorted colours	1000	**9.409 359**



3 Standard reaction tubes, 3810 X, PP

Eppendorf AG

- Flat, frosted cap and marking patch on the body of the tube provide generous space for labelling
- Simplified opening and closing due to improved neck/cap geometry
- Graduated from 0.1 to 1.5ml on the tube body
- Autoclavable when open (at 121°C for 20mins.)
- Can be centrifuged up to 30000 xg in fixed angle rotors (up to 70000 xg in swing-out rotors)
- Compatible with Micropestle



Capacity ml	Colour	PK	Cat. No.
1.5	transparent	1000	**9.409 317**
1.5	blue	1000	**9.409 337**
1.5	yellow	1000	**9.409 338**
1.5	green	1000	**9.409 339**
1.5	red	1000	**9.409 347**

4 5 Safe-lock reaction tubes, Biopur®, sterile

Eppendorf AG

Comply with the exacting requirements set by the medical, pharmaceutical and food industries, molecular biology and cell technology.

- Sterile
- Free from pyrogens, RNase, DNA and ATP
- Independently checked and certified by an external laboratory.
- Individually blister-packed



Capacity ml	PK	Cat. No.
0.5	50	**9.283 516**
1.5	100	**9.283 517**
2.0	100	**9.283 518**



1



1 LLG-Centrifuge tubes, PP

Polypropylene tubes with very good thermal, mechanical and chemical stability. Fitted with screw-on closure. Packed in boxes or bags. With graduations and labelling area. Cytotoxicity-free, DNase/RNase- and human DNA-free.

Centrifugation capacitiy (RCF): 6000 x g

Diam. mm	Height mm	Capacity ml	Form	Description	PK	Cat. No.
17.0	120	15	conical	sterile, single packed	50	**9.316 062**
17.0	120	15	conical	non-sterile, 8x50 in rack	400	**4.008 507**
17.0	120	15	conical	non-sterile	500	**9.316 063**
30.0	120	50	conical	sterile, single packed	50	**9.316 064**
30.0	120	50	conical	non-sterile	500	**9.316 065**
30.0	120	50	conical	non-sterile, in rack	50	**9.316 066**
30.0	120	50	with rim	sterile, single packed	50	**9.316 067**
30.0	120	50	with rim	sterile	50	**6.238 728**
30.0	120	50	with rim	non-sterile	50	**4.008 506**
30.0	120	50	with rim	non-sterile,4x50 in rack	200	**4.008 508**

2



2 Micro test tubes and racks, PP, 1.2 ml

BRAND

Suitable for biological examination, e.g. PCR, cell uptake studies, RIA, EIA, etc.
Functional design for storing, freezing and transporting reagents and samples.
Compatible with standard microtitre plates and suitable for work with multi-channel pipettes.

Properties:

- 8 x 12 configuration
- Alphanumeric identification system
- Tubes and rack are autoclavable (121°C, 2 bar), according to DIN EN 285
- Tube dimensions:8.8mm external Ø, height 45mm
- Suitable for storage up to -80°C
- Test tube capacity 1.2ml (1.1ml when capped)
- Individual tube or 8-tube strips available
- With PE cap (not autoclavable)

Type	PK	Cat. No.
Rack with 96 single test tubes, non-sterile, PP	10	**9.407 605**
Rack with 12 x 8-tube strips, non-sterile, PP	10	**9.407 606**
Test tubes, single, non-sterile, loose, PP	960	**9.407 607**
8-tube strips, non-sterile, loose, PP	120	**9.407 608**
Lid, single, non-sterile, loose, PE	960	**9.407 609**
8-cap strip, non-sterile, loose, PE	120	**9.407 610**
Rack with grid, non-sterile (empty), PP	10	**9.407 611**

3



3 Microtube Racks, 80-Well, PP

Autoclavable. Popular fraction collector plate-style rack. Easily load and transfer 80 tubes with 1.5ml or 2.0ml in a compact format (5 x 16 array). Polypropylene rack has moulded-in coordinates to aid organisation. Assorted colours. Dimensions (L x W x H): 225mm x 67mm x 28mm.

Colour	PK	Cat. No.
Blue, green, pink, yellow and orange	5	**6.237 973**
Blue	1	**6.243 204**
Yellow	1	**6.243 205**
Natural	1	**6.243 206**
Orange	1	**6.243 207**
Pink	1	**6.243 208**
Green	1	**6.243 209**

4



4 Cube Racks, PP

Interlock on all sides.

Autoclavable. Our user-friendly cube racks are a must for any laboratory. Accommodate 4 x 50ml tubes, 10 x 15ml conical tubes, 12 x 75mm or 12 x 100mm tubes or 16 x 1.5 to 2.0ml microcentrifuge tubes. Polypropylene racks slide together, allowing you to work with different tubes on as many connected racks as desired. Available in natural or assorted colours (blue, green, yellow orange and pink). Dimensions: 108 x 108 x 114mm.

Colour	PK	Cat. No.
Assorted Colours	5	**9.409 091**
Natural	1	**9.409 092**

Further Centrifuge tubes - please see page 672.

E & OE.

1 Microtube racks, 96-Well, PP

Heathrow Scientific

Autoclavable. Polypropylene rack has 96 wells for 0.5ml microcentrifuge tubes on one side and 96 wells for 1.5ml to 2.0ml microcentrifuge tubes on the other side. Wells are arranged in standard 8 x 12 array. Handy lid snaps into place via tabs on each end of rack. Dimensions (L x W x H): 246mm x 121mm x 50mm.



Colour	PK	Cat. No.
Blue, green, pink, yellow and orange	5	**9.193 982**
Natural	1	**6.237 620**
Blue	1	**6.237 267**
Green	1	**6.237 268**
Pink	1	**6.237 621**
Yellow	1	**6.237 622**
Orange	1	**6.237 623**

2 Pop-Up™ Rack, PP

Heathrow Scientific

Robust polypropylene construction. Simple, easy to open and close. Flatten for compact storage. Pops up for instant use. Expand and collapse when racks are needed. Printed grid aids rapid retrieval. Stack racks in open or closed position. Saves space when racks are not in use. Not recommended for steam sterilisation. Dimensions (L x W x H): 255mm x 137mm x 72mm when expanded, 21mm high when collapsed.



Colour	For	PK	Cat. No.
Pink	21 x 15ml and 12 x 50ml tubes	2	**9.193 997**
Blue	21 x 15ml and 12 x 50ml tubes	2	**9.193 998**

Further Tube Racks - please see page 34.

3 Microtube Storage Boxes, 50-/100-Well, PP

Heathrow Scientific

Autoclavable. Compact storage box has angled front slot for easy access to tubes. Rugged, polypropylene box has durable three-point hinges, snapping clasp for secure closure, moulded grid lines on lid, imprinted coordinates on bottom of base and imprinted and raised coordinates on tube wells. Ideal for sample or case study storage.Holds 1.5ml to 2.0ml microtubes. Resist storage temperatures from -80°C up to +121°C.



no. of wells	Dimensions (L x W x H) mm	Colour	PK	Cat. No.
50	141 x 92 x 56	blue, green, purple, yellow, orange	5	**9.193 985**
50	141 x 92 x 56	natural	1	**6.243 162**
100	141 x 151 x 57	blue, green, purple, yellow, orange	5	**9.193 981**
100	141 x 151 x 57	natural	1	**6.206 710**

Brandplates® - A complete premium-quality line - for every application!

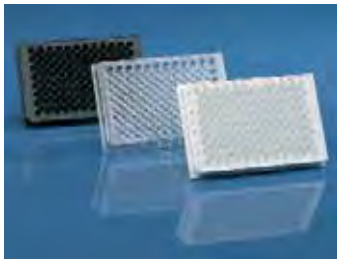
BRAND

Microplates for Cell Culture (sterile)
Cell culture is increasing in popularity in the research and development area. Outside of basic research, cells are cultivated today for a number of reasons, including the production of proteins and in particular as assay systems. As cell cultures can sometimes be quite demanding regarding their environment, the disposables used for cultivation have to be of highest quality. The four different cell culture surfaces of the Brandplates® allow the optimum combination between microplate and specific cell line.

cellGrade™
Standard plate for the cultivation of adherent cell cultures. PS-surface with different chemical groups, like e.g. carboxyl and hydroxyl groups, that are freely accessible. Surface is hydrophilic compared with non-treated PS.
cellGrade™ plus
For cultivation of fastidious cell cultures. In addition to carboxyl and hydroxyl chemical groups, free amino groups are present on the surface. The surface has a protein-like composition; cells can directly attach and spread out. Cells adhere faster, better rate of yield. Suited for serum reduced cultivation of cells.
cellGrade™ premium
Poly-D-Lysine-equivalent surface, with analogous results regarding growth performance and cell morphology. Optimal adhesion of cells to the surface reduces cell damage when washing frequently. Surface suited for serum-free and serum-reduced cultivation of cells. Good shelf life at room temperature.
inertGrade™
For cultivation of suspension cell cultures. Especially suited for cell cultures, when adhesion is not desired. Optimized surface characteristics reducing cell adhesion and protein adsorption, enzyme and cellular activation is minimized. Stem cells can be prevented from early differentiation.

Colours, wells and shapes:
- 96-, 384- and 1536-well format
- sterile according to Ph.Eur. and USP 29, SAL 10^{-6}
- standard or transparent bottom
- transparent, white or black
- various well bottom shapes: U-, V-, F-, C-bottom for 96-well format
- clearly distinguishable via colour code: orange embossed alphanumeric coding for 96-well standard
- free from endotoxins (< 0.01 EU/ml), DNase, DNA, RNase, non-cytotoxic (according to ISO 10993)
- Sterile Products comply with ISO 11137 and AAMI guidelines. A SAL of 10^{-6} is reached. Supplied individually wrapped with lid.
- ANSI/SLAS format

1

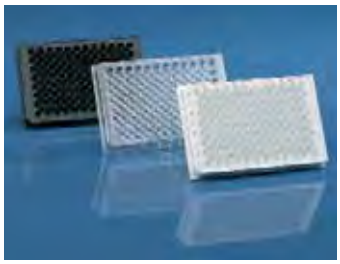


1 cellGrade™

PS, sterile. For standard cell culture applications. *BRAND*

Description	Bottom shape/ Well volume µl	Growth area approx. cm²	PK	Cat. No.
96-well, transparent	U / 330		50	**4.000 329**
96-well, transparent	V / 360	0.33	50	**4.000 330**
96-well, transparent	F / 350	0.32	50	**4.000 331**
96-well, transparent	C / 350	0.25	50	**4.000 332**
96-well, white	F / 350	0.32	50	**4.000 333**
96-well, black	F / 350	0.32	50	**4.000 334**
96-well, white / transparent	F / 330	0.31	50	**4.000 335**
96-well, black / transparent	F / 330	0.31	50	**4.000 336**
384-well, transparent	F / 100	0.12	50	**4.000 337**
384-well, white	F / 100	0.12	50	**4.000 338**
384-well, black	F / 100	0.12	50	**4.000 339**
384-well, white / transparent	F / 120	0.13	50	**4.000 343**
384-well, black / transparent	F / 120	0.13	50	**4.000 344**
1536-well, transparent	F / 10	0.02	50	**4.000 345**
1536-well, white	F / 10	0.02	50	**4.000 346**
1536-well, black	F / 10	0.02	50	**4.000 347**

2



2 cellGrade™ plus

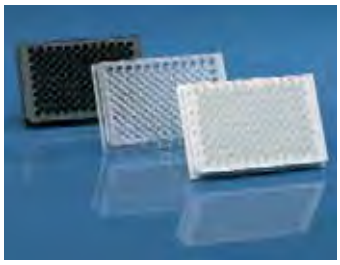
PS, sterile. For cultivation of fastidious cell lines and for serum-reduced cultivation. *BRAND*

Description	Bottom shape/ Well volume µl	Growth area approx. cm²	PK	Cat. No.
96-well, transparent	F / 350	0.32	50	**4.000 348**
96-well, white	F / 350	0.32	50	**4.000 349**
96-well, black	F / 350	0.32	50	**4.000 350**
96-well, white / transparent	F / 330	0.31	50	**4.000 351**
96-well, black / transparent	F / 330	0.31	50	**7.624 490**
384-well, transparent	F / 100	0.12	50	**4.000 352**
384-well, white / transparent	F / 120	0.13	50	**4.000 353**
384-well, black / transparent	F / 120	0.13	50	**4.000 354**

E & OE.

1 cellGrade™ premium

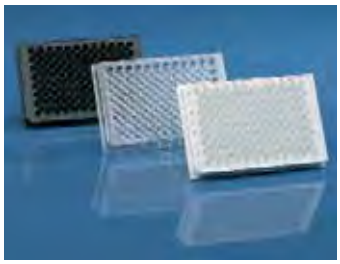
PS, sterile. For the most demanding cell lines, and for serum-reduced and serum-free cultivation. *BRAND*



Description	Bottom shape/ Well volume µl	Growth area approx. cm²	PK	Cat. No.
96-well, transparent	F / 350	0.32	50	**4.000 355**
96-well, white	F / 350	0.32	50	**4.000 356**
96-well, black	F / 350	0.32	50	**4.000 357**
96-well, white / transparent	F / 330	0.31	50	**4.000 358**
96-well, black / transparent	F / 330	0.31	50	**4.000 359**
384-well, transparent	F / 100	0.12	50	**4.000 360**
384-well, white / transparent	F / 120	0.13	50	**4.000 361**
384-well, black / transparent	F / 120	0.13	50	**4.000 362**

2 inertGrade™

PS, sterile. For cultivation of suspension and stem cells. *BRAND*



Description	Bottom shape/ Well volume µl	Growth area approx. cm²	PK	Cat. No.
96-well, transparent	U / 330		40	**4.000 314**
96-well, transparent	F / 350	0.32	40	**4.000 315**
96-well, white	U / 330		40	**4.000 316**
96-well, white	F / 350	0.32	40	**4.000 317**
96-well, white	C / 350	0.25	40	**4.000 318**
96-well, black	U / 330		40	**4.000 319**
96-well, black	F / 350	0.32	40	**4.000 320**
96-well, black	C / 350	0.25	40	**4.000 321**
96-well, white / transparent	F / 330	0.31	40	**4.000 322**
96-well, black / transparent	F / 330	0.31	40	**4.000 323**

3 F96 MicroWell™ Plates, PS

Clear, white or black plates with excellent optical clarity and flat bottom wells. Nunclon™Δ, Collagen I, Poly-D-Lysine surface modifications suitable for cell culture assays. *Thermo Scientific*
Material plates: Polystyrene
Total volume µl/well: 400



Surface	Colour	Sterile	Description	PK	Cat. No.
Nunclon™Δ	Clear	yes*	with lid	160	**6.803 751**
Nunclon™Δ	Clear	yes*	with lid	50	**9.407 473**
Nunclon™Δ	White	yes*	with lid	50	**6.802 646**
Nunclon™Δ	Black	yes*	with lid	50	**6.802 647**
Collagen I	Clear	no**	with lid	20	**4.008 866**
Poly-D-Lysin	Clear	no**	with lid	20	**4.008 858**
Non-treated	Clear	yes	with lid	160	**6.237 877**
Non-treated	White	yes	with lid	50	**6.231 848**
Non-treated	Black	yes	with lid	50	**7.601 891**
Non-treated	Clear	yes	without lid	180	**4.008 715**
Cell culture	Clear	yes	without lid	180	**4.008 767**
Non-treated	Clear	yes	with lid	160	**6.803 101**
Non-treated	Clear	yes	without lid	50	**9.390 515**
Cell culture	Clear	yes	without lid	50	**9.407 475**

* certified.
**Produced in clean environment.

4 96 Well Optical Bottom Plates, PS

- Nunclon™Ä, Poly-D-Lysine or Collagen I surfaces for cell culture *Thermo Scientific*
- Non-treated plates are optimised for scintillation counting
- White or black upper structure with polymer bottom plates combine the optical clarity of virgin crystalline polystyrene with optimal surface for a wide range of HTS applications
- Working volume range: 50 - 200µl/well



Surface	Colour	Sterile	Description	PK	Cat. No.
Cell Culture	White	yes	with lid	30	**4.008 852**
Cell Culture	Black	yes	with lid	30	**6.801 890**



1 384 Well Optical Bottom Plates, PS

Thermo Scientific

Combining a white or black upper structure with an optically clear, flat well bottom polymer base allows for reading from bottom and top, or both. Nunclon™Δ surface modifications are for cell culture optimized. Non-treated plates are ideal for scintillation counting.
Material plates: Polystyrene
Total volume µl/well: 120

Surface	Colour	Sterile	Description	PK	Cat. No.
Cell Culture	White	yes*	with lid	30	**4.009 018**
Cell Culture	Black	yes*	with lid	30	**4.009 004**
Non-treated	White	no	without lid	30	**4.008 951**
Non-treated	Black	no	without lid	30	**4.008 753**

* certified.



2 Multidishes, Nunclon™Δ Surface, PS, sterile

Thermo Scientific

4- to 48-well multidishes with Nunclon™Δ surface are useful for all areas of cell culture including scale-up and cloning. Raised well rims lower the risk of cross contamination.
Excellent optical quality. All available surface modifications are certified non-pyrogenic and tested for both monolayer formation and cloning efficiency employing primary cells as well as repeating cell lines. Sterile. With lid
Material dishes and lids: Polystyrene

no. of wells	Culture surface cm²	Working volume ml	Description	PK	Cat. No.
4	1.9	1	Nunclon Δ, Flat	120	**6.050 151**
4	21.8	5	Nunclon Δ, Flat	100	**4.009 034**
6	9.6	3	Nunclon Δ, Flat	75	**9.390 401**
6	9.6	3	Nunclon Δ, Flat	85	**9.390 402**
6	9.6	3	Poly-D-Lysin, Flat	20	**4.008 850**
6	9.6	3	Collagen I. Flat	20	**4.008 874**
8	10.5	3	Nunclon Δ, Flat	100	**4.009 045**
12	3.5	2	Nunclon Δ, Flat	75	**9.390 403**
24	1.9	1	Flat	75	**9.390 410**
24	1.9	1	Flat	85	**7.634 155**
48	1.1	0,5	Flat	75	**9.390 411**
48	1.1	0,5	Flat	85	**6.206 402**

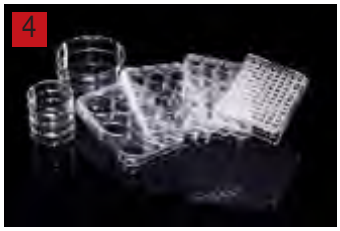


3 Multidishes, non-treated, PS, sterile

Thermo Scientific

Non-treated, sterile multidishes for suspension cell cultures are available in formats from 4 up to 48 wells. Raised well rims lower the risk of cross contamination. Excellent optical quality. Non-pyrogenic. With lid.
Material dishes and lids: Polystyrene

no. of wells	Working volume ml	PK	Cat. No.
4	1	120	**6.223 971**
6	3	75	**6.803 562**
12	2	75	**7.623 040**
24	1	75	**6.222 953**
48	0.5	75	**6.207 164**



4 Cell Culture Products with Low Cell Binding, PS, gamma irradiated

Thermo Scientific

Surface modifications for low cell attachment and binding are excellent for suspension cultures and non-adherent cell cluster. Different formats available: Petri Dishes, multidishes and microplates. Clear 96-well plates with flat or round well bottom and excellent optical quality. Gamma irradiated.
Material plates: Polystyrene

Type	Format	Capacity ml	PK	Cat. No.
Multidishes	6-Well	3	7	**4.008 554**
Multidishes	12-Well	2	7	**4.008 555**
Multidishes	24-Well	1	7	**4.008 556**
Petri dishes	Ø 60 mm	5	20	**4.008 726**
Petri dishes	Ø 90 mm	10	20	**4.008 754**

E & OE.

Microplates, PS, sterile

Capacity µl	Description	Colour	Sterile	PK	Cat. No.
400	Bottom shape flat, with lid, certified	Clear	yes	8	**7.635 245**
300	Bottom shape round, with lid, certified	Clear	yes	8	**7.635 246**

1 Cell Culture Dishes with thermosensitive UpCell™ Surface, PS

NEW!



Thermo Scientific

UpCell™ Surface enables harvesting of adherent cells by simple reduction of temperature from 37°C to below 32°C.

- Without trypsinization you will get your cells with intact surface proteins for culture passaging, single- cell analyses and cell transplantation reasearch.
- No manual cell scraping to get high viability.
- Enables harvesting of cell sheets and creation of 3D- tissue models held together by normal cell junctions and extracellular matrix deposited by the cells.
- Available in sterile MicroWell™ Plate, Petridish or MultiDish format.
- With lids with airvent rims.
- Certified for functionality, sterility, non- pyrogenic and non- toxicity.

6- Well- Multidish and 3.5cm- Dish will be delivered with specific membrane for cell sheet transfer.

Type	no. of wells	Culture surface cm²	Dimensions mm	Working volume ml	PK	Cat. No.
MicroWell™ plate	96	0.3	128/86**	0,2	8	**4.008 724**
Multidish	48	1.1	128/86**	0,5	6	**4.008 658**
Multidish	24	1.9	128/86**	1	6	**4.008 657**
Multidish	12	3.5	128/86**	2	6	**4.008 656**
Multidish*	6	9.6	128/86**	3	6	**4.008 655**
Petridish 100 mm	1	56.7	92/17**	12,5	6	**4.008 763**
Petridish 100 mm, with grid	1	56.7	92/17**	12,5	6	**4.008 764**
Petridish 60 mm	1	21.5	60/15**	5	30	**4.009 049**
Petridish 60 mm, with grid	1	21.5	60/15**	5	30	**4.009 050**
Petridish 35 mm*	1	8.8	40/12**	3	30	**4.009 011**

*with membrane for cell sheet transfer
**Max. ext. dimension

2 HydroCell™ Cell Culture Products for Low Cell Binding, PS, sterile



Thermo Scientific

Optimised surface modification inhibits cell attachment and binding thereby inhibiting undesired cell differentiation. Ideal for culturing suspension cells or cell cluster. Minimal protein adsorption leads to high yields of cell-secreted proteins.
Available in different formats: Petri dishes, multidishes and microplates.
Clear 95-well plates with flat or round well bottom and excellent optical quality.
Certified cell binding <1% (A549 cell line), non-pyrogenic, non-toxic and sterile.
Material plates: Polystyrol

Description	Format	Capacity ml	PK	Cat. No.
Petri dishes	dia. 3.5cm	3.0	30	**4.008 823**
Petri dishes	dia. 6cm	5.0	30	**4.008 859**
Petri dishes	dia. 10cm	12.5	6	**4.008 572**
Multidishes	12-Well	2.0	6	**4.008 622**
Multidishes	24-Well	1.0	6	**4.008 627**

Microplates, PS

Capacity µl	Description	Colour	Sterile	PK	Cat. No.
200	Bottom shape flat, with lid	Clear	yes	8	**4.008 714**
200	Bottom shape round, with lid	Clear	yes	8	**4.008 713**



1 Cell Culture Dishes, Nunclon™Δ Surface, PS, treated, sterile

Thermo Scientific

Surface treated dishes for cell culture available in various sizes and formats are optically clear and suitable for microscopy. Nunclon™Δ surface modification is certified non-pyrogenic and tested for both monolayer formation and cloning efficiency employing primary cells as well as repeating cell lines. Sterile. With lid. Packed in resealable bags.
Material: Polystyrene

Diam. mm	Height mm	Culture surface cm²	Working volume ml	PK	Cat. No.
35	10	8.8	3	500	**9.407 393**
60	15	21.5	5	400	**9.407 395**
100	15*	56.7	12.5	150	**9.407 398**
100	20*	56.7	12.5	480	**6.078 216**
150	20*	145.0	35	80	**9.407 399**
245	25**	500.0	135	16	**9.407 400**

* Packaged in recloseable bags.
**Without ventilation cams.

BRANDplates® Insert System

BRAND

For manual and automated cell and tissue culture work.
The BRAND Insert System, co-developed with the Fraunhofer Society, includes two different cell culture plates and two types of cell culture inserts, which can also be used in combination.

Quality features
General
- Sterile according ISO 11 137 and AAMI-Guidlines, SAL 10-6
- Non cytotoxic according to ISO 10 993 5, endotoxin free (<0.01 EU/ml), free from DNA, DNase and RNase.

Plates
- Innovative, specially designed wells with side feeding ports,
- Manufactured according to the requirements in ANSI/SLAS Standards 1 and 4
- pureGradeTM S (untreated) and cellGradeTM plus (TC treated) surface

Inserts
- Track-etched PC- und PET membranes
- 4 different pore sizes
- Hanging inserts
- Perfect positioning in the plates via guide ridges
- cellGradeTM plus surface (TC treated)

BRANDplates® plates
Cell culture plates for insert strips

24-well Standard Plate
The plate includes 24 individually fillable wells that can be fitted with strips of 4 inserts and/or individual inserts.
6-well Special Plate
The 4 wells are all connected as one large, elongated well. This well can be fitted with a strip of 4 inserts so that all 4 of the inserts in the strip can be supplied with medium at the same time.

BRANDplates® Insert Strips and Insert System
Cell culture inserts, smooth walled
Smooth-walled, for standard applications such as secretion studies, co-culture, migration studies, chemotaxis tests, etc

Cell culture inserts with Inlet Opening System*
With special inlet channels, for automated in vitro preparation of human tissues. The Inlet Opening System*enables rapid, consistent changing of media, from submersion culture to air-lift culture. The special inlet channels enable adjustment of the medium level with- out damage to the skin mode

* Patent pending

E & OE.

BRANDplates® Insert System

NEW!

BRANDplates ® Insert Strips smooth walled or with Inlet Opening System* (single packed) PS. cellGrade™ plus surface, sterile. Strips à 4 Inserts (divisible). *BRAND*

Description	Pore size µm	Membrane	PK	Cat. No.
smooth-walled	0.40	PC	1	**6.257 631** 1
smooth-walled	1.00	PC	12	**6.257 632**
smooth-walled	3.00	PC	12	**6.257 633**
smooth-walled	8.00	PC	12	**6.257 634**
Inlet Opening System	0.40	PC	12	**6.257 635** 2
Inlet Opening System	1.00	PC	12	**6.257 636**
Inlet Opening System	3.00	PC	12	**6.257 637**
Inlet Opening System	8.00	PC	12	**6.257 638**
smooth-walled	0.40	PET	12	**6.257 639**
smooth-walled	1.00	PET	12	**6.257 640**
smooth-walled	3.00	PET	12	**6.257 641**
smooth-walled	8.00	PET	12	**6.257 642**
Inlet Opening System	0.40	PET	12	**6.257 643**
Inlet Opening System	1.00	PET	12	**6.257 644**
Inlet Opening System	3.00	PET	12	**6.257 645**
Inlet Opening System	8.00	PET	12	**6.257 646**

* Patent pending

1



6.257 631

2



6.257 635

BRANDplates® 24-well Standard-Plates or 6-well Plates

PS. pureGrade™ S or cellGrade™ plus surface, sterile. In each case with lid with condensation rings (single packed). *BRAND*

3



6.257 627

Description	Surface	PK	Cat. No.
24 well standard plate	pureGrade™ S	10	**6.257 627** 3
6 well plate	pureGrade™ S	10	**6.257 628**
24 well standard plate	cellGrade™ plus	10	**6.257 629**
6 well plate	cellGrade™ plus	10	**6.257 630**

BRANDplates® Insert System, 6-well Plates filled with 6 Insert Strips

NEW!

PS. cellGrade™ plus surface, sterile. Insert strips smooth walled or Inlet Opening System*. In each case with lid with condensation rings (single packed). *BRAND*

Description	Pore size µm	Membrane	PK	Cat. No.
smooth-walled	0.40	PC	5	**6.257 647** 4
smooth-walled	1.00	PC	5	**6.257 648**
smooth-walled	3.00	PC	5	**6.257 649**
smooth-walled	8.00	PC	5	**6.257 650**
Inlet Opening System	0.40	PC	5	**6.257 651**
Inlet Opening System	1.00	PC	5	**6.257 652**
Inlet Opening System	3.00	PC	5	**6.257 653**
Inlet Opening System	8.00	PC	5	**6.257 654**
smooth-walled	0.40	PET	5	**6.257 655**
smooth-walled	1.00	PET	5	**6.257 656**
smooth-walled	3.00	PET	5	**6.257 657**
smooth-walled	8.00	PET	5	**6.257 658**
Inlet Opening System	0.40	PET	5	**6.257 659**
Inlet Opening System	1.00	PET	5	**6.257 660**
Inlet Opening System	3.00	PET	5	**6.257 661**
Inlet Opening System	8.00	PET	5	**6.257 662**

* Patent pending

4



6.257 647

1



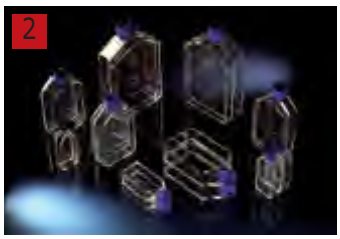
1 Cell culture flasks TripleFlask Nunclon™ Δ Surface, PS/PE-HD, sterile

Thermo Scientific

Cell culture flasks with three parallel growth surfaces provide a total culture area of 500 cm² - with external dimensions of a 175 cm² standard flask. Ideal for scale-up.
Available with Vent/Close caps or filter caps for good gas exchange. Certified non-pyrogenic and tested for both monolayer formation and cloning efficiency employing primary cells as well as repeating cell lines. Sterile
Material flasks: Polystyrene
Material caps: PE-HD

Culture surface cm²	Neck	Cover type	Working volume ml	PK	Cat. No.
500	Straight	Filter	200	32	**9.390 351**
500	Straight	Vent/Close	200	32	**9.390 350**

2



2 Cell Culture Flasks, Nunclon™Δ Surface, PS/PE-HD, sterile

Thermo Scientific

Nunclon™Δ cell culture flasks with surface areas from 75 to 175cm² are available with filter caps or Vent/Close caps for good gas exchange. Short, wide neck (angled or straight) allows easy access to entire growth surface. The Nunclon™Δ treatment is limited to the intended growth area. Neck areas are not treated to prevent cell attachment and growth in undesired areas. Certified non-pyrogenic and tested for both monolayer formation and cloning efficiency employing primary cells as well as repeating cell lines. Sterile.
Material flasks: Polystyrene
Material caps: HDPE

Culture surface cm²	Neck	Cover type	Working volume ml	PK	Cat. No.
25	Angled	Filter	7	160	**9.390 345**
25	Angled	Vent/Close	7	160	**9.407 027**
80	Straight	Filter	30	50	**9.390 346**
80	Straight	Vent/Close	30	50	**9.407 077**
175	Straight	Filter	68	32	**9.390 348**

3



3 Cell Culture Flasks EasyFlask™/TripleFlask, non-treated, PS/PE-HD, non-pyrogenic

Thermo Scientific

Non-treated, sterile flasks for suspension cell cultures. White caps for easy identification. Non-Pyrogenic.
Material flasks: Polystyrene
Material caps: PE-HD

Type	Capacity ml	Neck	Working volume ml	PK	Cat. No.
EasYFlask	70	curved	7	200	**6.702 724**
EasYFlask	260	curved	30	100	**6.222 672**
EasYFlask	645	straight	55	30	**7.900 288**
TripleFlask	800	straight	200	32	**7.900 289**

E & OE.

1 2 Cell Culture Flasks EasYFlask™, treated, PS/PE-HD, sterile

Thermo Scientific

Cell culture flasks available with Nunclon™Δ modified surface (culture areas of 25cm² to 225cm²) or Collagen I and Poly-D-Lysine coated (culture areas up to 175cm²). Choose cap: Filter caps for continuous venting or Vent/Close caps. Ergonomic closure enables opening and closing with 1/3 turn and "Y"-mark allows visual verification of vent position, even when stacked. Angled, wide neck gives easy access to entire growth surface. Graduations are both printed and moulded on the side walls. Certified non-pyrogenic and tested for both monolayer formation and cloning efficiency employing primary cells as well as repeating cell lines. Sterile.
Material flasks: Polystyrene
Material caps: PE-HD
Accessories: Vent/Close caps for 25cm² flasks, order no. 4.008 543.



2



Surface	Culture surface cm²	Cover type	Capacity ml	PK	Cat. No.
Nunclon™	25	Filter	7	200	**9.390 331**
Nunclon™	25	Vent/Close	7	200	**9.390 330**
Nunclon™	75	Filter	25	100	**9.390 333**
Nunclon™	75	Vent/Close	25	100	**9.390 332**
Nunclon™*	175	Filter	55	30	**7.510 686**
Nunclon™*	175	Vent/Close	55	30	**4.008 552**
Nunclon™*	225	Filter	70	30	**6.236 539**
Nunclon™*	225	Vent/Close	70	30	**4.008 625**
Collagen I	25	Filter	7	60	**4.009 044**
Collagen I	75	Filter	25	30	**6.244 028**
Collagen I	175	Filter	55	30	**4.009 123**
Poly-D-Lysin	25	Filter	7	60	**4.009 043**
Poly-D-Lysin	75	Filter	25	30	**4.008 945**
Poly-D-Lysin	175	Filter	55	30	**4.009 122**

* Batch no. and cat. no. printed on each flask.

3 Cell Scrapers, sterile

Thermo Scientific

Available in two different lengths with adjustable blade for optimal application flexibility. Non-pyrogenic. Sterile.

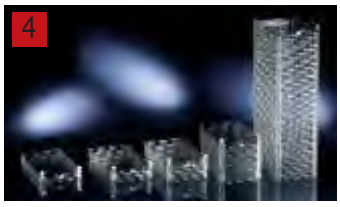


For bottles cm²	Length cm	Height mm	Width mm	PK	Cat. No.
25 - 80	23	7.5	15.5	50	**6.222 130**
75 - 175	32	16.0	17.5	250	**9.390 356**

4 Cell Factories with Nunclon™Δ Surface, PS, sterile

Thermo Scientific

Cell culture Cell Factories are optimal for industrial scale production of vaccines, monoclonal antibodies or pharmaceuticals. Nunclon™Δ modification is certified for cell culture, ideal for adherent cells and can be used for suspension cultures. Available in 1, 2, 4, 10 or 40 tray versions for easy scale-up. Additional connectors etc. please see Cell Factories Accessories. Sterile.
Material Cell Factories: Polystyrene



No. of chambers	Culture surface cm²	Capacity ml	PK	Cat. No.
1	632	200	8	**6.800 181**
2	1264	400	5	**6.231 100**
4	2528	800	10	**4.009 101**
10	6320	2000	2	**6.301 727**
40	25280	8000	2	**6.300 402**

5 Cell Factories EasyFill™ mit Nunclon™Δ Surface, PS, sterile

Thermo Scientific

A time and space saving vessel for large scale cell culture production. Suitable for industrial scale production of vaccines, monoclonal antibodies or pharmaceuticals.
Nunclon™Δ surface modification is certified for cell culture and ensures consistent cell growth layer to layer, lot to lot. Ready to use and easy to fill and empty with plug and play connection. Wide range of accessories available for different methods of filling, venting and harvesting (please see Cell Factories Accessories). Sterile.
Material cell factories: Polystyrene



No. of chambers	Culture surface cm²	Capacity ml	PK	Cat. No.
1	630	200	6	**4.008 721**
2	1260	400	6	**4.008 786**
4	2520	800	4	**4.008 806**
10	6300	2000	2	**4.008 779**

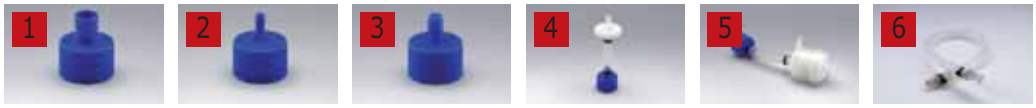
EasyFill™ Cell Factory System Accessories, PE-HD

NEW!

Thermo Scientific

It is now easy to create a Thermo Scientific Nunc EasyFill™ Cell Factory system for your applications.
- Connections made easy: Plug a media bag or tubing set to any cell factory.
- Save time and reduce costs: Minimise cleaning processes and sterility validations. Accessories are gamma irradiated and individually wrapped.
- Prevent build up of back pressure during filling application: New venting options provide additional air venting when filling and harvesting by gravity or with a peristaltic pump.

Description	PK	Cat. No.	
EasyFill™ Cell Factory Universal Adaptor Cap	12	**9.390 710**	1
EasyFill™ Cell Factory Barbed Cap, 1/4"	12	**9.390 711**	2
EasyFill™ Cell Factory Barbed Cap, 3/8"	12	**9.390 712**	3
1.0µm Air Vent Assembly, sterile	2	**9.390 713**	4
0.22µm Air Vent Assembly, sterile	2	**9.390 714**	5
Cell Factory Filling Tubing Set w/ Male MPC, sterile	2	**9.390 715**	6



9.390 710 | 9.390 711 | 9.390 712 | 9.390 713 | 9.390 714 | 9.390 715



7 Roller Bottles, InVitro/TufRol™/TufRol EZ, sterile

Thermo Scientific

Roller Bottles InVitro

For industrial scale production of vaccines, monoclonal antibodies or pharmaceuticals. In vitro Roller Bottles molded of durable PETG. Excellent substrate for adherent cells. Quick-action ergonomic closure reduces wrist stain and increases productivity. Wide range of sizes with surface areas from 1.050cm² to 4.200cm². Available in both Standard and the patented Expanded Surface (XPS), which enables increased cell growth and product yield without the need to purchase additional production equipment or increase labor. In Vitro XPS Roller Bottles have specially designed pleats that dramatically expand the available growth surface. The pleats are oriented in the direction of rotation to minimise turbulence. Flat panels between sections allow microscopic viewing and expedite drainage during medium replacement and cell harvest. Easy-to-read graduations for medium fills. Lot number is printed on each bottle to maximise traceability. Sterile.

Roller Bottles TufRol™ and TufRol™ EZ

TufRol™ Roller Bottles enable to scale cell culture processes from plates, to flasks, to roller bottles. They can be used as the primary production vessel or as a mid-scale expansion platform to feed Cell Factories or Suspension Culture Bioreactors. One-piece, seamless design reduces possibility of leaking. TufRol™ EZ bottles with shallow or deep indents make them excellent for manual and automated handling. Proprietary manufacturing process for greater impact resistance. Vertical expanded surfaces version facilitates emptying and reduces retention of product. Certified non-cytotoxic, non-pyrogenic and sterile (10^{-3} SAL). Validation Binder available.

Description	Culture surface cm²	Material	PK	Cat. No.
InVitro 1.2X, smooth surface, non-vented cap	1050	PETG	20	**4.008 624**
InVitro 1.2X, smooth surface, non-vented cap	1050	PETG	20	**4.008 608**
InVitro 1.2X, smooth surface, vented cap	1050	PETG	20	**4.008 674**
InVitro 1XL, smooth surface, non-vented cap	1800	PETG	22	**4.008 809**
InVitro 2X, pleated surface, non-vented cap	1700	PETG	20	**4.008 740**
InVitro 2.5X, pleated surface, non-vented cap	2100	PETG	20	**4.008 812**
InVitro 2.5X, pleated surface, non-vented cap	2100	PETG	20	**4.008 797**
InVitro 5X, pleated surface, non-vented cap	4200	PETG	22	**4.009 036**
InVitro 1.2X, smooth surface, Poly-D-Lysine treated, non-vented cap	1050	PETG	20	**4.009 117**
TufRol™, Smooth surface, easy on/off vented screw-cap	850	PS	20	**9.407 100**
TufRol™, Smooth surface, easy on/off non-vented screw-cap	850	PS	20	**9.407 101**
TufRol™, Smooth surface, easy on/off non-vented screw-cap	850	PS	20	**9.407 102**
TufRol™, Smooth surface, in double bag, easy on/off non-vented screw-cap	850	PS	20	**9.407 103**
TufRol™ EZ, Smooth surface, shallow indent, EZ twist vented cap	850	PS	20	**9.407 104**
TufRol™ EZ, Smooth surface, shallow indent, EZ twist vented cap	850	PS	20	**9.407 105**
TufRol™ EZ, Smooth surface, shallow indent, in double bag, EZ twist vented cap	850	PS	20	**9.407 106**
TufRol™ EZ, Smooth surface, deep indent, EZ twist vented cap	850	PS	20	**9.407 107**
TufRol™ EZ, Smooth surface, deep indent, EZ twist vented cap	850	PS	20	**9.407 108**
TufRol™ EZ, Smooth surface, deep indent, EZ twist vented cap	850	PS	20	**9.407 109**
TufRol™ EZ, Smooth surface, deep indent, in double bag, EZ twist vented cap	850	PS	20	**9.407 110**
TufRol™, Pleated surface, in double bag, easy on/off vented cap	1450	PS	20	**9.407 111**
TufRol™, Pleated surface, easy on/off non-vented cap	1450	PS	20	**9.407 112**
TufRol™, Pleated surface, in double bag, easy on/off non-vented cap	1450	PS	20	**9.407 113**
Vented caps for TufRol™ roller bottles, sterile, PE-HD		PE-HD	500	**9.407 114**
Easy on/off caps for TufRol™ roller bottles, sterile, PE-HD		PE-HD	500	**9.407 115**

Articles with double bag for cleanroom use.

E & OE.

1 2 3 LLG-Serological pipettes, PS, graduated, sterile

- Graduations for accurate dispensing up to ±2%
- Colour coding for easy volume identification
- Pyrogen-free
- Sterile, individually packed

Volume ml	Grad. ml	Colour code	PK	Cat. No.
1	1/100	yellow	500	**9.380 440**
2	1/50	green	500	**9.380 441**
5	1/10	blue	200	**7.930 401**
10	1/10	orange	200	**7.930 402**
10	1/10	orange (wide mouth)	200	**9.380 442**
25	2/10	red	150	**7.930 403**
50	5/10	purple	100	**9.380 443**







4 5 Pipettes, plastic, disposable, serological, PS

Ratiolab

These serological pipettes were specially designed for cell culture. The special colour-coded system makes it easy to identify the size of the pipette in use. The pipettes are made from high-grade polystyrene and have the following features:
- Guaranteed sterile (gamma irradiated)
- Guaranteed non-pyrogenic
- Guaranteed non-cytotoxic
- Guaranteed non-haemolytic
- Cotton plugged and colour coded
- Larger capacity through extra graduations
- 5ml, 10ml and 25ml pipettes are graduated with bi-directional secondary scale, enabling easier reading.
- Secure and easy-to-open 'tear off' packaging.





Capacity ml	Colour	Grad. ml	Negative graduations up to	PK	Cat. No.
1	Yellow	1/100	0.3 ml	500	**9.380 431**
2	Green	1/50	0.4 ml	500	**9.380 432**
5	Blue	1/10	3.0 ml	250	**9.380 433**
10	Orange	1/10	3.0 ml	200	**9.380 434**
25	Red	1/5	10.0 ml	100	**9.380 435**
50	Purple	1/5	5.0 ml	100	**9.380 436**

6 Serological Pipettes, PS, sterile

Sterilin

High-quality polystyrene.
Colour coded according to ISO requirements.



Volume ml	Grad. ml	Negative graduations up to	PK	Cat. No.
1*	1/100	0.2	1000	**9.380 123**
1	1/100	0.2	1000	**9.380 125**
5*	1/10	2.0	200	**9.380 131**
5	1/10	2.0	200	**9.380 133**
10*	1/10	3.0	500	**9.380 135**
10	1/10	3.0	500	**9.380 137**
25*	1/5	10.0	200	**9.380 139**

* sterile, individually packed

1



1 Serological pipettes, PS

NEW!

Thermo Scientific

Radiation-sterilised. Black graduations. Upper end with cotton wool plug. Individual sizes color coded. Additional scale for using the complete volume. Individually packed. Pyrogen-free.

Capacity	Grad.	additional scale	Accuracy	Colour code	PK	Cat. No.
ml	ml	ml	± ml			
1	1/100	0.3	0.02	yellow	1000	**9.380 453**
2	1/100	0.3	0.04	black	500	**9.380 454**
5	1/10	2	0.10	blue	200	**9.380 455**
10	1/10	3	0.20	orange	200	**9.380 456**
25	2/10	10	0.50	green	200	**9.380 457**
50	2/10	10	0.75	purple	100	**9.380 458**

3



3 LLG-Electrical pipette pump plus

This ergonomic pipette controller is lightweight, made from UV resistant material, features adjustable valves and is microprocessor controlled for reliability and accuracy. The powerful pump offers rapid yet sensitive aspiration and dispensing. Filling and dispensing speed is easily set using the same hand by pressing the large control button. The bright LED display will indicate which of the three modes has been selected, High, Low or Gravity Mode. The user labeling area enables customization, instant recognition and/or task designation. Additional features include hand neutral design, concave padded triggers, a 1ml pipette adapter to increase stability of small pipettes, a long life Li-Ion battery that allows
20 hours of continuous usage, low battery indicator and two holders as standard

- For 1-100ml glass or plastic pipettes
- Soft touch triggers
- 5 different coloured autoclavable nose pieces as standard included
- Uses standard 0.45µm hydrophobic filters
- Long life, easily changeable rechargeable battery
- Sensitive and adjustable aspiration and dispensing
- Labeling area for identification
- Delivered completely with universal voltage and plug faced charger
- Comes with bench stand and magnetic/fixable wall mount

Description	PK	Cat. No.
LLG-Electrical pipette pump plus	1	**9.281 041**
Membrane filter, 0.45µm, PTFE, non-sterile	5	**9.281 005**

2



6.080 523

Graduated pipettes for tissue culture, AR-glas®, amber graduations

Hirschmann

EX (TD) calibrated. Short form. Main point ring graduation. Specially for tissue culture and working on cleanroom benches. With durable amber stain graduation. Zero to the tip, Cotton plugged (8mm outer diameter).
For those products a Batch Calibration Report (free of charge on www.hirschmannlab.com/support + service/Technical support/calibration certificates), Single Calibration Report or DAkkS Certificate (former DKD Calibration Report) is available.

Volume	Grad.	Tolerance	Overall length ± 3 mm	PK	Cat. No.
ml	ml	± ml			
1	0.1	-	230	1	**6.080 498**
2	0.1	-	230	1	**6.090 340**
5	0.1	-	230	1	**6.080 523**
10	0.1	-	230	1	**6.510 172**
25	0.2	-	230	1	**6.510 335**

Our complete Liquid Handling range - please see page 887.

E & OE.

1 2 Disposable Erlenmeyer Flasks with screw closure, Type 4112, 4113, PETG, sterile

Thermo Scientific

Sterile disposable flasks with white PE-HD closure reduce the chance for cross contamination. Ideal for shaker and suspension cell culture, media preparation or storage. Made of light, crystal clear PETG plastic. Molded-in graduations. Leak-proof PE-HD screw closures open to vent with 1/4 turn. Flasks offer a 5-year shelf life, a 10-6 SAL, are non-pyrogenic and non-cytotoxic. Individually packaged for easy storage and handling. Available with flat or baffled bottom.
Vented closures with finish 38-430 (for 125ml and 250ml) or with finish 45-430 (for 500ml, 1000ml and 2000ml) separate available.

Type	Description	Volume ml	Cover type	PK	Cat. No.
4112	Flat Bottom	125	38-430	24	**7.630 506**
4112	Flat Bottom	250	38-430	12	**6.802 833**
4112	Flat Bottom	500	45-430	12	**6.229 662**
4112	Flat Bottom	1000	45-430	6	**6.234 596**
4112	Flat Bottom	2000	45-430	4	**9.141 301**
4112	Flat Bottom	2800	70	4	**9.141 302**
4113	Baffled Bottom	125	38-430	24	**6.901 167**
4113	Baffled Bottom	250	38-430	12	**6.901 168**
4113	Baffled Bottom	500	45-430	12	**6.234 594**
4113	Baffled Bottom	1000	45-430	6	**6.234 595**
4113	Baffled Bottom	2000	45-430	4	**6.227 923**
4113	Baffled Bottom	2800	70	4	**9.141 303**
4114	Vented Closure		38-430	12	**6.229 663**
4114	Vented Closure		45-430	12	**6.227 924**

1



2



3 4 Disposable Erlenmeyer Flasks with vented closure, Type 4115, 4116, PETG, sterile

Thermo Scientific

With blue vented closure, the chance for cross contamination is reduced. Ideal for shaker and suspension cell culture, media preparation or storage. Made of light, crystal clear PETG. Molded-in graduations. Leak-proof PE-HD closure has a hydrophobic 0.2µm PTFE membrane that allows sterile air exchange. Flasks offer a 5-year shelf life, a 10^{-6} SAL, are non-pyrogenic and non-cytotoxic. Available with flat or baffled bottom. Individually packaged for easy storage and handling.

Type	Description	Capacity ml	Cover type	PK	Cat. No.
4115	Flat Bottom	125	38-430	24	**6.234 530**
4115	Flat Bottom	250	38-430	12	**6.231 087**
4115	Flat Bottom	500	45-430	12	**9.141 304**
4115	Flat Bottom	1000	45-430	6	**9.141 305**
4115	Flat Bottom	2000	45-430	4	**9.141 306**
4115	Flat Bottom	2800	70	4	**9.141 307**
4116	Baffled Bottom	125	38-430	24	**9.141 308**
4116	Baffled Bottom	250	38-430	12	**9.141 309**
4116	Baffled Bottom	500	45-430	12	**9.141 310**
4116	Baffled Bottom	1000	45-430	6	**9.141 311**
4116	Baffled Bottom	2000	45-430	4	**9.141 312**
4116	Baffled Bottom	2800	70	4	**9.141 313**

3



4



5 Diagnostic Bottles Typ 2035, PETG, sterile

Thermo Scientific

With white PE-HD screw cap with liner. Ideal for sterile sampling, storage and shipment of reagents and buffer solutions. Bottles are sterile to 10-6 SAL, non-pyrogenic, non-cytotoxic and comply with USP VI guidelines.

Type	Capacity ml	Cover type	PK	Cat. No.
2035	5	diam. 20 mm/ design 415	100	**6.803 092**
2035	10	diam. 20 mm/ design 415	100	**6.205 128**
2035	20	diam. 20 mm/ design 415	100	**7.632 641**

5





1 Square Media Bottles Typ 2019, PETG, sterile

Thermo Scientific

With white PE-HD screw closure. Reduced permeability to CO_2/O_2 which reduces pH-shift. Bottles and closures are radiation-sterilised and non-pyrogenic to eliminate costly washing, depyrogenation and autoclaving steps. Heatshrink band around closure and neck provides tamper-evident seal. Packed in shrink-wrapped trays. 2L size has molded-in handgrips and a 53-mm (53B) white closure. Bottles are sterile to 10-6 SAL, non-pyrogenic, non-cytotoxic and comply with USP Class VI guidelines. Sterile. Transparent. Leakproof. Graduated.

Type	Capacity	Cover type	Dimensions	PK	Cat. No.
	ml		mm		
2019	30	diam. 20 mm	64 x 38 x 38	24	**9.103 121**
2019	60	diam. 24 mm	82 x 41 x 41	24	**9.103 122**
2019	125	diam. 38 mm/design 430	110 x 54 x 54	24	**9.103 123**
2019	250	diam. 38 mm/design 430	146 x 61 x 61	24	**9.103 124**
2019	500	diam. 38 mm/design 430	177 x 74 x 74	12	**9.103 125**
2019	1000	diam. 38 mm/design 430	220 x 94 x 94	12	**9.103 126**
2019	2000	diam. 53 mm/design 53B	271 x 116 x 116	6	**9.103 127**



2 Media Bottles with Certified Cleanness Type 382019, PETG, sterile

Thermo Scientific

Suited for biopharmaceutical processing and storage of critical reagents and bulk intermediates such as vaccine and protein therapeutic preparations. Manufactured in a certified ISO 14644-1 Class 7 cleanroom. Containers are lot certified to comply with particulate limits specified in USP <788>, EP 2.9.19, and JP 14th ed. Part 1, Section 24. Packaging is designed for cleanroom applications. Bottle and closure are secured with a tamper-resistant heat-shrink band and packaged in heat-sealed bags to support cleanroom operations. USP Class VI, EP Modified Abnormal Toxicity, and USP <661> physicochemical tests compliant. Bottles meet the requirements for USP Class VI, EP Modified Abnormal Toxicity Test, are non-cytotoxic, non-pyrogenic, non-hemolytic, and comply with USP <661> physicochemical guidelines. Resins are free of animal derived components (ADCF). Leakproof.

Type	Capacity	Cover type	PK	Cat. No.
	ml			
382019	30	diam. 20 mm /design 415	6	**9.102 958**
382019	60	diam. 24 mm /design 415	6	**9.102 959**
382019	125	diam. 38 mm /design 430	6	**9.102 960**
382019	250	diam. 38 mm /design 430	6	**9.102 961**
382019	500	diam. 38 mm /design 430	4	**9.102 962**
382019	1000	diam. 38 mm /design 430	4	**9.102 963**
382019	2000	diam. 53 mm /design 53B	1	**9.102 964**



3 InVitro™ Biotainer®-Bottle, Type 3025 , PETG, sterile

Thermo Scientific

With PE screw cap with silicone seal. Ready to use. With printed graduations in ml. With ribbed hand-grips (except 125ml and 5000ml). Materials meet current USP VI, are non-cytotoxic and non-pyrogenic.

Type	Capacity	Cover type	PK	Cat. No.
	ml			
3025	125	38 mm	5	**9.102 972**
3005	500	38 mm	5	**9.102 970**
3110	1000	48 mm	35	**9.102 974**
3230	2000	48 mm	20	**9.102 977**
3415	5000	48 mm*	6	**6.233 835**
3415	5000	48 mm	1	**9.102 984**

* with PE handle.



4 Filling and Venting Closures with 2 ports, Type 2162, PP

Thermo Scientific

With TPE gasket and port caps, Nalgene 50 platinum-cured silicone tubing. All plastic screw closures for sterile liquid transfer of tissue media, biological reagents, pure water and chemicals to and from Nalgene-carboys. For applications such as bio-reactors and fermenters. Suitable for all large Nalgene carboys or bottles with screw closures of 53mm (53B) or 83mm (83B). Includes two Nalgene 550 platinum-cured silicone tubing for drop tube and splash guard. Can be used with Nalgene carboy bottles with properly set up peristaltic pumps. Autoclavable.

Type	Dimensions (dia. x H)	Cover type	For tubing bore	PK	Cat. No.
	mm	mm	mm		
2162	66,7 x 68,6	53	6,3	1	**7.048 080**
2162	102 x 98	83	12,7	1	**7.048 081**
2162	102 x 98	83	6,3	1	**7.048 082**

E & OE.

LLG-Syringe Filters

1



We offer a line of syringe filters especially designed to provide efficient filtration of a broad variety of fluids, solvents, aqueous or inorganic solutions. Our syringe filters cover most applications in HPLC, pharmaceutical, environmental, biotechnology and food and beverage testing laboratories.

- Housing injected in Polypropylene or MABS
- Multifunctional Syringe filters equipped with Female Luer-Lock/Male Luer Lock or Male Luer Slip connections for different applications
- Pre-sterilised or non-sterile
- Sterile products in individual hard blister
- Superior pressure stability
- Easy to identify because of colour code and printed description

1 2 LLG-Syringe Filters, CA, sterile

2



Membrane	Pore size µm	Diam. mm	Colour	PK	Cat. No.
CA	0.20	13	blue	50	**9.055 510**
CA	0.20	25	blue	50	**9.055 511**
CA	0.45	13	yellow	50	**9.055 512**
CA	0.45	25	yellow	50	**9.055 513**

3 Filter units, Sartolab RF

3



Sartorius

Sterile filter units with receiver for sterile filtration of aqueous solutions and media, particularly cell culture. Simple and safe to handle. The integral polyethersulfone (PES) membrane guarantees extremely good throughput times and low protein binding, making it ideal for filtering proteinaceous solutions. The receiver is supplied with a flexible vacuum tubing adapter and a lid.

Type	Capacity ml	Pore size µm	PK	Cat. No.
Sartolab RF 150	150	0.22	12	**9.049 200**
Sartolab RF 250	250	0.22	12	**9.049 201**
Sartolab RF 500	500	0.22	12	**9.049 202**
Sartolab RF 1000	1000	0.22	12	**9.049 203**

4 Bottle-top filters, Sartolab BT

4



Sartorius

Sterile vacuum filters for screwing directly onto sterile bottles. Disposable units for sterile filtration of media and aqueous solutions. The special polyethersulphone (PES) membrane produces extremely good throughput times and low protein binding, making it ideal for cell culture applications. With GL45 screw connection for all standard bottles.
Caution: Only use sterile bottles authorised for use in low pressure applications.

Type	Capacity ml	Pore size µm	PK	Cat. No.
Sartolab BT 150	150	0.22	48	**9.049 204**
Sartolab BT 500	500	0.22	12	**9.049 205**
Sartolab BT 1000	1000	0.22	12	**9.049 206**



1 Pressure filtration units

Sartorius

Sartolab P 20. For sterile filtration of cell culture media. Ready-to-use, disposable filtration units. Surfactant-free, 0.2µm cellulose acetate membrane with minimal protein adsorption. With Luer lock inlet and filling bell on the outlet.

Sartolab P 20 plus. With additional, binding agent-free, glass-fibre pre-filter for media which are difficult to filter.

Type	PK	Cat. No.
Sartolab P 20	10	**9.054 681**
Sartolab P 20 plus	10	**9.054 686**

Accessories for Sartorius pressure filtration equipment Sartolab P20

Sartorius

Description	PK	Cat. No.
Coupling M12 x 1 with G$^{3}/_{8}$ male thread	1	**9.604 383**
Diaphragm pump, pressurizing, G$^{3}/_{8}$ male screwthread connection, for 220V, 50Hz supplies	1	**9.604 389**
Tripod for pressure filtration apparatus 9.604 345	1	**9.604 394**
Double-ended box spanner for tripod 9.604 394	1	**9.604 395**
Stainless steel forceps	1	**9.604 061**

Further designs available on request.



E & OE.

1 Aspirator with trap flask FTA-1

NEW!

Grant



Designed for routine aspiration of the supernatent alcohol/buffer from the walls of microtubes during DNA/RNA purification and other macromolecule reprecipitation techniques.

- All in one system with integrated pump
- Pump is for 1.5ml reaction tubes and very small volumes with an average suction power of 600mL/min
- Trap flasks volume 1L
- Fitted with hydrophobic microbiological filter
- Vacuum pressure of - 500mbar

- The hydrophobic microbiological suction filter eliminates risk of contamination from the trap flask. Efficiency up to 99.9%, holds particles bigger than 0.027 micron, which are smaller then agents of Hepatitis A, B and C.
- Polyethylene tube connects collecting tip to the trapping flask
- Built-in micro-compressor creates negative pressure in trapping flask for removal of liquid from microtubes
- Slim power cord can be used inside workstations
- 1L trap flask for collection of alcohol/buffer from microtest tube walls during reprecipitation techniques
- Tube holder to accommodate two tubes for collecting tip washing and storing, enabling re-use of the tip.

Type	Description	PK	Cat. No.
FTA-1	All in one system	1	**9.721 058**
FTA-B	Spare aspiration trap bottle	1	**9.721 075**
FTA-T	Spare tubing set	1	**9.721 076**
MA-8	8 channel adapter set	1	**9.721 077**
MA-8T	8 channel tip	1	**9.721 078**

2 EcoVac safety suction systems

schuett-biotec



For safe and comfortable removal of liquid excess. EcoVac increases the safety standard, when working with infectious material. Completely autoclavable. Screw-cap of safety bottle incl. 2 self-locking fittings. When tubing is removed, they close automatically and the bottle will be sealed hermetically. Safety bottle made of impact and chemical-resistant polypropylene, with screw-cap incl. 2 self-locking fittings, ventilation system, safety filter and 5m of silicone tubing.

EcoVac vacuum pump (optional):
Quiet with low vibration. Throughput 4L/min., 300mbar ult. vacuum, with illuminated on/off switch and 1m connecting cable. Overall dimensions: 80mm x 60mm x 160mm (W x H x D). 230V 50/60Hz.

Foot-switch (optional):
For short-time repeated use of EcoVac.

Supplied with: Safety bottle (breakproof and chemically stable) with screw cap and 2 self- locking fittings, silicone tubing 2 x 1.5m (autoclavable), safety filter, 2 angled fittings for tubing connection, 1 aeration insert.

Type	Capacity Litres	PK	Cat. No.
EcoVac 2 System	2	1	**9.777 000**
EcoVac 4 System	4	1	**9.777 001**
Vacuum pump, incl. 1m cable		1	**9.777 005**
Foot switch		1	**9.777 008**
Safety filter		2	**9.777 009**
Spare 2L bottle incl. Screw-cap with 2 self-locking fittings		1	**9.777 007**
Spare 4L bottle incl. Screw-cap with 2 self-locking fittings		1	**9.777 010**

Vacuum Bottles please see page 76.

Vacuum safety suction systems

The HLC by DITABIS Aspiration Systems are made for the controlled aspiration of liquids from typical lab containers like cuvetts, tubes, microplates, petri dishes or roller bottles.
They are also suited for the disposal of liquid biological or chemical waste and filtration of liquids by means of filter systems.

Ditabis

1



9.777 220

2



9.777 222

3



9.777 223

4



9.777 225

Safety suction systems AA, AC and AZ series

NEW!

Ditabis

- Membrane vacuum pump
- 2L or 4L bottle incl. fast lock clutches, filter, ventilation insert and 3M silicone hose

Features AA series:
- Membrane vacuum pump turns on and off automatically
- AA 02/04 with 1 handle
- AA 24 with 4L bottle, 2 handles and Y connector
- Enlarge the automatic suction system by adding up to 4 working places and reduce your expenses for each user.

Features AC series:
- Membrane pump with manual switch-off
- 2L or 4L bottle

Features AZ series:
- Small membrane vacuum pump
- 2L or 4L bottle
- Bottle holder optional

Type	Bottle size ml	Dimensions (W x D x H) mm	Pump cap. L/min / mbar	Description	PK	Cat. No.	
AA 02	2000	160 x 230 x 470	17 / 100	automatic switch-on / switch-off	1	**9.777 220**	1
AA 04	4000	160 x 230 x 530	17 / 100	automatic switch-on / switch-off	1	**9.777 221**	
AA 24	4000	160 x 230 x 530	17 / 100	automatic switch-on / switch-off	1	**9.777 222**	2
AC 02	2000	160 x 230 x 470	25 / 250	manually operated	1	**9.777 223**	3
AC 04	4000	160 x 230 x 530	25 / 250	manually operated	1	**9.777 224**	
AZ 02	2000	85 x 165 x 65*	8 / 700	manually operated	1	**9.777 225**	4
AZ 04	4000	85 x 165 x 65*	8 / 700	manually operated	1	**9.777 226**	

*Pump dimensions

5



9.777 227

Safety suction systems AE and AK series

NEW!

Suction systems for vacuum connection in the laboratory

Ditabis

Supplied with:
- 2L or 4L bottle incl. fast lock clutches, filter, ventilation insert and 3M silicone hose
- AK 02/04 with bottle holder and handle

Type	Bottle size ml	Description	PK	Cat. No.	
AE 02	2000	bottle holder and handle - please order separately	1	**9.777 173**	
AE 04	4000	bottle holder and handle - please order separately	1	**9.777 174**	
AK 02	2000	with bottle holder and handle	1	**9.777 227**	5
AK 04	4000	with bottle holder and handle	1	**9.777 228**	

E & OE.

Accessories for Safety suction systems

NEW!

Ditabis

Type	Description	PK	Cat. No.
AL 02	Spare bottle 2 litre, with fast locks in screw cap	1	**9.777 175**
AL 04	Spare bottle 4 litre, with fast locks in screw cap	1	**9.777 176**
AS 02	Safety bottle holder for 2 litre bottle, anosided aluminium	1	**9.777 178**
AS 04	Safety bottle Holder for 4 litre bottle, anosided aluminium	1	**9.777 179**
AW 01	Hose clip, in addition to the spare bottles	1	**9.777 177**
AV 03	Safety filter	1	**9.777 180**
AH 01	Handle with flow rate regulation, with adapter for pasteur pipettes, incl. 90° angled adapter	1	**9.777 181**
AR 40	Suction adapter with pipette tips, only for AH 01	1	**9.777 185**
AR 48	Adapter with suction rake, 8-channel, autoclavable, only for AH 01	1	**9.777 186**
AF 01	Foot-operated switch	1	**9.777 172**

BioChem-VacuuCenter BVC basic/control/professional

NEW!

VACUUBRAND

The compact BioChem-VacuuCenter offers the perfect solution for safe, sensitive and efficient aspiration of supernatants or filtration in all application areas.

- The BioChem-VacuuCenter BVC basic is designed for connection to an existing external vacuum source like a diaphragm pump or a vacuum network
- The BioChem VacuuCenter BVC control and professional serve for efficient and convenient aspiration of supernatants. The vacuum level and thus the suction force is sensitively adjustable by the electronic touch panel and allows a delicate and reproducible operation. The chemically-resistant diaphragm vacuum pump is automatically turned on and off as needed, which is reducing the low noise level even further.
- The BVC professional with 4L PP bottle with self-closing quick couplings minimises risks in transporting hazardous waste and in contamination of the workplace.
- All systems are available in two complete equipment options with different collection flasks and ready to accept a second aspiration hand controller (VHC) to support two users. The 2L borosilicate glass bottle (all types with "G" in the description) with a protective coating has a very high chemical resistance. For larger amounts of liquids the 4L bottle of unbreakable polypropylene (PP) is used.

Country specific power cable, please order separately.

Supply requirements: 230V 50/ 60Hz

Type	Pump Model	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
BVC basic	-	200 x 250 x 490	2.8	1	**9.882 225**
BVC basic G	-	180 x 230 x 430	2.8	1	**9.882 226**
BVC control	ME 1C	194 x 408 x 500	7.3	1	**9.882 227**
BVC control G	ME 1C	194 x 408 x 430	7.7	1	**9.882 228** 1
BVC professional	ME 1C	194 x 408 x 500	7.3	1	**9.882 229** 2
BVC professional G	ME 1C	194 x 408 x 430	7.7	1	**9.882 230**
Mains cable UK				1	**9.882 243**
Mains cable CH				1	**9.882 240**

1



9.882 228

2



9.882 229



1 Magnetic stirrer for cell cultures with internal control bioMIX 1

2mag

Maintenance-free, 2mag stepper-motor drive for extremely slow and 100% jerk-free, gentle mixing of cell cultures, with extended speed range from 5rpm up to 250rpm, even and smooth stirring at slow speeds, power setting (10-steps) for high power when stirring large and viscous media volumes and reduced power for non-warming, continuous operation. Digital display for speed and power setting, SoftStart for reliable and safe acceleration of the stirring bar, QuickSet for rapid setting of start and maximum speed, memory of last working status when switched off, suitable for culture flasks with spinning propeller or spinning ball systems.
Please note - we recommend, due to reduced heat emission, the specially developed series bioMIXdrive for use in incubators.

Specifications

Perm. operating temperature:	-10 to +50°C at 80% R.H. max. -40°C to +50°C, 10 to 95%, 500 to 1060hPa
Housing:	Stainless steel
Protection class:	IP64

Type	Rotation speed	Stirring capacity	Dimensions (W x D x H)	Power	Weight	PK	Cat. No.
	rpm	ml	mm	W	kg		
bioMIX 1	5 - 250	5 - 5000	188 x 230 x 38	6 (10-steps)	4.0	1	**9.646 001**



E & OE.

CO_2 Incubators, INCOmed

Memmert

Ventilation and Control:
- uniform atmosphere and temperature distribution owing to enclosed non-turbulent ventilation system in working chamber
- adaptive, fuzzy-supported multifunctional digital microprocessor PID-controller
- integral fault diagnostics on temperature, CO_2 and humidity limit control
- 2 x Class A , 4-wire circuit, Pt100 sensors mutually monitoring and maintaining the performance at the same temperature value
- digital 7-day programme timer with real time clock, precise minute setting
- digital display (LED) of all set parameters, such as temperature, weekdays, time, CO_2, humidity and set-up values - language to be chosen in setup
- CO_2 supply via sterile filter
- digital electronic CO_2 control with automatic zeroing (infrared measuring system)
- CO_2-supply being interrupted upon door opening
- digital display of set and actual values (LED 0.1°C resolution) of temperature and CO_2-concentration
- integral humidity limit control (88 to 97%) with digital display of relative humidity - setting accuracy 1%
- non-volatile, programme memory
- chip card (STERICard) for sterilization of working chamber with fixed cycle (4 hours/160°C) without removal of sensors and mountings

Multiple Overtemperature Protection:
- with audible and visual alarm in case of over-/undertemperature and over-/under-CO_2,open door and empty gas cylinder
- independently working, digitally adjustable electronic overtemperature controller TWW protection class 3.1
- additional adjustable Auto-Safety-Function "ASF" for over- and undertemperature automatically following the set value at a preset tolerance range
- mechanical temperature limiter TB class 1 switching the heating off at approx. 10°C above max. oven temperature

Heating Concept:
- large-area multi-function heating system on four sides incl. additional door and back heating to avoid condensation
- incl. works calibration certificate for +37°C

Textured Stainless Steel Casing:
- fully insulated stainless steel door with double locking and 4-point adjustment
- inner glass door with opening (8mm dia.) to take gas samples
- zinc-plated, steel rear panel

Interior:
- easy-to-clean interior, made of stainless steel, reinforced by deep drawn ribbing, material no. 1.4301, hermetically welded
- 3 non-tipping, perforated stainless steel shelves, 1 stainless steel water dish

Temperature Range: from +20°C (or amb. + 8°C whichever is higher) up to +45°C
Voltage/Power Rating: 230V (±10%), 50/60Hz; approx. 1000W (during heating)

1



9.867 732

2



9.867 733

Specifications

Type	Internal dimensions/housing (WxHxD) mm
INCO108med	560 x 480 x 400*/710 x 778 x 550**
INCO153med	480 x 640 x 500/630 x 938 x 650
INCO246med	640 x 640 x 600/790 x 938 x 750
	* Minus 25 mm for an air vent in centre of rear panel
	** Depth without door handle, please add 38 mm

Type	Internal volume	Shelf support ribs	Shelves	Stainless steel water dishes	Rating	Weight	PK	Cat. No.
	litres				W	kg		
INCO108med basic model	108	4*	2*	1*	1000	70	1	**9.867 732** 1
INCO53med basic model	153	6*	3*	1*	1500	80	1	**9.867 733** 2
INCO246med basic model	246	6*	3*	2**	2000	110	1	**9.867 734**
INCO108med with Premium-Modul T5	108	4*	2*	1*	1000	70	1	**9.867 703**
INCO153med with Premium-Modul T5	153	6*	3*	1*	1500	80	1	**9.867 704**
INCO246med with Premium-Modul T5	246	6*	3*	2**	2000	110	1	**9.867 705**

*full width
**half width

1



9.867 702

Accessories for CO_2 Incubators, INCOmed

Memmert

Comfort module:
two gas connections with quick release connectors, automatic switch-over gas cylinders (impossible in combination with O_2 module)
Hygiene module:
electropolished interior, seamlessly welded by laser
Communication module:
USB interface, "Celsius" standard software for the control and logging of temperature, CO_2; O_2 (with O_2 module) and relative humidity; internal log memory 1024 kB as ring memory for all setpoint values, actual values, errors, settings with real time and date: logging approx. 3 months at 1 min. logging interval; parallel printer interface for all PCL3-compatible printers
CO_2 module:
extended CO_2 range from 0 to 20%
Premium module:
includes Comfort, Hygiene, Communication and CO_2 module (impossible in combination with O_2 module)
Humidity module:
active microprocessor control for humidifying and dehumidifying (40 - 97% rh), incl. digital indication and auto-diagnostic system; humidity supply with distilled water (from an external tank) , dehumidifying via sterile filter; (standard humidity limit control and water dishes are omitted)
O_2 module:
control of oxygen concentration by N2 inlet, adjustment range 1% bis 20% O_2, setting accuracy 0.1%
Combination O_2 module with Comfort and Premium module impossible

Type	Description	PK	Cat. No.
B00325 INCOmed108	Additional stainless steel shelf, full width	1	**9.867 707**
B00321 INCOmed153	Additional stainless steel shelf, full width	1	**9.867 708**
B03813 INCOmed246	Additional stainless steel shelf, full width	1	**9.867 748**
B02787 INCOmed108	Additional stainless steel shelf, full width	1	**9.867 709**
B02784 INCOmed153	Additional water tray, full width	1	**9.867 710**
B02786 INCOmed246	Additional water tray, half width	1	**9.867 711**
E06162	O_2 Pressure reduction valve (DIN EN ISO 2503) incl. gas-bottle monitor	1	**9.867 712**
B04459	HEPA Interior filter	1	**9.867 731**
V2	RS485 interface (for cross linking of several devices) instead of USB	1	**9.867 713**
E04337	Additional Steri-Card (only for interior-sterilization)	1	**9.867 702** 1
W6	RS232 interface instead of USB	1	**9.867 722**
T1	Comfort module for INCOmed 108/153/246	1	**9.867 735**
T2	Hygiene module for INCOmed 108	1	**9.867 736**
T2	Hygiene module for INCOmed 153	1	**9.867 737**
T2	Hygiene module for INCOmed 246	1	**9.867 738**
T3	Communication module for INCOmed 108	1	**9.867 739**
T3	Communication module for INCOmed 153	1	**9.867 740**
T3	Communication module for INCOmed 246	1	**9.867 741**
T4	CO_2 module for INCOmed 108	1	**9.867 742**
T4	CO_2 module for INCOmed 153	1	**9.867 743**
T4	CO_2 module for INCOmed 246	1	**9.867 744**
T5	Premium module for INCOmed 108	1	**9.867 745**
T5	Premium module for INCOmed 153	1	**9.867 746**
T5	Premium module for INCOmed 246	1	**9.867 747**
K7	Active humidity control microprocessor (40 to 97% RH) for INCOmed 108/153/246	1	**9.867 706**
T6	O_2 module for INCO 108, 153, 246	1	**9.867 749**
F9	Entry port in the rear, heated, with silicone stopper, 40 mm inner diameter	1	**9.867 750**

E & OE.

1 CO_2 incubators, C Series

BINDER

The BINDER C is the fitting partner for routine applications for cell cultivation, contamination-free due to hot-air sterilisation at 180°C, reliable pH-stable thanks to the drift-free FPI infrared measuring system, high temperature precision with excellent dynamic and no risk of condensation even in high humidity.

Equipment:
- Air jacket system assuring temperature accuracy and excellent cell growth
- Temperature range from 7°C above ambient up to 50°C
- Water pan with built-in condensation control maintains dry interior walls
- Standard-compliant hot air sterilisation at 180°C (DIN 58947)
- Seamless deep-drawn inner chamber made of stainless steel with integrated shelf support system
- Drift-free infrared CO_2 measurement system
- Microprocessor with LED display for temperature and CO_2 concentration
- Independent temperature safety device class 3.1 (DIN 12880) with optical and audible temperature alarm
- Gas mixing head
- Interior volume 150L

1



Type	Description	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	PK	Cat. No.
C 150	right hinged door	500 x 500 x 600	680 x 815 x 820	1	**9.883 720**
C 150	left hinged door	500 x 500 x 600	680 x 815 x 820	1	**9.883 721**
2 C 150	incl. stacking adapter, right hinged door	500 x 500 x 600	680 x 815 x 1785	1	**9.883 722**
2 C 150	incl. stacking adapter, left hinged door	500 x 500 x 600	680 x 815 x 1785	1	**9.883 723**

CO_2 incubators, CB series

BINDER

The BINDER CB series is the premium class for all sensitive incubation applications. Even during complex cultivation experiments or individual environments under hypoxic conditions, it is easy to grow thanks to a comprehensive assortment of options and accessories.

Advantages:
- Hot air sterilisation at 180°C
- Seamless, deep-drawn inner chamber made of stainless steel
- Unique BINDER technology (patented air jacket system, controlled condensation, etc.)

Equipment:
- Electronically controlled APT.line™ preheating chamber assuring temperature accuracy and reproducible results
- Temperature range from 5°C above ambient temperature to 60°C
- MCS controller for temperature and CO_2 concentration
- Standard-compliant hot air sterilization at 180°C (DIN 58947)
- VENTAIR™ Jacket System
- Drift-free infrared CO_2 measurement system
- Permadry System, condensation-free double-pan humidification system, maintains dry interior walls
- Seamless deep-drawn inner chamber made of stainless steel with integrated shelf support system (flanges)
- Electronic self-diagnostic system for errors with visual and audible alarms, as well as relay potential changeover contact for central monitoring
- Independent temperature safety device class 3.1 (DIN 12880) with optical and audible temperature alarm
- RS 422 interface for communication software APT-COM™ DataControlSystem
- 2 perforated stainless steel shelves with standard equipment and O2 control

2



9.883 701

3



9.883 707

Type	Internal volume litres	Internal dimensions (W x D x H) mm	External dimensions (W x D x H) mm	PK	Cat. No.
CB 53	53	400 x 332 x 400	580 x 545 x 720	1	**9.883 725**
CB 150	150	500 x 500 x 600	680 x 722 x 919	1	**9.883 701** 2
CB 210	210	560 x 500 x 750	740 x 722 x 1069	1	**9.883 702**
CB 53*	53	400 x 332 x 400	580 x 545 x 720	1	**9.883 620**
CB 150*	150	500 x 500 x 600	680 x 722 x 919	1	**9.883 707** 3
CB 210*	210	560 x 500 x 750	740 x 722 x 1069	1	**9.883 706**
CB 53**	53	400 x 332 x 400	580 x 545 x 720	1	**9.883 724**
CB 150**	150	500 x 500 x 600	680 x 722 x 919	1	**9.883 704**
CB 210**	210	560 x 500 x 750	740 x 722 x 1069	1	**9.883 703**
CB 53***	53	400 x 332 x 400	580 x 545 x 720	1	**7.900 354**
CB 150***	150	400 x 332 x 400	680 x 722 x 919	1	**9.883 709**
CB 210***	210	560 x 500 x 750	740 x 722 x 1069	1	**9.883 708**

* With divided glass door.
**With O2 control.
***With O2 control and divided glass door.

1



1 Midi 40 CO_2 Incubator with small volume

Thermo Scientific

The Thermo Scientific Midi 40 CO_2 incubator is designed specifically for cell culture scientists who require a compact culturing workspace to handle small workloads, perform personal use applications, or simply address limited space environments. With its 1.4 cu ft (40L) capacity, the Midi 40 adds a new dimension to the Thermo Scientific portfolio of leading CO_2 incubation solutions. It delivers the performance and capabilities of full-sized incubators in a space-saving footprint, ideal for those who wish to avoid shared-use environments that can present potential contamination risk through unnecessary sample handling and repeated door openings. Easy to operate and economical to own, the fully featured Midi 40 offers remarkable value in a small footprint.

The Midi 40 includes:
- Advanced IntrLogic™ II microprocessor: bright digital display and intuitive touchpad for simplified entry of temperature, CO_2 and alarm data, with keyed setpoint switch to prevent unauthorised changes to your operating parameters.
- Stainless steel culture chamber: seamless, non-corrosive and exceptionally easy to clean. The Midi 40 is provided with four removable shelves.
- Highly efficient direct heating design: provides even heat distribution to all sides of the chamber, for accurate control with uniformity of ±0.1°C.
- Precise and reliable CO_2 control: featuring accurate thermal conductivity sensor located directly in the chamber, ensuring responsive control and long service life.
- Removable water reservoir: generates relative humidity values up to 95% with rapid recovery rates that promote optimal cell growth.
- Heated inner glass door: provides sample security while preventing unwanted condensation.
- Convenient data communication: RS-485 signal output is standard, in addition to audible and visual alarm functions to ensure proper operations.

Type	PK	Cat. No.
Midi-40	1	**4.009 273**



E & OE.

Inverted Microscope for advanced applications AE31

1



9.727 015

Motic

- Infinity Optics [CCIS®]
- Observation Tube Binocular -/Phototube 45°, F.N. 22
- Interpupillary Distance 55mm-75mm
- Eyepieces High-Eyepoint N-WF 10x/22mm with diopter adjustment on both eyepieces
- Side facing quintuple nosepiece
- Objectives CCIS Plan achromat PL 4x,
- CCIS Plan Achromat Phase PL Ph10x, LWD PL Ph20x, LWD PL Ph40x
- Plain stage 200mm x 260mm surface with metal & glass stage inserts
- Condensor ELWD N.A. 0.3 with phase slider (Ph1, BF, Ph3)
- Illumination Externally mounted lamp house, Koehler 6V/30W Quartz halogen with intensity control
- Universal power supply 100V-240V (CE)

Included: Ø 45mm blue, green intereference and ground glass filters, centering telescope power cord, Allen hexagonal key, vinyl dust cover
Optional available: mechanical stage with well plate holder, Epi-Fluorescence

Type	Description	PK	Cat. No.
AE31	Trinocular	1	**9.727 015** 1
AE31 UK	Trinocular	1	**9.727 016**

Inverted Routine microscope for live cell, AE2000

2



9.727 030

Motic

- Infinity Optics [CCIS®]
- Observation Tube Binocular -/Phototube 45°, F.N. 20
- Interpupillary Distance 48mm-75mm
- Eyepieces High-Eyepoint N-WF 10x/20mm provide dioptre adjustment for both eyes
- Side facing quadruple nosepiece
- Objectives CCIS Plan achromat PL 4x, LWD PL 40x
- CCIS Plan Achromat Phase PL Ph10x, LWD PL Ph20x
- Stage plain stage 200mm x 239mm surface with metal & glass stage inserts
- Condensor ELWD N.A. 0.3 with phase slider (Ph1, BF)
- Illumination 6V/30W halogen with intensity control and sleeping mode
- Universal power supply 100V-240V (CE)

Supplied with: dia. 45mm blue, green interference and neutral density filters with filter slider, centering telescope, power cord, Allen hexagonal key, vinyl dust cover.
Optional available Phase-contrast 4x/40x, mechanical stage with well plate holder, LED-Modul

3



9.727 031

Type	Description	PK	Cat. No.
AE2000	Binokular	1	**9.727 030** 2
AE2000	Trinokular	1	**9.727 031** 3

Microscopes and accessories - please see our chapter 10

1



1 Laminar Flow Clean Benches, Horizontal and Vertical Type Airstream®

Esco

Esco laminar flow clean benches are the premium selection for the discerning researcher, offering a combination of value, high quality construction, low operating noise levels, and a wide product range to suit all budgets, from the industry leader.

- Sentinel-Microprocessor maintains steady blower speed
- Airflow alarms
- Tempered glass side walls
- H14 HEPA filters providing superior product protection
- Pre-filter EU3
- Average Airflow Velocity (adjustable): 0.45m/s
- The air cleanliness within the work zone is better than ISO Class 5
- ISOCIDE™ antimicrobial coating on all painted surfaces minimizes contamination.

Standard equipment:
- 2 Electrical outlets
- UV Lamp with timer

More options and support stands on request.

Type	Size	External dimensions (W x D x H) mm	Description	PK	Cat. No.
Airstream® AHC-2D1	0.6m	730 x 797 x 1105	horizontal	1	**9.536 700**
Airstream® AHC-3D1	0.9m	1035 x 797 x 1105	horizontal	1	**9.536 701**
Airstream® AHC-4D1	1.2m	1340 x 797 x 1105	horizontal	1	**9.536 702**
Airstream® AHC-5D1	1.5m	1645 x 797 x 1105	horizontal	1	**9.536 703**
Airstream® AHC-6D1	1.8m	1950 x 804 x 1175	horizontal	1	**9.536 704**
Airstream® AVC-2D1	0.6m	730 x 770 x 1250	vertical	1	**9.536 705**
Airstream® AVC-3D1	0.9m	1035 x 770 x 1250	vertical	1	**9.536 706**
Airstream® AVC-4D1	1.2m	1340 x 770 x 1250	vertical	1	**9.536 707**
Airstream® AVC-5D1	1.5m	1645 x 770 x 1250	vertical	1	**9.536 708**
Airstream® AVC-6D1	1.8m	1950 x 770 x 1250	vertical	1	**9.536 709**

2



2 Microbiological Safety Cabinets, Class II, Type eSafe®

NEW!

Esco

The new eSafe® combines all features of the approved Infinity® with the latest technology and design. Class II according to DIN EN 12469.
- Optimized proportion.
- Energy-saving: just 190W in operation, 100W in stand-by mode.
- Low noise emission: 50.05dBA
- Ergonomically angled and motorized front sash for one hand operation
- Tempered glass side panels
- Large display to control all parameter in the field of view
- Esco triple-wall design with negative pressure prevents the possibility of contamination from leaks.
- Dual fan design for guaranteed safety
- The interior sides and back wall are formed from a single piece of stainless steal.
- Multi-piece work surface removal simplifies cleaning
- Esco ISOCIDE™ antimicrobial coating on all painted surfaces minimizes contamination.
- Sentinel-Platinum controller maintains steady blower speed
- Certified according to EN 12469 by TÜV-Nord, Germany
- Connector for HPV decontamination

Standard equipment:
- 4 electrical outlets
- UV lamp with timer

More options, support stands, installation on request.

Type	Size	External dimensions (W x D x H) mm	PK	Cat. No.
eSafe® EC2-4L8	1.2 m	1340 x 820 x 1450	1	**9.536 762**
eSafe® EC2-5L8	1.5 m	available as from spring 2014	1	**9.536 763**
eSafe® EC2-6L8	1.8 m	available as from spring 2014	1	**9.536 764**

E & OE.

1 Microbiological Safety Cabinets, Class II, Type NordicSafe®

NEW!

1



Esco

One of the silent Biological Safety Solutions from Esco.
Class II according to DIN EN 12469.
- Noise emission <51 dBA.
- Best comfort and safety at a favourable price.
- Esco triple-wall design with negative pressure prevents the possibility of contamination from leaks.
- Ergonomically angled and motorized front sash for one hand operation
- A large easy-to-read digital display and ergonomically sized touchpad.
- Tempered glass side panels
- Sentinel-Gold-controller maintains steady blower speed
- Sleep mode with 50% reduced power to save energy, to maintain safety
- Esco ISOCIDE™ antimicrobial coating on all painted surfaces minimizes contamination.
- Certified according to EN 12469 by TÜV-Nord, Germany

Standard equipment:
- 2 electrical outlets
- UV lamp with timer

More options, support stands, installation on request.

Type	Size	External dimensions (W x D x H) mm	PK	Cat. No.
NordicSafe® NC2-4L8	1.2 m	1200 x 812 x 1410	1	**9.536 760**
NordicSafe® NC2-6L8	1.8 m	1800 x 812 x 1410	1	**9.536 761**

2 Microbiological Safety Cabinet, class II Type Airstream®

2



Esco

The Industry's Most Energy Efficient Class II Cabinet.
Class II according to DIN 12469.

- Ergonomically angled and frameless front sash
- A large easy-to-read digital display and ergonomically sized touchpad.
- Tempered glass side walls
- Esco triple-wall design with negative pressure prevents the possibility of contamination from leaks.
- ISOCIDE™ antimicrobial coating on all painted surfaces minimises contamination.
- Sentinel-Microprocessor maintains steady blower speed
- INNOVA™ energy saving fan technology reduces cabinet power consumption.
- HPV-compliant and approved for safe decontamination

Other varieties:
- Airstream G with Dual-Exhaust Filters (2 x HEPA), better protection
- Airstream G with Dual-Exhaust Filters (1 x HEPA, 1 x Activated carbon), for additional chemical protection

Standard equipment:
- 2 Electrical outlets
- UV Lamp with timer

More options and support stands on request.

Type	Size	External dimensions (W x D x H) mm	PK	Cat. No.
Airstream E AC2-2E1	0.6 m	730 x 800 x 1400	1	**9.536 710**
Airstream E AC2-3E1	0.9 m	1035 x 800 x 1400	1	**9.536 711**
Airstream E AC2-4E1	1.2 m	1340 x 800 x 1400	1	**9.536 712**
Airstream E AC2-5E1	1.5 m	1645 x 800 x 1400	1	**9.536 713**
Airstream E AC2-6E1	1.8 m	1950 x 800 x 1400	1	**9.536 714**
Airstream G AC2-4G1*	1.2 m	1340 x 800 x 1470	1	**7.939 057**
Airstream G AC2-6G1*	1.8 m	1950 x 800 x 1470	1	**7.939 058**

*with additional charcoal filter

1



2



1 2 MSC-Advantage™ Class II Biosafety Cabinets

Thermo Scientific

Thermo Scientific biological safety cabinets combine smart design and extraordinary value with best-in-class energy efficiency, reliability and usability. The MSC-Advantage is designed to meet the stringent safety requirements of EN 12469:2000 and EN 61010-1:2001, and carries the NF Mark as well as the test report from the Health Protection Agency (HPA) from Porton Down, UK.

- 60% less energy consumption than competing AC motor-driven cabinets
- 60% less heat emission than competing AC motor-driven cabinets
- Extremely low noise level (54 or 59 dB(A)) for a more comfortable work environment
- Largest work surface area of any cabinet (more workspace for your research)
- Cleaning position of window (patented feature that allows user to clean the entire window)
- Sloped front window for improved ergonomics (more comfortable working position)
- Motor operates at reduced speed when front window is closed (keeps interior cleaner for faster set up each day and eliminates noise into the lab when not in use)
- Low overall height to fit into labs with shorter ceilings
- Supply/exhaust air filter: HEPA H 14 EN 1822, 99.999% at 0.3 µm particle size
- Additional exhaust filter option (AEF): HEPA H 14 EN 1822, 99.999% at 0.3 µm particle size
- Voltage: 230 V, 50/60 Hz

Description	External dimensions (W x D x H) mm	Internal dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
MSC Advantage 0.9	1000 x 800 x 1522	900 x 630 x 780	170	1	**4.010 047**
MSC Advantage 1.2	1300 x 798 x 1550	1200 x 495 x 780	240	1	**6.235 767**
MSC Advantage 1.5	1600 x 800 x 1522	1500 x 630 x 780	230	1	**4.010 048**
MSC Advantage 1.8	1900 x 798 x 1550	1800 x 495 x 780	340	1	**4.010 033**

Accessories for MSC-Advantage Microbiological Safety Cabinets Class II

Thermo Scientific

Description	PK	Cat. No.
Standard floor stand, 750mm height for 1.8M cabinet	1	**4.009 986**
Manual Adjustable stand, 1.2M cabinet, 750-950mm in 50mm increments	1	**4.009 987**
Manual Adjustable stand, 1.8M cabinet, 750-950mm in 50mm increments	1	**4.009 988**
Electric Adjustable stand, 750-950mm height for 1.2M cabinet	1	**4.009 989**
Electric Adjustable stand, 750-950mm height for 1.8M cabinet	1	**4.009 990**
Vacuum tap 3/8 connection	1	**4.009 992**
UV Light Option, Field Installed	1	**4.010 001**
UV Light Option, Factory Installed	1	**4.010 098**
Standard floor stand, 750mm height for 1.2M cabinet	1	**6.241 502**
Solenoid valve for combustable gas tap	1	**9.536 550**
Water tap H2O 3/8 connection	1	**9.536 551**
Non-combustible gas 3/8 tap with long neck for installation in side walls	1	**9.536 552**
Tap for flammable gas cylinders 3/8 connection	1	**9.536 553**

E & OE.

1 Microbiological Safety Cabinet BSC-700II



This miniature Class 2 safety workbench offers security on a minimum of space.
The protection of the user as well as the safety of the samples is ensured by the two HEPA filters with an efficiency of 99.995% at 0.3 microns. An air-flow gauge (velometer) monitors the speed of air at the front and will activate an alarm (audiovisual), if the fan malfunctions. The unit may be placed on a desk without any problems, optional with mobile base frame available.
Standard features:
- Electrical sliding window
- UV light, to be positioned freely
- 2 sockets, can be disconnected from outside
- Electronically controlled air stream
- Automatic readjustment of fan
- Stainless-steel working surface
- Quiet fan drive with low vibration
- Digital air flow indication
- Main switch as key-operated switch
- Option: Stainless steel base frame with 4 castors (2 castors are lockable)

Specifications

External dimensions (WxDxH):	700 x 650 x 1230mm
Working area dimensions (WxDxH):	600 x 500 x 540mm
Material front sash:	Multi-layer toughend glass
Material working area:	SUS 304 stainless steel
Clean level:	Class 10
Noise level:	65dB
Vibration:	≤5µm
Power requirements:	AC 230/V 50Hz
Power consumption:	800W
Light:	>680lux
Safety standard:	EN 12469

Type	PK	Cat. No.
BSC-700II	1	**9.536 800**

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General information about vials and caps

Technical Information – Vials

In chromatography a broad variety of glass or plastic vials are used as sample containers for analysis usage. As they are mainly used within autosamplers or any other automatic instrument, strict obedience of all dimensions is crucial for a trouble-free run. Besides these physical properties the vials also have to fulfill requirements regarding inertness and cleanliness, as otherwise analysis results may be incorrect.
LLG Labware consider the physical and chemical demands in their production process by various implementations:

Almost all vials are made out of 1st hydrolytic class glass. First hydrolytic class glass is very hard and has a low expansion coefficient even at high temperature variations. It shows an excellent chemical resistance to acidic and neutral solutions, and even to alkaline solutions due to its relatively low Alkali content. Higher density of the glass surface offers a higher hydrolytic resistance. Clear Glass of 1st hydrolytic class is differentiated by 33 expansion (Type 1, Class A) and 51 expansion glass (Type 1, Class B), whereas amber is generally worldwide only available as 51 expansion glass. The indicated lower expansion coefficient of 33 implies that this harder clear glass has to be processed at higher temperatures. These amount to approx. 1,200°C for 33 expansion glass in comparison to only approx. 1,000°C for glass of 51 expansion. In the USA typically clear glass in 33 expansion and amber glass in 51 expansion is used, whereas in Europe solely 51 expansion glass is processed. From a quality point of view both types of glass are equally suitable for usage in chromatography, as they both are glasses of 1st hydrolytic class.

Technical Information – Seals

Seals are the assembled combination of a cap and a septa. To carry out a correct analysis, it is important that besides the vial the seal is also inert and uncontaminated The closures sold by LLG Labware are automatically assembled and packed according to internally defined conditions of the supplier. Photocells check the side-orientation of the liner, so that it is ensured that the PTFE lamination is always directed towards the sample to build an inert barrier between sample and carrier material of the septa. A gauge control ensures that not more or less than one septa is installed. The final seals are automatically counted – and not weighed – by automates to guarantee quantity obedience. They are packed in tamper-proof evident zip-lock bags that allow easy identification of the content due to the transparent PE material. The zip-lock enables resealing of the bag to avoid any contamination of the closures during consumption. The batch number of the manufactured seal is printed on each PE-bag for traceability.

Technical Information – Septa

The right choice of septa depends on the application. Almost all septa are laminated on one side with PTFE, which has a high chemical resistance and forms an inert barrier between sample and carrier material of the septa. The carrier materials have different physical and chemical properties, such as temperature resistance, resealability properties, cleanliness, hardness, thickness, etc.

The individual conditions of the customer's application aim at the specific characteristics of the carrier material, e.g.:

Multiple injection?	Temperature?			thin, fragile needle?	blunt, thick needle?	critical analysis?	low coring?
↓	-40°C up to	-40°C up to	-60°C up to	↓	↓	↓	↓
good resealability properties necessary	120°C	110°C	200°C	soft and thin septa required	slitted/pre-cut liner as penetration aid (HPLC)	very clean liner required	both sided PTFE laminated liners required
↓	↓	↓	↓	↓	↓	↓	↓
Natural Rubber/TEF	Natural Rubber/TEF; Butyl/PTFE	Red Rubber/PTFE	Silicon/ PTFE	e.g. Silicon/ PTFE	e.g. 08 02 0039	Silicon/ PTFE	PTFE/Silicon/ PTFE PTFE/Butyl/ PTFE

E & OE.

LLG - Vials and autosamplers: compatibility chart

Agilent

Alternative LLG Labware products for use on Agilent GC, HPLC and Headspace instruments.

Agilent GC Products

	Crimp Neck ND 8	Agilent Art.-No.	Screw Neck ND9	Agilent Art.-No.	Crimp Neck ND11	Agilent Art.-No.
Vials	4.001 554	5180-0841	9.003 448	5182-0714	7.086 520	5181-3375
	6.235 006	5180-0844	6.803 174	5182-0715	7.608 160	5182-0543
			6.088 871	5182-0716	7.620 828	5181-3376
			4.008 249	5183-2030	6.233 918	9301-1388
Micro-Inserts			7.401 744	5183-2085	7.401 744	5183-2085
			6.093 247	5181-1270	6.093 247	5181-1270
			4.008 196	5181-3377	4.008 196	5181-3377
Seals	9.003 444	5180-0842	4.008 228	5182-0717	4.008 243	5181-1210
			9.003 451	5182-0720	9.003 446	5182-0552
			4.008 218	5182-0723	7.050 759	5181-1211
			4.008 216	5182-0717	4.001 564	5188-5386
			4.008 214	5185-5823	4.008 239	5181-1210

Agilent HPLC Products

	Screw Neck ND9	Agilent Art.-No.	Crimp Neck ND11	Agilent Art.-No.	Snap Ring ND11	Agilent Art.-No.
Vials	9.003 448	5182-0714	7.086 520	5181-3375	6.073 833	5182-0544
	6.803 174	5182-0715	7.608 160	5182-0543	7.622 228	5182-0546
	6.088 871	5182-0716	7.620 828	5181-3376	7.613 330	5182-0545
	4.008 249	5183-2030	6.233 918	9301-1388	4.008 255	5188-6593
Micro-Inserts	7.401 744	5183-2085	7.401 744	5183-2085	7.401 744	5183-2085
	6.093 247	5181-1270	6.093 247	5181-1270	6.093 247	5181-1270
	4.008 196	5181-3377	4.008 196	5181-3377	4.008 196	5181-3377
Seals	4.008 228	5182-0717	4.008 243	5181-1210	4.008 257	5182-3458
	9.003 451	5182-0720	9.003 446	5182-0552	4.008 258	5182-0541
	4,008 218	5182-0723	7.050 759	5181-1211	4.008 259	5182-0566
	4.008 216	5182-0717	4.001 564	5188-5386	4.008 256	5183-4511
	4.008 214	5185-5823	4.008 239	5181-1210		
	4.008 215	5185-5824	4.001 555			
	4.001 521	5183-2076				

Agilent Headspace Products

	Headspace Screw ND 18 (Combi Pal + G 1888A)	Agilent Art.-No.	Headspace Crimp Neck ND 20	Agilent Art.-No.
Vials	9.003 466	5188-5392	7.050 285	5182-0838
	6.227 874	5188-6538	9.003 452	5182-0837
	4.008 270	5188-2753		
	6.237 909	5188-6537		
Seals	4.008 268	5188-2759	4.001 557	5183-4479
			9.003 460	5183-4477
			9.003 453	5183-4474

Autosampler compatibility chart

The autosampler compatibility chart generally shows the most typical LLG-Labware vials and closures for usage on instruments of different manufacturers. Additionally the corresponding part number of the manufacturer is indicated. Beside these there also may be further products in our catalogue which may technically and functionally be suitable. We will gladly recommend other suitable products.

If applicable for a manufacturer, each table has been divided by the application HPLC, GC and Headspace. We generally recommend asking for cost-free samples for testing purposes.

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LLG - Vials and autosamplers: compatibility chart

C T C Analytics

Alternative LLG Labware products for use on CTC Analytics GC, HPLC and Headspace instruments.

CTC Analytics GC Products

	Crimp Neck ND 8	C T C Art.-No.	Screw Neck ND9	C T C Art.-No.	Crimp Neck ND11	C T C Art.-No.
Vials	4.001 554		9.003 448		7.086 520	
	6.235 606		6.803 174		7.608 160	
	4.001 515		6.088 871		7.620 828	
	6.902 044		4.008 249		6.233 918	
	4.008 202					
	4.008 203					
Micro-Inserts			7.401 744		7.401 744	
			6.093 247		6.093 247	
			4.008 196		4.008 196	
Seals	9.003 444		4.008 228		4.001 564	GC PAL
	4.008 198		9.003 451		9.003 446	
			4.001 521		7.050 759	
			4,008 218			
			4.008 215			

CTC Analytics HPLC Products

	Crimp Neck ND 8	C T C Art.-No.	Screw Neck ND9	C T C Art.-No.	Crimp Neck ND11	C T C Art.-No.	Snap Ring ND11	C T C Art.-No.
Vials	4.001 554		9.003 448		7.086 520		6.073 833	
	6.235 606		6.803 174		7.608 160		7.622 228	
	4.001 515		6.088 871		7.620 828		7.613 330	
	6.902 044		4.008 249		6.233 918		4.008 255	
	4.008 202							
	4.008 203							
Micro-Inserts			7.401 744		7.401 744		7.401 744	
			6.093 247		6.093 247		6.093 247	
			4.008 196		4.008 196		4.008 196	
Seals	9.003 444		4.008 228		4.008 243		4.008 258	
	4.008 198		9.003 451		9.003 446		4.008 259	
			4.001 521		7.050 759			
			4,008 218					
			4.008 215					

CTC Analytics Headspace Products

	Headspace Screw Neck ND 18 (Combi Pal)	C T C Art.-No.	Headspace Crimp Neck ND 20 (Combi Pal)	C T C Art.-No.
Vials	9.003 466		7.850 009	
	6.227 874		9.003 453	
	4.008 270			
	6.237 909			
Seals	4.008 268		7.850 010	
	6.241 111		6.234 541	

E & OE.

LLG - Vials and autosamplers: compatibility chart

Dionex
Alternative LLG Labware products for use on Dionex HPLC instruments.

Dionex HPLC Products									
	Crimp Neck ND 8	Dionex Art.-No.	Screw Neck ND8	Dionex Art.-No.	Screw Neck ND9	Dionex Art.-No.	Crimp Neck ND11	Dionex Art.-No.	Snap Ring ND11	Dionex Art.-No.
Vials	4.008 206		9.003 481		9.003 448		7.086 520		6.073 833	
	6.235 606		7.613 087		6.803 174		7.608 160		7.622 228	
	4.001 554		9.003 480		6.088 871		7.620 828		7.613 330	
			7.613 388		4.008 249		6.233 918		4.008 255	
Micro-Inserts			7.401 066		7.401 744		7.401 744		7.401 744	
			4.001 556		6.093 247		6.093 247		6.093 247	
			4.008 194		4.008 196		4.008 196		4.008 196	
Seals	4.008 200		4.008 209		4.008 228		4.008 243		4.008 257	
	9.003 444		9.003 484		9.003 451		9.003 446		4.008 258	
			6.232 178		4.001 521		7.050 759		4.008 259	
					4.008 214		4.001 555		4.008 256	
					4.008 215					

Autosampler compatibility chart

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LLG - Vials and autosamplers: compatibility chart

PerkinElmer

Alternative LLG Labware products for use on Agilent GC, HPLC and Headspace instruments.

PerkinElmer GC Products

	Crimp Neck ND 8	PerkinElmer Art.-No.	Screw Neck ND9	PerkinElmer Art.-No.	Screw Neck ND10	PerkinElmer Art.-No.	Crimp Neck ND11	PerkinElmer Art.-No.
Vials	6.235 606	N9302136	9.003 448	N9306201	6.242 103		7.086 520	N9301385
	9.003 427	N9301069	6.803 174	N9306201	7.615 715		7.608 160	N9301385
			4.008 247	N9306220	6.238 867		7.620 828	N9302680
			6.088 871	N9306220				
Micro-Inserts			6.093 247	N9300703	6.093 247	N9300703	6.093 247	N9300703
			4.008 196	N9300704	4.008 196	N9300704	4.008 196	N9300704
Seals	4.001 558	N9302140	4.008 228	N9306200	4.008 234	N9306205	7.060 469	N9306230
	9.003 443	03300806	9.003 451	N9306202	4.008 235	N9306205	4.008 243	N9306015
	4.008 200	03300806	4.008 214	N9306202			4.001 522	N9302684
							7.300 348	N9302685
							6.900 233	N9302686
							9.003 446	N9306228
							7.050 759	N9306229

PerkinElmer HPLC Products

	Crimp Neck ND 8	PerkinElmer Art.-No.	Screw Neck ND9	PerkinElmer Art.-No.	Screw Neck ND10	PerkinElmer Art.-No.	Crimp Neck ND11	PerkinElmer Art.-No.	Snap Ring ND11	PerkinElmer Art.-No.
Vials	6.235 606	N9302136	9.003 448	N9306201	6.242 103		7.086 520	N9301385	6.073 833	N9303418
			6.803 174	N9306201	7.615 715		7.608 160	N9301385	7.622 228	
			4.008 247	N9306220	6.238 867		7.620 828	N9302680	7.613 330	
			6.088 871	N9306220						
Micro-Inserts			6.093 247	N9300703	6.093 247	N9300703	6.093 247	N9300703	6.093 247	N9300703
			4.008 196	N9300704	4.008 196	N9300704	4.008 196	N9300704	4.008 196	N9300704
Seals	9.003 443	03300806	4.008 228	N9306200	4.008 234	N9306205	7.060 469	N9306230	6.073 555	N9303417
	4.008 200	03300806	9.003 451	N9306202	4.008 235	N9306205	4.008 243	N9306015	4.001 544	N9303419
			4.008 214	N9306202	4.008 237	N9306052	4.001 522	N9302684	4.008 256	N9303416
			4.001 521	N9306203			7.300 348	N9302685		
							6.900 233	N9302686		
							9.003 446	N9306228		
							7.050 759	N9306229		
							4.001 555			

PerkinElmer Headspace Products

	Headspace Screw Neck ND 18 CTC Combi Pal + Turbo Matrix™ HS16+40	PerkinElmer Art.-No.	Headspace Crimp Neck ND20 CTC Combi PAL	PerkinElmer Art.-No.	Headspace Crimp Neck ND20 Turbo Matrix™ HS 16, 40 + 110 *** not suitable for TurboMatrix™ 110	PerkinElmer Art.-No.
Vials	9.003 466	N6356479	7.850 009	N6356478	7.052 186 ***	N9302134
	6.227 874		9.003 453	N6356471	7.060 463	N9306079
	4.008 270	N9306075			4.008 281	N9303349
	6.237 909					
Seals	4.008 268	N9306077	7.850 010	N6356559	4.001 557	N9306266
	6.241 111	N6356475	6.234 541	N6356566	9.003 455	N9306266
			6.902 419	N6356562	4.008 276	N9306266
			6.229 635	N6356560	9.003 456	B0104241
			4.001 548	N6356560	7.050 286	B0104242
					7.060 477	B0110728
					7.060 433	B0038137

E & OE.

LLG - Vials and autosamplers: compatibility chart

Shimadzu

Alternative LLG Labware products for use on Shimadzu GC, HPLC and Headspace instruments.

Shimadzu GC Products

	Crimp Neck ND 8	Shimadzu Art.-No.	Screw Neck ND9	Shimadzu Art.-No.	Screw Neck ND10	Shimadzu Art.-No.	Crimp Neck ND11	Shimadzu Art.-No.	Screw Neck ND13	Shimadzu Art.-No.
Vials	4.001 554		9.003 448		6.242 103		7.086 520	980-01705	9.003 482	
	6.235 006		4.008 247				7.608 160		7.058 142	
	4.001 515		4.008 249				7.620 828			
	6.902 044						6.233 918			
	4.008 202									
	4.008 203									
Micro-Inserts			7.401 744	980-0487	7.401 744	980-0487	7.401 744	980-04987	7.055 4856	
			6.093 247	980-01707	6.093 247	980-01707	6.093 247	980-01707		
			4.008 196		4.008 196		4.008 196			
Seals	9.003 444		9.003 451		4.008 234		4.001 564	0980-01706	7.510 053	
	4.008 198		4.008 218		4.008 235		9.003 446			
			4.008 214		4.008 236		7.050 759			

Shimadzu HPLC Products

	Crimp Neck ND 8	Shimadzu Art.-No.	Screw Neck ND9	Shimadzu Art.-No.	Screw Neck ND10	Shimadzu Art.-No.	Crimp Neck ND11	Shimadzu Art.-No.	Snap Ring ND 11	Shimadzu Art.-No.
Vials	4.001 554		9.003 448		6.242 103		7.086 520	980-01705	6.073 833	
	6.235 006		4.008 247				4.001 565		6.224 358	
			4.008 249				4.001 516			
Micro-Inserts			7.401 744	980-0487	7.401 744	980-0487	7.401 744	980-04987	7.401 744	980-04987
			6.093 247	980-01707	6.093 247	980-01707	6.093 247	980-01707	6.093 247	980-01707
			4.008 196		4.008 196		4.008 196		4.008 196	
Seals	9.003 444		9.003 451		4.008 234		4.008 243	0980-01706	4.008 256	
	4.008 198		4.008 222		4.008 235		9.003 446		4.008 260	
	4.008 200		4.008 224		4.008 237		4.001 555		4.001 544	
			4.008 225						4.008 258	
			4.008 214							
			4.001 521							
			4.008 223							
			4.008 226							
			4.008 215							
			4.008 221							

Shimadzu Headspace Products

	Screw Neck ND 18 (AOC 5000)	Shimadzu Art.-No.	Headspace ND 18 (AOC 5000)	Shimadzu Art.-No.	Headspace ND 18 (HTA200H)	Shimadzu Art.-No.
Vials	9.003 466	980-00247	7.850 009	980-00664	7.050 285	
	4.003 270	961-00915	9.003.453	980-00111	9.003 453	980-00111
Seals	4.008 268	961-00914	7.850 010	961-01256	9.003 447	
	6.241 111	980-01708	6.234 541	980-03372	4.001 553	
			6.229 635	980-00112		
			4.001 548	980-00112		

Autosampler compatibility chart

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LLG - Vials and autosamplers: compatibility chart

Thermo Scientific

Alternative LLG Labware products for use on Thermo Scientific GC, HPLC and Headspace instruments.

Thermo Scientific GC Products

	Crimp Neck ND 8	Thermo Scientific Art.-No.	Screw Neck ND8	Thermo Scientific Art.-No.	Screw Neck ND9	Thermo Scientific Art.-No.	Crimp Neck ND11	Thermo Scientific Art.-No.
Vials	9.003 427	60180-707	9.003 481	60180-508	9.003 448	60180-723	7.086 520	60180-701
	4.001 554		7.613 087		6.803 174	60180-509	7.608 160	60180-502
	6.235 606		9.003 480	60180-560	4.008 247	60180-724	7.089 998	60180-702
	4.008 206	60180-505	7.613 388		6.088 871	60180-561	7.620 828	
	4.001 515							
	6.902 044							
	4.008 202							
	4.008 203							
Micro-Inserts			7.401 066	60180-265	7.401 744		7.401 744	
			9.003 435		6.093 247	60180-734	6.093 247	60180-734
			4.001 556	60180-721	4.008 196	60180-735	4.008 196	60180-735
			4.008 194	60180-722	4.001 547	60180-266	4.001 547	60180-266
Seals	9.003 443		4.008 209		4.008 228	60180-728	4.001 564	GC PAL
	4.008 200		9.003 484	60180-719	9.003 451	60180-729	4.008 239	
	9.003 444	60180-525	4.008 207		4.008 218		7.060 469	
	4.008 198				4.008 214		4.008 243	60180-705
							9.003 446	60180-706
							7.050 759	

Thermo Scientific HPLC Products

	Crimp Neck ND 8	Thermo Scientific Art.-No.	Screw Neck ND8	Thermo Scientific Art.-No.	Screw Neck ND9	Thermo Scientific Art.-No.	Crimp Neck ND11	Thermo Scientific Art.-No.	Snap Ring ND 11	Thermo Scientific Art.-No.
Vials	4.001 554		9.003 481	60180-508	9.003 448	60180-723	7.086 520		6.073 833	60180-740
	6.235 006		7.613 087		6.803 174	60180-509	7.608 160	60180-502	7.622 228	
	4.008 206	60180-505	9.003 480	60180-560	4.008 247	60180-724	7.089 998		7.613 330	60180-711
	4.001 515		7.613 388		6.088 871	60180-561	7.620 828			
	6.902 044									
	4.008 202									
	4.008 203									
Micro-Inserts			7.401 066	60180-265	7.401 744		7.401 744		7.401 744	
			9.003 435		6.093 247	60180-734	6.093 247	60180-734	6.093 247	60180-734
			4.001 556	60180-721	4.008 196	60180-735	4.008 196	60180-735	4.008 196	60180-735
			4.008 194	60180-722	4.001 547	60180-266	4.001 547	60180-266	4.001 547	60180-266
Seals	9.003 443	60180-708	4.008 209		4.008 228	60180-728	4.008 239		4.008 256	
	4.008 200		9.003 484	60180-719	9.003 451	60180-729	7.060 469		4.008 260	
	9.003 444	60180-525	4.008 207		4.008 218		4.008 243	60180-705	4.001 544	
	4.008 198				4.008 214		9.003 446	60180-706	4.008 258	60180-713
							7.050 759		4.008 261	
									4.008 257	60180-712

Thermo Scientific Headspace Products

	Headspace Screw Neck ND 18 (Combi Pal)	Thermo Scientific Art.-No.	Headspace Crimp Neck ND 20 (Combi Pal)	Thermo Scientific Art.-No.	Headspace Crimp Neck ND 20 (HS850/HS20	Thermo Scientific Art.-No.
Vials	9.003 466		7.850 009	60180-740	7.850 009	60180-504
	6.227 874		9.003.453	60180-506	9.003 453	60180-506
	4.008 270					
	6.237 909					
Seals	4.008 268		7.850 010		4.001 553	60180-511
	6.241 111		6.234 541	60180-520	9.003 454	60180-513
			6.229 635		4.001 549	60180-513
			4.001 548			

LLG - Vials and autosamplers: compatibility chart

VWR (Merck / Hitachi)

Alternative LLG Labware products for use on VWR (Merck / Hitachi) HPLC instruments.

VWR (Merck / Hitachi) HPLC Products

	Crimp Neck ND 8	VWR (Merck) Art.-No.	Screw Neck ND8	VWR (Merck) Art.-No.	Screw Neck ND9	VWR (Merck) Art.-No.	Crimp Neck ND11	VWR (Merck) Art.-No.	Snap Ring ND11	VWR (Merck) Art.-No.	Screw Neck ND13	VWR (Merck) Art.-No.
Vials	6.235 606	548-0078	9.003 481	548-0018	9.003 448	548-0028	7.086 520	548-0003	6.073 833	548-0011	9.003 0482	548-0051
	4.001 554	548-0080	7.613 087	548-0420	6.803 174	548-0029	7.608 160	548-0004	7.622 228	548-0422	13 09 1335	548-0509
			9.003 480	548-0448	6.088 871	548-0030	7.620 828	548-0005	7.613 330	548-0012	9.003 549	548-0052
			7.613 388	548-0019	4.008 249	548-0081	6.233 918	548-1442	4.008 255	548-1442	13 09 1336	548-0510
Micro-Inserts			7.401 066	548-0020	7.401 744	548-0006	7.401 744	548-0006	7.401 744	548-0006	7.055 486	548-0093
			9.003 435	548-0308	6.093 247	548-0002	6.093 247	548-0002	6.093 247	548-0002	4.001 567	548-0094
			4.001 556	548-0083	4.008 196	548-0001	4.008 196	548-0001	4.008 196	548-0001		
			4.008 194	548-0780								
Seals	9.003 444	548-0040	4.008 209	548-3322	4.008 228	548-0896	4.008 243	548-3272	4.008 258	548-0432	7.510 053	548-0054
	4.008 198	548-0038	9.003 484	548-0024	9.003 451	548-0085	9.003 446	548-0009	4.008 259	548-0434		
			6.232 178	548-0834	4.001 521	548-0088	7.050 759	548-0007				
					4,008 218	548-0087						
					4.008 215	548-0373						

Waters

Alternative LLG Labware products for use on Waters HPLC instruments.

Waters HPLC Products

	Screw Neck ND9	Waters Art.-No.	Screw Neck ND10	Waters Art.-No.	Snap Ring ND11	Waters Art.-No.	Screw Neck ND13	Waters Art.-No.	Shell Vials ND8	Waters Art.-No.
Vials	9.003 448		6.242 103	WAT063300	6.073 833		9.003 482	186000840	7.300 174	WAT025054C
	6.803 174	186000273	7.615 715		7.622 228	WAT094219	9.003 549	186001135	4.008 205	WAT025053C
	6.088 871	186000848	6.238 867		7.613 330	WAT094220				
	4.008 249				4.008 255					
	4.008 250									
	4.008 252									
Micro-Inserts	7.401 744		7.401 744		7.401 744		7.055 486	WAT015199		
	6.093 247	WAT094170	6.093 247	WAT094170	6.093 247	WAT094170	4.001 567	WAT072708		
	4.008 196		4.008 196		4.008 196					
Seals	4.008 214	186000274	4.008 243	WAT058874	4.008 258	186000303	7.510 053	186000841		
	4.008 215	186000305	9.003 446		6.242 212	186000304				
			7.050 759							

Autosampler compatibility chart

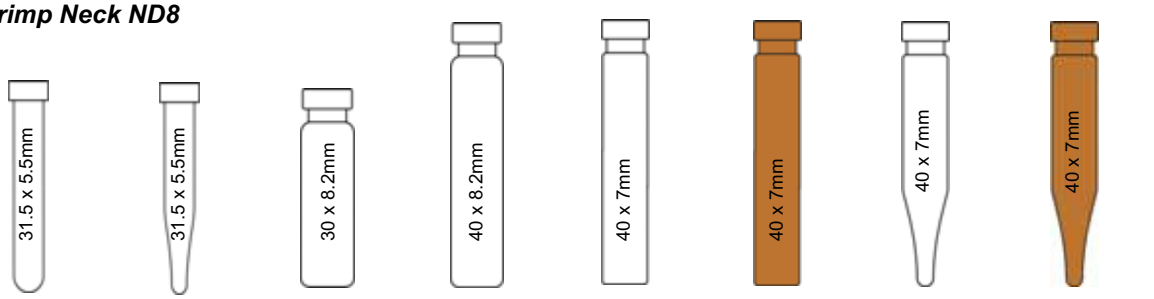
The autosampler compatibility chart generally shows the most typical LLG-Labware vials and closures for usage on instruments of different manufacturers. Additionally the corresponding part number of the manufacturer is indicated. Beside these there also may be further products in our catalogue which may technically and functionally be suitable. We will gladly recommend other suitable products.

If applicable for a manufacturer, each table has been divided by the application HPLC, GC and Headspace. We generally recommend asking for cost-free samples for testing purposes.

We kindly ask for your understanding that we do not take any guarantee for the correctness nor for the completeness of the data indicated here.

LLG - Flasks types

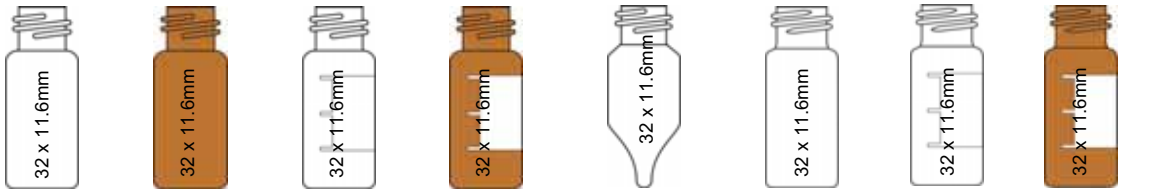
Crimp Neck ND8



4.001 554	6.235 606	9.003 427	4.008 206	4.008 202	4.008 203	4.001 515	6.902 044

Screw Neck ND8, small opening

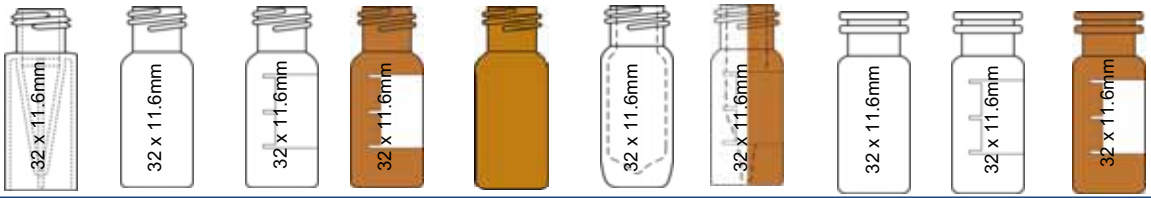
Screw Neck ND10, wide opening



9.003 481	9.003 480	7. 613 087	7.613 388	4.001 563	6.242 103	7.615 715	6.238 867

Short Thread ND9

Snap Ring ND11

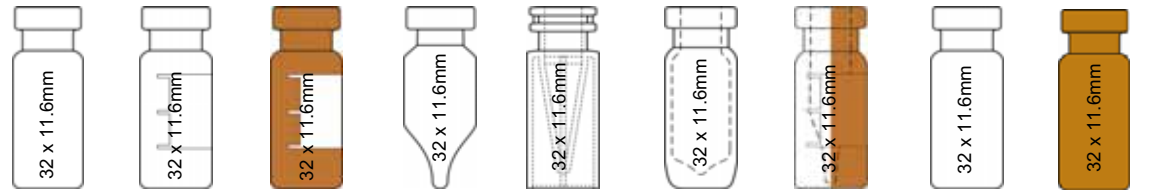


4.008 262	9.003 448	6.803 174	6.088 871	4.008 247	4.008 249	4.008 250 4.008 252	6.073 833	7.622 228	7.613 330

Crimp / Snap Neck ND11

small opening

small opening

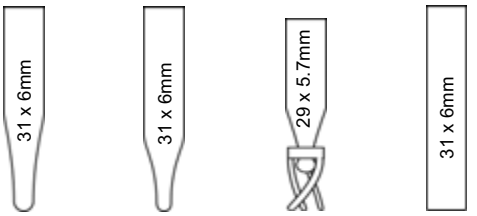


7.086 520	7.608 160	7.620 828	4.001 516	6.224 358	4.001 565	4.008 251 6.233 918	7.085 511	7.089 998

E & OE.

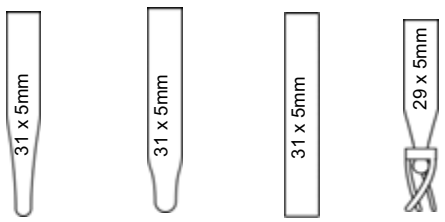
LLG - Flasks types

Micro-Inserts for wide opening



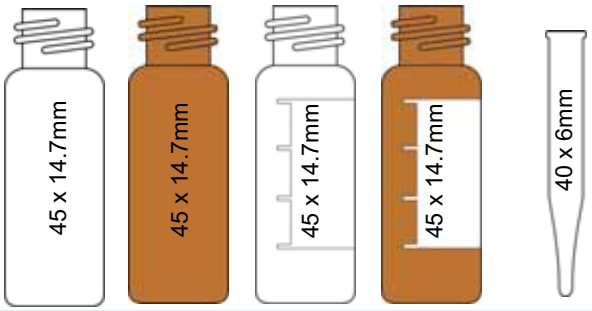
7.401 744	4.001 547	6.093 247	4.008 196

Micro-Inserts for small opening



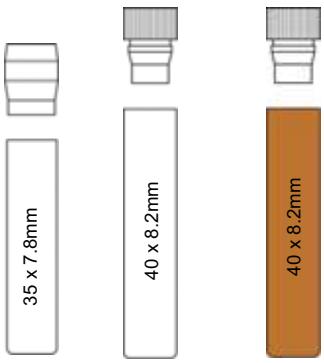
7.401 066	9.003 435	4.008 194	4.001 556

Screw Neck ND13



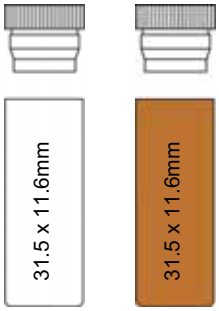
9.003 482	7.058 142	7.910 140	9.003 549	7.055 486

Shell Vials, 1ml (Insert)



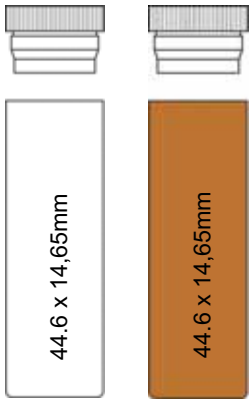
7.612 017	7.300 174	4.008 205

Shell Vials, 2ml



4.008 248	6.226 501

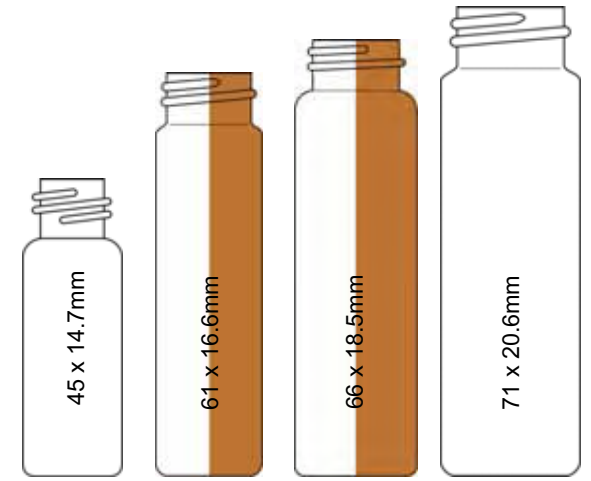
Shell Vials, 4ml (Insert)



7.632 226	6.227 544

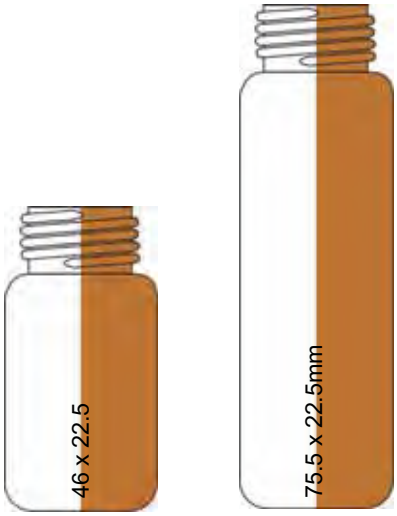
LLG - Flasks types

Storage Vials ND13, ND 15, ND18



7.613 421	7.616 898	7.616 655	6.239 037

Headspace ND 18



9.003 466 6.227 874	4.008 270 6.237 909

Snap Cap Vials

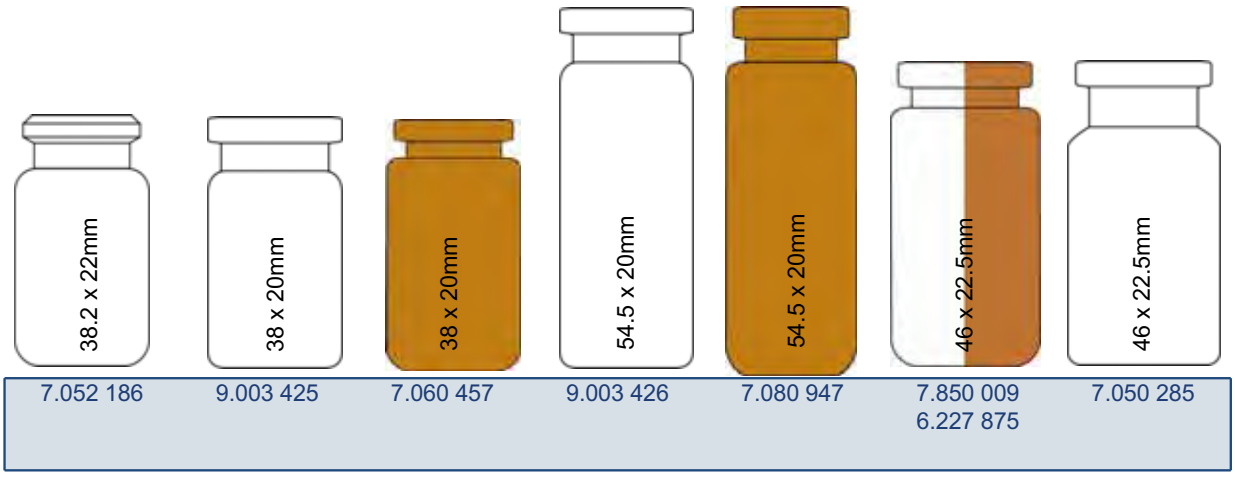


7.051 404	6.803 717	4.008 282	7.090 616

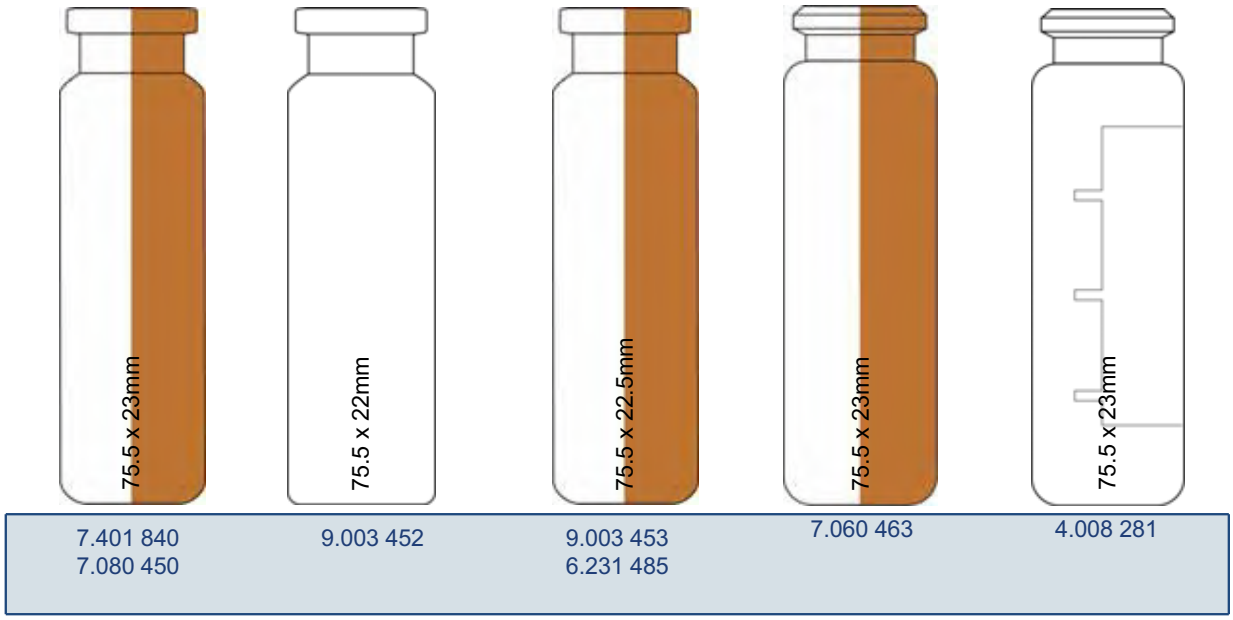
E & OE.

LLG - Flasks types

Headspace ND 20

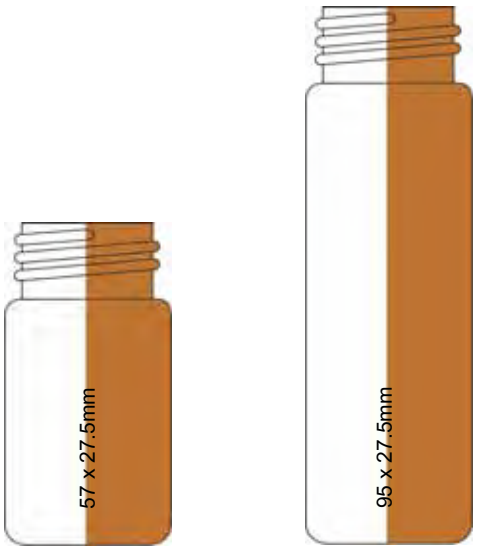


Headspace ND 20



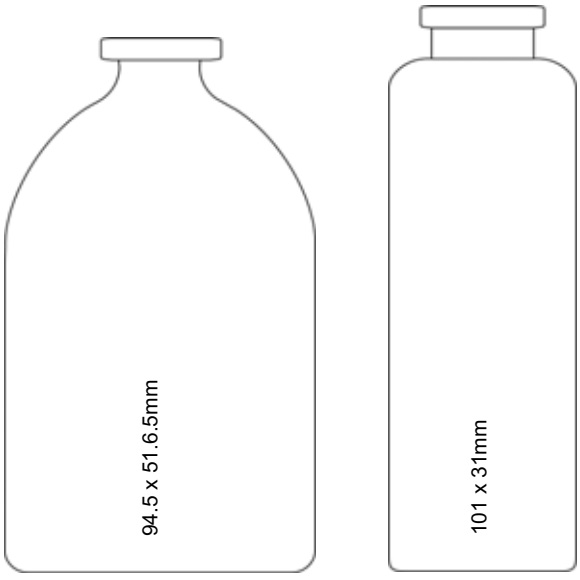
LLG - Flasks types

EPA-Vials ND24



4.008 204 4.008 298	4.008 297 4.008 299

Crimp Neck ND 20



7.060 465	7.060 459

E & OE.

LLG - Cap types

Aluminum Crimp Caps, centre hole

				
Size	**8mm**	**11mm**	**13mm**	**20mm**
Size centre hole Material Lacquer	4mm centre hole Aluminum clear	5.5mm centre hole Aluminum clear, red, blue, green, gold	6mm centre hole Aluminum clear, red, blue, green, gold	10mm centre hole Aluminum plain, red, blue, green, gold

Special Aluminum Crimp Caps

						
Size	**11mm**	**13mm**	**13mm**	**20mm**	**20mm**	**20mm**
Type of Cap Material Lacqer Special features	Centre hole Cap Aluminum cear with roll grove	Centre Tear Off Cap Aluminum clear, red, blue, green, gold	Complete Tear Off Cap Aluminum clear, red, blue, green, gold	Centre Tear Off Cap Aluminum clear, red, blue, green, gold	Complete Tear Off Cap Aluminum clear, red, blue, green, gold	Headspace Cap* Aluminum clear

Headspace Cap:* This cap has the function of a pressure release cap and is designed with special scorelines whose bridges break open at an internal vial pressure of 3.0 ± 0.5 bar to let the excess pressure escape. It is comparable with the three component PerkinElmer Headspace Closure (Aluminum Crimp Cap with slits, metal star washer, liner with ears) which offers the same effect with a different technical design.

Magnetic Caps, centre hole

							
Size	**9mm Screw Cap**	**11mm Crimp Cap**	**20mm Crimp Cap**	**20mm Crimp Cap**	**20mm Bimetal Crimp Cap**	**18mm Screw Cap**	**18mm Screw Cap**
Size centre hole Application Material Lacquer	6mm centre hole (GC) PP Screw Cap blue/ magn. overcap gold GC PAL Thermo Scientific TriPlus	5mm centre hole (GC) magnetic gold GC PAL, Thermo Scientific Tri Plus	5mm centre hole (HS) magnetic gold CE HS250/500/HS800, CTC 500 Fisons HS250/500 HS800	8mm centre hole (HS) magnetic Gold CTC Combi PAL	8mm centre hole (HS) Alu/magnetic red CTC Combi PAL	8mm centre hole (Universal) (Headspace/SPME) magnetic silver CTC Combi PAL PerkinElmer Agilent G1888A	Closed top Universal Screw Cap silver

PE-Caps for Crimp Necks

						
Size	**8mm**	**9mm**	**11mm**	**13mm**	**22mm**	**22mm**
Approp. Vial Size Cap Size centre hole Material, colour	For Crimp Neck ND8 8mm with thinned penetration point PE, blue	For Crimp Neck ND8 9 x 5.9mm 4mm centre hole PE, transparent	For Crimp Neck and Snap Ring ND11 11mm with thinned penetration point PE, blue	For Crimp Neck ND11 13 x 7.5mm 4.5mm centre hole PE, transparent	For HS Neck ND20 22 x 8.4mm 4.3mm centre hole PE, transparent Only for bevelled tops	For Crimp Neck ND20 22 x 9.1mm 4.3 centre hole or 6mm centre hole PE, transparent only for flat DIN Crimp Necks!

The drawings of the caps are not actual size. They should only visualize the special features of certain types of caps.

LLG - Cap types

Screw Caps

				
Size	**8mm**	**9mm**	**10mm**	**13mm**
Approp. Vial Thread Cap Design Size centre hole Material, colour	Screw Neck Vials ND8 8-425 thread Closed or open top 5.5mm centre hole PP, black or white	Short Thread Vials ND9 short thread, Closed or open top 6mm centre hole PP, black, transparent, blue, red, yellow, green	Screw Neck Vials ND10 10-425 thread, Closed or open top 7mm centre hole PP, black	Screw Neck Vials ND12 13-425 thread, Closed or open top 8.5mm centre hole PP, black, white

				
Size	**15mm**	**18mm**	**20mm**	**24mm**
Approp. Vial Thread Cap Design Size centre hole Material, colour	Screw Neck Vials ND15 15-425 thread, Closed or open top, 9mm centre hole PP, black, white	Screw Neck Vials ND18 18-400 thread, Closed or open top 12mm centre hole PP, black	Screw Neck Vials ND20 20-400 thread, Closed or open top, PP, white	Screw Neck Vials ND24 24-400 thread, Closed or open top 12.5mm centre hole PP, white

PE-Plugs for Shell Vials

						
Size	**8mm**	**8mm**	**8mm**	**8mm**	**12mm**	**15mm**
Vial/Plug combination Plug Size Material, colour Special Features	Plug 6mm PE, transparent	Plug 8mm PE, blue	Plug 8mm PE, transparent wth insertion barrier for Micro-Inserts	Plug 8mm PE, transparent without insertion barrier for Micro-Inserts	Plug 12mm PE, transparent	Plug 15mm PE, transparent

Snap Ring Caps

	
Size	**11mm**
Approp. Vial Cap Design Size centre hole Material Colour	Snap Ring Vials ND11 open top 6mm centre hole PE transparent*, blue*, red, yellow, green

Snap Caps

			
Size	**18mm**	**22mm**	**28mm**
Approp. Vial Cap Design Size Cap Material Colour	Snap Cap Vials ND18 closed top 19.8 x 5.2mm PE transparent	Snap Cap Vials ND22 closed top 23.5 x 5.5mm PE transparent	Snap Cap Vials ND28 closed top 29.7 x 5.6mm PE transparent

- available as a hard or soft PE Caps
- Hard Cap: tighter, but not so easy to push on or to remove
- Soft Cap: convenient in handling, but not as tight

The drawings of the caps are not actual size. They should only visualize the special features of certain types of caps.

Product Information – Sample Requests – Price Enquiries?
Our Customer Service Team is always at your disposal for further questions.

LLG-Crimp Neck Micro-Vials ND8



Capacity	ml	0.20	0.30	0.80	0.60	0.60	0.70	0.70	1.20
o.d. x Height	mm	5,5 x 31,5	5,5 x 31,5	8,2 x 30	7 x 40	7 x 40	7 x 40	7 x 40	8,2 x 40
Colour		clear	clear	clear	clear	amber	clear	amber	clear
Form		conical	round bottom	flat bottom	conical	conical	flat bottom	flat bottom	flat bottom
PK		100	100	100	100	100	100	100	100
Cat. No.		**6.235 606**	**4.001 554**	**9.003 427**	**4.001 515**	**6.902 044**	**4.008 202**	**4.008 203**	**4.008 206**

1 LLG - 2in1 and 3in1 Kits with Screw Neck Vials ND8 (small opening)

NEW!

2in1 KITs contain 100 vials and 100 closures in a blue PP-Box. As both components are always required at the same time, 2in1 KITs are a convenient way to obtain and store all required items for analysis. 2in1 KITs are available for any type of 1.5ml (32 x 11.6mm), 4ml (45 x 14.75mm) or 20ml Headspace Vial (75.5 x 23mm) with an appropriate seal. All advantages of the individual components (cleanroom packaging of the vials, recloseability of the packaging, etc.) remain unchanged.

Any other combination of vial and seal as a 2in1 KIT available.



Type	Capacity ml	Description	Cover type	PK	Cat. No.
2in1 Kit	1.50	clear	Screw Cap, black, hole, Silicon white / PTFE red	100	**6.238 965**
2in1 Kit	1.50	amber	Screw Cap, black, hole, Silicon white / PTFE red	100	**9.003 557**
2in1 Kit	1.50	amber, labelling field	Screw Cap, black, hole, Silicon white / PTFE red	100	**9.003 558**
2in1 Kit	1.50	clear, labelling field	Screw Cap, black, hole, Silicon white / PTFE red	100	**9.003 559**
3in1 Kit	1.50	clear	Screw Cap, black, hole, Silicon white /PTFE blue, slitted (Septa unassembled)	100	**6.223 506**

2 LLG-Crimping Tools ND8

Description	PK	Cat. No.
Manual crimper for 8 mm aluminium caps	1	**9.003 470**
Manual decapper for 8 mm aluminium caps	1	**9.003 511**



LLG-Aluminium Crimp Caps ND8, ready assembled and plain Crimp Cap ND8

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	Aluminium, silver, center hole	PTFE virginal, white	53° shore D	0.25	100	**4.001 558**
	Aluminium, silver, center hole	Natural rubber / red-orange / TEF transparent	60° shore A	1.00	100	**9.003 443**
	Aluminium, silver, center hole	Red Rubber / PTFE beige	45° shore A	1.00	100	**4.008 200**
	Aluminium, silver, center hole	Silicone white / PTFE red	45° shore A	1.30	100	**9.003 444**
	Aluminium, silver, center hole	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	**4.008 198**
	Aluminium, silver, center hole (no liner)				100	**4.001 552**

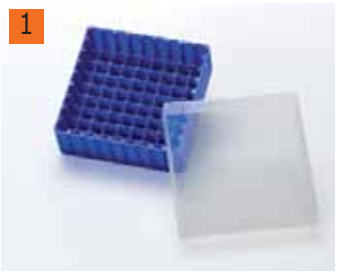
LLG-Screw Neck Vials ND8, small opening

						
Capacity	ml	1.50	1.50	1.50	1.50	1.10
o.d. x Height	mm	11.6 x 32	11.6 x 32	11.6 x 32	11.6 x 32	11.6 x 32
Colour		clear	clear, labeling field	amber	amber, labeling field	clear
Form		flat bottom	flat bottom	flat bottom	flat bottom	conical
PK		100	1000	100	1000	100
Cat. No.		**9.003 481**	**7.613 087**	**9.003 480**	**7.613 388**	**4.001 563**

LLG-Micro-Inserts for Screw Vials ND8, small opening

					
Capacity	ml	0.10	0.10	0.10	0.20
o.d. x Height	mm	5 x 31	5 x 31	5 x 29	5 x 31
Colour		clear	clear	clear	clear
Form		conical, 15mm tip	conical, 9mm tip	with plastic spring	flat bottom
PK		100	100	100	100
Cat. No.		**7.401 066**	**9.003 435**	**4.001 556**	**4.008 194**

1



1 LLG-PP Storage Boxes for 1.5ml vials ND8, ND9, ND10, ND11

PP Storage Box for 1.5ml (1.8ml, 2ml) vials or 2ml Shell Vials, with cover, (130x130x45mm).
81 cativities with alphanumeric coding of all 4 margins as well as the carities at the bottom.

Dimensions (L x W x H) mm	Colour	PK	Cat. No.
130 x 130 x 45	blue	1	**9.405 750**

LLG-PP Screw Seals ND8, ready assembled, and empty Screw Caps ND8

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	black, centre hole	Red Rubber / PTFE beige	45° shore A	1.00	100	**4.008 209**
	black, closed	Red Rubber / PTFE beige	45° shore A	1.00	100	**4.008 210**
	black, centre hole	Silicone white / PTFE red	45° shore A	1.30	100	**9.003 484**
	black, closed	Silicone white / PTFE red	45° shore A	1.30	100	**4.008 208**
	black, centre hole	Silicone white / PTFE red, slit	45° shore A	1.30	100	**6.232 178**
	black, centre hole	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	**4.008 207**
	black, centre hole	no liner	-		100	**7.060 421**
	black, closed	no liner	-		100	**7.075 960**

E & OE.

LLG Septa for Screw Caps ND8

	Septa	Hardness	Thickness mm	PK	Cat. No.
	PTFE virginal, white	53° shore D	0.25	100	**7.085 238**
	Red Rubber / PTFE beige	45° shore A	1.00	100	**4.008 197**
	Silicone white / PTFE red	45° shore A	1.30	100	**7.060 419**
	Silicone white / PTFE blue, slit	55° shore A	0.90	100	**7.085 892**

LLG-Short Thread Vials ND9, wide opening and Micro-Inserts

								
o.d. x Height	mm	11.6 x 32	11.6 x 32	11.6 x 32	11.6 x 32	6 x 31	6 x 31	5.7 x 29
Capacity	ml	1.50	1.50	1.50	1.50	0.10	0.10	0.10
Colour		clear	clear, labeling field*	amber	amber, labeling field*	clear	clear	clear
Form		flat bottom	flat bottom	flat bottom	flat bottom	conical 15mm tip	conical 12mm tip	with plastic spring
PK		100	1000	100	1000	100	100	100
Cat. No.		**9.003 448**	**6.803 174**	**4.008 247**	**6.088 871**	**7.401 744**	**4.001 547**	**6.093 247**

*With labelling field and fill line

LLG-Micro-Vials Short Thread Vials ND9, wide opening

					
Capacity	ml	1.10	0.20	0.20	0.30
o.d. x Height	mm	11.6 x 32	11.6 x 32	11.6 x 32	11.6 x 32
Colour		clear	clear	amber	transparent
Form		flat bottom, 15µl funnel in solid glas bottom	flat bottom with integrated 0.2mL insert	flat bottom with integrated 0.2mL insert	PP, with inner cone
PK		100	100	100	100
Cat. No.		**4.008 249**	**4.008 250**	**4.008 252**	**4.008 262**

1 LLG-PP Storage Boxes for 1.5ml vials ND8, ND9, ND10, ND11

PP Storage Box for 1.5ml (1.8ml, 2ml) vials or 2ml Shell Vials, with cover, (130x130x45mm).
81 cavities with alphanumeric coding of all 4 margins as well as the cavities at the bottom.

Dimensions (W x D x H) mm	Colour	PK	Cat. No.
130 x 130 x 45	orange	1	**9.405 751**

1

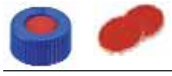


We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

SGE Analytical Science

LLG-PP Short Thread Seals ND9, ready assembled

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	transparent, centre hole	PTFE virginal, white	53° shore D	0.25	100	**4.008 220**
	blue, centre hole	PTFE virginal, white	53° shore D	0.25	100	**4.008 221**
	blue closed	PTFE virginal, white	53° shore D	0.25	100	**7.930 366**
	transparent, centre hole	Red Rubber / PTFE beige	45° shore A	1.00	100	**4.008 229**
	blue, centre hole	Red Rubber / PTFE beige	45° shore A	1.00	100	**4.008 228**
	blue closed	Red Rubber / PTFE beige	45° shore A	1.00	100	**4.008 230**
	transparent, centre hole	Silicone white / PTFE red	55° shore A	1.00	100	**7.076 778**
	blue, centre hole	Silicone white / PTFE red	55° shore A	1.00	100	**9.003 451**
	black, centre hole	Silicone white / PTFE red	55° shore A	1.00	100	**4.008 225**
	red, centre hole	Silicone white / PTFE red	55° shore A	1.00	100	**4.008 222**
	green, centre hole	Silicone white / PTFE red	55° shore A	1.00	100	**4.008 224**
	blue closed	Silicone white / PTFE red	55° shore A	1.00	100	**4.008 227**
	transparent, centre hole	Silicone white / PTFE blue, slit	55° shore A	1.00	100	**7.200 809**
	blue, centre hole	Silicone white / PTFE blue, slit	55° shore A	1.00	100	**4.001 521**
	black, center hole	Silicone white / PTFE blue, slit	55° shore A	1.00	100	**4.008 226**
	red, centre hole	Silicone white / PTFE blue, slit	55° shore A	1.00	100	**4.008 223**
	transparent, centre hole	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	**6.225 427**
	blue, centre hole	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	**4.008 218**

LLG-Septa for Thread Screw Caps ND9

	Septa	Hardness	Thickness mm	PK	Cat. No.
	PTFE virginal, white	53° shore D	0.25	100	**4.008 211**
	Red Rubber / PTFE beige	45° shore A	1.00	100	**4.008 213**
	Silicone white / PTFE red	55° shore A	1.00	100	**4.008 212**

E & OE.

LLG-PP UltraBond*Short Thread Seals ND9

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	Ultrabond* Seal blue, center hole	Red Rubber / PTFE beige	45° shore A	1.00	100	**4.008 216**
	Ultrabond* Seal blue, center hole	Silicone beige / PTFE white	45° shore A	1.30	100	**4.008 214**
	Ultrabond* Seal blue, center hole	Silicone beige / PTFE white, slit	45° shore A	1.30	100	**4.008 215**

*Cap+Liner form an inseparable unit, so that the liner cannot be pushed into the vial even with a blunt needle

1 LLG - 2in1 Kits with Short Thread Vials ND9 (wide opening)

NEW!

2in1 KITs contain 100 vials and 100 closures in a blue PP-Box. As both components are always required at the same time, 2in1 KITs are a convenient way to obtain and store all required items for analysis. 2in1 KITs are available for any type of 1.5ml (32 x 11.6mm), 4ml (45 x 14.75mm) or 20ml Headspace Vial (75.5 x 23mm) with an appropriate seal. All advantages of the individual components (cleanroom packaging of the vials, recloseability of the packaging, etc.) remain unchanged.

Any other combination of vial and seal as a 2in1 KIT available.



Description	Cover type	PK	Cat. No.
clear	Short Thread Cap, blue, hole, Silicon white / PTFE red	100	**9.003 560**
clear	Short Thread Cap, blue, hole, Silicon white / PFE blue, slitted	100	**7.621 765**
clear	Short Thread Cap, transparent, hole, Silicon white / PTFE red	100	**9.003 561**
clear, labelling field	Short Thread Cap, blue, hole, Silicon white / PFE blue, slitted	100	**9.003 562**
amber, labelling field	UltraBond Short Thread Cap, blue, hole, Silicon beige / PTFE white, slitted	100	**9.003 563**

LLG-Screw Neck Vials ND10, wide opening and Micro-Inserts

							
Capacity	ml	1.50	1.50	1.50	0.10	0.10	0.20
o.d. x Height	mm	11,6 x 32	11,6 x 32	11,6 x 32	6 x 31	5,7 x 29	6 x 31
Colour		clear	clear, labeling field	amber, labeling field	clear	clear	clear
Form		flat bottom	flat bottom	flat bottom	conical, 15mm tip	with plastic spring	flat bottom
PK		100	1000	1000	100	100	100
Cat. No.		**6.242 103**	**7.615 715**	**6.238 867**	**7.401 744**	**6.093 247**	**4.008 196**

2 LLG-PP Storage Boxes for 1.5ml vials ND8, ND9, ND10, ND11

PP Storage Box for 1.5ml (1.8ml, 2ml) vials or 2ml Shell Vials, with cover, (130x130x45mm).
81 cativities with alphanumeric coding of all 4 margins as well as the carities at the bottom.

Dimensions (L x W x H) mm	Colour	PK	Cat. No.
130 x 130 x 45	yellow	1	**9.405 753**



LLG-PP Screw Seals ND10 and empty Screw Caps ND10

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	black, center hole	Red Rubber / PTFE beige	45° shore A	1.00	100	**6.242 104**
	black, center hole	Silicone white / PTFE beige	45° shore A	1.50	100	**4.008 234**
	black, center hole	Silicone white / PTFE red	45° shore A	1.30	100	**4.008 235**
	black, center hole	Silicone white / PTFE blue, slit	55° shore A	1.50	100	**4.008 237**
	black, center hole	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	**4.008 236**
	black, center hole (no liner)				100	**4.008 231**

LLG Crimp Neck Vials ND11, small and wide opening (flat bottom)

						
Capacity	ml	1.50	1.50	1.50	1.50	1.50
o.d. x Height	mm	11.6 x 32	11.6 x 32	11.6 x 32	11.6 x 32	11.6 x 32
Colour		clear	amber	clear	clear, labeling field*	amber, labeling field*
Form		small opening	small opening	wide opening	wide opening	wide opening
PK		100	100	100	1000	1000
Cat. No.		**7.085 511**	**7.089 998**	**7.086 520**	**7.608 160**	**7.620 828**

*With labelling field and fill line

LLG-Micro Inserts for Crimp Neck Vials ND11

									
Capacity	ml	0.10	0.10	0.10	0.20	0.10	0.10	0.10	0.20
o.d. x Height	mm	5 x 31	5 x 31	5 x 29	5 x 31	6 x 31	6 x 31	5,7 x 29	6 x 31
Colour		clear	clear	clear	clear	clear	clear	clear	clear
Form		for small opening, conical, 15mm tip	for small opening, conical, 9mm tip	for small opening, with plastic spring	for small opening, flat bottom	for wide opening, conical, 15mm tip	for wide opening, conical, 12mm tip	for wide opening, with plastic spring	for wide opening, flat bottom
PK		100	100	100	100	100	100	100	100
Cat. No.		**7.401 066**	**9.003 435**	**4.001 556**	**4.008 194**	**7.401 744**	**4.001 547**	**6.093 247**	**4.008 196**

LLG-Micro Crimp Neck Vials ND11

							
Capacity	ml	1.10	1.10	1.10	1.10	0.20	0.20
o.d. x Height	mm	11,6 x 32	11,6 x 32	11,6 x 32	11,6 x 32	11,6 x 32	11,6 x 32
Colour		clear	clear	clear	amber	clear	amber
Form		flat bottom, 15 µl funnel in solid glass bottom	conical	conical with a round pedestal glass plate	conical with a round pedestal glass plate	flat bottom, with integrated 0.2 mL insert	flat bottom, with integrated 0.2 mL insert
PK		100	100	100	100	100	100
Cat. No.		**4.001 565**	**4.001 516**	**4.008 253**	**4.008 254**	**6.233 918**	**4.008 251**

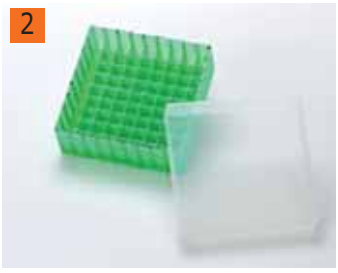
1 LLG Crimping tools ND11



Description	PK	Cat. No.
Manual crimper, height adjustable, for 11 mm aluminium crimp caps	1	**9.003 471**
Manual decapper for 11 mm aluminium crimp caps	1	**9.003 367**
Pneumatic crimping tool for 11 mm aluminium crimp caps (complete with **hand switch**)	1	**7.095 791**
Crimping head *without* pneumatic basic tool for 11 mm aluminium crimp caps	1	**4.003 923**
Decapping head *without* pneumatic basic tool for 11 mm aluminium crimp caps	1	**4.003 929**
Pneumatic basic intrument, pressure regulator, flexible polyurethane tubing, 11mm criper, 11mm decapper	1	**9.003 539**

2 LLG-PP Storage Box for 1.5ml Sample Vials ND8, ND9, ND10, ND11

81 cativities with alphanumeric coding of all 4 margins as well as the carities at the bottom.



Dimensions (L x W x H) mm	Colour	PK	Cat. No.
130 x 130 x 45	green	1	**9.405 754**



LLG-Aluminium Crimp Seals ND11, ready assembled and empty Crimp Caps ND11

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	aluminium, silver, centre hole	PTFE virginal, white	53° shore D	0.25	100	**4.001 559**
	aluminium, silver, centre hole	Natural rubber red-orange / TEF transparent	60° shore A	1.30	100	**9.003 441**
	aluminium, silver, centre hole	Natural rubber red-orange / TEF transparent (corresponds to Agilent quality)	60° shore A	1.00	100	**4.008 239**
	aluminium, silver, centre hole	Red Rubber / PTFE beige	45° shore A	1.00	100	**4.008 243**
	aluminium, silver, centre hole	Natural rubber / Butyl red-orange / TEF transparent	45° shore A	1.00	100	**7.060 469**
	aluminium, green, centre hole	Natural rubber / Butyl red-orange / TEF transparent	45° shore A	1.00	100	**4.001 522**
	aluminium, red, centre hole	Natural rubber / Butyl red-orange / TEF transparent	45° shore A	1.00	100	**7.300 348**
	aluminium, blue, centre hole	Natural rubber / Butyl red-orange / TEF transparent	45° shore A	1.00	100	**6.900 233**
	aluminium, gold, centre hole	Natural rubber / Butyl red-orange / TEF transparent	45° shore A	1.00	100	**9.003 459**
	aluminium, silver, centre hole	Silicone white / PTFE red	45° shore A	1.30	100	**9.003 446**
	aluminium, silver, centre hole	Silicone white / PTFE blue, cross-slit	55° shore A	1.50	100	**4.001 555**
	aluminium, silver, centre hole	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	**7.050 759**
	**magnetic**, gold, centre hole	Silicone white / PTFE red	45° shore A	1.30	100	**4.001 564**
	aluminium, silver, centre hole (no liner)				100	**7.510 176**

LLG-Septa for Crimp Caps ND11

	Septa	Hardness	Thickness mm	PK	Cat. No.
	PTFE virginal, white	53° shore D	0.25	100	**4.001 535**
	Red Rubber / PTFE beige	45° shore A	1.00	100	**4.008 238**
	Silicone white / PTFE red	45° shore A	1.30	100	**7.054 037**
	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	**6.801 244**

E & OE.

LLG-Snap Ring Vials ND11, wide opening and Micro-Inserts

								
Capacity	ml	1.50	1.50	1.50	0.20	0.10	0.10	0.10
o.d. x Height	mm	11,6 x 32	11,6 x 32	11,6 x 32	11,6 x 32	6 x 31	5,7 x 29	6 x 31
Colour		clear	clear, labeling field	amber, labeling field	clear	clear	clear	clear
Form		flat bottom	flat bottom	flat bottom	flat bottom, integrated 0.2mL insert	conical, 15mm tip	with plastic spring	flat bottom
PK		100	1000	1000	100	100	100	100
Cat. No.		**6.073 833**	**7.622 228**	**7.613 330**	**4.008 255**	**7.401 744**	**6.093 247**	**4.008 196**

LLG-PE Snap Ring Seals ND11,ready assembled

		Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
		transparent, centre hole	Red Rubber / PTFE beige	45° shore A	1.00	100	**4.008 261**
		blue, centre hole	Red Rubber / PTFE beige	45° shore A	1.00	100	**4.008 257**
		transparent, centre hole	Silicone white / PTFE red	45° shore A	1.30	100	**4.001 544**
		blue, centre hole	Silicone white / PTFE red	45° shore A	1.30	100	**4.008 258**
		transparent, centre hole	Silicone white / PTFE blue, cross-slit	55° shore A	1.00	100	**4.008 256**
		snap ring cap, blue, centre hole	Silicone white / PTFE blue, cross-slit	55° shore A	1.00	100	**6.242 212**
		transparent, centre hole	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	**6.073 555**
		blue, centre hole	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	**4.008 259**

1 LLG - 2in1 Kits with Crimp Neck Vials ND11 (wide opening)

NEW!

2in1 KITs contain 100 vials and 100 closures in a blue PP-Box. As both components are always required at the same time, 2in1 KITs are a convenient way to obtain and store all required items for analysis. 2in1 KITs are available for any type of 1.5ml (32 x 11.6mm), 4ml (45 x 14.75mm) or 20ml Headspace Vial (75.5 x 23mm) with an appropriate seal. All advantages of the individual components (cleanroom packaging of the vials, recloseability of the packaging, etc.) remain unchanged.

Any other combination of vial and seal as a 2in1 KIT available.



Description	Cover type	PK	Cat. No.
clear	Crimp Cap, silver, hole, Natural Rubber red-orange / TEF transparent	100	**6.257 139**
clear	Crimp Cap, silver, hole, Natural Rubber / Butyl red-orange / TEF transparent	100	**9.003 564**
clear, labelling field	Crimp Cap, silver, hole, Natural Rubber / Butyl red-orange / TEF transparent	100	**9.003 565**
amber, labelling field	Crimp Cap, silver, hole, Naturual Rubber red-orange / TEF transparent	100	**9.003 566**
clear	Crimp Cap, silver, hole, Silicon white / PTFE red	100	**6.238 979**

LLG Crimp neck vials ND13

			
Capacity	ml	2.00	4.00
o.d. x Height	mm	32 x 16	45 x 14,7
Colour		clear	clear
Form		flat bottom	flat bottom
PK		1000	1000
Cat. No.		**6.228 969**	**9.003 535**



1 LLG-Crimping Tools ND13

Description	PK	Cat. No.
Manual crimper, height adjustable, for 13 mm aluminium crimp caps	1	**9.003 473**
Manual crimper, height adjustable, for 13 mm flip top/flip off caps	1	**4.008 266**
Manual decapper for 13 mm aluminium crimp caps	1	**9.003 368**

LLG-Aluminium Crimp Seals ND13, ready assembled and empty Crimp Caps ND13

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	aluminium crimp cap, silver, centre hole	Pharma-Fix-Septa (Butyl/PTFE)	50° shore A	2.00	100	**7.060 475**
	aluminium centre tear off cap, silver	Butyl dark grey / Pharma-Fix-Septa (Butyl/PTFE)	50° shore A	2.00	100	**9.003 442**
		Butyl dark grey / Pharma-Fix-Septa (Butyl/PTFE)	50° shore A	2.00	1000	**9.003 548**
	aluminium crimp cap, silver, centre hole (no liner)	-			100	**6.801 727**

LLG-Screw Neck Vials and appropriate Micro-Insert

					
Capacity	ml	4.00	4.00	4.00	0.30
o.d. x Height	mm	14,7 x 45	14,7 x 45	14,7 x 45	6 x 40
Colour		clear	amber	amber, with labeling	clear
Form		flat bottom	flat bottom	flat bottom	conical, metal sprint necessary
PK		100	100	1000	100
Cat. No.		**9.003 482**	**7.058 142**	**9.003 549**	**7.055 486**

E & OE.

1 LLG-PP Storage Box for 4ml Sample Vials ND13



PP Storage Box for 4ml vials or 4ml Shell Vials, with cover, (130x130x45mm).
49 cativities with alphanumeric coding at the cavities

Dimensions (L x W x H) mm	Colour	PK	Cat. No.
130 x 130 x 52	red	1	**9.405 756**

LLG-PP Screw Seals ND13, ready assembled and empty Screw Caps ND13

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	black, centre hole	Red Rubber / PTFE beige	45° shore A	1.00	100	**6.242 468**
	black, closed top	Red Rubber / PTFE beige	45° shore A	1.00	100	**4.008 267**
	black, centre hole	Silicone creme / PTFE red	55° shore A	1.50	100	**7.510 053**
	black, closed top	Silicone creme / PTFE red	55° shore A	1.50	100	**6.242 267**
	black, centre hole				100	**7.071 151**
	black, closed top				100	**7.060 437**

LLG-Septa for Screw Caps ND13

	Septa	Hardness	Thickness mm	PK	Cat. No.
	PTFE virginal, white	53° shore D	0.25	100	**7.058 143**
	Red Rubber / PTFE beige	45° shore A	1.00	100	**4.008 264**
	Silicone creme / PTFE red	55° shore A	1.50	100	**4.008 263**

LLG-Screw Neck Vials for Storage Purposes ND13, ND 15, ND 18

					
Capacity	ml	4.00	8.00	12.00	16.00
o.d. x Height	mm	45 x 14,7	61 x 16,6	66 x 18,5	71 x 20,6
Colour		clear	clear	clear	clear
Form		ND13, flat bottom	ND15, flat bottom	ND15, flat bottom	ND18, flat bottom
PK		1000	1000	1000	1000
Cat. No.		**7.613 421**	**7.616 898**	**7.616 655**	**6.239 037**

LLG-Screw Seals for Screw Neck Vials ND13, ND 15, ND 18

		Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
		13mm cap, black, closed top	Butyl red / PTFE grey	55° shore A	1.30	1000	**6.240 135**
		15mm cap, black, closed top	Butyl red / PTFE grey	55° shore A	1.60	1000	**7.616 653**
		18mm cap, black, closed top	Butyl red / PTFE grey	55° shore A	1.60	1000	**7.910 125**

LLG-Replacement Septa for Screw Caps ND13, ND15, ND18

	Description	Hardness	Thickness mm	PK	Cat. No.
	13mm, Butyl red / PTFE grey	55° shore A	1.30	1000	**9.003 536**
	15mm, Butyl red / PTFE grey	55° shore A	1.60	1000	**9.003 537**
	18mm, Butyl red / PTFE grey	55° shore A	1.60	1000	**9.003 538**

LLG-Shell Vials (fire-polished neck) ND8 and ND12

								
Capacity	ml	1.00	1.00	1.00	2.00	2.00	4.00	4.00
o.d. x Height	mm	7,8 x 35	8,2 x 40	8,2 x 40	11,6 x 31,5	11,6 x 31,5	44,60 x 14,65	44,60 x 14,65
Colour		clear	clear	amber	clear	clear	clear	clear
Form		ND8, flat bottom	ND8, flat bottom	ND8, flat bottom	ND12, flat bottom	ND8, flat bottom	ND8, flat bottom	ND8, flat bottom
PK		1000	100	100	100	1000	1000	1000
Cat. No.		**7.612 017**	**7.300 174**	**4.008 205**	**4.008 248**	**6.226 501**	**7.632 226**	**6.227 544**

LLG Plugs, PE

	For	PK	Cat. No.
	ND8	100	**7.300 175**
	ND12	100	**4.008 265**
	ND15	1000	**9.003 540**

LLG-Snap Cap Vials ND18 and ND22

					
Capacity	ml	5.00	10.00	15.00	25.00
o.d. x Height	mm	20 x 40	22 x 50	26 x 48	26 x 65
Colour		clear	clear	clear	clear
Form		ND18, flat bottom	ND18, flat bottom	ND22, flat bottom	ND22, flat bottom
PK		100	100	100	100
Cat. No.		**7.051 404**	**6.803 717**	**4.008 282**	**7.090 616**

E & OE.

LLG-Snap Caps, PE, ND18 and ND22

	For	PK	Cat. No.
	ND18	100	**6.051 403**
	ND22	100	**7.090 617**

LLG-Headspace-Precision Thread Vials ND18

					
Capacity	ml	10.00	10.00	20.00	20.00
o.d. x Height	mm	22,5 x 46	22,5 x 46	22,5 x 75,5	22,5 x 75,5
Colour		clear	amber	clear	amber
Form		rounded bottom	rounded bottom	rounded bottom	rounded bottom
PK		100	1000	100	1000
Cat. No.		**9.003 466**	**6.227 874**	**4.008 270**	**6.237 909**

LLG-Magnetic Universal Screw Seals ND18 for Precision Thread Vials ND18

		Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
		silver, center hole	Silicone blue transparent/ PTFE white	45° shore A	1.30	100	**6.241 111**
		silver, center hole	Silicone white / PTFE blue	55° shore A	1.50	100	**4.008 268**
		silver, center hole	Butyl red / PTFE grey	55° shore A	1.60	100	**4.008 269**

LLG-Headspace-Vials ND20 (5ml and 10ml)

									
Capacity	ml	5.00	5.00	6.00	5.00	10.00	10.00	10.00	10.00
o.d. x Height	mm	20 x 38	20 x 38	22 x 38,20	21,7 x 38,20	20,0 x 54,5	20,0 x 54,5	22,5 x 46	22,5 x 46
Colour		clear	amber	clear	clear	clear	amber	clear	clear
Form		flat bottom flat DIN crimp neck	flat bottom flat DIN crimp neck	rounded bottom bevelled HS crimp neck	flat bottom bevelled HS crimp neck	flat bottom flat DIN crimp neck	flat bottom flat DIN crimp neck	flat bottom flat DIN crimp neck	rounded bottom bevelled HS crimp neck
For		Varian	Varian	PerkinElmer	Metrohm	Varian	Varian	DANI, Agilent	CTC, Varian
PK		100	100	100	100	100	100	100	100
Cat. No.		**9.003 425**	**7.060 457**	**7.052 186**	**4.008 285**	**9.003 426**	**7.080 947**	**7.050 285**	**7.850 009**

1 LLG Crimping tools ND20



Description	PK	Cat. No.
Manual crimper, height adjustable, for 20mm aluminium crimp caps	1	**9.003 475**
Manual crimper, height adjustable, for 20mm flip top/flip off caps	1	**4.008 278**
Manual decapper for 20mm aluminium crimp caps	1	**9.003 369**
Capping head *without* pneumatic crimping tool, for 20mm aluminium crimp caps	1	**9.003 546**
Decapping head *without* pneumatic basic tool for 20mm aluminium crimp caps	1	**4.003 927**
Pneumatic crimping tool for 20mm aluminium crimp caps (complete with **foot switch**)	1	**9.003 547**

LLG-Headspace-Vials ND20 (20ml and 50 ml)

								
Capacity	ml	20.00	20.00	20.00	20.00	20.00	20.00	50.00
o.d. x Height	mm	23.25 x 75.5	23.25 x 75.5	23 x 75.5	23 x 75.5	22.5 x 75.5	22.5 x 75.5	31 x 101
Colour		clear	amber	clear	clear, with label	clear	clear	clear
Form		flat bottom flat DIN crimp neck	flat bottom flat DIN crimp neck	rounded bottom bevelled HS crimp neck	rounded bottom bevelled HS crimp neck	flat bottom flat DIN crimp neck	rounded bottom flat DIN crimp neck	flat bottom flat DIN crimp neck
For				PerkinElmer	PerkinElmer	DANI, Agilent	CTC, Varian	
PK		100	100	100	100	100	100	100
Cat. No.		**7.401 840**	**7.080 450**	**7.060 463**	**4.008 281**	**9.003 452**	**9.003 453**	**7.060 459**

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LLG-PP Storage Boxes for 5ml, 10ml and 20ml Sample Vials

PP Storage Box for 5ml, 10ml and 20ml Headspace-Vials, with cover, 25 cavities.

Dimensions (L x W x H) mm	Colour	PK	Cat. No.
130 x 130 x 102	blue	1	**4.001 528**

LLG-Crimp Seals ND20, Aluminium, ready assembled

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	silver, center hole	Butyl red / PTFE grey	50° shore A	3.00	100	**9.003 454**
	silver, center hole	Butyl grey / PTFE grey	50° shore A	3.00	100	**4.001 549**
	silver, center hole	Pharma-Fix-Septa Butyl/PTFE	50° shore A	3.00	100	**9.003 430**
	gold, center hole	Pharma-Fix-Septa Butyl/PTFE	50° shore A	3.00	100	**4.008 275**
	silver, center hole	Silicone blue / PTFE colourless	45° shore A	3.00	100	**9.003 434**
	silver, center hole	Silicone white / PTFE beige	45° shore A	3.20	100	**9.003 460**
	silver, center hole	Butyl stopper, grey only unassembled	37° shore A		100	**7.060 477**

LLG-Headspace Seals ND20 (Pressure Release Caps), Aluminium, ready assembled

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	silver, centre hole	Butyl red / PTFE grey	50° shore A	3.00	100	**9.003 455**
	silver, centre hole	Butyl grey / PTFE grey	50° shore A	3.00	100	**4.001 557**
	silver, centre hole	Pharma-Fix-Septa Butyl/PTFE	50° shore A	3.00	100	**4.008 276**
	silver, centre hole	Silicone blue transp. / PTFE transparent	45° shore A	3.00	100	**7.050 286**
	silver, centre hole	Silicone white / PTFE beige	45° shore A	3.20	100	**9.003 456**
	silver, centre hole (no liner)				100	**4.008 271**

LLG-Crimp Seals ND20 (Center Tead Off Caps), Aluminium, ready assembled

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	gold	Pharma-Fix-Septa Butyl/PTFE	50° shore A	3.00	100	**9.003 445**
	silver	Butyl stopper, grey only unassembled	37° shore A		100	**7.087 863**

LLG-Crimp Seals ND20 (Complete Tear Off Caps), Aluminium, ready assembled

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	silver	Pharma-Fix-Septa Butyl/PTFE	50° shore A	3.00	100	**7.060 471**
	silver	Butyl stopper, grey only unassembled	37° shore A		100	**7.060 479**
	silver (no liner)				100	**7.056 751**

LLG-Bimetal Crimp Seals ND20, ready assembled

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	red/silver, centre hole	Butyl grey / PTFE grey	50° shore A	3.00	100	**9.003 457**
	red/silver, centre hole	Silicone blue transp. / PTFE transparent	45° shore A	3.00	100	**6.234 541**
	red/silver, centre hole	Silicone white / PTFE beige	45° shore A	3.20	100	**9.003 458**
	red/silver, centre hole (no liner)				100	**4.008 272**

LLG-Magnetic Crimp Seals ND20, ready assembled

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	gold, center hole 8 mm	Butyl red / PTFE grey	50° shore A	3.00	100	**4.001 548**
	gold, center hole 8 mm	Butyl grey / PTFE grey	50° shore A	3.00	100	**6.229 635**
	gold, center hole 8 mm	Pharma-Fix-Septa Butyl/PTFE	50° shore A	3.00	100	**6.902 419**
	gold, center hole 8 mm	Silicone blue transp./ PTFE transparent	45° shore A	3.00	100	**7.850 010**
	gold, center hole 8 mm (no liner)				100	**7.625 012**

LLG-Septa for Crimp Caps ND20

	Septa	Hardness	Thickness mm	PK	Cat. No.
	Butyl red / PTFE grey	50° shore A	3.00	100	**7.060 427**
	Butyl grey / PTFE grey	50° shore A	3.00	100	**4.008 273**
	Pharma-Fix-Septa Butyl/PTFE	50° shore A	3.00	100	**7.071 063**
	Silicone blue transp./ PTFE transparent	45° shore A	3.00	100	**4.008 274**
	Silicone white / PTFE beige	45° shore A	3.20	100	**7.050 202**
	Silicone white / Aluminium foil silver	50° shore A	3.00	100	**4.001 550**

LLG-PE Caps ND20, transparent and appropriate Septa ND19

		Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
		PE cap, transparent 22.00 x 8.40mm 4.3mm hole	Natural rubber red-orange/ TEF transparent	60° shore A	1.30	1000	**9.003 543**
		PE cap, transparent 22.00 x 8.40mm 4.3mm hole	Butyl red / PTFE grey	55° shore A	1.30	1000	**9.003 544**
		PE cap, transparent 22.00 x 9.10mm 4.3mm hole	Natural rubber red-orange/ TEF transparent	60° shore A	1.30	1000	**6.234 902**
		PE cap, transparent 22.00 x 9.10mm 4.3mm hole	Butyl red / PTFE grey	55° shore A	1.30	1000	**9.003 545**
		height 8.4mm, for bevelled top crimp neck ND20, centre hole 4.3mm (no liner)				100	**6.227 768**
		height 9.1mm, for flat DIN crimp neck ND20, centre hole 4.3mm (no liner)				100	**7.052 184**
			Butyl red / PTFE grey	55° shore A	1.30	100	**7.060 425**
			Natural rubber red-orange/ TEF transparent	45° shore A	1.30	100	**7.051 039**

LLG Stoppers ND20

	Description	PK	Cat. No.
	butyl grey	100	**7.060 433**
	bromine butyl red	100	**6.900 963**

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1 LLG-Crimp Neck Vial ND20 and Crimp Seal ND20

100 mL crimp neck vial, 51.6 x 94.5mm, clear, flat bottom, flat DIN crimp neck

Description	Caps	PK	Cat. No.
Vials only		60	**7.060 465**
Caps only	ND20 aluminium safety cap; silver, closed/centrical Pharma-Fix-Septa Butyl/PTFE	100	**4.001 551**

E & OE.

LLG-Screw Neck Vials ND24 (EPA Vials)

					
Capacity	ml	20.00	20.00	40.00	40.00
o.d. x Height	mm	27.5 x 57	27.5 x 57	27.5 x 95	27.5 x 95
Colour		clear	amber	clear	amber
Form		flat bottom	flat bottom	flat bottom	flat bottom
PK		100	100	100	100
Cat. No.		**4.008 204**	**4.008 298**	**4.008 297**	**4.008 299**

LLG-PP Screw Seals ND24 (UltraBond Seals and ready assembled Seals ND24), PP Screw Caps ND24 (empty) and Septa ND22

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	Ultrabond*, white, center hole	Silicone white / PTFE beige	45° shore A	3.20	100	**4.008 293**
	Ultrabond*, white, closed top	Silicone white / PTFE beige	45° shore A	3.20	100	**4.008 292**
	Ultrabond*, white, center hole	Red Rubber / PTFE beige	45° shore A	2.50	100	**4.008 294**
	white, perforated	Butyl red / PTFE gray (mounted)	55° shore A	2.50	1000	**7.633 064**
	white, closed	Butyl red / PTFE gray (mounted)	55° shore A	2.50	1000	**7.615 156**
	white, closed	Silicone white / PTFE beige (mounted)	45° shore A	3.20	1000	**6.233 339**
	white, perforated	Silicone white / PTFE beige (mounted)	45° shore A	3.20	1000	**9.003 541**
	white, center hole	no liner			100	**4.008 295**
	white, closed top	no liner			100	**4.008 296**
		Silicone white / PTFE beige	45° shore A	3.20	100	**4.008 291**
		Butyl red / PTFE gray	55° shore A	2.50	1000	**9.003 542**

*Cap+Liner form an inseparable unit, so that the liner cannot be pushed into the vial even with a blunt needle





1 Standard 5 mm NMR tubes, borosilicate glass 3.3

NEW!

Hilgenberg

The NMR tubes have precise tolerances for consistent high accuracy. Most suitable for autosampling NMR systems and high-throughput NMR.
- Borosilicate glass 3.3
- Economy quality
- One end closed, rim fire polished
- Applicable until 600 MHz

Outer diam. mm	Int. diam. mm	Wall thickness mm	Length mm	PK	Cat. No.
4,95 +/- 0,05	4,19 +/- 0,05	0.38	178	100	**9.400 310**
4,95 +/- 0,05	4,19 +/- 0,05	0.38	203	100	**9.400 311**



2 Standard closing caps for 5mm NMR tubes

NEW!

Hilgenberg

Description	Colour	PK	Cat. No.
NMR closing caps for 5mm tubes	red	100	**9.400 312**
NMR closing caps for 5mm tubes	green	100	**9.400 313**
NMR closing caps for 5mm tubes	yellow	100	**9.400 314**
NMR closing caps for 5mm tubes	orange	100	**9.400 315**
NMR closing caps for 5mm tubes	blue	100	**9.400 316**



3 DURAN® NMR tubes, three accuracy classes

NEW!

DURAN Group

NMR tubes are available, according to requirement, in three accuracy classes. The correct tube can be selected depending on magnetic field and spin. The tubes are noteworthy for their close tolerances and accuracy, especially to their straightness, wall thickness and wall thickness distribution. Consequently, quick and accurate test results are achievable.

Type Economic:
The disposable for economical use in fully automatic sample dispensers or where high throughputs are involved.
- Applicable until 300 MHz

Type Professional:
For professional use in industry and research in the medium and high resolution area of NMR spectroscopy.
- Applicable until 400 MHz

Type Scientific:
For scientific use with high value samples and optimum substance exploitation in the highest resolution range of NMR spectroscopy.
- Applicable until 500 MHz

Please order closing caps separately.

Type	Outer diam. mm	Int. diam. mm	Length mm	PK	Cat. No.
Economic	4,95 +/- 0,05	4,20 +/- 0,05	178	1	**7.083 596**
Professional	4,97 +/- 0,025	4,20 +/- 0,025	178	1	**7.083 595**
Scientific	4,97 +/- 0,013	4,20 +/- 0,025	178	1	**7.084 720**



4 NMR Tube Rack, polypropylene

NEW!

Scherf

Polypropylene rack with carrying handles features an upper deck with holes and a lower deck support for tube ends. For 72 tubes with 3 or 5 mm diameter. Dimensions: 213x115x222 mm (LxWxH)

Type	PK	Cat. No.
NMR Tube Rack	1	**9.301 065**

E & OE.

1 Syringe Terminations

Syringe terminations are offered in a number of different configurations designed to accommodate a broad range of applications. From cemented to removable needles, and luer taper /PTFE luer-lock to special syringe fittings, syringe barrel terminations serve a key function at the interface of a syringe and its mating connection. *Hamilton*

N, NR (Cemented Needle, Rheodyne)
Needles are cemented into the glass syringe barrel at a point corresponding to the zero graduation mark. NR stands for syringes with Rheodyne specified needles.

LTN (Luer Tip Cemented Needle)
Needles are cemented into the conical glass luer tip of the barrel at a point corresponding to the zero graduation mark.

SN (Special Needle)
Hamilton offers customized syringes with special needles. State the following details: needle length, gauge, point style, and whether electro-tapered. Example of a correct specification: 701 SN, 70mm, gauge 25, point style 3, not electrotapered. Without these details the corresponding standard syringe 701 N will be supplied.

RN (Removable Needle)
Removable needles seat precisely to the zero graduation mark of the syringe. Allows the use of different specification needles on the same syringe barrel.

LT (Luer Tip)
Ground glass syringe barrel with a male luer taper accepts most hypodermic needles. Use Kel-F hub needles and connectors for a tight seal.

KH (Knurled Hub)
Removable needle, knurled hub is used on 7000 Series syringes, exclusively. The attachment of a spacer enables repeatable depth injections.

C (ChemSeal)
1/4"-28 UNF, male fitting. Used in low volume applications where system dead volumes need to be minimized.

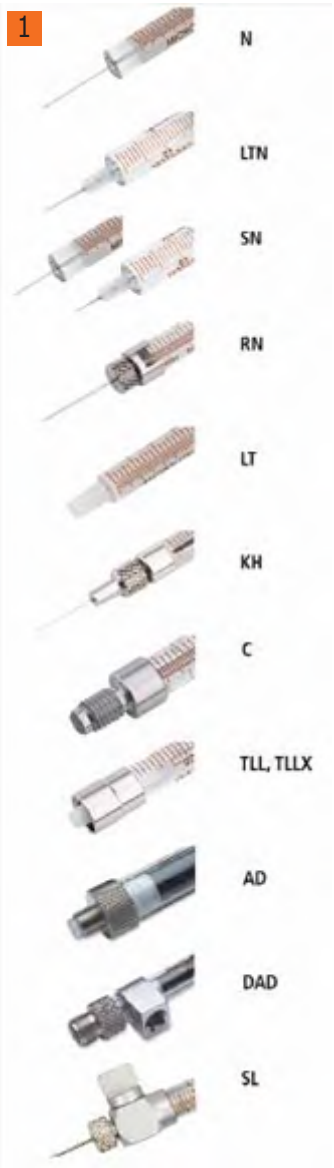
TLL, TLLX (PTFE Luer-Lock)
Male luer taper with nickel-plated brass hub accepts, and locks in place, luer hub needles and connectors. The X-style plunger stop incorporates a 6-32 UNC female thread on the end of the stop to allow attachment to drive arm mechanisms, such as on the Microlab 500 Series diluters/dispensers.

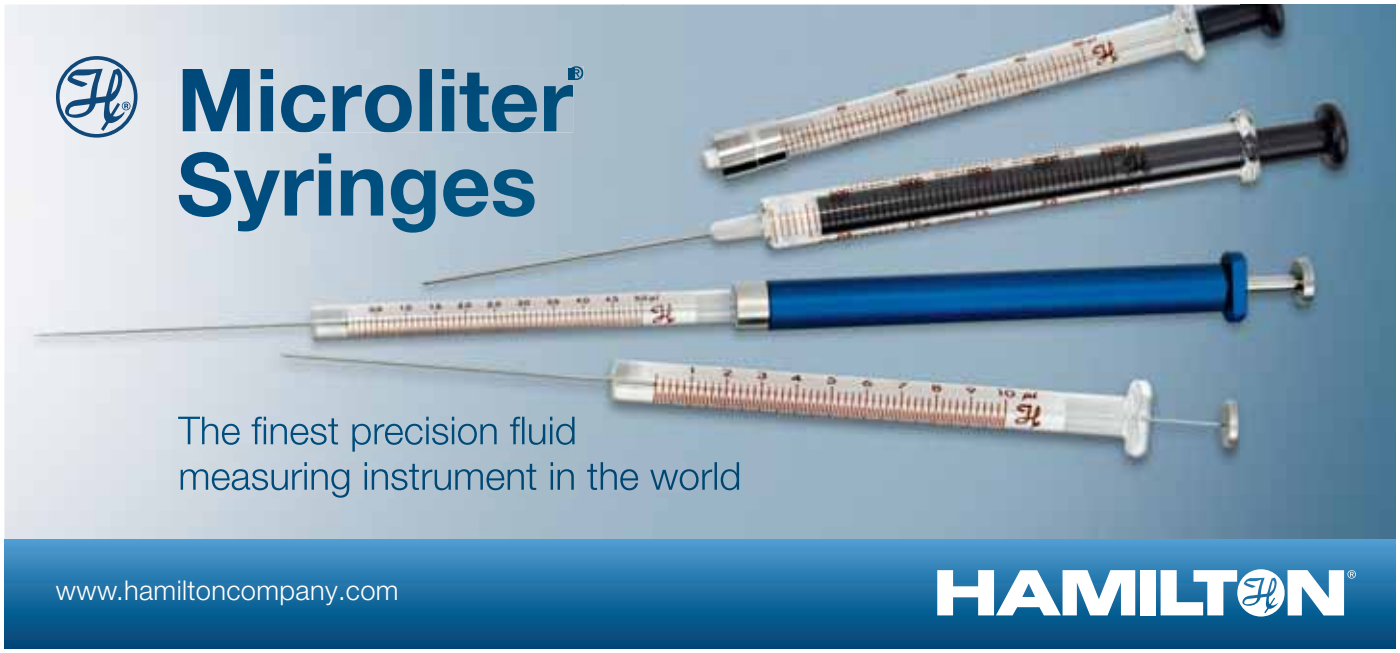
AD (AccuDil®)
M8 x 0.75, male fitting. Used with Microlab 1000 PLUS diluter/dispenser.

DAD (Diluter AccuDil®)
M8 x 0.75 male fitting with M6 x 1 side port. Used with Microlab 1000 Plus diluter/dispenser.

SL (SampleLock)
On/Off syringe valve with RN needle is cemented to a syringe barrel. Used for headspace, environmental sample collection and storage, pre-pressurization of gaseous samples for GC analysis, and sample spiking.

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1 Microlitre syringes, Needle Types

Hamilton

Point Style 2 (pst2): 12° bevelled non-coring needle point recommended for septum penetration. Ideal for gas chromatographic applications.

Point Style 3 (pst3): Blunt needle point (90°) for use with HPLC injection valves. Also recommended for applications where exact dosing is required (e.g. thin layer chromatographs).

Point Style 4 (pst4): 10-12° bevelled needle point recommended for life science applications; sharp point for animal injection.

Point Style 5 (pst5): Conical needle with side port for penetration of septa, thin-gauged vinyls and plastics without coring; minimizes septum damage

Point Style AS (pstAS): Special conical style needle point (8° taper) designed to withstand the demands of multiple injections; exclusively used on GC autosampler syringes

2



2 Microlitre syringes, 700 series, with fixed needle

Hamilton

With fixed needle (N, NR). NR stands for syringes with Rheodyne specified needles. Plungers are individually fitted, therefore cannot be interchanged and are not available as replacement parts. Needles are electro-tapered.

Needle length 51mm

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
75 N	5	26s	2 (GC)	1	**9.221 001**
701 N	10	26s	2 (GC)	1	**9.221 002**
701 N	10	26s	2 (GC)	6	**9.221 010**
702 N	25	22s	2 (GC)	1	**9.221 003**
705 N	50	22s	2 (GC)	1	**9.221 004**
710 N	100	22s	2 (GC)	1	**9.221 005**
725 N	250	22s	2 (GC)	1	**9.221 006**
750 N	500	22s	2 (GC)	1	**9.221 007**
75 N	5	26s	3 (HPLC)	1	**9.221 011**
701 N	10	26s	3 (HPLC)	1	**9.221 012**
702 NR	25	22s	3 (HPLC)	1	**9.221 013**
705 NR	50	22s	3 (HPLC)	1	**9.221 014**
710 NR	100	22s	3 (HPLC)	1	**9.221 015**
725 NR	250	22s	3 (HPLC)	1	**9.221 016**
750 N	500	22s	3 (HPLC)	1	**6.055 335**

3



9.221 081

Microlitre syringes, 700 series, for removable needles

Hamilton

- 5µl - 500µl
- For use with liquids
- Removable needles (RN9, or luer tip (LT)
- Plungers and Syringe barrels are not interchangeable or replaceable
- Tight tolerances between the plunger and the barrel

Needle length 51mm
Point style 2 (GC)

4



9.221 021

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
75 RN	5	26s	2 (GC)	1	**9.221 080**
701 RN	10	26s	2 (GC)	1	**9.221 081** 3
701 RN	10	26s	2 (GC)	6	**6.059 899**
702 RN	25	22s	2 (GC)	1	**9.221 082**
705 RN	50	22s	2 (GC)	1	**9.221 083**
710 RN	100	22s	2 (GC)	1	**9.221 084**
725 RN	250	22s	2 (GC)	1	**9.221 085**
750 RN	500	22s	2 (GC)	1	**9.221 086**
701 LT*	10	26s		1	**9.221 021** 4
702 LT*	25	22s		1	**9.221 022**
705 LT*	50	22s		1	**9.221 023**
710 LT*	100	22s		1	**9.221 024**
725 LT*	250	22s		1	**9.221 025**
750 LT*	500	22s		1	**9.221 026**

* Needle - please order separately.

E & OE.

1 Needles for RN syringes

Removable. Not for use in HPLC applications. *Hamilton*
Length 51mm
Point style 2

Type	Ext. diam. mm	Int. diam. mm	Gauge	Volume	PK	Cat. No.
7758-02	0.5	0.13	26s	2,5 µl - 100 µl	6	**9.221 692**
7758-03	0.7	0.15	22s	2,5 µl - 100 µl	6	**9.221 693**
7779-01	0.7	0.41	22s	250 µl - 10 ml	6	**9.221 694**
7779-03	0.7	0.15	22s	250 µl - 10 ml	6	**9.221 695**

1



2 Microlitre syringes, 800 series, with cemented/ removable needles

With cemented-in, standard needles (N). *Hamilton*
With metal handle. Plungers are individually fitted, therefore cannot be interchanged and are not available as replacement parts. Needles are electro-tapered.

With removable needle (RN).
Type RN complete with metal plunger handles.
Type RN B/P are syringes only without metal plunger (replacement syringes).
Needle length 51mm
Point style 2 (GC)

2



Type	Capacity µl	Gauge	Point style	PK	Cat. No.
85 N		26s	2	1	**9.221 105**
801 N	10	26s	2	1	**9.221 110**
802 N	25	22s	2	1	**9.221 111**
805 N	50	22s	2	1	**9.221 112**
810 N	100	22s	2	1	**9.221 113**
85 RN	5	26s	2	1	**9.221 115**
801 RN	10	26s	2	1	**9.221 116**
802 RN	25	22s	2	1	**9.221 117**
805 RN	50	22s	2	1	**9.221 118**
810 RN	100	22s	2	1	**9.221 119**
825 RN	250	22s	2	1	**9.221 120**
85 RN	5	26s		1	**6.803 384**
801 RN	10	26s		1	**6.222 013**
810 RN	100	22s		1	**6.231 153**
801 RN B/P	10			1	**9.221 172**

Microlitre syringes, 1700/1000 series, with LT and gas-tight

Glass barrel with PTFE-coated plunger, seal and with Luer Tip (LT). *Hamilton*
Gas-tight microlitre syringe without needle.
MS = Plunger stop fitted to prevent damage to the PTFE seal. Prevents the plunger tip from reaching the end of the syringe.

Type	Capacity µl	Grad. µl	PK	Cat. No.
1710 LT	100	1	1	**9.221 210** 3
1725 LT	250	5	1	**9.221 225**
1750 LT	500	10	1	**9.221 250**
1001 LT	1000	10	1	**9.221 251** 4
1002 LT	2500	50	1	**9.221 252**
1005 LT	5000	100	1	**9.221 255**

3



9.221 210

4



9.221 251

We can supply this manufacturer's whole product range !

partner of the LLG Lab Logistics Group

HAMILTON

1



9.221 300

Microlitre syringes, 1700/1000 series, with TLL/ TLLX and gas tight

Hamilton

Glass barrel with PTFE-coated plunger and seal, and Luer lock outlet (TLL). TLLX with 6-32 UNC female thread. Allows attachment to drive arm mechanisms, e.g. Microlab 500 Series diluters/dispensers.
Gas-tight microlitre syringe without needle. MS = Plunger stop fitted to prevent damage to the PTFE seal. Prevents the plunger tip from reaching the end of the syringe.

2



9.221 348

Type	Capacity µl	Grad. µl	PK	Cat. No.
1702 TLLX, TLL with stop	25	0,25	1	**9.221 300** 1
1705 TLLX, TLL with stop	50	0,5	1	**9.221 305**
1710 TLLX, TLL with stop	100	1	1	**9.221 310**
1725 TLLX, TLL with stop	250	5	1	**9.221 315**
1750 TLLX, TLL with stop	500	10	1	**9.221 320**
1001 TLL	1000	10	1	**9.221 348** 2
1001 TLL W/S	1000	20	1	**9.221 325**
1001 TLLX	1000	0,01	1	**9.221 328**
1002 TLL	2500	50	1	**9.221 330**
1005 TLL	5000	100	1	**9.221 335**
1010 TLL	10000	200	1	**9.221 340**
1025 TLL	25000	500	1	**9.221 347**
1025 TLL	25000	500	1	**9.221 345**

3



3 Needles for LT/TLL/TLLX syringes

Hamilton

Removable. With Luer tip made of Kel-F. All hypodermic needles available according to specification in 10mm to max. 1000mm lengths. Further point styles available on request.
Needle length 51mm

Type	Ext. diam. mm	Int. diam. mm	Gauge	Point style	PK	Cat. No.
KF 726s pst2	0.47	0.13	26s	2 (GC)	6	**9.221 609**
KF 726 pst2	0.46	0.26	26s	2 (GC)	6	**9.221 626**
KF 725 pst2	0.51	0.26	25s	2 (GC)	6	**9.221 625**
KF 724 pst2	0.57	0.31	24s	2 (GC)	6	**9.221 624**
KF 723 pst2	0.64	0.34	23s	2 (GC)	6	**9.221 623**
KF 722s pst2	0.72	0.15	22s	2 (GC)	6	**9.221 607**
KF 722 pst2	0.72	0.41	22s	2 (GC)	6	**9.221 622**
KF 721 pst2	0.82	0.51	21s	2 (GC)	6	**9.221 621**
KF 720 pst2	0.91	0.60	20s	2 (GC)	6	**9.221 620**
KF 726s pst3	0.47	0.13	26s	3 (HPLC)	6	**9.221 709**
KF 726 pst3	0.46	0.26	26s	3 (HPLC)	6	**9.221 726**
KF 725 pst3	0.51	0.26	25s	3 (HPLC)	6	**9.221 735**
KF 724 pst3	0.57	0.31	24s	3 (HPLC)	6	**9.221 724**
KF 723 pst3	0.64	0.34	23s	3 (HPLC)	6	**9.221 723**
KF 722s pst3	0.72	0.15	22s	3 (HPLC)	6	**9.221 707**
KF 722 pst3	0.72	0.41	22s	3 (HPLC)	6	**9.221 722**
KF 721 pst3	0.82	0.51	21s	3 (HPLC)	6	**9.221 721**
KF 720 pst3	0.91	0.60	20s	3 (HPLC)	6	**9.221 720**

4



9.221 487

Microlitre syringes, 1700/1000 series, with removable needle

Hamilton

Gas-tight microlitre syringes with removable needle (RN).

Needle length 51mm
Point style 2 (GC)

5



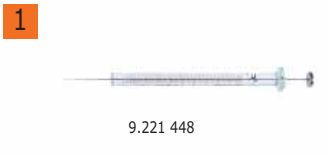
9.221 493

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
1701 RN	10	26s	2 (GC)	1	**9.221 487** 4
1702 RN	25	22s	2 (GC)	1	**9.221 488**
1702 RN	50	22s	2 (GC)	1	**9.221 489**
1710 RN	100	22s	2 (GC)	1	**9.221 490**
1725 RN	250	22s	2 (GC)	1	**9.221 491**
1750 RN	500	22s	2 (GC)	1	**9.221 492**
1001 RN	1000	22s	2 (GC)	1	**9.221 493** 5
1002 RN	2500	22s	2 (GC)	1	**9.221 494**

E & OE.

Microlitre syringes, 1700/1000 series, with cemented needle

1



9.221 448

With PTFE plunger seal. *Hamilton*
Gastight microlitre syringes with cemented-in needles (N).
Needles are electro-tapered (LTN).

Needle length 51mm
Point style 2 (GC)

2



9.221 470

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
1701 N	10	26s	2 (GC)	1	**9.221 448** 1
1702 N	25	22s	2 (GC)	1	**9.221 449**
1705 N	50	22s	2 (GC)	1	**9.221 450**
1710 N	100	22s	2 (GC)	1	**9.221 455**
1725 N	250	22s	2 (GC)	1	**9.221 460**
1750 LTN	500	22s	2 (GC)	1	**9.221 465**
1001 LTN	1000	22s	2 (GC)	1	**9.221 470** 2
1002 LTN	2500	22s	2 (GC)	1	**9.221 475**
1005 LTN	5000	22s	2 (GC)	1	**9.221 480**
1010 LTN	10000	22s	2 (GC)	1	**9.221 485**

3 Microlitre syringes, 1800 series, with ceneted or removable needle

3



10µl to 250µl *Hamilton*
- for use with gases and liquids
- removable needles (RN) or cemented needles (N)
- precision-machined PTFE-tipped plungers
- reinforced plungers
- plunger assemblies and glass barrels are replaceable

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
1801 N	10	26s	2	1	**9.221 836**
1802 N	25	22s	2	1	**9.221 837**
1805 N	50	22s	2	1	**9.221 838**
1810 N	100	22s	2	1	**9.221 839**
1825 N	250	22s	2	1	**9.221 840**
1801 RN	10	26s	2	1	**9.221 831**
1802 RN	25	22s	2	1	**9.221 832**
1805 RN	50	22s	2	1	**9.221 833**
1810 RN	100	22s	2	1	**9.221 834**
1825 RN	250	22s	2	1	**9.221 835**

4 Microlitre syringes, 7000 series, with removable needle

4



- 0.5µl - 5µl *Hamilton*
- For use with liquids
- Removable needles (KH)
- Positive displacement
- Sample contained in the needle
- No dead volume
- Replaceable syringe parts

Needle length 70mm

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
7000.5 KH	0.5	25	2	1	**6.700 111**
7001 KH	1.0	25	2	1	**9.221 121**
7101 KH	1.0	22	2	1	**6.802 391**
7002 KH	2.0	25	2	1	**6.204 624**
7102 KH	2.0	23	2	1	**6.801 037**
7105 KH	5.0	24	2	1	**9.221 125**
7000.5OC KH	0.5	32	3	1	**9.221 590**
7000.5 KH	0.5	25	3	1	**9.221 126**
7001 KH	1.0	25	3	1	**6.802 598**
7101 KH	1.0	22	3	1	**9.221 131**
7002 KH	2.0	25	3	1	**9.221 122**
7102 KH	2.0	23	3	1	**9.221 132**
7105 KH	5.0	24	3	1	**6.050 160**

Spare unit for Microlitre syringes, 7000 series

Hamilton

Type	PK	Cat. No.
Spare unit for syringes 7000.5	1	**9.221 181**
Spare unit for syringes 7001	1	**9.221 182**
Spare unit for syringes 7002	1	**9.221 183**
Spare unit for syringes 7105	1	**9.221 184**
Spare unit for syringes 7101	1	**9.221 185**
Spare unit for syringes 7102	1	**9.221 186**

1



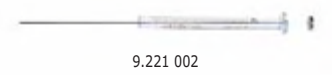
1 Microlitre syringe needles for HPLC

Removable. For use with Rheodyne valves and Valco system VSF 2. Fit Hamilton syringes from 5µl to 100µl capacity. *Hamilton*

Needle length 51mm

Type	Volume	Gauge	Point style	PK	Cat. No.
7780-04	250 µl - 1000 µl	22s	3 (HPLC)	6	**6.203 934**
7770-01	2,5 µl - 100 µl	22s	3 (HPLC)	6	**9.221 603**

2



9.221 002

Microlitre syringes for GC-autosamplers A

With cemented-in needles (N). For GC-autosamplers Agilent 7670 A, 7671 A, 7672 A and CTC GC PAL autosampler. *Hamilton*

Syringe types with Special needle (SN) available on request.
Needle length 51mm

3



6.239 360

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
75 N CTC	5.0	26s	AS	1	**6.304 828**
701 N	10.0	26s	2 (GC)	1	**9.221 002** 2
701 N CTC	10.0	26s	2 (GC)	1	**6.301 578**
701 N CTC	10.0	26s	AS	1	**6.303 229**
7701.2 CTC	1.2	26s	AS	1	**6.900 991**
1701 N	10.0	26s	2 (GC)	1	**9.221 448**
1702 N CTC Slim Line	25.0	26s	AS	1	**9.221 040**
1702 N CTC	25.0	26s	AS	1	**6.239 337**
1710 CTC	100.0	26s	AS	1	**6.206 124**
1725 N CTC	250.0	26s	AS	1	**6.239 360** 3
1750 N CTC	500.0	26s	AS	1	**9.221 041**

4



9.221 196

Microlitre syringe for GC-Autosampler

With cemented-in needles (N). For autosamplers Agilent 7673 - 7683, 6850 ALS and CTC GC PAL instruments. *Hamilton*

Syringe types with Special needle (SN) available on request.
Gauge: 23s

5



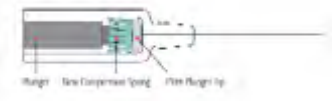
7.636 288

Type	Capacity µl	Point style	Needle length	PK	Cat. No.
701 N CTC	10	2	51	1	**9.221 063**
701 N CTC	10	AS	51	1	**7.636 288** 5
701 ASN	10	AS	43	1	**9.221 196** 4

6



7



6 7 GC-Syringes CTC Headspace®

The new High Dynamic (HD-) plunger has been optimised for higher throughput in the headspace technique. This headspace syringe has been designed for the CTC PAL autosampler system. Modern GC Headspace analysis requires injecting over large temperature ranges. Traditional headspace syringes are composed of rubber O-ring sealed plungers which have a limited sealing performance at high temperatures. *Hamilton*

Advantages:
- New sealing system based on a novel metal spring allows working with enhanced tightness
- Excellent performance over a large temperature range and temperature gradients
- Increased life-time compared to traditional headspace syringes
- Increased accuracy and reproducibility of headspace GC analysis

Type	Capacity µl	Gauge	Needle length mm	Point style	PK	Cat. No.
1001	1000	23	56	5	1	**6.200 515**
1001	1000	26	56	5	1	**6.303 926**
1002	2500	23	51	5	1	**6.201 089**
1002	2500	26	51	5	1	**6.801 137**
1005	5000	23	51	5	1	**6.235 326**
1005	5000	26	51	5	1	**9.221 065**

Microlitre syringes for GC-autosamplers please see page 1470.

E & OE.

1 Microlitre syringe C-Line for HPLC-Autosampler, for CTL autosampler



With cemented-in needles (N). *Hamilton*

Replacement plungers available on request.
Gauge 22s
Needle length 51mm
Point style 3 (HPLC)

Type	Capacity µl	PK	Cat. No.
700 Slim Line	10	1	**6.200 686**
1700 Slim Line	10	1	**9.221 052**
1700	25	1	**6.200 903**
1700 Slim Line	25	1	**6.236 085**
1700 Slim Line	100	1	**7.200 498**
1700	250	1	**6.803 417**
1700	500	1	**9.221 051**
1000	1000	1	**7.210 113**
1000	2500	1	**7.210 114**
1000	5000	1	**9.221 053**

2 Repeat dispensing device PB600-1 for Microlitre syringes



For syringes 25µl to 2.5ml. Dispenses 2% of total syringe volume each time the plunger is depressed. *Hamilton*

Type	PK	Cat. No.
PB 600-1	1	**9.221 650**

Gas syringes, FORTUNA®

Borosilicate glass. Transparent calibrated barrel.
With chemically-resistant, diffused amber stain graduations. *Poulten & Graf*

Capacity ml	Grad. ml	Type	PK	Cat. No.
25	1	Without stopcock	1	**9.143 055**
50	1	Without stopcock	1	**9.143 056**
100	1	Without stopcock	1	**9.143 057** 3
50	1	With capillary stopcock	1	**9.143 066**
100	1	With capillary stopcock	1	**9.143 067** 4



9.143 057



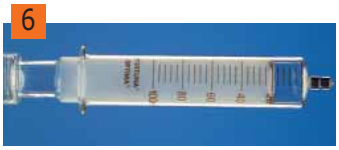
9.143 067

5 6 Syringes, FORTUNA OPTIMA®, Glass

With centre glass or metal luer nozzle. Interchangeable plungers and barrels (between identical capacity syringes). With amber graduations. Autoclavable up to +134°C. *Poulten & Graf*

Capacity ml	Material Cone ex	Nozzle type	PK	Cat. No.
1	glass	luer	1	**9.222 021**
2	glass	luer	1	**9.222 022**
5	glass	luer	1	**9.222 025**
10	glass	luer	1	**9.222 030**
20	glass	luer	1	**9.222 032**
50	glass	luer	1	**9.222 035**
1	metal	luer-lock	1	**9.222 061**
2	metal	luer-lock	1	**9.222 062**
5	metal	luer-lock	1	**9.222 065**
10	metal	luer-lock	1	**9.222 070**
20	metal	luer-lock	1	**9.222 072**
50	metal	luer-lock	1	**9.222 075**









1 2 Syringes, Glass-metal

With calibrated glass cylinder and plunger made of stainless steel. Plungers and cylinders interchangeable. With central metal cone. Graduated. Sterilisable up to +134°C. *Poulten & Graf*

Capacity ml	Nozzle type	PK	Cat. No.
1	Luer	1	**9.222 221**
2	Luer	1	**9.222 222**
5	Luer	1	**9.222 225**
10	Luer	1	**9.222 230**
20	Luer	1	**9.222 232**
50	Luer	1	**9.222 235**
1	Luer-Lock	1	**6.401 380**
2	Luer-Lock	1	**9.222 242**
5	Luer-Lock	1	**9.222 245**
10	Luer-Lock	1	**9.222 250**
20	Luer-Lock	1	**9.222 252**
50	Luer-Lock	1	**9.222 255**



3 Disposable syringes HSW NORM-JECT®, 2-part, PP/PE, sterile

Your first choice for an inert syringe. *Henke-Sass Wolf GmbH*
- PP barrel, with PE piston
- smooth flow, tight, high transparency barrel
- no rubber, styrene or DEHP, latex- and silicone-oil-free
- pyrogen-free, PVC-free, non-toxic
- sterile, individually blister strip packed
- defined position of the plunger at volume "0" to feel when plunger is completely inserted
- extended graduation for wider range of application
- tested for use in HPLC
- defined safety stop to avoid accidental pull-out of plunger and loss of medicine

Capacity ml	PK	Cat. No.
1 : 1/100 (Tuberculin)	100	**9.410 000**
2 (3)	100	**9.410 002**
5 (6)	100	**9.410 005**
10 (12)	100	**9.410 010**
20 (24)	100	**9.410 020**
30	50	**9.410 025**
50 (60)	30	**9.410 050**



4 Disposable syringes HSW SOFT-JECT®, 3-part, PP, sterile

NEW!

- Barrel: PP, Plunger: PP and polyisoprene rubber *Henke-Sass Wolf GmbH*
- Luer tip
- smooth flow, tight, high transparency barrel
- gliding of plunger supported by added slipping agent
- latex-free, pyrogen-free, DEHP-free, non-toxic
- sterile, individually blister strip packed
- defined safety stop to avoid accidental pull-out of plunger and loss of medicine

Capacity ml	PK	Cat. No.
1 (Tuberculin)	100	**9.410 061**
3	100	**9.410 062**
5	100	**9.410 063**
10	100	**9.410 064**
20	100	**9.410 065**
50 (60)	50	**9.410 066**

5



5 Syringe needles, Stainless steel, disposable, sterile

With Luer push-on fitting for use with disposable syringes. Supplied sterile in boxes of 100.

Gauge	Diam. mm	Length mm	PK	Cat. No.
18G x 1½ inch*	1.2	40	100	**9.950 302**
19G x 1½ inch	1.1	40	100	**9.950 303**
20G x 1 inch**	0.9	25	100	**9.950 304**
21G x 1½ inch**	0.8	40	100	**9.950 305**
23G x 1 inch	0.6	25	100	**9.950 306**
25G x 5/8 inch	0.5	16	100	**9.950 307**

* is a thin wall needle with a short bevel.
** are intravenous thin wall needles.

E & OE.

1 Syringes BD Discardit™ II, disposable, 2-piece, PP/PE, sterile

NEW!



Clear barrel for perfect visualisaion of syringe contents. *Becton Dickinson*
- 2-piece syringes with Luer-Tip
- Smooth plunger movement, reduced sliding force
- Retaining ring: prevents accidential plunger rod withdrawal
- Leak-tight: Tested in compliance with ISO 7886-1
- Scale marking: accurate graduation suited to user's needs
- Design of finger grip flanges ensure stability and comfort during injection
- Ergonomically designed plunger for single-handed operation
- Barrel material: Polypropylene
- Plunger material: Polyethylene
- Plunger lubricant: Oleamide
- Colour-coded packing units
- Sterilization method: Ethylene oxide
- Silicone oil-free
- Sterile single packing, single use, latex-free, PVC-free

For pressure applications we recommend three-part syringes.

Capacity ml	Nozzle type	Grad. ml	PK	Cat. No.
2	Concentric	0.10	100	**6.052 153**
5	Eccentric	0.20	100	**7.619 784**
10	Eccentric	0.50	100	**9.410 403**
20	Eccentric	1.00	80	**6.052 157**

2 Syringes, disposable, PP, sterile



Polypropylene with two-piece plunger and Luer nozzle. Without needle. Supplied sterile, individually pouch-sealed in outer boxes.

Capacity ml	PK	Cat. No.
1	100	**9.950 296**
2	100	**9.950 297**
5	100	**9.950 298**
10	100	**9.950 299**
20	120	**9.950 300**
50	60	**9.950 301**

3 Disposable needles HSW FINE-JECT®, PP/stainless steel, sterile



Sterile. Individually wrapped. *Henke-Sass Wolf GmbH*
Disposable. Luer fitting with plastic sheath.

Type	Diam. mm	Length mm	Colour	PK	Cat. No.
Pravaz 1	0.9	40	yellow	100	**9.410 101**
Pravaz 2	0.8	40	green	100	**9.410 102**
Pravaz 12	0.7	30	black	100	**9.410 112**
Pravaz 14	0.6	30	blue	100	**9.410 114**
Pravaz 16	0.6	25	blue	100	**9.410 116**
Pravaz 18	0.5	25	brown	100	**9.410 118**
Pravaz 20	0.4	20	grey	100	**9.410 120**

4 Micro capillaries



These disposable micro capillaries fill automatically from end to end. Their accuracy is better than 1%. A capillary tube holder is supplied with each pack. Also contains a small bulb with aperture which can be inserted into capillary and used as an effective support for filling and emptying tubes.

Capacity µl	PK	Cat. No.
0.5	100	**9.020 192**
1.0	100	**9.020 193**
2.0	100	**9.020 194**
5.0	100	**9.020 195**
10.0	100	**9.020 196**



Basic principles of SPE

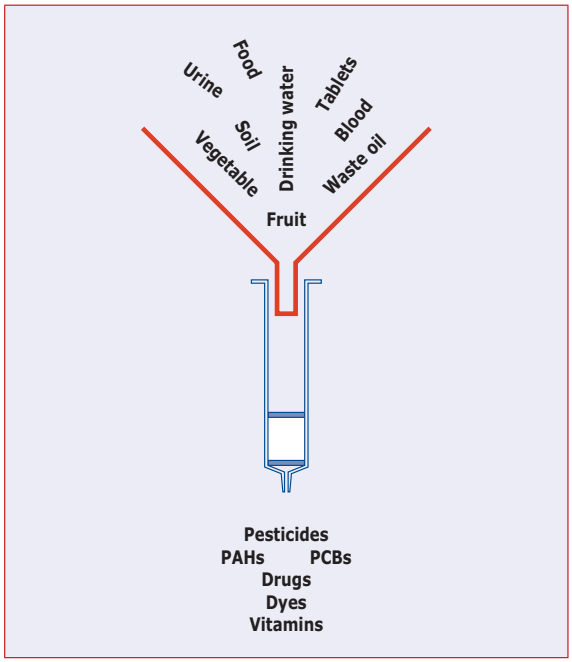


Solid phase extraction (SPE) is a powerful method for sample preparation and is used by most chromatographers today.

More than 20 years ago MACHEREY-NAGEL designed and introduced CHROMABOND® SPE cartridges containing silica-based adsorbents. Since then we developed the widest range of phases and products for SPE based on silica and polymeric materials.

SPE has capabilities in a broad range of applications:

- environmental analyses
- pharmaceutical and biochemical analyses
- organic chemistry
- food analysis



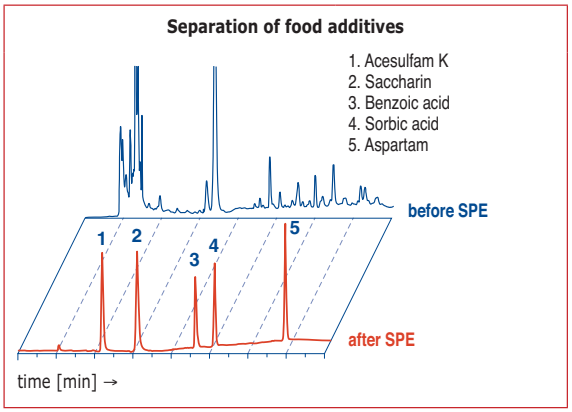
SPE is a form of digital (step-wise) chromatography designed to extract, partition, and/or adsorb one or more components from a liquid phase (sample) onto a stationary phase (adsorbent or resin). An adsorbed substance can be removed from the adsorbent by step-wise increase of elution strength of the eluent (step gradient technique). SPE extends a chromatographic system's lifetime, improves qualitative and quantitative analysis, and the demand placed on an analytical instrument is considerably lessened.

In general, SPE is used for three important purposes in state-of-the-art analyses:

- concentration of the analyte
  (up to factor 10.000 - increase of chromatographic sensibility / improved limits of detection)
- removal of interfering compounds
  (protection of subsequent analyses like HPLC, GC, TLC, UV or IR spectroscopy, ...)
- changing an analyte's environment to a simpler matrix more suitable for subsequent analyses

Advantages of SPE compared to classical liquid-liquid extraction:

- lower consumption of solvents
- faster – enormous time savings
- lower costs per sample
- potential for automation
- high consistency in individual sample handling
- more specific selectivity because of the broad range of adsorbents and different retention mechanisms
- optimisation of extraction by variation or adjusting of the solid phase and chromatographic conditions



Solid phase extraction

E & OE.

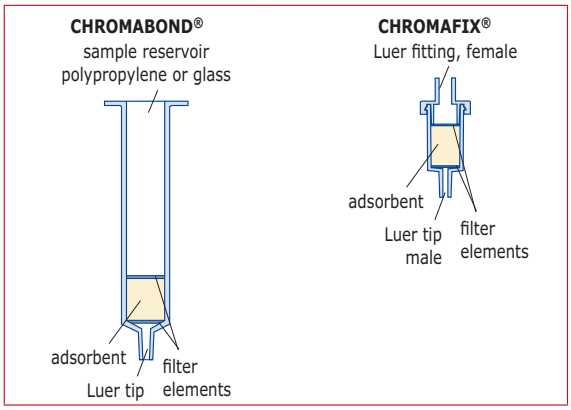


Basic principles and summary of MN phases for SPE

Solid phase extraction

Design of columns and cartridges

All CHROMABOND® columns and CHROMADIX® cartridges are manufactured from polypropylene (PP) with lowest content of extractables (plasticizers, stabilisers, ...) offering blank value free results by usage of most common solvents. The high quality CHROMABOND® adsorbents are kept in place by chemically very inert polyethylene filter elements (PE, standard pore size 20 µm). Funnel-shaped large volume columns, 96-well plates and cartridges for automated and on-line SPE packed with CHROMABOND® adsorbents are available on request.



CHROMABOND® polypropylene columns

- PP columns with PE filter elements
- different sizes from 1, 3, 6 up to 150 ml
- adsorbent weights from 20 mg to 50 g
- male luer tip as exit
- compatible with most robots (e.g., Gilson ASPEC™, Caliper AutoTrace®)

CHROMABOND® glass columns are available on request.

CHROMAFIX® cartridges

- PP cartridges with PE filter elements
- three different sizes with different adsorbent weights: **S**mall (0.4 ml), **M**edium (0.8 ml), **L**arge (1.8 ml))
- female Luer tip at the inlet, male Luer tip as exit
- offers alternative way of handling using positive pressure by syringes or peristaltic pumps
- especially suited for convenient SPE of small sample volumes

Phase	Matrix	Modification / Application	Similar phases*
RP phases			
HR-X	PS/DVB		ENVI-Chrom P, Strata™-X, Oasis® HLB, Nexus
PS-RP	PS/DVB	removal of organic components	Strata™ SDB-L, Bond Elut® ENV, Bond Elut® LMS, DCS-PS/DVB, ENV PS-DVB, Bakerbond™ H_2O-phobic DVB, Isolute® 101
C_{18}	silica	octadecyl, not endcapped	Strata™ C18-U, Accubond® C18, Bakerbond™ PolarPlus, Isolute® C18, LiChrolut® RP-18
C_{18} Hydra	silica	octadecyl, not endcapped, for polar analytes	
Normal phases			
SiOH	silica	unmodified	Strata™ Si-1, Bond Elut® silica, DSC-Si, LC-Si, CLEAN-UP® silica, Accubond® silica, Bakerbond™ silica gel, Isolute® silica, LiChrolut® Si
NH_2	silica	aminopropyl	Strata™ NH_2, Sep-Pak® NH_2, Bond Elut NH_2, DSC-NH_2, LC-NH_2, CLEAN-UP® aminopropyl, Accubond® NH_2, Bakerbond™ amino, Isolute® NH_2, LiChrolut® NH_2
OH	silica	diol	DSC-Diol, LC-Diol, Accubond® Diol (OH)
Alox A/N/B	aluminium oxide	acidic / neutral / basic	LC-Alumina-A/N/B, Accubond® aluminium oxide A/N/B
Florisil®	magnesium silicate		Strata™ FL-PR, Sep-Pak® Florisil®, Bond Elut® Florisil®, ENVI-Florisil®, LC-Florisil®, CLEAN-UP® Florisil®, Accubond® Florisil®, Bakerbond™ Florisil®, Isolute® FL, LiChrolut® Florisil®
PA	polyamide 6		DPA-6S
Ion exchangers			
SA	silica	benzenesulphonic acid cation exchanger (SCX)	Strata™ SCX, Bond Elut® SCX, DSC-SCX, LC-SCX, CLEAN-UP® Benzenesulfonic Acid, Accubond® SCX, Bakerbond™ Aromatic Sulfonic Acid, Isolute® SCX, LiChrolut® SCX
PSA	silica	propylsulphonic acid cation exchanger	
PS-OH^-	PS/DVB	strong anion exchanger, OH^- form	Oasis® MAX
PS-H^+	PS/DVB	strong cation exchanger, H^+ form	Oasis® MCX, Strata™ X-C
PS-Ag^+	PS/DVB	strong cation exchanger, Ag^+ form	
PS-Ba^{2+}	PS/DVB	strong cation exchanger, Ba^{2+} form	
Phases for special applications			
Drug	silica	bifunctional C_8/SA, for enrichment of drugs from urine	Strata™ Screen-C, Bond Elut® Certify I, DSC-MCAX, Clean Screen® DAU, Accubond® Evidex, Bakerbond™ Narc-2, Isolute® HCX, LiChrolut® TSC
Drug II	silica	bifunctional C_8/SB, for extraction of THC and derivatives as well as acidic analytes from biological fluids	Strata™ Screen-A, Bond Elut Certify II, Clean Screen® THC, Bakerbond® Narc-1, Isolute® HAX
CN/SiOH	silica	combination phase for PAHs from soil	
NH_2/C_{18}	silica	combination phase for PAHs from water	
Na_2SO_4/Florisil®		combination phase for extraction of hydrocarbons from water (DIN H-53 / ISO DIS 9377-4)	
SA/SiOH	silica	combination phase for PCBs from waste oil	
Diamino	silica	**p**rimary and **s**econdary amine functions (PSA), for determination of pesticides in food (QuEChERS method)	Supelclean PSA, Bond Elut PSA

* phases which provide a similar selectivity based on chemical or physical properties (list not complete)

1



1 CHROMABOND® HR-X

Spherical, hydrophobic polystyrene-divinylbenzene resin for SPE *MACHEREY-NAGEL*

Hydrophobic polystyrene-divinylbenzene copolymer pH stability 1 to14. High-purity material with highest reproducibility and lowest blank values due to a novel manufacturing process, spherical particles 85mm; pore size 55 to 60Å. Very high surface 1000m²/g; capacity 390mg/g (caffeine in water). Excellent recovery rates especially for the enrichment of pharmaceuticals/active ingredients due to the spherical structure of the particles, very homogeneous surface, and optimised pore structure.

Recommended applications: pharmaceuticals/active ingredients from tablets, creams and water/waste water, drugs and pharmaceuticals from urine, blood, serum and plasma trace analysis of pesticides.

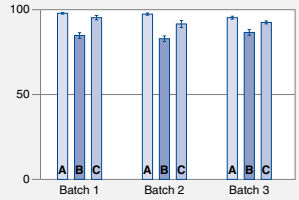
Capacity ml	Capacity mg	PK	Cat. No.
1	30	30	**4.003 808**
3	60	30	**4.003 811**
1	100	30	**4.003 809**
6	200	30	**4.003 814**
3	500	30	**4.003 813**
15	500	20	**4.003 819**
15	1000	20	**4.003 820**
3	200	250	**4.003 806**
6	200	250	**4.003 815**

BIGpacks: 4.003 806/4.003 815
Cartridges in further sizes and phases of the HR-X poduct range available on request.

Highest reproducibility

✓ within each batch ✓ from batch to batch

Compounds:
A phenobarbital
B pentobarbital
C hexobarbital



Barbiturates from serum

Column type:
CHROMABOND® HR-X
3 ml / 200 mg
Sample: 100 ng/ml each in serum
Column conditioning: 5 ml methanol, 5 ml dist. water
Sample application: 1 ml spiked serum
Column washing: 5 ml water
Elution: after drying 3 x 2 ml methanol

Further analysis: HPLC on NUCLEODUR® 100-5 C_{18} ec, see MN Appl. No. 117820

MN Appl. No. 304290

Standard protocol for method development with CHROMABOND® HR-X

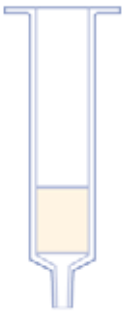
Column type:
CHROMABOND® HR-X
3 ml / 200 mg
Sample pretreatment: if necessary, adjust pH value
Column conditioning: 5 ml methanol
Equilibration: 5 ml water
Sample application: slowly aspirate the sample through the column
Column washing: 5 ml water – methanol (95:5, v/v)
Elution: after drying 3 x 2 ml methanol

Further analysis: if necessary, evaporate and redissolve in a suitable solvent; HPLC or GC



MN Appl. No. 304310

2



2 CHROMABOND® C_{18}

Octadecyl modified silica phase for SPE, not endcapped *MACHEREY-NAGEL*

Base material silica, pore size 60Å, particle size 45µm for C_{18}, specific surface 500m²/g, pH stability 2 to 8 octadecyl phases, not endcapped, carbon content 14% possesses more free silanols (SiOH), which allow secondary interactions with polar groups of the analytes.

Recommended applications: non-polar compounds, pesticides.

Capacity ml	Capacity mg	PK	Cat. No.
1	100	100	**6.226 798**
3	200	50	**9.003 487**
3	500	50	**9.003 488**
6	500	30	**6.902 222**
6	2000	30	**4.003 512**
6	1000	30	**6.234 031**
15	2000	20	**4.003 464**
45	5000	20	**6.700 747**
70	10000	10	**4.003 561**
3	500	250	**4.003 433**
6	500	250	**4.003 435**
6	1000	250	**4.003 437**

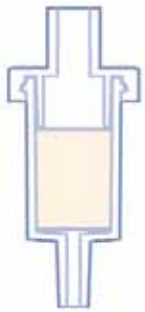
E & OE.

1 CHROMAFIX® C18

Octadecyl modified silica phase, not endcapped. *MACHEREY-NAGEL*

Size	Capacity mg	PK	Cat. No.
S	270	50	**7.083 665**
M	530	50	**7.079 617**
L	950	50	**4.003 838**

1



2 CHROMABOND® C_{18} Hydra

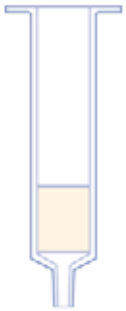
Octadecyl modified silica phase for SPE of polar analytes *MACHEREY-NAGEL*

Base material silica, pore size 60Å, particle size 45µm, specific surface 500m²/g, pH stability 2 to 8, special octadecyl phase for polar analytes, not endcapped, carbon content 15%.

Recommended applications: more polar compounds like pesticides and their polar degradation products, phenols, phenoxycarboxylic acids, nitroaromatics, pharmaceuticals.

Capacity ml	Capacity mg	PK	Cat. No.
1	50	100	**4.003 565**
1	100	100	**4.003 566**
3	200	50	**4.003 567**
3	500	50	**4.003 569**
6	500	30	**4.003 573**
3	1000	50	**4.003 571**
6	1000	30	**4.003 575**
6	2000	30	**4.003 576**
6	3000	30	**4.003 577**

2



3 CHROMABOND® NH_2

Aminopropyl modified silica phase for SPE *MACHEREY-NAGEL*

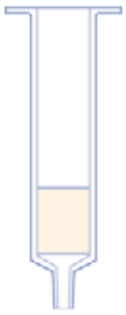
Base material silica, pore size 60Å, particle size 45µm, specific surface 500m²/g, pH stability 2 to 8, aminopropyl phase, carbon content 3.5%, polar, weak anion exchanger.

Recommended applications: trace elements, lipids.

Volume ml	Capacity mg	PK	Cat. No.
1	100	100	**4.003 465**
3	200	50	**4.003 609**
3	500	50	**6.228 063**
3	500	250	**4.003 466**
6	500	30	**6.224 868**
6	1000	30	**6.224 845**

BIGpacks: 4.003 466

3



4 CHROMABOND® OH (Diol)

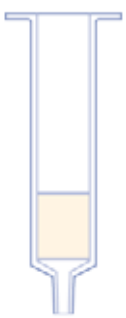
Diol modified silica phase for SPE *MACHEREY-NAGEL*

Base material silica, pore size 60Å, particle size 45µm, specific surface 500m²/g, pH stability 2 to 8, diol phase, carbon content 5.5%, polar properties similar to SiOH.

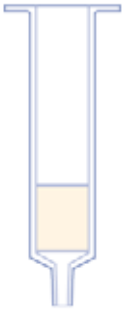
Recommended application: antibiotics, prostaglandins.

Capacity ml	Capacity mg	PK	Cat. No.
1	100	100	**4.003 470**
3	200	50	**4.003 610**
3	500	50	**4.003 471**
6	500	30	**6.224 847**

4



1



1 CHROMABOND® SiOH

Unmodified silica phase for SPE *MACHEREY-NAGEL*

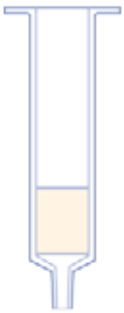
Unmodified, weakly acidic silica, pore size 60Å, particle size 45µm, specific surface 500m²/g, pH stability 2 to 8, very polar, adsorbs humidity from air, for this reason it should be kept well closed and if necessary dried before use due to its high affinity for polar compounds it should not be conditioned with polar (e.g. methanol) or water-containing solvents.

Recommended applications: aflatoxins, chloramphenicol, pesticides, steroids, vitamins.

Capacity ml	Capacity mg	PK	Cat. No.
1	100	100	**6.225 223**
3	200	50	**4.003 547**
3	500	50	**7.085 047**
6	500	30	**6.801 894**
6	1000	30	**4.003 481**
6	2000	30	**4.003 498**
15	2000	20	**4.003 550**
45	5000	20	**4.003 605**
70	10000	10	**6.202 850**
150	50000	10	**4.003 630**
3	500	250	**4.003 477**
6	1000	250	**4.003 482**
6	2000	250	**4.003 499**

BIGpacks: 4.003 477/4.003 482/4.003 499

2



2 CHROMABOND® Alox A/Alox N/Alox B

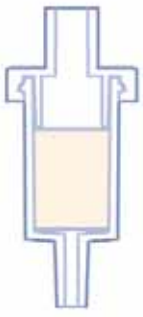
aluminium oxide, acidic, neutral, basic *MACHEREY-NAGEL*

aluminium oxide, high purity, pore volume 0.90ml/g, particle size 60 to 150µm, specific surface 150m²/g, acidic, pH 4 ±0.5, recommended application: together with phase SA for PCB and pesticides.

Alox A: acidic, pH 4 ±0.5
Alox N: neutral, pH 7 ±0.5
Alox B: basic, pH 9.5 ±0.5

Phase	Capacity ml	Capacity mg	PK	Cat. No.
Alox A	3	500	50	**4.003 621**
Alox A	6	500	30	**4.003 622**
Alox A	6	1000	30	**4.003 456**
Alox A	45	4000	20	**4.003 623**
Alox N	3	500	50	**4.003 619**
Alox N	6	500	30	**4.003 620**
Alox N	6	1000	30	**6.224 843**
Alox N	45	4000	20	**6.226 917**
Alox B	3	500	50	**4.003 615**
Alox B	6	500	30	**4.003 628**
Alox B	6	1000	30	**4.003 458**
Alox B	45	4000	20	**4.003 629**

3



3 CHROMAFIX® Alox N

Aluminium oxide, neutral, pH 7 ±0.5 *MACHEREY-NAGEL*

Size	Capacity mg	PK	Cat. No.
S	850	50	**4.003 853**
L	1700	50	**4.003 854**

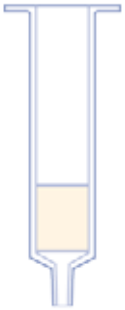
E & OE.

1 CHROMABOND® Florisil®

Magnesium silicate for SPE *MACHEREY-NAGEL*

Matrix magnesium silicate (MgO to SiOH 15:85), high purity, particle size 150 to 250µm.

Recommended application: organic tin compounds, aliphatic carboxylic acids, PCB, PAH.



Volume ml	Capacity mg	PK	Cat. No.
3	200	50	**4.003 624**
3	500	50	**4.003 488**
6	500	30	**4.003 557**
6	1000	30	**6.224 842**
6	1000	250	**4.003 489**
6*	1000	30	**4.003 490**

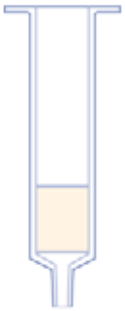
BIGpacks: 4.003 489
*Glass columns

2 CHROMABOND® PA

Polyamide 6 for SPE *MACHEREY-NAGEL*

Matrix polyamide 6, unmodified, high purity, particle size 40 to 80µm.

Recommended application: flavonoids, PAH.



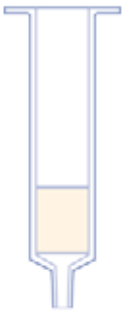
Capacity ml	Capacity mg	PK	Cat. No.
3	200	50	**4.003 595**
3	500	50	**4.003 511**
6	500	30	**7.089 089**
6	1000	30	**7.400 537**

3 CHROMABOND® PSA

Propylsulphonic acid modified silica cation exchanger for SPE *MACHEREY-NAGEL*

Base material silica, pore size 60Å, particle size 45µm, specific surface 500m²/g, pH stability 2 to 8, propylsulphonic acid modified silica, very strong cation exchanger (capacity ~ 0.7meq/g), contrary to the SA phase no P-P interactions.

Recommended applications: weak cations.



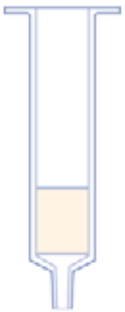
Capacity ml	Capacity mg	PK	Cat. No.
1	100	100	**4.003 626**
3	500	50	**4.003 627**
6	1000	30	**6.206 233**

4 CHROMABOND® SA

Benzenesulphonic acid modified silica cation exchanger for SPE (SCX) *MACHEREY-NAGEL*

Base material silica, pore size 60Å, particle size 45µm, specific surface 500m²/g, pH stability 2 to 8, benzenesulphonic acid modified silica, strongly acidic cation exchanger (capacity ~ 0.5meq/g). Adsorbent with hydrophobic and Π-Π interactions (benzene ring). Ion exchange of organic compounds from aqueous matrix. Elution of interesting compounds with solvent systems, which compensate the ionic and nonpolar interactions, e.g. methanolic HCl.

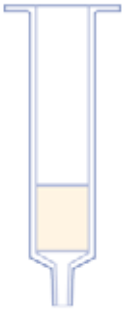
Recommended application: amino acids, amines, chlorophyll, PCB.



Capacity ml	Capacity mg	PK	Cat. No.
1	100	100	**6.314 563**
3	200	50	**4.003 563**
3	500	50	**7.051 056**
6	500	30	**4.003 613**
6	1000	30	**6.224 846**
3	500	250	**4.003 485**

BIGpack: 4.003 485

1



1 SPE phases for RP/ ion chromatography

SPE phases for polymer-based RP and ion chromatography *MACHEREY-NAGEL*

Base material: high-purity polystyrene-divinylbenzene copolymers (PS/DVB)
pore size 100 Å, paricle size 100µm. Verly low degree of swelling, thus very well suited for chromatography. Reliable function over the whole pH range from 0-14. Different modifications for different applications from elimination of nonpolar compounds up to removal of specific polar comonents.

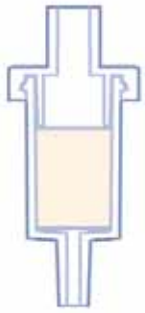
Recommended application:
Removal of interfering compounds
- improves chromatographic separtions, if the interfering components overlap with the analyte in the chromatogram
- improves lifetime of the chromatographic column, since interfering components can irreversibly block the column packing

Enrichment of the analytes

removal of organic interfering components from water	PS-RP hydrophobic PS/DVB-copolymer
removal or concentration of anions from water increasing the pH value in acidic samples removal or concentration of cations from water	PS-OH^- strong PS/DVB anion exanger, OH^- form capacity 0.6 meq/g
decreasing the pH value in basic samples	PS-H^+ strong PS/DVB cation exchanger, H^+ form, capacity 2.9 meg/g
removal of halide ions from water	PS-Ag^+ strong PS/DVB cation exchanger, Ag^+ form
removal of sulphate ions from water	PS-Ba^{2+} strong PS/DVB cation exchanger, Ba^{2+} Form

Phase	Capacity ml	Capacity mg	PK	Cat. No.
PS-OH-	3	200	30	**4.003 600**
PS-H+	3	200	30	**4.003 702**
PS-OH-	3	500	30	**4.003 581**
PS-H+	3	500	30	**4.003 589**
PS-OH-	6	500	30	**4.003 591**
PS-H+	6	500	30	**4.003 590**

2

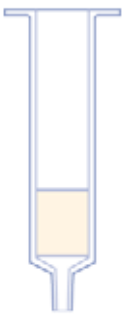


2 CHROMAFIX® PS

MACHEREY-NAGEL

Phase	Size	Capacity mg	PK	Cat. No.
PS-RP	S	200	50	**4.003 869**
PS-OH-	S	200	50	**4.003 867**
PS-H+	S	230	50	**4.003 866**
PS-Ag+	S	240	50	**4.003 865**
PS-Ba2+	S	280	50	**4.003 868**
PS-RP	M	320	50	**6.228 258**
PS-OH-	M	380	50	**4.003 861**
PS-H+	M	430	50	**7.401 474**
PS-Ag+	M	480	50	**4.003 864**
PS-Ba2+	M	550	50	**7.402 218**
PS-OH	L	800	50	**4.003 862**
PS-H+	L	900	50	**4.003 863**

3



3 CHROMABOND® Drug

Special silica phase for SPE enrichment of drugs from urine or plasma *MACHEREY-NAGEL*

Base material silica, pore size 60Å, particle size 45µm, specific surface 500m²/g, pH stability 2 to 8, special bifunctional modification - C_8/SA (strong cation exchanger - benzenesulphonic acid).

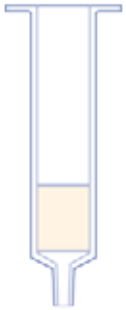
Recommended application: enrichment of acidic, neutral and basic drugs from urine or plasma.

Capacity ml	Capacity mg	PK	Cat. No.
1	100	100	**4.003 696**
3	200	50	**6.802 715**
3	500	50	**4.003 699**
6	500	30	**4.003 697**

E & OE.

1 CHROMABOND® Drug II

1



Special silica phase for SPE of THC and derivatives acidic analytes from biological fluids (urine, blood ...) *MACHEREY-NAGEL*

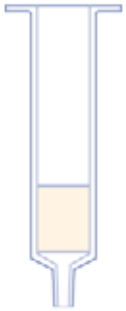
base material silica, pore size 60Å, particle size 45µm, specific surface 500m²/g, pH stability 2 to 8, special bifunctional modification - C_8/SB (strong anion exchanger - quaternary amine).

Recommended applications: extraction of THC and derivatives from urine, blood, serum, plasma, acidic analytes from biological fluids.

Capacity ml	Capacity mg	PK	Cat. No.
1	100	100	**4.003 700**
3	200	50	**4.003 695**
3	500	50	**4.003 701**
6	500	30	**4.003 698**

2 CHROMABOND® NH_2/C_{18}

2



Combination phase for SPE analysis of PAH from water containing humic acids *MACHEREY-NAGEL*

Special combination phase: aminopropyl phase for removal of interfering humic acids, octadecyl phase for enrichment of PAH.

Recommended application: PAH from water containing humic acids.

Capacity ml	Capacity ml / mg	PK	Cat. No.
6	500 / 500	30	**6.228 257**
6	500 / 1000	30	**4.003 675**

Glass columns available on request.

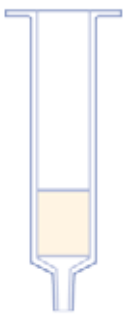
PAHs from water containing humic acids

Column type:
CHROMABOND® NH_2/C18, 6 ml, 500 mg/1 g glass column
Sample pretreatment:
mix 500 ml water sample with 25 ml 2-propanol
Column conditioning: 10 ml dichloromethane, 10 ml methanol, then 10 ml dist. water – 2-propanol (9:1, v/v)
Sample application: aspirate 500 ml of the pretreated water sample through the column (~ 5 ml/min)
Washing: 2 ml dist. water – 2-propanol (9:1, v/v), then dry column (about 20 min, vacuum)
Elution: 4 x 0.5 ml CH_2Cl_2 (percolate first 0.5 ml into the column packing without vacuum, the apply light vacuum), if necessary evaporate in a stream of nitrogen and fill up with a suitable solvent

MN Appl. No. 301260

3 CHROMABOND® CN/SiOH

3



Combination phase for SPE analysis of PAH *MACHEREY-NAGEL*

Special combination phase, cyanopropyl phase for selective adsorption of polycyclic aromatics via Π-Π interactions, unmodified silica phase for removal of polar compounds.

Recommended applications: Extraction of the 16 PAHs according to EPA from soil samples.

Capacity ml	Capacity ml / mg	PK	Cat. No.
3	500 / 1000	50	**4.003 507**
6	500 / 1000	30	**6.233 128**
6	500 / 1000	250	**4.003 514**

BIGpack: 4.003 514

PAHs from soil

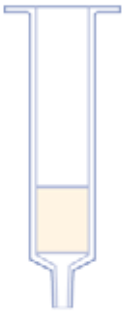
Column type:
CHROMABOND® CN/SiOH,
6 ml, 500/1000 mg
Sample pretreatment: dry 30 g soil with sodium sulphate and reflux 4 h with 250 ml petroleum ether in a Soxhlet extractor. For low PAH contents (colourless or weakly coloured extracts) concentrate extract to 1/10 of its volume in a rotation evaporator.
Column conditioning: 4 ml petroleum ether

MN Appl. Nr. 301310

Sample application:
aspirate 20 ml of the extract through the column
Washing: 2 ml petroleum ether
Elution: 2 x 2 ml acetonitrile / toluene (3:1, v/v), then evaporate or fill to the volume required

Further analysis: HPLC, e.g. with column 250 x 3 mm NUCLEOSIL® 5 C_{18} PAH
recovery rates see application 301310 at *www.mn-net.com*

1



1 CHROMABOND® Na_2SO_4/Florisil®

Combination phase for SPE of hydrocarbons from water acc. to DIN H53/ISO DIS 9377-4 *MACHEREY-NAGEL*

Special combination phase of sodium sulphate and Florisil®.

Recommended application: hydrocarbons from drinking, surface and waste waters.

Volume ml	Capacity ml / mg	PK	Cat. No.
6	2000 / 2000	30	**4.003 558**
6*	2000 / 2000	30	**6.900 415**
6*	2000 / 2000	250	**4.003 559**

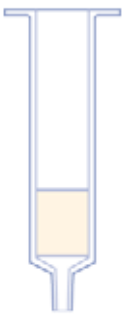
BIGpacks: 4.003 559
*Glass columns

Hydrocarbons from water

Column type:
CHROMABOND® Na_2SO_4/Florisil®,
2000/2000 mg, 6 ml glass column
Internal standard solution: dissolve 20 mg *n*-tetracontane ($C_{40}H_{82}$) in petroleum ether, add 20 ml *n*-decane ($C_{10}H_{22}$) and fill up to 1 litre with petroleum ether. For perparation of the extraction solution dilute standard solution 1:10 with petroleum ether.
Sample pretreatment: adjust 900 ml water (10 °C) with HCl (12 mol/l) to pH 2 and add 80 g $MgSO_4$. Add 50 ml of the extraction solution, close the bottle and stir the suspension intensely for 30 min.
Add enough dist. water to separate the organic from the aqueous phase.
Column conditioning: 5 ml petroleum ether
Sample application:
slowly aspirate or force the sample through the column
Elution: wash with 10 ml petroleum ether. Evaporate the combined solutions from sample application and elution to 1 ml at about 75 °C. If necessary, fill up to 1 ml again. (If the hydrocarbon content is high, evaporation to 1 ml may not be necessary.)
Recovery rate: must be > 80 % for *n*-tetracontane.

MN Appl. No. 302090

2



2 CHROMABOND® SA/SiOH

Combination phase for SPE analysis of PCB *MACHEREY-NAGEL*

Special combination phase:
SA: strongly acidic cation exchanger based on silica with benzenesulphonic acid modification.
SiOH: unmodified silica for removal of polar compounds.

Recommended application: extraction of PCB from waste oil (hexane extract).

Capacity ml	Capacity ml / mg	PK	Cat. No.
3	500 / 500	50	**6.901 798**
3	500 / 500	250	**4.003 513**

BIGpack: 4.003 513

E & OE.

PCBs from waste oil

Column type:
CHROMABOND® SA/SiOH, 3 ml, 500/500 mg

Column conditioning: 1 ml *n*-hexane
Sample application:
apply 250 µl waste oil to the column and aspirate or force it into the adsorbent with 2 x 1 ml *n*-hexane

MN Appl. No. 301390

Elution: aspirate or force another 2 x 500 µl *n*-hexane through the column; collect all *n*-hexane fractions and if necessary adjust to a concentration suitable for subsequent analysis by either evaporting *n*-hexane in a stream of nitrogen or by dilution with *n*-hexane

Recovery rates:
PCB-28 97 %, PCB-52 96 %. PCB-101 95 %, PCB-138 90 %, PCB-153 95 %, PCB-180 96 %, PCB-209 100 %

1 Adsorbent CHROMABOND® Diamino

MACHEREY-NAGEL

Weight g	PK	Cat. No.
100	100	**4.003 688**
20	20	**4.003 689**

1



2 Accessories CHROMABOND® QuEchERS

MACHEREY-NAGEL

Type	PK	Cat. No.
50ml PP-centrifuge tube with crew cap	50	**4.003 552**

2



3 CHROMABOND® Flash cartridges for Biotage® systems

Product range designed for use in Flash systems of Biotage AB (Flash 12i™ and FlashMaster™) without additional connectors or capillaries.

MACHEREY-NAGEL

on request all column types listed below can be packed with any CHROMABOND® adsorbent (please note that other packings often result in differing adsorbent weights).
CHROMABOND® Flash RS columns for Teledyne Isco® systems (RS) on request.

3



Description	Column Length cm	Int. diam. mm	Capacity g	PK	Cat. No.
Flash FM 15/2 SiOH	9.0	15.80	2.0	50	**4.003 785**
Flash FM 25/5 SiOH	10.0	20.50	5.0	50	**4.003 792**
Flash FM 25/10 SiOH	10.0	20.50	10.0	50	**4.003 693**
Flash FM 70/10 SiOH	15.4	26.80	10.0	30	**4.003 787**
Flash FM 70/20 SiOH	15.4	26.80	20.0	30	**4.003 799**
Flash FM 70/25 SiOH	15.4	26.80	25.0	30	**4.003 793**
Flash FM 150/25 SiOH	17.0	38.20	25.0	20	**4.003 694**
Flash FM 150/50 SiOH	17.0	38.20	50.0	20	**4.003 789**
Flash FM 150/70 SiOH	17.0	38.20	70.0	10	**4.003 784**
Flash FM 15/2 C_{18} ec	9.0	15.80	2.0	50	**4.003 791**
Flash FM 25/5 C_{18} ec	10.0	20.50	5.0	20	**4.003 786**
Flash FM 70/10 C_{18} ec	15.4	26.80	10.0	20	**4.003 788**
Flash FM 150/50 C_{18} ec	17.0	38.20	50.0	10	**4.003 790**
Flash FM 70/10 NH_2	15.4	26.80	10.0	1	**4.003 731**
Flash FM 70/20 NH_2	15.4	26.80	20.0	1	**4.003 730**



1 CHROMABOND® vacuum manifolds and accessories

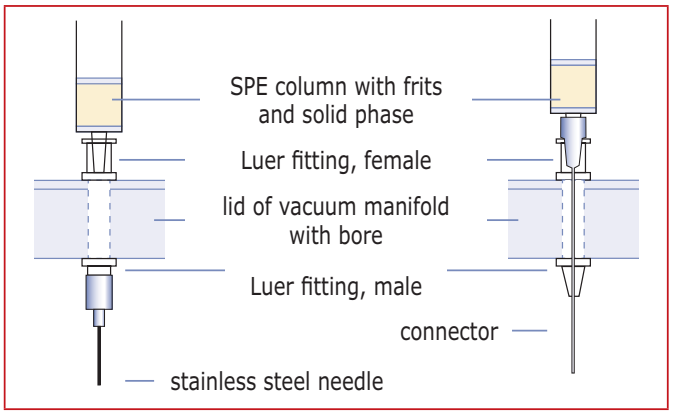
for simultaneous preparation of up to 12, 16 or 24 samples *MACHEREY-NAGEL*
replacement parts and accessories for special applications

Vacuum manifold complete consists of: glass cabinet with lid and lid gasket, removable needles on lower side of lid, vacuum gauge, control valve, valves and caps, variable rack.

Description	PK	Cat. No.
Vacuum manifold complete for up to 12 columns or cartridges (incl. reservoir tank)	1	**9.003 479**
Vacuum manifold complete for up to 16 columns or cartridges	1	**4.003 586**
Vacuum manifold complete for up to 24 columns or cartridges	1	**7.056 914**
Lids with gaskets for 12 columns (incl. Luer fittings and valves), plastic	1	**4.003 530**
Gaskets for lid with 12 positions (4.003 530, 9.003 479)	2	**6.801 608**
Luer fittings for lid, female	12	**4.003 534**
Luer fittings for lid, male	12	**4.003 535**
Valves, plastic	12	**7.089 161**
Stainless steel needles	12	**7.079 432**
Drying attachment for 12 columns	1	**4.003 536**
Products for protection from cross contamination valve, brass, tarnished	1	**4.003 538**
Products for protection from cross contamination valve as above	12	**7.089 162**
Products for protection from cross contamination stainless steel connectors	12	**7.079 431**
Tubing adaptor for 1,3 and 6 ml polypropylene columns (PTFE)	4	**6.900 713**

Protection from cross contamination

For special applications, which require maximum protection from cross contamination we supply chrome-plated brass valves and stainless steel or PTFE connectors, the application of which is shown below. These special connectors are fitted through the lid; thus the sample only has contact with the inert connector and not with the lid, directly flowing into the receptacle.



Drying attachment

If the eluate has to be evaporated, this can be performed with the so-called drying attachment (**11**, see below). This special lid has a gas connector on one side (**12**), from which the gas is fed simultaneously to the 12 or 24 stations (**13**). Thus 12 or 24 eluates can be evaporated simultaneously by just changing the lid and applying a stream of inert gas, e.g. nitrogen.



E & OE.



Syringe filters CHROMAFIL®

Sample clarification

Syringe filters are used for filtration of suspended matter from liquid samples or gases. With CHROMAFIL®, rapid purification and removal of particles is very simple: just place the filter on the syringe, and you are ready for filtration. Special manipulations are not required. Contamination of sensitive instrumentation by solid impurities can be avoided, thus increasing lifetime of chromatographic columns and equipment.

Advantages:

- **Polypropylene housing**
  considerably better solvent stability compared to acrylate and polystyrene filters, low content of extractable substances
- **Housing ultrasonically sealed, not glued**
  no extractable components from glues
- The special **thick rim** of the housing is ideal for use of the filters in laboratory robots (e.g. Benchmate™).
- **Filtration in both directions** possible, the liquid cannot bypass the membrane
- **Luer lock on side of entry**
  safe connection on the "high pressure" side
- **Luer exit**
  standard luer for 25 mm filters, minispike luer with low dead volume and small OD for 15 mm filters. Filter inlet and filter exit can be fitted to the CHROMABOND® columns for selective sample preparation with the aid of a special adaptor.
- **Deflector**
  the stream of liquid is broken and distributed, and does not directly hit the membrane: this prevents rupture of the membrane
- **Star-shaped distribution device**
  the liquid is evenly distributed to the whole membrane surface: this results in a better utilisation of the total area; the filter is not plugged up rapidly; high flow efficiency
- **Colour coded filters**
  filters with 0.2 µm pores have a yellow upper shell, that of filters with 0.45 µm pores is colourless; the different membrane types are distinguished by different colours of the lower shell
- Available **pore sizes** 0.2 and 0.45 µm (exceptions: PET filters with 1.2 µm, glass fibre filters with 1 µm, PES filters with 5 µm)
- **Filter sizes:** 25 and 15 mm diameter The small diameter filters are especially recommended for very small samples, which require extremely low dead volumes: 80 µl for 25 mm ∅, 12 µl for 15 mm ∅
- All filters can be **autoclaved** at **121 °C** and **1.1 bar** for 30 min.

Recommended filter size depending on sample volume

sample volume	recommended filter diameter
1 – 10 ml	15 mm
10 – 100 ml	25 mm



CHROMAFIL® BIG-BOXES

- 400 (25 mm) or 800 (15 mm) quality syringe filters
- food safe PE box with screw cap
- economical price

Depending on your filtration task you can choose filter membranes made from different materials:

Material
Polyester (PET) with or without glass fibre prefilter
Regenerated cellulose (RC)
Teflon® (PTFE)
Cellulose mixed esters (MV)
Cellulose acetate (CA) · sterile and non-sterile
Polyamide / Nylon (PA)
Polyethersulfone (PES) · sterile
Polyvinylidene difluoride (PVDF) with or without glass fibre prefilter
Glass fibre (GF)

Chemical compatibility of filter materials

The following table lists the chemical compatibility of our CHROMAFIL® materials. The chemical compatibility depends on several parameters such as time, pressure, temperature and concentration.

In most cases, CHROMAFIL® filters will have only short contact with a solvent. In these cases they may be used despite of limited compatibility.

For example, a PTFE filter with PP housing does not liberate any UV-detectable substances during filtration of 5 ml THF, although PP shows only limited resistance towards THF.

Solvent	Material									
	MV	CA	RC	PA	PTFE	PVDF	PES	PET	GF	PP
Acetaldehyde	⊖	⊖	⊕	○	⊕	⊕		⊕	⊕	○
Acetic acid, 100 %	⊖	⊖	⊖	⊖	⊕	⊕	⊕	⊕	⊕	⊕
Acetone	⊖	⊖	⊕	⊕	⊕	⊖	⊖	⊕	⊕	⊕
Acetonitrile	⊖	⊖	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Ammonia, 25 %	⊖	⊖	○	⊖	⊕	⊕	⊕	○	⊕	⊕
Benzene	⊕	⊕	⊕	⊕	⊕	○		⊕	⊕	○
n–Butanol	⊕	⊕	⊕	○	⊕	⊕	⊕	⊕	⊕	⊕
Cyclohexane	⊕	⊕	⊕	○	⊕	⊕	⊕	⊕	⊕	⊕
Dichloromethane	⊕	⊖	⊕	⊖	⊕	⊕	⊖	⊕	⊕	⊖
Diethyl ether	○	○	⊕	⊕	⊕	⊕	⊕	⊕	⊕	○
Dimethylformamide	⊖	⊖	○	⊕	⊕	⊖	⊖	⊕	⊕	⊕
1,4–Dioxane	⊖	⊖	⊕	⊕	⊕	○	⊖	⊕	⊕	○
Ethanol	⊖	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Ethyl acetate	⊖	⊖	⊕	⊕	⊕	⊕	⊕	⊕	⊕	○
Ethylene glycol	○	○	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Formic acid, 100 %	⊕	⊖	○	⊖	⊕	⊕	⊕	○	⊕	⊕
Hydrochloric acid, 30 %	⊖	⊖	⊖	⊖	⊕	⊕	⊕	⊖	⊕	⊕
Methanol	⊖	⊖	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Nitric acid, 65 %	⊖	⊖	⊖	⊖	○	○		○	⊕	⊖
Oxalic acid, 10 % aqueous	⊕	⊖	⊕	⊖	⊕	⊕		⊕	⊕	⊕
Petroleum ether	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Phosphoric acid, 80 %	⊖	⊖	○	⊖	⊕	○		⊕	⊕	⊕
Potassium hydroxide, 1 mol/l	⊖	⊖	○	⊕	⊕	○	⊕	○	⊕	⊕
2–Propanol	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Sodium hydroxide, 1 mol/l	⊖	⊖	○	⊕	⊕	○	○	○	○	⊕
Tetrachloromethane	⊕	⊖	⊕	⊕	⊕	○		⊕	⊕	○
Tetrahydrofuran	⊖	⊖	⊕	○	⊕	⊕	⊖	⊕	⊕	○
Toluene	⊕	⊖	⊕	⊕	⊕	⊕	⊕	⊕	⊕	○
Trichloroethene	⊕	⊕	⊕	○	⊕	⊕		⊕	⊕	○
Trichloromethane	⊕	⊖	⊕	⊖	⊕	⊕	⊖	⊕	⊕	⊖
Urea	⊕	⊕	⊕	⊕	⊕	⊕		⊕	⊕	⊕
Water	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Xylene	⊕	⊕	⊕	⊕	⊕	○		⊕	⊕	○

Data not guaranteed. ⊕ resistant, ⊖ not resistant, ○ limited resistance

MV = cellulose mixed esters, CA = cellulose acetate, RC = regenerated cellulose, PA = polyamide, PTFE = polytetrafluoroethylene (Teflon), PVDF = polyvinylidene difluoride, PES = polyethersulfone, PET = polyester, GF = glass fibre, PP = polypropylene (housing material)

E & OE.

LLG-Syringe Filters

We offer a line of syringe filters especially designed to provide efficient filtration of a broad variety of fluids, solvents, aqueous or inorganic solutions. Our syringe filters cover most applications in HPLC, pharmaceutical, environmental, biotechnology and food and beverage testing laboratories.

- Housing injected in Polypropylene or MABS
- Multifunctional Syringe filters equipped with Female Luer-Lock/Male Luer Lock or Male Luer Slip connections for different applications
- Pre-sterilised or non-sterile
- Sterile products in individual hard blister
- Superior pressure stability
- Easy to identify because of colour code and printed description

LLG-Syringe Filters, non sterile

Membrane	Pore size µm	Housing	Diam. mm	PK	Cat. No.
CA	0.20	Acrylic, blue	13	500	**9.055 500** 1
CA	0.20	Acrylic, blue	25	500	**9.055 501**
CA	0.45	Acrylic, yellow	13	500	**9.055 502**
CA	0.45	Acrylic, yellow	25	500	**9.055 503** 2
CA	0.80	Acrylic, green	13	500	**9.055 504**
CA	0.80	Acrylic, green	25	500	**7.970 389**
Nylon	0.20	PP	13	500	**9.055 520** 3
Nylon	0.20	PP	25	500	**9.055 521**
Nylon	0.45	PP	13	500	**9.055 522**
Nylon	0.45	PP	25	500	**9.055 523**
RC	0.20	PP	13	500	**9.055 530** 4
RC	0.20	PP	25	500	**9.055 531**
RC	0.45	PP	13	500	**9.055 532**
RC	0.45	PP	25	500	**9.055 533**
PE	0.20	PP	13	500	**9.055 540**
PE	0.20	PP	25	500	**9.055 541** 5
PE	0.50	PP	13	500	**9.055 542**
PE	0.50	PP	25	500	**9.055 543**
PTFE	0.20	PP	13	500	**7.970 402**
PTFE	0.20	PP	25	500	**9.055 535**
PTFE	0.45	PP	13	500	**7.970 385**
PTFE	0.45	PP	25	500	**6.255 331**
PES	0.20	Acrylic	13	500	**9.055 524**
PES	0.20	Acrylic	25	500	**9.055 525**
PES	0.45	Acrylic	13	500	**9.055 526**
PES	0.45	Acrylic	25	500	**7.970 213**
PVDF	0.20	PP	13	500	**7.970 258**
PVDF	0.20	PP	25	500	**7.970 387**
PVDF	0.45	PP	13	500	**9.055 534**
PVDF	0.45	PP	25	500	**7.970 286**
GF	0.70	PP	25	500	**9.055 550**
GF	1.00	PP	25	500	**9.055 551**
GF	1.20	PP	25	500	**9.055 552**
GF	3.10	PP	25	500	**9.055 553**

1



9.055 500

2



9.055 503

3



9.055 520

4



9.055 530

5



9.055 541

6 7 LLG-Syringe Filters, CA, sterile

Membrane	Pore size µm	Diam. mm	Colour	PK	Cat. No.
CA	0.20	13	blue	50	**9.055 510**
CA	0.20	25	blue	50	**9.055 511**
CA	0.45	13	yellow	50	**9.055 512**
CA	0.45	25	yellow	50	**9.055 513**

6



7



Disposable syringes please see page 1406.

Syringe filters CHROMAFIL®

CHROMAFIL® Xtra *MACHEREY-NAGEL*

labelled for method validation and cerification

Xtra: imprint for direct identification of membrane type, diameter and pore size
Xtra: low bleeding polypropylene housing
Xtra: colour-free plain polypropylene

CHROMAFIL® syringe filters with polyester (PET) membrane

hydrophilic multipurpose membrane *MACHEREY-NAGEL*

For polar as well as non-polar solvents. The HPLC filter, especially suited for mixtures of water and organic solvents; for TOC/DOC determination; not cytotoxic, does not inhibit the growth of microorganisms and higher cells.

Polyester filter with integrated glass fibre prefilter (GF/PET): recommended for solutions with a high load of particulate matter or for highly viscous solutions.

Type	Pore size µm	Membrane dia. mm	Housing colour top	Housing colour base	PK	Cat. No.
PET-20/25	0.20	25	labelled		100	**4.003 417**
PET-45/25	0.45	25	labelled		100	**6.232 548**
PET-120/25	1.20	25	labelled		100	**6.232 549**
PET-20/25	0.20	25	labelled		400	**4.003 418**
PET-45/25	0.45	25	labelled		400	**4.003 416**
PET-120/25	1.20	25	labelled		400	**6.233 172**
PET-20/15 MS*	0.20	15	yellow	orange	800	**4.003 397**
PET-45/15 MS*	0.45	15	colourless	orange	800	**4.003 398**
GF/PET-20/25	1.0/0.20	25	blue	orange	100	**9.049 079**
GF/PET-45/25	1.0/0.45	25	black	orange	100	**9.049 080**
GF/PET-20/25	1.0/0.20	25	blue	orange	400	**9.049 020**
GF/PET-45/25	1.0/0.45	25	black	orange	400	**9.049 021**

MS = minispike on filter exit
CHROMAFIL® Xtra: 4.003 417/6.232 548/6.232 549/4.003 418/4.003 416/6.233 172
BIG-BOX: 4.003 418/4.003 416/6.233 172/4.003 397/4.003 398/9.049 020/9.049 021
*also available as small pack with 100 pieces

1



1 CHROMAFIL® syringe filters with regenerated cellulose (RC) membrane

hydrophilic membrane with very low adsorption *MACHEREY-NAGEL*

for aqueous and organic/aqueous liquids i.e. polar and medium polar sample solutions. Binding capacity for proteins 84µg/25mm filter.

Type	Pore size µm	Membrane dia. mm	Housing colour top	Housing colour base	PK	Cat. No.
RC-20/25	0.20	25	labelled		100	**4.003 424**
RC-45/25	0.45	25	labelled		100	**4.003 426**
RC-20/25	0.20	25	labelled		400	**4.003 425**
RC-45/25	0.45	25	labelled		400	**6.233 891**
RC-20/15 MS	0.20	15	yellow	blue	100	**9.049 025**
RC-20/15 MS	0.20	15	yellow	blue	800	**4.003 399**
RC-45/15 MS	0.45	15	colourless	blue	100	**9.049 026**
RC-45/15 MS	0.45	15	colourless	blue	800	**4.003 400**

MS = minispike on filter exit
BIG-BOX: 4.003 425/6.233 891/4.003 399/4.003 400
CHROMAFIL® Xtra: 4.003 424/4.003 426/4.003 425/6.233 891

For more syringe Filters please see page 1421.



E & OE.

1 CHROMAFIL® PTFE (Polytetrafluorethylene)

hydrophobic membrane *MACHEREY-NAGEL*

for nonpolar liquids and gases very resistant towards all kinds of solvents as well as acids and bases flushing with alcohol, followed by water, makes the originally hydrophobic membrane more hydrophilic.



Type	Pore size µm	Membrane dia. mm	Housing colour top	Housing colour base	PK	Cat. No.
PTFE-20/25	0.20	25	labelled		100	**4.003 409**
PTFE-45/25	0.45	25	labelled		100	**9.049 059**
PTFE-20/25	0.20	25	labelled		400	**4.003 410**
PTFE-45/25	0.45	25	labelled		400	**9.049 060**
O-20/3	0.20	3	natural	natural	100	**9.049 053**
O-45/3	0.45	3	natural	natural	100	**9.049 054**
O-20/15 MS	0.20	15	yellow	natural	100	**9.049 055**
O-45/15 MS	0.45	15	natural	natural	100	**9.049 056**
O-20/15 MS	0.20	15	yellow	natural	800	**4.003 394**
O-45/15 MS	0.45	15	natural	natural	800	**4.003 395**

MS = minispike on filter exit
BIG-BOX: 4.003 410/9.049 060/4.003 394/4.003 395
CHROMAFIL® Xtra: 4.003 409/9.049 059/4.003 410/9.049 060

2 CHROMAFIL® MV (cellulose mixed membrane)

Hydrophilic membrane *MACHEREY-NAGEL*
- for aqueous or polar solutions
- CHROMAFIL® Xtra



Type	Pore size µm	Membrane dia. mm	PK	Cat. No.
MV-20/25	0.20	25	100	**4.003 407**
MV-45/25	0.45	25	100	**4.003 405**
MV-20/25	0.20	25	400	**4.003 408**
MV-45/25	0.45	25	400	**4.003 406**

BIG-BOX: 4.003 408/4.003 406

3 CHROMAFIL® CA (cellulose acetate)

hydrophilic membrane *MACHEREY-NAGEL*

For filtration of water-soluble oligomers and polymers, especially suited for biological macromolecules. Very high shape stability in aqueous solutions extremely low binding capacity for proteins (21µg/ 25mm filter).

Available in a sterile package (S) for filtration under sterile conditions (each filter individually sealed).



Type	Pore size µm	Membrane dia. mm	Housing colour top	Housing colour base	PK	Cat. No.
CA-20/25	0.20	25	labelled		100	**4.003 419**
CA-45/25	0.45	25	labelled		100	**4.003 421**
CA-20/25	0.20	25	labelled		400	**4.003 420**
CA-45/25	0.45	25	labelled		400	**4.003 422**
CA-20/25 S*	0.20	25	yellow	red	50	**9.049 036**
CA-45/25 S*	0.45	25	natural	red	50	**9.049 037**

BIG-BOX: 4.003 420/4.003 422
*sterile pack
CHROMAFIL® Xtra: 4.003 419/4.003 421/4.003 420/4.003 422

4 CHROMAFIL® PA (Polyamide = Nylon)

rather hydrophilic membrane *MACHEREY-NAGEL*

for aqueous and organic/aqueous medium polar liquids



Type	Pore size µm	Membrane dia. mm	Housing colour top	Housing colour base	PK	Cat. No.
PA-20/25	0.20	25	labelled		100	**4.003 411**
PA-45/25	0.45	25	labelled		100	**6.232 389**
PA-20/25	0.20	25	labelled		400	**4.003 412**
PA-45/25	0.45	25	labelled		400	**6.234 011**
AO-20/3	0.20	3	light beige	light beige	100	**9.049 047**
AO-45/3	0.45	3	light beige	light beige	100	**9.049 048**

BIG-BOX: 4.003 412/6.234 011
CHROMAFIL® Xtra: 4.003 411/6.232 389/4.003 412/6.234 011

1



1 CHROMAFIL® Polyvinylidene difluoride (PVDF)

hydrophilic membrane *MACHEREY-NAGEL*

for polar and nonpolar solutions, water-soluble oligomers and polymers like proteins
binding capacity for proteins 82µg/25mm filter. The PVDF filter with integrated glass fibre prefilter (GF/P) is recommended for filtration of biological samples with high particle loads. This filter features a high binding capacity for proteins. Also suited for filtration of polar and non-polar solutions.

Type	Pore size µm	Membrane dia. mm	Housing colour top	Housing colour base	PK	Cat. No.
PVDF-20/25	0,20	25	labelled		100	**4.003 413**
PVDF-45/25	0,45	25	labelled		100	**9.049 063**
PVDF-20/25	0,20	25	labelled		400	**4.003 414**
PVDF-45/25	0,45	25	labelled		400	**4.003 415**
GF/P-45/25	1,0/0,45	25	black	white	400	**4.003 402**
GF/P-45/25	1,0/0,45	25	black	white	100	**4.003 401**

CHROMAFIL® Xtra: 4.003 413/9.049 063/4.003 414/4.003 415 BIG-BOX: 4.003 414/4.003 402/4.003 415

2



2 CHROMAFIL® Glass fibre (GF)

inert filter *MACHEREY-NAGEL*

nominal pore size 1µm, allows higher flow rates than smaller pore filters; for solutions
with high loads of particulate matter or for highly viscous solutions (e. g. soil samples, fermentation broths) as prefilters for other CHROMAFIL® filters, they prevent plugging of the membrane.

Type	Pore size µm	Membrane dia. mm	Housing colour top	Housing colour base	PK	Cat. No.
GF- 100/25	nom. 1.0	25	labelled		100	**6.232 362**
GF- 100/25	nom. 1.0	25	labelled		400	**4.003 423**
GF- 100/15 MS	nom. 1.0	15	blue	natural	100	**9.049 077**

MS = minispike on filter exit CHROMAFIL® Xtra: 6.232 362/4.003 423 BIG-BOX: 4.003 423

3



3 Syringe filters, disposable, Spartan® range

GE Healthcare

Versatile use - ready-to-use filter units with a hydrophilic,
low protein-binding membrane made of regenerated cellulose.
First class chemical resistance against the usual aqueous
and organic HPLC solvents
- Spartan® 13 and 30 are tested and certified for UV adsorbance
substances at wavelengths of 210nm and 254nm with water, methanol and acetonitrile;
- Spartan® 13 has an extremely low hold up volume; <10µl, for optimal filtration

Applications:
Ideal for HPLC sample preparation to achieve reproducible results. Carefully controlled manufacture guarantees lowest traces of UV- absorbing, extractable components.

Type	Diam. mm	Pore size µm	Connection in / out	PK	Cat. No.
13 RC	13	0.20	LLF/LM	100	**9.049 948**
13 RC	13	0.20	LLF/LM	500	**9.049 980**
13 RC	13	0.20	LLF/Mini-Tip	100	**9.049 943**
13 RC	13	0.20	LLF/Mini-Tip	500	**9.049 951**
13 RC	13	0.45	LLF/LM	100	**9.049 949**
13 RC	13	0.45	LLF/Mini-Tip	100	**9.049 944**
13 RC	13	0.45	LLF/Mini-Tip	500	**9.049 950**
30 RC	30	0.20	LLF/LM	100	**9.049 941**
30 RC	30	0.20	LLF/LM	500	**9.049 965**
30 RC	30	0.45	LLF/LM	50	**9.049 960**
30 RC	30	0.45	LLF/LM	100	**9.049 942**
30 RC	30	0.45	LLF/LM	500	**9.049 959**

LLF = luer-lock female
LM = luer male

For more syringe Filters please see page 1421.

E & OE.

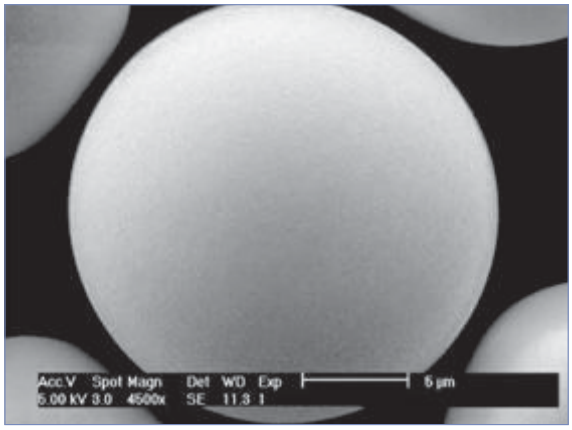
NUCLEODUR® high purity silica for HPLC

NUCLEODUR® is a fully synthetical type B silica (silica of 3rd generation) offering highly advanced physical properties like **totally spherical** particle shape, outstanding **surface microstructure**, high **pressure stability** and **low metal content**.

NUCLEODUR® as a state-of-the-art silica is the ideal base material for modern HPLC phases. It is the result of MACHEREY-NAGEL's pioneering research in chromatography for more than 40 years and succeeds MN's famous NUCLEOSIL® silica.

In RP liquid chromatography the efficiency of the packing is strongly affected by the quality of the base silica itself. Shortcomings in the surface geometry of the particles or metal contaminants are the main reasons for inadequate coverage with the covalently bonded alkylsilanes in the subsequent derivatization steps. It is well known, that poor surface coverage and, in consequence, high activity of residual free silanols often results in peak tailing or adsorption, particularly with basic compounds.

Particle shape and surface symmetry



NUCLEODUR® silicas are synthesized in a unique and carefully controlled manufacturing process which provides silica particles, which are totally spherical. The picture shows the outstanding smoothness of the NUCLEODUR® surface.

Purity

As already mentioned above, a highly pure silica is required for achieving symmetric peak shapes and maximum resolution. Inclusions of e.g. iron or alkaline earth metal ions on the silica surface are largely responsible for the unwanted interactions with ionizable analytes, e.g. amines or phenolic compounds.

NUCLEODUR® is virtually free of metal impurities and low acidic surface silanols. Elemental analysis data of NUCLEODUR® 5 µm measured by AAS are listed below.

Elementary analysis (metal ions) of NUCLEODUR® 100-5

Aluminium	<	5	ppm
Iron	<	5	ppm
Sodium	<	5	ppm
Calcium	<	10	ppm
Titanium	<	1	ppm
Zirconium	<	1	ppm
Arsenic	<	0.5	ppm
Mercury	<	0.05	ppm

Pressure stability

The totally spherical and 100% synthetic silica gel exhibits an outstanding mechanical stability, even at high pressures up to 800 bar and elevated eluent flow rates.

In addition, after several cycles of repeated packing, no significant drop in pressure can be observed. The latter is of prime importance for preparative and process-scale applications.

Physical properties of NUCLEODUR®

Surface (BET)	340 m^2/g
Pore size	110 Å
Pore volume	0.9 ml/g

NUCLEODUR® modifications

Several different surface modifications based on NUCLEODUR® silica have been developed over the last years providing a full range of specified HPLC phases and an ideal tool for every separation:

- NUCLEODUR® C_{18} Gravity and C_8 Gravity
- NUCLEODUR® C_{18} Isis
- NUCLEODUR® C_{18} Pyramid
- NUCLEODUR® Sphinx RP
- NUCLEODUR® CN and CN-RP
- NUCLEODUR® NH_2 and NH_2-RP
- NUCLEODUR® C_{18} ec and C_8 ec

For important properties of NUCLEODUR® phases please see our summary.

Columns for HPLC



Overview of NUCLEODUR® HPLC phases

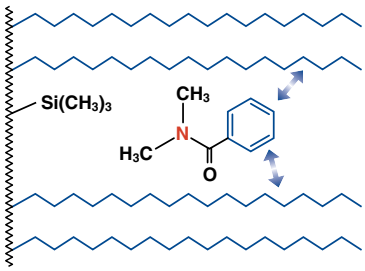
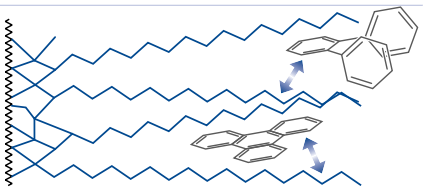
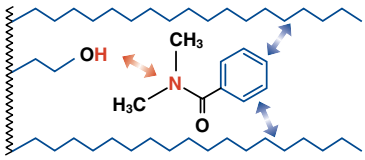
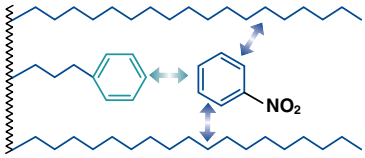
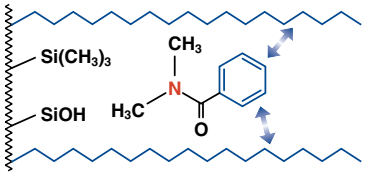
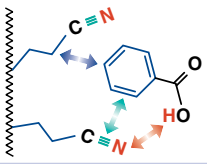
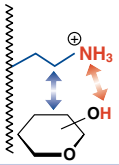
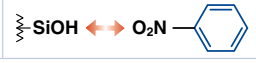
Columns for HPLC

Phase	Specification	Characteristics* A	B	C	Stability	Structure
C_{18} Gravity	octadecyl phase, high density coating multi-endcapping 18 % C · USP **L1**	⬢⬢⬢⬢⬢	◖	⬢⬢◖	pH stability 1 – 11, suited for LC/MS	NUCLEODUR® $(Si\text{-}O_2)_n$
C_8 Gravity	octyl phase, high density coating multi-endcapping 11 % C · USP **L7**	⬢⬢◖	⬢	⬢◖	pH stability 1 – 11, suited for LC/MS	NUCLEODUR® $(Si\text{-}O_2)_n$
C_{18} Isis	octadecyl phase with specially crosslinked surface modification endcapping 20 % C · USP **L1**	⬢⬢⬢⬢◖	⬢⬢	⬢⬢⬢⬢⬢	pH stability 1 – 10, suited for LC/MS	NUCLEODUR® $(Si\text{-}O_2)_n$
C_{18} Pyramid	C_{18} modification with polar endcapping 14 % C · USP **L1**	⬢⬢⬢⬢	⬢⬢◖	⬢⬢	stable in 100 % aqueous eluents without phase collapse, pH stability 1 – 9, suited for LC/MS	NUCLEODUR® $(Si\text{-}O_2)_n$ OH OH
Sphinx RP	bifunctional RP phase, balanced ratio of propyl-phenyl and C_{18} ligands; endcapping 15 % C; USP **L1** and **L11**	⬢⬢⬢	⬢⬢◖	⬢	pH stability 1 – 10, suited for LC/MS	NUCLEODUR® $(Si\text{-}O_2)_n$
C_{18} ec	octadecyl phase, medium density coating endcapping 17.5 % C · USP **L1**	⬢⬢⬢⬢	⬢	⬢⬢⬢◖	pH stability 1 – 9	NUCLEODUR® $(Si\text{-}O_2)_n$ Si–OH Si–O–$Si(CH_3)_3$
C_8 ec	octyl phase, medium density coating endcapping 10.5 % C · USP **L7**	⬢⬢	⬢◖	⬢⬢◖	pH stability 1 – 9	NUCLEODUR® $(Si\text{-}O_2)_n$ Si–OH Si–O–$Si(CH_3)_3$
CN / CN-RP	cyano (nitrile) phase for NP and RP separations 7 % C · USP **L10**	⬢	⬢⬢⬢⬢	–	pH stability 1 – 8, suited for mobile phases with high contents of water	NUCLEODUR® $(Si\text{-}O_2)_n$ C≡N Si–OH C≡N Si–O–$Si(CH_3)_3$
NH_2 / NH_2-RP	amino phase for NP and RP separations 2.5 % C · USP **L8**	⬢	⬢⬢⬢⬢	–	pH stability 2 – 8, suited for mobile phases with high contents of water	NUCLEODUR® $(Si\text{-}O_2)_n$ NH_2 Si–OH NH_2 Si–OH
SiOH	unmodified USP **L3**	–	n.a.	–	pH stability 2 – 8	$(Si\text{-}O_2)_n$ Si–OH
	* A = hydrophobic selectivity, B = polar / ionic selectivity, C = steric selectivity					

E & OE.

An optimised phase for every separations



Application	Similar phases**	Separation principle · Retention mechanism	
in general compounds with ionizable functional groups such as basic pharmaceuticals and pesticides	**NUCLEOSIL® C_{18} HD** Waters Xterra® RP_{18} / MS C_{18}; Phenomenex Luna® C18 (2), Synergi™ und Max RP; Zorbax® Extend C18; Inertsil® ODS III; Purospher® RP-18, Star RP-18	**only hydrophobic interactions** (van der Waals interactions)	
like C_{18} Gravity, however generally shorter retention times for nonpolar compounds	**NUCLEOSIL® C_8 HD** Waters Xterra® RP_8 / MS C_8; Phenomenex Luna® C8; Zorbax® Eclipse; XDB-C8		
high steric selectivity, thus suited for separation of positional and structural isomers, planar / non-planar molecules	**NUCLEOSIL® C_{18} AB** Inertsil® ODS-P; YMC® Pro C18RS	steric interactions and **hydrophobic interactions**	
basic pharmaceutical ingredients, very polar compounds, organic acids	Phenomenex Aqua®; YMC® AQ; Waters Atlantis® dC18	**hydrophobic interactions** and **polar interactions** (H bonds)	
compounds with aromatic and multiple bond systems	no similar phases	**π-π interactions** and **hydrophobic interactions**	
robust C_{18} phase for routine analyses	**NUCLEOSIL® C_{18}** Spherisorb® ODS II; Hypersil® ODS; Waters Symmetry® C18; Inertsil® ODS II; Kromasil® C18; LiChrospher® RP 18	**only hydrophobic interactions** (van der Waals interactions) some residual silanol interactions	
robust C_8 phase for routine analyses	**NUCLEOSIL® C_8 ec / C_8** Spherisorb® C8; Hypersil® MOS; Waters Symmetry® C8; Kromasil® C8; LiChrospher® RP 8		
polar organic compounds (basic drugs, molecules containing π electron systems	**NUCLEOSIL® CN / CN-RP**	**π-π interactions**, **polar interactions** (H bonds), **hydrophobic interactions**	
sugars, sugar alcohols and other hydroxy compounds, DNA bases, polar compounds in general	**NUCLEOSIL® NH_2 / NH_2-RP**	**polar / ionic interactions**, **hydrophobic interactions**	
polar organic compounds in general	**unmodified NUCLEOSIL®**	**polar / ionic interactions**	

** phases which provide a similar selectivity based on chemical and physical properties

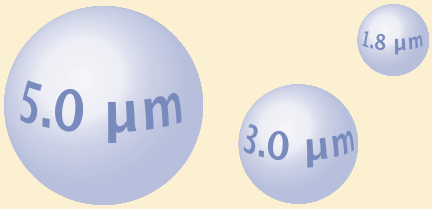
Columns for HPLC



Particle size and separation efficiency

1.8 µm particles for increased separation efficiency

- decrease of analysis time (ultra fast HPLC)
- shorter columns with high separation efficiency
- significant improvement of resolution
- increased detection sensitivity
- suitable for **LC/MS** due to low bleeding characteristics
- all NUCLEODUR® premium phases are available in 1.8 µm: C_{18} Gravity, C_8 Gravity, C_{18} Isis, C_{18} Pyramid, Sphinx RP
- NUCLEODUR® 1.8 µm particles are fractionated to limit the increase in back pressure



Now available: 1.8 µm particle size!

Features of 1.8 µm NUCLEODUR® silica particles

- **increase of separation efficiency by higher number of theoretical plates (N)**
- **significant improvement in resolution**
- **low column back pressure**

Comparison of back pressure:

Eluent: 100 % methanol
Flow rate: 1.5 ml/min
Temperature: 22 °C
Column dimension: 50 x 4.6 mm

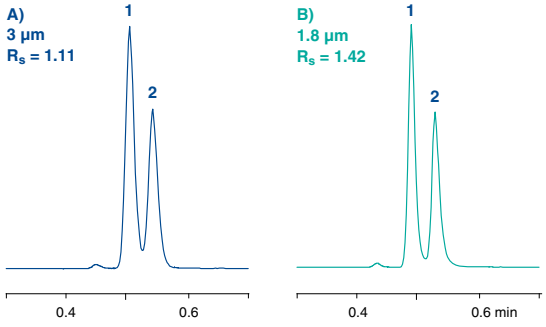
	NUCLEODUR® C_{18} Gravity	Competitor A
3 µm	70 bar	–
1.8 µm	130 bar	170 bar

- **shorter run times**

Resolution as a function of particle size

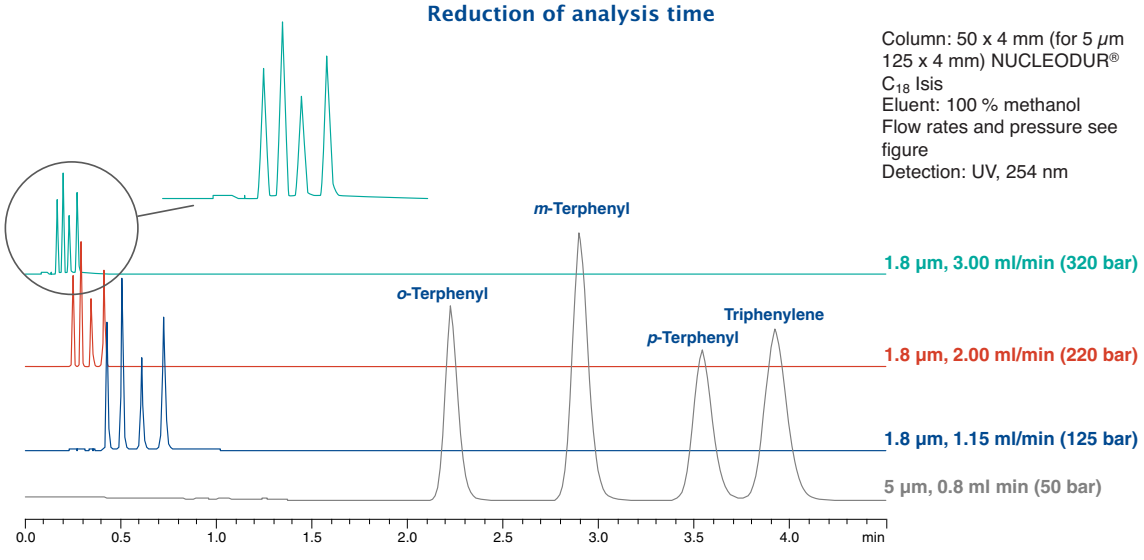
Column: 50 x 4 mm NUCLEODUR® C_{18} Gravity A) 3 µm, B) 1.8 µm
Eluent: acetonitrile – water (80:20, v/v)
Flow rate: 2 ml/min
Pressure: A) 80 bar, B) 160 bar
Detection: UV, 254 nm

Peaks:
1. Naphthalene
2. Ethylbenzene



Reduction of analysis time

Column: 50 x 4 mm (for 5 µm 125 x 4 mm) NUCLEODUR® C_{18} Isis
Eluent: 100 % methanol
Flow rates and pressure see figure
Detection: UV, 254 nm



Columns for HPLC

E & OE.

1 HPLC columns with NUCLEODUR® phases

1



NUCLEODUR® C18 - C 8 Gravity nonpolar high density phases *MACHEREY-NAGEL*

available as octadecyl (C18 -USP L!) and octyl (C8 - USP L7) modifications
Pore size 110 Å; particle sizes 1.8µm, 3µm and 5µm for C18, 1.8 and 5µm for C8
7, 10, 12 and 16µm particles for preparative separations on request
carbon content 18 %C for C18 , 11%C for C8
ideal for method development
allows HPLC at pH extremes (pH 1 - 11)
suitable for **LC/MS** due to low bleeding characteristics
recommended for overall sophisticated analytical separations
optimal for: pharmaceuticals, e.g. analgesics, antiinflammatory drugs, antidepressants; herbicides; phytopharmaceuticals; immunosppressants

EC analytical columns NUCLEODUR® C_8 Gravity, 1.8µm

particle size 1.8µm, 11% C *MACHEREY-NAGEL*

Int. dia. mm	Length mm	PK	Cat. No.
2.0	30	1	**4.004 563**
3.0	30	1	**4.004 564**
4.0	30	1	**4.004 565**
4.6	30	1	**4.004 566**
2.0	50	1	**4.004 559**
3.0	50	1	**4.004 560**
4.0	50	1	**4.004 561**
4.6	50	1	**4.004 562**

EC analytical columns NUCLEODUR® C18 Gravity, 1.8µm

particle size 1.8µm, 18% C *MACHEREY-NAGEL*

Int. dia. mm	Length mm	PK	Cat. No.
2.0	30	1	**4.004 392**
3.0	30	1	**4.004 393**
4.0	30	1	**4.004 394**
4.6	30	1	**4.004 395**
2.0	50	1	**4.004 396**
3.0	50	1	**4.004 397**
4.0	50	1	**4.004 398**
4.6	50	1	**4.004 399**

EC analytical columns NUCLEODUR® C18 Gravity, 3µm

particle size 3µm, 18% C. *MACHEREY-NAGEL*

Int. dia. mm	Length mm	PK	Cat. No.
2.0	50	1	**4.004 400**
3.0	50	1	**4.004 401**
4.0	50	1	**4.004 402**
4.6	50	1	**4.004 403**
2.0	125	1	**4.004 404**
3.0	125	1	**6.232 333**
4.0	125	1	**4.004 405**
4.6	125	1	**4.004 406**
2.0	150	1	**4.004 411**
3.0	150	1	**4.004 412**
4.0	150	1	**4.004 413**
4.6	150	1	**4.004 414**
2.0	250	1	**4.004 407**
3.0	250	1	**4.004 408**
4.0	250	1	**4.004 409**
4.6	250	1	**4.004 410**

Guard columns for EC columns NUCLEODUR® C18 Gravity, 3µm

MACHEREY-NAGEL

Type	PK	Cat. No.
for 2 and 3 mm i.d.	3	**4.004 624**
for 4 and 4.6 mm i.d.	3	**4.004 625**

Guard columns for EC columns require guard column adapter EC (Cat. No. 7.081 898)

1



1 VarioPrep preparative columns NUCLEODUR® C_{18} Gravity

Particle size 5µm, 18% C — *MACHEREY-NAGEL*

Int. diam. mm	Length mm	PK	Cat. No.
10	50	1	**4.004 773**
10	250	1	**4.004 775**
8*	10	2	**4.004 780**

*10 x 8mm ID VarioPrep guard columns require the VP guard column holder 8mm (4.002 176) and fit on 10mm ID VP columns.

NUCLEODUR® C18 Isis phase with high steric selectivity

MACHEREY-NAGEL

C18 phase with special polymeric, crosslinked surface modification - USP L1
pore size 110 Å, particle sizes 1.8µm, 3µm and 5µm; 20%C
high steric selectivity
outstanding surface deactivation
suitable for **LC/MS** due low bleeding characteristics
pH stability 1 - 10
broad range of application: steroids, (o,p,m-) substituted aromatics, fat-soluble vitamins

Surface modification

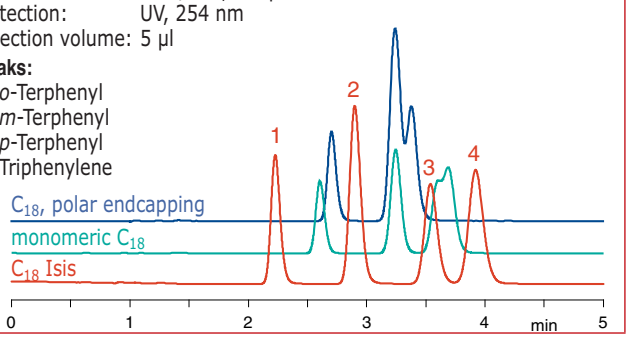
By use of specific C_{18} silanes and appropriate polymeric bonding technologies a dense shield of alkyl chains protects the subjacent silica matrix. Elemental analysis of NUCLEODUR® C_{18} Isis shows a carbon load of 20%.

The target crosslinking of the C_{18} chains on the surface enables the separation of compounds with similar molecular structure but different stereochemical properties. The technical term for this feature is steric selectivity.

Steric selectivity of NUCLEODUR® C_{18} Isis

Columns: 125 x 4 mm; **NUCLEODUR® C_{18} Isis**, **monomerically coated C_{18} phase**, **C_{18} phase with polar endcapping**
Eluent: methanol – water (90:10, v/v)
Flow rate: 1 ml/min, temperature 35 °C
Detection: UV, 254 nm
Injection volume: 5 µl

Peaks:
1. *o*-Terphenyl
2. *m*-Terphenyl
3. *p*-Terphenyl
4. Triphenylene

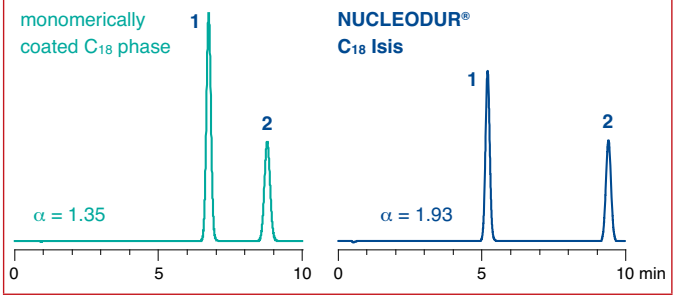


The separation of *o*-terphenyl and triphenylene is a concrete example to evaluate the selectivity potential of a reversed phase column in terms of the different shape of two molecules. The phenyl rings of *o*-terphenyl are twisted out of plane while triphenylene has a planar geometry.

The separation factor (α value) is a measure for the steric selectivity. As is shown in the following chromatograms the α value is considerable larger on NUCLEODUR® C_{18} Isis compared to a conventional C_{18} column.

Steric selectivity of NUCLEODUR® C_{18} Isis

Columns 125 x 4 mm; eluent methanol – water (80:20, v/v)
Flow rate: 1 ml/min, temperature 40 °C
Detection: UV, 254 nm, injection volume 1 µl
Peaks: 1. *o*-Terphenyl, 2. Triphenylene



EC analytical columns NUCLEODUR® C18 Isis, 1.8µm

particle size 1.8µm, 20% C — *MACHEREY-NAGEL*

Int. dia. mm	Length mm	PK	Cat. No.
2.0	30	1	**4.004 501**
3.0	30	1	**4.004 502**
4.0	30	1	**4.004 503**
4.6	30	1	**4.004 504**
2.0	50	1	**4.004 497**
3.0	50	1	**4.004 498**
4.0	50	1	**4.004 499**
4.6	50	1	**4.004 500**
2.0	100	1	**4.006 019**

E & OE.

1 NUCLEODUR® C18 Pyramid phase for highly aqueous eluents

1



stabel in 100 % aqueous eluent systems- USP L1 *MACHEREY-NAGEL*
pore size 110 Å, particle sizes 1.8µm, 3µm and 5µm; 14 % C
7 and 10µm particles for preparative separations on request
interesting polar selectivity features
excellent base deactivation; suitable for **LC/MS** due low bleeding characteristics
pH stability 1 - 9
Ideal for: analgesics, penicillin antibiotics, nucleic acid bases, water-soluble vitamins, complexing agetns, organic acids

RP HPLC with highly aqueous eluents

Conventional reversed phase columns often display stability problems in eluent systems with high percentage of water (> 95%) as evidenced by a sudden decrease of retention time and overall poor reproducibility. This phenomenon is described as phase collapse caused by the mobile phase expelled from the pores due to the fact, that hydrophobic RP phases are incompletely wetted with the mobile phase.

Different approaches can be used to increase column stability with highly aqueous mobile phase systems. The most promising concepts are incorporating a polar group in the hydrophobic alkyl chain, or using hydrophilic endcapping procedures to improve the wettability of the reversed phase modification.

Stability features

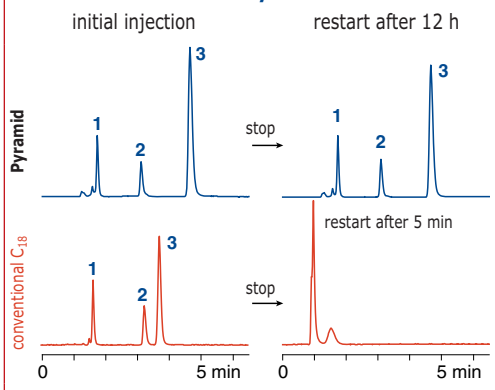
NUCLEODUR® C_{18} Pyramid is a silica phase with hydrophilic endcapping, designed especially for use in eluent systems of up to 100% water. The stability test shows the retention behaviour of tartaric, acetic and maleic acid under purely aqueous conditions on NUCLEODUR® C_{18} Pyramid in comparison with a conventionally bonded RP phase.

It can be shown that the retention times for NUCLEODUR® C_{18} Pyramid remain nearly unchanged between initial injection and restart after the flow has been stopped for 12 hours, whilst the performance of the conventional RP column collapsed totally after 5 min.

Retention characteristics

The polar surface derivatization exhibits retention characteristics, which differentiate the "Pyramid" from conventional C_{18} stationary phases. The chromatogram at right shows the improved retention behaviour of very polar compounds such as short chain organic acids, which are insufficiently retained on RP columns with predominantly hydrophobic surface properties.

Stability test

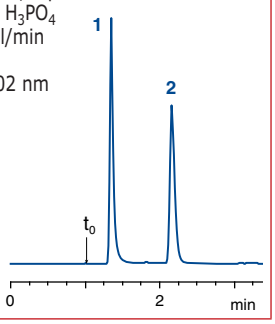


both columns 125 x 4 mm ID; 50 mM KH_2PO_4 pH 2.5, 0.7 ml/min; 25 °C; UV, 210 nm; injection volume 1 µl
Peaks: 1. tartaric acid, 2. acetic acid, 3. maleic acid
MN Appl. No. 120870

Separation of very polar compounds

Column:	125 x 4 mm NUCLEODUR® C_{18} Pyramid, 5 µm
Eluent:	0.2 % H_3PO_4
Flow rate:	1,0 ml/min
Temperature:	22 °C
Detection:	UV, 202 nm
Injection volume:	2 µl

Peaks:
1. Formic acid
2. Acetic acid



MN Appl. No. 119170

EC analytical columns NUCLEODUR® C18 Pyramid, 1.8µm

particle size 1.8µm, 14% C. *MACHEREY-NAGEL*

Int. dia. mm	Length mm	PK	Cat. No.
2.0	30	1	**4.004 473**
3.0	30	1	**4.004 474**
4.0	30	1	**4.004 475**
4.6	30	1	**4.004 476**
2.0	50	1	**4.004 477**
3.0	50	1	**4.004 478**
4.0	50	1	**4.004 479**
4.6	50	1	**4.004 480**

1



1 EC analytical columns NUCLEODUR® C18 Pyramid, 3µm

particle size 3µm, 14% C — *MACHEREY-NAGEL*

Int. dia. mm	Length mm	PK	Cat. No.
2.0	50	1	**4.004 469**
3.0	50	1	**4.004 470**
4.0	50	1	**4.004 471**
4.6	50	1	**4.004 472**
2.0	125	1	**4.004 458**
3.0	125	1	**4.004 459**
4.0	125	1	**4.004 460**
4.6	125	1	**6.232 796**
2.0	150	1	**4.004 461**
3.0	150	1	**4.004 462**
4.0	150	1	**4.004 463**
4.6	150	1	**4.004 464**
2.0	250	1	**4.004 465**
3.0	250	1	**4.004 466**
4.0	250	1	**4.004 467**
4.6	250	1	**4.004 468**

Guard columns for EC columns NUCLEODUR® C18 Pyramid, 3µm

MACHEREY-NAGEL

Type	PK	Cat. No.
for 2 and 3 mm i.d.	3	**4.004 739**
for 4 and 4,6 mm i.d.	3	**4.004 740**

Guard columns for EC columns require guard column adapter EC (Cat. No. 7.081 898)

partner of the LLG Lab Logistics Group

We can **supply** this **manufacturer's whole product range !**

MN

NUCLEODUR® Sphinx RP bifunctional RP phase

distinct selectivity based on bifunctional surface coverage - USP L1 and USP L11 *MACHEREY-NAGEL*
pore size 110 Å, particle sizes 1.8µm, 3µm and 5µm; 14 %C
high density of covalently bonded silanes for tailing-free peaks widens the scope for method development
pH stability 1 - 10
suitable for **LC/MS** due low bleeding characteristics
high reproducibility and consistent quality due to tight QC procedures
range of application: quinolone antibiotics, sulfonamides, xanthines, substituted aromatics

Alternative RP selectivity

NUCLEODUR® Sphinx RP is characterized by exceptional selectivity features generated by a well-balanced ratio of covalently bonded octadecyl and phenyl groups. The combination of classical hydrophobic with π–π interactions (aromatic ring system) expands the scope of selectivity in comparison with conventional reversed phase packings. NUCLEODUR® Sphinx RP is particularly suited for the separation of molecules containing aromatic and multiple bonds. For the separation of polar compounds NUCLEODUR® Sphinx RP can be especially recommended and can also outperform many customary C_{18} phases.

In addition, exhaustive endcapping steps minimize unwanted surface silanol activity and guarantee excellent peak shapes even for strongly basic analytes.

Different from standard phenyl phases, NUCLEODUR® Sphinx RP is far more stable towards hydrolysis and is also suggested for LC/MS applications.

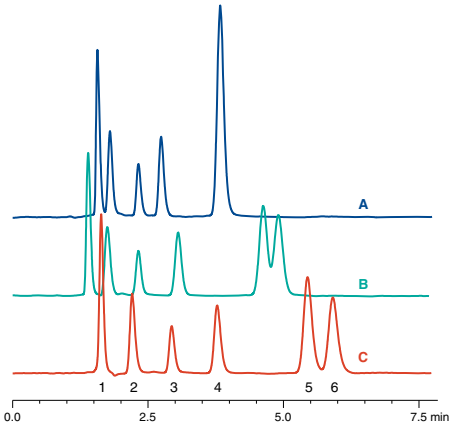
Due to the additional intermolecular interactions NUCLEODUR® Sphinx RP is an interesting replenishment to the high density bonded phases NUCLEODUR® C_8/C_{18} Gravity and the polar endcapped NUCLEODUR® C_{18} Pyramid.

Separation of flavonoids on 3 different NUCLEODUR® phases

Columns: 150 x 4.6 mm
A) NUCLEODUR® C_8 Gravity, 5 µm
B) NUCLEODUR® C_{18} Gravity, 5 µm
C) NUCLEODUR® Sphinx RP, 5 µm
Eluent: water – methanol (40:60, v/v), 1 ml/min, 30 °C
Detection: UV, 270 nm; injection volume: 3 µl

Peaks:
1. Catechin, 2. Rutin, 3. Fisetin, 4. Quercetin
5. Kaempferol, 6. Isorhamnetin

MN Appl. No. 119830



EC analytical columns NUCLEODUR® Sphinx RP, 1.8µm

particle size 1.8µm, 14% C *MACHEREY-NAGEL*

Int. dia. mm	Length mm	PK	Cat. No.
2.0	30	1	**4.004 598**
3.0	30	1	**4.004 599**
4.0	30	1	**4.004 600**
4.6	30	1	**4.004 601**
2.0	50	1	**4.004 602**
3.0	50	1	**4.004 603**
4.0	50	1	**4.004 604**
4.6	50	1	**4.004 605**

NUCLEODUR® C_{18} ec - C_8 ec nonpolar phases for routine analyses

Available with medium density octadecyl (C18 - USP L1) and octyl (C8 - USP L7) modification pore size 110 Ä, particle sizes, 3µm and 5µm; 7µm, 10µm, 12µm, 16µm, 20µm, 30µm und 50µm for preparative separations on request for daily routine analysis and up-scaling for preparative HPLC, pH stability 1 - 9. Carbon content 17.5%C for C18 , 10.5%C for C8, high reproducibility from lot to lot for standard routine applications in reversed phase chromatography.

MACHEREY-NAGEL

NUCLEODUR® C_{18} ec for daily routine analysis and up-scaling in preparative HPLC

The efficiency of a separation is controlled by particle size and selectivity of the stationary phase. The exceptional surface coverage of monomeric bonded alkylsilanes, combined with an exhaustive endcapping, results in a surface with lowest silanol activity. This allows the tailing-free elution of polar compounds such as basic drugs. NUCLEODUR® C_{18} ec is also ideal for scale-up purposes.

Chemical stability

The utmost purity of the base silica and the exceptional silane bonding chemistry minimizes the risk of dissolution, or hydrolysis at pH extremes.

High loadability

Loadability, probably the most important feature for preparative LC, is determined by pore size, pore volume and surface area of the packing.

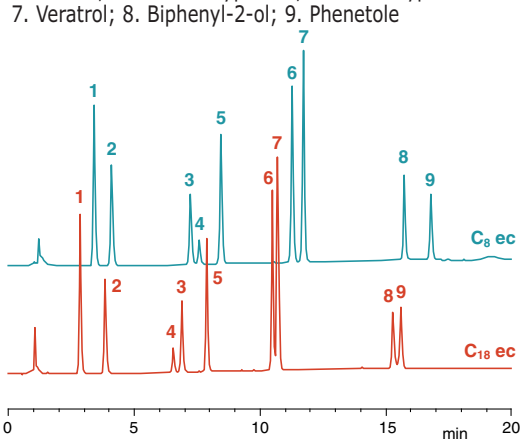
NUCLEODUR® octyl phases

Based on the same totally spherical and highly pure silica the C_8 phases exhibit the same excellent chemical and mechanical stability features as the C_{18} counterparts. Due to the shorter chain and less hydrophobic properties of the stationary phase the retention of nonpolar compounds is decreased, and in consequence a reduction in time of analysis can be achieved. Moreover a stronger polar selectivity, particularly with the separation of ionizable analytes is frequently observed (as distinct from the C_{18} phases).

Separation of phenols

Columns: 250 x 4 mm NUCLEODUR® 100-5 C_8 ec / C_{18} ec
Eluent: A) water, B) methanol
Gradient for C_8: 2 min 20 % B, then to 60 % B in 12 min; gradient for C_{18}: 2 min 25 % B, then to 65 % B in 12 min
Flow rate 1.0 ml/min, temperature 25 °C
Detection UV 275 nm, injection volume 10 µl

Peaks:
1. Resorcinol; 2. Pyrocatechol; 3. 4-Methoxyphenol
4. Phenol; 5. 2-Methoxyphenol; 6. 2-Ethoxyphenol
7. Veratrol; 8. Biphenyl-2-ol; 9. Phenetole



MN Appl. No. 120890/120891

Some general principles are:

- High density C_8 and C_{18} phases allow tailing-free elution even for very polar compounds
- Octyl phases (C_8) show superior polar selectivity
- Octadecyl phases (C_{18}) show superior hydrophobic selectivity
- Hydrophobic compounds show shorter retention times on C_8 phases

EC analytical columns NUCLEODUR® 100-3 C_8 ec, 3 µm

Octyl phases, 10.5% C, particle size 3µm.

MACHEREY-NAGEL

Int. dia. mm	Length mm	PK	Cat. No.
2.0	50	1	**4.004 388**
3.0	50	1	**4.004 389**
4.0	50	1	**4.004 390**
4.6	50	1	**4.004 391**
2.0	125	1	**4.004 379**
3.0	125	1	**4.004 380**
4.0	125	1	**4.004 381**
4.6	125	1	**4.004 382**
4.6	150	1	**4.004 383**
2.0	250	1	**4.004 384**
3.0	250	1	**4.004 385**
4.0	250	1	**4.004 386**
4.6	250	1	**4.004 387**

Guard columns for EC columns NUCLEODUR® 100-3 C8 ec, 3 µm

MACHEREY-NAGEL

Type	PK	Cat. No.
for 2 and 3 mm i.d.	3	**4.004 607**
for 4 and 4.6 mm i.d.	3	**4.004 608**

Guard columns for EC columns require guard column adapter EC (Cat. No. 7.081 898)

1 EC analytical columns NUCLEODUR® 100-3 C18 ec, 3 µm

Octadecyl phases, 17.5% C

MACHEREY-NAGEL

Int. dia. mm	Length mm	PK	Cat. No.
2.0	50	1	**4.004 375**
3.0	50	1	**4.004 376**
4.0	50	1	**4.004 377**
4.6	50	1	**4.004 378**
4.6	100	1	**4.006 933**
2.0	125	1	**9.003 796**
3.0	125	1	**9.003 797**
4.0	125	1	**9.003 798**
4.6	125	1	**9.003 799**
4.6	150	1	**9.003 800**
2.0	250	1	**9.003 801**
3.0	250	1	**9.003 802**
4.0	250	1	**9.003 803**
4.6	250	1	**9.003 804**

1



Guard columns for EC columns NUCLEODUR® 100-3 C18 ec, 3 qm

MACHEREY-NAGEL

Type	PK	Cat. No.
for 3 mm i.d.	3	**9.003 794**
for 4 mm i.d.	3	**9.003 795**

Guard columns for EC columns require guard column adapter EC (Cat. No. 7.081 898)



NUCLEODUR® CN/CN-RP cyano-modified high purity silica phase

MACHEREY-NAGEL

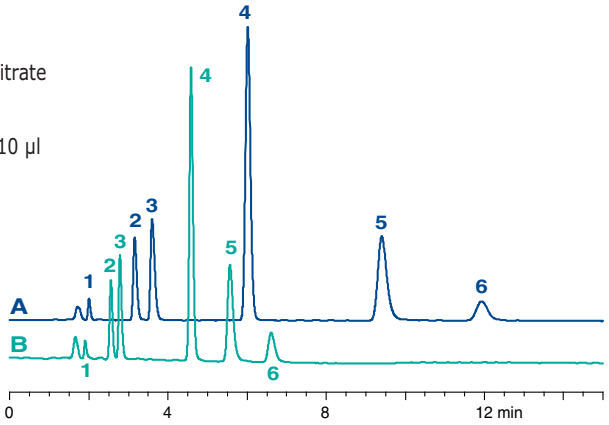
pore size 110 Å, particle sizes 3µm and 5µm; 7%C - USP L10
multi-mode columns (RP and NP)
widens the scope in selectivity
differnet retention characteristics compared to C8 and C18
stable against hydrolysis at low pH values, working range pH 1-8
high reproducibility from lot to lot
ideal for: tricyclic antidepressants, steroids, organic acids

Separation of cold medicine ingredients on two different NUCLEODUR® phases

Columns:
A) 250 x 4 mm NUCLEODUR® 100-5 C_{18} ec
B) 250 x 4 mm NUCLEODUR® 100-5 CN-RP
Eluent: acetonitrile – 100 mM sodium citrate pH 2.5 (15:85, v/v)
Flow rate: 1.0 ml/min, temperature 25 °C
Detection: UV, 270 nm, injection volume: 10 µl

Peaks:
1. Maleic acid
2. Norephedrine
3. Ephedrine
4. Acetaminophen
5. Chlorpheniramine
6. Brompheniramine

MN Appl. No. 119340



EC analytical columns NUCLEODUR® 100-3 CN-RP, 3µm

eluent in column acetonitrile, particle size 3µm.

MACHEREY-NAGEL

Int. dia. mm	Length mm	PK	Cat. No.
2.0	50	1	**4.004 442**
3.0	125	1	**4.004 441**
4.0	150	1	**4.004 439**
4.6	150	1	**4.004 440**

Guard columns for EC columns NUCLEODUR® 100-3 CN-RP, 3µm

MACHEREY-NAGEL

Type	PK	Cat. No.
for 2 and 3 mm i.d.	3	**4.004 663**
for 4 and 4.6 mm i.d.	3	**4.004 664**

Guard columns for EC columns require guard column adapter EC (Cat. No. 7.081 898)



E & OE.

NUCLEODUR® NH2/NH2 -RP amino-modified high purity silica phase

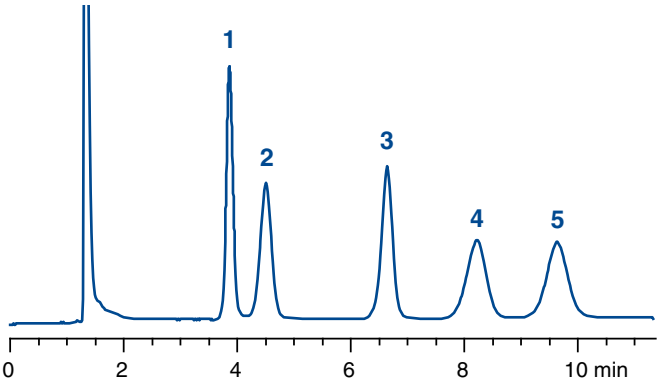
pore size 110 Å, particle sizes 3 and 5µm; 2.5%C; not endcapped - USP L8 *MACHEREY-NAGEL*
multi-mode columns (RP and NP)
normal phase chromatography (NP) with hexan, dichloromethane or 2-propanol as mobile phase for polar compounds such as substituted anilines, esters, chlorinated pesticides
reversed phase chromatography (RP) of polar compounds like sugars in aqueous-organic eluent systems
ion exchange chromatography of anions and organic acids using common buffers and organic modifiers
stable against hydrolysis at low pH, working range pH 2-8, 100% stable in water, suitable for LC-MS
Ideal for:
polar compounds under RP conditions (sugars, DNA bases), hydrocarbons under NP conditions
Eluent in column is *n*-heptane for the NP mode - RP columns are delivered in acetonitrile - water. For changing the solvent system a rinsing step with THF may be necessary.

Reversed phase separation of sugars

Column: 250 x 4 mm NUCLEODUR® 100-5 NH_2-RP
Eluent: acetonitrile – water (79:21, v/v)
Flow rate: 2 ml/min
Detection: RI

Peaks:
1. Fructose
2. Glucose
3. Saccharose
4. Maltose
5. Lactose

MN Appl. No. 122160



EC analytical columns NUCLEODUR® 100-3 NH2-RP, 3µm

eluent in column acetonitrile, particle size 3µm. *MACHEREY-NAGEL*

Int. dia. mm	Length mm	PK	Cat. No.
4.6	150	1	**9.003 875**

Guard columns for EC columns NUCLEODUR® 100-3 NH2-RP, 3µm

MACHEREY-NAGEL

Type	PK	Cat. No.
for 4.6 mm ID	1	**9.003 878**

Guard columns for EC columns require guard column adapter EC (Cat. No. 7.081 898)

NUCLEOSIL® 100-5 C18 PAH special octadecyl phase for PAH analysis

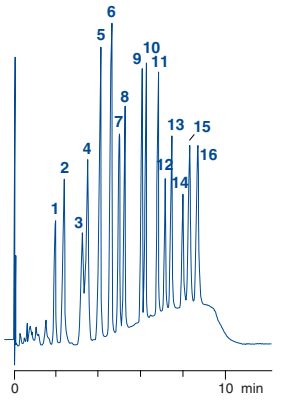
Base material NUCLEOSIL® silica, particle size 5µm, pore size 110 Å; polymeric coating - USP L1; eluent in column acetonitrile/water 70:30; allows efficient gradient separation of the 16 PAH in accordance with EPA, detection of the separated PAH by UV (250 to 280nm), with diode array or with fluorescence detection at different wave-legths for excitation and emission (acenaphthylene cannot be analysed with fluorescence detection). *MACHEREY-NAGEL*

Rapid separation of 16 PAH according to EPA

Column: 50 x 4 mm NUCLEOSIL® 100-5 C_{18} PAH
Eluents: A) water; B) acetonitrile
Gradient: from 55 to 100 % B in 2.5 min; then 3.5 min at 100 % B; finally in 0.1 min from 100 to 55 % B
Flow rate: 1 ml/min; pressure 25 – 30 bar
Temperature: 25 °C
Detection: UV, 260 nm
Injection volume: 10 µl

Peaks:
1. Naphthalene
2. Acenaphthylene
3. Acenaphthene
4. Fluorene
5. Phenantrene
6. Anthracene
7. Fluoranthene
8. Pyrene
9. Benz[a]anthracene
10. Chrysene
11. Benzo[b]fluoranthene
12. Benzo[k]fluoranthene
13. Benzo[a]pyrene
14. Dibenz[ah]anthracene
15. Benzo[ghi]perylene
16. Indeno[1,2,3-cd]pyrene

MN Appl. No. 115030



EC analytical columns NUCLEOSIL® 100-5 C18 PAH, 5µm

octadecyl phase PAH, particle size 5µm. *MACHEREY-NAGEL*

Int. dia. mm	Length mm	PK	Cat. No.
4.0	50	1	**4.002 491**
3.0	150	1	**4.002 493**
4.0	150	1	**4.002 494**
2.0	250	1	**7.089 855**
3.0	250	1	**4.002 372**
4.0	250	1	**4.002 373**
4.6	250	1	**4.002 374**

Guard columns for EC columns NUCLEOSIL® 100-5 C_{18} PAH, 5µm

MACHEREY-NAGEL

On request.

We can supply this manufacturer's whole product range !

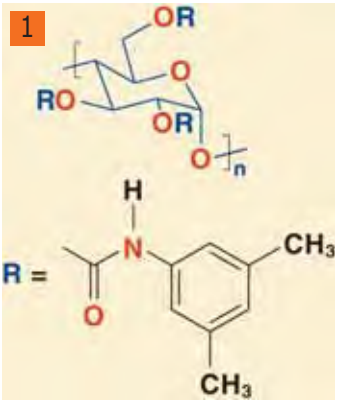
partner of the LLG Lab Logistics Group

MN

E & OE.

1 HPLC columns for enantiomer separation

NUCLEOCEL *ALPHA* enantiomer separation based on amylose derivatives *MACHEREY-NAGEL*



base material silica,
chiral selector amylose-(3.5-dimethylphenylcarbamate) - USP L51
similar phases: Chiralpak® AD, Kromasil®, AmyCoat®, Europak 01
high resolution type (S), 5µm particle size, allows use of shorter columns (150mm) for faster separations, pressure stability up to ~ 150 bar
(2000 psi)

NUCLEOCEL *ALPHA* for normal phase applications:
eluent in column *n*-heptane - propanol-2 (90:10, v/v)
typical eluents are heptane - propanol mixtures

NUCLEOCEL *ALPHA-RP* for reversed phase applications:
eluent in column acetonitrile - water (50:50), v/v)
designed for use either in polar organic mode or with eluents containing high concentrations of chaotropic salts such as perchlorate

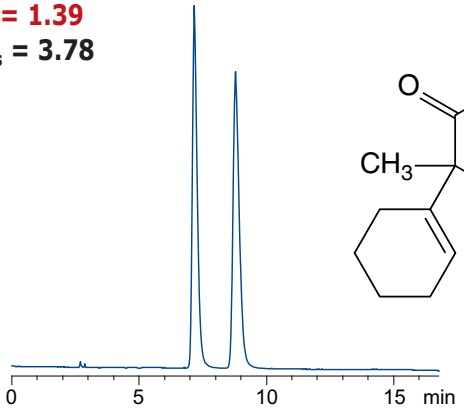
recommended application: pharmaceutically active compounds, chiral pollutants (e. g. herbicides, PCB), chiral compounds in food (dyes, preservatives), chiral catalysts and bioorganic compounds

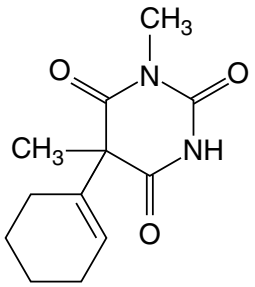
Enantiomer separation of hexobarbital

Column:	250 x 4.6 mm NUCLEOCEL *ALPHA S*
Eluent:	*n*-heptane – 2-propanol (80:20, v/v)
Flow rate:	1 ml/min
Temperature:	22 °C
Detection:	UV, 210 nm
Injection volume:	5 µl
Concentration:	1 µg/µl

MN Appl. No. 121940

α = 1.39
R_s = 3.78





EC analytical columns NUCLEOCEL *ALPHA S*, 5µm

eluent in column n-heptane - propanol-2, particle size 5µm. *MACHEREY-NAGEL*

Guard columns for EC columns Nucleocel *ALPHA S*, 5µm

MACHEREY-NAGEL

Guard columns for EC columns require guard column adapter EC (Cat. No. 7.081 898)

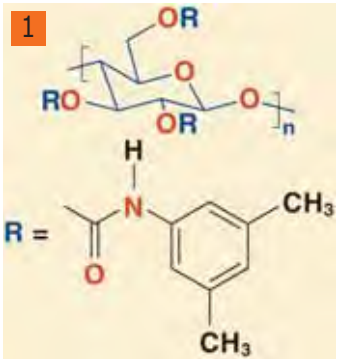
EC analytical columns NUCLEOCEL *ALPHA-RP S*, 5µm

eluent in column acetonitrile - water, particle size 5µm *MACHEREY-NAGEL*

Guard columns for EC columns NUCLEOCEL *ALPHA-RP S*, 5µm

MACHEREY-NAGEL

Guard columns for EC columns require guard column adapter EC (Cat. No. 7.081 898)



1 HPLC columns for enantiomer separation

NUCLEOCEL *DELTA* enantiomer separation based on cellulose derivatives *MACHEREY-NAGEL*

base material silica,
chiral selector Cellulosetris-(3.5-dimethylphenylcarbamate) - USP L40
similar phases: Chiralcel® OD, Kromasil®, CelluCoat™, Eurocel® 01
standard particle size 10µm

S-Type for high resolution, allows use of shorter columns (150 mm) for faster separations, pressure stability up to ~ 150 bar (2000 psi)

NUCLEOCEL *DELTA* for normal phase applications:
eluent in column *n*-heptane - propanol-2 (90:10, v/v)
typical eluents are heptane - propanol mixtures

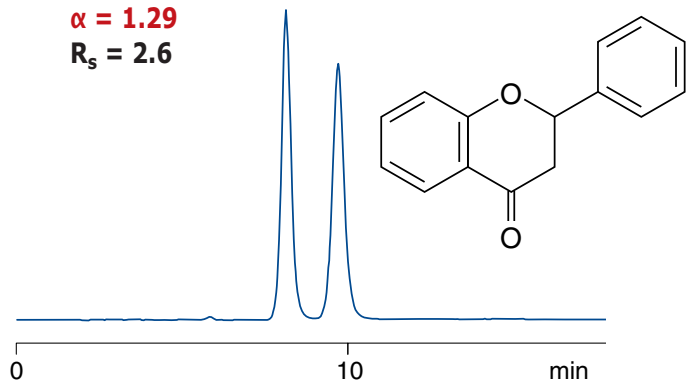
NUCLEOCEL *DELTA-RP* for reversed phase applications:
eluent in column acetonitrile - water (40:60), v/v)
designed for use either in polar organic mode or with eluents containing high concentrations of chaotropic salts such as perchlorate

recommended applications: pharmaceutically active compounds, chiral pollutants (e. g. herbicides, PCB), chiral compounds in food (dyes, preservatives), chiral catalysts and bioorganic compounds.

Enantiomer separation of flavanone

Column:	250 x 4.6 mm NUCLEOCEL *DELTA S*
Eluent:	*n*-heptane – 2-propanol (90:10, v/v)
Flow rate:	1 ml/min
Temperature:	25 °C
Detection:	UV, 254 nm
Injection volume:	5 µl
Concentration:	1 µg/µl

MN Appl. No. 121260



EC analytical columns NUCLEOCEL *DELTA S*, 5µm

eluent in column *n*-heptane - propanol-2, particle size 5µm *MACHEREY-NAGEL*

Int. dia. mm	Length mm	PK	Cat. No.
4.6	150	1	**4.002 446**
4.6	250	1	**4.002 445**

Guard columns for EC colums NUCLEOCEL *DELTA S*, 5µm

MACHEREY-NAGEL

Type	PK	Cat. No.
for 4.6 mm i.d.	1	**4.002 511**

Guard columns for EC columns require guard column adapter EC (Cat. No. 7.081 898)

EC analytical columns NUCLEOCEL *DELTA-RP S*, 5µm

Eluent in column acetonitrile - water, particle size 5µm. *MACHEREY-NAGEL*

Int. dia. mm	Length mm	PK	Cat. No.
4.6	150	1	**4.002 449**
4.6	250	1	**4.002 448**

E & OE.

Guard columns for EC columns NUCLEOCEL *DELTA-RP S*, 5µm

MACHEREY-NAGEL

Type	PK	Cat. No.
for 4.6 mm i.d.	1	**4.002 512**

Guard columns for EC columns require guard column adapter EC (Cat. No. 7.081 898)

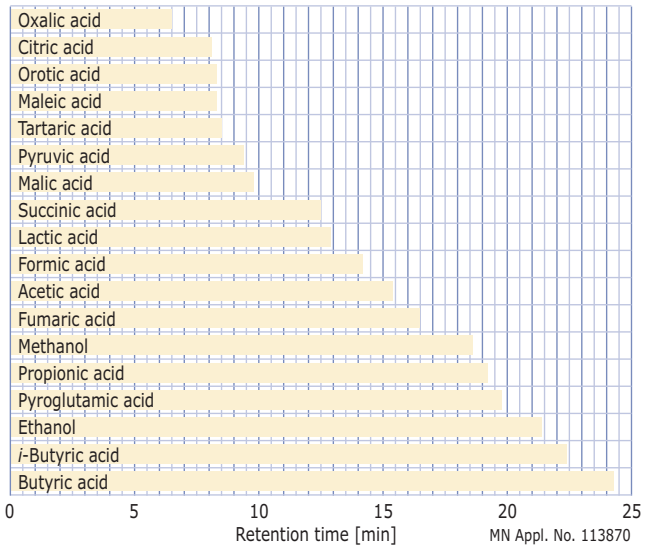
NUCLEOGEL® SUGAR 810 separation of sugars

MACHEREY-NAGEL

sulphonated polystyrene/divinylbenzene resins in diffent ionic forms
and RP chromatography
separation mechanism includes ion exclusion, ion exchange, size exclusion, ligand exchange as well as NP and RP chromatography
H^+ form: separation of sugars, sugar alcohols and organic acids - USP L17 - eluent in column 0.01 N H_2SO_4
Ca^{2+} form: separation of mono-, di- and oligosaccharides - USP L19
eluent in column water

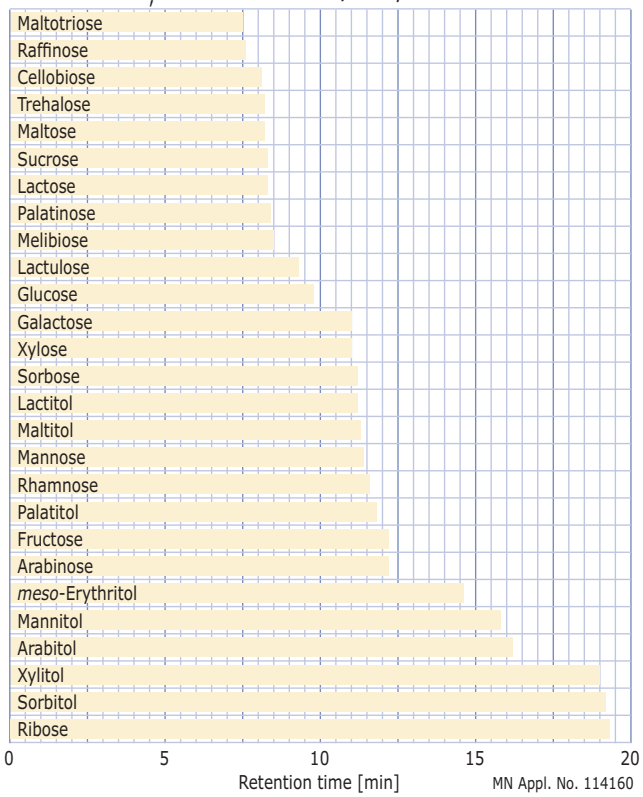
Organic acids and alcohols

Column: 300 x 7.8 mm NUCLEOGEL® SUGAR 810 H
Injection volume: 5 µl
Eluent: 5 mmol H_2SO_4
Flow rate: 0.6 ml/min
Temperature: 35 °C
Detection: RI



Sugars and sugar alcohols

Column: 300 x 7.8 mm NUCLEOGEL® SUGAR 810 Ca
Eluent water, flow rate 0.6 ml/min, detection RI



NUCLEOGEL® SUGAR 810 H

Valco type columns for separation of sugars, sugar alcohols and organic acids - USP L17 eluent in column 0.01N H_2SO_4

MACHEREY-NAGEL

Int. dia. mm	Length mm	PK	Cat. No.
7.8	300	1	**4.002 276**

Guard columns for NUCLEOGEL® SUGAR 810 H columns

MACHEREY-NAGEL

Type	PK	Cat. No.
for 7,8 mm i.d.	2	**4.002 277**

This guard columns require the CC column holder 30mm (Cat. No. 4.002 762).

NUCLEOGEL® SUGAR 810 Ca

Valco type columns for separation of mono-, di- and oliogosaccharides - USP L19 eluent in column water.

MACHEREY-NAGEL

Int. dia. mm	Length mm	PK	Cat. No.
7.8	300	1	**4.002 274**

Guard columns for NUCLEOGEL® SUGAR 810 Ca columns

MACHEREY-NAGEL

Type	PK	Cat. No.
for 7.8 mm i.d.	2	**4.002 275**

This guard columns require the CC column holder 30 mm (Cat. No. 4.002 762).

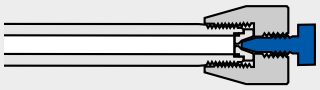
MN column systems

EC standard columns for analytical HPLC

MACHEREY-NAGEL

analytical column system manufactured from stainless steel M 8 outer threads on both ends combination of sealing element and very fine-meshed stainless steel screen, PTFE sealing ring and fitting adaptor column heads SW 12 with inner threads M8 x 0.75 and UNF 10-32, as built -in guard columns use Chrom-Cart® guard column cartridges with 8mm lenght with the guard column adaptor EC, packed with NUCLEODUR® spherical silica.

Available standard dimensions of EC columns · please ask for availability of certain phases

ID [mm]	Length [mm]										End fitting design
	8*	20	30	50	75	100	125	150	200	250	300	
2	–	x	x	x	x	x	x	x	x	x	x	
3	x	x	x	x	x	x	x	x	x	x	x	
4	x	x	x	x	x	x	x	x	x	x	x	
4,6	–	x	x	x	x	x	x	x	x	x	x	

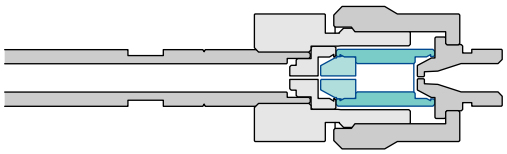
* Please note that 3 mm ID guard column cartridges are applicable for 2 mm ID and 3 mm ID EC columns, while 4 mm ID guard column cartridges are also used for 4.6 mm ID EC columns.

Installation of the EC guard column adaptor (Cat.No. 7.081 898)






EC column with CC guard column





Accessories and replacement parts for EC columns

MACHEREY-NAGEL

Description	PK	Cat. No.
Guard column adapter EC	1	**7.081 898**
1/16" nut for connecting 1/16" capillaries	5	**4.002 179**
1/16" ferrule	5	**4.002 180**
1/16" end cap, plastic	4	**4.002 178**
EC fitting adaptor	1	**4.002 219**
EC column head (nut)	1	**4.002 220**
EC PTFE sealing ring	4	**4.002 221**
3-part sealing combination for EC columns	1	**4.002 222**

1 Chromatographic columns with Frit, PTFE- /or Valve Stopcock

Chromatography columns with socket and with frit. *Isolab*
Manufactured from borosilicate glass 3.3 which is resistant to heat and almost all chemicals.
NS necks are in compliance with DIN 12242 standards.

Length mm	Int. diam. mm	Capacity ml	Description	PK	Cat. No.
200	10	15	without frit NS 14/23	1	**4.008 398**
400	20	125	without frit NS 29/32	1	**4.008 399**
600	30	430	without frit NS 29/32	1	**4.008 400**
200	10	15	with frit (P=0) NS 14/23	1	**4.008 401**
300	10	25	with frit (P=0) NS 14/23	1	**4.008 402**
200	15	35	with frit (P=0) NS 14/23	1	**4.008 403**

1

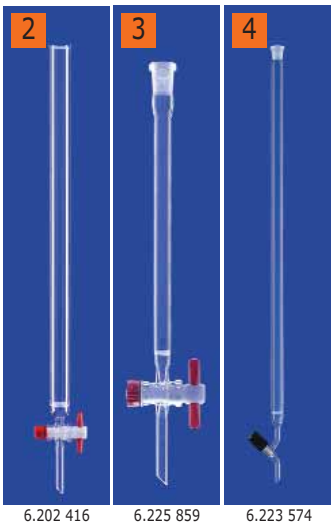


Chromatographic columns, PTFE- or Valve Stopcock

DURAN® tubing. *Lenz*
Chromatography columns with sintered frit, porosity 0.
Available in three versions:
- with beaded rim and PTFE stopcock
- with NS socket and PTFE stopcock
- with NS socket and valve stopcock (bore 0 - 2.5mm)

Length mm	Int. diam. mm	Capacity ml	Description	Stopcock	PK	Cat. No.
200	15	35	beaded rim	PTFE	1	**6.205 017**
400	20	125	beaded rim	PTFE	1	**6.202 416** 2
600	30	430	beaded rim	PTFE	1	**6.202 417**
800	40	1000	beaded rim	PTFE	1	**6.202 418**
100	10	8	socket NS 14/23	PTFE	1	**6.225 859** 3
200	10	15	socket NS 14/23	PTFE	1	**9.025 912**
300	10	23	socket NS 14/23	PTFE	1	**9.025 913**
200	15	35	socket NS 14/23	PTFE	1	**9.025 914**
400	20	125	socket NS 29/32	PTFE	1	**6.203 961**
600	30	430	socket NS 29/32	PTFE	1	**6.303 297**
200	15	35	socket NS 29/32	Valve	1	**6.223 574** 4

2 3 4



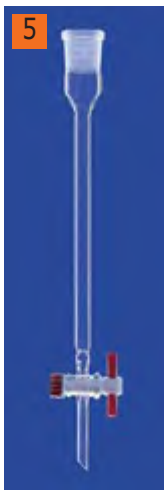
6.202 416 6.225 859 6.223 574

Chromatography columns, DURAN®, ground glass joint, PTFE Stopcock

Made of DURAN® tubing. *Lenz*
With PTFE stopcock.
With NS ground socket neck as indicated
Indents are moulded in above the stopcock for holding cotton wool plug supports.

Length mm	Int. diam. mm	Capacity ml	Description	PK	Cat. No.
200	10	15	with NS 14 / 23 socket	1	**9.025 932**
400	20	125	with NS 29 / 32 socket	1	**9.025 934**
600	30	430	with NS 29 / 32 socket	1	**9.025 936** 5

5



9.025 936

6 Glass wool

Extra fine. In packs as outlined below.

Capacity g	PK	Cat. No.
30	1	**9.114 303**
1000	1	**9.114 310**

6



Stands and fittings - please see page 165.



1 Quartz wool

Silica. Fibre thickness 4µm to 12µm. *proQuarz GmbH*

Capacity g	PK	Cat. No.
500	1	**9.114 331**

Silica adsorbents for low pressure column chromatography

standard silica 60, pore size ~ 60 Å; pore volume ~ 0.75ml/g; spec. surface BET ~ 500m²/g. highly porous, amorphous silicic acid in the form of hard, opalescent particles, prepared by precipitation of water glass with sulphuric acid. For higher demands on the performance of column packings we recommend our high-purity irregular Polygoprep silicas. Silica FIA for the fluorescence indicator adsorption procedure for the determination of hydrocarbon groups in the testing of liquid fuels in accordance with DIN 51791 and ASTM D 1319-58T. The FIA method determines saturated hydrocarbons, olefins and aromatic hydrocarbons of a sample chromatographically by adsorption and desorption in a column filled with FIA silica, in the presence of a fluorescent dye mixture. *MACHEREY-NAGEL*

Description	Particle size	Weight kg	PK	Cat. No.
Silica 60, 0.015 - 0.04 mm		1	1	**4.004 999**
Silica 60, 0.025 - 0.04 mm		1	1	**4.004 948**
Silica 60, 0.04 - 0.063 mm	230 - 400 mesh	1	1	**4.004 968**
Silica 60 M, 0.04 - 0.063 mm	230 - 400 mesh	1	1	**4.004 971**
Silica 60, 0.05 - 0.1 mm	130 -270 mesh	1	1	**4.004 974**
Silica 60, 0.05 - 0.2 mm	70 -270 mesh	1	1	**4.004 954**
Silica 60, 0. 063 - 0.2 mm	70 - 230 mesh	1	1	**4.004 957**
Silica 60, < 0.063 mm	+ 230 mesh	1	1	**4.004 977**
Silica 60, < 0.08 mm	+ 190 mesh	1	1	**4.004 951**
Silica 60, 0.1 - 0.2 mm	70 - 130 mesh	1	1	**4.004 960**
Silica 60, 0.2 - 0.5 mm	35 - 70 mesh	1	1	**4.004 962**
Silica 60, 0.5 - 1.0 mm	18 - 35 mesh	1	1	**4.004 965**
Silica 60, 0.015 - 0.04 mm		5	1	**4.005 001**
Silica 60, 0.025 - 0.04 mm		5	1	**4.004 950**
Silica 60, 0.04 - 0.063 mm	230 - 400 mesh	5	1	**4.004 970**
Silica 60 M, 0.04 - 0.063 mm	230 - 400 mesh	5	1	**4.004 973**
Silica 60, 0.05 - 0.1 mm	130 - 270 mesh	5	1	**4.004 976**
Silica 60, 0.05 - 0.2 mm	70 - 270 mesh	5	1	**4.004 956**
Silica 60, 0. 063 - 0.2 mm	70 - 230 mesh	5	1	**4.004 959**
Silica 60, < 0.063 mm	+ 230 mesh	5	1	**4.004 979**
Silica 60, < 0.08 mm	+ 190 mesh	5	1	**4.004 953**
Silica 60, 0.1 - 0.2 mm	70 - 130 mesh	5	1	**4.004 961**
Silica 60, 0.2 - 0.5 mm	35 - 70 mesh	5	1	**4.004 964**
Silica 60, 0.5 - 1.0 mm	18 - 35 mesh	5	1	**4.004 967**
Silica 60, 0.015 - 0.04 mm		25	1	**4.005 000**
Silica 60, 0.025 - 0.04 mm		25	1	**4.004 949**
Silica 60, 0.04 - 0.063 mm	230 - 400 mesh	25	1	**4.004 969**
Silica 60 M, 0.04 - 0.063 mm	230 - 400 mesh	25	1	**4.004 972**
Silica 60, 0.05 - 0.1 mm	130 - 270 mesh	25	1	**4.004 975**
Silica 60, 0.05 - 0.2 mm	70 - 270 mesh	25	1	**4.004 955**
Silica 60, 0. 063 - 0.2 mm	70 - 230 mesh	25	1	**4.004 958**
Silica 60, < 0.063 mm	+ 230 mesh	25	1	**4.004 978**
Silica 60, < 0.08 mm	+ 190 mesh	25	1	**4.004 952**
Silica 60, 0.2 - 0.5 mm	35 - 70 mesh	25	1	**4.004 963**
Silica 60, 0.5 - 1.0 mm	18 - 35 mesh	25	1	**4.004 966**
Silicia FIA fine	0,071 - 0,16 mesh	1	1	**4.004 980**
Silicia FIA coarse	0,071 - 0,63 mesh	1	1	**4.004 981**



2 HPLC bottles, DURAN® complete system 4-port screw cap

For sterile transfer of media or for feeding solvent to HPLC instruments. The bottle is pressure/vacuum resistant from -1 to +1.5 bar (tested by TÜV in accordance with EN 1596, GS marked). Complete with a 4-port screw cap (autoclavable, reusable) made from PP, 4 connection screw caps (black, M8 thread) and silicone seal. Suitable for tube diameters of 1.6mm and 3.2mm. Spare parts are available individually. Further connection system components for the GL45 thread are available upon request (Tubing not included). Neutral/Type I glass acc. to USP/EP. With Retrace Code (Batch Identification), with certificate available via the internet. Autoclavable. *DURAN Group*

Capacity ml	PK	Cat. No.
500	1	**9.072 526**
1000	1	**9.072 525**

1 Flexible connecting system for DURAN® GL 45 flasks

DURAN Group

Materials used: PP and PTFE. Flexible modular system. Four different tube diameters (1.6mm; 3.0mm; 3.2mm and 6.0mm) can be connected. Sterile pressure equalisation is possible through use of a membrane filter. Unused ports can be provided with a blind cap. Typical applications: safe transfer of liquid media within a closed and sterile system (evaporation is reduced). Temperature resistant up to max. 140°C. For all solvents PP-resistant.



Ordering example
You would like to fit two bottles with a 3-port connection system. You would like to work with two different tube diameters (1.6mm and 3mm) and pressure equalisation. Consequently, you need the following individual components:
Screw cap GL 45 3-port (Art. No. 7.623 018) 1 pack (2 per pack);
Screw cap GL 14 (Art. No. 6.227 781) 2 packs (2 per pack);
Insert for screw cap GL14 1.6mm inner diameter (Art. No. 6.229 494) 2 packs (1 per pack);
Insert for screw cap GL14 3.0mm inner diameter (Art. No. 6.229 495) 2 packs (1 per pack);
Pressure equalisation set (complete) (Art. No. 6.228 023) 2 packs (1 per pack).

Description	PK	Cat. No.
Scew cap GL 45, 2 port x GL 14	1	**6.227 780**
Screw cap GL 45, 3 port x GL 14	1	**7.623 018**
Screw cap GL 14 for tubing connector	1	**6.227 781**
Liner for GL 14 screw cap, 1.6mm i.d. hole	1	**6.229 494**
Liner for GL 14 screw cap, 3mm i.d. hole	1	**6.229 495**
Liner for GL 14 screw cap, 3.2mm i.d. hole	1	**6.230 213**
Liner for GL 14 screw cap, 6mm i.d. hole	1	**6.227 782**
Screw cap, GL 14, red	1	**7.623 838**
Pressure equalising set, 0.2µm filter, for 2- / 3-Port screw cap	1	**6.228 023**
Replacement 0.2µm membrane filter for pressure equalising set	2	**6.230 844**
Bottle 1000ml, GL 45, DURAN® pressure resistant up to +1.5 bar	1	**9.971 704**
Bottle 500ml, GL 45, DURAN® pressure resistant up to +1.5 bar	1	**9.071 707**

Connecting system for GL 80 flasks please see page 64.

2 Accessories for connecting system for DURAN® GL 45 bottles, DURAN®

DURAN Group

Description	PK	Cat. No.
Screw cap HPLC GL 45, 4 Port complete	1	**6.226 328**
Spare set for HPLC screw cap	1	**6.226 329**
Pressure equilization, 0.2µm for 4-Port-cap, incl. membrane filter	1	**6.226 915**
Spare membrane filter for pressure equilization, 0,2 µm	1	**6.230 844**
Bottle 1000 ml, GL 45, DURAN® pressure resistant up to +1,5 bar	1	**9.971 704**
Bottle 500 ml, GL 45, DURAN® pressure resistant up to +1,5 bar	1	**9.071 707**



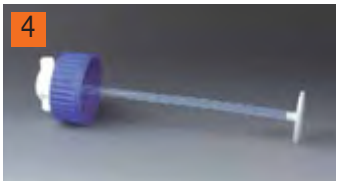
Scrubber Adapter for Bottles, PTFE

BOLA

Consisting of PTFE body with connecting nut and two lateral GL18 threaded necks, a 300mm long FEP inlet tube and a gas distributor with frit. Easy in- and outlet of gas by means of rigid-walled tubing (e.g. PTFE) which can be connected to the threaded necks using Bola Laboratory Screw Joints. Elastic tubing can be connected by means of hose connectors. Inlet tube can be individually shortened. Special feature: the body of the adapter can be turned independently from the connecting nut. This means, that the completely assembled adaptor can be removed and fixed onto another bottle without the risk of disarranging the tubing. Suitable for bottles with GL45 or GLS80 threads and capacities between 100ml and 5000ml.



9.110 310



9.110 311

Thread	Tube length mm	PK	Cat. No.
GL45	300	1	**9.110 310** 3
GLS 80	300	1	**9.110 311** 4

SafetyCaps

Scat

The integral air filter blocks hazardous vapours and cleans the inflowing air from dust and dirt particles. With various connectors for capillaries and tubes. Safety Caps are available for most common glass bottles (e.g. thread size GL45). They can be customised for other container sizes by using different adapters. Especially recommended for HPLC use: Solvents stay clean and components of solvent mixtures can not evaporate. Optimum protection against health hazards caused by evaporation and insufficient sealing.

Key advantages:

- No evaporation of hazardous gases
- No contamination of solvents
- No crimping of connection tubing
- Easy container exchange
- No air intake (HPLC)
- Save expensive solvents by avoiding evaporation
- Cost efficiency
- Detailed analysis due to stable solvent mixture

SafetyCaps

Scat

Safe solvent supply. With integral air filter vent. For maximum efficiency, we recommend that the vent is changed every 6 months. The filter membrane absorbs dust and dirt particles to protect your solvent reservoirs. The vent is universally suitable for all Safety Caps. It also works with your current Safety Caps, simply replace the old vent with the new one.

Description	Thread	Connections	PK	Cat. No.	
SafetyCaps I	GL45	1 capillary (3.2mm o.d.)	1	**9.139 850**	1
SafetyCaps II	GL45	2 capillaries (3.2mm o.d.)	1	**9.139 851**	
SafetyCaps III	GL45	3 capillaries (3.2mm o.d.)	1	**9.139 852**	
SafetyCaps IV	GL45	4 capillaries (3.2mm o.d.)	1	**9.139 853**	2
SafetyCaps VI	GL45	6 capillaries (3.2mm o.d.)	1	**9.139 854**	
SafetyCaps I, with 1 stopcock	GL45	1 capillary (3.2mm o.d.)	1	**9.139 855**	3
SafetyCaps II, with 2 stopcocks	GL45	2 capillaries (3.2mm o.d.)	1	**9.139 856**	
SafetyCaps III, with 3 stopcocks	GL45	3 capillaries (3.2mm o.d.)	1	**9.139 857**	
SafetyCaps IV, with 4 stopcocks	GL45	4 capillaries (3.2mm o.d.)	1	**9.139 858**	
SafetyCaps VI, with 6 stopcocks	GL45	6 capillaries (3.2mm o.d.)	1	**9.139 859**	
SafetyCaps II, combined (1with stopcock / 1 without stopcock)	GL45	2 capillaries (3.2mm o.d.)	1	**9.139 860**	4
SafetyCaps III, combined (2 with stopcocks / 1 without stopcock)	GL45	3 capillaries (3.2mm o.d.)	1	**9.139 861**	
SafetyCaps I	3/16'', GL45	1 capillary (3/16" o.d.)	1	**9.139 862**	
SafetyCaps II	NS 29/32	2 capillaries (3.2mm o.d.)	1	**9.139 863**	

1



9.139 850

2



9.139 853

3



9.139 855

4



9.139 860

5



6.253 976

SafetyCaps S40

NEW!

Scat

SafetyCaps S40 have the same properties as any SafetyCaps, but fit on smaller bottle threads without using an adapter. Save extraction of solvents without transferring to other bottles.

Description	Thread	PK	Cat. No.	
SafetyCap I	S40	1	**6.253 976**	5
SafetyCap II	S40	1	**7.628 821**	
SafetyCap I with stopcock	S40	1	**9.139 895**	

E & OE.

1 Pressure relief valve for SafetyCaps

Pressure relief valve for SafetyCaps, with integral air filter. *Scat*
The valve opens when the HPLC pump is operated, and allows air to flow into the bottle - this prevents a vacuum building up in the bottle. As soon as the pump stops, the membrane immediately seals properly and no dangerous solvent vapours can escape.

Description	PK	Cat. No.
Pressure relief valve for SafetyCaps	1	**9.139 864**
Pressure relief valve for SafetyCaps (refill pack of 10)	10	**4.005 886**
Pressure relief valve for SafetyCaps (refill pack of 50)	50	**9.139 897**
Pressure relief valve SafetyCaps, fire-resistant	1	**4.005 769**

1



SafetyWasteCaps with or without hose connection

For a safe disposal of liquid waste. Safety Waste Caps have a connection for an exhaust vent filter. The exhaust vent filter absorbs 99% of all volatile substances that can evaporate from the containers during solvent disposal. For optimum protection of health and environment. Safety Waste Caps are manufactured of pure PTFE and PE-HD, ensuring maximum chemical resistance against organic solvents and other aggressive chemicals. *Scat*

Please order exhaust vent filter separately.

Thread	Connections	PK	Cat. No.	
S40	3 connectors 2.3/3.2mm o.d.	1	**7.628 820**	
S40	2 connectors 2.3/3.2mm o.d., 1 tubing 6.4mm i.d.	1	**9.139 896**	
GL45	3 connectors Ø 2.3/3.2mm o.d.	1	**9.139 865**	
GL45	2 connectors Ø 2,3/3.2mm o.d., 1 tubing Ø 6.4mm i.d.	1	**9.139 866**	4
GL80	4 connectors Ø 2.3/3.2mm o.d., 1 tubing Ø 6.4mm i.d.	1	**9.139 869**	
S51	2 x connectors 2.3 / 3.2mm o.d., 1 x connector 6.4mm i.d.	1	**4.005 583**	
S55	2 x connectors 2.3 / 3.2mm o.d., 1 x connector 6.4mm i.d.	1	**4.005 584**	
S60/61	3 x connectors 2.3 / 3.2mm o.d.	1	**9.139 867**	2
S60/61	2 x connectors 2.3 / 3.2mm o.d., 1 x connector 6.4mm i.d.	1	**9.139 868**	3
S70/71	2 x connectors 2.3 / 3.2mm o.d., 1 x connector 6.4mm i.d.	1	**4.005 585**	
S90	4 x connectors 2.3 / 3.2mm o.d., 1 x connector 6.4mm i.d.	1	**9.139 870**	

2



9.139 867

3



9.139 868

4



9.139 866

5 Thread adapters for SafetyCaps/SafetyWasteCaps, PTFE

Scat

Description	PK	Cat. No.
Adapter GL38 (f) - GL45 (m)	1	**9.139 882**
Adapter GL40 (f) - GL45 (m)	1	**9.139 883**

5



1



4.005 884

2



9.042 895

3



9.139 872

4



4.005 631

5



9.042 896

Charcoal filters for Safety Waste Caps

3 sizes of absorbent charcoal filters (with capacity for 3, 6 or 9 months respectively) available. *Scat*

Depending on the required capacity 3 filter sizes each with a different lifetime are available.
With a specific surface of 1.200 m2/g, our multi-component granulate is the optimum filter media for nearly all solvent vapors. It is based on active charcoal and contains additional components which prevent sticking or clump formation and therefore prevent restriction of the filter performance. 99% of the volatile substances are captured.
Exhaust filters with splash guard are recommended for SafetyWasteCaps with integrated Safety Funnels.
Filter also available with change indicator.

Filter size	Life time	Description	PK	Cat. No.	
S	3 months		1	**9.139 871**	
S	3 months	Supply pack	4	**4.005 884**	1
S	3 months	with splash guard	1	**4.005 634**	
S	3 months	Fire-resistant	1	**4.005 782**	
S	3 months	with change indicator	1	**9.042 895**	2
M	6 months		1	**9.139 872**	3
M	6 months	Supply pack	3	**4.005 885**	
M	6 months	with splash guard	1	**4.005 631**	4
M	6 months	Fire-resistant	1	**4.005 784**	
M	6 months	with change indicator	1	**9.042 896**	5
L	9 months		1	**9.139 873**	
L	9 months	with splash guard	1	**4.005 635**	

6



6 SafetyWasteCaps with safety funnel

Press the locking mechanism to open the funnel when disposing liquid waste. When releasing, the funnel will close automatically and seal the container safely. With integral exhaust filter, for optimum protection against hazardous vapours and gases. Each cap has different connectors for multiple capillaries. *Scat*

Please order exhaust vent filter separately.

Thread	Connections	PK	Cat. No.
S 50	2 x connectors 2.3/3.2mm o.d.	1	**9.139 874**
S 55	2 x connectors 2.3/3.2mm o.d.	1	**9.139 875**
S 60 / 61	2 x connectors 2.3/3.2mm o.d.	1	**9.139 876**
S 65	4 x connectors 2.3/3.2mm o.d.	1	**9.139 877**
S 70 / 71	4 x connectors 2.3/3.2mm o.d.	1	**9.139 878**

7



7 Safety Waste Caps with mechanical level control

- Proven SCAT technology for SafetyWasteCaps *Scat*
- Different thread sizes
- Connections for capillaries and tubings
- Exhaust filter
- Safety funnel
- Mechanical level control
- Supplied as a set with connectors

Thread	Connections	PK	Cat. No.
S55	2 x connectors 2.3/3.2mm o.d., 1 x connector 6.4 mm i.d.	1	**4.005 612**
S60/61	2 x connectors 2.3/3.2mm o.d., 1 x connector 6.4 mm i.d.	1	**4.005 613**
S90	4 x connectors 2.3/3.2mm o.d., 1 x connector 6.4 mm i.d.	1	**4.005 616**

Further safety funnel and canisters - please see page 253.

E & OE.

Collectors for Safety Waste Caps

Collectors for additional ports to add more tubings and capillaries. Delivered with fittings. *Scat*

Description	Material	PK	Cat. No.	
3 x connectors (90°) for 3 capillaries diam. 3.2mm o.d.	PTFE/PFA/PP	1	**9.139 888**	1
3 x connectors (90°) for 2 capillaries diam. 3.2mm o.d. and 1 tubing diam. 6.4-9mm i.d.	PTFE/PFA/PP	1	**4.005 859**	2
3 x connectors (90°) for 3 tubings diam. 6.4-9mm i.d.	PTFE/PP	1	**4.005 864**	
2 x connectors (90°) for 3 tubings diam. 6.4-9mm i.d.	PTFE/PP	1	**4.005 865**	3
2 x connectors (straight) for 2 capillaries diam.3.2mm o.d.	PTFE/PFA	1	**4.005 866**	
3 x connectors (straight) for 3 capillaries diam.3.2mm o.d.	PTFE/PFA	1	**4.005 860**	4
8 x connectors (straight) for 8 capillaries diam.3.2mm o.d.	PTFE/PFA	1	**9.139 889**	
8 x connectors (straight) for 7 capillaries diam.3.2mm o.d. and 1 tubing diam. 6.4-9mm i.d.	PTFE/PFA/PP	1	**4.005 976**	

1



9.139 888

2



4.005 859

3



4.005 865

4



4.005 860

5 Fittings and Ferrules for SafetyCaps/SafetyWasteCaps

One-piece fittings with integrated ferrule for Safety Caps and Safety Waste Caps.
Not used parts could be closed with a plug. *Scat*

Description	Thread	Material	Colour	PK	Cat. No.	
Fittings for capillaries diam. 1.6mm o.d.	UNF 1/4" 28G	PFA	green	5	**6.241 792**	
Fittings for capillaries diam. 1.6mm o.d.	UNF 1/4" 28G	PTFE	white	5	**4.005 938**	
Fittings for capillaries diam. 1.6mm o.d.	UNF 1/4" 28G	PTFE	white	10	**4.005 444**	
Fittings for capillaries diam. 2.3mm o.d.	UNF 1/4" 28G	PFA	violet	5	**6.255 961**	
Fittings for capillaries diam. 2.3mm o.d.	UNF 1/4" 28G	PFA	grey	5	**6.241 793**	
Fittings for capillaries diam. 2.3mm o.d.	UNF 1/4" 28G	PTFE	white	5	**4.005 939**	
Fittings for capillaries diam. 2.3mm o.d.	UNF 1/4" 28G	PTFE	white	10	**4.005 445**	
Fittings for capillaries diam. 3.2mm o.d.	UNF 1/4" 28G	PFA	black	5	**9.042 891**	
Fittings for capillaries diam. 3.2mm o.d.	UNF 1/4" 28G	PFA	blue	5	**9.042 892**	
Fittings for capillaries diam. 3.2mm o.d.	UNF 1/4" 28G	PFA	red	5	**7.639 112**	
Fittings for capillaries diam. 3.2mm o.d.	UNF 1/4" 28G	PFA	yellow	5	**9.042 893**	
Fittings for capillaries diam. 3.2mm o.d.	UNF 1/4" 28G	PFA	neutral	5	**9.042 894**	
Fittings for capillaries diam. 3.2mm o.d.	UNF 1/4" 28G	PTFE	white	10	**4.005 446**	
Fittings for capillaries diam. 4.76mm (3/16") o.d.	UNF 5/16"-24	PTFE	white	1	**4.005 448**	
Fittings for capillaries diam. 6.35mm (1/4") o.d.	M 10 x 1	PTFE	white	1	**4.005 447**	
Blind plugs for capillary connections	UNF 1/4" 28G	PTFE	neutral	10	**9.139 890**	
Blind plugs for capillary connections	UNF 5/16"-24	PFA	white	5	**4.005 945**	
Blind plugs for capillary connections	UNF 5/16"-24	PTFE	white	10	**4.005 880**	6
Blind plugs for capillary and tubing connections	M 10 x 1	PTFE	white	1	**4.005 883**	7
Blind plugs for capillary connections	GL14	PTFE/VITON	white/black	1	**4.005 504**	8

5



6



4.005 880

7



4.005 883

8



4.005 504

1 Hydrogen Generators for GC combustion detector applications and GC and GC/MS carrier gas applications

NEW!

Parker Hannifin GmbH

The Parker domnick hunter H high purity hydrogen and H-MD for ultra high purity gas generators offer the optimum combination of safe operation, reliability and performance.
Utilising field proven PEM cell technology, hydrogen is produced on demand from deionised water and electricity, at low pressure and with minimal stored volume. Innovative control software allows unrivalled operational safety and reliability. The H generators ideally supply fuel gas to all known GC combustion detectors used in today's laboratory workflows. Three models operate at flow rates; 160 ml/min, 250 ml/min and 500 ml/min. Hydrogen generators are available with Remote Networking software. RemoteNet allows up to 27 hydrogen generators to be actively controlled from one central PC, and facilitates true cascading capabilities.

The H-MD generators ideally supply GC and GC/MS carrier gas, in addition to all known combustion detectors that are routinely used in today's laboratory workflows. Four models operate at flow rates; 160 ml/min, 250 ml/min, 500 ml/min and 1100 ml/min.

- Eliminate dangerous hydrogen cylinders from the work place
- Simple to install and operate
- Compact, reliable with minimal maintenance
- Produces a continuous supply of 99.9995% pure hydrogen at up to 6.9 bar
- (H-MD) Produces a continuous supply of 99.99995% pure hydrogen up to 1.100ml/min and 6.9 bar
- 2 year warranty for the cell
- Optional automatic water fill and remote networking capability

Specifications

Ambient Temperature Range:	5 - 40°C
Water Supply Pressure*:	0.1 bar g
Water Supply Flow Rate*:	1 L/min
Water Quality:	Deionised. ASTM II, >1MΩ, <1µs, filtered to <100µm
Supply Voltage Range:	90 - 264V 50/60Hz
Port Connections	
Hydrogen Outlet:	1/8" Compression Fitting
Water Drain:	Quick Release Push in Fitting
Water Fill*:	Quick Release Push in Fitting

*With optional AWF

Type	Flow rate L / min.	Purity %	Flow rate L / week	Delivery Pressure bar g	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
20H*	0.16	>99.9995	1.25	0.3 - 6.89	342 x 437 x 456	19.0	1	**9.870 301**
40H*	0.25	>99.9995	2.00	0.3 - 6.89	342 x 437 x 456	19.0	1	**9.870 302**
60H*	0.50	> 99.9995	4.00	0.3 - 6.89	342 x 437 x 456	19.0	1	**9.870 303**
20H-MD*	0.16	>99.99995	1.69	0.69 - 6.89	342 x 470 x 456	20.5	1	**9.870 311**
40H-MD*	0.25	>99.99995	2.41	0.69 - 6.89	342 x 470 x 456	20.5	1	**9.870 312**
60H-MD*	0.50	>99.99995	4.82	0.69 - 6.89	342 x 470 x 456	20.5	1	**9.870 313**
110H-MD	1.10	>99.99995	10.60	0.69 - 6.89	342 x 470 x 456	23.6	1	**9.870 314**

Note: For auto water fill option add suffix AWF ie 20H-AWF or 20H-MD-AWF
*With optional AWF

1



Preventative Maintenance

Parker Hannifin GmbH

Description	Change interval	PK	Cat. No.
Replacement desiccant cartridge	As required*	1	**9.870 308**

* 20H Continuous operation approx 6 to 7 months
* 40H Continuous operation approx 4 to 5 months
* 60H Continuous operation approx 2 to 3 months

E & OE.

1 Zero Air Generators for GC combustion detector applications

NEW!

Parker Hannifin GmbH

The Parker domnick hunter UHP-ZA zero air generators produce a continuous stream of organic impurity free air from an external dry compressed air source and offer superior limits of detection over and above other modes of supply. Flow rates range from 1 L/min to 30 L/min. The UHP-ZA generators feature an interchangeable top panel facilitating the direct mounting of any Parker domnick hunter hydrogen generator. The stackable system forms an innovative, modular FID gas station suitable for all known GC combustion detectors such as FID, FPD and NPD. UHP-ZA generators may also be used in many other chemical analysis and life science applications, including LC/MS source gas, zero and combustion gas for total hydrocarbon analysers and as a gas sensing calibration and dilution gas.

- Ultra high purity, organic free, air for GC combustion detectors
- Increase resolution and detection limits of analysis
- Compact, reliable with minimal operator attention and maintenance
- Eliminate inconvenient and potentially dangerous air cylinders
- Payback period typically less than 24 months
- Models available to supply up to 75 FID's

Specifications

Ambient Temperature Range:	5 - 40°C
Organic Impurity:	< 0.1ppm
Inlet Air Quality:	Clean dry compressed air ISO8573-1:2001 Class 3.2.1
Supply Voltage Range:	103 - 126V 60Hz 207 - 253V 50/60Hz
Port Connections	
Outlet (UHP-10ZA-S & UHP-35ZA-S):	1/8" Compression Fitting
Inlet (UHP-10ZA-S & UHP-35ZA-S):	1/8" Compression Fitting
Outlet (UHP-50ZA-S - UHP-300ZA-S):	1/4" Compression Fitting
Inlet (UHP-50ZA-S - UHP-300ZA-S):	1/4" Compression Fitting

Type	Flow rate	Air Inlet	Delivery Pressure	Dimensions (W x D x H)	Weight	PK	Cat. No.
	L / min.	L/min	bar g	mm	kg		
UHP-10ZA-S	1.00	1.2	4 - 10	340 x 425 x 325	10.2	1	**9.870 331**
UHP-35ZA-S	3.50	42.0	4 - 10	340 x 425 x 325	14.2	1	**9.870 332**
UHP-50ZA-S	5.00	6.0	4 - 10	340 x 425 x 325	14.2	1	**9.870 333**
UHP-75ZA-S	7.50	9.0	4 - 10	340 x 425 x 325	14.2	1	**9.870 334**
UHP-150ZA-S	15.00	18.0	4 - 10	340 x 425 x 325	15.2	1	**9.870 335**
UHP-200ZA-S	20.00	24.0	4 - 10	340 x 425 x 325	15.2	1	**9.870 336**
UHP-300ZA-S	30.00	35.0	4 - 10	340 x 425 x 325	15.2	1	**9.870 337**

Note: Add suffix E' for 207-253V 50/60Hz ie. UHP-10ZA-S-E
Add suffix W' for 103 -126V 60Hz ie. UHP-10ZA-S-W

1



Preventative Maintenance

Parker Hannifin GmbH

Description	Change interval	PK	Cat. No.
Inlet Filter PM Kit - all models	12 Months	1	**9.870 338**
Outlet Filter PM Kit - all models	12 Months	1	**9.870 339**
Fan PM Kit, 230V - all models	24 Months	1	**9.870 340**

Generators for GC makeup gas and carrier gas applications

Parker Hannifin GmbH

The Parker domnick hunter zero nitrogen generators employ robust, field proven technology to produce ultra high purity nitrogen for GC makeup and carrier gas applications. An integral heated platinum catalyst ensures carrier grade nitrogen free from organic impurities to <0.1ppm. The generators provide a continuous stream of ultra high purity nitrogen from a single plug & play' unit. Models are available with and without an integral oil free compressor, are extremely quiet in operation and are fully approved for use by major instrumentation manufacturers. Innovative design features include economy mode as standard which extends compressor life and significantly reduces on going running costs.

- Ultra high purity, organic free, nitrogen
- Economy mode as standard, increases compressor life
- Ideal for GC make-up and carrier gas applications including ECD
- Integral oil free compressor, with advanced noise reduction technology
- Eliminate inconvenient and potentially dangerous nitrogen cylinders
- Compact, reliable with minimal operator attention and maintenance

Specifications

Ambient Temperature Range:	15 - 25°C
Organic contaminants:	< 0.1ppm total hydrocarbons
Inlet Air Quality*:	Clean dry compressed air ISO8573-1:2001 Class 2.-.1
Supply Voltage Range:	103 - 126V 60Hz 207 - 253V 50/60Hz
Port Connections	
Inlet*:	1/4" Compression Fitting
Outlet:	1/8" Compression Fitting

*Non compressor models only

Type	Description	Flow rate	Purity	Air Inlet	Delivery Pressure	Dimensions (W x D x H)	Weight	PK	Cat. No.
		L / min.	%	L/min	bar g	mm	kg		
UHPZN2-1000		1.00	>99,9995 %	42.0	5	345 x 667 x 869	86.0	1	**9.870 412** 1
UHPZN2-1000C	with compressor	1.00	>99,9995 %		5	345 x 667 x 869	96.0	1	**9.870 413**
UHPZN2-3000		3.00	>99,9995 %	52.0	5	345 x 667 x 869	86.0	1	**9.870 414**
UHPZN2-3000C	with compressor	3.00	>99,9995 %		5	345 x 667 x 869	96.0	1	**9.870 415**

Note: Add suffix E' for 207-253V 50/60Hz ie. UHPZN2-1000-E
Add suffix W' for 103 -126V 60Hz ie. UHPZN2-1000-W

1



9.870 412

E & OE.

Ultra High Purity Nitrogen Generators for GC and other critical analytical applications

NEW!

Parker Hannifin GmbH

The Parker domnick hunter nitrogen gas generators employ robust, field proven technology to produce ultra high purity nitrogen for critical life science, chemical analysis and spectroscopy applications. Flow rates range from 0.55 L/min to 3 L/min, with purities >99.9995%. The generators provide a continuous stream of ultra high purity nitrogen from a single plug & play' unit. Models are available with and without an integral an oil free compressor, are extremely quiet in operation and are fully approved for use by major instrumentation manufacturers. Innovative design features include economy mode as standard which extends compressor life and significantly reduces on going running costs.

- Complete Plug and Play' system specifically designed for critical analytical applications
- Produces a continuous supply of 99.999% purity nitrogen 24 hours a day
- Integral oil free compressor, with advanced noise reduction technology
- Eliminate inconvenient and potentially dangerous nitrogen cylinders
- Compact, reliable with minimal operator attention and maintenance
- Economy mode as standard; increases compressor life

Specifications

Ambient Temperature Range:	15 - 25°C
Inlet Air Quality*:	Clean dry compressed air ISO8573-1:2001 Class 2.-.1
Supply Voltage Range:	103 - 126V 60Hz/207 - 253V 50/60Hz
Port Connections	
Inlet*:	1/4" Compression Fitting
Outlet UHPN2 550 & 750:	1/8" Compression Fitting
Outlet UHPN2 1500 & 3000:	1/4" Compression Fitting

*Non compressor models only

Type	Description	Flow rate	Purity	Air Inlet	Oulet Pressure	Dimensions (W x D x H)	Weight	PK	Cat. No.
		L / min.	%	L/min	bar g	mm	kg		
UHPN2-550		0.55	>99,9995	33.0	5	345 x 417 x 869	44.0	1	**9.870 404** 1
UHPN2-550C	with compressor	0.55	>99,9995		5	345 x 417 x 869	50.0	1	**9.870 405**
UHPN2-750		0.75	>99,9995	33.0	5	345 x 417 x 869	44.0	1	**9.870 406**
UHPN2-750C	with compressor	0.75	>99,9995		5	345 x 417 x 869	50.0	1	**9.870 407**
UHPN2-1500		1.50	>99,9995	117.0	5	345 x 667 x 869	84.0	1	**9.870 408**
UHPN2-1500C	with compressor	1.50	>99,9995		5	345 x 667 x 869	93.0	1	**9.870 409**
UHPN2-3000		3.00	>99,9995	117.0	5	345 x 667 x 869	84.0	1	**9.870 410**
UHPN2-3000C	with compressor	3.00	>99,9995		5	345 x 667 x 869	93.0	1	**9.870 411**

Note: Add suffix E' for 207-253V 50/60Hz ie. UHPN2-750-E
Add suffix W' for 103 -126V 60Hz ie. UHPN2-750-W

1



9.870 404

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1 Nitrogen Generators for Agilent 6400 & 6500 LC/MS instruments

NEW!

Parker Hannifin GmbH

The Parker domnick hunter LCMS64/65 dual flow nitrogen gas generators employ robust, field proven technology to meet the drying, sheath, nebulisation and collision gas requirements of the Agilent Technologies QQQ & Q-TOF instrumentation portfolio. The LCMS64/65 generators provide two continuous streams of high purity nitrogen from a single plug & play' unit. Models are available both with and without an integral oil free compressor, are extremely quiet in operation, and fully approved for use by major instrumentation manufacturers. Innovative design and technology facilitate maximum instrument uptime, attractive return on investment and proven analytical performance, eliminating the need for other modes of supply.

- Complete Plug and Play' system specifically designed for the Agilent 6400 & 6500
- Produces a continuous supply of LC/MS grade nitrogen 24 hours a day
- Integral oil free compressor, with noise reduction technology
- Eliminate inconvenient and potentially dangerous nitrogen cylinders
- Compact, reliable with minimal operator attention and maintenance
- Phthalate-free componentry

Specifications

Ambient Temperature Range:	5 - 40°C
Inlet Air Quality*:	Clean dry compressed air ISO8573-1:2001 Class 2.-.1
Supply Voltage Range:	103 - 126V 60Hz 207 - 253V 50/60Hz
Port Connections	
Nitrogen Outlet:	1/4" Compression Fitting
Air Inlet*:	1/4" Compression Fitting

*Non compressor models only

Type	Description	Flow rate Nitrogen L / min.	Purity %	Air Inlet L/min	Delivery Pressure bar g	Dimensions (W x D x H) mm	Air Inlet L/min	PK	Cat. No.
LCMS64-0		0.20	> 99.999	90.0	6.8	510 x 559 x 705	103.0	1	**9.870 389**
LCMS64-1	with Compressor	0.20	> 99.999		6.8	510 x 826 x 705	143.0	1	**9.870 390**
LCMS65-0		0.20	> 99.999	90.0	6.8	510 x 559 x 705	103.0	1	**9.870 391**
LCMS65-1	with Compressor	0.20	> 99.999		6.8	510 x 826 x 705	143.0	1	**9.870 392**

Note: Add suffix E' for 207-253V 50/60Hz ie LCMS64-0-E
Add suffix W' for 103 -126V 60Hz ie LCMS64-0-W

2



9.870 394

Nitrogen and Dry Air Generators for LC/MS instruments

NEW!

Parker Hannifin GmbH

The Parker domnick hunter LCMS20/3 dual flow nitrogen and dry air generators employ robust, field proven technology to meet the nebulisation requirements of LC/MS instruments, both in positive and negative ionisation mode. The LCMS20/3 generators provide two continuous streams of high purity nitrogen and dry air from a single plug & play' unit. Models are available with and without an integral oil free compressor, are extremely quiet in operation and are fully approved for use by major instrumentation manufacturers. Innovative design and technology facilitate maximum instrument uptime, attractive return on investment and proven analytical performance, eliminating the need for other modes of supply.

- Complete Plug and Play' system specifically designed for LC/MS
- Produces a continuous supply of LC/MS grade nitrogen 24 hours a day
- Integral oil free compressor, with noise reduction technology
- Eliminate inconvenient and potentially dangerous nitrogen cylinders
- Compact, reliable with minimal operator attention and maintenance
- Phthalate-free componentry

Specifications

Ambient Temperature Range:	5 - 40°C
Inlet Air Quality*:	Clean dry compressed air ISO8573-1:2001 Class 2.-.1
Supply Voltage Range:	103 - 126V 60Hz 207 - 253V 50/60Hz
Port Connections	
Outlet:	1/4" Compression Fitting
Inlet*:	1/4" Compression Fitting

*Non compressor models only

Type	Description	Flow rate Nitrogen L / min.	Purity Nitrogen %	Air Inlet L/min	Delivery Pressure bar g	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
LCMS20/3-0		20.00	> 99	85.0	7	510 x 559 x 705	103.0	1	**9.870 393**
LCMS20/3-1	with Compressor	20.00	> 99		7	510 x 826 x 705	143.0	1	**9.870 394**

Note: Add suffix E' for 207-253V 50/60Hz ie. LCMS20/3-0-E
Add suffix W' for 103 -126V 60Hz ie. LCMS20/3-0-W



Summary of MN phases for GC

MN offers more than 40 different phases for gas chromatography from very nonpolar to polar columns.

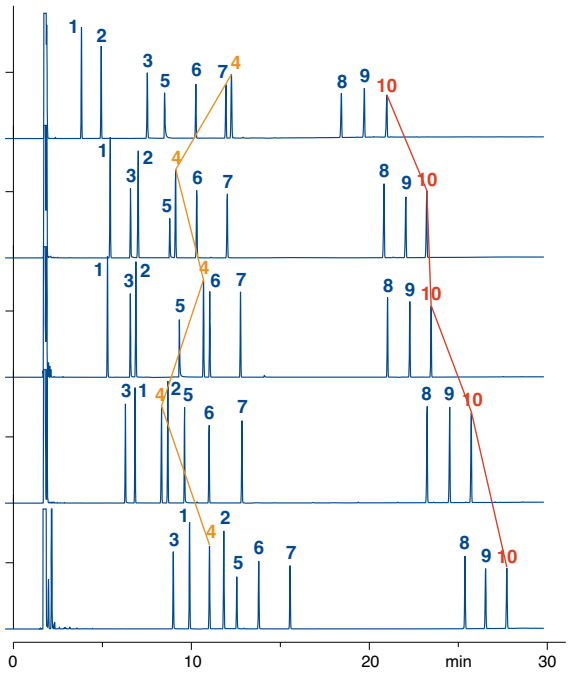
Nonpolar stationary phases (e.g. 100 % dimethylpolysiloxane phases) separate by volatility (i.e. boiling point) only. Typical analytes are linear hydrocarbons (*n*-alkanes).

Polar phases offer additional interactions, which may improve a separation. When increasing the polarity, e.g. by introducing phenyl and / or cyanopropyl groups, separation is increasingly influenced by differences in dipole moment and by charge transfer effects (e.g. for 5 – 50 % diphenylpolysiloxane phases). Typical analytes are hydrocarbons, which contain oxygen, sulphur, nitrogen, phosphorus or halogen atoms, unsaturated molecules which can be polarised and aromatics.

For components featuring different hydrogen bonding capacities and the ability to form strong hydrogen bonds, polyethylene glycol phases (WAX) are the best choice for a separation. Typical analytes are alcohols and carboxylic acids.

Selectivity has to be optimized for the critical pair of components or for the main component. You should always select the least polar column which solves your separation task. About 70 % of all separations can be performed on non- to midpolar columns. These columns generally feature high temperature stability.

Comparison of separation properties of selected OPTIMA® phases



OPTIMA® 225
max. temp. 260/280 °C

OPTIMA® 1701
max. temp. 320/340 °C

OPTIMA® 17
max. temp. 320/340 °C

OPTIMA® 5
max. temp. 340/360 °C

OPTIMA® 1
max. temp. 340/360 °C

increasing polarity

All columns:	0.5 µm film, 30 m x 0.32 mm ID
Sample:	MN-OPTIMA® test mixture
Injection:	1.0 µl, split 1:50
Carrier gas:	80 kPa N_2
Temperature:	80 °C → T_{max} (isothermal), 8 °C/min
Detector:	FID, 260 – 300 °C, 2^6

Peaks:

1. Undecane
2. Dodecane
3. Octanol
4. Dimethylaniline
5. Decylamine
6. Methyl decanoate
7. Methyl undecanoate
8. Henicosane
9. Docosane
10. Tricosane

Each column is individually tested and supplied with test certificate and test chromatogram, but without fittings or ferrules. Column ends are melted or closed with septa, and thus protected from atmospheric oxygen. Additionally, we include the corresponding test mixture with each column.

On request, all columns can be supplied with a 5 inch / 13 cm cage for the Agilent GC 6850.

Capillary columns for GC

Summary of MN phases for GC



Phase	Composition	max. temperature [1]	USP	Similar phases [2]	Page
Standard phases					
OPTIMA® 1	100 % dimethylpolysiloxane	340/360 °C	G1 G2 G38	PERMABOND® SE-30, OV-1, DB-1, SE-30, HP-1, SPB-1, CP-Sil 5 CB, Rtx®-1, 007-1, BP1, MDN-1, AT™-1, ZB-1, OV-101	86
OPTIMA® 1 MS Accent	100 % dimethylpolysiloxane	340/360 °C	G1 G2 G38	Ultra-1, DB-1MS, HP-1MS, Rtx®-1MS, Equity™-1, AT™-1MS, VF-1MS, CP-Sil 5 CB MS	88
OPTIMA® 5	5 % phenyl – 95 % methylpolysiloxane	340/360 °C	G27 G36	PERMABOND® SE-52, SE-54, SE-52, DB-5, HP-5, SPB-5, CP-Sil 8, Rtx®-5, 007-5, BP5, MDN-5, AT™-5, ZB-5	89
OPTIMA® 5 MS	5 % diphenyl - 95 % dimethylpolysiloxane	340/360 °C	G27 G36	DB-5MS, HP-5MS, Ultra-2, Equity™-5, CP-Sil 8CB low bleed/MS, Rtx®-5SIL-MS, Rtx®-5MS, 007-5MS, BPX5, MDN-5S, AT™-5MS, VF-5MS	90
OPTIMA® 5 MS Accent	silarylene phase with selectivity similar to 5 % diphenyl – 95 % dimethylpolysiloxanphasee	340/360 °C	G27 G36		91
OPTIMA® 17	phenylmethylpolysiloxane, 50 % phenyl	320/340 °C	G3	OV-17, DB-17, HP-50+, HP-17, SPB-50, SP-2250, Rtx®-50, CP-Sil 24 CB, 007-17, ZB-50	92
OPTIMA® 624	6 % cyanopropylphenyl – 94 % dimethylpolysiloxane	280/300 °C	G43	HP-624, HP-VOC, DB-624, DB-VRX, SPB-624, CP-624, Rtx®-624, Rtx®-Volatiles, 007-624, BP624, VOCOL	94
OPTIMA® 624 *LB*	as above, low bleed phase	280/300 °C	G43		
OPTIMA® 1701	14 % cyanopropylphenyl – 86 % dimethylpolysiloxane	300/320 °C	G46	OV-1701, DB-1701, CP-Sil 19 CB, HP-1701, Rtx®-1701, SPB-1701, 007-1701, BP10, ZB-1701	93
OPTIMA® 225	50 % cyanopropylmethyl – 50 % phenylmethylpolysiloxane	260/280 °C	G7 G19	DB-225, HP-225, OV-225, Rtx®-225, CP-Sil 43, 007-225, BP225	95
OPTIMA® WAX	polyethylene glycol 20000 Dalton	240/250 °C	G16	PERMABOND® CW 20 M, DB-Wax, Supelcowax™, HP-Wax, HP-INNOWax, Rtx®-Wax, CP-Wax 52 CB, Stabilwax, 007-CW, BP20, AT™-Wax, ZB-Wax	96
OPTIMA® FFAP	polyethylene glycol-2-nitro-terephthalate	250/260 °C	G25 G35	PERMABOND® FFAP, DB-FFAP, HP-FFAP, CP-SIL 58 CB, 007-FFAP, CP-FFAP CB, Nukol	97
Phases for special separations					
OPTIMA® 5 Amine	5 % phenyl – 95 % methylpolysiloxane, specially deactivated for amine separations	300/320 °C	G27 G36	Rtx-5 Amine, PTA-5	98
LIPODEX® E	octakis-(2,6-di-O-pentyl-3-O-butyryl)-γ-cyclodextrin for enantiomer separation	200/220 °C	–	–	99
HYDRODEX β-6TBDM	heptakis-(2,3-di-O-methyl-6-O-t-butyldimethyl-silyl)-β-cyclodextrin for enantiomer separation	230/250 °C	–	–	100
HYDRODEX β-TBDAc	heptakis-(2,3-di-O-acetyl-6-O-t-butyldimethyl-silyl)-β-cyclodextrin for enantiomer separation	220/240 °C	–	–	100

[1] first temperature for isothermal operation, second value for short isotherms in a temperature programme. Please note, that for columns with 0.53 mm ID and for columns with thicker films temperature limits are generally lower. For details refer to the description of individual phases.

[2] phases which provide a similar selectivity based on chemical and physical properties

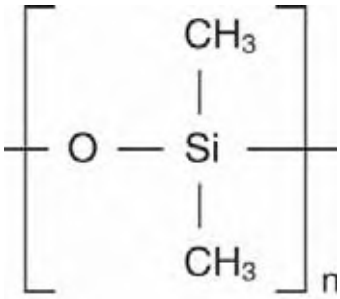
E & OE.

1 OPTIMA® 1 high performance capillary columns for GC

100% dimethylpolysiloxane *MACHEREY-NAGEL*

nonpolar phase separation of components according to boiling points thick film columns ≥3µm film are especially recommended for solvent analysis.
Similar phases: Permabond® SE-30, OV-1, DB-1, SE-30, HP-1, SPB-1, CP-Sil 5 CB, Rtx-1, 007-1, BP1, MDN-1, AT-1, ZB-1, OV-101.
For columns with 0.25 to 0.32mm ID and films <3µm the max. temperature for isothermal operation is 340°C, the max. temperature for short isotherms in a temperature programme is 360°C.
For 0.53mm ID columns with films <3µm the max. temperatures are 320 and 340°C, resp. for thick film columns with films ≥3µm the max. temperatures are 300 and 320°C, resp.

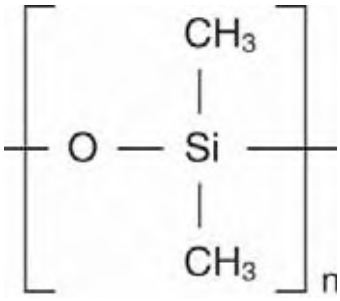
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Int. diam. mm	Ext. diam. mm	Film thickness µm	Length m	PK	Cat. No.
0.25	0.4	0.10	25	1	**9.003 657**
0.25	0.4	0.25	25	1	**9.003 662**
0.25	0.4	0.50	25	1	**9.003 667**
0.25	0.4	1.00	25	1	**9.003 671**
0.25	0.4	0.10	30	1	**9.003 658**
0.25	0.4	0.25	30	1	**9.003 663**
0.25	0.4	0.50	30	1	**9.003 668**
0.25	0.4	1.00	30	1	**9.003 672**
0.25	0.4	0.25	50	1	**9.003 664**
0.25	0.4	0.50	50	1	**9.003 669**
0.25	0.4	1.00	50	1	**9.003 673**
0.25	0.4	0.10	60	1	**9.003 659**
0.25	0.4	0.25	60	1	**9.003 665**
0.25	0.4	0.50	60	1	**9.003 670**
0.25	0.4	1.00	60	1	**9.003 674**
0.32	0.5	0.10	25	1	**9.003 676**
0.32	0.5	0.25	25	1	**9.003 682**
0.32	0.5	0.35	25	1	**9.003 686**
0.32	0.5	0.50	25	1	**9.003 691**
0.32	0.5	1.00	25	1	**9.003 697**
0.32	0.5	3.00	25	1	**9.003 701**
0.32	0.5	5.00	25	1	**9.003 706**
0.32	0.5	0.10	30	1	**9.003 677**
0.32	0.5	0.25	30	1	**9.003 683**
0.32	0.5	0.35	30	1	**9.003 687**
0.32	0.5	0.50	30	1	**9.003 692**
0.32	0.5	1.00	30	1	**9.003 698**
0.32	0.5	3.00	30	1	**9.003 702**
0.32	0.5	5.00	30	1	**9.003 707**
0.32	0.5	0.10	50	1	**9.003 678**
0.32	0.5	0.25	50	1	**9.003 684**
0.32	0.5	0.35	50	1	**9.003 688**
0.32	0.5	0.50	50	1	**9.003 693**
0.32	0.5	1.00	50	1	**9.003 699**
0.32	0.5	3.00	50	1	**9.003 703**
0.32	0.5	5.00	50	1	**9.003 708**
0.32	0.5	0.10	60	1	**9.003 679**
0.32	0.5	0.25	60	1	**9.003 685**
0.32	0.5	0.35	60	1	**9.003 689**
0.32	0.5	0.50	60	1	**9.003 694**
0.32	0.5	1.00	60	1	**9.003 700**
0.32	0.5	3.00	60	1	**9.003 704**
0.53	0.8	0.50	25	1	**4.003 149**
0.53	0.8	1.00	25	1	**4.003 164**
0.53	0.8	2.00	25	1	**4.003 152**
0.53	0.8	5.00	25	1	**4.003 265**
0.53	0.8	0.50	30	1	**4.003 150**
0.53	0.8	1.00	30	1	**4.003 165**
0.53	0.8	2.00	30	1	**4.003 153**
0.53	0.8	5.00	30	1	**4.003 266**
0.53	0.8	5.00	30	1	**4.003 267**

Custom-made columns to your specifications available on request.
Each column is individually tested and supplied with test certificate and test chromatogram, but without fittings or ferrules.
Column ends are melted or closed with septa, and thus protected from atmospheric oxygen. Additionally, we supply the corresponding test mixture with each column.

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OPTIMA® 1 MS Accent ultra-low bleed capillary columns for GC

100 % dimethylpolysiloxane *MACHEREY-NAGEL*

nonpolar phase with ultra-low bleeding, ideal for ion trap and quadrupol MS detectors increased sensitivity due to an unmatched low background level perfect inertness for basic compounds
solvent rinsing for removal of impurities applicable
application areas: all-round phase for environmental analyses, trace analyses, EPA methods, pesticides, PCB, food and drug analyses
similar phases: Ultra-1, DB-1 MS, HP-1 MS, Rtx-1 MS, Equity™1, AT-1 MS, VF-1 MS, CP-Sil 5 CB MS
max. temperature for isothermal operation 340°C, max. temperature for short isotherms in a temperature programme 360°C

Int. diam. mm	Ext. diam. mm	Film thickness µm	Length m	PK	Cat. No.
0.25	0.4	0.25	30	1	**4.003 001**
0.25	0.4	0.50	30	1	**4.003 003**
0.32	0.5	0.25	30	1	**4.002 998**
0.32	0.5	0.50	30	1	**4.003 005**

Each column is individually tested and supplied with test certificate and test chromatogram, but without fittings or ferrules. Column ends are melted or closed with septa, and thus protected from atmospheric oxygen.
Additionally, we supply the corresponding test mixture with each column.

EPA 8140 / 8141 / 8141 A org. P pesticides

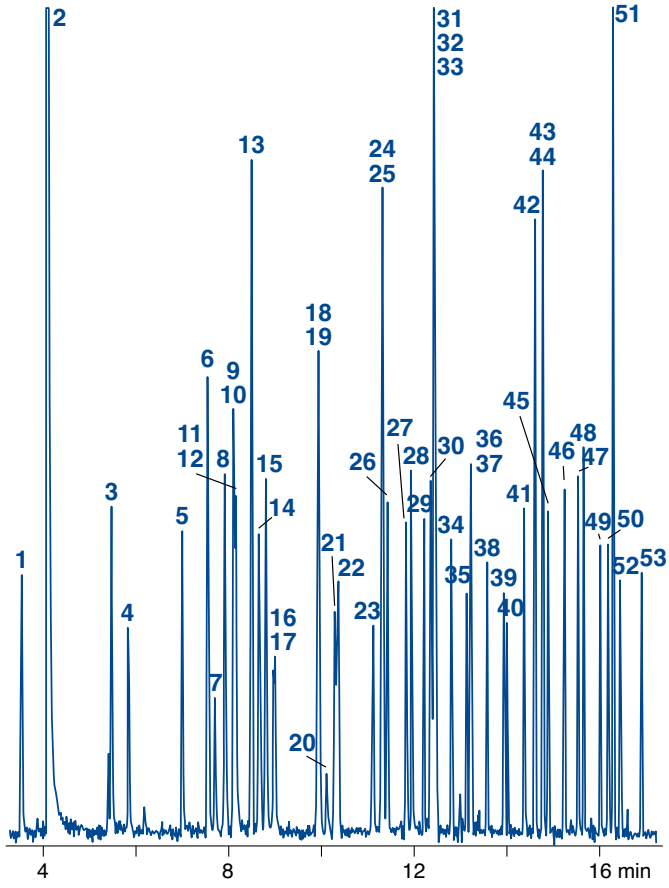
Column: OPTIMA® 1 MS Accent, 0.50 µm film, 30 m x 0.32 mm ID

Sample: 0.2 µg/ml in hexane, 8140/8141 OP pesticides calibration mix A + 8141 OP pesticides calibration mix B;
IS triphenyl phosphate and tributyl phosphate

Injection splitless (for 1 min); inj. temperature 250 °C
Carrier gas He, 1 ml/min, constant pressure
Temperature 100 °C → 180 °C, 10 °C/min (2 min) → 300 °C, 18 °C/min (3 min)
Detector: FPD (flame photometric detector), 280 °C

Peaks:
1. Dichlorvos, 2. Hexamethylphosphoramide, 3. Mevinphos, 4. Trichlorfon, 5. TEPP, 6. Thionazin, 7. Demeton-O, 8. Ethoprop 9. Tributyl phosphate (IS), 10. Dicrotophos, 11. Monocrotophos, 12. Naled, 13. Sulfotepp, 14. Phorate, 15. Dimethoate, 16. Demeton-S, 17. Dioxathion, 18. Terbufos, 19. Fonophos, 20. Phosphamidon-Isomer, 21. Diazinon, 22. Disulfoton, 23. Phosphamidon, 24. Dichlorofenthion, 25. Parathion-methyl, 26. Chlorpyrifos methyl, 27. Ronnel, 28. Fenitrothion, 29. Malathion, 30. Fenthion, 31. Aspon, 32. Parathion-ethyl, 33. Chlorpyrifos, 34. Trichloronate, 35. Chlorfenvinphos, 36. Merphos, 37. Crotoxyphos, 38. Stirofos, 39. Tokuthion, 40. Merphos oxidation product, 41. Fensulfothion, 42. Famphur, 43. Ethion, 44. Bolstar, 45. Carbophenothion, 46. Triphenyl phosphate (IS), 47. Phosmet, 48. EPN, 49. Azinphos-methyl, 50. Leptophos, 51. Tri-*o*-cresyl phosphate, 52. Azinphos-ethyl, 53. Coumaphos

MN Appl. No. 213030



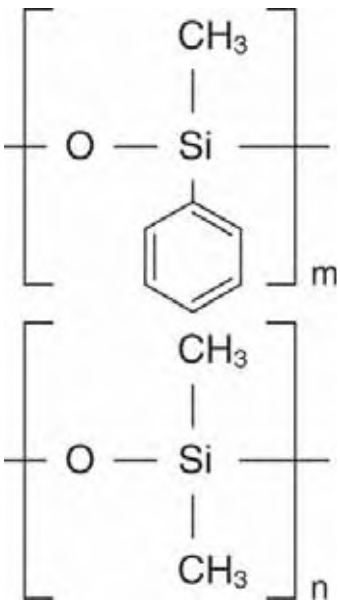
E & OE.

1 OPTIMA® 5 capillary columns for GC

5% phenyl - 95% dimethylpolysiloxane *MACHEREY-NAGEL*

USP G27, G36 nonpaolar standard phase with large range of application similar phases: Permabond® SE-52 , SE-54, SE-52, DB-5, HP-5, SPB-5, CP-Sil 8, Rtx-5, 007-5, BP5, MDN-5, AT-5, ZB-5 for columns with 0.1 to 0.32mm ID and films <3µm the max. temperature for isothermal operation is 340°C, the max. temperature for short isotherms in a temperature programme is 360°C for 0.53mm ID columns with films < 3µm the max. temperatures are 320 and 340°C, resp. for thick film columns with films ≥ 3µm the max. temperatures are 300 and 320°C, resp.

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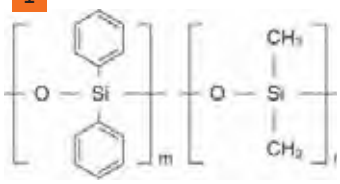
Int. diam. mm	Ext. diam. mm	Film thickness µm	Length m	PK	Cat. No.
0.10	0.4	0.10	10	1	**4.003 235**
0.25	0.4	0.10	25	1	**9.003 709**
0.25	0.4	0.25	25	1	**9.003 715**
0.25	0.4	0.35	25	1	**9.003 719**
0.25	0.4	0.50	25	1	**9.003 723**
0.25	0.4	1.00	25	1	**9.003 727**
0.25	0.4	0.10	30	1	**9.003 710**
0.25	0.4	0.25	30	1	**9.003 716**
0.25	0.4	0.35	30	1	**9.003 720**
0.25	0.4	0.50	30	1	**9.003 724**
0.25	0.4	1.00	30	1	**9.003 728**
0.25	0.4	0.10	50	1	**9.003 711**
0.25	0.4	0.25	50	1	**9.003 717**
0.25	0.4	0.35	50	1	**9.003 721**
0.25	0.4	0.50	50	1	**9.003 725**
0.25	0.4	1.00	50	1	**9.003 729**
0.25	0.4	0.10	60	1	**9.003 712**
0.25	0.4	0.25	60	1	**9.003 718**
0.25	0.4	0.35	60	1	**9.003 722**
0.25	0.4	0.50	60	1	**9.003 726**
0.25	0.4	1.00	60	1	**9.003 730**
0.32	0.5	0.10	25	1	**9.003 733**
0.32	0.5	0.25	25	1	**9.003 738**
0.32	0.5	0.35	25	1	**9.003 742**
0.32	0.5	0.50	25	1	**9.003 746**
0.32	0.5	1.00	25	1	**9.003 751**
0.32	0.5	3.00	25	1	**9.003 755**
0.32	0.5	5.00	25	1	**9.003 760**
0.32	0.5	0.10	30	1	**9.003 734**
0.32	0.5	0.25	30	1	**9.003 739**
0.32	0.5	0.35	30	1	**9.003 743**
0.32	0.5	0.50	30	1	**9.003 747**
0.32	0.5	1.00	30	1	**9.003 752**
0.32	0.5	3.00	30	1	**9.003 756**
0.32	0.5	5.00	30	1	**9.003 761**
0.32	0.5	0.10	50	1	**9.003 735**
0.32	0.5	0.25	50	1	**9.003 740**
0.32	0.5	0.35	50	1	**9.003 744**
0.32	0.5	0.50	50	1	**9.003 748**
0.32	0.5	1.00	50	1	**9.003 753**
0.32	0.5	3.00	50	1	**9.003 757**
0.32	0.5	0.10	60	1	**9.003 736**
0.32	0.5	0.25	60	1	**9.003 741**
0.32	0.5	0.35	60	1	**9.003 745**
0.32	0.5	0.50	60	1	**9.003 749**
0.32	0.5	1.00	60	1	**9.003 754**
0.32	0.5	3.00	60	1	**9.003 758**
0.53	0.8	0.50	25	1	**4.003 155**
0.53	0.8	1.00	25	1	**4.003 168**
0.53	0.8	2.00	25	1	**4.003 158**
0.53	0.8	5.00	25	1	**4.003 261**
0.53	0.8	0.50	30	1	**4.003 156**
0.53	0.8	1.00	30	1	**4.003 169**
0.53	0.8	2.00	30	1	**4.003 159**
0.53	0.8	5.00	30	1	**4.003 262**
0.53	0.8	2.00	50	1	**4.003 160**
0.53	0.8	5.00	50	1	**4.003 263**
0.53	0.8	2.00	60	1	**4.003 161**

Custom-made columns to your specifications available on request.

Each column is individually tested and supplied with test certificate and test chromatogram, but without fittings or ferrules. Column ends are melted or closed with septa, and thus protected from atmospheric oxygen.

Additionally, we supply the corresponding test mixture with each column.

1



1 OPTIMA® 5 MS capillary columns for GC

5% diphenyl - 95% dimethylpolysiloxane *MACHEREY-NAGEL*

nonpolar phase with low bleeding, deal for GC/MS and ECD applications and general analyses at trace level perfect inertness for basic compounds.
Similar phases: DB-5 MS, HP-5 MS, Ultra-2, Equity-5, CP-Sil 8 CB low bleed/MS, Rtx-5SIL-MS, Rtx-5 MS, 007-5 MS, BPX5, MDN-5S, AT-5 MS, VF-5 MS.
max. temperature for isothermal operation: 340°C, max. temperature for short isotherms in a temperature programme: 360°C

Int. diam. mm	Ext. diam. mm	Film thickness µm	Length m	PK	Cat. No.
0.25	0.4	0.25	30	1	**7.080 092**
0.25	0.4	0.50	30	1	**4.003 099**
0.25	0.4	1.00	30	1	**4.003 101**
0.32	0.5	0.25	30	1	**6.700 690**
0.32	0.5	0.50	30	1	**4.003 093**

Custom-made columns to your specifications available on request.
Each column is individually tested and supplied with test certificate and test chromatogram, but without fittings or ferrules. Column ends are melted or closed with septa, and thus protected from atmospheric oxygen.
Additionally, we supply the corresponding test mixture with each column.

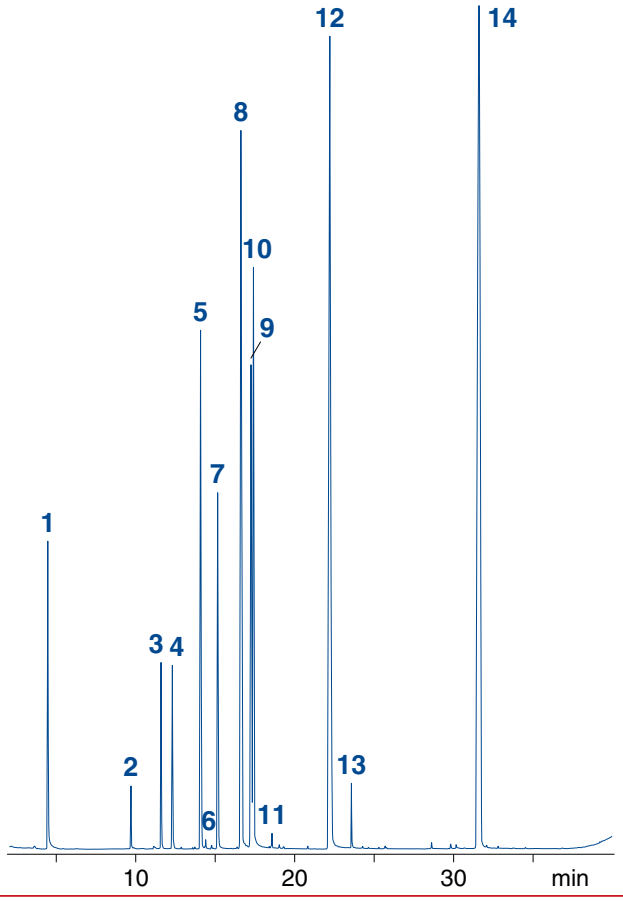
Analysis of various phenols

Column: OPTIMA® 5 MS, 30 m x 0.25 mm ID, 0.25 µm film, max. temperature 340/360 °C
Sample: 5 ppm each except *N-i*-propylaniline (9.4 ppm)
Method: SPME
Temperature: 40 °C (2 min) → 240 °C, 6 °C/min → 320 °C, 20 °C/min
Detector: MSD

Peaks:
1. Toluene-D_8
2. Phenol
3. 2-Methylphenol (*o*-Cresol)
4. Nitrobenzene-D_5
5. *N-i*-Propylaniline
6. 2,4-Dichlorophenol
7. 4-Chlorophenol
8. 4-Bromo-2-chlorophenol
9. 3-Bromophenol
10. 4-Chloro-3-methylphenol
11. 2,4-Dibromophenol
12. 2-Hydroxybiphenyl
13. 2-Cyclohexylphenol
14. Hexafluorobisphenol A

courtesy of Riedel-de-Haën, Seelze, Germany

MN Appl. No. 210110

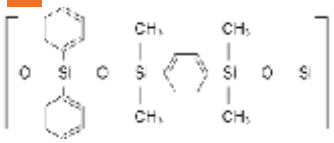




E & OE.

1 OPTIMA® 5 MS Accent capillary columns for GC

silarylene phase *MACHEREY-NAGEL*



with polarity similar to a 5 % diphenyl -95 % dimethylpolysiloxane phase.
USP G27, G36
lowest column bleed, nonpolar phase, ideal for ion trap and quadrupol MS detectors solvent rinsing for removal of impurities applicable
application areas: all-round phase for environmental analyses, trace analyses, EPA methods, pesticides, PCB, food and drug analyses
similar phases: DB-5 MS, HP-5 MS, Ultra-2, Equity-5, CP-Sil 8 CB low bleed/MS, Rtx-5SIL-MS, Rtx-5 MS, 007-5 MS, BPX5, MDN-5S, AT-5 MS, VF-5 MS

max. temperature for isothermal operation: 340°C,
max. temperature for short isotherms in a temperature programme: 360°C
for cloumns with film thicknesses > 5.5 µm the max. temperatures are 320 and 340°C

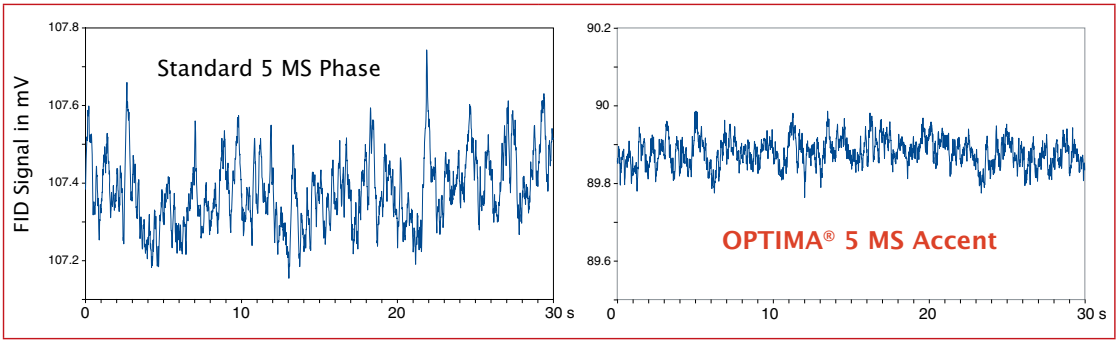
Int. diam. mm	Ext. diam. mm	Film thickness µm	Length m	PK	Cat. No.
0.25	0.4	0.25	30	1	**4.003 017**
0.25	0.4	0.50	30	1	**4.003 019**
0.25	0.4	1.00	30	1	**4.003 021**
0.32	0.5	0.25	30	1	**4.003 009**
0.32	0.5	0.50	30	1	**4.003 013**

Each column is individually tested and supplied with test certificate and test chromatogram, but without fittings or ferrules. Column ends are melted or closed with septa, and thus protected from atmospheric oxygen.
Additionally, we supply the corresponding test mixture with each column.

The bleed comparison test of the OPTIMA® 5-MS Accent with a conventional 5-MS phase shows the outstanding performance of the silarylene phase.

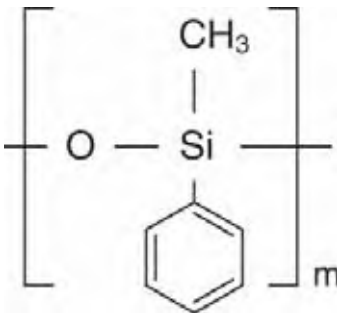
Background noise at 340 °C

The unmatched low background level of the OPTIMA® 5 MS Accent, which is approximately three times lower compared to a 5 MS brand column, provides significantly increased sensitivity and allows the application in trace analyses particularly of high-boiling compounds.



2 Optima® 17 capillary columns for GC

phenylmethylpolysiloxane (50 % phenyl) *MACHEREY-NAGEL*



medium polar phase
preferred applications: steroids, pesticides, drug analyses
USP G3
similar phases: OV-17, DB-17, HP50+, HP17, SPB-50, SP-2250, Rtx-50, CP-Sil 24 CB, 007-17, ZB50

max. temperature for isothermal operation: 320°C, max. temperature for short isotherms in a temperature programme: 340°C, for 0.53mm ID columns the max. temperatures are 300 and 320°C, resp.

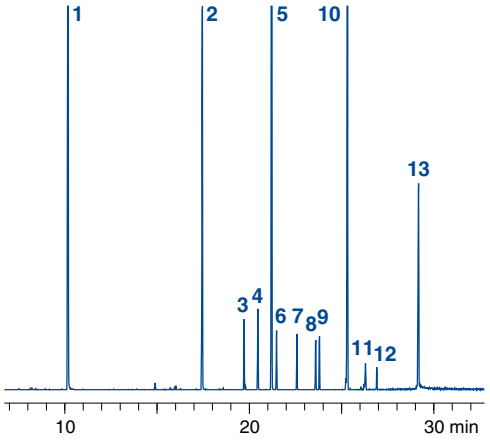
Int. diam. mm	Ext. diam. mm	Film thickness µm	Length m	PK	Cat. No.
0.10	0.4	0.10	10	1	**4.003 236**
0.25	0.4	0.15	25	1	**4.003 181**
0.25	0.4	0.25	25	1	**4.003 026**
0.25	0.4	0.50	25	1	**4.003 046**
0.25	0.4	0.15	30	1	**4.003 182**
0.25	0.4	0.25	30	1	**4.003 027**
0.25	0.4	0.50	30	1	**4.003 047**
0.32	0.5	0.25	25	1	**4.003 112**
0.32	0.5	0.35	25	1	**4.003 194**
0.32	0.5	0.50	25	1	**4.003 185**
0.32	0.5	0.15	30	1	**4.003 193**
0.32	0.5	0.25	30	1	**4.003 113**
0.32	0.5	0.35	30	1	**4.003 195**
0.32	0.5	0.50	30	1	**4.003 186**
0.53	0.8	1.00	25	1	**4.003 191**
0.53	0.8	1.00	30	1	**4.003 192**

In addition to this standard programme we will be happy to supply columns custom-made to your specifications.

Analysis of pesticides

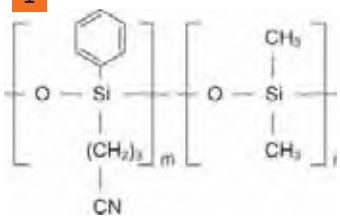
Column: OPTIMA® 17, 0.20 µm film, 25 m x 0.20 mm ID, max. temperature 320/340 °C,
Sample: pesticide standard of the cantonal laboratory Schaffhausen (Switzerland), 0.1 mg/ml or 0.01 mg/ml each
Inj. volume: 1.0 µl
Carrier gas: He, 25 cm/s, 3 s without split
Temperature: 100 °C (3 min), 8 °C/min → 250 °C, 10 °C/min → 320 °C
Detector: MSD HP 5971

MN Appl. No. 200930



Peaks:
1. Dichlorphos
2. Naled
3. Vinclozolin
4. Chlorthalonil
5. Chlorpyrifos
6. Dichlofluanid
7. Procymidon
8. Captan
9. Folpet
10. Carbophenothion
11. Iprodion
12. Captafol
13. Coumaphos

1



1 Optima® 1701 capillary columns for GC

14 % Cyanopropyl-phenyl - 86 % Dimethylpolysiloxane *MACHEREY-NAGEL*

USP G46
medium polar phase
special selectivity due to high cyanopropyl content
reference column for structure identification, e.g. in combination with Optima 5
film thickness 1 µm for solvent analyses
similar phases: OV-1701, DB-1701, CP?Sil 19 CB, HP-1701, Rtx-1701, SPB-1701, 007-1701, BP10, ZB-1701

max. temperature for isothermal operation: 300°C, max. temperature for short isotherms in a temperature programme: 320°C
for 0.53mm ID columns the max. temperatures are 280 and 300°C, resp.

Int. diam. mm	Ext. diam. mm	Film thickness µm	Length m	PK	Cat. No.
0.25	0.4	0.25	25	1	**4.003 035**
0.25	0.4	0.25	30	1	**4.003 036**
0.25	0.4	0.50	30	1	**4.003 039**
0.25	0.4	1.00	30	1	**4.003 272**
0.32	0.5	0.25	30	1	**4.003 104**
0.32	0.5	0.35	30	1	**4.003 223**
0.32	0.5	0.50	30	1	**4.003 108**
0.32	0.5	1.00	30	1	**4.003 269**
0.53	0.8	1.00	25	1	**4.003 172**
0.53	0.8	2.00	25	1	**4.003 178**
0.53	0.8	1.00	30	1	**4.003 173**
0.53	0.8	2.00	30	1	**4.003 179**

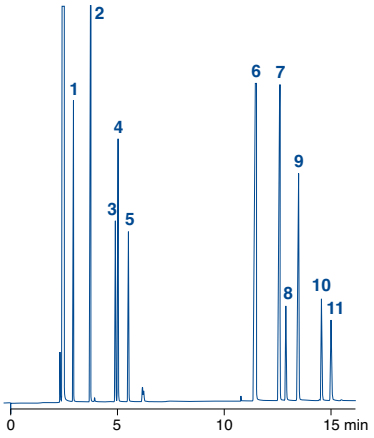
Custom-made columns to your specifications on request.
Each column is individually tested and supplied with test certificate and test chromatogram, but without fittings or ferrules.
Column ends are melted or closed with septa, and thus protected from Additionally, we supply the corresponding test mixture with each column.

Analysis of aromatic hydrocarbons

Column: OPTIMA® 1701, 0.25 µm film, 25 m x 0.32 mm ID, max. temp. 300/320 °C
Inj. volume: 1 µl
Carrier gas: 0.6 bar N_2
Split: 1:40
Temperature: 60 °C → 120 °C, 4 °C/min
Detector: FID 260 °C

Peaks:
1. Benzene
2. Toluene
3. Ethylbenzene
4. *p*-Xylene
5. *o*-Xylene
6. Phenol
7. 2-Methylphenol
8. 2,6-Dimethylphenol
9. 4-Methylphenol
10. 2,4-Dimethylphenol
11. 2,4,6-Trimethylphenol

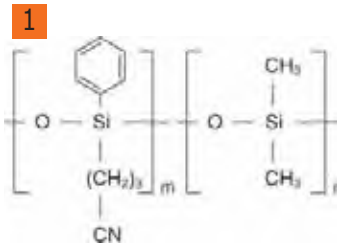
MN Appl. No. 200400



E & OE.

1 Optima® 624 capillary columns for GC

6% cyanopropyl-phenyl - 94% dimethylpolysiloxane *MACHEREY-NAGEL*



USP G43
medium polar phase
recommended for environmental analyses
similar phases: HP-624, HP-VOC, DB-624, DB-VRX, SPB-624, CP-624, Rtx-624, Rtx-Volatiles, 007-624, BP624, VOCOL

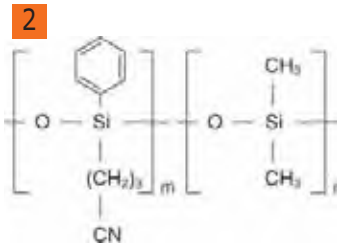
max. temperature for isothermal operation: 280°C, max. temperature for short isotherms in a temperature programme: 300°C

Int. diam. mm	Ext. diam. mm	Film thickness µm	Length m	PK	Cat. No.
0.25	0.4	1.40	30	1	**4.003 211**
0.25	0.5	1.80	30	1	**4.003 217**
0.53	0.8	3.00	25	1	**4.003 220**
0.53	0.8	3.00	30	1	**4.003 221**

Custom-made columns to your specifications avaialble on request.
Each column is individually tested and supplied with test certificate and test chromatogram, but without fittings or ferrules.
Column ends are melted or closed with septa. Additionally, we supply the corresponding test mixture with each column.

2 Optima® 624 *LB* capillary columns for GC

6% cyanopropyl-phenyl - 94% dimethylpolysiloxane *MACHEREY-NAGEL*



USP G 43
medium polar phase
low bleed columns for halogenated hydrocarbons, volatiles, aromatic compounds, solvents etc.
similar phases: HP-624, HP-VOC, DB-624, DB-VRX, SPB-624, CP-624, Rtx-624, Rtx-Volatiles, 007-624, BP624, VOCOL

max. temperature for isothermal operation: 280°C, max. temperature for short isotherms in a temperature programme: 300°C

Int. diam. mm	Ext. diam. mm	Film thickness µm	Length m	PK	Cat. No.
0.32	0.5	1.80	30	1	**4.003 214**
0.32	0.5	1.80	50	1	**4.003 215**

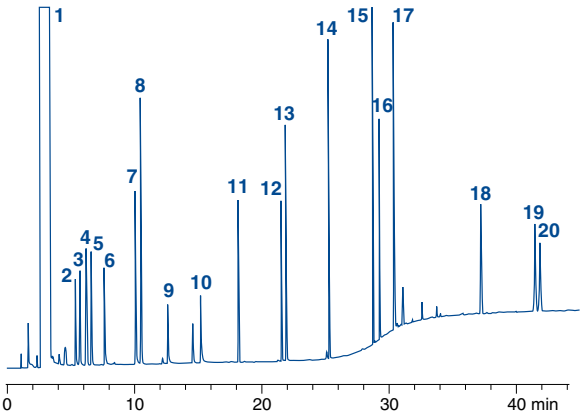
Custom-made columns to your specifications available on request.
Each column is individually tested and supplied with test certificate and test chromatogram, but without fittings or ferrules.
Column ends are melted or closed with septa. Additionally, we supply the corresponding test mixture with each column.

Solvents and semi-volatiles

Column: OPTIMA® 624 *LB*, 1.8 µm film, 30 m x 0.32 mm ID; Retention Gap Phe-Sil 0.5 m x 0.53 mm
Carrier gas: 1.1 bar He
Temperature: 45 °C (3 min) → 150 °C (6 °C/min) → 300 °C (18 °C/min), 20 min 300 °C
Injection: 1 µl (10 ppm per substance in acetone), cold on-column
Detection: FID 280 °C

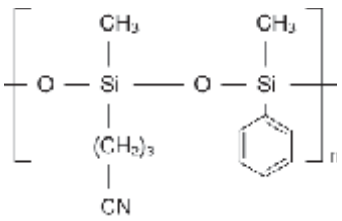
Peaks:

1. Acetone
2. Ethyl acetate
3. Tetrahydrofuran
4. Cyclohexane
5. Methyl-2-butanol-2
6. Butanol-1
7. Pyridine
8. Toluene
9. Dimethylformamide
10. Dimethylsulphoxide
11. Decane
12. Octanol-1
13. Acetophenone
14. Butyrophenone
15. Heptanophenone
16. Methoxy-5-indole
17. Dibenzylamine
18. Methyl eicosanoate
19. Methyl *cis*-13-docosenoate
20. Methyl docosanoate



MN Appl. No. 212520

1



1 OPTIMA® 225 capillary columns for GC

50% cyanopropylmethyl - 50% phenylmethylpolysiloxane *MACHEREY-NAGEL*

USP G7/G19
middle polar phase
recommended for fatty acid analyses
similar phases: DB-225, HP-225, OV-225, Rtx-225, CP-Sil 43, 007-225, BP225

max. temperature for isothermal operation: 260°C, max. temperature for short isotherms in a temperature programme: 280°C

Int. diam. mm	Ext. diam. mm	Film thickness µm	Length m	PK	Cat. No.
0.10	0.4	0.10	10	1	**4.003 050**
0.25	0.4	0.25	30	1	**4.003 066**
0.32	0.5	0.25	30	1	**4.003 117**

Custom-made columns to your specifications available on request.
Each column is individually tested and supplied with test certificate and test chromatogram, but without fittings or ferrules.
Column ends are melted or closed with septa. Additionally, we supply the corresponding test mixture with each column.

Analysis of FAME in porcine fat

Column: OPTIMA® 225, 0.25 µm film, 25 m x 0.32 mm ID, max. temperature 260/280 °C
Carrier gas: 60 kPa H_2, injection volume 1 µl, split 1:40
Temperature: 50 °C (2 min) → 125 °C, 30 °C/min → 160 °C, 5 °C/min → 180 °C, 20 °C/min → 200 °C, 3 °C/min → 220 °C, 20 °C/min (10 min)
Detector: FID 260 °C

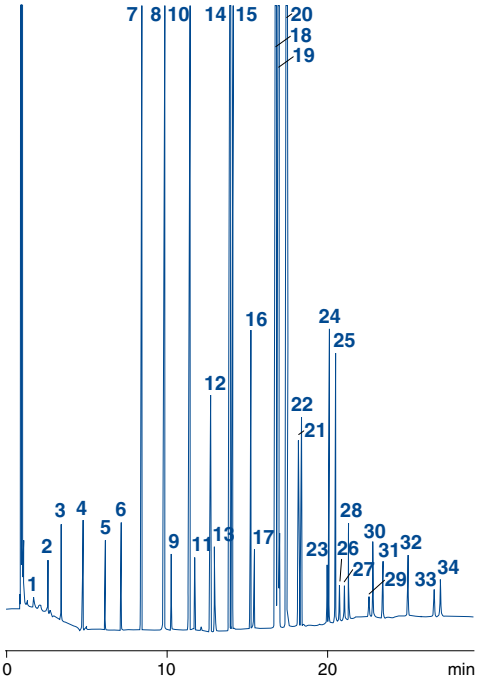
Peaks:

1. C4:0
2. C5:0
3. C6:0
4. C8:0
5. C10:0
6. C11:0
7. C12:0
8. C13:0
9. C13:1
10. C14:0
11. C14:1
12. C15:0
13. C15:1
14. C16:0
15. C16:1
16. C17:0
17. C17:1
18. C18:0
19. C18:1
20. C18:2
21. C18:3
22. C19:0
23. C20:0
24. C20:1
25. C20:2
26. C20:4
27. C20:3
28. C20:5
29. C22:0
30. C22:1
31. C22:2
32. C22:6
33. C24:0
34. C24:1

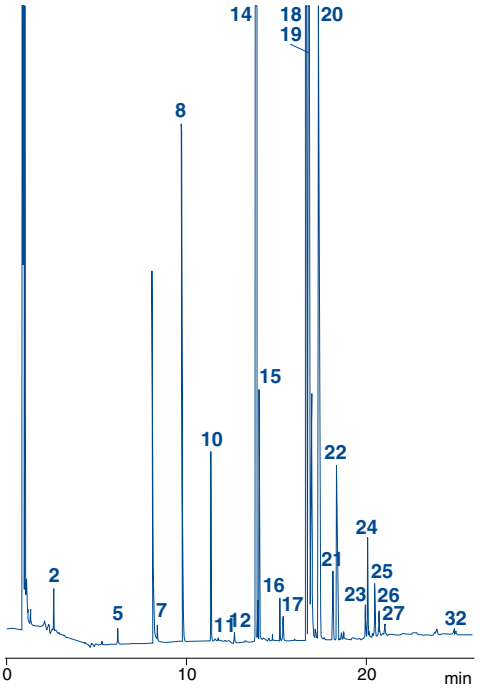
courtesy of Dr. Bantleon, Mr. Leusche, Mr. Hagemann, VFG-Labor, Versmold, Germany

MN Appl. No. 210060

FAME standard



FAME in porcine fat

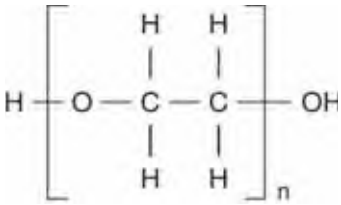


E & OE.

1 Optima® WAX capillary columns for GC

polyethylene glycol 20000 daltons *MACHEREY-NAGEL*

1



USP G16
polar phase
recommended for solvent analysis and alcohols
suitable for aqueous solutions
similar phases: Premabond® CW 20 M_, DB-Wax, Supelcowax, HP-Wax, HP-INNOWAX, Rtx-Wax, CP-Wax 52 CB, Stabilwax, 007-CW, BP20, AT-Wax, ZB-Wax

max. temperature for isothermal operation 240°C, max. temperature for short isotherms in a temperature programme: 250°C,for 0.53 mm ID columns the max. temperatures are 220 and 240°C, resp.

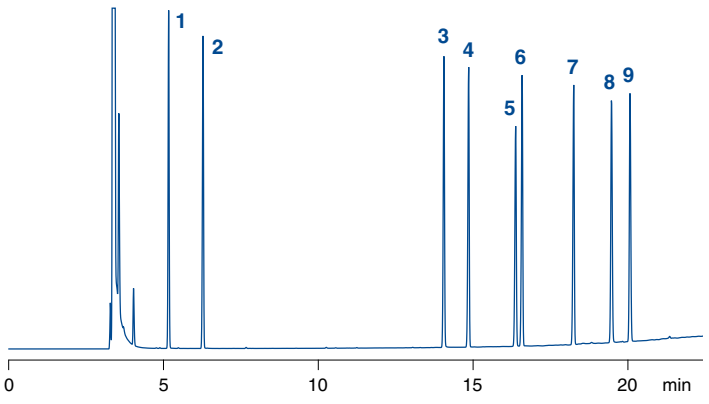
Int. diam. mm	Ext. diam. mm	Film thickness µm	Length m	PK	Cat. No.
0.25	0.4	0.25	25	1	**9.003 762**
0.25	0.4	0.25	30	1	**9.003 763**
0.32	0.5	0.25	30	1	**9.003 767**
0.32	0.5	0.50	30	1	**9.003 771**
0.53	0.8	1.00	25	1	**4.003 175**
0.53	0.8	1.00	30	1	**4.003 176**
0.53	0.8	2.00	30	1	**4.003 174**

Custom-made columns to your specifications available on request.
Each column is individually tested and supplied with test certificate and test chromatogram, but without fittings or ferrules.
Column ends are melted or closed with septa. Additionally, we supply the corresponding test mixture with each column.

Modified Grob test

Column: OPTIMA® WAX, 0.5 µm film, 50 m x 0.32 mm ID, max. temperature 250/260 °C
Inj. volume: 1 µl
Carrier gas: 1,2 bar He
Split: 1:20
Temperature: 80 °C → 250 °C, 8 °C/min
Detector: FID 250 °C

Peaks:
1. Decane
2. Undecane
3. Octanol
4. Methyl decanoate
5. Dicyclohexylamine
6. Methyl undecanoate
7. Methyl dodecanoate
8. 2,6-Dimethylaniline
9. 2,6-Dimethylphenol

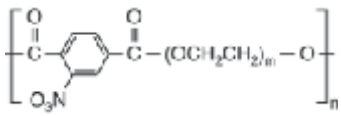


MN Appl. No. 211170

2 Optima® FFAP capillary columns for GC

polyethylene glycol 2-nitroterephthalate *MACHEREY-NAGEL*

2



close equivalent USP G25/G35
polar phase
recommended for FAME, free carboxylic acids
similar phases: Permabond FFAP , DB-FFAP, HP-FFAP, CP-Sil 58 CB, 007-FFAP, CP-FFAP CB, Nukol

for columns with 0.10 to 0.32mm ID the max. temperature for isothermal operation is 250°C, the max. temperature for short isotherms in a temperature programme is 260°C for 0.53mm ID columns the max. temperatures are 220 and 240°C, resp.

Int. diam. mm	Ext. diam. mm	Film thickness µm	Length m	PK	Cat. No.
0.10	0.4	0.10	10	1	**4.003 079**
0.25	0.4	0.25	25	1	**9.003 774**
0.25	0.4	0.25	30	1	**9.003 775**
0.32	0.5	0.25	30	1	**9.003 779**
0.32	0.5	0.50	30	1	**9.003 783**
0.53	0.8	1.00	25	1	**4.003 111**
0.53	0.8	0.50	30	1	**4.003 110**

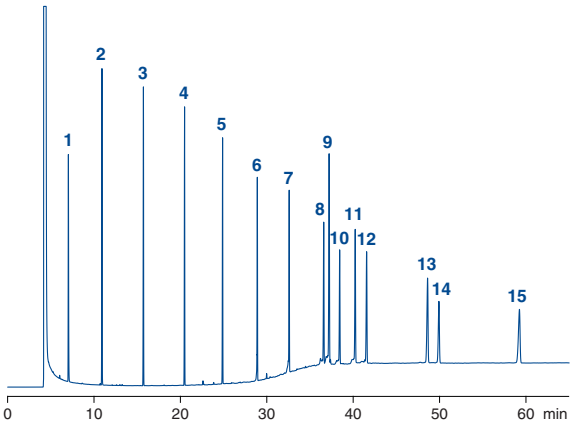
Custom-made columns to your specifications on request.
Each column is individually tested and supplied with test certificate and test chromatogram, but without fittings or ferrules. Column ends are melted or closed with septa, and thus protected from atmospheric oxygen.
Additionally, we supply the corresponding test mixture with each column.

FAME test

Column: OPTIMA® FFAP, 0.25 µm film, 60 m x 0.32 mm ID, max. temperature 250/260 °C
Carrier gas: 1.2 bar He, split
Temperature: 55 °C → 250 °C, 6 °C/min
Injection: 1,0 µl, 220 °C
Detector: FID 220 °C

Peaks:
1. C4
2. C6
3. C8
4. C10
5. C12
6. C14
7. C16
8. C18
9. C18:1 *cis/trans*
10. C18:2
11. C18:3
12. C20
13. C22
14. C22:1
15. C24

MN Appl. No. 211140



Optima® 5 Amine GC capillary columns for amine separation

MACHEREY-NAGEL

especially deactivated for the analysis of polyfunctional amines such as ethanolamines, amino-functionalised diols and similar compounds, which are important base materials in industrial chemistry, and shows strong tailing on standard-deactivated columns; similar phases: Rtx-5 Amine, PTA-5; USP G27/G36; improved linearity for analyses of active components at trace levels: no amine absorptions even for aliphatic and aromatic amines at concentrations of 100 pg/peak; tested with the Optima® Amine test mixture, which among others also contains diethanolamine and propanol-pyridine (this test mixture is supplied with each column). Max. temperature for isothermal operation: 300°C, max. temperature for short isotherms in a temperature programme: 320°C.

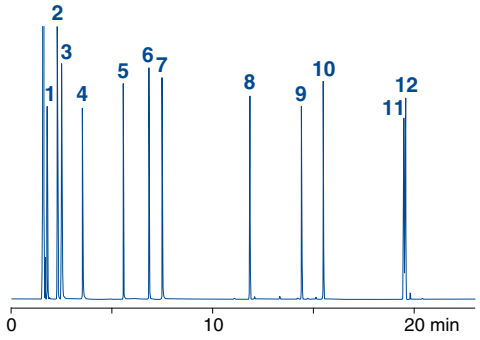
Int. diam. mm	Ext. diam. mm	Film thickness µm	Length m	PK	Cat. No.
0.25	0.4	0.50	30	1	**6.900 659**
0.25	0.4	1.00	30	1	**4.003 123**
0.32	0.5	0.25	30	1	**4.003 125**

Separation of secondary and tertiary amines

Column: OPTIMA® 5 Amine, 0.5 µm film, 30 m x 0.25 mm ID, max. temperature 300/320 °C
Injection volume: 1 µl
Carrier gas: 0,6 bar H_2, Split 1:100
Temperature: 100 °C (3 min) → 280 °C, 10 °C/min
Detector: FID 280 °C

Peaks:
1. Diethylamine
2. Di-isopropylamine
3. Triethylamine
4. Di-*n*-propylamine
5. Di-*n*-butylamine
6. Tri-*n*-propylamine
7. Di-isobutylamine
8. Tri-*n*-butylamine
9. Di-isohexylamine
10. Dicyclohexylamine
11. Dibenzylamine
12. Tri-*n*-hexylamine

MN Appl. No. 210280



E & OE.

Reagents and methods for derivatisation

Derivatisation reagents *MACHEREY-NAGEL*

for improved volatility, better thermal stability or low limit of detection in gas chromatography prerequisite: quantitative, rapid and reproducible formation of only on derivative halogen atoms introduced by derivatisation (e.g. trifluoroacetates) allow specific detection (ECD) with the advantage of high sensitivity elution order and fragmentation patterns in MS can be influenced by a specific derivatisation
reagents for **silylation - alkylation (methylation) - acylation** are available

These products contain harmful substances which must be specially labelled as hazardous. For detailed information please see the MSDS, which can be downloaded under www.mn-net.com.

Selection guide for derivatisation of important functional groups in GC

Function	method	derivative	recommended reagents
Alcohols, phenols	silylation	R'O – TMS	MSTFA
	acylation	R'O – CO – R	HFBA, MBTFA
R'OH	alkylation	R'O – R	TMSH
sterically hindered	silylation	R'O – TMS	BSTFA, SILYL-991
Amines	silylation	R' – NR'' – TMS	MSTFA, SILYL-991
primary, secondary	acylation	R' – NR'' – CO – R	HFBA, MBTFA
hydrochlorides	silylation	R' – NR'' – TMS	MSTFA
Amides	silylation	not stable	
	acylation	R' – CO – NH – CO – R	MBTFA, HFBA
Amino acids	silylation	R' – CH(NH – TMS) – CO – O – TMS	BSTFA, MSTFA
	alkylation (a) + acylation (b)	R' – CH(NH – CO – R) – CO – O – R	a) TMSH b) HFBA, MBTFA
Carboxylic acids	silylation	R' – CO – O – TMS	MSTFA
(fatty acids)		susceptible to hydrolysis	
	alkylation	R' – CO – O – R	TMSH
Carbohydrates	silylation		MSTFA
	acylation		MBTFA
Steroids	acylation		MBTFA, HFBA

Derivatisation method development kit

Which type of derivatisation is best suited for your sample (alkylation, silylation or acylation)? Test kit for determination of the optimum derivatisation. *MACHEREY-NAGEL*

Content	PK	Cat. No.
2 x 1 ml each for TMSH, MSTFA, MBTFA	1	**4.001 514**

Acylation kit

Which is the proper reagent for acylation?
Test kit for determination of the optimum acylation. *MACHEREY-NAGEL*

Content	PK	Cat. No.
2 x 1 ml each for MBTFA , TFAA, MBHFBA	1	**6.207 118**

Alkylation kit

Which is the proper reagent for methylation?
Test kit for determination of the optimum akylation. *MACHEREY-NAGEL*

Content	PK	Cat. No.
3x1 ml each for TMSH, DMF-DMA	1	**4.001 513**

Silylation kit

Which is the proper reagent for silylation?
Test kit for determination of the optimum silylation. *MACHEREY-NAGEL*

Content	PK	Cat. No.
2 x 1 ml each for MSTFA, BSTFA, TSIM, MSHFBA	1	**6.704 458**

Acylation reagents for GC - Anhydrides

MACHEREY-NAGEL

Acylation with fluorinated acid anhydrides can be used for alcohols, phenols, carboxylic acids, amines, amino acids and steroids forming volatile, stable derivatives suited for FID as well as for ECD detection.

by-products of acylation with anhydrides: corresponding acids
excess reagent and the acid formed have to be removed

Heptafluorobutyric acid anhydride (HFBA)
m.w. 410.06, Bp 106 - 107°C (760mm Hg),
C_3F_7 - CO - O - CO - C_3F_7
density d20°/4° = 1.665

Description	Capacity ml	PK	Cat. No.
HFBA	1	20	**4.001 480**
HFBA	10	1	**4.001 479**
HFBA	10	5	**4.001 481**

Methods for acylation

Acylation with fluorinated acid anhydrides:

Acylation with HFBA can be used for alcohols, phenols, carboxylic acids, amines, amino acids and steroids forming volatile, stable derivatives suited for FID as well as for ECD detection.

Procedure:
Dissolve 0.1 to 1 mg of the sample in 0.1 ml solvent, add 0.1 ml HFBA and heat to 60 – 70 °C for 1 – 2 hours. If the sample need not be concentrated prior to the analysis and if there is no danger of catalytically induced side reactions, pyridine is used as solvent. The reaction solution can be injected directly into the gas chromatograph. Otherwise use a volatile solvent and evaporate solvent, excess derivatisation reagent and free acid in a stream of nitrogen. Dissolve the residue in 50 µl hexane, chloroform etc. and inject aliquot portions.

MN Appl. No. 213042

Acylation with fluorinated acid amides:

This method is recommended for alcohols, primary and secondary amines as well as thiols under mild, neutral conditions. MBTFA also forms very volatile derivatives with carbohydrates [J. Sullivan and L. Schewe, J. Chromatogr. Sci. 15 (1977) 196 – 197].

Procedure:
Add 0.5 ml MBTFA to about 2 mg sample. If there is no reaction at ambient temperature, heat the reaction mixture to 120 °C. Compounds which are difficult to dissolve, can be trifluoracetylated in suitable solvent mixtures. It is recommended to use a ratio of solvent to MBTFA of 4 : 1. The reaction mixture can be chromatographed directly.

MN Appl. No. 213051

Acylation reagents for GC - Bisacylamides

MACHEREY-NAGEL

Acylation with fluorinated acid amides is recommended for alcohols, primary and secondary amines as well as for thiols under mild, neutral conditions. MBTFA also forms very volatile derivatives with carbohydrates.

by-products: corresponding neutral acylamides, which can be easily removed due to their high volatility; because of neutral conditions and favourable chromatographic properties often removal of the bisacylamide is not necessary. Thus sample preparation is much more convenient.

MBTFA /MBHFBA
N-methyl-bis(trifluoroacetamide) MBTFA
m.w. 223.08, Bp 123 - 124°C (760mm Hg), density d20°/4° = 1.55,
CF_3 - CO - $N(CH_3)$ - CO - CF_3

Description	Capacity ml	PK	Cat. No.
MBTFA	1	20	**7.401 143**
MBTFA	10	1	**7.510 796**
MBTFA	10	5	**6.228 605**

Due to their purpose, derivatisation reagents are very reactive substances. For this reason they should be stored cool and protected from moisture.
The derivatisation reagents are supplied in vials with crimp caps for easy access with a syringe. Vials with pierced sealing disks have limited stability and should be used soon.

Alkylation reagents for GC - Trimethylsulphonium hydroxide

TMSH (0.2M in methanol) M.G. 94.06

MACHEREY-NAGEL

Description	Capacity ml	PK	Cat. No.
TMSH	1	10	**7.086 147**
TMSH	1	20	**7.083 308**
TMSH	10	5	**4.001 512**

Silylation reagents - BSTFA, SILYL-991

N,O-bis-trimethylsilyl-trifluoroacetamide *MACHEREY-NAGEL*
m.w. 257.4, Bp 40°C (12mm Hg), density d20°/4° = 0.961
BSTFA: R = CF_3 powerful trimethylsilyl donor with approximately the same donor strength as the non-fluorinated analogue BSA
advantage of BSTFA over BSA: greater volatility of its reaction products (particularly useful for GC of some lower boiling TMS amino acids.

BSTFA is nonpolar (less polar than MSTFA), and can be mixed with acetonitrile for improved solubility. For silylating fatty acid amides, hindered hydroxyls and other compounds, which are difficult to silylate (like secondary alcohols and amines), we recommend BSTFA + 1% trimethylchlorosilane (TMCS), available under the designation SILYL-991.

Description	Capacity ml	PK	Cat. No.
BSTFA	1	20	**4.001 486**
BSTFA	10	1	**6.803 320**
BSTFA	10	5	**4.001 487**
SILYL-991 (BSTFA - TMCS (99:1)	1	20	**4.001 511**
SILYL-991 (BSTFA - TMCS (99:1)	50	1	**4.001 510**

Due to their purpose, derivatisation reagents are very reactive substances. For this reason they should be stored cool and protected from moisture.
The derivatisation reagents are supplied in vials with crimp caps for easy access with a syringe. Vials with pierced sealing disks have limited stability and should be used immediately.

Silylation with BSTFA or SILYL-991 (BSTFA + 1 % TMCS)

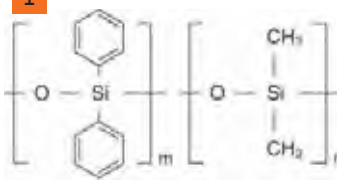
Procedure:
Add 0.5 ml silylation reagent to 1 – 10 mg sample; if necessary, add some solvent (normally pyridine or DMF [dimethylformamide] are used). Heat to 60 – 80 °C for 20 min to increase the reaction rate.

BSTFA MN Appl. No. 213092 · SILYL-991 MN Appl. No. 213093

1 Silylation reagents - MSTFA

N-methyl-N-trimethylsilyl-trifluoroacetamide *MACHEREY-NAGEL*
m.w. 199.1, Bp 70°C (75mm Hg), density d20°/4° = 1.11
MSTFA: R' = CF_3, R" = CH_3
the most volatile trimethylsilyl amide available
very strong TMS donor which does not cause any noticeable fouling of the FID burning chamber even after long-time measuring series
The already good solution characteristics can be improved by addition of submolar quantities of protic solvents (e.g. TFA for extremely polar compounds such as hydrochlorides) or pyridine (e.g. for carbohydrates).

1



recommended application: carboxylic acids, hydroxy and ketocarboxylic acids, amino acids, amines, alcohols, polyalcohols, sugars, mercaptans and similar compounds with active hydrogen atoms. Even amine hydrochlorides can be silylated directly.
advantages: complete reaction with high reaction rates, even without a catalyst (1 to 2% TMCS or TSIM)
the by-product of the reaction (N-methyltrifluoroacetamide) features high volatility and short retention time.

Description	Capacity ml	PK	Cat. No.
MSTFA	1	20	**7.055 892**
MSTFA	10	1	**6.704 091**
MSTFA	10	5	**6.085 475**
MSTFA	50	6	**6.227 450**
MSTFA	100	6	**4.001 493**

Due to their purpose, derivatisation reagents are very reactive substances. For this reason they should be stored cool and protected from moisture.
The derivatisation reagents are supplied in vials with crimp caps for easy access with a syringe. Vials with pierced sealing disks have limited stability and should be used soon.

Silylation with MSTFA

Procedure:
Dissolve 10 – 15 mg sample in 0.8 ml solvent, then add 0.2 ml MSTFA. The reaction mixture can be heated to 60 – 70 °C for up to 1 h and can be analysed directly. If TFA is used as a solvent, proceed as follows [M. Donike, J. Chromatogr. 85 (1973) 1 – 7]: Dissolve 1 – 2 mg sample in 100 µl TFA. Dropwise add 0.9 ml MSTFA.
After cooling the sample can be chromatographed directly.

MN Appl. No. 213111

1



1 Three-layer septa for GC inlet

Low density silicone wad sandwiched between two high density silicone layers. Working temperature max. 200°C. *Hamilton*

Diam. mm	PK	Cat. No.
6.35	12	**9.221 801**
8.00	12	**9.221 802**
9.00	12	**9.221 803**
9.50	12	**9.221 804**
10.00	12	**9.221 805**
12.70	12	**9.221 806**
11.00	12	**9.221 807**
13.00	12	**9.221 809**
16.00	12	**9.221 808**

2



2 Syringes for Agilent GC autosampler

NEW!

GC syringes for Agilent autosampler 7673, 7683 and 6850 with fixed or removable needle
two different needle diameter and tapered needles
high reproducibiliy, low carry-over *SGE Analytical Science*

Gauge (OD) mm	Needle Typ	Capacity µl	PK	Cat. No.
23-26s (0.63/0.47)	fixed	5	1	**9.221 270**
23-26s (0.63/0.47)	fixed	5	6	**6.204 103**
23-26s (0.63/0.47)	fixed	10	1	**6.226 427**
23-26s (0.63/0.47)	fixed	10	6	**6.254 971**
23-26s (0.63/0.47)	fixed	10 (Gas tight)	1	**9.221 271**
23-26s (0.63/0.47)	fixed	10 (Gas tight)	6	**9.221 272**
26 (0.47)	fixed	5	1	**6.203 350**
26 (0.47)	fixed	5	6	**6.205 076**
23 (0.63)	fixed	5	1	**9.221 273**
23 (0.63)	fixed	5	6	**6.072 528**
26 (0.47)	fixed	10	1	**9.221 274**
26 (0.47)	fixed	10	6	**6.206 502**
23 (0.63)	fixed	10	1	**6.089 587**
23 (0.63)	fixed	10	6	**6.050 962**
26 (0.47)	removable	0.5	1	**6.228 788**
23 (0.63)	removable	0.5	1	**9.221 275**
23 (0.63)	removable	1	1	**9.221 276**

3



7.653 145

4



6.236 751

5



6.223 553

6



9.003 588

Inlet Liner and o-rings for Agilent GC

NEW!

Inlet Liner for Agilent 5890, 6850, 6890, 7890 und HP4890. SGE's inlet liners come as a complete, single packed unit. *SGE Analytical Science*

5 or 25 packs, individualy packed
Complete with instrument appropriate o-rings and sealing rings
Each pack supplied with quality test results

Description	Ext. diam. mm	Int. dia. mm	Length mm	PK	Cat. No.	
Split, Straight-through Liner	6.3	4.0	78.5	5	**7.653 145**	3
Split, with Quartz wool	6.3	4.0	78.5	5	**9.003 576**	
Split / Splitless with Single Taper	6.3	4.0	78.5	5	**9.003 579**	
Split / Splitless with Single Taper (Quartz Wool)	6.3	4.0	78.5	5	**6.236 751**	4
Split/Splitless Focus Liner	6.3	4.0	78.5	5	**6.223 552**	
Split/Splitless Focus Liner	6.3	4.0	78.5	25	**6.239 332**	
Split/Splitless Tapered Focus Liner	6.3	4.0	78.5	5	**6.223 553**	5
Split/Splitless Tapered Focus Liner	6.3	4.0	78.5	25	**9.003 572**	
Split/Splitless FAST Focus Liner	6.3	2.3	78.5	5	**6.223 554**	
Split/Splitless Tapered FAST Focus Liner	6.3	2.3	78.5	5	**9.003 586**	
Split/Splitless Recessed Gooseneck (Quartz Wool)	6.3	4.0	78.5	5	**9.003 588**	6
ConnecTite Liner Bottom Hole	6.3	4.0	78.5	5	**9.003 587**	
Viton o-ring, suitable for liners with OD 6,3mm	6.3	4.0	78.5	10	**9.221 277**	

Consumables from other GC manufacturers on request

1 Ferrules for Agilent GC

NEW!



High quality ferrules made of 100% Graphite or 15%Graphite/85%Vespel *SGE Analytical Science*

Type A: 15%Graphite/85%Vespel, for injectors and detectors at atmospheric pressure (e.g. FID)

Type B: 15%Graphite/85%Vespel, for GC-MS interface connection

Type C: 100%Graphite, for injectors and detectors at atmospheric pressure (not for GC-MS)

Column ID mm	Ferrule ID mm	Type	PK	Cat. No.
0.1 - 0.25	0.4	A	10	**6.223 558**
0.32	0.5	A	10	**9.221 278**
0.53	0.8	A	10	**9.221 279**
0.1 - 0.25	0.4	B	10	**6.088 109**
0.32	0.5	B	10	**6.059 976**
0.53	0.8	B	10	**6.059 977**
0.1 - 0.32	0.5	C	10	**7.652 355**
0.45 - 0.53	0.8	C	10	**9.221 280**

2 Septa for Agilent GC

NEW!



All septa are made with a high grade silicone material to minimize needle coring. These new materials meet or exceed industry standards, giving you reassurance in the quality of your work. All these septa grant a good durability, excellent resealing properties and excellent solvent resistance. *SGE Analytical Science*

GP = General Purpose Silicone Septa for non-demanding routine applications up to 200°C.
EC = High Temperature Silicone Septa, for significantly longer injection life, low bleed and low injection port adhesion.
MN = High Temperature Premium Silicone Septa for autosamplers, up to 400 injections per septum.

Also available: Septa for instruments from Perkin-Elmer, Shimadzu, Thermo and Varian/Bruker.

Diam. mm	Material	Temp. max. °C	PK	Cat. No.
5.0	GP	200	50	**9.003 590**
5.0	MN	400	50	**9.003 591**
9.5	GP	200	50	**6.224 189**
9.5	EC	400	25	**9.003 592**
9.5	HT	400	25	**9.003 593**
11.0	GP	200	50	**6.085 419**
11.0	EC	400	25	**9.003 594**
11.0	MN	400	50	**6.255 348**
11.0	HT	400	25	**9.003 595**
12.5	GP	200	50	**6.087 242**
12.5	HT	400	25	**9.003 596**
12.5	EC	400	25	**9.003 597**

3 Syringes for CTC autosampler

NEW!



Type A - syringes for CTC Analytics HTS, HTC and LC PAL (needle tip: LC)
Type B - syringes for CTC Analytics CombiPal and GC PAL with fixed or removable needle, two different needle diameters (needle tip: cone). High reproducibiliy, low carry-over *SGE Analytical Science*

Gauge (OD) mm	Type	Needle length mm	Needle Typ	Capacity µl	PK	Cat. No.
22 (0.72)	A	51	fixed	25 (Gas tight)	1	**9.221 286**
22 (0.72)	A	51	fixed	100 (Gas tight)	1	**9.221 287**
22 (0.72)	A	51	removable	250 (Gas tight)	1	**9.221 288**
26 (0.47)	B	50	fixed	5	1	**6.239 096**
23 (0.63)	B	50	fixed	5	1	**7.607 298**
26 (0.47)	B	50	fixed	10 (Gas tight)	1	**9.221 289**
26 (0.47)	B	50	fixed	10 (Gas tight)	6	**9.221 290**
23 (0.63)	B	50	fixed	10	1	**7.607 297**
23 (0.63)	B	50	fixed	10	6	**9.221 291**

1



1 Syringes for Perkin-Elmer GC autosampler

NEW!

GC syringes for all Perkin-Elmer autosampler e.g. Clarus. With fixed or removable needle. Two different needle diameter. All needles are 70mm long with a cone point style. High reproducibiliy, low carry-over.

SGE Analytical Science

Gauge (OD) mm	Needle Typ	Capacity µl	PK	Cat. No.
26 (0.47)	fixed	5	1	**9.221 281**
23 (0.63)	fixed	5	1	**9.221 282**
26 (0.47)	fixed	5 (Gas tight)	1	**9.221 283**
23 (0.63)	fixed	5 (Gas tight)	1	**6.204 955**

2



6.206 049

3



6.206 050

4



9.003 568

Inlet Liner for Perkin-Elmer GC

NEW!

Inlet Liner for Perkin-Elmer Autosystem and Clarus 500, 600. SGE's inlet liners come as a complete, single packed unit. 5 or 25 packs, individualy packed. Complete with instrument appropriate o-rings and sealing rings. Each pack supplied with quality test results.

SGE Analytical Science

Description	Ext. diam. mm	Int. diam. mm	Length mm	PK	Cat. No.
Split / Splitless Focus Liner	6.2	4.0	92.0	5	**6.206 049** 2
Split / Splitless Tapered Focus Liner	6.2	4.0	92.0	5	**9.003 567**
Split straight through liner	6.2	4.0	92.0	5	**6.206 050** 3
Split / Splitless Focus Liner für PSS Injector	4.0	2.0	86.2	5	**9.003 568** 4
PTV liner with 0.25 mm ID restriction	2.0	1.0	88.0	5	**9.003 569**

5



5 Ferrules for Perkin-Elmer GC

NEW!

High quality ferrules made of 100% Graphite or 15%Graphite/85%Vespel
Type A - 15%Graphite/85%Vespel, for injectors and detectors at atmospheric pressure (e.g. FID)
Type C - 100%Graphite, for injectors and detectors at atmospheric pressure (not for GC-MS)

SGE Analytical Science

Column ID mm	Ferrule ID mm	Type	PK	Cat. No.
0.1 - 0.25	0.4	A	10	**6.088 109**
0.32	0.5	A	10	**6.059 976**
0.53	0.8	A	10	**6.059 977**
0.1 - 0.32	0.5	C	10	**9.221 284**
0.45 - 0.53	0.8	C	10	**9.221 285**

Consumables from other GC manufacturers on request

We can **supply** this **manufacturer's whole product range !**

partner of the LG Lab Logistics Group

SGE Analytical Science

Ready-to-use layers layers for TLC

Support materials for TLC ready-to-use layers *MACHEREY-NAGEL*

Glass plates: glass, ~ 1.3mm thick, high requirements for weight, packaging and storage, ideal torsional strength, high temperature stability, susceptible to breakage, can not be cut with scissors, high resistance against solvents, mineral acids and conc. ammonia, suitability for aqueous detection reagents depends on the phase

POLYGRAM®: polyester, ~ 0.2mm thick, low requirements for weight, packaging and storage, low torsional strength, max. 185°C temperature stability, not susceptible to breakage, can be cut with scissors, high resistance against solvents, mineral acids and conc. ammonia, very suitable for aqueous detection reagents

ALUGRAM®: aluminium, ~ 0.15mm thick, low requirements for weight, packaging and storage, relatively high torsional strength, high temperature stability, not susceptible to breakage, can be cut with scissors, high resistance against solvents, low resistance against mineral acids and conc. ammonia, limited suitable for aqueous detection reagents

ADAMANT unmodified standard silica layers for TLC

Silica 60, specific surface (BET) ~ 500m²/g, mean pore size 60Å, specific pore volume 0.75ml/g, particle size 5 to 17µm. Outstanding hardness and abrasion resistance due to an optimized binder system. Increased separation efficiency due to an optimized particle size distirbution. High suitability for trace analyses resulting from a UV indicator with brilliance and a low-noise background of the layer. *MACHEREY-NAGEL*

Available as glass plates with or without fluorescent indicator (UV254).

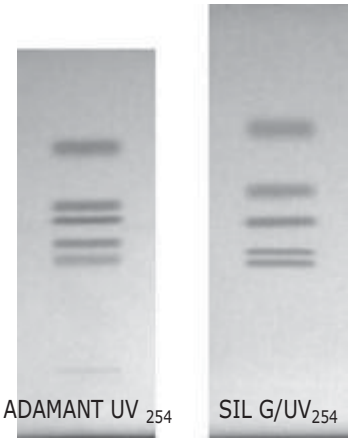
Type	Plate format cm	Path length mm	PK	Cat. No.
ADAMANT UV254	2.5 x 7.5	0.25	100	**4.005 060**
ADAMANT	5 x 10	0.25	50	**4.005 067**
ADAMANT UV254	5 x 10	0.25	50	**4.005 061**
ADAMANT	5 x 10	0.25	200	**4.005 068**
ADAMANT UV254	5 x 10	0.25	200	**4.005 062**
ADAMANT UV254	5 x 20	0.25	100	**4.005 063**
ADAMANT	10 x 10	0.25	25	**4.005 069**
ADAMANT UV254	10 x 10	0.25	25	**4.005 064**
ADAMANT UV254	10 x 20	0.25	50	**4.005 065**
ADAMANT	20 x 20	0.25	25	**4.005 070**
ADAMANT UV254	20 x 20	0.25	25	**4.005 066**
ADAMANT	10 x 20	0.25	25	**9.003 472**

Separation of steroids

Layers: ADAMANT UV_{254}, SIL G/UV_{254}; eluent: trichloromethane – methanol (97:3)
Developing time: 10 minutes; 0.1 % solution in $CHCl_3$

R_f	ADAMANT	SIL G
Cortisone	0.37	0.27
Corticosterone	0.43	0.30
Testosterone	0.50	0.39
Desoxycorticosterone	0.55	0.46
Progesterone	0.73	0.62
Migration distance	5.0 cm	5.7 cm

MN Appl. No. 402930



SIL G unmodified standard silica layers for TLC, glass plates/ POLYGRAM®

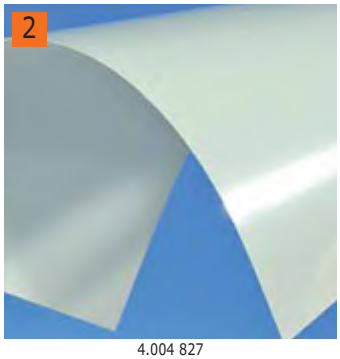
glass plates, POLYGRAM®, ALUGRAM® *MACHEREY-NAGEL*

silica 60, specific surface (BET) ~500m²/g, mean pore size 60 Å, specific pore volume 0.75 ml/g, particle size 5 to 17µm; standard grade; thickness of layer for analytical plates 0.25mm, for preparative plates 0.5 and 1mm; for 2mm preparative layers a slightly coarser material is used indicators: manganese activated zinc silicate with green fluorescence for short-wave UV (254nm); special inorganic fluorescent pigment with blue fluorescence for long-wave UV (366nm)
binders: highly polymeric products, which are stable in almost all organic solvents and resistant towards aggressive visualisation reagents; binder system for Polygram® sheets is also completely stable in purely aqueous eluents
available as glass plates, Polygram polyester sheets and Alugram aluminium sheets.
Available as glass plates with or without fluorescent indicator (UV254).

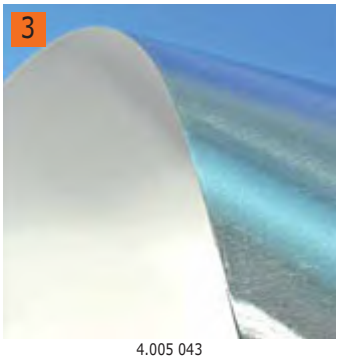
Type	Plate format cm	Path length mm	PK	Cat. No.	
Glass plates SIL G-25 UV_{254}	2.5 x 7.5	0.25	100	**4.004 850**	1
Glass plates SIL G-25	5 x 10	0.25	50	**6.230 729**	
Glass plates SIL G-25	5 x 10	0.25	50	**4.004 848**	
Glass plates SIL G-25	5 x 10	0.25	200	**4.004 847**	
Glass plates SIL G-25	5 x 10	0.25	200	**4.004 849**	
Glass plates SIL G-25	5 x 20	0.25	100	**4.004 846**	
Glass plates SIL G-25 UV_{254}	5 x 20	0.25	100	**6.232 660**	
Glass plates SIL G-25 UV_{254}	10 x 10	0.25	25	**9.003 474**	
Glass plates SIL G-25	10 x 20	0.25	50	**6.227 917**	
Glass plates SIL G-25 UV_{254}	10 x 20	0.25	50	**6.230 274**	
Glass plates SIL G-25	20 x 20	0.25	25	**9.003 491**	
Glass plates SIL G-25 UV_{254}	20 x 20	0.25	25	**9.003 492**	
Glass plates SIL G-100	20 x 20	1.00	15	**4.004 853**	
Glass plates SIL G-100 UV_{254}	20 x 20	1.00	15	**7.300 555**	
Glass plates SIL G-200	20 x 20	2.00	12	**6.224 417**	
Glass plates SIL G-200 UV_{254}	20 x 20	2.00	12	**4.004 854**	
POLYGRAM® polyester sheets SIL G	2.5 x 7.5	0.20	200	**4.004 827**	2
POLYGRAM® polyester sheets SIL G UV_{254}	2.5 x 7.5	0.20	200	**4.004 826**	
POLYGRAM® polyester sheets SIL G	4 x 8	0.20	50	**4.004 825**	
POLYGRAM® polyester sheets SIL G UV_{254}	4 x 8	0.20	50	**9.003 493**	
POLYGRAM® polyester sheets SIL G	5 x 20	0.20	50	**6.803 651**	
POLYGRAM® polyester sheets SIL G UV_{254}	5 x 20	0.20	50	**9.003 476**	
POLYGRAM® polyester sheets SIL G	20 x 20	0.20	25	**6.202 190**	
POLYGRAM® polyester sheets SIL G UV_{254}	20 x 20	0.20	25	**9.003 494**	
POLYGRAM® polyester sheets SIL G	40 x 20	0.20	25	**4.004 822**	
POLYGRAM® polyester sheets SIL G UV_{254}	40 x 20	0.20	25	**4.004 824**	
ALUGRAM® aluminium sheets SIL G UV_{254}	2.5 x 7.5	0.20	200	**4.005 043**	3
ALUGRAM® aluminium sheets SIL G UV_{254}	4 x 8	0.20	50	**9.003 496**	
ALUGRAM® aluminium sheets SIL G	5 x 7.5	0.20	20	**4.005 042**	
ALUGRAM® aluminium sheets SIL G UV_{254}	5 x 7.5	0.20	20	**6.227 948**	
ALUGRAM® aluminium sheets SIL G	5 x 10	0.20	50	**6.802 883**	
ALUGRAM® aluminium sheets SIL G UV_{254}	5 x 10	0.20	50	**9.003 477**	
ALUGRAM® aluminium sheets SIL G	5 x 20	0.20	50	**7.084 918**	
ALUGRAM® aluminium sheets SIL G UV_{254}	5 x 20	0.20	50	**9.003 478**	
ALUGRAM® aluminium sheets SIL G	10 x 20	0.20	20	**4.005 052**	
ALUGRAM® aluminium sheets SIL G UV_{254}	10 x 20	0.20	20	**6.233 568**	
ALUGRAM® aluminium sheets SIL G	20 x 20	0.20	25	**7.059 745**	
ALUGRAM® aluminium sheets SIL G UV_{254}	20 x 20	0.20	25	**9.003 497**	
ALUGRAM® aluminium sheets SIL G UV_{254}	20 x 20	0.20	25	**6.242 312**	
ALUGRAM® aluminium sheets SIL G	20 x 20	0.20	25	**9.003 465**	



4.004 850



4.004 827



4.005 043

1 TLC plates, Silica gel 60 F 254



Merck

Material	Gel thickness mm	Width mm	Length mm	PK	Cat. No.
Glass	0.25	20.0	20.0	25	**9.130 050**
Glass	0.25	10.0	20.0	50	**9.130 051**
Glass	0.25	5.0	20.0	100	**9.130 052**
Glass	0.25	5.0	20.0	25	**9.130 053**
Glass	0.25	5.0	10.0	200	**9.130 054**
Glass	0.25	5.0	10.0	25	**9.130 055**
Glass	0.25	2.5	7.5	100	**9.130 056**
Glass	0.25	2.5	7.5	500	**9.130 057**
Aluminium	0.20	20.0	20.0	25	**9.130 058**
Aluminium	0.20	5.0	10.0	50	**9.130 059**
Aluminium	0.20	5.0	7.5	20	**9.130 060**
Plastic	0.20	20.0	20.0	25	**9.130 063**

TLC plates

Silica gel 60 F_{254}

Merck

Material	Gel thickness mm	Dimensions mm	PK	Cat. No.
Glass backed	0.5	20 x 20	20	**9.130 061**
Glass backed	2	20 x 20	12	**9.130 062**

2 ALUGRAM® Nano-SIL unmodified Nano-silica layers for HPTLC



ALUGRAM®

MACHEREY-NAGEL

Nano silica 60, specific surface (BET) ~ 500m²/g, mean pore size 60Å, specific pore volume 0.75ml/g, particle size 2 to 10µm. Indicator: manganese activated zinc silicate with green fluorescence for short-wave UV (254nm).

Binder: highly polymeric product, which is stable in almost all organic solvents and resistant towards aggressive visualisation reagents. Narrow fractionation of the silica particles allows sharper separations, shorter developing times, shorter migration distances, smaller samples and an increased detection sensitivity compared to SIL G plates.

Available as glass plates with or without fluorescent indicator (UV254).

Type	Plate format cm	Path length mm	PK	Cat. No.
ALUGRAM® NANO-SIL G	5 x 20	0.20	50	**4.005 044**
ALUGRAM® NANO-SIL G UV254	5 x 20	0.20	50	**6.227 900**
ALUGRAM® NANO-SIL G	20 x 20	0.20	25	**6.227 899**
ALUGRAM® NANO-SIL G UV254	20 x 20	0.20	25	**4.005 045**



1



4.004 880

2



7.400 375

RP-18 W/UV254 octadecyl-modified nano silica layers for HPTLC

glass plates, ALUGRAM® *MACHEREY-NAGEL*

base material: Nano-K silica 60, specific surface (BET) ~500m²/g, mean pore size 60Å, specific pore volume 0.75ml/g, particle size 2 to 10 µm; for preparative plates (1 mm thickness of layer) standard silica 60, particle size 5 to 17 µm, pH stability 2 to 10 indicator: acid-resistant product with a pale blue fluorescence for short-wave UV (254nm); UV-absorbing substances apppear as dark-blue to black spots on a light-blue background; partial octadecyl modification, wettable with water, carbon content 14%. 18-100 normal phase or reversed phase separation modes with eluents from anhydrous solvents to mixtures with high concentrations of water (see figure); the relative polarity of the eluent determines the polarity of the layer.
Recommended application: aminophenols, barbiturates, preservatives, nucleobases, polycyclic aromatic hydrocarbons, steroids, tetracyclines, plasticizers (phthalates).

Available as glass plates with or without fluorescent indicator (UV254).

Type	Plate format cm	Path length mm	PK	Cat. No.
ALUGRAM® Glass plates RP-18 W UV_{254}	5 x 20	0.25	50	**4.004 880** 1
ALUGRAM® Glass plates RP-18 W UV_{254}	10 x 10	0.25	25	**6.206 173**
ALUGRAM® Glass plates RP-18 W UV_{254}	10 x 20	0.25	50	**4.004 879**
ALUGRAM® Glass plates RP-18 W UV_{254}	20 x 20	0.25	25	**4.004 878**
ALUGRAM® Glass plates RP-18 W UV_{254}	20 x 20	1.00	15	**4.004 881**
ALUGRAM® aluminium sheets RP-18 W UV_{254}	4 x 8	0.15	50	**7.400 375** 2
ALUGRAM® aluminium sheets RP-18 W UV_{254}	5 x 10	0.15	50	**6.901 143**
ALUGRAM® aluminium sheets RP-18 W UV_{254}	5 x 20	0.15	50	**4.005 046**
ALUGRAM® aluminium sheets RP-18 W UV_{254}	10 x 10	0.15	25	**4.005 047**
ALUGRAM® aluminium sheets RP-18 W UV_{254}	20 x 20	0.15	25	**6.704 046**

3



3 Aluminium oxide layers for TLC

Standard, rigid TLC plates in a choice of media, backing materials, and with dimensions as outlined below. *MACHEREY-NAGEL*

Material	Gel thickness mm	Dimensions mm	PK	Cat. No.
POLYGRAM aluminium oxide*	0,2	200 x 200	25	**9.003 495**
ALUGRAM aluminium oxide*	0,2	200 x 200	25	**9.003 498**

*with 254 nm UV indicator

4



4 Chromatography paper, reels

Chromatography Paper 1 CHR *GE Healthcare*
The standard chromatography paper. Good resolution for general analytical separations.
Pure cellulose. Thickness 0.18mm. Capillary rise (water) 130mm/30 min.

Chromatography Paper 3MM CHR
Used in electophoresis, in general chemistry and as blotting paper. Pure cellulose. Thickness 0.34mm.
Capillary rise (water) 130mm/30 min.

Grade	Width mm	Length mm	PK	Cat. No.
1Chr	10	1000	1	**9.950 322**
1Chr	20	1000	1	**9.950 323**
1Chr	30	1000	1	**9.950 324**
1Chr	40	1000	1	**9.950 325**
1Chr	50	1000	1	**9.950 326**
1Chr	100	1000	1	**9.950 328**
1Chr	150	1000	1	**9.950 329**
3MMChr	20	1000	1	**9.950 327**
3MMChr	100	1000	1	**9.950 330**
3MMChr	150	1000	1	**9.950 331**
3MMChr	190	1000	1	**9.950 332**
3MMChr	230	1000	1	**9.950 333**
3MMChr	270	1000	1	**9.950 334**

E & OE.

1 2 Chromatography paper/Ion exchange papers

GE Healthcare

Whatman chromatography papers are the most widely used papers for chromatography worldwide. This acceptance and usage reflects the purity, high quality and consistency of Whatman papers. These qualities are relied upon by chromatographers and essential to successful reproducible chromatography. Whatman chromatography paper media are made from specially selected cotton cellulose. They are rigorously quality controlled for characteristics important to the chromatographer and to ensure uniformity within the grade.

1 Chr world standard chromatography paper. A smooth surface, 0.18 mm thick with a linear flow rate (water) of 130 mm/30 min. Good resolution for general analytical separations.
3MM Chr widely used as a blotting paper, 3MM Chr is used in both electrophoresis and for general chemistry. A medium thickness paper (0.34 mm) used extensively for general chromatography and electrophoresis. Flow rate is 130 mm/30 min.
3 Chr medium thickness paper (0.36 mm) with a flow rate of 130 mm/30 min. For general applications with medium/heavy solute loadings. Frequently used for separation of inorganic compounds and for electrophoresis.
17 Chr thick (0.92 mm) and highly absorbent paper with a very high flow rate of 190 mm/30 min. Suitable for the heaviest loadings and ideal for preparative paper chromatography and electrophoresis.

Ion exchange papers
DE81: A thin (0.20 mm) DEAE cellulose paper-a weakly basic anion exchanger with diethylaminoethyl functional groups. The ion exchange capacity is 1.7 µeq/cm² and flow rate is 95 mm/30 min. For use with reverse transcriptase assays and DNA polymerase.
SG81: A unique paper (0.27 mm thick) combining cellulose and large pore silica gel. Suitable for separations in which both partition and adsorption are important, including the separation of phospholipids, steroids, phenols and dyes. Flow rate is 110 mm/30 min.
P81: A thin (0.23 mm) cellulose phosphate paper. Strong cation exchanger of high capacity. Ion exchange capacity is 18.0 µeq/cm² and the flow rate is 125 mm/30 min. For use with protein kinase assay with peptide substrates.





Grade	Dimensions mm	PK	Cat. No.
1Chr	100 x 300	100	**9.950 308**
1Chr	200 x 200	100	**9.950 309**
1Chr	250 x 250	100	**9.950 310**
1Chr	460 x 570	100	**9.950 311**
3MMChr	200 x 200	100	**9.950 312**
3MMChr	315 x 355	100	**9.950 313**
3Chr	460 x 570	100	**9.950 314**
3MMChr	460 x 570	100	**9.950 371**
3MMChr	580 x 680	100	**9.950 315**
4Chr	460 x 570	100	**9.950 316**
17Chr	460 x 570	25	**9.950 317**
DE81	460 x 570	25	**9.950 318**
SG81	460 x 570	25	**9.950 319**
P81	460 x 570	25	**9.950 320**

Chromatography strips

Divided into 12 bands, each of 15mm wide, for parallel separation of 12 samples.

GE Healthcare

Grade	Width mm	Length mm	PK	Cat. No.
1Chr CRL	110	213	100	**9.950 321**

3 Ion exchange papers

GE Healthcare

A thin (0.20mm) DEAE cellulose paper-a weakly basic anion exchanger with diethylaminoethyl functional groups. The ion exchange capacity is 1.7µeq/cm2 and flow rate is 95mm/30 min. For use with reverse transcriptase assays and DNA polymerase.



Grade	Diam. mm	PK	Cat. No.
DE81	23	400	**9.950 335**



1 Standard separating chamber with knob lid/ ground cover plate

With absolutely flat chamber floor, ground flange rim and lid for all TLC plates up to 200mm x 200mm.

Other separating chambers available on request.

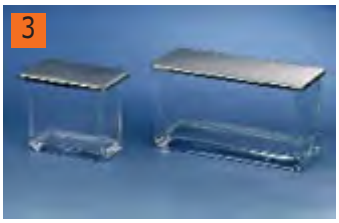
Type	PK	Cat. No.
Separating chamber with knob lid	1	**9.020 160**
Separating chamber with glass lid	1	**9.020 173**
Knob lid for 9.020 160	1	**9.020 163**
Glass lid for 9.020 173	1	**9.020 177**



2 Simultaneous developing chamber and DC accessories

MACHEREY-NAGEL

Type	PK	Cat. No.
DC simultaneous chamber for up to 5 plates, 20cm x 20cm	1	**9.003 500**
Laboratory atomiser, glass with rubber bulb	1	**4.004 909**
Glass capillary 1µl	150	**7.056 849**
Outlining templates	2	**4.004 903**
Chromatography Paper MN 260, 7.5cm x 17cm (for saturating)	100	**4.004 907**



3 Nano separating chambers, with knob/ stainless lid

The Nano separating chambers with 100mm x 100mm plate format have all the advantages of standard separating chambers.

Type	PK	Cat. No.
Nano separating chamber 100mm x 100mm, with knob lid	1	**9.020 210**
Nano separating chamber 100mm x 100mm, with stainless steel lid	1	**9.020 212**
Nano knob lid, 100mm x 100mm	1	**9.020 211**
Nano stainless steel lid, 100mm x 100mm	1	**9.020 213**
Nano filter paper for vapour conditioning the chamber, 210mm x 110mm, 25 sheets	25	**9.020 214**



4 H separating chamber

biostep GmbH

The H separating chambers make optimum use of HPTLC gel layer advantages. Small particle size 5µm, stringently controlled pore size and distribution, and more theoretical bases. Excellent value for money and can be supplied for time and cost saving in 50mm x 50mm plate format or traditional 100mm x 100mm format. Optimum separations are achieved even on the shortest runs.

Type	Width mm	Length mm	PK	Cat. No.
H separation chamber	50	50	1	**9.023 150**
H separation chamber	100	100	1	**9.023 160**
Frit rods		50	5	**9.023 955**
Cover plate	50	50	1	**9.023 956**
Cover plate	100	100	1	**9.023 957**



5 Chromatography sprayer SG 1

Spraying with powerful and quiet pump.The finest spray is produced even when the battery power is low. Liquids, up to the viscosity of light oil, can be finely sprayed at the touch of a button. Particle diameter 5µm to 10µm with a throughput of 20ml/min. based on water. The reservoir bottle for the spray reagent is made of borosilicate glass. The bottle is screwed into the high-grade PTFE nozzle and can be changed in seconds. With quick-charging dock as a storage base. Overload protection enables continuous storage of the sprayer in the charging station. Supplied with battery, battery charger, bottle and nozzle.

Type	PK	Cat. No.
SG 1	1	**9.539 045**
Reagent reservoir, 50 ml	10	**9.539 046**

1 Special atomiser, with rubber blowball

With rubber blowball for nebulising reagents. Can be connected to other compressed air supplies.

Type	PK	Cat. No.
Special atomiser	1	**9.024 000**



2 Test tube atomiser, glass

Glass atomiser for nebulising small amounts of reagents. Atomiser can be inserted in a 12ml test tube with a ground joint and held in position with a spring clip.

Type	PK	Cat. No.
Test tube atomiser	1	**9.023 990**



3 UV analysis lamp HP-UVIS®

For UV analysis without a darkroom. High-pressure mercury lamp emits very intense radiation at 366nm for fluorescence evaluation. Specially selected 254nm filters enable optimal contrast. Minimal footprint in spite of simultaneous observation points for two 200mm x 200mm plates. Inclined plate angle gives comfortable viewing.
Dimensions (WxDxH) 325mm x 290mm x 480mm. Weight: 11.5kg. Supply requirements 230V.

Type	PK	Cat. No.
HP-UVIS®	1	**9.539 360**



4 UV irradiation system BIO-LINK, BLX 254

- Compact and powerful, ideal for a broad range of applications
- Precise measurement and control technology, non-ageing UV sensors
- Choice for irradiation parameter energy or time
- Easy operation: Programme memory, storage of the last parameters, programme resumes after opening of the door, auto-restart after power failure
- Secure and stable construction, very easy to use
- Easy exchange of the UV tubes for wavelength change

Dimensions (WxDxH)
Housing: 350 x 360 x 305mm
Interior: 260 x 330 x 145mm

Type	Description	Tubes W	Wave-length nm	PK	Cat. No.
BLX-254	UV crosslinker	5 x 8	254	1	**9.971 923**

Other models available on request.



5 TLC Viewing cabinets, CN-6/ CN-15

Model CN-6:
- for one or two UV hand lamps model BVL-6; choice of combined wavelengths 254nm, 312nm and 365nm
- cabinet dimensions (WxDxH): 300mm x 280mm x 240mm

Model CN-15:
- integral high intensity UV lamps, extra large capacity; easy access also for large samples; white-light bulb for normal observation
- removable bottom panel for use with an BETXF Professional Line transilluminator
- cabinet dimensions (W x D x H): 505mm x 415mm x 280mm

Type	Description	Tubes W	Wave-length nm	PK	Cat. No.
CN-6	without UV handlamps	-	-	1	**9.971 926**
CN-15.LC*	with integrated UV tubes and white-light source	4 x 15	365 / 254	1	**9.971 927**

* Other models available on request.





1 TLC Imaging system BIO-CHROM II

- Scientific imaging system for documentation and analysis of TLC plates
- Easy acquisition and storage of the data via PC
- High-intensity epi-UV illumination
- Easy access to the darkroom through large front-opening
- Extensive UV protection
- Removable bottom panel for optional use with an UV transilluminator

All models with the following standard components:
- Scientific s/w CCD camera with 1 MP resolution (4 MP EP) and USB 2.0 port
- High aperture zoom with UV/VIS spectral filter
- Darkroom CN-15 with 2 x 15W tubes 365nm, 2 x 15W tubes 254nm and white light source
- Light protecting hood and camera stand
- Free PC image acquisition and analysis software BIO-CAPT with basic modules for MW, densitometric and R(f) analyses

Type	Description	PK	Cat. No.
BIO-CHROM II	With standard components	1	**7.930 261**



2 Universal application and evaluation template

Plexiglass. Simplifies application, marking and evaluation of thin layer chromatograms. Size 200mm x 200mm.

Type	PK	Cat. No.
Universal application and evaluation template	1	**9.020 131**



3 Outlining templates

With limit stops for precise positioning of the plate on the template. Provide precise pipette guidance due to triangular apertures in a 5mm spaced grid, providing 9, 19 or 39 outlining points, depending on the size of the template. A non-slip coating means that the outlining template does not slide on the bench.

Width mm	Length mm	PK	Cat. No.
100	100	1	**9.020 134**
50	50	1	**9.020 135**
200	100	1	**9.020 136**
200	200	1	**9.020 137**



4 TLC plate cutter

For scoring and cutting glass backed TLC plates. For cost-effectiveness in plate use, or in order to give individual plates different derivatives after separation. Supplied with cutting ring and template.

Type	PK	Cat. No.
TLC plate cutter	1	**9.539 041**



5 Laboratory dryer HT0139

NEW!

Power: approx. 2100 W. 2 speed settings, 3 temperature settings with cold air-stream button. soft-touch housing. Air-inlet grille detachable for cleaning. cable retracts at the touch of a button.

Type	PK	Cat. No.
HT0139	1	**9.106 788**

E & OE.

Legal measurement units are compulsory in legal and official use

Parameter	Name	Unit and conversion factor	Comments
Activity, radioactive	Becquerel Curie	1 Bq = 1 /s 1 Ci = 3.7 x 10^{10} /s	SI Unit
Equivalent dose	Sievert Röntgen equivalent man	1 Sv = 1 J/kg 1 rem = 10^{-2} J/kg	SI Unit
Work, mechanical	Joule Erg	J = 1 N x m = 1 kg x m^2/s^2 1 erg = 10^{-7} J	SI Unit
Illumination	Lux Nox	1 lx = 1 lm/m^2 1 nx = 10^{-3} lx	SI Unit
Unit of power of a lens system	Dioptre	1 dpt = 1/m	also known as refractive power
Density	–	kg/m^3	Sl Unit; measurement is usually given in g/ml or g/cm^3
Rotation, specific	– –	Degrees x m^2/kg Degrees x dm^{-1} x g^{-1} x ml	Sl Unit; measurement is usually given in degrees; rotation value of 1 g of substance in 1 ml of solution in a 10 cm long tube
Number of revolutions	Revolutions per second Revolutions per minute	1 s^{-1} = 1 Hz 1 min^{-1} = 1 UpM = 1/60 s^{-1} = 1 min^{-1} = rpm	Sl Unit
Pressure	Pascal Bar physical atmosphere technical atmosphere techn. atmosph. overpressure Metres water column Millimetre mercury column or Torr	1 Pa = 1 N/m^2 1 bar = 10^5 Pa 1 atm = 1.01325 x 10^5 Pa 1 at = 1 kp/cm^2 ato = atm + 1 1 mWS = 9.790 x 10^3 Pa 1 mm Hg = 1 Torr = 1.3332 x 10^2 Pa	Sl Unit; see also "Conversion of Imperial units into metric units" table
Energy	Joule Electronvolt Calorie	1 J = 1 N x m = 1 kg x m^2/s^2 = 1 W x s 1 eV = 1.60219 x 10^{-19} J 1 cal = 4.1868 J	Sl Unit
Absorbed dose	Gray Rad Rem	1 Gy = 1 J/kg 1 rd = 0.01 J/kg 1 rem = 0.01 J/kg	Sl Unit
Absorbed dose / rate	–	1 Gy/s = 1 W/kg	Sl Unit
Extinction coefficent, molar specific	– –	l/mol x cm l/g x cm	also known as spectral absorption measure (DIN) or decadic absorptivity (IUPAC)
Field strength, electric	Volt per metre	1 V/m = 1 m x kg/(s^3 x A) = 1 W/(A x m)	SI Unit
magnetic	Ampere per metre Oersted	1 A/m 1 Oe = $\frac{10^3}{4\pi}$ A/m	Sl Unit
Area	Square metre Are Hectare	1 m^2 = 1 m x 1 m = 1 sq. m 1 a = 10^2 m^2 1 ha = 10^4 m^2	Sl Unit
Flow, magnetic	Weber Maxwell	1 Wb = 1 V x s 1 M = 10^{-8} Wb	Sl Unit
Flow density, electric magnetic	Coulomb per square metre Tesla Gauss	C/m^2 1 T = 1 Wb/m^2 = 1 V x s/m^2 1 G = 10^{-4} T	Sl Unit Sl Unit, previously magnetic induction

Frequency	Hertz	1 Hz = 1 s^{-1} 1 s^{-1} = 1Hz	SI unit for periodic operations
Velocity	Metre per second Kilometre per hour	m/s 1 km/h = 0.27 m/s	SI unit
Inductance, electromagnetic	Henry Internat. Henry	1 H = 1 Wb/A = 1 V x s/A = 1 W x s/A^2 = 1Ω x s 1 H_{int} = 1.00049 H	SI unit
Ion dose	Coulomb per kilogram Röntgen	C/kg 1 R = 2.58 x 10^{-4} C/kg	SI unit
Capacitance, electric	Farad internat. Farad	1 F = 1 C/V = 1 A^2 x s/W = 1 s/Ω 1 F_{int} = 0.99951 F	SI unit
Force	Newton Pond Dyn	1 N = 1 kg x m/s^2 1 P = 9.807 x10^{-3} N 1 dyn = 10^{-5} N	SI unit
Charge, electric	Coulomb	1 C = 1 A x s = 1 J/V	SI unit
Length	Metre Micrometre Ångström Femtometre (Fermi) Inch	1 m 1 µ = 10^{-6} m 1 Å = 10^{-10} m 1 f = 10^{-15} m 1'' = 25.4 mm	SI basic unit
Power	Watt Horsepower	1 W = 1 J/s 1 PS = 0.735 kW	SI unit
Conductance, related to length	Siemens per centimetre	1 S/cm = 1Ω^{-1} x cm^{-1}	SI unit
Conductance, electric	Siemens	1 S = 1Ω^{-1}	SI unit
Luminance	Candela per square metre Nit Stilb Lambert	1 cd/m^2 1 nt = 1 cd/m^2 1 sb = 1 cd/cm^2 1 la = $\frac{1}{\pi}$ sb = $\frac{1}{\pi}$ cd/cm^2	SI unit
Luminous radiation, specific	Lumen per square metre Phot	1 lm/m^2 1 ph = 1 lm/m^2	SI unit
Luminous intensity	Candela Hefner candle Internat. candle	1 cd 1 HK = 0.903 cd 1 IK = 1.019 cd	SI basic unit
Luminous Flux	Lumen	1 lm = 1 sr x cd = 1cd	SI unit
Mass (Weight read from scales)	Kilogram Gram Ton Metric carat Atomic mass unit Dalton	1 kg 1 g = 10^{-3} kg 1 t = 10^3 kg 1 Kt = 0.2 g 1 u = 1 amu = 1.6605 x 10^{-27} kg 1 Dalton = 1.6602 x 10^{-27} kg	SI basic unit For precious stones only
Voltage, electric	Volt Internat. Volt	1 V = 1 J/C = 1 W/A V_{int} = 1.00034 V	SI unit, also electric potential
Amount of substance	Mol Mol quantity Gram molecule Gram atom Gram equivalent	1 mol 1 Mol 1 Mol 1 Tom 1 Val	SI basic unit
Amount of substance fraction	- – Mole fraction	mol/mol %	also known as amount fraction

Parameter	Name	Unit and conversion factor	Comments
Amount of substance concentration	Molarity	1 mol/l	
	Molality	1 mol/kg	
	Normality	1 N	
Current electrical	Ampere	1 A = 1 C/s	SI basic unit
	Internat. Ampere	$1\,A_{int}$ = 1.000291 A	
Temperature	Kelvin	K = °C + 273.15	Sl basic unit
	Degrees Celsius	°C = K – 273.15	
	Degrees Kelvin	°K = K	
	Degrees Fahrenheit	°F = 1.8 K – 459.4	
	Degrees Rankine	°Rank = 1.8 K	
	Degrees Reaumur	°R = 1.25 °C	
Viscosity, dynamic	–	1 Pa x s = 1 N x s x m^2 = 1 kg/s x m	SI unit
	Poise	1 P = 0.1 Pa x s	
kinematic	–	m^2/s	SI unit
	Stokes	1 St = 1 cm^2/s	
Volumes	Cubic metre	1 m^3 = 1 m x 1 m x 1 m = 1 cbm	SI unit
	Litre	1 l = 10^{-3} m^3 = 1 cdm	
	Solid cubic metre	1 Fm = 1 m^3	
	Stacked cubic metre	1 Rm = 1 m^3	
	Standard cubic metre	1 Nm = 1 m^3	
Volume flow rate	–	1 m^3/s = 10^3 l/s	SI unit
Volume flow	–	1 l/s = 10^6 mm^3/s	
Heat	Joule	1 J = 1 N x m = 1 W x s	SI unit
	Calorie	1 cal = 4.187 J	
Resistance, electrical	Ohm	1 Ω = 1 V/A = 1 W/A^2 = 1 kg x m^2/s^3 x A^2	SI unit
	Internat. Ohm	$1\,\Omega_{int}$ = 1.00079 Ω	
specific	–	1 Ω x mm^2/m	
Angle, plane	Radian	1 rad = 1 m/1 m = 57°17'45''	Supplementary SI unit (plane angle = relationship of an arc to the radius of a circle)
	Round angle	1 round ang. = 2π rad = 360°	
	Degree	1° = $\frac{\pi}{180}$ rad	
	Minute	1' = (1/60)°	
	Second	1'' = (1/60)'	
	Gon	1 gon = $\frac{\pi}{180}$ rad	
solid	Steradian	1 sr = 1 m^2/1 m^2	Supplementary SI unit; solid angle = relationship of the area of the surface of the sphere cut off by this angle to the square of the radius of the sphere Sl basic unit
Time	Second	1 s = 1 sec	
	Minute	1 min = 60 s = 1 min	
	Hour	1 h = 60 min	
	Day	1 d = 24 h	

Conversion of Imperial units into metric units

Parameter	Unit	Symbol	Conversion		Comments
Length	inch	in	1 in	= 2.54 cm	
	foot	ft	1 ft	= 0.305 m	
	yard	yd	1 yd	= 0.914 m	
	mile	mi	1 mi	= 1.609 km	
Area	square inch	in^2	1 in^2	= 6.452 cm^2	
	square foot	ft^2	1 ft^2	= 9.290 dm^2	
	square yard	yd^2	1 yd^2	= 0.836 m^2	
	square mile	mi^2	1 mi^2	= 2.590 km^2	
Volume	cubic inch	in^3	1 in^3	= 16.39 cm^3	
	cubic foot	ft^3	1 ft^3	= 28.31 dm^3	
	cubic yard	yd^3	1 yd^3	= 0.765 m^3	
Measure for	minim		1 minim	= 59.19 mm^3	for GB
liquids	minim		1 minim	= 61.61 mm^3	for USA
	fluid ounce	ozfl	1 ozfl	= 28.41 cm^3	for GB
	fluid ounce	ozfl	1 ozfl	= 29.57 cm^3	for USA
	liquid pint	pt	1 pt	= 568.3 cm^3	for GB
	liquid pint	pt	1 pt	= 473.2 cm^3	for USA
	liquid quart	qt	1 qt	= 1.136 dm^3	for GB
	liquid quart	qt	1 qt	= 946.4 cm^3	for USA
	gallon	gal	1 gal	= 4.546 dm^3	for GB
	gallon	gal	1 gal	= 3.785 dm^3	for USA
	barrel		1 barrel	= 159.0 dm^3	for oil
Measure for dry	dry pint		1 dry pint	= 550.6 cm^3	for USA
substances	dry quart		1 dry quart	= 1.101 dm^3	for USA
	dry barrel		1 dry barrel	= 115.6 dm^3	for USA
Mass	grain	gr	1 gr	= 64,80 mg	
(Weight)	dram	dr	1 dr	= 1.772 g	
	ounce	oz	1 oz	= 28.35 g	
	pound	lb	1 lb	= 453.6 g	
	quarter	qr	1 qr	= 12.70 kg	for GB
	cental	ctl	1 ctl	= 45.36 kg	for GB
	(long) hundredweight	cwt	1 cwt	= 50.80 kg	for GB
	short hundredweight	sh cwt	1 sh cwt	= 45.36 kg	for USA
	(long) ton	tnl	1 tnl	= 1016 kg	for GB
	short ton	tnsh	1 tnsh	= 907.2 kg	
	pennyweight	dwt	1 dwt	= 1.555 g	for precious stones and metals
	troy ounce	oz tr	1 oz tr	= 31,10 g	for GB
	troy ounce	oz t	1 oz t	= 31,10 g	for USA
Density	pound/cubic foot	lb/ft^2	1 lb/ft^2	= 0,016 g/cm^3	
	pound/cubic inch	lb/in^2	1 lb/in^2	= 27,68 g/cm^3	
	pound/cubic yard	lb/yd^2	1 lb/yd^2	= 0,593 kg/m^3	
Pressure	pound/square inch	lb/in^2	1 lb/in^2	= 6,895 · 10^{-2} bar	
	(p.s.i.)		(1 p.s.i.	= 6,895 · 10^{-2} bar)	
	pound/square foot	lb/ft^2	1 lb/ft^2	= 4,788 · 10^{-4} bar	
	inch Hg	in Hg	1 in Hg	= 3,337 · 10^{-2} bar	
	inch WS	in WS	1 in WS	= 2,487 · 10^{-3} bar	

Plastic Materials

The careful evaluation of material requirements by the user is absolutely necessary. The following recommendations from technical literature and/or the raw material manufacturers themselves only offer information to allow decisionmaking. They do not replace, under any circumstances, qualification tests by the user, who must be familiar with the respective application conditions in each case.
Plastics have become generally accepted as an alternative material to glass within the laboratory. Physical and chemical characteristics vary strongly. Application conditions decide which plastic is suitable. There are various influences: Exposure period and concentration of chemicals involved, temperature load, sterilization requirement, mechanical load, aging, e.g. by the effect of cleaning agents or by other environmental factors.

Abbreviations of the most important plastics, acc. to DIN 7728

ABS	Acrylo-Butadiene-Styrene-Copolymer
ACL	Acetal (Polyoxymethylene)
CA	Cellulose acetate
CN	Cellulose nitrate
CP	Cellulose propionate
ECTFE	Ethylene-Chlortrifluoroethylene-Copolymer
ETFE	Ethylene-Tetrafluoroethylene-Copolymer
FEP	Tetrafluoroethylene-Perfluoropropylene
GF	Glass-fibre, Glass-fibre reinforced
NBR	Nitrile rubber
NR	Natural rubber
NYL	Nylon (Polyamide)
PA	Polyamide (Nylon)
PAN	Polyacrylonitrile
PC	Polycarbonate
PCTFE	Polychlorotrifluoroethylene
PE	Polyethylene
PBTP	Polybutylene terephthalate
PE-HD	High density polyethylene
PE-LD	Low density polyethylene
PETP	Polyethylene terephthalate
PFA	Perfluoralkoxylalkane
PMMA	Polymethylmethacrylate
PMP	Polymethylpentene (TPX®)
POM	Polyoxymethylene
PP	Polypropylene
PPO	modified Polyphenylene oxide
PS	Polystyrol
PSE	Polysulphone
PTFE	Polytetrafluoroethylene
PUR	Polyurethane
PVC	Polyvinyl chloride
SAN	Styrene-Acrylnitrile-Copolymer
SB	Styrene-Butadiene-Copolymer (Impact-resistant PS)
SI	Silicone rubber
TFE	Teflon® (Tetrafluorethylene, PTFE)

Physical characteristics

	Operating temperature max. °C	Brittle point temperature °C	Density ca. g/cm³	Flexibility	Transparency
ABS	85	-40	1.05	rigid	none
ECTFE/ETFE	150	-100	1.70	moderate	opaque
FEP/PFA	205/250	-270	2.15	moderate	opaque
NR	70	-40	1.2	excellent	none
PA	90	0	1.13	rigid	opaque
PC	130	-130	1.20	rigid	total
PE-HD	105	-50	0.95	rigid	opaque
PE-LD	80…90	-50	0.92	excellent	opaque
PMMA	65…95	-50	1.18	rigid	total
PMP (TPX®)	175	0	0.83	rigid	total
POM	85	-40	1.42	good	none
PP	135	0	0.90	rigid	opaque
PPO, mod.	150	-40	1.08	good	none
PS	70	-20	1.05	rigid	total
PTFE	270	-270	2.17	excellent	none
PVC	80	-20	1.35	rigid	total or coloured
SAN	70	-40	1.03	rigid	total
SI	180	-60	1.1	excellent	opaque

Sterilization stability of major plastics (without warranty)

Only sterilize carefully cleaned vessels, rinsed with distilled water.
Always remove closures!

	Steam sterilization 121°C, up to 20 min acc. DIN	°-Radiation 25 kGy	Gas (Ethylene oxide)	Chemical (Formalin, Ethanol)
ABS	no	no	yes	yes
ECTFE/ETFE	yes	no	yes	yes
FEP/PFA/PTFE	yes	no	yes	yes
NR	no	no	yes	yes
PA	no	yes	yes	yes
PC	yes [1)]	yes	yes	yes
PE-HD	no	yes	yes	yes
PE-LD	no	yes	yes	yes
PMMA	no	yes	no	yes
PMP (TPX®)	yes	yes	yes	yes
POM	no	no	yes	yes
PP	yes	no	yes	yes
PPO, mod.	yes	no	yes	yes
PS	no	yes	no	yes
PVC	no [2)]	no	yes	yes
SAN	no	no	yes	yes
SI	yes	no	yes	yes

[1)] Loss of rigidity is possible.
[2)] Some exceptions possible.

Chemical resistance of major plastics in relation to substance groups (without warranty)

Plastics are divided into the following three groups according to their chemical stability:

A = very good chemical stability.
Constant exposure to the medium does not cause damage to the plastic over 30 days.
The plastic can remain resistant for years.

B = good to fair chemical stability.
Constant exposure to the medium causes slight damage/change within the period of 7 to 30 days.
Some of these changes are partially reversible (radiation, softening, reductions in rigidity, discoloration).

C = low chemical stability.
Not suitable for prolonged exposure to the medium. Damage can occur immediately
(reduction in rigidity, deformation, discoloration, increased porosity, dissolving)!

Substance group at 20 °C	ABS	ECTFE ETFE	NR	PA	PC	PE-HD	PE-LD	PMMA	PMP (TPX®)	POM	PP	PPO	PS	PTFE FEP PFA	PVC	SAN	SI
Acids																	
weak, dilute	B	A	B	B	B	A	A	C	A	C	A	B	B	A	A	B	B
highly conc. oxidising acids	C	A	C	C	C	A	A	C	A	C	A	C	B	A	A	C	C
Oxidisers	C	B	C	C	C	B	B	C	B	C	B	C	C	A	C	C	C
Caustic solutions (lyes)	B	A	A	B	C	A	A	A	A	A	A	A	A	A	A	A	A
Alcohols, aliphatic	A	A	A	B	A	A	A	C	A	A	A	B	A	A	A	A	A
Ketones	C	B	C	A	C	B	B	C	B	A	B	C	C	A	C	C	C
Aldehydes	C	A	B	B	B	A	A	B	B	B	A	B	C	A	C	C	B
Esters	C	A	B	A	C	B	B	B	B	C	B	C	C	A	C	C	B
Hydrocarbons																	
aliphatic	C	A	C	A	B	A	B	A	B	A	A	A	C	A	A	C	C
aromatic	C	A	C	A	C	A	B	C	C	A	B	B	C	A	C	C	C
halogenated	C	A	C	B	C	B	C	C	C	A	B	B	C	A	C	C	C
Ether	C	A	C	A	C	B	C	C	C	A	B	C	C	A	C	C	C

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A. Schweizer
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4.000 255	1253	4.000 360	1337	4.003 066	1464	4.003 426	1422	4.003 789	1417	4.004 474	1431	4.004 977	1444	4.007 798	269
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4.000 257	1254	4.000 362	1337	4.003 093	1460	4.003 435	1410	4.003 791	1417	4.004 476	1431	4.004 979	1444	4.007 801	266
4.000 258	1254	4.000 363	1252	4.003 099	1460	4.003 437	1410	4.003 792	1417	4.004 477	1431	4.004 980	1444	4.007 801	269
4.000 259	1254	4.000 364	1252	4.003 101	1460	4.003 456	1412	4.003 793	1417	4.004 478	1431	4.004 981	1444	4.007 802	266
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4.000 261	1254	4.000 366	1252	4.003 108	1462	4.003 464	1410	4.003 806	1410	4.004 480	1431	4.005 000	1444	4.007 807	269
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4.000 263	1254	4.000 390	1231	4.003 111	1465	4.003 466	1411	4.003 809	1410	4.004 498	1430	4.005 042	1474	4.007 809	266
4.000 264	1254	4.000 391	1231	4.003 112	1461	4.003 470	1411	4.003 811	1410	4.004 499	1430	4.005 043	1474	4.007 810	266
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4.000 282	1251	4.001 512	1468	4.003 161	1459	4.003 513	1416	4.003 866	1414	4.004 598	1433	4.005 068	1473	4.007 832	266
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4.000 286	1251	4.001 516	1386	4.003 169	1459	4.003 535	1418	4.003 923	1387	4.004 602	1433	4.005 444	1449	4.007 836	267
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4.000 292	1251	4.001 547	1383	4.003 178	1462	4.003 557	1413	4.004 378	1435	4.004 624	1429	4.005 583	1447	4.007 854	957
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4.000 297	1252	4.001 551	1396	4.003 186	1461	4.003 565	1411	4.004 383	1434	4.004 740	1432	4.005 616	1448	4.007 859	957
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4.000 319	1337	4.002 274	1442	4.003 266	1457	4.003 613	1413	4.004 402	1429	4.004 881	1476	4.005 945	1449	4.007 911	1252
4.000 320	1337	4.002 275	1442	4.003 267	1457	4.003 615	1412	4.004 403	1429	4.004 903	1478	4.005 954	256	4.007 912	1252
4.000 321	1337	4.002 276	1441	4.003 269	1462	4.003 619	1412	4.004 404	1429	4.004 907	1478	4.005 955	256	4.007 913	1252
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4.008 065	466	4.008 297	1397	4.008 405	618	4.008 552	1343	4.009 332	842	4.009 456	480	4.010 023	420	6.052 902	1109
4.008 075	845	4.008 298	1397	4.008 406	617	4.008 554	1338	4.009 333	842	4.009 456	1309	4.010 027	420	6.052 959	888
4.008 077	845	4.008 299	1397	4.008 408	617	4.008 555	1338	4.009 334	842	4.009 457	478	4.010 033	1362	6.053 383	310
4.008 135	570	4.008 300	879	4.008 411	617	4.008 556	1338	4.009 335	842	4.009 457	480	4.010 047	1362	6.053 384	310
4.008 136	649	4.008 301	879	4.008 412	617	4.008 570	42	4.009 336	842	4.009 457	1309	4.010 048	1362	6.053 546	1085
4.008 137	433	4.008 302	879	4.008 414	617	4.008 572	1339	4.009 337	842	4.009 458	478	4.010 098	1362	6.053 602	946
4.008 149	650	4.008 303	882	4.008 417	623	4.008 574	1257	4.009 338	842	4.009 458	480	4.010 227	842	6.053 838	1109
4.008 150	570	4.008 304	882	4.008 418	623	4.008 582	1274	4.009 339	842	4.009 458	1309	4.010 228	842	6.054 191	750
4.008 194	1382	4.008 305	882	4.008 419	623	4.008 599	1255	4.009 340	842	4.009 459	478	4.010 229	842	6.054 193	748
4.008 194	1386	4.008 306	882	4.008 420	623	4.008 606	1255	4.009 341	843	4.009 459	480	4.010 230	842	6.054 343	888
4.008 196	1385	4.008 307	873	4.008 421	623	4.008 608	1344	4.009 342	843	4.009 459	1309	4.010 231	842	6.054 581	1164
4.008 196	1386	4.008 308	873	4.008 422	621	4.008 622	1339	4.009 343	843	4.009 460	478	4.010 232	842	6.054 658	748
4.008 196	1389	4.008 309	873	4.008 423	621	4.008 624	1344	4.009 344	843	4.009 460	480	4.010 233	842	6.054 664	674
4.008 197	1383	4.008 310	873	4.008 424	621	4.008 625	1343	4.009 345	843	4.009 460	1309	4.010 234	843	6.054 780	1186
4.008 198	1381	4.008 311	973	4.008 425	621	4.008 627	1339	4.009 346	843	4.009 461	478	4.011 045	477	6.055 271	1110
4.008 200	1381	4.008 312	976	4.008 426	621	4.008 637	42	4.009 347	843	4.009 461	480	4.011 048	477	6.055 335	1400
4.008 202	1381	4.008 313	174	4.008 427	621	4.008 649	1254	4.009 348	843	4.009 461	1309	4.011 049	838	6.055 472	888
4.008 203	1381	4.008 313	979	4.008 428	615	4.008 650	1254	4.009 349	843	4.009 462	478	4.011 050	838	6.055 561	1188
4.008 204	1397	4.008 314	975	4.008 433	96	4.008 655	1339	4.009 350	843	4.009 463	478	4.011 051	838	6.056 433	1109
4.008 205	1392	4.008 315	975	4.008 434	96	4.008 656	1339	4.009 351	843	4.009 464	478	4.011 052	839	6.056 446	854
4.008 206	1381	4.008 316	975	4.008 435	96	4.008 657	1339	4.009 352	832	4.009 465	478	4.011 053	839	6.056 580	977
4.008 207	1382	4.008 317	975	4.008 436	96	4.008 658	1339	4.009 353	481	4.009 466	478	4.011 054	840	6.056 812	129
4.008 208	1382	4.008 318	975	4.008 437	727	4.008 674	1344	4.009 356	832	4.009 467	478	4.011 055	840	6.056 820	889
4.008 209	1382	4.008 322	896	4.008 438	727	4.008 687	1254	4.009 394	481	4.009 468	478	4.011 057	477	6.056 856	594
4.008 210	1382	4.008 323	896	4.008 439	727	4.008 713	1339	4.009 395	481	4.009 469	478	4.011 058	477	6.056 947	944
4.008 211	1384	4.008 324	896	4.008 440	135	4.008 714	1339	4.009 397	481	4.009 470	478	4.011 059	477	6.057 011	944
4.008 212	1384	4.008 327	401	4.008 441	134	4.008 715	1337	4.009 399	481	4.009 471	478	4.011 060	838	6.057 070	1212
4.008 213	1384	4.008 328	401	4.008 445	111	4.008 721	1343	4.009 401	481	4.009 472	478	4.011 061	838	6.057 100	888
4.008 214	1385	4.008 329	401	4.008 446	111	4.008 724	1339	4.009 402	481	4.009 473	478	4.011 062	838	6.057 101	888
4.008 215	1385	4.008 330	634	4.008 447	111	4.008 726	1338	4.009 403	481	4.009 474	478	4.011 063	839	6.057 279	749
4.008 216	1385	4.008 331	634	4.008 448	111	4.008 740	1344	4.009 427	481	4.009 475	478	4.011 064	839	6.058 016	946
4.008 218	1384	4.008 332	634	4.008 449	111	4.008 750	42	4.009 428	481	4.009 476	478	4.011 065	840	6.058 130	1109
4.008 220	1384	4.008 333	634	4.008 450	111	4.008 753	1338	4.009 429	481	4.009 477	478	4.011 066	840	6.058 191	892
4.008 221	1384	4.008 334	634	4.008 451	111	4.008 754	1338	4.009 430	481	4.009 478	478	4.011 067	841	6.059 018	516
4.008 222	1384	4.008 335	634	4.008 452	113	4.008 763	1339	4.009 431	481	4.009 479	478	4.011 068	841	6.059 056	1109
4.008 223	1384	4.008 336	634	4.008 453	113	4.008 764	1339	4.009 432	481	4.009 480	478	4.011 070	842	6.059 364	892
4.008 224	1384	4.008 337	634	4.008 454	112	4.008 767	1337	4.009 433	481	4.009 480	479	4.011 071	842	6.059 697	1109
4.008 225	1384	4.008 338	634	4.008 455	112	4.008 779	1343	4.009 434	481	4.009 480	838	6.005 993	107	6.059 699	892
4.008 226	1384	4.008 339	634	4.008 456	112	4.008 780	1254	4.009 435	481	4.009 480	1308	6.018 346	978	6.059 769	854
4.008 227	1384	4.008 340	634	4.008 457	112	4.008 786	1343	4.009 436	481	4.009 481	478	6.018 347	978	6.059 800	892
4.008 228	1384	4.008 341	629	4.008 458	112	4.008 797	1344	4.009 437	481	4.009 481	479	6.049 748	674	6.059 899	1400
4.008 229	1384	4.008 342	629	4.008 459	112	4.008 802	1254	4.009 438	481	4.009 481	838	6.050 012	284	6.059 957	135
4.008 230	1384	4.008 343	629	4.008 460	112	4.008 806	1343	4.009 439	481	4.009 481	1308	6.050 012	285	6.059 972	1109
4.008 231	1386	4.008 344	629	4.008 461	112	4.008 809	1344	4.009 440	481	4.009 482	478	6.050 131	59	6.059 976	1471
4.008 234	1386	4.008 345	629	4.008 471	123	4.008 812	1344	4.009 441	481	4.009 482	479	6.050 132	59	6.059 976	1472
4.008 235	1386	4.008 347	636	4.008 472	123	4.008 823	1339	4.009 442	478	4.009 482	838	6.050 133	59	6.059 977	1471
4.008 236	1386	4.008 348	636	4.008 473	123	4.008 824	43	4.009 442	479	4.009 482	1308	6.050 151	1338	6.059 977	1472
4.008 237	1386	4.008 349	636	4.008 474	123	4.008 825	43	4.009 442	838	4.009 483	478	6.050 155	1164	6.060 786	1187
4.008 238	1388	4.008 350	636	4.008 475	123	4.008 838	749	4.009 442	1308	4.009 483	479	6.050 160	1403	6.060 787	1187
4.008 239	1388	4.008 351	636	4.008 476	123	4.008 843	749	4.009 443	478	4.009 483	838	6.050 329	547	6.060 788	1187
4.008 243	1388	4.008 352	636	4.008 477	123	4.008 850	1338	4.009 444	478	4.009 483	1308	6.050 333	750	6.060 789	1188
4.008 247	1383	4.008 353	636	4.008 478	123	4.008 852	1337	4.009 445	478	4.009 485	478	6.050 553	1165	6.070 009	975
4.008 248	1392	4.008 354	636	4.008 479	123	4.008 858	1337	4.009 446	478	4.009 485	480	6.050 554	1165	6.070 044	173
4.008 249	1383	4.008 355	629	4.008 480	123	4.008 859	1339	4.009 446	479	4.009 485	1309	6.050 585	750	6.070 046	606
4.008 250	1383	4.008 356	629	4.008 481	123	4.008 866	1337	4.009 446	838	4.009 486	478	6.050 586	750	6.070 072	975
4.008 251	1386	4.008 357	629	4.008 482	123	4.008 874	1338	4.009 446	1308	4.009 487	478	6.050 827	888	6.070 172	139
4.008 252	1383	4.008 358	629	4.008 483	123	4.008 944	42	4.009 447	478	4.009 487	479	6.050 915	459	6.070 187	1164
4.008 253	1386	4.008 360	629	4.008 484	123	4.008 945	1343	4.009 447	479	4.009 487	838	6.050 962	1470	6.070 190	140
4.008 254	1386	4.008 370	604	4.008 485	123	4.008 951	1338	4.009 447	838	4.009 487	1308	6.051 172	249	6.070 228	139
4.008 255	1389	4.008 371	604	4.008 486	166	4.008 952	748	4.009 447	1308	4.009 488	478	6.051 307	946	6.070 424	944
4.008 256	1389	4.008 372	604	4.008 487	166	4.009 004	1338	4.009 448	478	4.009 488	480	6.051 403	1393	6.070 565	195
4.008 257	1389	4.008 373	608	4.008 488	166	4.009 009	1255	4.009 448	479	4.009 488	1309	6.051 579	1110	6.070 616	1085
4.008 258	1389	4.008 375	601	4.008 489	166	4.009 010	1254	4.009 448	838	4.009 489	478	6.051 629	516	6.071 748	889
4.008 259	1389	4.008 376	626	4.008 490	165	4.009 011	1339	4.009 448	1308	4.009 490	478	6.051 845	1109	6.071 767	819
4.008 261	1389	4.008 377	597	4.008 491	165	4.009 018	1338	4.009 449	478	4.009 491	478	6.051 881	946	6.071 888	169
4.008 262	1383	4.008 378	597	4.008 492	165	4.009 034	1338	4.009 449	479	4.009 492	478	6.051 958	1187	6.072 042	129
4.008 263	1391	4.008 379	590	4.008 493	165	4.009 036	1344	4.009 449	838	4.009 494	842	6.051 993	946	6.072 172	615
4.008 264	1391	4.008 380	590	4.008 494	165	4.009 043	1343	4.009 449	1308	4.009 506	481	6.052 018	521	6.072 218	750
4.008 265	1392	4.008 381	590	4.008 495	633	4.009 044	1343	4.009 450	478	4.009 506	843	6.052 085	1274	6.072 285	1109
4.008 266	1390	4.008 382	590	4.008 496	633	4.009 045	1338	4.009 450	479	4.009 511	481	6.052 153	1407	6.072 288	594
4.008 267	1391	4.008 383	590	4.008 497	633	4.009 049	1339	4.009 450	838	4.009 514	481	6.052 157	1407	6.072 360	1109
4.008 268	1393	4.008 384	590	4.008 498	633	4.009 050	1339	4.009 450	1308	4.009 515	481	6.052 163	1274	6.072 528	1470
4.008 269	1393	4.008 385	590	4.008 499	633	4.009 087	748	4.009 451	478	4.009 516	481	6.052 409	1108	6.072 558	595
4.008 270	1393	4.008 386	594	4.008 500	633	4.009 101	1343	4.009 451	479	4.009 517	481	6.052 519	1187	6.073 105	1109
4.008 271	1394	4.008 387	594	4.008 501	446	4.009 104	42	4.009 451	838	4.009 518	481	6.052 520	1187	6.073 106	1111
4.008 272	1395	4.008 388	594	4.008 502	1134	4.009 111	1075	4.009 451	1308	4.009 519	481	6.052 521	1187	6.073 183	606
4.008 273	1396	4.008 390	596	4.008 503	910	4.009 117	1344	4.009 452	478	4.009 521	481	6.052 587	152	6.073 481	597
4.008 274	1396	4.008 391	596	4.008 506	674	4.009 122	1343	4.009 452	479	4.009 522	481	6.052 588	152	6.073 489	626
4.008 275	1394	4.008 392	596	4.008 506	1334	4.009 123	1343	4.009 452	838	4.009 525	832	6.052 589	152	6.073 505	89
4.008 276	1394	4.008 393	596	4.008 507	674	4.009 142	748	4.009 452	1308	4.009 532	481	6.052 590	152	6.073 555	1389
4.008 278	1393	4.008 394	596	4.008 507	1334	4.009 142	748	4.009 453	478	4.009 533	481	6.052 591	152	6.073 833	1389
4.008 281	1394	4.008 395	596	4.008 508	674	4.009 173	1075	4.009 453	480	4.009 534	832	6.052 592	152	6.074 044	166
4.008 282	1392	4.008 396	596	4.008 508	1334	4.009 273	832	4.009 453	1309	4.009 986	1362	6.052 593	152	6.074 754	327
4.008 285	1393	4.008 397	134	4.008 510	97	4.009 273	1358	4.009 454	478	4.009 987	1362	6.052 594	152	6.074 805	606
4.008 291	1397	4.008 398	1443	4.008 512	135	4.009 275	658	4.009 454	480	4.009 988	1362	6.052 595	152	6.075 746	675
4.008 292	1397	4.008 399	1443	4.008 513	110	4.009 276	658	4.009 454	1309	4.009 989	1362	6.052 596	152	6.075 807	761
4.008 293	1397	4.008 400	1443	4.008 514	518	4.009 327	842	4.009 455	478	4.009 990	1362	6.052 598	152	6.075 814	1297
4.008 294	1397	4.008 401	1443	4.008 515	118	4.009 329	842	4.009 455	480	4.009 992	1362	6.052 630	1165	6.075 820	752
4.008 295	1397	4.008 402	1443	4.008 516	118	4.009 330	842	4.009 455	1309	4.010 001	1362	6.052 729	748	6.075 980	1110
4.008 296	1397	4.008 403	1443	4.008 517	118	4.009 331	842	4.009 456	478	4.010 022	420	6.052 763	1108	6.076 057	196

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6.076 204	174	6.087 345	751	6.201 255	797	6.205 674	675	6.223 093	520	6.225 737	1295	6.228 246	470	6.229 762	309
6.076 257	129	6.087 538	614	6.201 298	594	6.205 692	589	6.223 094	520	6.225 773	1039	6.228 255	517	6.229 781	795
6.076 309	167	6.087 703	1166	6.201 320	797	6.205 692	653	6.223 125	1231	6.225 791	458	6.228 257	1415	6.229 783	355
6.076 362	1164	6.088 058	614	6.201 456	1109	6.205 694	595	6.223 191	1196	6.225 818	921	6.228 258	1414	6.229 903	474
6.076 481	946	6.088 109	1471	6.201 457	1109	6.205 753	15	6.223 201	1274	6.225 848	921	6.228 311	749	6.229 909	1187
6.076 532	449	6.088 109	1472	6.201 514	1254	6.205 839	675	6.223 248	1257	6.225 859	1443	6.228 324	627	6.229 955	848
6.076 532	614	6.088 125	1107	6.201 570	418	6.205 857	44	6.223 256	975	6.225 909	889	6.228 382	384	6.229 964	650
6.076 639	1107	6.088 166	1165	6.201 643	797	6.205 906	917	6.223 283	614	6.225 931	164	6.228 387	100	6.229 999	471
6.076 641	1107	6.088 530	129	6.201 670	797	6.205 920	44	6.223 298	100	6.225 934	1245	6.228 424	977	6.230 074	668
6.076 887	198	6.088 668	1108	6.201 671	1075	6.205 921	44	6.223 310	1296	6.225 967	716	6.228 425	977	6.230 186	917
6.076 896	947	6.088 774	748	6.201 672	1274	6.205 922	44	6.223 318	1329	6.225 967	1319	6.228 436	855	6.230 213	1445
6.076 989	946	6.088 853	169	6.201 892	1048	6.205 965	589	6.223 413	224	6.225 979	1182	6.228 471	210	6.230 274	1474
6.077 002	952	6.088 871	1383	6.201 895	1075	6.205 965	653	6.223 427	615	6.225 989	594	6.228 500	449	6.230 318	177
6.077 283	1274	6.088 950	749	6.201 981	447	6.205 966	589	6.223 506	1381	6.226 018	1179	6.228 502	223	6.230 345	1228
6.077 361	888	6.089 284	166	6.202 021	170	6.205 966	653	6.223 522	311	6.226 022	1290	6.228 560	1227	6.230 350	1088
6.077 366	888	6.089 587	1470	6.202 172	797	6.206 034	1255	6.223 552	1470	6.226 043	100	6.228 599	1160	6.230 365	646
6.077 369	165	6.089 601	947	6.202 190	1474	6.206 049	1472	6.223 553	1470	6.226 081	112	6.228 605	1468	6.230 404	14
6.077 738	590	6.089 903	1187	6.202 219	209	6.206 050	1472	6.223 554	1470	6.226 130	44	6.228 639	520	6.230 405	14
6.077 875	750	6.089 904	1187	6.202 281	601	6.206 124	1404	6.223 558	1471	6.226 179	35	6.228 676	946	6.230 416	1244
6.077 876	750	6.089 965	750	6.202 305	550	6.206 128	751	6.223 574	1443	6.226 207	521	6.228 679	946	6.230 433	1102
6.077 877	750	6.090 340	894	6.202 416	1443	6.206 129	752	6.223 901	44	6.226 328	1445	6.228 698	928	6.230 433	1270
6.078 159	874	6.090 340	1346	6.202 417	1443	6.206 130	752	6.223 971	1338	6.226 329	1445	6.228 699	928	6.230 445	784
6.078 171	76	6.090 366	220	6.202 418	1443	6.206 131	752	6.223 990	647	6.226 427	1470	6.228 700	928	6.230 463	1245
6.078 216	1340	6.090 388	750	6.202 467	469	6.206 139	594	6.223 990	1025	6.226 501	1392	6.228 701	928	6.230 464	1245
6.078 305	748	6.090 412	310	6.202 713	892	6.206 173	1476	6.224 032	210	6.226 573	582	6.228 702	928	6.230 465	1245
6.078 412	752	6.090 419	750	6.202 714	892	6.206 195	589	6.224 033	210	6.226 573	583	6.228 703	928	6.230 515	1039
6.079 073	606	6.090 495	751	6.202 804	596	6.206 195	653	6.224 050	825	6.226 619	1290	6.228 704	928	6.230 535	961
6.079 079	752	6.090 497	990	6.202 838	750	6.206 201	961	6.224 148	224	6.226 643	606	6.228 705	928	6.230 554	390
6.079 156	977	6.090 788	220	6.202 839	750	6.206 206	39	6.224 171	160	6.226 798	1410	6.228 706	930	6.230 607	1260
6.079 157	977	6.090 811	868	6.202 850	1412	6.206 233	1413	6.224 187	223	6.226 802	178	6.228 707	930	6.230 626	326
6.079 307	170	6.091 137	1108	6.202 868	892	6.206 304	44	6.224 189	1471	6.226 901	1075	6.228 708	930	6.230 635	1179
6.079 397	888	6.091 756	868	6.203 014	596	6.206 305	39	6.224 190	1295	6.226 915	1445	6.228 709	930	6.230 658	376
6.079 513	59	6.091 887	220	6.203 095	459	6.206 347	39	6.224 191	1295	6.226 917	1412	6.228 715	944	6.230 719	601
6.079 568	530	6.092 721	888	6.203 235	919	6.206 348	458	6.224 207	961	6.226 934	1040	6.228 716	944	6.230 729	1474
6.079 602	139	6.092 728	944	6.203 237	489	6.206 393	746	6.224 223	1231	6.226 935	1040	6.228 718	943	6.230 775	945
6.079 648	640	6.092 769	854	6.203 237	495	6.206 402	1338	6.224 227	947	6.226 936	1040	6.228 719	943	6.230 826	599
6.079 677	750	6.093 022	672	6.203 350	1470	6.206 421	121	6.224 228	947	6.226 949	1290	6.228 720	943	6.230 844	1445
6.079 678	1254	6.093 232	640	6.203 402	897	6.206 439	39	6.224 229	947	6.226 950	1290	6.228 721	946	6.230 844	1445
6.079 718	977	6.093 247	1383	6.203 415	601	6.206 495	825	6.224 230	947	6.227 097	210	6.228 740	947	6.230 903	1231
6.079 772	173	6.093 247	1385	6.203 416	601	6.206 502	1470	6.224 231	943	6.227 144	1239	6.228 742	947	6.230 923	222
6.079 785	751	6.093 247	1386	6.203 518	449	6.206 524	597	6.224 232	947	6.227 149	529	6.228 743	947	6.230 948	42
6.079 786	751	6.093 247	1389	6.203 535	797	6.206 587	1109	6.224 233	944	6.227 150	529	6.228 744	947	6.230 984	848
6.079 787	751	6.093 874	1110	6.203 549	825	6.206 594	363	6.224 234	945	6.227 197	355	6.228 745	947	6.231 039	1151
6.079 788	751	6.095 234	315	6.203 561	310	6.206 600	963	6.224 235	944	6.227 253	1239	6.228 746	947	6.231 072	100
6.079 803	606	6.200 206	1164	6.203 569	595	6.206 625	987	6.224 236	946	6.227 289	529	6.228 747	947	6.231 087	1347
6.080 130	750	6.200 208	210	6.203 571	595	6.206 675	873	6.224 287	585	6.227 292	529	6.228 748	947	6.231 100	1343
6.080 156	1109	6.200 263	526	6.203 572	595	6.206 691	310	6.224 312	719	6.227 381	718	6.228 749	947	6.231 115	108
6.080 217	311	6.200 303	187	6.203 603	1249	6.206 693	310	6.224 312	1324	6.227 381	1325	6.228 750	947	6.231 153	1401
6.080 235	1107	6.200 394	516	6.203 604	1249	6.206 710	755	6.224 397	625	6.227 404	796	6.228 751	947	6.231 161	1160
6.080 286	126	6.200 398	171	6.203 934	1404	6.206 710	1335	6.224 405	1245	6.227 443	1040	6.228 752	945	6.231 269	549
6.080 286	518	6.200 432	874	6.203 961	1443	6.206 732	957	6.224 412	943	6.227 450	1469	6.228 753	945	6.231 283	442
6.080 498	894	6.200 433	874	6.204 103	1470	6.206 733	957	6.224 417	1474	6.227 486	944	6.228 754	945	6.231 284	470
6.080 498	1346	6.200 434	874	6.204 134	39	6.206 856	100	6.224 460	39	6.227 536	53	6.228 755	945	6.231 285	470
6.080 511	1110	6.200 447	598	6.204 184	944	6.206 861	854	6.224 461	39	6.227 544	1392	6.228 756	945	6.231 336	1109
6.080 523	894	6.200 448	892	6.204 286	797	6.206 884	946	6.224 507	631	6.227 666	1106	6.228 757	945	6.231 388	204
6.080 523	1346	6.200 496	873	6.204 321	596	6.206 907	309	6.224 557	957	6.227 688	100	6.228 758	945	6.231 389	226
6.080 611	1164	6.200 515	1404	6.204 322	596	6.206 960	947	6.224 842	1413	6.227 717	449	6.228 761	930	6.231 425	226
6.080 908	943	6.200 593	76	6.204 399	855	6.207 044	810	6.224 843	1412	6.227 761	1303	6.228 788	1470	6.231 447	226
6.081 021	750	6.200 639	904	6.204 472	961	6.207 050	1298	6.224 845	1411	6.227 768	1396	6.228 848	1233	6.231 448	334
6.081 022	750	6.200 643	314	6.204 492	516	6.207 112	383	6.224 846	1413	6.227 780	1445	6.228 856	225	6.231 450	750
6.081 029	752	6.200 643	315	6.204 497	1110	6.207 118	1467	6.224 847	1411	6.227 781	1445	6.228 898	237	6.231 451	750
6.081 209	892	6.200 654	193	6.204 551	585	6.207 122	377	6.224 868	1411	6.227 782	1445	6.228 911	160	6.231 512	822
6.081 483	1110	6.200 675	590	6.204 624	1403	6.207 164	1338	6.224 893	917	6.227 789	346	6.228 923	803	6.231 520	668
6.081 654	752	6.200 676	598	6.204 794	613	6.207 171	377	6.224 913	1102	6.227 796	1175	6.228 924	803	6.231 539	464
6.081 798	888	6.200 677	598	6.204 795	613	6.207 191	39	6.224 913	1270	6.227 832	618	6.228 969	1390	6.231 540	101
6.081 879	752	6.200 686	1405	6.204 811	749	6.207 277	957	6.224 914	1103	6.227 849	237	6.228 976	1093	6.231 541	725
6.082 633	944	6.200 777	1108	6.204 819	594	6.210 059	919	6.224 915	1103	6.227 874	1393	6.229 038	1260	6.231 555	1106
6.082 701	752	6.200 782	588	6.204 852	596	6.210 129	327	6.225 059	327	6.227 895	412	6.229 039	1260	6.231 591	1088
6.082 702	752	6.200 782	653	6.204 878	675	6.210 168	605	6.225 112	819	6.227 896	583	6.229 041	718	6.231 607	347
6.082 970	751	6.200 838	150	6.204 890	625	6.222 013	1401	6.225 158	575	6.227 899	1475	6.229 041	1325	6.231 686	961
6.083 463	989	6.200 843	748	6.204 902	1057	6.222 130	1343	6.225 161	310	6.227 900	1475	6.229 213	810	6.231 720	1160
6.083 519	750	6.200 894	1110	6.204 936	39	6.222 163	1075	6.225 206	310	6.227 906	1094	6.229 282	1260	6.231 721	1290
6.084 029	888	6.200 903	1405	6.204 955	1472	6.222 275	1151	6.225 207	310	6.227 917	1474	6.229 315	346	6.231 748	1093
6.084 072	888	6.200 910	135	6.205 017	1443	6.222 339	873	6.225 208	310	6.227 922	100	6.229 358	436	6.231 770	131
6.084 197	166	6.200 921	1107	6.205 076	1470	6.222 441	1254	6.225 223	1412	6.227 923	1347	6.229 381	1262	6.231 770	1283
6.084 538	752	6.200 935	195	6.205 104	100	6.222 480	944	6.225 256	100	6.227 924	1347	6.229 422	459	6.231 785	1253
6.084 681	943	6.200 955	888	6.205 105	100	6.222 503	797	6.225 263	797	6.227 942	963	6.229 494	1445	6.231 788	716
6.084 722	1107	6.201 004	155	6.205 109	39	6.222 543	1075	6.225 278	167	6.227 948	1474	6.229 495	1445	6.231 788	1319
6.084 976	944	6.201 005	155	6.205 110	39	6.222 575	794	6.225 298	718	6.228 020	1125	6.229 606	222	6.231 805	95
6.085 184	1330	6.201 006	57	6.205 128	1347	6.222 582	359	6.225 298	1325	6.228 023	1445	6.229 607	222	6.231 823	1246
6.085 289	947	6.201 023	210	6.205 165	961	6.222 584	1107	6.225 371	668	6.228 031	100	6.229 608	222	6.231 832	1244
6.085 419	1471	6.201 034	28	6.205 169	675	6.222 630	1110	6.225 372	668	6.228 059	310	6.229 625	957	6.231 847	1254
6.085 475	1469	6.201 034	1289	6.205 218	62	6.222 672	1342	6.225 427	1384	6.228 063	1411	6.229 635	1395	6.231 848	1337
6.085 561	946	6.201 067	1106	6.205 412	327	6.222 688	822	6.225 477	572	6.228 096	187	6.229 655	1229	6.231 860	716
6.085 852	946	6.201 068	167	6.205 413	327	6.222 778	856	6.225 506	90	6.228 145	1290	6.229 662	1347	6.231 860	1319
6.085 914	136	6.201 070	749	6.205 415	327	6.222 853	952	6.225 507	90	6.228 184	1105	6.229 663	1347	6.231 946	675
6.086 375	1108	6.201 071	750	6.205 458	515	6.222 953	1338	6.225 557	617	6.228 209	1245	6.229 692	612	6.231 953	594
6.086 631	1187	6.201 089	1404	6.205 483	39	6.222 960	1075	6.225 614	572	6.228 218	718	6.229 695	612	6.231 957	112
6.087 044	526	6.201 104	873	6.205 512	589	6.223 053	1075	6.225 622	521	6.228 218	1325	6.229 702	442	6.231 964	647
6.087 242	1471	6.201 199	590	6.205 512	653	6.223 092	298	6.225 714	35	6.228 233	1254	6.229 740	961	6.231 964	1025

6.231 995	376	6.234 320	192	6.236 264	116	6.237 702	590	6.239 009	168	6.240 974	593	6.242 670	689	6.243 666	653
6.232 027	607	6.234 424	718	6.236 293	846	6.237 703	116	6.239 037	1391	6.240 975	593	6.242 694	621	6.243 667	588
6.232 031	210	6.234 424	1324	6.236 303	590	6.237 704	597	6.239 096	1471	6.240 976	596	6.242 701	166	6.243 667	653
6.232 074	608	6.234 451	1240	6.236 317	621	6.237 705	878	6.239 136	927	6.240 977	596	6.242 703	165	6.243 668	588
6.232 176	1260	6.234 466	90	6.236 318	621	6.237 706	727	6.239 177	101	6.240 978	596	6.242 704	135	6.243 668	653
6.232 178	1382	6.234 510	21	6.236 319	621	6.237 707	727	6.239 178	927	6.240 982	615	6.242 742	27	6.243 669	616
6.232 190	515	6.234 511	347	6.236 320	621	6.237 708	727	6.239 195	112	6.240 983	615	6.242 774	625	6.243 670	616
6.232 207	131	6.234 515	892	6.236 321	621	6.237 709	873	6.239 227	243	6.241 090	585	6.242 784	89	6.243 673	623
6.232 207	1283	6.234 530	1347	6.236 328	39	6.237 710	873	6.239 228	243	6.241 105	383	6.242 793	466	6.243 738	608
6.232 288	1261	6.234 541	1395	6.236 329	39	6.237 711	588	6.239 229	243	6.241 111	1393	6.242 811	1109	6.243 739	608
6.232 289	1261	6.234 576	1268	6.236 330	39	6.237 711	651	6.239 242	243	6.241 114	670	6.242 812	1109	6.243 740	607
6.232 290	1260	6.234 591	529	6.236 346	590	6.237 724	395	6.239 273	1240	6.241 116	976	6.242 844	326	6.243 741	607
6.232 291	1260	6.234 592	529	6.236 347	592	6.237 751	1242	6.239 332	1470	6.241 130	152	6.242 855	253	6.243 754	1175
6.232 314	355	6.234 594	1347	6.236 355	866	6.237 752	1242	6.239 337	1404	6.241 198	964	6.242 856	253	6.243 865	529
6.232 327	222	6.234 595	1347	6.236 426	878	6.237 877	1337	6.239 360	1404	6.241 199	259	6.242 980	255	6.243 905	128
6.232 333	1429	6.234 596	1347	6.236 456	130	6.237 901	64	6.239 384	1091	6.241 216	976	6.243 010	27	6.243 959	1218
6.232 337	1245	6.234 598	515	6.236 477	1055	6.237 909	1393	6.239 416	222	6.241 225	1166	6.243 011	27	6.243 960	1218
6.232 352	855	6.234 641	310	6.236 508	590	6.237 965	1091	6.239 419	770	6.241 227	1166	6.243 012	27	6.243 960	1219
6.232 362	1424	6.234 665	1224	6.236 532	1097	6.237 967	1245	6.239 420	190	6.241 238	225	6.243 055	601	6.243 960	1221
6.232 389	1423	6.234 666	1224	6.236 533	1097	6.237 971	1068	6.239 423	1012	6.241 255	359	6.243 056	601	6.244 006	132
6.232 433	822	6.234 716	294	6.236 539	1343	6.237 973	1334	6.239 438	881	6.241 274	353	6.243 069	627	6.244 011	621
6.232 481	1160	6.234 725	1302	6.236 596	100	6.237 979	370	6.239 505	855	6.241 291	727	6.243 069	1164	6.244 028	1343
6.232 482	1160	6.234 735	752	6.236 597	100	6.237 998	866	6.239 507	167	6.241 371	532	6.243 162	755	6.244 067	461
6.232 523	1239	6.234 736	752	6.236 598	100	6.238 001	381	6.239 547	606	6.241 373	926	6.243 162	1335	6.244 120	775
6.232 525	101	6.234 815	526	6.236 599	100	6.238 005	431	6.239 618	797	6.241 460	505	6.243 175	327	6.244 121	775
6.232 548	1422	6.234 827	353	6.236 618	108	6.238 007	37	6.239 724	976	6.241 474	335	6.243 203	37	6.244 589	629
6.232 549	1422	6.234 850	347	6.236 683	123	6.238 061	1229	6.239 745	1262	6.241 477	338	6.243 204	1334	6.244 591	602
6.232 574	529	6.234 859	327	6.236 719	351	6.238 106	927	6.239 754	37	6.241 495	1233	6.243 205	1334	6.244 592	602
6.232 577	529	6.234 902	1396	6.236 751	1470	6.238 115	1240	6.239 776	1063	6.241 502	1362	6.243 206	1334	6.244 593	602
6.232 630	1261	6.234 956	613	6.236 773	597	6.238 117	948	6.239 788	241	6.241 518	1063	6.243 207	1334	6.244 594	602
6.232 660	1474	6.234 957	613	6.236 774	590	6.238 118	949	6.239 804	167	6.241 533	629	6.243 208	1334	6.245 038	351
6.232 685	1099	6.235 003	582	6.236 800	990	6.238 119	949	6.239 812	619	6.241 602	401	6.243 209	1334	6.246 006	589
6.232 685	1184	6.235 003	583	6.236 805	646	6.238 120	948	6.239 822	167	6.241 603	401	6.243 210	38	6.246 006	652
6.232 715	294	6.235 003	584	6.236 825	1066	6.238 121	948	6.239 879	1058	6.241 639	314	6.243 211	38	6.246 007	589
6.232 796	1432	6.235 017	697	6.236 845	1206	6.238 132	1231	6.239 883	387	6.241 644	1329	6.243 212	38	6.246 007	652
6.232 797	1260	6.235 019	624	6.236 850	515	6.238 138	360	6.239 884	387	6.241 652	727	6.243 213	38	6.246 008	589
6.232 813	470	6.235 042	90	6.236 854	360	6.238 139	360	6.239 903	725	6.241 661	253	6.243 229	109	6.246 008	652
6.232 828	555	6.235 065	624	6.236 915	678	6.238 140	360	6.240 019	63	6.241 668	621	6.243 339	1063	6.246 009	589
6.232 917	288	6.235 082	253	6.236 921	1088	6.238 141	35	6.240 026	536	6.241 669	621	6.243 360	1063	6.246 009	652
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6.233 114	594	6.235 110	597	6.236 954	605	6.238 169	359	6.240 038	671	6.241 671	621	6.243 410	1060	6.246 010	652
6.233 128	1415	6.235 111	597	6.237 000	908	6.238 170	359	6.240 039	1106	6.241 673	255	6.243 414	1058	6.246 011	589
6.233 172	1422	6.235 155	223	6.237 001	908	6.238 171	359	6.240 040	1106	6.241 690	1091	6.243 423	1063	6.246 011	652
6.233 176	106	6.235 183	443	6.237 002	908	6.238 192	1037	6.240 060	633	6.241 693	629	6.243 542	877	6.248 077	253
6.233 339	1397	6.235 199	856	6.237 003	908	6.238 239	554	6.240 071	926	6.241 705	334	6.243 544	877	6.248 078	255
6.233 381	301	6.235 214	347	6.237 016	1230	6.238 272	1329	6.240 089	1230	6.241 715	605	6.243 545	877	6.250 017	1107
6.233 404	566	6.235 231	582	6.237 017	1230	6.238 277	1240	6.240 102	927	6.241 723	253	6.243 546	877	6.250 142	136
6.233 440	1201	6.235 243	751	6.237 126	108	6.238 278	1240	6.240 135	1392	6.241 792	1449	6.243 547	877	6.250 225	1110
6.233 543	377	6.235 314	1290	6.237 141	1268	6.238 341	1291	6.240 191	447	6.241 793	1449	6.243 581	629	6.250 278	797
6.233 548	1253	6.235 326	1404	6.237 160	37	6.238 345	590	6.240 223	1160	6.241 814	879	6.243 582	629	6.250 413	873
6.233 568	1474	6.235 330	582	6.237 164	592	6.238 346	597	6.240 242	1066	6.241 820	101	6.243 583	629	6.250 417	1257
6.233 613	347	6.235 370	918	6.237 165	592	6.238 376	214	6.240 323	1100	6.241 830	1063	6.243 584	629	6.250 420	797
6.233 617	1239	6.235 377	1044	6.237 166	592	6.238 377	214	6.240 332	1245	6.241 879	531	6.243 585	629	6.250 483	873
6.233 618	1240	6.235 417	1295	6.237 167	588	6.238 426	345	6.240 333	633	6.241 887	671	6.243 586	629	6.250 491	1151
6.233 664	1295	6.235 534	569	6.237 167	651	6.238 472	590	6.240 342	618	6.241 888	671	6.243 604	604	6.251 060	1111
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6.233 696	1281	6.235 596	285	6.237 267	755	6.238 478	952	6.240 378	758	6.241 972	108	6.243 609	597	6.251 347	323
6.233 706	546	6.235 606	1381	6.237 267	1335	6.238 525	896	6.240 382	384	6.241 980	621	6.243 610	597	6.251 366	617
6.233 742	927	6.235 610	855	6.237 268	755	6.238 526	621	6.240 397	197	6.241 981	621	6.243 611	597	6.251 423	1038
6.233 743	927	6.235 611	855	6.237 268	1335	6.238 527	621	6.240 397	197	6.241 983	335	6.243 612	597	6.251 424	1038
6.233 744	927	6.235 684	466	6.237 286	546	6.238 532	595	6.240 397	198	6.242 036	1245	6.243 613	597	6.251 438	377
6.233 745	927	6.235 728	345	6.237 287	134	6.238 545	758	6.240 412	621	6.242 062	1081	6.243 614	597	6.251 448	650
6.233 748	106	6.235 736	14	6.237 305	646	6.238 546	758	6.240 421	133	6.242 103	1385	6.243 615	597	6.251 451	834
6.233 756	1253	6.235 767	1362	6.237 312	623	6.238 547	758	6.240 425	597	6.242 104	1386	6.243 616	594	6.251 474	101
6.233 757	100	6.235 794	291	6.237 313	623	6.238 548	193	6.240 426	590	6.242 163	591	6.243 617	594	6.251 521	580
6.233 767	285	6.235 823	28	6.237 328	725	6.238 574	1175	6.240 465	247	6.242 170	727	6.243 618	594	6.251 593	256
6.233 795	353	6.235 823	1289	6.237 330	650	6.238 591	1061	6.240 471	125	6.242 171	399	6.243 619	594	6.251 689	15
6.233 811	675	6.235 892	1091	6.237 379	950	6.238 613	670	6.240 474	174	6.242 195	1329	6.243 620	594	6.251 768	1279
6.233 833	355	6.235 935	294	6.237 469	469	6.238 614	671	6.240 474	979	6.242 212	1389	6.243 621	593	6.251 900	927
6.233 835	1348	6.235 935	323	6.237 535	649	6.238 615	671	6.240 475	132	6.242 234	519	6.243 622	593	6.251 939	466
6.233 844	291	6.235 961	1134	6.237 538	650	6.238 630	1120	6.240 505	812	6.242 239	384	6.243 623	593	6.252 068	274
6.233 851	1253	6.235 962	1134	6.237 539	650	6.238 672	460	6.240 509	585	6.242 240	590	6.243 624	593	6.252 153	92
6.233 889	855	6.235 963	1134	6.237 540	650	6.238 676	309	6.240 535	1106	6.242 267	1391	6.243 625	593	6.252 154	92
6.233 891	1422	6.235 964	1134	6.237 541	650	6.238 677	309	6.240 542	681	6.242 287	664	6.243 633	308	6.252 163	1249
6.233 912	1254	6.235 965	1134	6.237 542	650	6.238 711	168	6.240 542	1267	6.242 312	1474	6.243 654	595	6.252 163	1250
6.233 918	1386	6.235 966	629	6.237 620	755	6.238 728	674	6.240 595	671	6.242 393	23	6.243 655	595	6.252 166	92
6.234 011	1423	6.235 995	304	6.237 620	1335	6.238 728	1334	6.240 599	466	6.242 394	621	6.243 656	595	6.252 181	255
6.234 026	27	6.236 005	1203	6.237 621	755	6.238 796	647	6.240 637	464	6.242 395	621	6.243 657	595	6.252 200	22
6.234 031	1410	6.236 022	617	6.237 621	1335	6.238 796	1025	6.240 684	471	6.242 396	633	6.243 658	595	6.252 321	856
6.234 050	284	6.236 025	250	6.237 622	755	6.238 821	810	6.240 716	1063	6.242 423	1134	6.243 659	595	6.252 383	529
6.234 067	1028	6.236 035	376	6.237 622	1335	6.238 840	873	6.240 725	1231	6.242 424	108	6.243 660	595	6.252 384	529
6.234 067	1029	6.236 081	1290	6.237 623	755	6.238 844	167	6.240 744	309	6.242 434	650	6.243 661	595	6.252 403	590
6.234 159	1099	6.236 085	1405	6.237 623	1335	6.238 860	14	6.240 745	309	6.242 463	976	6.243 662	595	6.252 619	192
6.234 159	1184	6.236 109	429	6.237 627	976	6.238 867	1385	6.240 766	436	6.242 468	1391	6.243 663	595	6.252 620	192
6.234 184	716	6.236 112	588	6.237 628	978	6.238 927	555	6.240 795	314	6.242 495	589	6.243 664	588	6.252 670	14
6.234 184	1319	6.236 112	651	6.237 629	979	6.238 947	554	6.240 956	515	6.242 495	652	6.243 664	651	6.252 729	1174
6.234 247	672	6.236 223	851	6.237 648	171	6.238 965	1381	6.240 962	626	6.242 557	926	6.243 665	588	6.252 739	858
6.234 298	836	6.236 224	851	6.237 656	222	6.238 979	1389	6.240 963	626	6.242 634	1100	6.243 665	653	6.252 823	466
6.234 299	836	6.236 239	618	6.237 684	222	6.239 008	727	6.240 973	593	6.242 669	689	6.243 666	588	6.252 905	318

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6.252 946	466	6.256 163	855	6.258 234	568	6.300 299	888	6.401 582	39	6.801 787	750	6.900 428	167	7.018 947	640
6.253 092	247	6.256 440	438	6.258 244	599	6.300 334	1049	6.510 003	946	6.801 788	750	6.900 429	167	7.018 948	640
6.253 093	247	6.256 441	438	6.258 269	568	6.300 402	1343	6.510 005	1274	6.801 789	750	6.900 430	167	7.019 150	598
6.253 096	247	6.256 442	438	6.258 271	568	6.300 656	794	6.510 172	894	6.801 867	1106	6.900 522	618	7.019 155	598
6.253 139	1290	6.256 514	532	6.258 273	568	6.300 669	1254	6.510 172	1346	6.801 868	1106	6.900 523	604	7.019 156	598
6.253 163	524	6.256 520	536	6.258 322	812	6.300 696	1109	6.510 180	874	6.801 871	1332	6.900 648	630	7.019 163	598
6.253 256	591	6.256 566	1011	6.258 415	633	6.300 995	172	6.510 181	874	6.801 872	1332	6.900 659	1466	7.019 164	598
6.253 276	1317	6.256 590	646	6.258 416	633	6.301 466	1149	6.510 182	874	6.801 890	1337	6.900 669	1075	7.019 181	590
6.253 281	1317	6.256 763	806	6.258 417	633	6.301 526	227	6.510 183	874	6.801 894	1412	6.900 713	1418	7.019 182	590
6.253 311	198	6.256 805	335	6.258 421	645	6.301 538	943	6.510 301	750	6.801 962	623	6.900 761	167	7.019 207	593
6.253 331	616	6.256 809	491	6.258 446	965	6.301 574	150	6.510 319	549	6.801 977	1166	6.900 828	598	7.019 244	595
6.253 344	1117	6.256 816	491	6.258 472	1290	6.301 578	1404	6.510 335	894	6.801 978	1166	6.900 834	598	7.019 272	596
6.253 368	1243	6.256 893	114	6.258 629	1011	6.301 604	943	6.510 335	1346	6.801 979	1166	6.900 835	598	7.019 348	1290
6.253 408	189	6.256 893	519	6.258 630	1011	6.301 637	247	6.510 380	1110	6.802 032	1332	6.900 839	598	7.019 669	445
6.253 481	53	6.256 894	114	6.258 636	261	6.301 671	1254	6.510 405	30	6.802 057	750	6.900 937	946	7.019 670	445
6.253 506	1097	6.256 894	519	6.258 680	597	6.301 718	166	6.510 405	675	6.802 214	750	6.900 963	1396	7.019 672	445
6.253 537	628	6.256 895	114	6.258 681	597	6.301 727	1343	6.510 709	1186	6.802 215	750	6.900 991	1404	7.019 673	445
6.253 538	628	6.256 895	519	6.258 682	599	6.301 732	892	6.510 849	59	6.802 229	1255	6.901 030	1049	7.019 675	445
6.253 577	936	6.256 896	114	6.258 683	613	6.302 116	590	6.510 856	1330	6.802 266	746	6.901 143	1476	7.020 037	1039
6.253 608	1065	6.256 896	519	6.258 684	613	6.302 202	57	6.510 864	944	6.802 292	749	6.901 167	1347	7.020 038	1039
6.253 609	1065	6.256 897	114	6.258 685	613	6.302 247	748	6.510 909	171	6.802 293	749	6.901 168	1347	7.020 294	897
6.253 610	1065	6.256 897	519	6.258 692	623	6.302 336	718	6.700 069	1258	6.802 391	1403	6.901 208	749	7.020 295	897
6.253 611	1065	6.256 898	114	6.258 693	623	6.302 336	1325	6.700 111	1403	6.802 431	752	6.901 244	749	7.020 330	34
6.253 612	1065	6.256 898	519	6.258 695	623	6.302 391	854	6.700 333	392	6.802 474	1332	6.901 328	334	7.021 486	60
6.253 613	1065	6.257 002	351	6.258 696	624	6.302 596	748	6.700 357	308	6.802 496	1109	6.901 329	1254	7.021 547	1290
6.253 649	189	6.257 139	1389	6.258 697	624	6.302 598	748	6.700 568	752	6.802 498	946	6.901 399	873	7.021 548	1290
6.253 743	23	6.257 173	781	6.258 698	624	6.302 645	1110	6.700 690	1460	6.802 513	989	6.901 567	51	7.021 549	1290
6.253 748	1066	6.257 176	1278	6.258 699	624	6.302 667	1258	6.700 747	1410	6.802 537	1149	6.901 617	590	7.021 550	1290
6.253 751	21	6.257 177	1278	6.258 821	28	6.302 852	1111	6.700 903	873	6.802 598	1403	6.901 622	327	7.021 797	590
6.253 785	21	6.257 178	1278	6.258 822	28	6.302 979	210	6.701 485	1331	6.802 614	167	6.901 629	327	7.021 838	595
6.253 916	922	6.257 179	1278	6.258 823	28	6.302 993	1108	6.702 588	1291	6.802 646	1337	6.901 653	188	7.021 840	595
6.253 917	922	6.257 180	1278	6.258 824	28	6.303 032	892	6.702 724	1342	6.802 647	1337	6.901 670	327	7.022 042	974
6.253 918	922	6.257 181	1278	6.258 825	28	6.303 229	1404	6.704 046	1476	6.802 715	1414	6.901 671	327	7.022 043	974
6.253 919	922	6.257 247	1011	6.258 826	28	6.303 297	1443	6.704 091	1469	6.802 726	750	6.901 798	1416	7.022 044	974
6.253 920	922	6.257 318	1331	6.258 827	28	6.303 525	77	6.704 458	1467	6.802 727	750	6.901 799	597	7.023 754	716
6.253 921	922	6.257 342	531	6.258 888	791	6.303 738	888	6.800 124	889	6.802 824	58	6.901 807	524	7.023 754	1321
6.253 922	922	6.257 343	531	6.258 996	59	6.303 743	892	6.800 126	171	6.802 833	1347	6.901 915	1332	7.047 043	449
6.253 961	1290	6.257 359	342	6.259 209	981	6.303 795	169	6.800 139	189	6.802 871	1075	6.901 962	606	7.047 785	718
6.253 976	1446	6.257 480	822	6.260 000	749	6.303 841	172	6.800 181	1343	6.802 883	1474	6.901 984	1023	7.047 785	1325
6.254 003	15	6.257 572	352	6.260 001	749	6.303 926	1404	6.800 202	590	6.802 901	327	6.902 044	1381	7.047 787	718
6.254 004	14	6.257 627	1341	6.260 002	749	6.303 988	873	6.800 204	171	6.802 902	327	6.902 222	1410	7.047 787	1325
6.254 027	1290	6.257 628	1341	6.260 003	749	6.304 147	108	6.800 205	76	6.802 927	1149	6.902 292	23	7.047 789	718
6.254 106	625	6.257 629	1341	6.260 004	750	6.304 307	181	6.800 209	640	6.802 939	1075	6.902 308	671	7.047 789	1325
6.254 108	624	6.257 630	1341	6.260 005	750	6.304 322	220	6.800 214	590	6.802 957	613	6.902 309	671	7.047 791	718
6.254 169	377	6.257 631	1341	6.260 006	750	6.304 378	797	6.800 215	590	6.802 978	597	6.902 310	671	7.047 791	1325
6.254 171	256	6.257 632	1341	6.260 007	750	6.304 822	1165	6.800 224	1107	6.803 005	1075	6.902 328	825	7.047 793	718
6.254 273	504	6.257 633	1341	6.260 008	750	6.304 828	1404	6.800 228	748	6.803 016	748	6.902 419	1395	7.047 793	1325
6.254 275	150	6.257 634	1341	6.260 009	750	6.304 939	606	6.800 235	590	6.803 043	752	6.902 444	623	7.047 850	709
6.254 325	606	6.257 635	1341	6.260 010	750	6.305 117	520	6.800 243	1108	6.803 050	751	6.902 445	623	7.048 062	76
6.254 337	1160	6.257 636	1341	6.260 011	750	6.305 430	892	6.800 337	597	6.803 056	752	7.008 959	126	7.048 063	76
6.254 364	936	6.257 637	1341	6.260 012	750	6.305 840	750	6.800 382	28	6.803 067	412	7.008 959	519	7.048 064	76
6.254 389	15	6.257 638	1341	6.260 013	750	6.306 078	797	6.800 382	1289	6.803 092	1347	7.008 960	126	7.048 065	76
6.254 394	1019	6.257 639	1341	6.260 014	750	6.306 164	171	6.800 399	748	6.803 101	1337	7.008 960	519	7.048 080	1348
6.254 430	1101	6.257 640	1341	6.260 015	750	6.306 275	595	6.800 451	1116	6.803 102	524	7.008 961	126	7.048 081	1348
6.254 445	1101	6.257 641	1341	6.260 016	750	6.306 285	603	6.800 620	28	6.803 174	1383	7.008 961	519	7.048 082	1348
6.254 447	23	6.257 642	1341	6.260 017	750	6.306 286	595	6.800 620	1289	6.803 185	944	7.008 962	126	7.048 388	719
6.254 523	606	6.257 643	1341	6.260 018	750	6.306 595	113	6.800 621	28	6.803 270	750	7.008 962	519	7.048 388	1324
6.254 597	654	6.257 644	1341	6.260 019	750	6.306 619	803	6.800 621	1289	6.803 320	1469	7.008 966	18	7.048 389	718
6.254 598	655	6.257 645	1341	6.260 020	750	6.306 834	1075	6.800 632	1050	6.803 323	672	7.008 967	17	7.048 389	1324
6.254 599	655	6.257 646	1341	6.260 021	751	6.306 990	593	6.800 667	1048	6.803 324	672	7.008 968	18	7.048 390	719
6.254 600	655	6.257 647	1341	6.260 022	751	6.307 252	166	6.800 724	205	6.803 325	672	7.008 969	17	7.048 390	1324
6.254 601	655	6.257 648	1341	6.260 023	751	6.307 327	597	6.800 733	169	6.803 371	100	7.008 970	18	7.048 391	718
6.254 602	655	6.257 649	1341	6.260 024	751	6.307 820	597	6.801 015	91	6.803 384	1401	7.008 971	17	7.048 391	1324
6.254 603	655	6.257 650	1341	6.260 025	751	6.307 821	597	6.801 018	889	6.803 417	1405	7.008 972	18	7.048 392	719
6.254 604	654	6.257 651	1341	6.260 026	751	6.307 822	597	6.801 019	889	6.803 543	595	7.008 973	17	7.048 392	1324
6.254 729	1227	6.257 652	1341	6.260 027	751	6.307 823	597	6.801 020	889	6.803 562	1338	7.008 974	18	7.048 393	718
6.254 755	342	6.257 653	1341	6.260 028	751	6.308 526	1075	6.801 021	889	6.803 567	100	7.008 975	17	7.048 393	1324
6.254 890	628	6.257 654	1341	6.260 029	752	6.311 677	188	6.801 022	889	6.803 609	311	7.008 976	17	7.048 395	718
6.254 918	1127	6.257 655	1341	6.260 030	752	6.314 563	1413	6.801 023	889	6.803 610	311	7.008 977	17	7.048 395	1324
6.254 947	200	6.257 656	1341	6.260 031	752	6.318 848	188	6.801 024	889	6.803 611	311	7.008 978	17	7.048 396	719
6.254 971	1470	6.257 657	1341	6.260 032	752	6.321 027	310	6.801 037	1403	6.803 651	1474	7.008 999	876	7.048 396	1324
6.255 204	1111	6.257 658	1341	6.260 033	752	6.323 052	236	6.801 073	28	6.803 674	1075	7.009 005	877	7.048 397	719
6.255 307	524	6.257 659	1341	6.260 034	752	6.324 668	188	6.801 073	1289	6.803 675	1075	7.009 008	877	7.048 397	1324
6.255 331	700	6.257 660	1341	6.260 035	752	6.401 078	1332	6.801 096	205	6.803 676	1075	7.009 011	877	7.048 662	24
6.255 331	1421	6.257 661	1341	6.260 036	752	6.401 081	1332	6.801 137	1404	6.803 677	62	7.009 014	877	7.048 662	1287
6.255 348	1471	6.257 662	1341	6.260 037	752	6.401 082	1332	6.801 219	1107	6.803 717	1392	7.009 017	877	7.048 663	24
6.255 458	855	6.257 820	617	6.260 038	752	6.401 093	76	6.801 237	1110	6.803 751	1337	7.009 020	877	7.048 663	1287
6.255 503	608	6.257 821	617	6.260 039	752	6.401 134	1332	6.801 239	108	6.900 034	1075	7.009 023	877	7.048 731	721
6.255 582	986	6.257 823	645	6.260 040	752	6.401 135	1332	6.801 244	1388	6.900 035	1075	7.009 026	877	7.048 731	1325
6.255 611	351	6.257 926	648	6.260 041	752	6.401 199	1152	6.801 332	1106	6.900 070	139	7.009 045	125	7.048 732	721
6.255 624	515	6.257 926	1026	6.260 042	752	6.401 203	597	6.801 571	716	6.900 098	187	7.009 046	125	7.048 732	1325
6.255 637	806	6.257 941	592	6.260 043	752	6.401 205	647	6.801 571	1319	6.900 118	108	7.009 310	89	7.048 733	721
6.255 678	131	6.258 150	599	6.260 044	752	6.401 205	1025	6.801 580	1075	6.900 119	530	7.017 796	442	7.048 733	1325
6.255 678	1283	6.258 155	201	6.260 045	752	6.401 235	209	6.801 608	1418	6.900 157	606	7.017 797	442	7.048 734	721
6.255 692	779	6.258 173	793	6.260 046	752	6.401 256	166	6.801 635	1151	6.900 233	1388	7.018 397	895	7.048 734	1325
6.255 804	1232	6.258 182	14	6.300 025	888	6.401 380	1406	6.801 655	746	6.900 312	615	7.018 398	895	7.048 801	1043
6.255 806	599	6.258 228	616	6.300 026	888	6.401 441	191	6.801 662	1110	6.900 353	76	7.018 413	895	7.048 802	1043
6.255 819	730	6.258 229	1117	6.300 028	888	6.401 458	89	6.801 699	752	6.900 361	750	7.018 680	603	7.050 202	1396
6.255 826	123	6.258 233	568	6.300 086	1109	6.401 505	750	6.801 707	752	6.900 409	1165	7.018 681	603	7.050 285	1393
6.255 961	1449	6.258 234	568	6.300 168	630	6.401 579	35	6.801 727	1390	6.900 415	1416	7.018 936	640	7.050 286	1394

7.050 759	1388	7.079 676	1332	7.510 076	1331	7.619 816	866	7.637 932	1108	7.930 403	897	9.000 150	101	9.001 365	989
7.051 039	1396	7.079 677	1331	7.510 176	1388	7.620 719	108	7.638 526	1110	7.930 403	1345	9.000 151	101	9.001 366	989
7.051 056	1413	7.079 679	746	7.510 242	874	7.620 817	526	7.638 719	775	7.930 430	537	9.000 152	101	9.001 367	989
7.051 092	43	7.079 716	1332	7.510 391	912	7.620 828	1386	7.638 738	877	7.939 057	1361	9.000 153	101	9.001 368	989
7.051 404	1392	7.079 737	89	7.510 426	975	7.621 765	1385	7.638 923	1046	7.939 058	1361	9.000 154	101	9.001 369	989
7.052 184	1396	7.080 092	1460	7.510 427	975	7.621 811	449	7.639 112	1449	7.939 127	1237	9.000 204	101	9.001 370	989
7.052 186	1393	7.080 208	520	7.510 455	1250	7.622 228	1389	7.650 112	192	7.939 128	1237	9.000 205	101	9.001 371	989
7.052 895	43	7.080 450	1394	7.510 456	1250	7.622 477	518	7.651 616	945	7.939 129	1237	9.000 206	101	9.001 400	993
7.052 896	43	7.080 947	1393	7.510 686	1343	7.622 596	637	7.651 746	64	7.939 153	265	9.000 208	101	9.001 401	993
7.053 349	746	7.081 898	1442	7.510 691	750	7.622 815	628	7.651 831	628	7.939 161	265	9.000 210	101	9.001 402	993
7.053 350	746	7.083 308	1468	7.510 796	1468	7.623 018	1445	7.651 871	28	7.939 170	265	9.000 212	101	9.001 403	993
7.053 718	674	7.083 522	754	7.510 838	640	7.623 040	1338	7.651 871	1289	7.939 174	268	9.000 216	101	9.001 404	993
7.053 930	43	7.083 595	1398	7.600 059	748	7.623 809	223	7.651 872	28	7.939 193	268	9.000 220	101	9.001 405	993
7.053 933	43	7.083 596	1398	7.600 162	746	7.623 810	223	7.651 872	1289	7.939 195	268	9.000 225	101	9.001 406	993
7.054 037	1388	7.083 665	1411	7.600 324	28	7.623 838	1445	7.651 881	167	7.939 204	268	9.000 230	101	9.001 410	993
7.054 161	27	7.084 720	1398	7.600 324	1289	7.623 881	223	7.651 884	113	7.939 213	268	9.000 304	102	9.001 411	993
7.055 107	1327	7.084 918	1474	7.600 405	28	7.623 893	51	7.651 893	646	7.939 215	268	9.000 305	102	9.001 412	993
7.055 383	103	7.085 047	1412	7.600 405	1289	7.623 930	627	7.652 008	628	7.939 223	268	9.000 306	102	9.001 420	992
7.055 418	474	7.085 238	1383	7.601 147	615	7.623 930	1164	7.652 355	1471	7.939 331	268	9.000 308	102	9.001 421	992
7.055 486	1390	7.085 372	43	7.601 585	869	7.623 934	526	7.652 552	28	7.939 339	268	9.000 310	102	9.001 422	992
7.055 667	646	7.085 511	1386	7.601 891	1337	7.624 167	214	7.652 552	1289	7.939 351	268	9.000 312	102	9.001 423	992
7.055 892	1469	7.085 892	1383	7.601 951	1109	7.624 168	214	7.652 828	1075	7.939 352	268	9.000 316	102	9.001 424	992
7.056 751	1395	7.086 147	1468	7.602 492	1332	7.624 247	1075	7.652 924	316	7.939 353	268	9.000 320	102	9.001 425	992
7.056 849	1478	7.086 520	1386	7.602 538	108	7.624 490	1336	7.653 124	515	7.960 500	66	9.000 325	102	9.001 426	992
7.056 914	1418	7.087 863	1395	7.602 595	226	7.624 685	1298	7.653 145	1470	7.960 501	66	9.000 330	102	9.001 427	992
7.058 005	520	7.087 938	89	7.603 129	1086	7.625 012	1395	7.653 251	200	7.960 502	66	9.000 460	102	9.001 428	992
7.058 102	754	7.087 939	89	7.603 959	1254	7.625 555	223	7.653 307	192	7.960 503	66	9.000 461	102	9.001 429	992
7.058 103	754	7.087 940	89	7.604 109	746	7.625 884	515	7.653 714	588	7.960 504	66	9.000 462	102	9.001 430	992
7.058 120	520	7.089 089	1413	7.604 410	210	7.626 118	628	7.653 714	653	7.960 505	66	9.000 470	102	9.001 431	992
7.058 142	1390	7.089 161	1418	7.604 787	697	7.626 190	1061	7.654 045	108	7.960 506	66	9.000 471	102	9.001 432	992
7.058 143	1391	7.089 162	1418	7.605 462	274	7.626 372	1106	7.654 046	108	7.960 507	66	9.000 472	102	9.001 433	992
7.058 640	89	7.089 855	1438	7.605 528	1075	7.626 422	254	7.654 202	1228	7.960 508	66	9.000 941	250	9.001 434	992
7.059 541	978	7.089 998	1386	7.605 582	169	7.626 508	1321	7.654 694	1109	7.960 509	66	9.000 943	250	9.002 601	53
7.059 689	1332	7.090 616	1392	7.606 374	27	7.626 509	1321	7.655 427	517	7.960 510	66	9.000 944	250	9.002 602	53
7.059 690	1332	7.090 617	1393	7.606 375	27	7.626 510	1321	7.655 618	253	7.960 511	66	9.000 945	250	9.002 603	53
7.059 691	1332	7.095 791	1387	7.606 579	1110	7.626 542	205	7.655 865	385	7.960 512	66	9.000 956	248	9.002 606	53
7.059 745	1474	7.190 001	27	7.606 811	752	7.626 604	386	7.656 131	102	7.960 513	66	9.000 965	250	9.002 607	53
7.059 827	746	7.190 011	27	7.607 198	28	7.626 614	386	7.656 279	21	7.970 029	37	9.000 996	248	9.002 608	53
7.059 854	521	7.190 021	27	7.607 198	1289	7.626 764	1160	7.656 640	787	7.970 213	700	9.001 015	988	9.002 611	57
7.059 855	521	7.190 023	27	7.607 297	1471	7.626 766	1160	7.656 680	760	7.970 213	1421	9.001 018	988	9.002 612	57
7.060 419	1383	7.190 028	27	7.607 298	1471	7.627 062	1090	7.656 681	760	7.970 224	221	9.001 022	988	9.002 670	53
7.060 421	1382	7.200 073	1110	7.607 431	748	7.627 340	1177	7.656 840	858	7.970 225	221	9.001 054	515	9.002 670	56
7.060 425	1396	7.200 075	888	7.607 632	748	7.627 352	1177	7.656 860	342	7.970 226	221	9.001 075	525	9.002 671	53
7.060 427	1396	7.200 111	897	7.607 778	28	7.627 795	734	7.656 993	1069	7.970 241	618	9.001 076	525	9.002 671	56
7.060 433	1396	7.200 160	597	7.607 778	1289	7.628 209	606	7.657 889	351	7.970 258	700	9.001 077	525	9.002 721	54
7.060 437	1391	7.200 347	595	7.607 913	598	7.628 259	1100	7.658 057	350	7.970 258	1421	9.001 078	525	9.002 722	54
7.060 457	1393	7.200 409	904	7.607 926	1075	7.628 820	1447	7.700 004	637	7.970 271	689	9.001 079	525	9.002 723	54
7.060 459	1394	7.200 414	1330	7.608 012	716	7.628 821	1446	7.850 009	1393	7.970 278	618	9.001 080	525	9.003 032	1136
7.060 463	1394	7.200 433	946	7.608 012	1319	7.629 194	308	7.850 010	1395	7.970 286	700	9.001 081	525	9.003 033	1136
7.060 465	1396	7.200 457	1290	7.608 160	1386	7.629 195	305	7.900 066	310	7.970 286	1421	9.001 082	525	9.003 240	1136
7.060 469	1388	7.200 489	625	7.608 352	103	7.629 381	1166	7.900 085	1060	7.970 290	326	9.001 083	525	9.003 301	1137
7.060 471	1395	7.200 498	1405	7.610 014	752	7.629 417	614	7.900 098	1097	7.970 385	700	9.001 084	525	9.003 302	1137
7.060 475	1390	7.200 508	874	7.610 545	752	7.629 440	633	7.900 140	549	7.970 385	1421	9.001 085	525	9.003 303	1137
7.060 477	1394	7.200 519	749	7.610 567	746	7.629 636	189	7.900 288	1342	7.970 387	700	9.001 086	525	9.003 304	1137
7.060 479	1395	7.200 575	746	7.610 631	607	7.629 638	189	7.900 289	1342	7.970 387	1421	9.001 110	988	9.003 305	1136
7.060 678	895	7.200 809	1384	7.610 673	597	7.629 639	189	7.900 354	831	7.970 389	700	9.001 111	988	9.003 306	1137
7.060 690	876	7.210 036	140	7.610 674	597	7.629 763	1047	7.900 354	1357	7.970 389	1421	9.001 112	988	9.003 320	1136
7.060 691	876	7.210 113	1405	7.610 677	597	7.629 955	624	7.900 380	805	7.970 402	700	9.001 115	988	9.003 367	1387
7.060 692	876	7.210 114	1405	7.612 017	1392	7.630 153	114	7.900 400	806	7.970 402	1421	9.001 118	988	9.003 368	1390
7.060 693	876	7.300 006	1332	7.612 290	1332	7.630 409	977	7.900 426	536	7.970 573	633	9.001 130	988	9.003 369	1393
7.060 694	876	7.300 124	1332	7.612 465	51	7.630 506	1347	7.900 427	535	7.970 611	689	9.001 132	988	9.003 374	1137
7.070 022	598	7.300 156	1331	7.612 486	1106	7.630 646	749	7.900 428	536	7.980 024	1160	9.001 133	988	9.003 375	1137
7.070 048	1332	7.300 174	1392	7.612 486	1106	7.630 775	961	7.900 483	633	7.980 025	1160	9.001 134	990	9.003 376	1137
7.071 045	448	7.300 175	1392	7.613 087	1382	7.631 201	515	7.900 484	633	7.980 027	1160	9.001 135	988	9.003 425	1393
7.071 063	1396	7.300 197	1331	7.613 330	1389	7.631 205	531	7.900 486	633	7.980 214	1187	9.001 137	988	9.003 426	1393
7.071 151	1391	7.300 223	250	7.613 388	1382	7.631 964	572	7.900 515	294	7.980 357	591	9.001 138	988	9.003 427	1381
7.072 085	27	7.300 224	250	7.613 421	1391	7.631 971	575	7.900 515	323	7.980 358	591	9.001 210	988	9.003 430	1394
7.072 367	752	7.300 348	1388	7.613 795	27	7.632 226	1392	7.900 620	1242	7.980 791	599	9.001 335	990	9.003 434	1394
7.075 021	67	7.300 349	746	7.613 796	606	7.632 543	39	7.910 063	882	9.000 030	394	9.001 335	992	9.003 435	1382
7.075 031	876	7.300 555	1474	7.615 156	1397	7.632 597	310	7.910 125	1392	9.000 031	394	9.001 336	990	9.003 435	1386
7.075 941	803	7.300 557	746	7.615 367	957	7.632 641	1347	7.910 128	351	9.000 032	99	9.001 336	992	9.003 441	1388
7.075 960	1382	7.300 580	1332	7.615 661	797	7.632 676	464	7.920 043	1239	9.000 034	99	9.001 337	990	9.003 442	1390
7.076 245	646	7.380 421	674	7.615 715	1385	7.633 064	1397	7.920 095	1109	9.000 038	99	9.001 337	992	9.003 443	1381
7.076 312	59	7.380 422	674	7.616 171	100	7.634 155	1338	7.920 120	672	9.000 041	99	9.001 338	990	9.003 444	1381
7.076 778	1384	7.380 423	674	7.616 257	1109	7.634 892	145	7.920 135	1242	9.000 044	99	9.001 338	992	9.003 445	1395
7.076 849	1332	7.400 375	1476	7.616 277	613	7.635 031	1257	7.930 022	1247	9.000 049	99	9.001 340	989	9.003 446	1388
7.077 212	520	7.400 404	598	7.616 476	210	7.635 086	224	7.930 023	1247	9.000 054	99	9.001 341	989	9.003 448	1383
7.077 661	43	7.400 537	1413	7.616 566	716	7.635 087	224	7.930 030	604	9.000 059	99	9.001 345	990	9.003 451	1384
7.077 849	746	7.400 768	978	7.616 566	1319	7.635 088	224	7.930 074	1075	9.000 063	99	9.001 346	991	9.003 452	1394
7.077 852	43	7.401 066	1382	7.616 653	1392	7.635 089	224	7.930 095	1247	9.000 074	100	9.001 347	990	9.003 453	1394
7.078 667	646	7.401 066	1386	7.616 655	1391	7.635 245	1339	7.930 139	132	9.000 075	100	9.001 347	992	9.003 454	1394
7.078 722	89	7.401 143	1468	7.616 800	100	7.635 246	1339	7.930 246	1262	9.000 076	100	9.001 349	991	9.003 455	1394
7.078 821	754	7.401 474	1414	7.616 898	1391	7.635 711	1251	7.930 261	1480	9.000 077	100	9.001 355	989	9.003 456	1394
7.078 822	754	7.401 744	1383	7.617 935	195	7.635 816	618	7.930 290	878	9.000 110	100	9.001 356	989	9.003 457	1395
7.079 366	746	7.401 744	1385	7.618 344	317	7.635 908	626	7.930 291	878	9.000 111	100	9.001 357	989	9.003 458	1395
7.079 431	1418	7.401 744	1386	7.618 482	314	7.636 288	1404	7.930 366	1384	9.000 112	100	9.001 358	989	9.003 459	1388
7.079 432	1418	7.401 744	1389	7.619 615	287	7.636 628	51	7.930 401	897	9.000 113	100	9.001 359	989	9.003 460	1394
7.079 563	1080	7.401 840	1394	7.619 653	222	7.636 659	209	7.930 401	1345	9.000 114	100	9.001 362	989	9.003 465	1474
7.079 568	749	7.402 218	1414	7.619 784	1407	7.636 721	1060	7.930 402	897	9.000 115	100	9.001 363	989	9.003 466	1393
7.079 617	1411	7.510 053	1391	7.619 815	866	7.637 274	124	7.930 402	1345	9.000 116	100	9.001 364	989	9.003 470	1381

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9.003 472	1473	9.003 687	1457	9.003 912	142	9.005 102	193	9.005 351	213	9.005 595	206	9.010 118	1284	9.011 323	638
9.003 473	1390	9.003 688	1457	9.003 913	142	9.005 103	193	9.005 352	213	9.005 596	206	9.010 120	24	9.011 324	638
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9.003 478	1474	9.003 694	1457	9.003 951	47	9.005 109	189	9.005 365	218	9.005 629	207	9.010 122	1286	9.011 400	637
9.003 479	1418	9.003 697	1457	9.003 954	47	9.005 115	190	9.005 366	217	9.005 630	207	9.010 123	24	9.011 401	637
9.003 480	1382	9.003 698	1457	9.003 964	47	9.005 116	188	9.005 367	217	9.005 631	207	9.010 123	1286	9.011 402	637
9.003 481	1382	9.003 699	1457	9.004 006	402	9.005 117	188	9.005 368	217	9.005 632	207	9.010 125	24	9.011 403	637
9.003 482	1390	9.003 700	1457	9.004 008	402	9.005 118	190	9.005 376	217	9.005 634	208	9.010 125	1286	9.011 404	637
9.003 484	1382	9.003 701	1457	9.004 010	402	9.005 123	188	9.005 377	217	9.005 637	207	9.010 126	24	9.011 405	637
9.003 487	1410	9.003 702	1457	9.004 012	402	9.005 124	188	9.005 378	217	9.005 638	207	9.010 126	1286	9.011 406	637
9.003 488	1410	9.003 703	1457	9.004 014	402	9.005 125	188	9.005 390	216	9.005 660	209	9.010 127	24	9.011 407	637
9.003 491	1474	9.003 704	1457	9.004 016	402	9.005 126	188	9.005 391	216	9.005 666	204	9.010 127	1286	9.011 408	637
9.003 492	1474	9.003 706	1457	9.004 057	402	9.005 127	187	9.005 392	216	9.005 667	204	9.010 128	24	9.011 409	637
9.003 493	1474	9.003 707	1457	9.004 060	402	9.005 128	187	9.005 393	216	9.005 668	204	9.010 128	1286	9.011 503	635
9.003 494	1474	9.003 708	1457	9.004 065	402	9.005 131	193	9.005 394	216	9.005 669	204	9.010 130	1284	9.011 504	635
9.003 495	1476	9.003 709	1459	9.004 108	402	9.005 132	268	9.005 395	219	9.005 670	203	9.010 135	1284	9.011 505	635
9.003 496	1474	9.003 710	1459	9.004 109	402	9.005 133	268	9.005 396	219	9.005 671	203	9.010 140	1284	9.011 506	635
9.003 497	1474	9.003 711	1459	9.004 110	402	9.005 134	188	9.005 397	219	9.005 672	203	9.010 150	1284	9.011 507	635
9.003 498	1476	9.003 712	1459	9.004 111	402	9.005 142	195	9.005 398	219	9.005 673	203	9.010 151	1284	9.011 508	635
9.003 500	1478	9.003 715	1459	9.004 112	402	9.005 145	195	9.005 400	219	9.005 674	203	9.010 152	1284	9.011 510	635
9.003 511	1381	9.003 716	1459	9.004 113	402	9.005 146	195	9.005 401	219	9.005 675	203	9.010 153	1284	9.011 523	635
9.003 535	1390	9.003 717	1459	9.004 114	402	9.005 147	186	9.005 402	219	9.005 681	204	9.010 180	1284	9.011 524	635
9.003 536	1392	9.003 718	1459	9.004 115	402	9.005 149	186	9.005 403	219	9.005 686	209	9.010 185	1284	9.011 525	635
9.003 537	1392	9.003 719	1459	9.004 153	402	9.005 157	189	9.005 405	216	9.005 687	209	9.010 224	1285	9.011 526	635
9.003 538	1392	9.003 720	1459	9.004 154	402	9.005 164	187	9.005 406	216	9.005 690	209	9.010 239	1285	9.011 527	635
9.003 539	1387	9.003 721	1459	9.004 155	402	9.005 166	192	9.005 407	216	9.005 691	209	9.010 244	1285	9.011 528	635
9.003 540	1392	9.003 722	1459	9.004 156	402	9.005 169	187	9.005 408	216	9.005 692	209	9.010 254	1285	9.011 530	635
9.003 541	1397	9.003 723	1459	9.004 157	402	9.005 170	224	9.005 409	216	9.005 695	202	9.010 266	1285	9.011 545	635
9.003 542	1397	9.003 724	1459	9.004 158	402	9.005 171	189	9.005 420	221	9.005 696	202	9.010 273	1285	9.011 546	635
9.003 543	1396	9.003 725	1459	9.004 159	402	9.005 172	189	9.005 421	221	9.005 697	202	9.010 472	1285	9.011 547	635
9.003 544	1396	9.003 726	1459	9.004 160	402	9.005 173	189	9.005 422	221	9.005 698	202	9.010 473	1285	9.011 548	635
9.003 545	1396	9.003 727	1459	9.004 161	402	9.005 174	189	9.005 423	221	9.005 699	202	9.010 474	1285	9.011 550	635
9.003 546	1393	9.003 728	1459	9.004 162	402	9.005 175	189	9.005 424	221	9.005 731	201	9.010 475	1285	9.011 602	635
9.003 547	1393	9.003 729	1459	9.004 163	402	9.005 176	221	9.005 427	223	9.005 732	201	9.010 476	1285	9.011 603	635
9.003 548	1390	9.003 730	1459	9.004 305	403	9.005 177	221	9.005 446	230	9.005 733	201	9.010 477	1285	9.011 605	635
9.003 549	1390	9.003 733	1459	9.004 310	403	9.005 180	224	9.005 447	230	9.005 744	209	9.010 478	1285	9.011 609	635
9.003 557	1381	9.003 734	1459	9.004 315	403	9.005 190	224	9.005 451	230	9.005 750	203	9.010 481	1291	9.011 610	635
9.003 558	1381	9.003 735	1459	9.004 320	403	9.005 199	226	9.005 452	230	9.005 751	203	9.010 482	1291	9.011 613	635
9.003 559	1381	9.003 736	1459	9.004 330	403	9.005 200	224	9.005 456	204	9.005 752	203	9.010 512	1285	9.011 615	635
9.003 560	1385	9.003 738	1459	9.004 340	403	9.005 206	226	9.005 458	204	9.005 753	203	9.010 601	30	9.011 622	635
9.003 561	1385	9.003 739	1459	9.004 350	403	9.005 207	226	9.005 500	194	9.005 754	203	9.010 602	30	9.011 623	635
9.003 562	1385	9.003 740	1459	9.004 370	403	9.005 208	226	9.005 501	194	9.005 755	203	9.010 603	30	9.011 625	635
9.003 563	1385	9.003 741	1459	9.004 400	404	9.005 209	226	9.005 502	194	9.005 756	202	9.010 605	30	9.011 629	635
9.003 564	1389	9.003 742	1459	9.004 561	403	9.005 222	223	9.005 503	194	9.005 757	202	9.010 608	30	9.011 630	635
9.003 565	1389	9.003 743	1459	9.004 568	403	9.005 223	223	9.005 504	194	9.005 758	202	9.010 609	30	9.011 632	635
9.003 566	1389	9.003 744	1459	9.004 575	403	9.005 250	229	9.005 505	194	9.005 759	202	9.010 610	30	9.011 635	635
9.003 567	1472	9.003 745	1459	9.004 582	403	9.005 251	228	9.005 506	194	9.005 761	202	9.010 611	30	9.011 642	638
9.003 568	1472	9.003 746	1459	9.004 589	403	9.005 252	228	9.005 507	194	9.006 001	186	9.010 612	30	9.011 643	638
9.003 569	1472	9.003 747	1459	9.004 640	403	9.005 253	228	9.005 508	194	9.006 002	186	9.010 613	30	9.011 644	638
9.003 572	1470	9.003 748	1459	9.004 650	404	9.005 254	228	9.005 509	194	9.006 002	192	9.010 614	30	9.011 645	638
9.003 576	1470	9.003 749	1459	9.004 651	404	9.005 260	229	9.005 511	194	9.006 003	186	9.010 620	30	9.011 647	638
9.003 579	1470	9.003 751	1459	9.004 652	404	9.005 266	222	9.005 512	194	9.006 020	189	9.010 690	759	9.011 653	638
9.003 586	1470	9.003 752	1459	9.004 653	404	9.005 267	222	9.005 513	194	9.006 021	189	9.010 691	760	9.011 655	638
9.003 587	1470	9.003 753	1459	9.004 654	404	9.005 268	222	9.005 514	194	9.006 101	190	9.010 692	760	9.011 656	638
9.003 588	1470	9.003 754	1459	9.004 655	404	9.005 269	222	9.005 515	194	9.006 102	190	9.010 693	760	9.011 657	638
9.003 590	1471	9.003 755	1459	9.004 656	404	9.005 270	222	9.005 516	194	9.006 103	190	9.010 694	760	9.011 658	638
9.003 591	1471	9.003 756	1459	9.004 657	404	9.005 271	229	9.005 530	208	9.006 306	224	9.010 770	902	9.011 660	638
9.003 592	1471	9.003 757	1459	9.004 710	406	9.005 272	229	9.005 531	194	9.006 307	224	9.010 781	901	9.011 663	637
9.003 593	1471	9.003 758	1459	9.004 900	405	9.005 275	220	9.005 540	208	9.006 308	224	9.010 782	901	9.011 664	637
9.003 594	1471	9.003 760	1459	9.005 001	196	9.005 276	220	9.005 541	194	9.006 371	218	9.010 783	901	9.011 665	637
9.003 595	1471	9.003 761	1459	9.005 002	196	9.005 277	220	9.005 542	194	9.006 372	218	9.010 784	901	9.011 666	637
9.003 596	1471	9.003 762	1465	9.005 008	196	9.005 278	220	9.005 543	194	9.006 373	218	9.010 793	902	9.011 667	637
9.003 597	1471	9.003 763	1465	9.005 009	196	9.005 279	220	9.005 544	194	9.006 374	218	9.010 794	902	9.011 668	637
9.003 657	1457	9.003 767	1465	9.005 011	196	9.005 307	224	9.005 545	194	9.006 891	230	9.010 795	902	9.011 675	637
9.003 658	1457	9.003 771	1465	9.005 014	196	9.005 308	224	9.005 546	194	9.006 892	230	9.010 800	902	9.011 676	637
9.003 659	1457	9.003 774	1465	9.005 015	196	9.005 309	224	9.005 547	194	9.006 893	229	9.010 801	902	9.011 677	637
9.003 662	1457	9.003 775	1465	9.005 017	196	9.005 310	224	9.005 549	194	9.006 902	246	9.011 009	53	9.011 678	637
9.003 663	1457	9.003 779	1465	9.005 020	196	9.005 311	224	9.005 555	209	9.006 903	246	9.011 010	53	9.011 680	637
9.003 664	1457	9.003 783	1465	9.005 046	211	9.005 312	218	9.005 558	210	9.006 907	246	9.011 025	53	9.011 685	637
9.003 665	1457	9.003 794	1435	9.005 047	211	9.005 313	218	9.005 559	210	9.006 910	246	9.011 060	53	9.011 686	637
9.003 667	1457	9.003 795	1435	9.005 048	211	9.005 314	218	9.005 561	210	9.006 911	246	9.011 069	53	9.011 687	637
9.003 668	1457	9.003 796	1435	9.005 049	211	9.005 315	218	9.005 563	210	9.010 012	1291	9.011 071	53	9.011 688	637
9.003 669	1457	9.003 797	1435	9.005 061	211	9.005 327	217	9.005 565	210	9.010 013	1291	9.011 072	53	9.011 690	637
9.003 670	1457	9.003 798	1435	9.005 065	192	9.005 328	217	9.005 566	210	9.010 014	1291	9.011 076	53	9.011 693	653
9.003 671	1457	9.003 799	1435	9.005 066	195	9.005 329	217	9.005 570	210	9.010 016	1291	9.011 078	53	9.011 694	653
9.003 672	1457	9.003 800	1435	9.005 067	195	9.005 339	214	9.005 575	205	9.010 018	1291	9.011 102	54	9.011 695	653
9.003 673	1457	9.003 801	1435	9.005 070	190	9.005 340	214	9.005 576	205	9.010 019	1291	9.011 103	54	9.011 696	653
9.003 674	1457	9.003 802	1435	9.005 071	186	9.005 341	214	9.005 577	206	9.010 032	1290	9.011 104	54	9.011 697	653
9.003 676	1457	9.003 803	1435	9.005 072	186	9.005 342	214	9.005 580	206	9.010 036	1290	9.011 170	53	9.011 698	653
9.003 677	1457	9.003 804	1435	9.005 073	187	9.005 343	214	9.005 581	206	9.010 037	1290	9.011 181	53	9.011 703	636
9.003 678	1457	9.003 875	1437	9.005 074	187	9.005 344	219	9.005 585	206	9.010 046	1291	9.011 316	638	9.011 704	636
9.003 679	1457	9.003 878	1437	9.005 075	187	9.005 345	219	9.005 586	206	9.010 048	1291	9.011 317	638	9.011 705	636
9.003 682	1457	9.003 890	268	9.005 078	190	9.005 346	219	9.005 587	206	9.010 050	1284	9.011 318	638	9.011 706	636
9.003 683	1457	9.003 901	142	9.005 079	191	9.005 347	219	9.005 590	206	9.010 060	1284	9.011 319	638	9.011 707	636
9.003 684	1457	9.003 906	47	9.005 090	191	9.005 348	219	9.005 592	206	9.010 070	1284	9.011 320	638	9.011 708	636
9.003 685	1457	9.003 910	142	9.005 100	189	9.005 349	213	9.005 593	206	9.010 080	1285	9.011 321	638	9.011 710	636

9.011 732	612	9.011 957	596	9.012 294	601	9.012 625	603	9.013 215	16	9.013 932	13	9.018 935	137	9.032 073	1034
9.011 733	612	9.011 958	596	9.012 295	601	9.012 626	603	9.013 220	16	9.013 933	13	9.018 936	137	9.032 074	1034
9.011 734	612	9.011 959	596	9.012 296	601	9.012 634	604	9.013 228	16	9.013 934	13	9.018 937	137	9.032 075	1034
9.011 735	612	9.011 960	596	9.012 297	601	9.012 635	604	9.013 238	16	9.014 001	14	9.018 940	137	9.032 076	1034
9.011 736	612	9.011 961	596	9.012 301	619	9.012 636	604	9.013 244	16	9.014 002	14	9.018 942	137	9.032 115	762
9.011 740	629	9.011 962	596	9.012 302	619	9.012 637	604	9.013 248	16	9.014 003	14	9.018 945	137	9.032 127	762
9.011 750	629	9.011 963	596	9.012 303	619	9.012 638	604	9.013 254	16	9.014 004	14	9.018 950	137	9.032 131	761
9.011 755	629	9.011 964	596	9.012 305	619	9.012 639	604	9.013 256	16	9.014 005	14	9.018 960	137	9.032 132	761
9.011 760	629	9.011 965	596	9.012 306	620	9.012 653	603	9.013 258	16	9.014 006	15	9.018 970	137	9.032 133	761
9.011 765	629	9.011 966	596	9.012 307	620	9.012 654	603	9.013 262	16	9.014 007	18	9.019 002	1134	9.032 134	761
9.011 766	629	9.011 967	596	9.012 308	620	9.012 655	603	9.013 264	16	9.014 008	18	9.019 005	1134	9.032 135	761
9.011 767	629	9.011 968	596	9.012 310	620	9.012 656	603	9.013 266	16	9.014 020	25	9.019 010	1134	9.032 371	794
9.011 768	630	9.011 969	596	9.012 311	630	9.012 657	603	9.013 270	16	9.014 021	25	9.019 020	1134	9.032 372	794
9.011 769	630	9.011 970	596	9.012 312	630	9.012 658	603	9.013 315	17	9.014 022	25	9.019 030	1134	9.032 373	794
9.011 770	630	9.011 971	596	9.012 313	630	9.012 659	603	9.013 320	17	9.014 023	26	9.019 035	1134	9.032 374	794
9.011 771	630	9.011 982	598	9.012 314	630	9.012 660	603	9.013 328	17	9.014 024	26	9.019 040	1134	9.032 376	794
9.011 773	636	9.011 983	598	9.012 315	630	9.012 701	607	9.013 338	17	9.014 025	26	9.019 050	1134	9.032 377	794
9.011 774	636	9.011 984	598	9.012 316	630	9.012 703	607	9.013 344	17	9.014 026	25	9.019 060	1134	9.032 422	761
9.011 775	636	9.011 985	598	9.012 317	630	9.012 751	615	9.013 348	17	9.014 027	25	9.019 070	1134	9.032 423	761
9.011 776	636	9.011 986	598	9.012 319	630	9.012 752	615	9.013 350	17	9.014 028	25	9.019 080	1134	9.032 425	761
9.011 777	636	9.012 001	598	9.012 321	605	9.012 753	615	9.013 354	17	9.014 029	25	9.019 090	1134	9.032 426	761
9.011 778	636	9.012 002	598	9.012 322	605	9.012 755	615	9.013 356	17	9.014 030	21	9.019 092	1134	9.032 427	761
9.011 779	636	9.012 003	598	9.012 326	605	9.012 756	615	9.013 358	17	9.014 031	21	9.019 100	1134	9.032 726	761
9.011 780	636	9.012 006	598	9.012 327	605	9.012 757	615	9.013 362	17	9.014 032	21	9.019 110	1134	9.032 727	761
9.011 781	636	9.012 007	598	9.012 328	605	9.012 764	615	9.013 364	17	9.014 033	22	9.019 150	1135	9.032 728	761
9.011 793	636	9.012 008	598	9.012 329	605	9.012 765	615	9.013 366	17	9.014 034	22	9.019 152	1135	9.032 729	761
9.011 794	636	9.012 009	598	9.012 330	606	9.012 766	615	9.013 370	17	9.014 035	727	9.020 131	1480	9.032 740	762
9.011 795	636	9.012 010	598	9.012 333	606	9.012 767	615	9.013 610	15	9.014 036	727	9.020 134	1480	9.032 741	762
9.011 796	636	9.012 012	598	9.012 336	606	9.012 768	615	9.013 611	15	9.014 037	727	9.020 135	1480	9.032 742	761
9.011 801	590	9.012 013	598	9.012 337	606	9.012 769	615	9.013 612	15	9.014 038	727	9.020 136	1480	9.032 743	761
9.011 802	590	9.012 014	598	9.012 402	606	9.012 770	615	9.013 613	15	9.014 039	727	9.020 137	1480	9.032 845	254
9.011 805	590	9.012 015	598	9.012 403	606	9.012 921	175	9.013 614	15	9.014 100	628	9.020 160	1478	9.032 920	120
9.011 810	590	9.012 016	598	9.012 404	606	9.012 922	175	9.013 615	15	9.018 292	130	9.020 163	1478	9.032 930	120
9.011 815	590	9.012 017	598	9.012 405	606	9.012 923	175	9.013 616	15	9.018 294	130	9.020 173	1478	9.032 932	120
9.011 827	591	9.012 018	598	9.012 406	606	9.012 925	175	9.013 670	16	9.018 310	130	9.020 177	1478	9.032 940	120
9.011 828	591	9.012 019	598	9.012 407	606	9.012 927	175	9.013 671	16	9.018 311	129	9.020 192	1407	9.032 945	120
9.011 829	591	9.012 021	592	9.012 408	606	9.012 928	175	9.013 672	16	9.018 312	129	9.020 193	1407	9.032 946	120
9.011 835	590	9.012 022	592	9.012 410	606	9.012 929	175	9.013 673	16	9.018 313	129	9.020 194	1407	9.033 018	45
9.011 840	590	9.012 023	592	9.012 413	605	9.012 932	175	9.013 674	16	9.018 314	129	9.020 195	1407	9.033 026	45
9.011 845	590	9.012 024	592	9.012 414	605	9.012 933	175	9.013 675	16	9.018 315	129	9.020 196	1407	9.033 029	45
9.011 850	590	9.012 101	607	9.012 415	605	9.012 934	175	9.013 676	16	9.018 316	130	9.020 210	1478	9.033 034	45
9.011 855	590	9.012 103	607	9.012 416	605	9.012 935	175	9.013 680	17	9.018 317	130	9.020 211	1478	9.033 121	47
9.011 860	590	9.012 121	608	9.012 417	605	9.012 936	175	9.013 681	17	9.018 318	130	9.020 212	1478	9.033 123	47
9.011 864	590	9.012 123	608	9.012 470	616	9.012 937	175	9.013 682	17	9.018 319	130	9.020 213	1478	9.033 124	47
9.011 865	590	9.012 138	608	9.012 471	616	9.012 938	175	9.013 683	17	9.018 360	130	9.020 214	1478	9.033 131	47
9.011 866	590	9.012 141	603	9.012 501	618	9.012 939	175	9.013 684	17	9.018 363	130	9.023 150	1478	9.033 133	47
9.011 867	590	9.012 143	603	9.012 502	618	9.012 940	176	9.013 702	16	9.018 364	128	9.023 160	1478	9.033 134	47
9.011 868	590	9.012 153	603	9.012 505	618	9.012 944	175	9.013 703	16	9.018 370	130	9.023 955	1478	9.033 141	47
9.011 869	590	9.012 161	608	9.012 506	618	9.012 945	175	9.013 704	16	9.018 377	128	9.023 956	1478	9.033 143	47
9.011 870	590	9.012 163	608	9.012 507	616	9.012 971	176	9.013 706	16	9.018 378	128	9.023 957	1478	9.033 144	47
9.011 875	590	9.012 173	600	9.012 508	616	9.012 972	176	9.013 707	16	9.018 388	129	9.023 990	1479	9.033 201	43
9.011 877	590	9.012 182	600	9.012 509	616	9.012 973	176	9.013 708	16	9.018 389	129	9.024 000	1479	9.033 202	43
9.011 880	590	9.012 183	600	9.012 510	616	9.012 974	176	9.013 710	16	9.018 510	127	9.025 912	1443	9.033 211	43
9.011 885	590	9.012 184	630	9.012 511	617	9.012 975	176	9.013 722	17	9.018 511	127	9.025 913	1443	9.033 212	43
9.011 901	594	9.012 185	630	9.012 515	617	9.012 976	176	9.013 723	17	9.018 512	128	9.025 914	1443	9.033 213	43
9.011 902	594	9.012 186	630	9.012 516	617	9.012 977	176	9.013 724	17	9.018 519	128	9.025 932	1443	9.033 230	43
9.011 903	594	9.012 187	630	9.012 517	617	9.012 978	176	9.013 725	17	9.018 520	128	9.025 934	1443	9.033 231	43
9.011 904	594	9.012 188	630	9.012 518	617	9.013 007	13	9.013 726	17	9.018 539	127	9.025 936	1443	9.033 232	43
9.011 905	594	9.012 189	630	9.012 522	617	9.013 008	13	9.013 727	17	9.018 540	127	9.030 128	592	9.033 233	43
9.011 906	594	9.012 190	630	9.012 523	617	9.013 014	13	9.013 728	17	9.018 547	127	9.031 961	760	9.033 234	43
9.011 907	594	9.012 191	630	9.012 524	617	9.013 017	13	9.013 729	17	9.018 549	128	9.031 962	760	9.033 235	43
9.011 908	594	9.012 193	608	9.012 525	616	9.013 024	13	9.013 731	17	9.018 553	128	9.031 964	760	9.033 236	43
9.011 910	594	9.012 203	601	9.012 526	616	9.013 029	13	9.013 734	17	9.018 554	128	9.031 970	760	9.033 237	43
9.011 915	594	9.012 213	601	9.012 527	616	9.013 036	13	9.013 735	17	9.018 560	128	9.031 972	762	9.033 238	43
9.011 920	594	9.012 216	602	9.012 528	616	9.013 041	13	9.013 773	18	9.018 584	131	9.031 973	762	9.033 239	43
9.011 924	593	9.012 217	602	9.012 530	616	9.013 048	13	9.013 774	18	9.018 584	1283	9.031 982	762	9.033 240	43
9.011 926	593	9.012 218	602	9.012 533	616	9.013 053	13	9.013 775	18	9.018 585	131	9.031 983	762	9.033 241	43
9.011 927	593	9.012 219	602	9.012 534	616	9.013 054	13	9.013 776	18	9.018 585	1283	9.031 984	762	9.033 242	43
9.011 928	593	9.012 247	602	9.012 535	618	9.013 063	13	9.013 900	13	9.018 698	133	9.032 011	762	9.033 251	180
9.011 930	593	9.012 248	602	9.012 536	618	9.013 068	13	9.013 901	13	9.018 699	133	9.032 012	762	9.033 252	180
9.011 931	593	9.012 249	602	9.012 537	618	9.013 073	13	9.013 902	13	9.018 741	1282	9.032 013	762	9.033 253	180
9.011 932	593	9.012 250	602	9.012 538	624	9.013 086	13	9.013 903	13	9.018 742	1282	9.032 015	762	9.033 270	49
9.011 933	595	9.012 264	601	9.012 539	624	9.013 117	14	9.013 904	13	9.018 750	132	9.032 018	762	9.033 270	1264
9.011 935	595	9.012 266	601	9.012 540	625	9.013 124	14	9.013 905	13	9.018 751	132	9.032 019	762	9.033 275	49
9.011 936	595	9.012 268	601	9.012 541	625	9.013 129	14	9.013 906	13	9.018 752	132	9.032 021	762	9.033 275	1264
9.011 938	595	9.012 271	602	9.012 542	618	9.013 136	14	9.013 910	13	9.018 753	132	9.032 022	762	9.033 280	49
9.011 939	595	9.012 272	602	9.012 543	618	9.013 141	14	9.013 911	13	9.018 754	132	9.032 024	762	9.033 280	1264
9.011 941	595	9.012 274	602	9.012 544	618	9.013 148	14	9.013 912	13	9.018 755	132	9.032 025	762	9.033 285	49
9.011 942	595	9.012 275	602	9.012 545	616	9.013 153	14	9.013 913	13	9.018 756	132	9.032 027	762	9.033 285	1264
9.011 943	595	9.012 276	602	9.012 546	618	9.013 154	14	9.013 914	13	9.018 758	132	9.032 028	762	9.033 286	49
9.011 945	595	9.012 279	602	9.012 547	616	9.013 163	14	9.013 915	13	9.018 759	132	9.032 030	762	9.033 286	1264
9.011 946	595	9.012 282	601	9.012 548	617	9.013 168	14	9.013 916	13	9.018 760	132	9.032 033	762	9.033 287	49
9.011 947	595	9.012 285	601	9.012 603	602	9.013 192	16	9.013 920	13	9.018 761	132	9.032 065	1034	9.033 287	1264
9.011 949	595	9.012 287	600	9.012 606	602	9.013 208	16	9.013 921	13	9.018 762	132	9.032 066	1034	9.033 288	49
9.011 950	595	9.012 288	600	9.012 607	604	9.013 209	16	9.013 922	13	9.018 779	132	9.032 067	1034	9.033 288	1264
9.011 951	595	9.012 289	600	9.012 608	604	9.013 210	16	9.013 923	13	9.018 794	133	9.032 068	1034	9.033 341	47
9.011 952	595	9.012 290	600	9.012 611	604	9.013 211	16	9.013 924	13	9.018 798	132	9.032 069	1034	9.033 342	47
9.011 953	596	9.012 291	601	9.012 613	604	9.013 212	16	9.013 925	13	9.018 801	136	9.032 070	1034	9.033 344	47
9.011 955	596	9.012 292	601	9.012 621	604	9.013 213	16	9.013 930	13	9.018 805	136	9.032 071	1034	9.033 346	47
9.011 956	596	9.012 293	601	9.012 623	604	9.013 214	16	9.013 931	13	9.018 820	136	9.032 072	1034	9.033 350	47

9.033 410	47	9.040 380	154	9.040 896	298	9.041 370	312	9.042 615	1043	9.042 877	255	9.043 036	1198	9.045 957	720
9.033 412	47	9.040 381	154	9.040 897	298	9.041 371	312	9.042 620	1043	9.042 878	255	9.043 037	1198	9.045 957	1326
9.033 414	47	9.040 388	154	9.040 904	327	9.041 372	312	9.042 625	1043	9.042 879	255	9.043 038	1198	9.045 958	720
9.033 416	47	9.040 389	154	9.040 905	327	9.041 442	326	9.042 643	1050	9.042 880	254	9.043 039	1198	9.045 958	1326
9.033 418	47	9.040 425	155	9.040 906	327	9.041 443	326	9.042 644	1050	9.042 881	253	9.043 040	1198	9.045 959	720
9.033 420	47	9.040 438	155	9.040 907	327	9.041 446	326	9.042 646	1045	9.042 882	253	9.043 041	1198	9.045 959	1326
9.033 430	47	9.040 450	155	9.040 911	310	9.041 447	326	9.042 647	1045	9.042 891	1449	9.043 042	1198	9.045 961	720
9.033 440	47	9.040 550	155	9.040 912	310	9.041 448	326	9.042 648	1045	9.042 892	1449	9.043 043	1198	9.045 961	1326
9.033 450	104	9.040 551	158	9.040 913	310	9.041 450	305	9.042 651	1047	9.042 893	1449	9.043 301	600	9.045 963	720
9.033 451	104	9.040 552	158	9.040 914	310	9.041 451	305	9.042 652	1045	9.042 894	1449	9.043 302	600	9.045 963	1326
9.033 452	104	9.040 553	158	9.040 915	310	9.041 452	305	9.042 653	1045	9.042 895	1448	9.043 305	600	9.045 971	719
9.033 453	104	9.040 554	158	9.040 916	310	9.041 454	305	9.042 654	1045	9.042 896	1448	9.043 306	600	9.045 971	1326
9.033 454	104	9.040 555	158	9.040 920	310	9.041 455	305	9.042 655	1046	9.042 899	256	9.043 307	600	9.045 972	719
9.033 455	104	9.040 556	158	9.040 921	310	9.041 456	305	9.042 656	1046	9.042 900	257	9.043 310	600	9.045 972	1326
9.033 456	104	9.040 557	158	9.040 922	310	9.041 457	305	9.042 657	1046	9.042 901	257	9.043 311	600	9.045 975	719
9.033 457	104	9.040 562	159	9.040 923	310	9.041 458	305	9.042 658	1047	9.042 902	257	9.043 901	1199	9.045 975	1326
9.033 458	104	9.040 574	159	9.040 924	310	9.041 470	307	9.042 659	1046	9.042 905	257	9.043 902	1199	9.045 976	719
9.033 470	104	9.040 575	159	9.040 925	310	9.041 471	307	9.042 660	1046	9.042 906	257	9.043 903	1199	9.045 976	1326
9.033 471	104	9.040 576	159	9.040 926	310	9.041 472	307	9.042 674	1043	9.042 907	257	9.043 904	1199	9.045 978	720
9.033 472	104	9.040 577	159	9.040 927	310	9.041 475	326	9.042 675	1043	9.042 910	258	9.043 905	1199	9.045 978	1327
9.033 632	136	9.040 578	159	9.040 928	310	9.041 476	326	9.042 676	1043	9.042 911	258	9.043 906	1199	9.045 979	720
9.033 636	136	9.040 579	159	9.040 940	311	9.041 506	305	9.042 681	1043	9.042 912	258	9.043 907	1199	9.045 979	1327
9.033 640	136	9.040 580	159	9.040 941	311	9.041 508	305	9.042 682	1043	9.042 915	258	9.043 909	1199	9.046 020	718
9.033 653	136	9.040 581	159	9.040 942	311	9.041 553	308	9.042 683	1043	9.042 916	258	9.043 910	1199	9.046 020	1324
9.033 655	136	9.040 582	159	9.040 943	311	9.041 557	308	9.042 684	1043	9.042 917	258	9.043 911	1199	9.046 021	721
9.033 657	136	9.040 583	159	9.040 944	311	9.041 560	307	9.042 690	1044	9.042 920	258	9.043 915	1199	9.046 021	1327
9.033 659	136	9.040 584	159	9.040 945	311	9.041 562	308	9.042 710	1042	9.042 921	258	9.043 916	1199	9.046 022	718
9.033 740	136	9.040 585	159	9.040 949	309	9.041 565	307	9.042 715	1042	9.042 922	258	9.043 917	1199	9.046 022	1325
9.033 741	136	9.040 612	155	9.040 950	309	9.041 619	286	9.042 720	1042	9.042 925	258	9.043 918	1199	9.046 023	718
9.034 110	135	9.040 614	155	9.040 951	309	9.041 619	293	9.042 725	1042	9.042 926	258	9.043 950	1199	9.046 023	1325
9.034 112	135	9.040 616	155	9.040 955	309	9.041 620	286	9.042 730	1042	9.042 927	258	9.045 700	1199	9.046 024	718
9.034 114	135	9.040 618	155	9.040 957	312	9.041 620	293	9.042 740	1039	9.042 930	258	9.045 701	1199	9.046 024	1325
9.034 253	136	9.040 620	155	9.040 958	312	9.041 621	316	9.042 741	1039	9.042 931	258	9.045 702	1199	9.046 034	719
9.034 257	136	9.040 625	155	9.040 993	339	9.041 621	322	9.042 742	1039	9.042 932	258	9.045 703	1199	9.046 034	1326
9.034 258	136	9.040 635	155	9.041 004	311	9.041 754	308	9.042 743	1039	9.042 934	258	9.045 704	1199	9.046 035	719
9.034 553	135	9.040 636	155	9.041 007	311	9.041 755	308	9.042 751	1042	9.042 935	258	9.045 705	1199	9.046 035	1326
9.034 557	135	9.040 652	155	9.041 009	311	9.041 756	308	9.042 753	1042	9.042 936	258	9.045 706	1199	9.046 037	719
9.034 558	135	9.040 711	156	9.041 033	312	9.041 757	308	9.042 755	1042	9.042 937	258	9.045 707	1199	9.046 037	1326
9.039 811	259	9.040 712	156	9.041 034	311	9.041 758	308	9.042 757	1042	9.042 940	257	9.045 708	1199	9.046 038	719
9.039 812	259	9.040 713	156	9.041 036	312	9.041 759	308	9.042 759	1042	9.042 941	258	9.045 709	1199	9.046 038	1326
9.039 813	257	9.040 714	156	9.041 043	309	9.041 760	308	9.042 761	1042	9.042 942	258	9.045 710	1199	9.046 041	719
9.039 814	257	9.040 715	156	9.041 045	309	9.041 761	308	9.042 763	1045	9.042 943	258	9.045 711	1199	9.046 041	1326
9.039 816	257	9.040 716	156	9.041 048	309	9.041 764	308	9.042 765	1045	9.042 943	259	9.045 800	682	9.046 042	719
9.039 817	257	9.040 717	156	9.041 050	309	9.041 765	308	9.042 767	1045	9.042 945	259	9.045 801	682	9.046 042	1326
9.039 818	257	9.040 718	156	9.041 051	309	9.042 006	1050	9.042 769	1045	9.042 946	259	9.045 802	682	9.046 044	719
9.039 921	51	9.040 719	156	9.041 052	309	9.042 007	1049	9.042 771	1043	9.042 947	259	9.045 803	682	9.046 044	1326
9.039 922	51	9.040 720	156	9.041 053	327	9.042 019	1040	9.042 772	1043	9.042 950	259	9.045 804	682	9.046 045	719
9.039 923	51	9.040 722	309	9.041 055	327	9.042 031	1040	9.042 773	1043	9.042 951	259	9.045 805	682	9.046 045	1326
9.039 925	51	9.040 723	309	9.041 056	327	9.042 038	1040	9.042 774	1045	9.042 956	259	9.045 806	682	9.046 055	720
9.039 926	51	9.040 724	309	9.041 072	312	9.042 043	1040	9.042 775	1045	9.042 972	259	9.045 807	682	9.046 055	1327
9.039 928	51	9.040 725	309	9.041 081	309	9.042 047	1040	9.042 776	1043	9.042 975	257	9.045 808	682	9.046 056	720
9.040 006	50	9.040 727	309	9.041 092	312	9.042 119	1040	9.042 777	1043	9.042 976	258	9.045 809	682	9.046 056	1327
9.040 010	50	9.040 728	309	9.041 100	305	9.042 131	1040	9.042 778	1043	9.042 977	258	9.045 810	682	9.046 061	720
9.040 011	50	9.040 729	309	9.041 105	305	9.042 132	1041	9.042 779	1045	9.042 978	256	9.045 820	682	9.046 061	1327
9.040 012	50	9.040 734	309	9.041 110	305	9.042 138	1040	9.042 780	1045	9.042 979	256	9.045 821	682	9.046 062	720
9.040 022	50	9.040 735	309	9.041 112	305	9.042 139	1041	9.042 801	1041	9.042 980	256	9.045 822	682	9.046 062	1327
9.040 025	50	9.040 744	310	9.041 117	305	9.042 143	1040	9.042 802	1041	9.042 988	256	9.045 825	682	9.046 064	720
9.040 030	49	9.040 746	310	9.041 120	305	9.042 144	1041	9.042 803	1041	9.043 001	1197	9.045 826	682	9.046 064	1327
9.040 031	49	9.040 749	310	9.041 140	300	9.042 147	1040	9.042 804	1041	9.043 002	1197	9.045 827	682	9.046 065	720
9.040 032	49	9.040 760	312	9.041 141	300	9.042 148	1041	9.042 805	1041	9.043 003	1197	9.045 830	682	9.046 065	1327
9.040 033	49	9.040 782	312	9.041 142	301	9.042 232	1041	9.042 810	1039	9.043 004	1197	9.045 831	682	9.046 067	720
9.040 034	49	9.040 796	312	9.041 143	301	9.042 239	1041	9.042 811	1039	9.043 005	1197	9.045 832	682	9.046 067	1327
9.040 110	50	9.040 810	297	9.041 144	301	9.042 244	1041	9.042 812	1039	9.043 006	1197	9.045 833	682	9.046 068	720
9.040 115	50	9.040 811	297	9.041 145	301	9.042 248	1041	9.042 815	1040	9.043 007	1197	9.045 834	682	9.046 068	1327
9.040 206	50	9.040 812	297	9.041 146	302	9.042 319	1041	9.042 850	255	9.043 008	1197	9.045 840	689	9.046 109	720
9.040 212	50	9.040 813	297	9.041 147	302	9.042 331	1041	9.042 851	255	9.043 009	1197	9.045 841	689	9.046 109	1326
9.040 216	49	9.040 814	297	9.041 148	302	9.042 338	1041	9.042 852	255	9.043 010	623	9.045 842	689	9.046 110	720
9.040 325	50	9.040 815	297	9.041 149	302	9.042 343	1041	9.042 853	255	9.043 011	623	9.045 843	689	9.046 110	1326
9.040 330	50	9.040 817	297	9.041 150	302	9.042 347	1041	9.042 854	255	9.043 012	623	9.045 844	689	9.046 111	720
9.040 332	50	9.040 817	297	9.041 151	303	9.042 419	1041	9.042 855	255	9.043 013	623	9.045 845	689	9.046 111	1326
9.040 335	50	9.040 818	297	9.041 152	303	9.042 431	1041	9.042 856	255	9.043 014	623	9.045 850	689	9.046 121	720
9.040 336	154	9.040 818	297	9.041 153	303	9.042 438	1041	9.042 857	255	9.043 015	623	9.045 851	689	9.046 121	1326
9.040 337	154	9.040 840	298	9.041 155	301	9.042 443	1041	9.042 858	255	9.043 016	623	9.045 852	689	9.046 122	720
9.040 338	154	9.040 841	298	9.041 156	304	9.042 447	1041	9.042 859	255	9.043 017	623	9.045 860	691	9.046 122	1326
9.040 339	154	9.040 842	298	9.041 160	304	9.042 500	1042	9.042 860	254	9.043 018	623	9.045 861	691	9.046 123	720
9.040 340	154	9.040 843	298	9.041 163	304	9.042 505	1042	9.042 861	254	9.043 019	623	9.045 862	691	9.046 123	1326
9.040 341	154	9.040 844	298	9.041 164	304	9.042 509	1042	9.042 862	254	9.043 020	623	9.045 865	691	9.046 131	720
9.040 342	154	9.040 845	298	9.041 165	304	9.042 514	1042	9.042 863	254	9.043 021	624	9.045 866	691	9.046 131	1326
9.040 343	154	9.040 851	298	9.041 166	304	9.042 519	1042	9.042 864	254	9.043 022	624	9.045 867	691	9.046 132	720
9.040 344	154	9.040 870	298	9.041 167	304	9.042 523	1042	9.042 866	254	9.043 023	624	9.045 868	691	9.046 132	1326
9.040 345	154	9.040 872	298	9.041 180	305	9.042 528	1042	9.042 867	254	9.043 023	625	9.045 951	720	9.046 133	720
9.040 346	154	9.040 873	298	9.041 182	305	9.042 530	1044	9.042 868	255	9.043 026	624	9.045 951	1326	9.046 133	1326
9.040 347	154	9.040 876	298	9.041 207	304	9.042 543	1044	9.042 869	255	9.043 026	625	9.045 952	720	9.046 141	720
9.040 348	154	9.040 877	298	9.041 211	304	9.042 544	1044	9.042 870	255	9.043 027	624	9.045 952	1326	9.046 141	1326
9.040 349	154	9.040 881	298	9.041 217	304	9.042 545	1044	9.042 871	253	9.043 027	625	9.045 953	720	9.046 142	720
9.040 350	154	9.040 886	298	9.041 303	304	9.042 555	1044	9.042 872	253	9.043 028	1198	9.045 953	1326	9.046 142	1326
9.040 351	154	9.040 890	298	9.041 304	304	9.042 556	1044	9.042 873	253	9.043 029	1198	9.045 954	720	9.046 143	720
9.040 352	154	9.040 891	298	9.041 367	309	9.042 557	1044	9.042 874	253	9.043 030	1198	9.045 954	1326	9.046 143	1326
9.040 353	154	9.040 892	298	9.041 368	309	9.042 558	1044	9.042 875	253	9.043 031	1198	9.045 956	720	9.046 151	719
9.040 379	154	9.040 895	298	9.041 369	309	9.042 573	1044	9.042 876	255	9.043 035	1198	9.045 956	1326	9.046 151	1325

9.046 152	719	9.049 092	705	9.049 753	1265	9.049 854	1266	9.050 453	160	9.052 040	721	9.052 387	723	9.054 132	698
9.046 152	1325	9.049 094	705	9.049 754	680	9.049 855	680	9.050 454	160	9.052 041	721	9.052 388	723	9.054 132	1275
9.046 153	719	9.049 095	705	9.049 754	1266	9.049 855	1266	9.050 584	161	9.052 042	721	9.052 389	723	9.054 133	698
9.046 153	1325	9.049 097	705	9.049 755	679	9.049 856	680	9.050 601	161	9.052 043	721	9.052 390	723	9.054 133	1275
9.046 166	709	9.049 098	705	9.049 755	1266	9.049 856	1266	9.050 602	161	9.052 044	721	9.052 391	726	9.054 139	698
9.046 167	709	9.049 101	704	9.049 756	679	9.049 857	680	9.050 603	161	9.052 060	721	9.052 392	726	9.054 139	1275
9.046 168	709	9.049 102	704	9.049 756	1266	9.049 857	1266	9.050 604	161	9.052 061	721	9.052 393	726	9.054 202	698
9.046 171	709	9.049 103	704	9.049 757	679	9.049 858	680	9.050 611	161	9.052 062	721	9.052 394	726	9.054 202	1275
9.046 172	709	9.049 104	704	9.049 757	1266	9.049 858	1266	9.050 612	161	9.052 063	721	9.052 395	726	9.054 203	698
9.046 173	709	9.049 105	704	9.049 758	679	9.049 859	680	9.050 696	161	9.052 064	721	9.052 400	726	9.054 203	1275
9.046 176	709	9.049 107	704	9.049 758	1266	9.049 859	1266	9.050 715	1027	9.052 065	721	9.052 412	726	9.054 460	698
9.046 181	709	9.049 108	704	9.049 759	679	9.049 860	680	9.050 716	1027	9.052 066	723	9.052 417	726	9.054 462	698
9.046 182	710	9.049 109	704	9.049 759	1266	9.049 860	1266	9.050 717	1027	9.052 067	723	9.052 423	726	9.054 464	698
9.046 187	710	9.049 116	705	9.049 760	679	9.049 861	679	9.050 721	1027	9.052 068	723	9.052 427	726	9.054 465	698
9.046 188	710	9.049 117	705	9.049 760	1265	9.049 861	1265	9.050 722	1027	9.052 069	723	9.052 432	726	9.054 671	681
9.046 191	708	9.049 118	705	9.049 761	679	9.049 862	679	9.050 723	1027	9.052 080	106	9.052 436	726	9.054 671	1267
9.046 196	708	9.049 119	705	9.049 761	1265	9.049 862	1265	9.050 750	161	9.052 081	106	9.052 439	726	9.054 672	681
9.046 197	708	9.049 120	705	9.049 762	679	9.049 863	679	9.050 751	161	9.052 082	106	9.052 443	726	9.054 672	1267
9.048 933	684	9.049 122	704	9.049 762	1265	9.049 863	1266	9.050 752	161	9.052 083	106	9.052 449	726	9.054 673	681
9.048 934	684	9.049 123	704	9.049 763	679	9.049 864	679	9.050 796	159	9.052 084	106	9.052 450	726	9.054 673	1267
9.048 937	684	9.049 126	705	9.049 763	1265	9.049 864	1266	9.050 797	159	9.052 085	106	9.052 451	726	9.054 674	681
9.048 938	684	9.049 127	705	9.049 764	679	9.049 865	704	9.050 798	159	9.052 086	106	9.052 453	724	9.054 674	1267
9.048 939	684	9.049 128	705	9.049 764	1265	9.049 866	704	9.050 799	159	9.052 087	106	9.052 454	724	9.054 675	681
9.048 940	684	9.049 129	704	9.049 765	680	9.049 911	702	9.050 811	159	9.052 088	106	9.052 625	628	9.054 675	1267
9.048 942	684	9.049 130	704	9.049 765	1265	9.049 912	702	9.050 812	159	9.052 089	106	9.052 744	715	9.054 681	714
9.048 943	684	9.049 146	705	9.049 766	680	9.049 913	702	9.050 813	159	9.052 090	106	9.052 744	1321	9.054 681	1350
9.048 944	684	9.049 147	705	9.049 766	1265	9.049 915	702	9.050 814	159	9.052 091	106	9.052 745	716	9.054 686	714
9.048 945	684	9.049 151	713	9.049 767	680	9.049 916	702	9.050 815	159	9.052 092	106	9.052 745	1321	9.054 686	1350
9.048 946	684	9.049 152	713	9.049 767	1265	9.049 917	702	9.050 816	159	9.052 114	726	9.052 746	716	9.055 000	1278
9.049 015	683	9.049 180	699	9.049 768	680	9.049 918	702	9.050 817	159	9.052 121	726	9.052 746	1321	9.055 001	1278
9.049 016	683	9.049 181	699	9.049 768	1265	9.049 927	702	9.050 818	159	9.052 126	726	9.052 747	716	9.055 002	1278
9.049 017	683	9.049 182	699	9.049 769	680	9.049 931	702	9.051 036	14	9.052 131	726	9.052 747	1321	9.055 006	699
9.049 018	683	9.049 183	699	9.049 769	1265	9.049 932	702	9.051 044	14	9.052 213	722	9.052 748	716	9.055 006	1275
9.049 019	683	9.049 200	1349	9.049 770	680	9.049 933	702	9.051 054	14	9.052 214	722	9.052 748	1321	9.055 008	699
9.049 020	1422	9.049 201	1349	9.049 770	1265	9.049 934	702	9.051 063	14	9.052 215	722	9.052 749	716	9.055 008	1275
9.049 021	1422	9.049 202	1349	9.049 771	680	9.049 936	702	9.051 068	14	9.052 216	722	9.052 749	1321	9.055 010	699
9.049 025	1422	9.049 203	1349	9.049 771	1266	9.049 937	702	9.051 073	14	9.052 222	722	9.052 901	716	9.055 010	1275
9.049 026	1422	9.049 204	1349	9.049 772	680	9.049 941	704	9.051 086	14	9.052 226	722	9.052 901	723	9.055 011	699
9.049 027	683	9.049 205	1349	9.049 772	1266	9.049 941	1424	9.051 088	14	9.052 232	722	9.052 901	1321	9.055 011	1275
9.049 030	707	9.049 206	1349	9.049 773	680	9.049 942	704	9.051 091	14	9.052 301	724	9.052 903	722	9.055 012	699
9.049 031	707	9.049 241	712	9.049 773	1266	9.049 942	1424	9.051 150	13	9.052 302	724	9.052 905	722	9.055 012	1275
9.049 032	707	9.049 242	712	9.049 774	680	9.049 943	704	9.051 151	13	9.052 303	724	9.052 910	722	9.055 013	699
9.049 033	707	9.049 243	714	9.049 774	1266	9.049 943	1424	9.051 152	13	9.052 304	724	9.052 913	722	9.055 013	1275
9.049 035	690	9.049 243	1323	9.049 775	680	9.049 944	704	9.051 153	13	9.052 305	724	9.052 915	722	9.055 014	699
9.049 036	1423	9.049 300	717	9.049 775	1266	9.049 944	1424	9.051 154	13	9.052 311	724	9.052 920	722	9.055 014	1275
9.049 037	1423	9.049 300	1323	9.049 776	680	9.049 948	704	9.051 155	13	9.052 312	724	9.052 923	723	9.055 015	699
9.049 038	706	9.049 304	717	9.049 776	1266	9.049 948	1424	9.051 156	13	9.052 313	724	9.052 925	723	9.055 015	1275
9.049 039	706	9.049 304	1323	9.049 777	679	9.049 949	704	9.051 236	728	9.052 314	724	9.052 941	723	9.055 017	699
9.049 040	706	9.049 311	717	9.049 777	1265	9.049 949	1424	9.051 244	728	9.052 315	724	9.052 942	723	9.055 017	1275
9.049 041	706	9.049 311	1323	9.049 778	679	9.049 950	704	9.051 254	728	9.052 321	724	9.052 943	723	9.055 018	699
9.049 042	707	9.049 312	717	9.049 778	1265	9.049 950	1424	9.051 263	728	9.052 322	724	9.052 944	723	9.055 018	1275
9.049 043	707	9.049 312	1323	9.049 779	679	9.049 951	704	9.051 268	728	9.052 323	724	9.052 951	723	9.055 019	699
9.049 044	707	9.049 313	717	9.049 779	1265	9.049 951	1424	9.051 273	728	9.052 324	724	9.052 952	716	9.055 019	1275
9.049 045	689	9.049 313	1323	9.049 780	679	9.049 955	710	9.051 286	728	9.052 325	724	9.052 952	723	9.055 020	699
9.049 046	707	9.049 315	717	9.049 780	1265	9.049 959	704	9.051 288	728	9.052 331	724	9.052 952	1321	9.055 020	1275
9.049 047	1423	9.049 315	1323	9.049 781	679	9.049 959	1424	9.051 291	728	9.052 332	724	9.052 953	723	9.055 022	699
9.049 048	1423	9.049 320	717	9.049 781	1265	9.049 960	704	9.051 308	632	9.052 333	724	9.052 954	723	9.055 022	1275
9.049 049	707	9.049 320	1323	9.049 782	680	9.049 960	1424	9.051 320	632	9.052 334	724	9.052 973	722	9.055 023	699
9.049 050	707	9.049 340	717	9.049 782	1265	9.049 961	710	9.051 321	632	9.052 335	724	9.052 975	722	9.055 023	1275
9.049 051	707	9.049 340	1323	9.049 783	680	9.049 962	710	9.051 324	632	9.052 341	724	9.052 980	722	9.055 025	699
9.049 052	707	9.049 341	717	9.049 783	1265	9.049 963	710	9.051 325	632	9.052 342	724	9.053 044	698	9.055 025	1275
9.049 053	1423	9.049 341	1323	9.049 784	680	9.049 964	710	9.051 424	727	9.052 343	724	9.053 048	698	9.055 026	699
9.049 054	1423	9.049 672	693	9.049 784	1265	9.049 965	704	9.051 436	727	9.052 344	724	9.053 049	698	9.055 026	1275
9.049 055	1423	9.049 730	681	9.049 785	680	9.049 965	1424	9.051 444	727	9.052 345	724	9.053 055	698	9.055 027	699
9.049 056	1423	9.049 731	681	9.049 785	1265	9.049 980	704	9.051 454	727	9.052 361	724	9.053 064	698	9.055 027	1275
9.049 057	707	9.049 732	681	9.049 786	680	9.049 980	1424	9.051 455	727	9.052 362	724	9.053 068	698	9.055 028	699
9.049 058	707	9.049 733	681	9.049 786	1265	9.049 981	710	9.051 456	727	9.052 363	724	9.053 069	698	9.055 028	1275
9.049 059	1423	9.049 734	681	9.049 787	680	9.049 982	710	9.051 457	727	9.052 364	724	9.053 075	698	9.055 031	699
9.049 060	1423	9.049 735	681	9.049 787	1265	9.049 990	710	9.051 458	727	9.052 365	724	9.053 222	699	9.055 031	1275
9.049 063	1424	9.049 736	681	9.049 788	680	9.049 991	710	9.051 459	727	9.052 366	724	9.053 223	699	9.055 032	699
9.049 065	708	9.049 737	681	9.049 788	1266	9.049 992	710	9.051 460	727	9.052 367	723	9.053 224	699	9.055 032	1275
9.049 066	708	9.049 738	681	9.049 789	680	9.049 993	710	9.051 471	727	9.052 368	723	9.053 227	699	9.055 034	699
9.049 067	708	9.049 739	681	9.049 789	1266	9.049 996	710	9.051 474	727	9.052 369	723	9.053 242	699	9.055 034	1275
9.049 068	708	9.049 740	681	9.049 790	680	9.049 997	710	9.051 519	728	9.052 370	723	9.053 243	699	9.055 037	699
9.049 069	708	9.049 741	681	9.049 790	1266	9.050 018	76	9.051 531	728	9.052 371	723	9.053 304	698	9.055 037	1275
9.049 070	708	9.049 742	681	9.049 791	680	9.050 019	76	9.051 619	728	9.052 372	723	9.053 308	698	9.055 500	700
9.049 073	705	9.049 742	1267	9.049 791	1266	9.050 020	76	9.051 631	728	9.052 373	723	9.053 309	698	9.055 500	1421
9.049 077	1424	9.049 743	681	9.049 792	680	9.050 021	76	9.052 021	721	9.052 374	723	9.053 349	698	9.055 501	700
9.049 078	708	9.049 743	1267	9.049 792	1266	9.050 022	76	9.052 022	721	9.052 375	723	9.053 364	698	9.055 501	1421
9.049 079	708	9.049 744	681	9.049 793	680	9.050 023	76	9.052 023	721	9.052 376	723	9.053 368	698	9.055 502	700
9.049 079	1422	9.049 744	1267	9.049 793	1266	9.050 411	161	9.052 024	721	9.052 377	723	9.053 369	698	9.055 502	1421
9.049 080	708	9.049 745	681	9.049 850	679	9.050 412	161	9.052 025	721	9.052 378	723	9.053 384	698	9.055 503	700
9.049 080	1422	9.049 745	1267	9.049 850	1266	9.050 413	161	9.052 031	721	9.052 379	723	9.053 388	698	9.055 503	1421
9.049 081	705	9.049 746	681	9.049 851	679	9.050 414	161	9.052 032	721	9.052 380	723	9.053 389	698	9.055 504	700
9.049 082	705	9.049 746	1267	9.049 851	1266	9.050 421	161	9.052 033	721	9.052 381	723	9.053 424	698	9.055 504	1421
9.049 084	705	9.049 747	681	9.049 852	679	9.050 422	161	9.052 034	721	9.052 382	723	9.053 428	698	9.055 510	700
9.049 085	705	9.049 747	1267	9.049 852	1266	9.050 423	161	9.052 036	721	9.052 383	723	9.053 429	698	9.055 510	1349
9.049 087	705	9.049 750	679	9.049 853	679	9.050 424	161	9.052 037	721	9.052 384	723	9.053 432	698	9.055 510	1421
9.049 088	705	9.049 750	1266	9.049 853	1266	9.050 451	160	9.052 038	721	9.052 385	723	9.054 122	698	9.055 511	700
9.049 091	705	9.049 753	680	9.049 854	679	9.050 452	160	9.052 039	721	9.052 386	723	9.054 122	1275	9.055 511	1349

9.055 511	1421	9.056 242	685	9.056 711	693	9.056 888	1084	9.058 682	697	9.063 909	686	9.070 202	76	9.071 984	60
9.055 512	700	9.056 243	685	9.056 712	692	9.056 891	691	9.058 683	697	9.065 104	686	9.070 203	76	9.071 985	60
9.055 512	1349	9.056 244	685	9.056 713	692	9.056 892	691	9.058 684	697	9.065 105	686	9.070 204	76	9.071 987	60
9.055 512	1421	9.056 245	685	9.056 716	692	9.056 893	691	9.058 809	695	9.065 106	686	9.070 205	76	9.071 988	60
9.055 513	700	9.056 246	685	9.056 721	693	9.056 894	691	9.058 812	695	9.065 107	686	9.070 210	77	9.071 989	60
9.055 513	1349	9.056 247	685	9.056 722	692	9.056 895	691	9.058 839	695	9.065 108	686	9.070 211	77	9.071 991	60
9.055 513	1421	9.056 251	686	9.056 723	692	9.056 896	691	9.058 842	695	9.065 109	686	9.070 212	77	9.071 992	60
9.055 520	700	9.056 252	686	9.056 724	693	9.056 899	193	9.058 865	695	9.066 597	685	9.070 213	77	9.071 995	60
9.055 520	1421	9.056 253	686	9.056 725	693	9.057 005	695	9.058 869	695	9.066 598	686	9.070 301	45	9.071 996	60
9.055 521	700	9.056 254	686	9.056 726	692	9.057 011	695	9.058 872	695	9.068 210	562	9.070 302	45	9.071 997	60
9.055 521	1421	9.056 255	686	9.056 727	693	9.057 012	695	9.058 935	695	9.068 211	562	9.070 303	45	9.071 998	60
9.055 522	700	9.056 256	686	9.056 729	693	9.057 041	695	9.058 939	695	9.068 212	562	9.070 304	45	9.072 000	59
9.055 522	1421	9.056 257	686	9.056 730	693	9.057 042	695	9.058 942	695	9.068 213	562	9.070 305	45	9.072 001	59
9.055 523	700	9.056 278	684	9.056 731	693	9.057 067	1263	9.058 946	695	9.068 214	562	9.070 306	45	9.072 002	59
9.055 523	1421	9.056 279	684	9.056 732	693	9.057 075	1263	9.058 951	695	9.068 215	562	9.070 307	45	9.072 003	59
9.055 524	700	9.056 294	688	9.056 733	693	9.057 077	1263	9.058 965	695	9.068 216	562	9.070 308	45	9.072 004	59
9.055 524	1421	9.056 295	688	9.056 734	693	9.057 078	1263	9.058 969	695	9.068 217	562	9.070 321	42	9.072 005	59
9.055 525	700	9.056 296	688	9.056 739	693	9.057 079	1263	9.058 975	362	9.068 218	562	9.070 322	42	9.072 007	59
9.055 525	1421	9.056 297	688	9.056 740	693	9.057 081	1264	9.058 981	695	9.068 219	562	9.070 323	42	9.072 008	59
9.055 526	700	9.056 298	688	9.056 741	693	9.057 083	1264	9.058 987	695	9.068 220	562	9.070 408	77	9.072 009	59
9.055 526	1421	9.056 299	688	9.056 742	693	9.057 085	1264	9.059 016	362	9.068 221	562	9.070 414	77	9.072 010	59
9.055 530	700	9.056 301	688	9.056 743	693	9.057 086	1264	9.059 017	362	9.068 222	562	9.070 419	77	9.072 011	59
9.055 530	1421	9.056 304	687	9.056 744	693	9.057 088	1264	9.059 018	362	9.068 223	562	9.070 424	77	9.072 012	59
9.055 531	700	9.056 305	687	9.056 745	693	9.057 090	1264	9.059 506	719	9.068 224	562	9.070 505	77	9.072 013	59
9.055 531	1421	9.056 306	687	9.056 750	692	9.057 091	1264	9.059 506	1325	9.068 225	562	9.070 508	77	9.072 014	59
9.055 532	700	9.056 307	687	9.056 751	692	9.057 092	1264	9.059 507	719	9.068 226	562	9.070 514	77	9.072 015	59
9.055 532	1421	9.056 308	687	9.056 752	692	9.057 093	1264	9.059 507	1325	9.068 227	562	9.070 519	77	9.072 016	59
9.055 533	700	9.056 309	687	9.056 753	692	9.057 094	1264	9.059 508	719	9.068 228	562	9.070 524	77	9.072 017	59
9.055 533	1421	9.056 324	688	9.056 754	692	9.057 095	1264	9.059 508	1325	9.068 229	562	9.070 808	78	9.072 018	59
9.055 534	700	9.056 325	688	9.056 755	692	9.057 096	1264	9.059 509	719	9.068 230	562	9.070 814	78	9.072 019	59
9.055 534	1421	9.056 326	688	9.056 756	692	9.057 098	1264	9.059 509	1325	9.068 231	562	9.070 817	78	9.072 020	59
9.055 535	700	9.056 327	688	9.056 759	692	9.057 099	1264	9.060 102	689	9.068 232	562	9.070 824	78	9.072 041	79
9.055 535	1421	9.056 331	684	9.056 760	692	9.057 100	1264	9.060 103	689	9.068 233	562	9.070 836	78	9.072 041	83
9.055 540	700	9.056 332	684	9.056 761	692	9.057 105	1263	9.060 104	689	9.068 234	562	9.070 844	78	9.072 042	79
9.055 540	1421	9.056 333	685	9.056 762	692	9.057 107	1263	9.060 105	689	9.068 235	562	9.070 854	78	9.072 051	79
9.055 541	700	9.056 334	683	9.056 763	692	9.057 115	1263	9.060 106	689	9.068 236	562	9.070 863	78	9.072 052	79
9.055 541	1421	9.056 337	684	9.056 764	692	9.057 116	1263	9.060 200	690	9.068 237	562	9.070 873	78	9.072 055	79
9.055 542	700	9.056 338	684	9.056 765	692	9.057 117	1263	9.060 201	690	9.068 238	562	9.070 886	78	9.072 060	79
9.055 542	1421	9.056 340	684	9.056 771	693	9.057 120	1263	9.060 202	690	9.068 239	562	9.070 917	78	9.072 061	79
9.055 543	700	9.056 341	684	9.056 772	693	9.057 122	1263	9.060 203	690	9.068 240	562	9.070 924	78	9.072 062	79
9.055 543	1421	9.056 399	690	9.056 773	693	9.057 123	1263	9.060 204	690	9.068 276	562	9.070 936	78	9.072 065	79
9.055 550	700	9.056 400	690	9.056 774	693	9.057 124	1263	9.060 205	690	9.068 277	562	9.070 944	78	9.072 070	79
9.055 550	1421	9.056 401	690	9.056 775	693	9.057 125	1263	9.060 206	690	9.068 278	562	9.070 954	78	9.072 076	61
9.055 551	700	9.056 402	690	9.056 777	693	9.057 126	1263	9.060 207	690	9.068 279	562	9.070 963	78	9.072 077	61
9.055 551	1421	9.056 403	690	9.056 780	692	9.057 127	1263	9.060 303	690	9.068 280	562	9.071 405	66	9.072 078	61
9.055 552	700	9.056 404	690	9.056 781	692	9.057 130	1263	9.060 304	690	9.068 281	562	9.071 408	66	9.072 079	61
9.055 552	1421	9.056 405	690	9.056 782	692	9.057 131	1263	9.060 305	690	9.068 282	562	9.071 414	66	9.072 092	72
9.055 553	700	9.056 406	690	9.056 783	692	9.057 132	1263	9.060 306	690	9.068 283	562	9.071 419	66	9.072 092	79
9.055 553	1421	9.056 407	690	9.056 784	692	9.057 133	1263	9.062 303	685	9.068 284	562	9.071 424	66	9.072 093	72
9.056 196	683	9.056 410	689	9.056 785	692	9.057 191	695	9.062 304	685	9.068 285	562	9.071 505	66	9.072 093	79
9.056 198	684	9.056 411	689	9.056 787	692	9.057 193	695	9.062 305	685	9.068 286	562	9.071 508	66	9.072 094	72
9.056 199	684	9.056 412	689	9.056 801	693	9.057 219	694	9.062 400	685	9.068 287	562	9.071 514	66	9.072 094	79
9.056 200	684	9.056 413	689	9.056 802	692	9.057 220	694	9.062 402	685	9.068 288	562	9.071 519	66	9.072 095	79
9.056 201	684	9.056 414	689	9.056 803	692	9.057 222	694	9.062 403	685	9.068 289	562	9.071 524	66	9.072 155	61
9.056 202	684	9.056 415	689	9.056 805	692	9.057 225	694	9.062 405	685	9.068 290	562	9.071 680	59	9.072 156	61
9.056 203	684	9.056 416	689	9.056 807	703	9.057 226	694	9.062 406	685	9.068 291	562	9.071 681	59	9.072 157	61
9.056 204	684	9.056 417	689	9.056 809	703	9.057 228	694	9.062 407	685	9.068 292	562	9.071 682	59	9.072 158	61
9.056 205	684	9.056 419	690	9.056 810	703	9.057 341	694	9.062 704	686	9.068 293	562	9.071 683	59	9.072 159	62
9.056 206	684	9.056 420	690	9.056 811	693	9.057 342	694	9.062 706	686	9.068 294	562	9.071 684	59	9.072 160	77
9.056 207	684	9.056 421	690	9.056 814	693	9.057 433	696	9.063 106	687	9.068 295	562	9.071 685	59	9.072 161	77
9.056 208	684	9.056 422	690	9.056 816	692	9.057 452	696	9.063 107	687	9.068 296	562	9.071 686	60	9.072 162	77
9.056 209	684	9.056 423	690	9.056 820	703	9.057 453	696	9.063 206	688	9.068 297	562	9.071 687	60	9.072 163	77
9.056 210	684	9.056 424	690	9.056 821	703	9.057 454	696	9.063 301	687	9.068 298	562	9.071 688	60	9.072 164	67
9.056 211	684	9.056 425	690	9.056 822	703	9.057 565	696	9.063 303	687	9.068 299	562	9.071 689	60	9.072 165	67
9.056 212	684	9.056 426	690	9.056 823	703	9.057 571	696	9.063 304	687	9.068 300	562	9.071 690	60	9.072 166	67
9.056 213	684	9.056 427	690	9.056 824	711	9.057 572	696	9.063 305	687	9.068 301	562	9.071 691	60	9.072 167	67
9.056 214	684	9.056 461	683	9.056 825	711	9.057 578	696	9.063 306	687	9.068 302	562	9.071 692	63	9.072 168	84
9.056 215	684	9.056 500	683	9.056 826	711	9.057 605	696	9.063 307	687	9.068 303	562	9.071 701	61	9.072 169	84
9.056 216	684	9.056 502	683	9.056 827	711	9.057 611	696	9.063 308	687	9.068 304	562	9.071 702	61	9.072 170	84
9.056 217	684	9.056 503	683	9.056 828	711	9.057 612	696	9.063 309	687	9.068 305	562	9.071 706	61	9.072 171	84
9.056 219	684	9.056 504	683	9.056 829	711	9.057 618	696	9.063 310	687	9.068 306	562	9.071 707	61	9.072 172	84
9.056 220	685	9.056 505	683	9.056 830	711	9.057 712	696	9.063 402	687	9.068 307	562	9.071 707	1445	9.072 173	84
9.056 221	685	9.056 506	683	9.056 831	711	9.057 771	696	9.063 403	687	9.068 308	562	9.071 707	1445	9.072 175	84
9.056 222	685	9.056 507	683	9.056 832	711	9.057 791	696	9.063 404	687	9.068 500	692	9.071 817	66	9.072 177	84
9.056 223	685	9.056 641	693	9.056 833	711	9.057 792	696	9.063 405	687	9.068 501	692	9.071 824	66	9.072 181	58
9.056 224	685	9.056 643	692	9.056 834	711	9.057 795	696	9.063 406	687	9.068 502	692	9.071 836	66	9.072 182	58
9.056 225	685	9.056 661	693	9.056 835	711	9.057 798	696	9.063 407	687	9.068 503	692	9.071 844	66	9.072 183	58
9.056 226	685	9.056 662	692	9.056 836	711	9.057 800	695	9.063 408	687	9.068 504	692	9.071 854	66	9.072 184	58
9.056 227	685	9.056 663	692	9.056 837	711	9.057 812	695	9.063 409	687	9.068 505	692	9.071 863	66	9.072 185	58
9.056 230	683	9.056 666	692	9.056 838	711	9.058 326	694	9.063 410	687	9.068 506	692	9.071 896	63	9.072 210	66
9.056 231	683	9.056 667	693	9.056 839	712	9.058 327	694	9.063 411	687	9.068 507	692	9.071 897	64	9.072 325	67
9.056 232	683	9.056 671	693	9.056 840	711	9.058 328	694	9.063 604	686	9.068 699	691	9.071 899	63	9.072 326	67
9.056 233	683	9.056 672	692	9.056 841	711	9.058 360	1264	9.063 606	686	9.068 702	691	9.071 966	63	9.072 327	67
9.056 234	683	9.056 673	692	9.056 842	711	9.058 623	697	9.063 607	686	9.068 703	691	9.071 968	63	9.072 331	58
9.056 235	683	9.056 674	693	9.056 843	711	9.058 624	697	9.063 611	686	9.069 003	1083	9.071 969	64	9.072 332	58
9.056 236	683	9.056 676	692	9.056 844	711	9.058 642	697	9.063 804	688	9.069 011	359	9.071 979	60	9.072 334	58
9.056 237	683	9.056 679	693	9.056 845	711	9.058 643	697	9.063 805	688	9.069 922	97	9.071 980	60	9.072 335	58
9.056 239	683	9.056 691	693	9.056 846	711	9.058 644	697	9.063 905	686	9.069 924	97	9.071 981	60	9.072 336	58
9.056 240	685	9.056 692	692	9.056 847	711	9.058 663	697	9.063 906	686	9.070 200	76	9.071 982	60	9.072 337	58
9.056 241	685	9.056 699	693	9.056 887	1084	9.058 664	697	9.063 907	686	9.070 201	76	9.071 983	60	9.072 338	58

9.072 371	78	9.072 862	83	9.073 036	70	9.073 396	72	9.103 011	83	9.103 281	85	9.106 280	179	9.112 577	1206
9.072 372	78	9.072 863	83	9.073 042	70	9.073 397	72	9.103 012	83	9.103 282	85	9.106 284	179	9.112 578	1206
9.072 373	78	9.072 866	83	9.073 050	73	9.073 398	72	9.103 013	83	9.103 283	85	9.106 286	179	9.112 579	1205
9.072 374	78	9.072 867	83	9.073 051	73	9.073 399	72	9.103 014	83	9.103 284	86	9.106 287	179	9.112 580	1205
9.072 375	78	9.072 868	83	9.073 052	73	9.073 400	72	9.103 015	83	9.103 285	86	9.106 288	179	9.112 581	1205
9.072 376	78	9.072 869	71	9.073 053	73	9.073 456	82	9.103 016	83	9.103 286	86	9.106 450	180	9.112 583	1205
9.072 377	78	9.072 870	71	9.073 054	73	9.073 457	82	9.103 017	83	9.103 287	86	9.106 460	180	9.112 584	1205
9.072 378	78	9.072 871	71	9.073 055	73	9.073 458	82	9.103 035	84	9.103 288	86	9.106 460	1243	9.112 585	1205
9.072 379	79	9.072 872	71	9.073 056	73	9.073 459	82	9.103 036	84	9.103 289	86	9.106 508	180	9.112 586	1205
9.072 380	79	9.072 873	71	9.073 057	73	9.073 480	70	9.103 037	84	9.105 376	241	9.106 510	180	9.112 587	1205
9.072 381	79	9.072 874	71	9.073 060	73	9.073 481	70	9.103 038	84	9.105 377	240	9.106 515	180	9.112 588	1206
9.072 382	79	9.072 875	71	9.073 061	73	9.073 500	80	9.103 039	84	9.105 378	241	9.106 520	180	9.112 589	1206
9.072 383	79	9.072 876	71	9.073 062	73	9.073 501	80	9.103 040	84	9.105 379	241	9.106 525	180	9.112 590	1206
9.072 384	79	9.072 877	71	9.073 063	73	9.073 502	80	9.103 077	86	9.105 380	240	9.106 530	180	9.112 591	1205
9.072 385	79	9.072 878	71	9.073 064	73	9.073 503	80	9.103 121	1348	9.105 400	241	9.106 538	180	9.112 592	1206
9.072 386	79	9.072 879	71	9.073 065	73	9.073 504	80	9.103 122	1348	9.105 401	241	9.106 540	180	9.112 593	1206
9.072 387	79	9.072 880	71	9.073 066	73	9.073 505	80	9.103 123	1348	9.105 402	241	9.106 545	180	9.112 594	1206
9.072 400	62	9.072 881	71	9.073 067	73	9.073 510	68	9.103 124	1348	9.105 403	241	9.106 550	180	9.112 595	1205
9.072 401	62	9.072 882	71	9.073 070	70	9.073 511	68	9.103 125	1348	9.105 404	241	9.106 555	180	9.112 603	1206
9.072 402	62	9.072 883	71	9.073 071	44	9.073 512	68	9.103 126	1348	9.105 405	241	9.106 560	180	9.112 604	1206
9.072 525	1444	9.072 884	71	9.073 071	70	9.073 512	515	9.103 127	1348	9.105 406	241	9.106 570	1264	9.112 605	1206
9.072 526	1444	9.072 885	71	9.073 072	44	9.073 513	68	9.103 136	44	9.105 407	241	9.106 571	1264	9.112 607	1206
9.072 681	899	9.072 886	71	9.073 072	70	9.073 514	68	9.103 137	44	9.105 408	241	9.106 572	1264	9.112 608	1206
9.072 682	899	9.072 887	71	9.073 073	44	9.073 515	68	9.103 138	44	9.105 409	241	9.106 574	1264	9.112 609	1206
9.072 683	899	9.072 893	71	9.073 073	70	9.073 516	68	9.103 140	44	9.105 410	241	9.106 580	1264	9.112 610	1206
9.072 741	80	9.072 893	72	9.073 074	44	9.073 681	69	9.103 148	44	9.105 411	241	9.106 581	1264	9.112 611	1206
9.072 741	87	9.072 894	72	9.073 074	70	9.073 682	69	9.103 149	44	9.105 412	241	9.106 582	1264	9.112 651	1328
9.072 742	80	9.072 895	72	9.073 075	70	9.073 684	69	9.103 200	67	9.105 413	241	9.106 583	1264	9.114 303	1443
9.072 742	87	9.072 896	72	9.073 300	92	9.073 686	69	9.103 201	67	9.105 414	241	9.106 600	582	9.114 310	1443
9.072 743	80	9.072 897	72	9.073 310	91	9.073 688	69	9.103 202	67	9.105 415	241	9.106 602	582	9.114 331	1444
9.072 743	87	9.072 898	72	9.073 311	91	9.073 778	69	9.103 221	73	9.105 416	241	9.106 604	582	9.114 526	1224
9.072 745	80	9.072 899	72	9.073 312	91	9.073 779	69	9.103 222	73	9.105 417	241	9.106 606	583	9.114 526	1224
9.072 745	87	9.072 900	72	9.073 313	91	9.073 781	69	9.103 223	73	9.105 418	241	9.106 607	583	9.115 036	108
9.072 748	80	9.072 901	72	9.073 314	81	9.073 782	69	9.103 224	73	9.105 419	241	9.106 608	583	9.115 041	108
9.072 748	87	9.072 902	72	9.073 314	88	9.074 051	72	9.103 225	73	9.105 450	240	9.106 608	583	9.115 045	108
9.072 750	80	9.072 903	72	9.073 315	81	9.074 052	72	9.103 226	73	9.105 451	240	9.106 609	583	9.115 140	108
9.072 750	87	9.072 904	72	9.073 315	85	9.074 053	72	9.103 227	73	9.105 452	240	9.106 609	583	9.115 150	108
9.072 751	80	9.072 905	83	9.073 315	88	9.074 054	72	9.103 228	74	9.105 453	240	9.106 610	583	9.115 160	108
9.072 751	87	9.072 914	85	9.073 318	81	9.074 061	72	9.103 229	74	9.105 700	240	9.106 610	583	9.115 245	109
9.072 752	80	9.072 915	85	9.073 318	85	9.074 062	72	9.103 230	74	9.105 701	240	9.106 611	583	9.115 265	109
9.072 752	87	9.072 919	85	9.073 318	88	9.074 063	72	9.103 231	74	9.105 702	240	9.106 650	409	9.115 295	109
9.072 755	80	9.072 924	85	9.073 319	81	9.074 064	72	9.103 232	74	9.105 703	240	9.106 650	409	9.115 301	101
9.072 755	87	9.072 929	85	9.073 319	88	9.074 071	70	9.103 233	74	9.105 704	240	9.106 650	409	9.115 302	101
9.072 757	80	9.072 932	70	9.073 320	81	9.074 072	70	9.103 234	75	9.105 705	240	9.106 785	814	9.115 303	101
9.072 757	87	9.072 934	70	9.073 320	88	9.074 073	70	9.103 235	75	9.105 706	240	9.106 788	1480	9.115 304	101
9.072 759	80	9.072 943	74	9.073 321	85	9.100 030	156	9.103 236	75	9.105 707	240	9.106 795	814	9.115 305	101
9.072 759	87	9.072 944	74	9.073 322	85	9.100 031	156	9.103 237	75	9.105 708	240	9.106 798	814	9.115 306	101
9.072 762	80	9.072 945	74	9.073 344	69	9.100 032	156	9.103 238	75	9.105 709	240	9.106 836	179	9.115 307	101
9.072 762	87	9.072 946	74	9.073 345	69	9.100 033	156	9.103 239	75	9.105 710	240	9.106 837	179	9.115 308	101
9.072 771	81	9.072 947	74	9.073 346	69	9.100 040	157	9.103 240	75	9.105 711	240	9.106 838	179	9.115 310	101
9.072 771	88	9.072 948	74	9.073 347	69	9.100 041	157	9.103 241	75	9.105 712	240	9.110 010	183	9.115 311	101
9.072 773	81	9.072 949	74	9.073 348	69	9.100 042	157	9.103 242	75	9.105 713	240	9.110 011	183	9.115 312	101
9.072 773	85	9.072 950	73	9.073 349	69	9.100 043	157	9.103 243	75	9.105 720	240	9.110 215	627	9.115 313	101
9.072 773	88	9.072 951	73	9.073 355	91	9.100 044	157	9.103 244	75	9.105 721	240	9.110 215	1164	9.115 314	101
9.072 775	81	9.072 952	73	9.073 356	91	9.100 045	157	9.103 245	75	9.105 722	240	9.110 220	627	9.115 315	101
9.072 775	85	9.072 953	73	9.073 357	91	9.100 046	157	9.103 246	75	9.105 723	240	9.110 220	1164	9.115 316	101
9.072 775	88	9.072 954	73	9.073 358	91	9.100 047	157	9.103 247	75	9.105 724	240	9.110 225	627	9.115 350	359
9.072 777	81	9.072 955	73	9.073 359	91	9.100 048	157	9.103 248	75	9.105 725	240	9.110 225	1164	9.115 351	359
9.072 777	88	9.072 965	68	9.073 360	91	9.100 049	157	9.103 249	75	9.105 726	240	9.110 230	627	9.115 404	979
9.072 778	68	9.072 966	68	9.073 361	91	9.100 050	157	9.103 250	75	9.105 727	240	9.110 230	1164	9.115 411	979
9.072 778	81	9.072 967	68	9.073 362	91	9.100 051	157	9.103 251	75	9.105 728	240	9.110 236	627	9.115 430	979
9.072 778	88	9.072 968	68	9.073 363	91	9.100 052	157	9.103 252	75	9.105 729	240	9.110 236	1164	9.115 450	979
9.072 779	68	9.072 970	68	9.073 364	91	9.100 060	157	9.103 253	75	9.105 730	240	9.110 237	627	9.115 480	979
9.072 779	70	9.072 971	68	9.073 365	80	9.102 204	45	9.103 254	76	9.105 731	240	9.110 237	1164	9.115 485	979
9.072 781	68	9.072 971	69	9.073 365	87	9.102 206	45	9.103 255	76	9.105 732	240	9.110 290	625	9.115 487	979
9.072 781	70	9.072 972	68	9.073 366	80	9.102 208	45	9.103 256	76	9.105 733	240	9.110 310	1445	9.115 501	898
9.072 782	68	9.072 972	69	9.073 366	87	9.102 210	45	9.103 257	76	9.105 740	240	9.110 311	1445	9.115 502	898
9.072 783	81	9.072 973	68	9.073 368	80	9.102 214	45	9.103 258	76	9.106 013	177	9.110 380	627	9.115 505	898
9.072 784	81	9.072 974	74	9.073 368	87	9.102 216	45	9.103 259	76	9.106 015	177	9.110 390	627	9.115 506	898
9.072 785	81	9.072 975	74	9.073 369	80	9.102 218	45	9.103 260	83	9.106 102	177	9.110 391	627	9.115 507	898
9.072 786	81	9.072 976	74	9.073 369	87	9.102 220	45	9.103 261	83	9.106 103	177	9.110 452	627	9.115 510	979
9.072 787	81	9.072 977	74	9.073 370	80	9.102 224	45	9.103 262	83	9.106 104	177	9.110 472	626	9.115 515	651
9.072 788	81	9.072 978	74	9.073 370	87	9.102 226	45	9.103 263	83	9.106 105	177	9.110 473	626	9.115 611	640
9.072 789	81	9.072 979	74	9.073 373	82	9.102 228	45	9.103 264	83	9.106 106	177	9.110 474	626	9.115 612	640
9.072 790	81	9.072 981	68	9.073 374	82	9.102 230	45	9.103 265	83	9.106 107	177	9.110 500	143	9.115 613	640
9.072 791	81	9.072 982	68	9.073 375	82	9.102 232	45	9.103 266	83	9.106 205	177	9.110 501	143	9.115 614	640
9.072 808	85	9.072 983	68	9.073 376	82	9.102 321	46	9.103 267	83	9.106 208	177	9.110 510	143	9.115 615	640
9.072 814	85	9.072 984	68	9.073 377	82	9.102 322	46	9.103 268	83	9.106 210	177	9.110 511	143	9.115 617	640
9.072 819	85	9.072 985	68	9.073 378	82	9.102 958	1348	9.103 269	83	9.106 212	177	9.112 565	1206	9.115 618	640
9.072 824	85	9.072 986	68	9.073 385	69	9.102 959	1348	9.103 270	83	9.106 213	177	9.112 566	1206	9.115 619	640
9.072 850	82	9.072 987	68	9.073 386	69	9.102 960	1348	9.103 271	83	9.106 215	177	9.112 567	1206	9.115 642	640
9.072 851	82	9.072 988	68	9.073 387	69	9.102 961	1348	9.103 272	83	9.106 240	178	9.112 568	1206	9.115 644	640
9.072 852	82	9.072 989	68	9.073 388	44	9.102 962	1348	9.103 273	83	9.106 241	178	9.112 569	1206	9.116 011	640
9.072 853	82	9.072 990	68	9.073 389	44	9.102 963	1348	9.103 274	83	9.106 242	178	9.112 570	1206	9.116 012	640
9.072 854	82	9.073 030	74	9.073 390	44	9.102 964	1348	9.103 275	83	9.106 261	178	9.112 571	1206	9.116 013	640
9.072 855	82	9.073 031	74	9.073 391	44	9.102 970	1348	9.103 276	83	9.106 263	178	9.112 572	1206	9.116 014	640
9.072 856	82	9.073 032	74	9.073 392	44	9.102 972	1348	9.103 277	83	9.106 265	360	9.112 573	1206	9.116 015	640
9.072 857	82	9.073 033	74	9.073 393	44	9.102 974	1348	9.103 278	83	9.106 266	178	9.112 574	1206	9.116 017	640
9.072 858	82	9.073 034	74	9.073 394	44	9.102 977	1348	9.103 279	85	9.106 278	179	9.112 575	1206	9.116 113	640
9.072 859	82	9.073 035	74	9.073 395	72	9.102 984	1348	9.103 280	85	9.106 279	179	9.112 576	1206	9.116 133	640

9.116 135	640	9.129 806	282	9.130 389	282	9.139 890	1449	9.140 305	592	9.140 396	597	9.141 091	591	9.141 644	25
9.116 771	145	9.129 807	282	9.130 390	282	9.139 892	254	9.140 306	592	9.140 397	597	9.141 092	591	9.141 654	25
9.116 772	145	9.129 901	1176	9.130 391	282	9.139 893	254	9.140 307	592	9.140 398	597	9.141 093	591	9.141 664	25
9.116 773	145	9.129 902	1176	9.130 392	282	9.139 894	254	9.140 308	592	9.140 400	599	9.141 100	23	9.141 671	25
9.116 775	145	9.129 904	1176	9.130 393	1176	9.139 895	1446	9.140 309	592	9.140 401	599	9.141 101	23	9.141 673	25
9.116 776	146	9.129 905	1176	9.130 394	1176	9.139 896	1447	9.140 310	592	9.140 402	599	9.141 102	23	9.141 676	25
9.116 777	146	9.129 907	1176	9.130 400	1176	9.139 897	1447	9.140 311	592	9.140 410	615	9.141 105	598	9.141 686	25
9.116 778	146	9.129 909	1176	9.130 401	1175	9.139 906	54	9.140 312	592	9.140 411	615	9.141 106	598	9.141 717	25
9.116 780	146	9.129 911	1176	9.130 402	1175	9.139 907	54	9.140 313	592	9.140 412	615	9.141 107	598	9.141 724	25
9.116 781	145	9.129 912	1176	9.130 403	1175	9.139 916	54	9.140 314	592	9.140 413	615	9.141 108	598	9.141 736	25
9.116 782	145	9.129 913	1176	9.130 406	1175	9.139 917	54	9.140 315	592	9.140 414	615	9.141 109	598	9.141 744	25
9.116 783	145	9.129 914	1176	9.130 407	1175	9.139 918	54	9.140 316	592	9.140 415	615	9.141 110	598	9.141 754	25
9.116 784	145	9.129 916	1176	9.130 408	1175	9.139 919	54	9.140 317	592	9.140 416	615	9.141 111	598	9.141 763	25
9.116 786	146	9.129 918	1176	9.130 409	1175	9.139 921	54	9.140 318	592	9.140 420	615	9.141 112	598	9.141 764	25
9.116 787	146	9.129 919	1176	9.130 410	1175	9.139 922	54	9.140 319	592	9.140 421	615	9.141 113	598	9.141 824	26
9.116 788	146	9.129 921	1176	9.130 411	1175	9.139 925	55	9.140 320	594	9.140 422	615	9.141 114	22	9.141 836	26
9.116 789	146	9.129 923	1176	9.130 412	1175	9.139 926	55	9.140 321	594	9.140 423	615	9.141 117	22	9.141 844	26
9.116 901	639	9.129 924	1176	9.130 413	1175	9.139 929	51	9.140 322	594	9.140 424	615	9.141 124	22	9.141 851	26
9.116 902	638	9.129 926	1176	9.130 414	1175	9.139 930	51	9.140 323	594	9.140 502	607	9.141 132	22	9.141 854	26
9.116 903	638	9.129 927	1176	9.130 415	1175	9.139 931	51	9.140 324	594	9.140 503	607	9.141 136	22	9.141 860	591
9.116 904	638	9.129 928	1176	9.130 416	1175	9.139 932	51	9.140 325	594	9.140 504	608	9.141 139	22	9.141 861	591
9.116 909	639	9.129 931	1176	9.130 417	1175	9.139 933	52	9.140 326	594	9.140 507	608	9.141 144	22	9.142 001	610
9.116 911	639	9.129 932	1176	9.130 418	1175	9.139 934	52	9.140 327	594	9.140 508	608	9.141 154	22	9.142 002	610
9.116 924	639	9.129 933	1176	9.130 419	1175	9.139 935	52	9.140 328	594	9.140 511	608	9.141 163	22	9.142 003	610
9.116 925	639	9.129 934	1176	9.130 420	1175	9.139 936	52	9.140 329	594	9.140 513	607	9.141 169	1287	9.142 004	611
9.116 934	639	9.129 937	1176	9.130 421	1175	9.139 937	52	9.140 330	594	9.140 514	607	9.141 170	1287	9.142 005	611
9.116 935	639	9.129 938	1176	9.130 422	1175	9.139 938	51	9.140 331	594	9.140 515	606	9.141 171	1287	9.142 006	611
9.116 950	638	9.129 942	1176	9.130 423	1175	9.139 939	51	9.140 332	594	9.140 516	606	9.141 172	1287	9.142 007	611
9.116 960	235	9.129 943	1176	9.130 424	1175	9.139 970	56	9.140 333	594	9.140 517	606	9.141 173	1287	9.142 008	611
9.117 002	640	9.130 001	282	9.130 425	1175	9.139 975	56	9.140 334	594	9.140 518	606	9.141 174	1287	9.142 009	611
9.117 003	640	9.130 002	283	9.130 426	1175	9.139 997	53	9.140 335	594	9.140 519	606	9.141 175	1286	9.142 010	611
9.117 004	640	9.130 003	283	9.130 427	1175	9.139 997	56	9.140 336	594	9.140 520	606	9.141 176	1286	9.142 011	611
9.117 012	640	9.130 004	283	9.130 428	1175	9.140 000	56	9.140 337	594	9.140 521	627	9.141 177	1286	9.142 024	609
9.117 013	640	9.130 007	283	9.130 429	1175	9.140 001	55	9.140 338	594	9.140 522	627	9.141 178	1286	9.142 036	609
9.117 014	640	9.130 009	283	9.130 430	1175	9.140 002	55	9.140 339	594	9.140 523	627	9.141 180	22	9.142 037	610
9.117 100	162	9.130 010	283	9.130 431	1175	9.140 003	56	9.140 340	593	9.140 524	627	9.141 181	22	9.142 038	610
9.117 105	162	9.130 013	283	9.130 432	1175	9.140 004	55	9.140 341	593	9.140 525	627	9.141 182	22	9.142 039	610
9.117 110	162	9.130 016	282	9.130 433	1175	9.140 011	55	9.140 342	593	9.140 526	627	9.141 183	22	9.142 040	610
9.117 115	162	9.130 017	282	9.130 434	1175	9.140 021	57	9.140 343	593	9.140 527	627	9.141 184	22	9.142 041	610
9.117 116	162	9.130 018	282	9.130 436	1175	9.140 022	57	9.140 344	593	9.140 528	627	9.141 185	22	9.142 042	610
9.117 118	162	9.130 050	1475	9.130 437	1175	9.140 023	57	9.140 345	593	9.140 530	626	9.141 186	22	9.142 043	610
9.117 130	162	9.130 051	1475	9.130 438	1175	9.140 025	57	9.140 346	593	9.140 531	626	9.141 187	22	9.142 044	609
9.117 131	162	9.130 052	1475	9.130 439	1175	9.140 026	57	9.140 347	593	9.140 532	626	9.141 188	22	9.142 045	610
9.117 132	162	9.130 053	1475	9.130 440	1175	9.140 027	57	9.140 348	593	9.140 533	626	9.141 224	23	9.142 046	610
9.117 133	162	9.130 054	1475	9.130 603	282	9.140 030	57	9.140 349	593	9.140 534	626	9.141 236	23	9.142 047	610
9.117 134	162	9.130 055	1475	9.130 605	282	9.140 031	57	9.140 350	593	9.140 535	626	9.141 244	23	9.142 048	610
9.117 135	162	9.130 056	1475	9.130 626	282	9.140 032	57	9.140 351	593	9.140 536	628	9.141 254	23	9.142 049	610
9.117 177	162	9.130 057	1475	9.130 651	282	9.140 033	57	9.140 352	593	9.140 537	628	9.141 260	24	9.142 050	610
9.117 199	162	9.130 058	1475	9.130 652	282	9.140 037	57	9.140 353	593	9.140 538	628	9.141 260	1287	9.142 051	610
9.117 220	162	9.130 059	1475	9.130 656	282	9.140 038	57	9.140 354	593	9.140 539	628	9.141 261	24	9.142 054	609
9.118 921	163	9.130 060	1475	9.130 657	282	9.140 040	58	9.140 355	593	9.140 783	153	9.141 261	1287	9.142 063	609
9.118 921	163	9.130 061	1475	9.130 658	282	9.140 042	58	9.140 356	593	9.140 784	153	9.141 270	21	9.142 071	609
9.118 921	163	9.130 062	1475	9.130 659	282	9.140 043	58	9.140 357	593	9.140 784	1160	9.141 271	21	9.142 076	609
9.118 923	163	9.130 063	1475	9.130 660	282	9.140 046	58	9.140 358	593	9.140 786	153	9.141 272	21	9.142 120	610
9.118 924	163	9.130 112	283	9.130 661	282	9.140 047	58	9.140 359	593	9.140 787	1160	9.141 273	21	9.142 121	610
9.118 925	163	9.130 116	283	9.130 663	282	9.140 048	58	9.140 360	595	9.140 788	1160	9.141 274	21	9.142 122	610
9.118 926	163	9.130 118	283	9.130 666	282	9.140 050	58	9.140 361	595	9.140 789	1160	9.141 275	21	9.142 123	610
9.118 928	163	9.130 200	280	9.139 850	1446	9.140 051	58	9.140 362	595	9.140 790	1160	9.141 276	21	9.142 124	610
9.118 929	163	9.130 203	280	9.139 851	1446	9.140 054	58	9.140 363	595	9.140 791	1160	9.141 277	21	9.142 126	610
9.118 945	164	9.130 210	280	9.139 852	1446	9.140 061	58	9.140 364	595	9.140 792	1160	9.141 280	22	9.142 127	610
9.118 946	164	9.130 213	280	9.139 853	1446	9.140 062	58	9.140 365	595	9.140 813	153	9.141 281	22	9.142 128	610
9.118 947	164	9.130 305	280	9.139 854	1446	9.140 063	58	9.140 366	595	9.140 817	153	9.141 282	22	9.142 129	610
9.118 960	163	9.130 306	280	9.139 855	1446	9.140 065	58	9.140 367	595	9.140 968	24	9.141 283	22	9.142 130	610
9.118 961	163	9.130 325	280	9.139 856	1446	9.140 068	58	9.140 368	595	9.140 968	1287	9.141 301	1347	9.142 131	610
9.118 962	163	9.130 326	280	9.139 857	1446	9.140 070	58	9.140 369	595	9.140 969	24	9.141 302	1347	9.142 132	610
9.118 963	163	9.130 344	281	9.139 858	1446	9.140 071	58	9.140 370	595	9.140 969	1287	9.141 303	1347	9.142 133	610
9.118 964	163	9.130 347	281	9.139 859	1446	9.140 072	58	9.140 371	595	9.141 014	21	9.141 304	1347	9.142 134	610
9.118 965	163	9.130 355	281	9.139 860	1446	9.140 073	58	9.140 372	595	9.141 017	21	9.141 305	1347	9.142 135	610
9.118 970	163	9.130 356	281	9.139 861	1446	9.140 097	57	9.140 373	595	9.141 024	21	9.141 306	1347	9.142 136	610
9.118 971	164	9.130 358	281	9.139 862	1446	9.140 098	57	9.140 374	595	9.141 028	21	9.141 307	1347	9.142 137	610
9.118 975	163	9.130 359	281	9.139 863	1446	9.140 099	57	9.140 375	595	9.141 032	21	9.141 308	1347	9.142 138	610
9.118 976	163	9.130 360	281	9.139 864	1447	9.140 100	57	9.140 376	595	9.141 036	21	9.141 309	1347	9.142 139	610
9.118 977	163	9.130 361	281	9.139 865	1447	9.140 101	57	9.140 377	595	9.141 039	21	9.141 310	1347	9.142 140	610
9.118 978	163	9.130 362	281	9.139 866	1447	9.140 102	57	9.140 378	595	9.141 044	21	9.141 311	1347	9.142 141	610
9.118 979	163	9.130 363	281	9.139 867	1447	9.140 103	57	9.140 380	596	9.141 053	21	9.141 312	1347	9.142 142	610
9.118 980	164	9.130 366	282	9.139 868	1447	9.140 108	58	9.140 381	596	9.141 054	21	9.141 313	1347	9.142 143	610
9.118 981	164	9.130 367	281	9.139 869	1447	9.140 110	62	9.140 382	596	9.141 063	21	9.141 381	23	9.142 170	611
9.118 982	164	9.130 368	281	9.139 870	1447	9.140 110	64	9.140 383	596	9.141 068	21	9.141 382	23	9.142 171	611
9.118 983	164	9.130 377	282	9.139 871	1448	9.140 113	102	9.140 384	596	9.141 073	21	9.141 383	23	9.142 172	611
9.118 984	164	9.130 378	282	9.139 872	1448	9.140 114	102	9.140 385	591	9.141 079	21	9.141 384	23	9.142 173	611
9.118 985	165	9.130 379	282	9.139 873	1448	9.140 115	102	9.140 386	591	9.141 080	21	9.141 385	23	9.142 174	611
9.118 986	165	9.130 380	282	9.139 874	1448	9.140 116	102	9.140 387	591	9.141 081	21	9.141 417	25	9.142 175	611
9.118 987	165	9.130 381	282	9.139 875	1448	9.140 118	102	9.140 388	591	9.141 082	21	9.141 424	25	9.142 176	611
9.119 900	230	9.130 382	282	9.139 876	1448	9.140 119	102	9.140 389	591	9.141 083	21	9.141 436	25	9.142 177	611
9.129 800	280	9.130 383	282	9.139 877	1448	9.140 205	109	9.140 390	597	9.141 084	21	9.141 444	25	9.142 178	611
9.129 801	280	9.130 384	282	9.139 878	1448	9.140 210	109	9.140 391	597	9.141 085	21	9.141 454	25	9.142 179	611
9.129 802	280	9.130 385	282	9.139 882	1447	9.140 301	592	9.140 392	597	9.141 086	21	9.141 464	25	9.142 180	611
9.129 803	280	9.130 386	282	9.139 883	1447	9.140 302	592	9.140 393	597	9.141 087	21	9.141 468	25	9.142 181	611
9.129 804	282	9.130 387	282	9.139 888	1449	9.140 303	592	9.140 394	597	9.141 088	21	9.141 471	25	9.142 182	611
9.129 805	282	9.130 388	282	9.139 889	1449	9.140 304	592	9.140 395	597	9.141 089	21	9.141 636	25	9.142 183	611

9.142 184	611	9.144 410	1108	9.150 461	518	9.151 869	1076	9.160 090	1070	9.160 818	1073	9.161 296	1079	9.164 533	1312
9.142 185	611	9.144 450	1108	9.150 462	518	9.151 870	1076	9.160 092	1070	9.160 819	1073	9.161 297	1079	9.164 534	1312
9.142 186	611	9.144 460	1107	9.150 463	518	9.151 871	1076	9.160 095	1070	9.160 822	1077	9.161 298	1079	9.164 535	1312
9.142 187	611	9.144 465	1107	9.150 464	519	9.152 109	109	9.160 125	124	9.160 823	1077	9.161 299	1079	9.164 536	1312
9.142 246	609	9.144 480	1108	9.150 465	519	9.152 125	109	9.160 126	124	9.160 824	1077	9.161 300	1080	9.164 537	1312
9.142 251	609	9.144 490	1107	9.150 530	116	9.156 018	118	9.160 127	124	9.160 825	1077	9.161 340	1081	9.164 538	1312
9.142 257	609	9.144 502	1108	9.150 620	111	9.156 020	118	9.160 128	124	9.160 827	1077	9.161 341	1081	9.164 539	1312
9.142 259	609	9.144 510	1108	9.150 639	518	9.156 027	118	9.160 129	124	9.160 828	1077	9.161 350	1083	9.164 541	1313
9.142 271	609	9.144 550	1108	9.150 640	518	9.156 030	118	9.160 130	124	9.160 829	1077	9.161 352	1083	9.164 542	1313
9.142 272	609	9.144 601	1107	9.150 641	518	9.156 100	463	9.160 135	124	9.160 830	1077	9.161 361	1078	9.164 543	1313
9.142 273	609	9.144 602	1107	9.150 642	518	9.156 101	463	9.160 187	124	9.160 831	1077	9.161 362	1078	9.164 544	1313
9.142 476	609	9.144 605	1107	9.150 643	113	9.156 102	463	9.160 188	124	9.160 899	1085	9.161 363	1078	9.164 545	1313
9.142 834	611	9.144 610	1107	9.150 644	113	9.156 103	463	9.160 200	1072	9.161 000	1073	9.161 364	1078	9.164 546	1313
9.142 846	611	9.144 620	1107	9.150 645	113	9.156 104	463	9.160 205	125	9.161 015	1077	9.161 365	1078	9.164 550	1313
9.142 857	611	9.144 650	1107	9.150 646	113	9.156 105	463	9.160 210	125	9.161 018	1077	9.161 366	1078	9.164 551	1313
9.142 866	611	9.144 660	1109	9.150 665	111	9.156 106	463	9.160 270	178	9.161 020	1077	9.161 367	1078	9.164 660	1315
9.142 867	611	9.144 662	1109	9.150 685	111	9.156 107	463	9.160 271	178	9.161 021	1077	9.161 368	1078	9.164 661	1315
9.142 868	611	9.144 663	1109	9.150 700	111	9.156 108	463	9.160 380	124	9.161 022	1077	9.161 369	1078	9.164 662	1315
9.142 869	611	9.144 664	1109	9.150 703	111	9.156 110	119	9.160 380	1077	9.161 024	1077	9.161 370	1082	9.164 663	1315
9.142 934	611	9.144 666	1109	9.150 717	135	9.156 129	463	9.160 381	124	9.161 032	1077	9.161 380	1078	9.164 664	1315
9.142 946	611	9.144 667	1109	9.150 718	135	9.156 130	463	9.160 381	1077	9.161 040	1077	9.161 381	1078	9.164 665	1315
9.142 951	611	9.144 710	1108	9.150 719	135	9.156 131	463	9.160 386	125	9.161 050	1077	9.161 382	1078	9.164 666	1315
9.142 957	611	9.144 730	1107	9.150 720	135	9.156 132	463	9.160 386	1078	9.161 060	1077	9.161 386	1083	9.164 667	1315
9.142 964	611	9.144 750	1108	9.150 721	135	9.156 133	463	9.160 387	125	9.161 061	1077	9.161 395	1078	9.164 668	1315
9.143 003	26	9.144 751	1107	9.150 722	103	9.156 134	463	9.160 387	1078	9.161 062	1077	9.161 400	1082	9.164 669	1315
9.143 006	26	9.144 755	1108	9.150 723	103	9.156 135	463	9.160 388	125	9.161 063	1077	9.163 250	1082	9.164 670	1315
9.143 009	26	9.144 756	1107	9.150 724	103	9.156 136	463	9.160 388	1078	9.161 064	1077	9.163 251	1082	9.164 671	1315
9.143 012	26	9.144 758	1107	9.150 726	103	9.156 137	463	9.160 391	125	9.161 065	1077	9.163 252	1082	9.164 672	1315
9.143 015	26	9.144 759	1110	9.150 727	103	9.156 138	463	9.160 391	1078	9.161 066	1077	9.163 253	1082	9.164 673	1315
9.143 031	27	9.144 760	1110	9.150 728	103	9.156 142	463	9.160 392	125	9.161 070	1077	9.163 273	1083	9.164 674	1315
9.143 032	27	9.144 761	1110	9.150 729	103	9.156 148	463	9.160 392	1078	9.161 072	1077	9.163 274	1083	9.164 675	1315
9.143 033	27	9.144 770	1110	9.150 730	103	9.156 164	463	9.160 393	125	9.161 074	1077	9.163 275	1083	9.164 676	1315
9.143 035	27	9.144 771	1110	9.150 732	103	9.156 165	463	9.160 393	1078	9.161 078	1067	9.163 280	1082	9.164 677	1315
9.143 036	27	9.144 772	1110	9.150 733	103	9.156 166	463	9.160 480	1069	9.161 079	1067	9.163 281	1082	9.164 678	1315
9.143 037	27	9.144 780	1110	9.150 800	111	9.156 167	463	9.160 481	1069	9.161 080	1067	9.163 283	1083	9.164 679	1315
9.143 040	26	9.144 781	1110	9.150 801	111	9.156 168	463	9.160 482	1069	9.161 086	1067	9.163 284	1082	9.164 680	1316
9.143 055	1405	9.144 791	1110	9.150 802	111	9.156 169	463	9.160 483	1069	9.161 098	1068	9.163 285	1076	9.164 681	1316
9.143 056	1405	9.144 801	1110	9.150 810	111	9.156 170	463	9.160 484	1069	9.161 110	1073	9.163 286	1076	9.164 682	1316
9.143 057	1405	9.144 811	1110	9.150 811	111	9.156 171	463	9.160 485	1069	9.161 120	1073	9.164 050	530	9.164 683	1316
9.143 066	1405	9.144 971	1111	9.150 812	111	9.156 172	463	9.160 486	1069	9.161 130	1073	9.164 075	530	9.164 690	1316
9.143 067	1405	9.145 020	1114	9.150 815	113	9.156 173	463	9.160 487	1069	9.161 140	1073	9.164 100	530	9.164 691	1316
9.143 090	47	9.145 705	1103	9.150 816	113	9.156 174	463	9.160 488	1069	9.161 141	1073	9.164 125	530	9.164 692	1316
9.143 471	33	9.145 706	1103	9.150 817	113	9.156 175	463	9.160 489	1069	9.161 145	1073	9.164 206	529	9.164 693	1316
9.143 473	33	9.148 099	260	9.150 820	111	9.156 176	463	9.160 490	1069	9.161 151	1074	9.164 209	529	9.165 101	115
9.143 475	33	9.148 100	260	9.151 040	1056	9.156 177	463	9.160 491	1069	9.161 155	1074	9.164 212	529	9.170 000	182
9.143 477	33	9.148 101	260	9.151 050	1056	9.156 178	463	9.160 492	1069	9.161 161	1074	9.164 215	529	9.170 001	182
9.144 024	100	9.148 104	260	9.151 051	1056	9.156 179	463	9.160 493	1069	9.161 162	1074	9.164 218	529	9.170 002	182
9.144 032	100	9.148 200	260	9.151 052	1056	9.156 180	463	9.160 494	1069	9.161 163	1074	9.164 225	529	9.170 003	182
9.144 034	100	9.148 203	260	9.151 053	1056	9.156 181	464	9.160 533	1070	9.161 164	1074	9.164 235	529	9.170 004	182
9.144 038	100	9.148 212	260	9.151 055	1055	9.156 182	464	9.160 534	1070	9.161 165	1074	9.164 306	529	9.170 005	182
9.144 041	100	9.148 216	260	9.151 106	1056	9.156 183	464	9.160 535	1070	9.161 171	1074	9.164 309	529	9.170 010	182
9.144 044	100	9.148 300	260	9.151 107	1056	9.156 184	464	9.160 536	1070	9.161 172	1074	9.164 312	529	9.170 015	1084
9.144 049	100	9.148 301	260	9.151 108	1056	9.156 185	464	9.160 537	1070	9.161 173	1074	9.164 315	529	9.170 020	1084
9.144 054	100	9.148 302	260	9.151 147	1054	9.156 186	464	9.160 543	1070	9.161 174	1074	9.164 318	529	9.170 051	181
9.144 059	100	9.149 860	407	9.151 148	1054	9.156 187	464	9.160 651	117	9.161 175	1074	9.164 355	530	9.170 051	1276
9.144 063	100	9.149 862	407	9.151 149	1054	9.156 188	464	9.160 652	117	9.161 181	1076	9.164 357	530	9.170 052	181
9.144 098	1107	9.149 872	407	9.151 155	1055	9.159 996	119	9.160 653	117	9.161 182	1076	9.164 373	530	9.170 052	1276
9.144 099	1107	9.149 873	407	9.151 171	1057	9.160 000	119	9.160 654	117	9.161 183	1076	9.164 374	530	9.170 053	181
9.144 101	1108	9.149 874	407	9.151 175	1057	9.160 001	119	9.160 655	117	9.161 184	1076	9.164 375	530	9.170 053	1276
9.144 102	1108	9.149 875	407	9.151 178	1057	9.160 004	114	9.160 656	118	9.161 185	1076	9.164 410	529	9.170 054	181
9.144 103	1107	9.149 876	407	9.151 179	1057	9.160 010	115	9.160 657	118	9.161 186	1076	9.164 411	529	9.170 054	1276
9.144 104	1107	9.149 877	407	9.151 186	1054	9.160 012	1071	9.160 658	118	9.161 187	1076	9.164 412	529	9.170 055	181
9.144 105	1108	9.149 878	407	9.151 423	1055	9.160 013	1071	9.160 659	118	9.161 188	1076	9.164 413	529	9.170 055	1276
9.144 110	1108	9.149 881	407	9.151 427	1055	9.160 014	1071	9.160 660	123	9.161 189	1076	9.164 420	529	9.170 056	181
9.144 120	1108	9.149 898	407	9.151 433	1055	9.160 020	1071	9.160 680	119	9.161 190	1076	9.164 421	529	9.170 056	1276
9.144 140	1108	9.149 902	27	9.151 442	1055	9.160 020	1281	9.160 702	1281	9.161 200	1076	9.164 422	529	9.170 057	181
9.144 150	1108	9.149 905	27	9.151 453	1055	9.160 022	1071	9.160 703	1281	9.161 208	1074	9.164 501	1312	9.170 057	1276
9.144 156	1107	9.149 906	27	9.151 509	1056	9.160 025	1071	9.160 704	1281	9.161 210	1080	9.164 502	1312	9.170 058	181
9.144 157	1107	9.149 907	27	9.151 510	1056	9.160 030	1070	9.160 705	1281	9.161 211	1080	9.164 503	1312	9.170 058	1276
9.144 201	1107	9.149 916	27	9.151 594	1055	9.160 035	1070	9.160 706	1281	9.161 215	1080	9.164 504	1312	9.170 059	181
9.144 202	1107	9.149 917	27	9.151 680	1054	9.160 036	1070	9.160 708	1281	9.161 230	1079	9.164 510	1313	9.170 059	1276
9.144 205	1107	9.149 918	27	9.151 682	1054	9.160 037	1070	9.160 710	1281	9.161 235	1079	9.164 511	1313	9.170 060	181
9.144 210	1107	9.149 919	27	9.151 688	1054	9.160 040	1070	9.160 800	1073	9.161 250	1079	9.164 512	1313	9.170 060	1276
9.144 220	1107	9.150 012	110	9.151 817	1054	9.160 041	1279	9.160 801	1073	9.161 260	1079	9.164 513	1313	9.170 061	181
9.144 240	1107	9.150 015	110	9.151 850	1076	9.160 042	1279	9.160 802	1073	9.161 270	1081	9.164 514	1313	9.170 061	1276
9.144 250	1107	9.150 018	110	9.151 851	1076	9.160 043	1279	9.160 803	1073	9.161 272	1081	9.164 515	1312	9.170 100	1276
9.144 300	1108	9.150 021	110	9.151 852	1076	9.160 050	1281	9.160 804	1073	9.161 281	1081	9.164 515	1313	9.170 141	1274
9.144 301	1108	9.150 025	110	9.151 854	1076	9.160 052	1281	9.160 805	1073	9.161 282	1081	9.164 520	1312	9.170 143	1274
9.144 302	1108	9.150 030	110	9.151 855	1076	9.160 053	1281	9.160 806	1073	9.161 283	1081	9.164 521	1312	9.170 146	1274
9.144 340	1108	9.150 050	110	9.151 856	1076	9.160 054	1281	9.160 807	1073	9.161 284	1080	9.164 522	1312	9.170 148	1274
9.144 350	1108	9.150 060	110	9.151 857	1076	9.160 055	1280	9.160 808	1073	9.161 285	1080	9.164 523	1312	9.170 151	1274
9.144 360	1108	9.150 073	111	9.151 858	1076	9.160 056	1280	9.160 809	1073	9.161 286	1080	9.164 524	1312	9.170 153	1274
9.144 361	1108	9.150 074	111	9.151 859	1076	9.160 057	1280	9.160 810	1073	9.161 287	1080	9.164 525	1312	9.170 451	1274
9.144 372	1107	9.150 080	111	9.151 860	1076	9.160 058	1280	9.160 811	1073	9.161 288	1080	9.164 526	1312	9.170 456	1274
9.144 375	1108	9.150 081	111	9.151 861	1076	9.160 061	1280	9.160 812	1073	9.161 290	1078	9.164 527	1312	9.170 460	1274
9.144 376	1108	9.150 082	111	9.151 862	1076	9.160 062	1280	9.160 813	1073	9.161 291	1080	9.164 528	1312	9.170 461	1274
9.144 385	1107	9.150 213	110	9.151 863	1076	9.160 063	1280	9.160 814	1073	9.161 292	1080	9.164 529	1312	9.170 462	1274
9.144 390	1110	9.150 218	110	9.151 864	1076	9.160 070	1070	9.160 815	1073	9.161 293	1080	9.164 530	1312	9.170 463	1274
9.144 391	1110	9.150 221	110	9.151 866	1076	9.160 072	1070	9.160 816	1073	9.161 294	1080	9.164 531	1312	9.170 464	1274
9.144 392	1110	9.150 226	110	9.151 868	1076	9.160 075	1070	9.160 817	1073	9.161 295	1079	9.164 532	1312	9.170 465	1274

9.170 466	1274	9.190 028	28	9.191 233	235	9.192 899	1121	9.193 772	40	9.196 024	652	9.197 380	65	9.198 960	444
9.170 467	1274	9.190 033	28	9.191 255	1121	9.192 907	1120	9.193 774	40	9.196 036	588	9.197 381	65	9.198 970	444
9.170 570	1274	9.190 036	28	9.191 262	1117	9.192 908	1121	9.193 776	40	9.196 036	652	9.197 382	65	9.198 980	444
9.170 571	1274	9.190 038	28	9.191 263	1117	9.192 909	1121	9.193 784	40	9.196 044	588	9.197 383	65	9.200 014	104
9.170 572	1274	9.190 101	29	9.191 265	1117	9.192 910	1121	9.193 788	40	9.196 044	652	9.197 385	65	9.200 017	104
9.170 573	1274	9.190 103	29	9.191 268	1117	9.192 911	1121	9.193 824	41	9.196 054	588	9.197 386	65	9.200 020	104
9.170 574	1274	9.190 106	29	9.191 268	1117	9.192 912	1121	9.193 836	41	9.196 054	652	9.197 391	65	9.200 022	104
9.170 575	1274	9.190 108	29	9.191 271	1117	9.192 913	1121	9.193 848	41	9.196 063	588	9.197 393	65	9.200 028	104
9.170 576	1274	9.190 111	29	9.191 272	1116	9.192 914	1121	9.193 948	41	9.196 063	652	9.197 395	65	9.200 035	104
9.170 577	1274	9.190 112	29	9.191 277	1122	9.192 915	1121	9.193 970	40	9.196 224	588	9.197 396	65	9.200 037	104
9.170 578	1274	9.190 113	29	9.191 278	1122	9.192 916	1121	9.193 971	40	9.196 224	653	9.197 400	458	9.200 114	104
9.170 579	1274	9.190 116	29	9.191 288	1117	9.192 917	1121	9.193 972	40	9.196 236	588	9.197 403	116	9.200 117	104
9.170 580	1274	9.190 121	29	9.191 310	232	9.192 918	1121	9.193 973	40	9.196 236	653	9.197 404	116	9.200 120	104
9.170 581	1274	9.190 123	29	9.191 320	233	9.192 919	1121	9.193 974	40	9.196 244	588	9.197 405	116	9.200 122	104
9.170 621	1173	9.190 126	29	9.191 321	233	9.192 920	1120	9.193 975	40	9.196 244	653	9.197 406	116	9.200 128	104
9.170 622	1173	9.190 128	29	9.191 322	233	9.192 921	1120	9.193 980	757	9.196 254	588	9.197 407	116	9.200 135	104
9.170 623	1173	9.190 133	29	9.191 330	235	9.192 922	1120	9.193 981	755	9.196 254	653	9.197 408	116	9.200 137	104
9.170 624	1173	9.190 136	29	9.191 331	235	9.192 932	1121	9.193 981	1335	9.196 263	588	9.197 424	116	9.200 150	103
9.170 701	1056	9.190 138	29	9.191 340	232	9.192 946	1120	9.193 982	755	9.196 263	653	9.197 426	116	9.200 155	103
9.171 121	123	9.190 151	29	9.191 341	232	9.192 947	1120	9.193 982	1335	9.197 001	459	9.197 431	116	9.200 160	103
9.171 122	123	9.190 153	29	9.191 342	232	9.192 948	1120	9.193 983	754	9.197 003	459	9.197 433	116	9.200 165	103
9.171 123	123	9.190 156	29	9.191 343	233	9.192 949	1120	9.193 984	754	9.197 006	458	9.197 435	116	9.200 170	103
9.171 124	123	9.190 158	29	9.191 344	233	9.192 950	1120	9.193 985	755	9.197 007	459	9.197 460	445	9.200 177	103
9.171 211	124	9.190 161	29	9.191 345	233	9.193 012	40	9.193 985	1335	9.197 009	458	9.197 461	445	9.200 181	103
9.171 213	124	9.190 162	29	9.191 346	235	9.193 018	40	9.193 986	756	9.197 011	459	9.197 462	445	9.200 182	103
9.171 214	124	9.190 163	29	9.191 347	235	9.193 024	40	9.193 987	756	9.197 013	459	9.197 463	445	9.200 183	103
9.171 215	124	9.190 166	29	9.191 348	235	9.193 112	41	9.193 988	36	9.197 019	459	9.197 464	445	9.200 184	103
9.171 217	124	9.190 171	29	9.192 387	1123	9.193 124	41	9.193 989	36	9.197 020	459	9.197 465	445	9.200 203	104
9.171 221	124	9.190 173	29	9.192 401	1122	9.193 141	37	9.193 990	35	9.197 021	458	9.197 466	445	9.200 204	104
9.171 223	124	9.190 176	29	9.192 403	1122	9.193 142	37	9.193 992	41	9.197 022	458	9.197 490	1279	9.200 205	104
9.171 224	124	9.190 178	29	9.192 404	1122	9.193 143	37	9.193 993	41	9.197 023	458	9.197 496	1279	9.200 206	104
9.171 225	124	9.190 183	29	9.192 405	1123	9.193 144	37	9.193 997	36	9.197 024	458	9.197 497	1279	9.200 207	104
9.171 311	123	9.190 186	29	9.192 406	1123	9.193 145	37	9.193 997	1335	9.197 030	459	9.197 499	1279	9.200 208	104
9.171 313	123	9.190 188	29	9.192 410	1123	9.193 146	37	9.193 998	36	9.197 031	459	9.197 502	445	9.200 220	105
9.171 314	123	9.190 200	28	9.192 415	1123	9.193 147	37	9.193 998	1335	9.197 032	459	9.197 503	445	9.200 225	105
9.171 316	123	9.190 202	28	9.192 417	1123	9.193 200	39	9.194 000	35	9.197 033	460	9.197 504	445	9.200 232	105
9.171 411	125	9.190 205	28	9.192 418	1123	9.193 201	39	9.194 001	753	9.197 034	460	9.197 505	445	9.200 243	105
9.171 414	125	9.190 305	28	9.192 420	1124	9.193 202	39	9.194 002	909	9.197 036	460	9.197 506	445	9.200 252	105
9.171 418	125	9.190 310	28	9.192 421	1124	9.193 230	38	9.194 003	909	9.197 053	456	9.197 507	445	9.200 267	105
9.171 425	125	9.190 320	28	9.192 422	1124	9.193 230	1293	9.194 004	909	9.197 053	575	9.197 508	445	9.200 269	105
9.172 025	1135	9.190 410	29	9.192 423	1124	9.193 231	38	9.194 005	46	9.197 054	456	9.197 509	445	9.200 270	105
9.172 026	1135	9.190 416	29	9.192 425	1124	9.193 231	1293	9.194 005	253	9.197 055	456	9.197 510	445	9.200 275	105
9.172 027	1135	9.190 418	29	9.192 426	1124	9.193 232	38	9.194 006	46	9.197 055	575	9.197 512	445	9.200 282	105
9.172 042	1135	9.190 508	29	9.192 427	1124	9.193 232	1293	9.194 006	253	9.197 060	456	9.197 514	445	9.200 283	105
9.172 043	1135	9.190 516	29	9.192 428	1124	9.193 233	38	9.194 007	46	9.197 101	462	9.197 515	445	9.200 292	105
9.172 044	1135	9.190 521	29	9.192 431	1124	9.193 233	1293	9.194 007	253	9.197 121	461	9.197 520	445	9.200 297	105
9.172 050	1135	9.190 524	29	9.192 434	1124	9.193 240	38	9.194 008	223	9.197 122	461	9.197 525	445	9.200 324	103
9.172 051	1135	9.190 600	30	9.192 435	1124	9.193 240	1293	9.194 009	753	9.197 124	461	9.197 530	445	9.200 327	103
9.172 052	1135	9.190 605	30	9.192 436	1124	9.193 241	38	9.194 011	619	9.197 125	461	9.197 535	445	9.200 328	103
9.172 053	1135	9.190 901	31	9.192 437	1124	9.193 241	1293	9.194 015	35	9.197 126	461	9.197 540	445	9.200 335	103
9.172 054	1135	9.190 902	31	9.192 441	1125	9.193 242	38	9.194 016	35	9.197 127	461	9.197 545	445	9.200 345	103
9.172 055	1135	9.190 903	31	9.192 442	1125	9.193 242	1293	9.194 017	35	9.197 128	461	9.197 550	445	9.200 370	105
9.172 056	1135	9.190 940	362	9.192 445	1123	9.193 243	38	9.194 021	37	9.197 129	461	9.197 560	445	9.200 372	105
9.172 060	1136	9.190 946	116	9.192 446	1124	9.193 243	1293	9.194 022	37	9.197 130	461	9.197 570	445	9.200 373	105
9.172 061	1136	9.190 964	1107	9.192 447	1124	9.193 245	38	9.194 023	37	9.197 138	461	9.197 580	445	9.200 374	105
9.172 062	1136	9.190 965	1107	9.192 448	1124	9.193 245	1293	9.194 024	37	9.197 140	461	9.197 585	446	9.200 375	105
9.172 063	1136	9.190 966	1107	9.192 501	1125	9.193 246	38	9.194 025	37	9.197 144	462	9.197 586	446	9.200 376	105
9.172 064	1136	9.190 967	1107	9.192 507	1125	9.193 246	1293	9.194 513	39	9.197 145	462	9.197 587	446	9.200 377	105
9.172 305	98	9.190 968	1107	9.192 550	1122	9.193 247	38	9.194 514	39	9.197 146	462	9.197 588	446	9.200 378	105
9.173 176	109	9.190 969	1107	9.192 551	1122	9.193 247	1293	9.194 515	39	9.197 147	462	9.197 590	446	9.200 379	105
9.180 040	151	9.190 973	1105	9.192 566	1118	9.193 248	38	9.194 516	39	9.197 149	461	9.197 591	446	9.200 380	105
9.180 050	151	9.190 974	1126	9.192 567	1118	9.193 248	1293	9.194 517	39	9.197 176	462	9.197 592	446	9.200 392	105
9.180 060	151	9.190 975	1126	9.192 568	1118	9.193 250	38	9.194 523	39	9.197 177	462	9.197 593	446	9.200 394	105
9.180 070	151	9.190 976	1125	9.192 569	1118	9.193 250	1293	9.194 524	39	9.197 179	462	9.197 594	446	9.200 412	104
9.180 080	151	9.190 977	1125	9.192 570	1118	9.193 251	38	9.194 525	39	9.197 194	461	9.197 643	446	9.200 416	104
9.180 112	151	9.190 980	1105	9.192 601	1149	9.193 251	1293	9.194 526	39	9.197 195	461	9.197 645	446	9.200 420	104
9.180 117	151	9.190 981	1105	9.192 602	1149	9.193 252	38	9.194 527	39	9.197 202	464	9.197 652	445	9.200 426	104
9.180 120	151	9.190 982	1105	9.192 605	1149	9.193 252	1293	9.194 533	39	9.197 205	464	9.197 654	445	9.200 428	104
9.180 125	151	9.190 983	1106	9.192 611	1149	9.193 253	38	9.194 534	39	9.197 206	464	9.197 655	445	9.200 430	104
9.180 130	151	9.190 984	1106	9.192 612	1149	9.193 253	1293	9.194 535	39	9.197 207	464	9.197 658	445	9.200 440	104
9.180 140	151	9.190 985	1114	9.192 615	1149	9.193 255	38	9.194 536	39	9.197 251	613	9.197 689	1311	9.200 450	104
9.180 142	151	9.191 010	234	9.192 641	1149	9.193 255	1293	9.194 537	39	9.197 252	613	9.197 717	446	9.200 518	103
9.180 150	151	9.191 036	1117	9.192 642	1149	9.193 256	38	9.194 543	39	9.197 253	613	9.197 725	446	9.200 524	103
9.180 199	151	9.191 037	1117	9.192 646	1149	9.193 256	1293	9.194 544	39	9.197 256	613	9.197 735	446	9.200 526	103
9.180 200	151	9.191 038	1117	9.192 711	1149	9.193 257	38	9.194 545	39	9.197 257	613	9.197 740	446	9.200 529	103
9.180 201	151	9.191 040	1117	9.192 712	1149	9.193 257	1293	9.194 546	39	9.197 258	613	9.197 742	446	9.200 533	103
9.180 210	152	9.191 145	234	9.192 714	1149	9.193 258	38	9.194 547	39	9.197 311	613	9.198 010	458	9.200 536	103
9.180 215	152	9.191 148	234	9.192 751	1149	9.193 258	1293	9.194 553	39	9.197 312	613	9.198 050	613	9.200 700	105
9.180 220	152	9.191 149	234	9.192 752	1149	9.193 260	38	9.194 554	39	9.197 313	613	9.198 766	444	9.200 701	105
9.180 230	152	9.191 150	222	9.192 755	1149	9.193 260	1293	9.194 555	39	9.197 314	613	9.198 767	444	9.200 702	105
9.190 001	28	9.191 155	232	9.192 761	1149	9.193 261	38	9.194 556	39	9.197 321	613	9.198 910	444	9.200 703	105
9.190 003	28	9.191 156	232	9.192 762	1149	9.193 261	1293	9.194 557	39	9.197 322	613	9.198 912	446	9.200 704	105
9.190 006	28	9.191 158	232	9.192 765	1149	9.193 262	38	9.194 563	39	9.197 323	613	9.198 919	444	9.200 705	105
9.190 008	28	9.191 213	233	9.192 892	1120	9.193 262	1293	9.194 564	39	9.197 324	613	9.198 920	444	9.200 706	105
9.190 011	28	9.191 215	233	9.192 893	1120	9.193 263	38	9.194 565	39	9.197 355	614	9.198 925	444	9.201 025	126
9.190 013	28	9.191 216	233	9.192 894	1120	9.193 263	1293	9.194 566	39	9.197 356	614	9.198 930	444	9.201 025	519
9.190 016	28	9.191 220	234	9.192 895	1120	9.193 762	40	9.194 567	39	9.197 359	614	9.198 935	444	9.201 030	126
9.190 021	28	9.191 229	233	9.192 896	1121	9.193 764	40	9.196 020	588	9.197 363	614	9.198 940	444	9.201 030	519
9.190 023	28	9.191 230	233	9.192 897	1121	9.193 766	40	9.196 020	652	9.197 364	614	9.198 945	444	9.201 035	126
9.190 026	28	9.191 231	235	9.192 898	1121	9.193 768	40	9.196 024	588	9.197 379	65	9.198 950	444	9.201 035	519

9.201 040	126	9.204 332	119	9.205 645	140	9.207 115	147	9.207 525	152	9.208 215	1003	9.209 442	632	9.220 841	115
9.201 040	519	9.204 610	122	9.205 657	140	9.207 133	144	9.207 529	152	9.208 216	142	9.209 443	632	9.220 850	114
9.201 052	126	9.205 142	139	9.205 658	140	9.207 134	144	9.207 601	148	9.208 216	1003	9.209 444	632	9.220 851	114
9.201 052	519	9.205 143	139	9.205 663	140	9.207 135	144	9.207 602	148	9.208 217	142	9.209 514	630	9.220 852	114
9.201 053	126	9.205 144	139	9.205 665	140	9.207 153	145	9.207 603	148	9.208 217	1003	9.209 517	630	9.220 853	114
9.201 053	519	9.205 145	139	9.205 668	140	9.207 154	145	9.207 611	148	9.208 218	142	9.209 518	630	9.220 940	113
9.201 055	126	9.205 146	139	9.205 672	140	9.207 155	145	9.207 612	148	9.208 218	1003	9.209 529	630	9.220 945	113
9.201 055	519	9.205 147	139	9.205 678	140	9.207 156	145	9.207 613	148	9.208 219	142	9.209 559	630	9.220 980	182
9.201 057	126	9.205 148	139	9.205 680	140	9.207 157	145	9.207 621	148	9.208 219	1003	9.209 581	630	9.220 990	183
9.201 057	519	9.205 149	139	9.205 691	140	9.207 158	145	9.207 622	148	9.208 222	142	9.209 582	630	9.221 001	1400
9.201 058	126	9.205 150	139	9.205 700	141	9.207 162	631	9.207 623	148	9.208 222	1003	9.209 714	635	9.221 002	1400
9.201 058	519	9.205 157	137	9.205 701	141	9.207 163	146	9.207 631	148	9.208 380	141	9.209 718	635	9.221 002	1404
9.201 059	126	9.205 158	137	9.205 702	141	9.207 165	146	9.207 632	148	9.208 381	141	9.209 725	635	9.221 003	1400
9.201 059	519	9.205 159	137	9.205 703	141	9.207 167	147	9.207 707	152	9.208 382	141	9.209 732	635	9.221 004	1400
9.201 061	126	9.205 160	137	9.205 704	141	9.207 168	146	9.207 708	152	9.208 383	141	9.209 735	635	9.221 005	1400
9.201 061	519	9.205 166	137	9.205 705	141	9.207 169	147	9.207 709	152	9.208 384	141	9.209 802	143	9.221 006	1400
9.201 062	126	9.205 170	137	9.205 706	141	9.207 174	147	9.207 710	152	9.208 385	141	9.209 803	143	9.221 007	1400
9.201 062	519	9.205 171	137	9.205 707	141	9.207 179	147	9.207 712	152	9.208 386	141	9.209 806	143	9.221 010	1400
9.201 065	126	9.205 173	137	9.205 708	141	9.207 182	146	9.207 713	152	9.208 387	141	9.209 807	143	9.221 011	1400
9.201 065	519	9.205 174	137	9.205 709	141	9.207 183	146	9.207 715	152	9.208 439	141	9.209 808	143	9.221 012	1400
9.201 091	125	9.205 179	137	9.205 711	140	9.207 184	146	9.207 717	152	9.208 440	141	9.209 809	143	9.221 013	1400
9.201 092	125	9.205 180	137	9.205 712	140	9.207 185	146	9.207 718	152	9.208 441	141	9.209 810	143	9.221 014	1400
9.201 093	125	9.205 184	137	9.205 713	140	9.207 189	146	9.207 720	152	9.208 442	141	9.209 816	143	9.221 015	1400
9.201 113	126	9.205 187	137	9.205 714	140	9.207 190	146	9.207 722	152	9.208 443	141	9.209 817	143	9.221 016	1400
9.201 113	518	9.205 192	137	9.205 731	140	9.207 200	148	9.207 725	152	9.208 444	141	9.209 818	143	9.221 021	1400
9.201 118	126	9.205 195	137	9.205 732	140	9.207 203	148	9.207 801	149	9.208 445	141	9.209 819	143	9.221 022	1400
9.201 118	518	9.205 200	137	9.205 733	140	9.207 205	148	9.207 811	149	9.208 930	144	9.209 820	143	9.221 023	1400
9.201 121	126	9.205 222	138	9.205 734	140	9.207 207	148	9.207 812	149	9.208 931	144	9.209 821	143	9.221 024	1400
9.201 121	518	9.205 233	138	9.205 735	140	9.207 208	148	9.207 813	149	9.208 932	144	9.209 839	143	9.221 025	1400
9.201 125	126	9.205 245	138	9.205 740	140	9.207 210	148	9.207 821	149	9.208 933	144	9.209 840	143	9.221 026	1400
9.201 125	518	9.205 246	138	9.205 741	140	9.207 221	146	9.207 822	149	9.208 935	144	9.209 841	143	9.221 040	1404
9.201 126	126	9.205 258	138	9.205 745	138	9.207 222	146	9.207 823	149	9.208 940	144	9.209 842	143	9.221 041	1404
9.201 126	518	9.205 259	138	9.205 758	138	9.207 223	146	9.207 831	149	9.208 941	144	9.209 844	144	9.221 051	1405
9.201 131	126	9.205 260	138	9.205 765	138	9.207 224	146	9.207 832	149	9.208 942	144	9.209 851	144	9.221 052	1405
9.201 131	518	9.205 265	138	9.205 769	138	9.207 225	146	9.207 833	149	9.208 943	144	9.209 852	144	9.221 053	1405
9.201 135	126	9.205 266	138	9.205 772	138	9.207 226	146	9.207 834	149	9.208 957	144	9.209 858	145	9.221 063	1404
9.201 135	518	9.205 269	138	9.205 774	138	9.207 231	148	9.207 835	149	9.209 004	631	9.209 859	145	9.221 065	1404
9.201 140	126	9.205 270	138	9.205 782	138	9.207 232	148	9.207 841	149	9.209 005	631	9.209 926	631	9.221 080	1400
9.201 140	518	9.205 273	138	9.205 784	138	9.207 233	148	9.207 842	149	9.209 006	631	9.209 927	631	9.221 081	1400
9.201 143	126	9.205 274	138	9.205 787	138	9.207 234	148	9.207 843	149	9.209 007	631	9.210 143	122	9.221 082	1400
9.201 143	518	9.205 275	138	9.205 792	138	9.207 235	148	9.207 844	149	9.209 008	631	9.220 013	113	9.221 083	1400
9.201 219	126	9.205 279	138	9.205 804	137	9.207 236	148	9.207 845	149	9.209 014	632	9.220 015	113	9.221 084	1400
9.201 219	518	9.205 280	138	9.205 805	137	9.207 241	148	9.207 846	149	9.209 018	632	9.220 018	113	9.221 085	1400
9.201 222	126	9.205 282	138	9.205 806	137	9.207 242	148	9.207 865	149	9.209 025	632	9.220 021	113	9.221 086	1400
9.201 222	518	9.205 284	138	9.205 807	137	9.207 243	148	9.207 866	149	9.209 032	632	9.220 025	113	9.221 105	1401
9.201 232	126	9.205 285	138	9.205 808	137	9.207 244	148	9.207 867	149	9.209 045	632	9.220 030	113	9.221 110	1401
9.201 232	518	9.205 287	138	9.205 809	137	9.207 245	148	9.207 869	149	9.209 065	62	9.220 115	113	9.221 111	1401
9.201 235	126	9.205 292	138	9.205 816	139	9.207 246	148	9.207 871	149	9.209 067	62	9.220 118	113	9.221 112	1401
9.201 235	518	9.205 294	138	9.205 818	139	9.207 247	148	9.207 872	149	9.209 068	62	9.220 121	113	9.221 113	1401
9.201 590	109	9.205 300	138	9.205 820	139	9.207 251	148	9.207 873	149	9.209 069	62	9.220 125	113	9.221 115	1401
9.201 596	109	9.205 301	138	9.205 823	139	9.207 252	148	9.207 874	149	9.209 075	62	9.220 201	112	9.221 116	1401
9.203 322	621	9.205 302	138	9.205 824	140	9.207 253	148	9.207 875	149	9.209 076	62	9.220 202	112	9.221 117	1401
9.203 323	621	9.205 303	138	9.205 825	140	9.207 254	148	9.208 076	413	9.209 077	62	9.220 203	112	9.221 118	1401
9.203 325	621	9.205 304	138	9.205 826	140	9.207 255	148	9.208 080	413	9.209 081	62	9.220 204	112	9.221 119	1401
9.203 328	621	9.205 305	138	9.205 827	140	9.207 256	148	9.208 081	413	9.209 083	62	9.220 205	112	9.221 120	1401
9.203 330	621	9.205 306	138	9.205 829	140	9.207 257	148	9.208 100	413	9.209 086	632	9.220 206	112	9.221 121	1403
9.203 332	621	9.205 307	138	9.205 830	140	9.207 261	147	9.208 101	413	9.209 088	632	9.220 207	112	9.221 122	1403
9.203 372	621	9.205 308	138	9.205 831	140	9.207 262	147	9.208 120	410	9.209 114	631	9.220 208	112	9.221 125	1403
9.203 373	621	9.205 309	138	9.205 833	140	9.207 263	147	9.208 121	410	9.209 114	716	9.220 210	112	9.221 126	1403
9.203 375	621	9.205 345	139	9.205 834	140	9.207 264	147	9.208 131	410	9.209 114	1321	9.220 213	112	9.221 131	1403
9.203 376	621	9.205 358	139	9.205 835	140	9.207 265	147	9.208 131	413	9.209 115	143	9.220 215	112	9.221 132	1403
9.203 377	621	9.205 359	139	9.205 836	140	9.207 270	146	9.208 201	142	9.209 118	631	9.220 218	112	9.221 172	1401
9.203 378	621	9.205 365	139	9.205 839	140	9.207 291	149	9.208 201	1003	9.209 119	143	9.220 221	112	9.221 181	1403
9.203 462	622	9.205 366	139	9.205 898	142	9.207 292	149	9.208 202	142	9.209 125	631	9.220 313	112	9.221 182	1403
9.203 463	622	9.205 369	139	9.205 899	142	9.207 293	149	9.208 202	1003	9.209 126	143	9.220 318	112	9.221 183	1403
9.203 465	622	9.205 370	139	9.205 904	150	9.207 294	149	9.208 203	142	9.209 132	631	9.220 321	112	9.221 184	1403
9.203 466	622	9.205 372	139	9.205 906	150	9.207 295	149	9.208 203	1003	9.209 133	143	9.220 363	112	9.221 185	1403
9.203 467	622	9.205 373	139	9.205 910	150	9.207 296	149	9.208 204	142	9.209 135	631	9.220 368	112	9.221 186	1403
9.203 468	622	9.205 374	139	9.205 914	150	9.207 297	149	9.208 204	1003	9.209 136	143	9.220 371	112	9.221 196	1404
9.203 482	622	9.205 379	139	9.205 918	150	9.207 298	149	9.208 205	142	9.209 146	632	9.220 415	113	9.221 210	1401
9.203 483	622	9.205 380	139	9.206 300	149	9.207 299	149	9.208 205	1003	9.209 186	632	9.220 421	113	9.221 225	1401
9.203 485	622	9.205 382	139	9.206 734	149	9.207 336	147	9.208 206	142	9.209 188	632	9.220 490	115	9.221 250	1401
9.203 486	622	9.205 384	139	9.206 735	149	9.207 338	147	9.208 206	1003	9.209 190	632	9.220 491	115	9.221 251	1401
9.203 487	622	9.205 386	139	9.206 736	149	9.207 340	147	9.208 207	142	9.209 258	632	9.220 492	115	9.221 252	1401
9.203 488	622	9.205 387	139	9.206 737	149	9.207 356	147	9.208 207	1003	9.209 260	632	9.220 493	115	9.221 255	1401
9.203 531	622	9.205 392	139	9.206 738	149	9.207 357	147	9.208 208	142	9.209 262	632	9.220 495	115	9.221 270	1470
9.203 532	622	9.205 394	139	9.206 941	141	9.207 435	152	9.208 208	1003	9.209 320	632	9.220 510	115	9.221 271	1470
9.203 533	622	9.205 397	139	9.206 944	141	9.207 436	152	9.208 209	142	9.209 322	632	9.220 515	115	9.221 272	1470
9.203 534	622	9.205 398	139	9.206 951	141	9.207 437	152	9.208 209	1003	9.209 324	632	9.220 607	115	9.221 273	1470
9.203 535	622	9.205 482	139	9.206 956	141	9.207 439	152	9.208 210	142	9.209 326	632	9.220 610	115	9.221 274	1470
9.204 206	117	9.205 492	139	9.206 957	141	9.207 440	152	9.208 210	1003	9.209 327	632	9.220 613	115	9.221 275	1470
9.204 207	117	9.205 608	140	9.206 961	141	9.207 445	152	9.208 211	142	9.209 329	632	9.220 615	115	9.221 276	1470
9.204 220	117	9.205 609	140	9.206 962	141	9.207 452	152	9.208 211	1003	9.209 331	632	9.220 616	115	9.221 277	1470
9.204 222	116	9.205 616	140	9.206 967	141	9.207 460	152	9.208 212	142	9.209 414	631	9.220 620	115	9.221 278	1471
9.204 231	116	9.205 619	140	9.206 968	141	9.207 465	152	9.208 212	1003	9.209 418	631	9.220 625	115	9.221 279	1471
9.204 232	116	9.205 621	140	9.206 973	141	9.207 510	152	9.208 213	142	9.209 425	631	9.220 630	115	9.221 280	1471
9.204 233	116	9.205 630	140	9.206 976	141	9.207 512	152	9.208 213	1003	9.209 432	631	9.220 812	114	9.221 281	1472
9.204 234	116	9.205 633	140	9.206 977	141	9.207 514	152	9.208 214	142	9.209 435	631	9.220 816	114	9.221 282	1472
9.204 235	116	9.205 634	140	9.207 113	147	9.207 517	152	9.208 214	1003	9.209 440	632	9.220 820	114	9.221 283	1472
9.204 325	118	9.205 644	140	9.207 114	147	9.207 521	152	9.208 215	142	9.209 441	632	9.220 830	114	9.221 284	1472

9.221 285	1472	9.222 062	1405	9.223 394	90	9.224 292	456	9.226 707	558	9.226 798	560	9.226 889	561	9.230 571	32
9.221 286	1471	9.222 065	1405	9.223 395	90	9.224 292	575	9.226 708	558	9.226 799	560	9.226 890	561	9.230 579	32
9.221 287	1471	9.222 070	1405	9.223 397	90	9.224 293	456	9.226 709	558	9.226 800	560	9.226 891	561	9.230 650	32
9.221 288	1471	9.222 072	1405	9.223 400	90	9.224 307	172	9.226 710	558	9.226 801	560	9.229 990	633	9.230 651	32
9.221 289	1471	9.222 075	1405	9.223 401	90	9.224 310	172	9.226 711	558	9.226 802	560	9.229 991	633	9.230 652	32
9.221 290	1471	9.222 221	1406	9.223 402	90	9.224 311	172	9.226 712	558	9.226 803	560	9.229 992	633	9.230 653	32
9.221 291	1471	9.222 222	1406	9.223 403	90	9.224 312	172	9.226 713	558	9.226 804	560	9.230 002	634	9.230 654	32
9.221 300	1402	9.222 225	1406	9.223 491	86	9.224 320	173	9.226 714	558	9.226 805	560	9.230 003	634	9.230 655	32
9.221 305	1402	9.222 230	1406	9.223 492	86	9.224 322	173	9.226 715	558	9.226 806	560	9.230 004	634	9.230 656	32
9.221 310	1402	9.222 232	1406	9.223 493	86	9.224 330	172	9.226 716	558	9.226 807	560	9.230 006	634	9.230 657	32
9.221 315	1402	9.222 235	1406	9.223 494	86	9.224 401	171	9.226 717	558	9.226 808	560	9.230 007	634	9.230 703	33
9.221 320	1402	9.222 242	1406	9.223 500	87	9.224 425	171	9.226 718	558	9.226 809	560	9.230 009	634	9.230 706	33
9.221 325	1402	9.222 245	1406	9.223 501	87	9.224 440	171	9.226 719	558	9.226 810	560	9.230 012	634	9.230 707	33
9.221 328	1402	9.222 250	1406	9.223 502	87	9.224 445	172	9.226 720	558	9.226 811	560	9.230 053	634	9.230 708	33
9.221 330	1402	9.222 252	1406	9.223 503	87	9.224 448	172	9.226 721	558	9.226 812	560	9.230 054	634	9.230 709	33
9.221 335	1402	9.222 255	1406	9.223 504	86	9.224 460	171	9.226 722	558	9.226 813	560	9.230 056	634	9.230 710	33
9.221 340	1402	9.223 110	81	9.223 505	86	9.224 470	171	9.226 723	558	9.226 814	560	9.230 057	634	9.230 712	33
9.221 345	1402	9.223 110	88	9.223 506	86	9.224 471	171	9.226 724	558	9.226 815	560	9.230 058	634	9.230 714	33
9.221 347	1402	9.223 111	81	9.223 507	86	9.224 472	171	9.226 725	558	9.226 816	560	9.230 059	634	9.230 715	33
9.221 348	1402	9.223 111	88	9.223 508	86	9.224 501	172	9.226 726	558	9.226 817	560	9.230 061	634	9.230 716	33
9.221 448	1403	9.223 112	81	9.223 701	274	9.224 502	172	9.226 727	558	9.226 818	560	9.230 062	634	9.230 718	33
9.221 448	1404	9.223 112	88	9.223 705	274	9.224 761	457	9.226 728	558	9.226 819	560	9.230 107	633	9.230 720	33
9.221 449	1403	9.223 113	81	9.223 710	274	9.224 761	575	9.226 729	558	9.226 820	560	9.230 110	633	9.230 722	33
9.221 450	1403	9.223 113	88	9.223 715	274	9.224 762	457	9.226 730	558	9.226 821	560	9.230 112	633	9.230 724	33
9.221 455	1403	9.223 114	81	9.223 721	274	9.224 762	575	9.226 731	558	9.226 822	560	9.230 114	633	9.230 726	33
9.221 460	1403	9.223 114	88	9.223 722	274	9.224 851	612	9.226 732	558	9.226 823	560	9.230 119	633	9.230 728	33
9.221 465	1403	9.223 120	81	9.223 730	274	9.224 852	612	9.226 733	558	9.226 824	560	9.230 124	633	9.230 730	33
9.221 470	1403	9.223 120	88	9.223 731	274	9.224 853	612	9.226 734	558	9.226 825	560	9.230 129	633	9.230 732	33
9.221 475	1403	9.223 152	92	9.223 741	274	9.224 854	612	9.226 735	558	9.226 826	560	9.230 145	633	9.230 734	33
9.221 480	1403	9.223 155	92	9.223 742	274	9.225 027	167	9.226 736	558	9.226 827	560	9.230 160	633	9.230 736	33
9.221 485	1403	9.223 160	92	9.223 751	274	9.225 030	167	9.226 737	558	9.226 828	560	9.230 161	633	9.230 738	33
9.221 487	1402	9.223 162	92	9.223 752	274	9.225 033	167	9.226 738	558	9.226 829	560	9.230 162	633	9.230 741	33
9.221 488	1402	9.223 165	92	9.223 756	274	9.225 081	167	9.226 739	558	9.226 830	560	9.230 163	633	9.230 745	33
9.221 489	1402	9.223 166	92	9.223 771	274	9.226 650	557	9.226 740	558	9.226 831	560	9.230 164	633	9.230 750	33
9.221 490	1402	9.223 223	88	9.223 791	274	9.226 651	557	9.226 741	558	9.226 832	560	9.230 165	633	9.230 755	33
9.221 491	1402	9.223 224	88	9.223 900	167	9.226 652	557	9.226 742	558	9.226 833	560	9.230 166	633	9.230 760	33
9.221 492	1402	9.223 225	88	9.223 901	167	9.226 653	557	9.226 743	558	9.226 834	560	9.230 167	633	9.230 765	33
9.221 493	1402	9.223 226	88	9.223 902	168	9.226 654	557	9.226 744	558	9.226 835	560	9.230 168	633	9.230 821	1293
9.221 494	1402	9.223 231	88	9.223 904	170	9.226 655	557	9.226 745	558	9.226 836	560	9.230 203	32	9.230 822	1293
9.221 590	1403	9.223 232	88	9.223 905	170	9.226 656	557	9.226 746	558	9.226 837	560	9.230 205	32	9.230 823	1293
9.221 603	1404	9.223 233	88	9.223 906	170	9.226 657	557	9.226 747	558	9.226 838	560	9.230 208	32	9.230 824	1293
9.221 607	1402	9.223 234	88	9.223 907	173	9.226 658	557	9.226 748	558	9.226 839	560	9.230 210	32	9.230 825	1293
9.221 609	1402	9.223 236	89	9.223 913	171	9.226 659	557	9.226 750	559	9.226 840	560	9.230 212	32	9.230 826	1293
9.221 620	1402	9.223 237	89	9.223 915	169	9.226 660	557	9.226 751	559	9.226 841	560	9.230 214	32	9.230 827	1293
9.221 621	1402	9.223 238	89	9.223 916	173	9.226 661	557	9.226 752	559	9.226 842	560	9.230 217	32	9.230 828	1293
9.221 622	1402	9.223 239	89	9.223 917	173	9.226 662	557	9.226 753	559	9.226 843	560	9.230 218	32	9.230 829	1293
9.221 623	1402	9.223 240	89	9.223 918	174	9.226 663	557	9.226 754	559	9.226 844	560	9.230 221	32	9.230 830	1293
9.221 624	1402	9.223 252	89	9.223 919	174	9.226 664	557	9.226 755	559	9.226 845	560	9.230 223	32	9.230 831	1293
9.221 625	1402	9.223 255	89	9.224 000	458	9.226 665	557	9.226 756	559	9.226 846	560	9.230 226	32	9.230 832	1293
9.221 626	1402	9.223 340	89	9.224 026	456	9.226 666	557	9.226 757	559	9.226 847	560	9.230 229	32	9.230 833	1293
9.221 650	1405	9.223 341	89	9.224 026	575	9.226 667	557	9.226 758	559	9.226 848	560	9.230 231	32	9.230 834	1293
9.221 692	1401	9.223 342	89	9.224 028	456	9.226 668	557	9.226 759	559	9.226 850	561	9.230 236	32	9.230 835	1293
9.221 693	1401	9.223 343	89	9.224 028	575	9.226 669	557	9.226 760	559	9.226 851	561	9.230 241	32	9.230 836	1293
9.221 694	1401	9.223 344	89	9.224 031	456	9.226 670	557	9.226 761	559	9.226 852	561	9.230 247	32	9.230 837	1293
9.221 695	1401	9.223 345	89	9.224 031	575	9.226 671	557	9.226 762	559	9.226 853	561	9.230 250	32	9.231 010	1288
9.221 707	1402	9.223 346	89	9.224 032	456	9.226 672	557	9.226 763	559	9.226 854	561	9.230 256	32	9.231 012	1288
9.221 709	1402	9.223 347	89	9.224 032	575	9.226 673	557	9.226 764	559	9.226 855	561	9.230 260	32	9.231 015	1288
9.221 720	1402	9.223 348	89	9.224 033	456	9.226 674	557	9.226 765	559	9.226 856	561	9.230 264	32	9.231 017	1288
9.221 721	1402	9.223 349	89	9.224 033	575	9.226 675	557	9.226 766	559	9.226 857	561	9.230 271	32	9.231 019	1288
9.221 722	1402	9.223 350	89	9.224 041	165	9.226 676	557	9.226 767	559	9.226 858	561	9.230 279	32	9.231 022	1288
9.221 723	1402	9.223 351	89	9.224 042	165	9.226 677	557	9.226 768	559	9.226 859	561	9.230 287	32	9.231 024	1288
9.221 724	1402	9.223 354	89	9.224 043	165	9.226 678	557	9.226 769	559	9.226 860	561	9.230 294	32	9.231 032	1288
9.221 726	1402	9.223 355	89	9.224 044	165	9.226 679	557	9.226 770	559	9.226 861	561	9.230 481	32	9.231 042	1288
9.221 735	1402	9.223 356	89	9.224 045	165	9.226 680	557	9.226 771	559	9.226 862	561	9.230 482	32	9.231 052	1288
9.221 801	1470	9.223 357	89	9.224 051	166	9.226 681	557	9.226 772	559	9.226 863	561	9.230 483	32	9.231 072	1288
9.221 802	1470	9.223 358	89	9.224 054	166	9.226 682	557	9.226 773	559	9.226 864	561	9.230 484	32	9.231 077	1288
9.221 803	1470	9.223 359	89	9.224 115	165	9.226 683	557	9.226 774	559	9.226 865	561	9.230 485	32	9.231 082	1288
9.221 804	1470	9.223 360	89	9.224 126	165	9.226 684	557	9.226 775	559	9.226 866	561	9.230 486	32	9.231 100	1289
9.221 805	1470	9.223 370	90	9.224 127	165	9.226 685	557	9.226 776	559	9.226 867	561	9.230 487	32	9.231 101	1289
9.221 806	1470	9.223 371	90	9.224 130	165	9.226 686	557	9.226 777	559	9.226 868	561	9.230 488	32	9.231 102	1289
9.221 807	1470	9.223 372	90	9.224 135	165	9.226 687	557	9.226 778	559	9.226 869	561	9.230 503	32	9.231 103	1289
9.221 808	1470	9.223 373	90	9.224 226	165	9.226 688	557	9.226 779	559	9.226 870	561	9.230 505	32	9.231 104	1289
9.221 809	1470	9.223 374	90	9.224 227	165	9.226 689	557	9.226 780	559	9.226 871	561	9.230 508	32	9.231 105	1289
9.221 831	1403	9.223 375	90	9.224 230	165	9.226 690	557	9.226 781	559	9.226 872	561	9.230 510	32	9.231 106	1289
9.221 832	1403	9.223 376	90	9.224 252	167	9.226 691	557	9.226 782	559	9.226 873	561	9.230 512	32	9.231 107	1289
9.221 833	1403	9.223 377	90	9.224 253	167	9.226 692	558	9.226 783	559	9.226 874	561	9.230 514	32	9.231 108	1289
9.221 834	1403	9.223 378	90	9.224 254	167	9.226 693	558	9.226 784	559	9.226 875	561	9.230 517	32	9.231 120	1288
9.221 835	1403	9.223 379	90	9.224 258	168	9.226 694	558	9.226 785	559	9.226 876	561	9.230 518	32	9.231 130	1288
9.221 836	1403	9.223 380	90	9.224 263	168	9.226 695	558	9.226 786	559	9.226 877	561	9.230 521	32	9.231 140	1288
9.221 837	1403	9.223 381	90	9.224 264	168	9.226 696	558	9.226 787	559	9.226 878	561	9.230 523	32	9.231 150	1288
9.221 838	1403	9.223 384	90	9.224 266	456	9.226 697	558	9.226 788	559	9.226 879	561	9.230 526	32	9.231 178	1288
9.221 839	1403	9.223 385	90	9.224 266	575	9.226 698	558	9.226 789	559	9.226 880	561	9.230 529	32	9.231 185	1288
9.221 840	1403	9.223 386	90	9.224 267	170	9.226 699	558	9.226 790	559	9.226 881	561	9.230 531	32	9.231 190	1288
9.222 021	1405	9.223 387	90	9.224 268	168	9.226 700	558	9.226 791	559	9.226 882	561	9.230 536	32	9.231 205	34
9.222 022	1405	9.223 388	90	9.224 269	168	9.226 701	558	9.226 792	560	9.226 883	561	9.230 541	32	9.231 207	34
9.222 025	1405	9.223 389	90	9.224 274	169	9.226 702	558	9.226 793	560	9.226 884	561	9.230 547	32	9.231 209	34
9.222 030	1405	9.223 390	90	9.224 278	169	9.226 703	558	9.226 794	560	9.226 885	561	9.230 550	32	9.231 210	34
9.222 032	1405	9.223 391	90	9.224 284	133	9.226 704	558	9.226 795	560	9.226 886	561	9.230 556	32	9.231 211	34
9.222 035	1405	9.223 392	90	9.224 289	133	9.226 705	558	9.226 796	560	9.226 887	561	9.230 560	32	9.231 212	34
9.222 061	1405	9.223 393	90	9.224 291	168	9.226 706	558	9.226 797	560	9.226 888	561	9.230 564	32	9.231 213	34

9.231 214	34	9.231 512	31	9.234 513	810	9.236 714	369	9.250 308	107	9.251 193	94	9.252 331	725	9.264 101	251
9.231 215	34	9.231 514	31	9.234 514	810	9.236 720	363	9.250 310	107	9.251 194	94	9.252 332	725	9.264 101	1132
9.231 218	34	9.231 516	31	9.234 515	810	9.236 721	363	9.250 313	107	9.251 195	94	9.252 333	725	9.264 102	251
9.231 220	34	9.231 518	31	9.234 990	365	9.236 722	363	9.250 314	107	9.251 196	94	9.252 334	725	9.264 102	1132
9.231 225	34	9.231 520	31	9.235 120	368	9.236 723	363	9.250 316	107	9.251 197	94	9.252 335	725	9.264 103	251
9.231 226	34	9.231 522	31	9.235 135	396	9.236 724	363	9.250 319	107	9.251 200	93	9.252 338	725	9.264 103	1132
9.231 229	34	9.231 530	31	9.235 145	392	9.236 725	363	9.250 327	107	9.251 201	93	9.252 339	725	9.264 104	252
9.231 231	34	9.231 532	31	9.235 245	363	9.236 726	363	9.250 340	108	9.251 202	93	9.252 340	725	9.264 104	1133
9.231 232	34	9.231 534	31	9.235 250	363	9.236 727	363	9.250 350	108	9.251 203	93	9.252 341	725	9.264 105	252
9.231 233	34	9.231 535	31	9.235 255	363	9.236 728	363	9.250 351	108	9.251 204	93	9.252 342	725	9.264 105	1133
9.231 234	34	9.231 536	31	9.235 260	363	9.236 729	363	9.250 389	107	9.251 205	93	9.252 343	725	9.264 106	252
9.231 237	34	9.231 541	31	9.235 265	363	9.236 783	364	9.250 390	107	9.251 208	95	9.252 344	725	9.264 106	1133
9.231 238	34	9.231 660	33	9.235 275	363	9.236 784	364	9.250 391	107	9.251 210	95	9.252 345	725	9.264 146	245
9.231 240	34	9.231 660	1289	9.235 276	363	9.236 785	364	9.250 392	107	9.251 212	95	9.252 348	725	9.264 147	245
9.231 245	34	9.231 661	33	9.235 277	363	9.236 786	364	9.250 393	107	9.251 215	95	9.252 349	725	9.264 148	249
9.231 270	31	9.231 661	1289	9.235 278	363	9.236 787	364	9.250 394	107	9.251 220	95	9.252 500	725	9.264 149	249
9.231 271	31	9.231 662	33	9.235 279	363	9.236 788	364	9.250 399	108	9.251 225	95	9.252 501	725	9.264 160	242
9.231 272	31	9.231 662	1289	9.235 505	364	9.236 789	364	9.250 400	108	9.251 237	93	9.252 502	725	9.264 163	243
9.231 273	31	9.231 663	33	9.235 510	364	9.236 790	364	9.250 401	108	9.251 241	93	9.252 503	725	9.264 164	242
9.231 274	31	9.231 663	1289	9.235 525	364	9.236 800	364	9.250 402	108	9.251 248	93	9.252 504	725	9.264 165	244
9.231 275	31	9.231 664	33	9.235 536	364	9.236 801	364	9.250 403	108	9.251 307	95	9.252 505	725	9.264 170	242
9.231 276	31	9.231 664	1289	9.235 545	364	9.236 810	401	9.250 404	108	9.251 311	95	9.252 506	725	9.264 171	243
9.231 277	31	9.231 665	33	9.235 546	364	9.236 811	401	9.250 405	108	9.251 316	95	9.252 507	725	9.264 172	242
9.231 278	31	9.231 665	1289	9.235 547	364	9.236 812	401	9.250 406	108	9.251 319	95	9.253 006	760	9.264 174	243
9.231 279	31	9.231 666	33	9.235 548	364	9.236 813	401	9.250 407	108	9.251 323	96	9.253 008	760	9.264 175	243
9.231 326	1292	9.231 666	1289	9.235 549	364	9.236 814	401	9.250 630	110	9.251 332	96	9.253 131	606	9.264 180	249
9.231 327	1292	9.231 667	33	9.235 550	364	9.236 815	401	9.250 635	110	9.251 338	96	9.253 135	606	9.264 181	249
9.231 328	1292	9.231 667	1289	9.235 663	366	9.236 816	401	9.250 640	110	9.251 340	96	9.253 140	606	9.264 190	250
9.231 329	1292	9.231 668	33	9.235 664	366	9.236 817	401	9.250 650	110	9.251 341	96	9.253 406	1076	9.264 191	250
9.231 330	1292	9.231 668	1289	9.235 665	366	9.236 818	401	9.250 660	110	9.251 342	96	9.253 412	1076	9.268 100	408
9.231 331	1292	9.231 669	33	9.235 666	366	9.236 819	401	9.250 665	110	9.251 343	96	9.260 020	391	9.268 101	408
9.231 332	1292	9.231 669	1289	9.235 667	366	9.236 840	405	9.250 670	110	9.251 391	94	9.260 150	392	9.268 103	408
9.231 333	1292	9.231 670	33	9.235 668	366	9.236 841	405	9.250 680	110	9.251 392	94	9.260 178	394	9.268 110	408
9.231 334	1292	9.231 670	1289	9.235 669	366	9.236 842	405	9.250 900	106	9.251 393	94	9.260 179	394	9.268 111	408
9.231 335	1292	9.231 671	33	9.235 670	366	9.236 843	405	9.250 901	106	9.251 394	94	9.260 181	394	9.268 113	408
9.231 336	1292	9.231 671	1289	9.235 671	366	9.236 844	405	9.250 902	106	9.251 395	94	9.260 184	393	9.268 120	408
9.231 337	1292	9.231 672	33	9.235 672	366	9.236 845	405	9.250 903	106	9.251 396	94	9.260 186	393	9.268 121	408
9.231 338	1292	9.231 672	1289	9.235 673	366	9.236 846	405	9.250 904	106	9.251 550	97	9.260 187	393	9.268 123	408
9.231 339	1292	9.231 673	33	9.235 674	366	9.236 847	405	9.250 905	106	9.251 551	97	9.260 188	392	9.268 130	408
9.231 340	1292	9.231 673	1289	9.235 675	366	9.236 848	405	9.250 906	106	9.251 552	97	9.260 189	394	9.268 131	408
9.231 341	1292	9.231 674	33	9.235 676	366	9.236 849	405	9.250 907	106	9.251 553	97	9.262 005	389	9.268 133	408
9.231 342	1292	9.231 674	1289	9.235 677	366	9.241 131	368	9.250 910	106	9.251 554	97	9.262 010	389	9.268 140	408
9.231 345	1292	9.231 675	33	9.235 678	366	9.241 134	367	9.250 911	106	9.251 555	97	9.262 062	390	9.268 210	408
9.231 347	1292	9.231 675	1289	9.235 679	366	9.242 340	367	9.250 912	106	9.251 556	97	9.262 071	393	9.268 213	408
9.231 369	1292	9.231 676	33	9.235 680	366	9.243 100	372	9.250 913	106	9.251 557	97	9.262 080	391	9.268 220	408
9.231 372	1292	9.231 676	1289	9.235 681	366	9.243 101	372	9.250 914	106	9.251 558	96	9.262 111	391	9.268 223	408
9.231 374	1292	9.231 677	33	9.235 682	366	9.243 102	373	9.250 915	106	9.251 559	622	9.262 205	390	9.268 230	408
9.231 375	1292	9.231 677	1289	9.235 683	366	9.243 111	373	9.250 916	106	9.251 560	97	9.262 210	390	9.268 233	408
9.231 377	1292	9.231 678	33	9.235 684	366	9.243 112	373	9.250 920	106	9.251 561	97	9.262 410	389	9.268 301	408
9.231 379	1292	9.231 678	1289	9.235 685	366	9.243 113	373	9.250 921	106	9.251 602	94	9.262 411	389	9.268 303	408
9.231 381	1292	9.231 679	33	9.235 686	366	9.243 114	373	9.250 922	106	9.251 605	94	9.262 510	389	9.268 310	408
9.231 385	1292	9.231 679	1289	9.235 705	364	9.243 165	368	9.250 923	106	9.251 610	94	9.262 520	391	9.268 313	408
9.231 388	1292	9.231 680	33	9.235 708	364	9.246 002	367	9.250 924	106	9.251 615	94	9.262 521	391	9.268 320	408
9.231 403	1292	9.231 680	1289	9.235 710	364	9.246 003	367	9.250 925	106	9.251 620	94	9.262 530	391	9.268 323	408
9.231 404	1292	9.231 681	33	9.235 720	364	9.246 004	367	9.250 930	106	9.251 625	94	9.262 605	213	9.268 330	408
9.231 413	1292	9.231 681	1289	9.236 021	365	9.246 005	367	9.250 931	106	9.251 630	94	9.262 606	213	9.268 333	408
9.231 414	1292	9.231 682	33	9.236 022	365	9.246 006	367	9.250 932	106	9.251 635	94	9.263 004	99	9.268 340	408
9.231 421	1292	9.231 682	1289	9.236 023	365	9.246 310	367	9.250 933	106	9.251 640	95	9.263 005	99	9.268 790	408
9.231 422	1292	9.231 683	33	9.236 024	365	9.246 311	367	9.250 934	106	9.251 645	95	9.263 006	99	9.269 420	408
9.231 423	1292	9.231 683	1289	9.236 025	365	9.246 312	367	9.250 935	106	9.251 650	95	9.263 007	99	9.269 480	409
9.231 424	1292	9.231 684	33	9.236 026	365	9.246 313	367	9.250 936	106	9.251 655	95	9.263 008	99	9.270 100	973
9.231 425	1292	9.231 684	1289	9.236 027	365	9.246 314	367	9.250 937	106	9.251 660	95	9.263 009	99	9.270 101	973
9.231 426	1292	9.232 994	443	9.236 028	365	9.246 315	367	9.250 940	109	9.251 665	95	9.263 010	99	9.270 102	973
9.231 427	1292	9.232 994	575	9.236 601	365	9.246 316	367	9.250 941	109	9.251 720	95	9.263 011	99	9.270 103	973
9.231 428	1292	9.232 996	443	9.236 602	365	9.246 317	367	9.250 942	109	9.251 725	95	9.263 012	99	9.270 104	973
9.231 429	1292	9.232 998	443	9.236 603	365	9.246 318	367	9.250 943	109	9.251 730	95	9.263 013	99	9.270 115	974
9.231 435	1292	9.232 999	443	9.236 604	365	9.246 319	367	9.251 003	93	9.251 735	95	9.263 015	99	9.270 116	974
9.231 436	1292	9.233 000	443	9.236 605	365	9.250 030	107	9.251 005	93	9.251 740	95	9.263 020	99	9.270 117	974
9.231 437	1292	9.233 010	868	9.236 606	365	9.250 035	107	9.251 007	93	9.251 741	95	9.263 025	99	9.270 118	974
9.231 438	1292	9.233 015	868	9.236 607	365	9.250 040	107	9.251 011	93	9.251 814	96	9.263 424	99	9.270 119	974
9.231 441	1292	9.233 110	868	9.236 608	365	9.250 045	107	9.251 016	93	9.251 819	96	9.263 432	99	9.270 120	974
9.231 442	1292	9.233 115	868	9.236 609	365	9.250 050	107	9.251 019	93	9.251 829	96	9.263 434	99	9.270 121	975
9.231 443	1292	9.233 125	868	9.236 610	365	9.250 060	107	9.251 023	93	9.252 022	724	9.263 441	99	9.270 122	975
9.231 444	1292	9.233 210	868	9.236 611	365	9.250 070	107	9.251 123	93	9.252 027	725	9.263 446	99	9.270 125	975
9.231 445	1292	9.233 215	868	9.236 612	365	9.250 130	107	9.251 128	93	9.252 028	724	9.263 452	99	9.270 144	975
9.231 446	1292	9.233 225	868	9.236 613	365	9.250 135	107	9.251 133	93	9.252 034	724	9.263 457	99	9.270 147	975
9.231 447	1292	9.233 315	868	9.236 614	365	9.250 140	107	9.251 138	93	9.252 044	724	9.263 461	99	9.270 148	975
9.231 448	1292	9.233 325	868	9.236 615	365	9.250 145	107	9.251 141	93	9.252 045	725	9.263 466	99	9.270 155	974
9.231 449	1292	9.233 345	868	9.236 700	371	9.250 150	107	9.251 146	93	9.252 054	724	9.263 470	99	9.270 156	974
9.231 456	1291	9.233 347	868	9.236 701	369	9.250 160	107	9.251 157	93	9.252 055	725	9.263 471	99	9.270 157	974
9.231 457	1291	9.233 365	868	9.236 703	369	9.250 170	107	9.251 161	93	9.252 070	725	9.263 472	99	9.270 158	974
9.231 458	1291	9.233 367	868	9.236 704	371	9.250 180	107	9.251 169	93	9.252 090	725	9.263 473	99	9.270 159	974
9.231 460	1292	9.233 369	868	9.236 705	371	9.250 225	107	9.251 185	94	9.252 110	725	9.263 474	99	9.270 160	974
9.231 461	1292	9.233 371	868	9.236 707	369	9.250 230	107	9.251 186	94	9.252 125	725	9.263 475	99	9.270 161	973
9.231 462	1292	9.233 400	868	9.236 708	372	9.250 235	107	9.251 187	94	9.252 150	725	9.263 476	99	9.270 162	973
9.231 463	1292	9.234 253	868	9.236 709	372	9.250 240	107	9.251 188	94	9.252 185	725	9.263 477	99	9.270 163	973
9.231 464	1292	9.234 254	868	9.236 710	369	9.250 245	107	9.251 189	94	9.252 240	725	9.263 526	99	9.270 164	973
9.231 465	1292	9.234 510	810	9.236 711	369	9.250 250	107	9.251 190	94	9.252 270	725	9.263 528	99	9.270 165	973
9.231 466	1292	9.234 511	810	9.236 712	369	9.250 260	107	9.251 191	94	9.252 320	725	9.263 530	99	9.270 166	973
9.231 510	31	9.234 512	810	9.236 713	369	9.250 306	107	9.251 192	94	9.252 330	725	9.263 532	99	9.270 167	973

9.270 168	973	9.272 110	891	9.273 111	887	9.274 008	874	9.274 791	875	9.276 449	881	9.276 652	879	9.277 025	886
9.270 169	973	9.272 111	891	9.273 112	887	9.274 020	874	9.274 792	875	9.276 450	881	9.276 653	879	9.277 050	886
9.270 536	978	9.272 112	891	9.273 113	887	9.274 028	874	9.274 793	875	9.276 451	881	9.276 679	880	9.277 100	886
9.270 538	978	9.272 113	891	9.273 114	887	9.274 038	874	9.274 794	875	9.276 452	881	9.276 680	880	9.277 105	886
9.270 540	978	9.272 114	891	9.273 115	887	9.274 048	874	9.274 795	875	9.276 453	881	9.276 681	880	9.277 110	886
9.270 542	978	9.272 115	891	9.273 116	887	9.274 054	874	9.274 796	875	9.276 454	881	9.276 682	880	9.277 120	886
9.270 734	978	9.272 116	891	9.273 117	887	9.274 062	874	9.274 797	875	9.276 455	881	9.276 683	880	9.277 125	886
9.270 737	978	9.272 117	891	9.273 118	887	9.274 064	874	9.274 870	877	9.276 456	881	9.276 684	880	9.277 150	886
9.270 738	978	9.272 118	891	9.273 119	887	9.274 071	874	9.275 008	878	9.276 457	881	9.276 685	880	9.277 305	401
9.270 764	978	9.272 121	892	9.273 121	889	9.274 072	874	9.275 020	878	9.276 460	883	9.276 686	880	9.277 310	401
9.270 767	978	9.272 122	892	9.273 122	889	9.274 073	874	9.275 028	878	9.276 461	883	9.276 687	880	9.277 325	401
9.270 768	978	9.272 124	892	9.273 123	889	9.274 074	874	9.275 038	878	9.276 462	883	9.276 688	880	9.277 350	401
9.270 780	977	9.272 125	892	9.273 125	889	9.274 075	874	9.275 048	878	9.276 463	883	9.276 689	880	9.277 400	401
9.270 785	977	9.272 127	892	9.273 127	889	9.274 076	874	9.275 054	878	9.276 464	883	9.276 690	880	9.277 410	401
9.270 905	978	9.272 129	892	9.273 132	889	9.274 077	874	9.275 062	878	9.276 465	883	9.276 691	880	9.277 425	401
9.270 915	978	9.272 131	892	9.273 133	889	9.274 080	876	9.275 070	877	9.276 470	880	9.276 692	880	9.277 450	401
9.270 921	974	9.272 250	891	9.273 134	889	9.274 081	876	9.275 071	877	9.276 471	880	9.276 693	880	9.277 500	401
9.270 922	974	9.272 251	891	9.273 135	889	9.274 082	876	9.275 072	877	9.276 472	880	9.276 694	880	9.280 000	908
9.270 923	974	9.272 252	891	9.273 138	889	9.274 083	876	9.275 073	877	9.276 473	880	9.276 695	880	9.280 001	908
9.270 924	974	9.272 253	891	9.273 220	888	9.274 084	876	9.275 074	877	9.276 474	880	9.276 696	880	9.280 002	908
9.270 925	974	9.272 254	891	9.273 221	888	9.274 085	876	9.275 075	877	9.276 475	880	9.276 697	880	9.280 003	908
9.270 990	980	9.272 255	891	9.273 222	888	9.274 086	876	9.275 076	877	9.276 476	880	9.276 698	880	9.280 004	908
9.270 995	979	9.272 256	891	9.273 223	888	9.274 105	872	9.275 080	878	9.276 477	880	9.276 699	882	9.280 005	908
9.271 053	976	9.272 260	887	9.273 224	888	9.274 108	872	9.275 081	878	9.276 478	880	9.276 700	882	9.280 006	908
9.271 055	976	9.272 261	887	9.273 225	888	9.274 120	872	9.275 082	878	9.276 479	880	9.276 701	882	9.280 007	908
9.271 056	976	9.272 262	887	9.273 226	888	9.274 128	872	9.275 083	878	9.276 480	880	9.276 702	882	9.280 008	908
9.271 058	976	9.272 263	887	9.273 232	890	9.274 138	872	9.275 084	878	9.276 481	880	9.276 703	882	9.280 009	908
9.271 082	976	9.272 264	887	9.273 233	890	9.274 148	872	9.275 085	878	9.276 482	880	9.276 704	882	9.280 011	909
9.271 084	976	9.272 265	887	9.273 235	890	9.274 154	872	9.275 086	878	9.276 483	880	9.276 705	882	9.280 012	910
9.271 085	976	9.272 267	887	9.273 236	890	9.274 162	872	9.275 208	878	9.276 484	880	9.276 706	882	9.280 013	953
9.271 086	976	9.272 268	887	9.273 238	890	9.274 164	872	9.275 220	878	9.276 485	880	9.276 707	882	9.280 014	909
9.271 087	976	9.272 269	887	9.273 239	890	9.274 170	872	9.275 228	878	9.276 486	880	9.276 708	882	9.280 030	915
9.271 088	976	9.272 270	887	9.273 257	889	9.274 171	872	9.275 238	878	9.276 487	880	9.276 709	882	9.280 031	915
9.271 332	981	9.272 350	892	9.273 258	889	9.274 172	872	9.275 248	878	9.276 488	880	9.276 710	882	9.280 032	915
9.271 333	981	9.272 351	892	9.273 259	889	9.274 173	872	9.275 254	878	9.276 489	880	9.276 711	882	9.280 033	915
9.271 334	981	9.272 352	892	9.273 260	889	9.274 174	872	9.275 262	878	9.276 500	883	9.276 712	882	9.280 034	915
9.271 335	981	9.272 353	892	9.273 261	889	9.274 175	872	9.275 738	18	9.276 501	883	9.276 713	882	9.280 035	915
9.271 338	981	9.272 354	892	9.273 262	889	9.274 176	872	9.275 740	18	9.276 502	883	9.276 714	882	9.280 036	915
9.271 980	897	9.272 355	892	9.273 263	889	9.274 177	872	9.275 742	18	9.276 503	883	9.276 715	884	9.280 037	915
9.271 985	897	9.272 358	892	9.273 264	889	9.274 178	872	9.275 744	18	9.276 504	883	9.276 716	884	9.280 038	915
9.271 986	897	9.272 359	892	9.273 265	889	9.274 180	872	9.275 746	18	9.276 505	883	9.276 717	884	9.280 039	915
9.272 000	893	9.272 366	894	9.273 266	889	9.274 181	872	9.275 748	18	9.276 506	883	9.276 718	884	9.280 040	910
9.272 001	893	9.272 367	894	9.273 268	889	9.274 182	872	9.275 772	18	9.276 507	883	9.276 719	884	9.280 041	910
9.272 002	893	9.272 368	894	9.273 269	889	9.274 183	872	9.275 773	18	9.276 508	883	9.276 720	884	9.280 042	910
9.272 003	893	9.272 369	894	9.273 270	887	9.274 184	872	9.275 775	18	9.276 509	883	9.276 733	884	9.280 043	910
9.272 004	893	9.272 370	894	9.273 271	887	9.274 185	872	9.275 776	18	9.276 510	883	9.276 734	884	9.280 044	910
9.272 005	893	9.272 371	894	9.273 272	887	9.274 186	872	9.275 777	18	9.276 511	883	9.276 735	884	9.280 045	910
9.272 006	893	9.272 372	894	9.273 273	887	9.274 187	872	9.275 778	18	9.276 512	883	9.276 736	884	9.280 046	910
9.272 007	893	9.272 373	894	9.273 276	887	9.274 188	872	9.275 779	18	9.276 513	883	9.276 737	884	9.280 047	910
9.272 008	893	9.272 374	894	9.273 280	887	9.274 190	875	9.275 850	15	9.276 514	883	9.276 738	884	9.280 050	911
9.272 009	893	9.272 375	894	9.273 281	887	9.274 191	875	9.275 852	15	9.276 590	886	9.276 739	884	9.280 051	911
9.272 016	893	9.272 376	894	9.273 282	887	9.274 192	875	9.276 002	879	9.276 591	886	9.276 758	881	9.280 052	911
9.272 017	893	9.272 377	894	9.273 284	887	9.274 193	875	9.276 003	879	9.276 592	886	9.276 759	881	9.280 053	911
9.272 018	893	9.272 380	891	9.273 286	887	9.274 194	875	9.276 004	879	9.276 593	886	9.276 760	881	9.280 054	911
9.272 019	893	9.272 381	891	9.273 288	887	9.274 195	875	9.276 006	879	9.276 594	886	9.276 761	881	9.280 055	911
9.272 020	893	9.272 382	891	9.273 301	895	9.274 196	875	9.276 007	879	9.276 595	886	9.276 762	881	9.280 056	911
9.272 021	893	9.272 383	891	9.273 302	895	9.274 197	875	9.276 008	879	9.276 600	879	9.276 763	881	9.280 057	911
9.272 022	893	9.272 384	891	9.273 305	895	9.274 198	873	9.276 010	972	9.276 601	879	9.276 764	881	9.280 060	911
9.272 023	893	9.272 385	891	9.273 310	895	9.274 199	873	9.276 011	972	9.276 602	879	9.276 765	881	9.280 061	911
9.272 024	893	9.272 387	891	9.273 320	895	9.274 200	873	9.276 012	972	9.276 603	879	9.276 766	881	9.280 062	911
9.272 025	893	9.272 388	891	9.273 325	895	9.274 201	873	9.276 013	972	9.276 604	879	9.276 767	881	9.280 063	911
9.272 026	893	9.272 389	891	9.273 350	895	9.274 202	873	9.276 243	883	9.276 605	879	9.276 768	881	9.280 065	912
9.272 027	893	9.272 390	891	9.273 399	895	9.274 203	873	9.276 246	883	9.276 606	879	9.276 769	881	9.280 066	912
9.272 028	893	9.272 391	891	9.273 826	899	9.274 204	873	9.276 247	883	9.276 607	879	9.276 770	881	9.280 089	935
9.272 031	895	9.272 392	891	9.273 827	899	9.274 206	873	9.276 248	883	9.276 608	879	9.276 818	886	9.280 090	935
9.272 032	895	9.272 507	895	9.273 836	899	9.274 207	873	9.276 249	883	9.276 609	879	9.276 820	886	9.280 091	935
9.272 033	895	9.272 510	895	9.273 837	899	9.274 408	876	9.276 250	883	9.276 610	879	9.276 828	886	9.280 092	935
9.272 034	895	9.272 512	895	9.273 838	899	9.274 409	876	9.276 251	883	9.276 611	879	9.276 838	886	9.280 093	935
9.272 036	895	9.272 513	895	9.273 848	900	9.274 410	876	9.276 252	883	9.276 612	879	9.276 848	886	9.280 094	935
9.272 037	895	9.273 001	890	9.273 849	900	9.274 411	876	9.276 253	883	9.276 613	879	9.276 854	886	9.280 095	935
9.272 069	894	9.273 002	890	9.273 850	900	9.274 412	876	9.276 254	883	9.276 614	879	9.276 862	886	9.280 096	935
9.272 070	894	9.273 003	890	9.273 851	900	9.274 413	876	9.276 255	883	9.276 620	882	9.276 880	884	9.280 097	935
9.272 071	894	9.273 005	890	9.273 852	900	9.274 414	876	9.276 260	881	9.276 621	882	9.276 885	884	9.280 099	935
9.272 072	894	9.273 007	890	9.273 853	900	9.274 415	876	9.276 261	881	9.276 622	882	9.276 887	884	9.280 100	914
9.272 073	894	9.273 012	890	9.273 860	900	9.274 420	876	9.276 262	881	9.276 623	882	9.276 919	885	9.280 101	914
9.272 074	894	9.273 013	890	9.273 861	900	9.274 428	876	9.276 263	881	9.276 624	882	9.276 920	885	9.280 102	914
9.272 075	894	9.273 014	890	9.273 868	900	9.274 438	876	9.276 264	881	9.276 625	882	9.276 921	885	9.280 103	914
9.272 076	894	9.273 015	890	9.273 868	906	9.274 448	876	9.276 265	881	9.276 626	882	9.276 922	885	9.280 104	914
9.272 077	894	9.273 018	890	9.273 870	900	9.274 454	876	9.276 270	881	9.276 627	882	9.276 923	885	9.280 105	914
9.272 078	894	9.273 019	890	9.273 895	900	9.274 462	876	9.276 271	881	9.276 628	882	9.276 924	885	9.280 106	914
9.272 079	894	9.273 101	887	9.273 896	900	9.274 464	876	9.276 272	881	9.276 629	882	9.276 949	885	9.280 113	914
9.272 086	894	9.273 102	887	9.273 900	901	9.274 508	875	9.276 273	881	9.276 630	882	9.276 950	885	9.280 114	914
9.272 089	894	9.273 103	887	9.273 920	901	9.274 520	875	9.276 274	881	9.276 631	882	9.276 951	885	9.280 115	914
9.272 102	893	9.273 104	887	9.273 925	901	9.274 528	875	9.276 275	881	9.276 645	879	9.276 952	885	9.280 116	914
9.272 104	893	9.273 105	887	9.273 928	901	9.274 538	875	9.276 436	881	9.276 646	879	9.276 953	885	9.280 129	914
9.272 105	891	9.273 106	887	9.273 930	901	9.274 548	875	9.276 438	881	9.276 647	879	9.276 954	885	9.280 130	914
9.272 106	891	9.273 107	887	9.273 980	901	9.274 554	875	9.276 443	881	9.276 648	879	9.276 955	885	9.280 131	952
9.272 107	891	9.273 108	887	9.273 985	901	9.274 562	875	9.276 446	881	9.276 649	879	9.277 005	886	9.280 132	952
9.272 108	891	9.273 109	887	9.273 990	901	9.274 564	875	9.276 447	881	9.276 650	879	9.277 010	886	9.280 133	952
9.272 109	891	9.273 110	887	9.274 005	874	9.274 790	875	9.276 448	881	9.276 651	879	9.277 020	886	9.280 521	911

9.280 522	911	9.282 413	926	9.282 633	923	9.283 187	933	9.283 581	935	9.284 211	959	9.284 511	63	9.287 958	964
9.280 575	916	9.282 414	926	9.282 634	923	9.283 188	933	9.283 595	1233	9.284 212	959	9.284 512	63	9.287 959	964
9.280 576	916	9.282 415	926	9.282 635	923	9.283 189	933	9.283 596	1233	9.284 213	959	9.284 513	63	9.287 960	964
9.280 577	916	9.282 416	926	9.282 636	923	9.283 190	933	9.283 615	954	9.284 214	959	9.284 514	63	9.287 961	964
9.280 578	916	9.282 417	926	9.282 637	923	9.283 191	933	9.283 616	954	9.284 215	959	9.284 515	63	9.287 962	963
9.280 579	916	9.282 418	926	9.282 638	923	9.283 192	933	9.283 618	954	9.284 216	959	9.284 516	63	9.287 963	963
9.280 581	913	9.282 419	926	9.282 639	923	9.283 193	933	9.283 623	1248	9.284 217	959	9.284 517	63	9.287 964	963
9.280 602	912	9.282 420	926	9.282 640	923	9.283 194	933	9.283 624	1248	9.284 218	959	9.284 518	63	9.287 965	963
9.280 605	912	9.282 421	926	9.282 641	923	9.283 200	931	9.283 656	935	9.284 220	960	9.284 519	63	9.287 966	963
9.280 610	912	9.282 430	929	9.282 642	923	9.283 201	931	9.283 657	935	9.284 221	960	9.284 520	63	9.287 967	963
9.280 620	912	9.282 431	929	9.282 643	923	9.283 202	931	9.283 800	962	9.284 222	960	9.284 521	63	9.287 968	964
9.280 696	936	9.282 432	929	9.282 644	923	9.283 203	931	9.283 801	962	9.284 223	960	9.284 522	64	9.287 969	964
9.280 705	936	9.282 433	929	9.282 645	923	9.283 204	931	9.283 802	962	9.284 224	960	9.284 523	64	9.287 970	964
9.280 710	936	9.282 434	929	9.282 646	923	9.283 205	931	9.283 803	962	9.284 225	960	9.284 524	64	9.287 995	963
9.280 720	936	9.282 435	929	9.282 647	923	9.283 206	931	9.283 804	962	9.284 226	960	9.284 525	64	9.287 996	963
9.280 724	912	9.282 436	929	9.282 648	923	9.283 207	931	9.283 810	962	9.284 227	960	9.284 530	64	9.287 997	963
9.280 726	912	9.282 437	929	9.282 651	924	9.283 208	931	9.283 958	907	9.284 230	960	9.284 531	62	9.287 998	963
9.280 730	912	9.282 438	929	9.282 652	924	9.283 209	931	9.283 961	907	9.284 231	960	9.284 531	64	9.288 200	905
9.280 732	912	9.282 439	929	9.282 653	924	9.283 210	931	9.283 962	907	9.284 232	960	9.284 532	64	9.288 201	905
9.280 741	912	9.282 440	929	9.282 654	924	9.283 211	931	9.283 965	907	9.284 233	960	9.284 533	64	9.300 021	360
9.280 742	912	9.282 441	929	9.282 655	924	9.283 212	931	9.283 966	907	9.284 234	960	9.284 534	64	9.300 022	360
9.280 743	912	9.282 450	927	9.282 656	924	9.283 213	931	9.283 967	907	9.284 235	960	9.284 535	64	9.300 023	360
9.280 745	912	9.282 451	927	9.282 657	924	9.283 214	931	9.283 968	907	9.284 236	960	9.284 536	64	9.300 032	360
9.280 751	913	9.282 452	927	9.282 658	924	9.283 215	931	9.283 969	907	9.284 237	960	9.284 537	64	9.300 037	360
9.280 752	913	9.282 453	927	9.282 661	924	9.283 216	931	9.283 970	907	9.284 250	1257	9.284 538	64	9.300 041	360
9.280 753	913	9.282 454	927	9.282 662	924	9.283 217	931	9.284 020	980	9.284 251	1257	9.284 539	64	9.300 113	360
9.280 755	913	9.282 455	927	9.282 663	924	9.283 218	931	9.284 021	980	9.284 252	1257	9.284 540	64	9.300 123	360
9.280 800	912	9.282 456	927	9.282 664	924	9.283 219	931	9.284 022	964	9.284 253	1257	9.284 541	80	9.300 124	360
9.280 801	912	9.282 457	927	9.282 665	924	9.283 220	931	9.284 023	964	9.284 255	1257	9.284 541	972	9.300 127	360
9.280 802	912	9.282 458	927	9.282 666	924	9.283 221	931	9.284 024	964	9.284 256	1257	9.284 542	80	9.300 150	360
9.280 803	912	9.282 459	927	9.282 667	924	9.283 222	934	9.284 025	964	9.284 257	1257	9.284 542	972	9.300 151	360
9.280 805	912	9.282 460	927	9.282 668	924	9.283 223	934	9.284 026	964	9.284 258	1257	9.284 543	80	9.300 152	360
9.280 810	912	9.282 461	927	9.282 669	924	9.283 224	934	9.284 027	964	9.284 259	1257	9.284 543	972	9.300 153	360
9.280 850	913	9.282 462	927	9.282 670	924	9.283 225	934	9.284 030	965	9.284 260	1257	9.284 544	80	9.300 154	360
9.280 901	913	9.282 463	927	9.282 671	924	9.283 226	934	9.284 031	965	9.284 264	1257	9.284 544	972	9.300 155	360
9.280 903	913	9.282 464	927	9.282 672	924	9.283 227	934	9.284 032	965	9.284 265	1161	9.284 545	80	9.300 160	360
9.280 905	913	9.282 465	927	9.282 673	925	9.283 228	934	9.284 033	965	9.284 266	1161	9.284 545	972	9.300 161	360
9.280 923	957	9.282 466	927	9.282 674	925	9.283 229	934	9.284 034	965	9.284 267	1161	9.284 567	62	9.300 162	360
9.280 924	957	9.282 467	927	9.282 675	925	9.283 230	934	9.284 035	965	9.284 268	1161	9.284 568	62	9.300 163	360
9.280 928	957	9.282 470	929	9.282 676	925	9.283 240	933	9.284 040	956	9.284 281	1161	9.284 849	969	9.300 164	360
9.280 929	957	9.282 471	929	9.282 677	925	9.283 241	933	9.284 041	957	9.284 282	1161	9.284 850	969	9.300 500	361
9.280 930	957	9.282 472	929	9.282 678	925	9.283 242	933	9.284 042	957	9.284 283	1161	9.284 851	969	9.300 805	361
9.280 931	957	9.282 473	929	9.282 679	925	9.283 243	933	9.284 043	957	9.284 285	1161	9.284 852	969	9.300 810	361
9.280 932	957	9.282 474	929	9.282 680	925	9.283 244	933	9.284 070	972	9.284 286	1161	9.284 853	969	9.300 815	361
9.280 933	957	9.282 475	929	9.282 681	925	9.283 245	933	9.284 071	972	9.284 287	1161	9.284 854	969	9.300 820	361
9.280 934	957	9.282 476	929	9.282 682	925	9.283 246	933	9.284 072	972	9.284 288	1161	9.287 756	987	9.300 825	361
9.280 935	957	9.282 477	929	9.282 683	925	9.283 247	933	9.284 073	972	9.284 292	1161	9.287 779	987	9.300 830	361
9.280 936	957	9.282 478	929	9.282 684	925	9.283 248	933	9.284 074	972	9.284 293	1161	9.287 780	987	9.300 835	361
9.280 937	957	9.282 479	929	9.282 685	925	9.283 249	933	9.284 075	972	9.284 294	1161	9.287 781	987	9.301 006	359
9.280 938	957	9.282 480	928	9.282 686	925	9.283 250	933	9.284 076	972	9.284 295	1257	9.287 800	967	9.301 008	359
9.280 939	957	9.282 481	930	9.282 687	925	9.283 251	933	9.284 077	972	9.284 296	1257	9.287 801	967	9.301 010	359
9.280 940	957	9.282 482	930	9.282 688	925	9.283 252	933	9.284 078	970	9.284 297	1257	9.287 802	967	9.301 026	359
9.280 941	957	9.282 483	930	9.282 689	925	9.283 254	934	9.284 079	970	9.284 298	1257	9.287 803	967	9.301 028	359
9.280 942	957	9.282 484	930	9.282 690	925	9.283 257	933	9.284 080	970	9.284 299	1257	9.287 804	967	9.301 030	359
9.280 943	957	9.282 500	943	9.282 691	925	9.283 279	932	9.284 081	970	9.284 404	970	9.287 805	967	9.301 065	1398
9.280 944	956	9.282 501	943	9.282 692	925	9.283 280	932	9.284 082	970	9.284 405	970	9.287 806	967	9.301 066	359
9.280 945	956	9.282 510	944	9.282 693	925	9.283 281	932	9.284 083	970	9.284 410	970	9.287 807	967	9.301 067	359
9.281 005	906	9.282 511	944	9.283 135	955	9.283 282	932	9.284 084	970	9.284 411	970	9.287 808	967	9.301 068	359
9.281 005	1346	9.282 512	944	9.283 136	955	9.283 283	932	9.284 085	970	9.284 414	970	9.287 809	967	9.301 069	361
9.281 041	906	9.282 513	944	9.283 137	955	9.283 284	932	9.284 086	970	9.284 415	970	9.287 815	967	9.301 216	102
9.281 041	1346	9.282 514	944	9.283 138	955	9.283 285	932	9.284 087	970	9.284 420	970	9.287 816	967	9.301 220	102
9.281 050	909	9.282 515	945	9.283 139	955	9.283 286	932	9.284 088	971	9.284 421	970	9.287 820	968	9.301 224	102
9.281 051	909	9.282 516	945	9.283 140	955	9.283 287	932	9.284 089	971	9.284 424	970	9.287 831	967	9.301 228	102
9.281 052	909	9.282 517	945	9.283 141	955	9.283 288	932	9.284 092	971	9.284 425	970	9.287 832	967	9.301 232	102
9.281 053	909	9.282 518	945	9.283 142	955	9.283 289	932	9.284 093	971	9.284 430	970	9.287 833	967	9.301 236	102
9.281 054	909	9.282 519	945	9.283 143	955	9.283 290	932	9.284 180	962	9.284 431	970	9.287 834	967	9.301 240	102
9.281 080	905	9.282 520	945	9.283 144	955	9.283 291	932	9.284 181	962	9.284 434	970	9.287 835	967	9.301 356	49
9.281 085	905	9.282 521	945	9.283 145	955	9.283 292	932	9.284 182	962	9.284 435	970	9.287 836	967	9.301 357	49
9.281 086	906	9.282 522	945	9.283 146	955	9.283 293	932	9.284 183	962	9.284 440	969	9.287 859	907	9.301 358	49
9.281 087	906	9.282 523	945	9.283 147	955	9.283 294	932	9.284 184	962	9.284 441	969	9.287 870	987	9.301 359	49
9.281 088	906	9.282 524	945	9.283 148	955	9.283 295	932	9.284 185	962	9.284 444	969	9.287 871	987	9.301 360	49
9.281 090	906	9.282 525	945	9.283 149	955	9.283 296	932	9.284 190	958	9.284 445	969	9.287 875	987	9.301 361	49
9.281 091	906	9.282 526	945	9.283 150	955	9.283 297	932	9.284 191	959	9.284 450	969	9.287 881	987	9.301 362	49
9.281 092	906	9.282 527	945	9.283 151	955	9.283 298	932	9.284 192	959	9.284 451	969	9.287 882	987	9.301 460	48
9.281 094	906	9.282 528	945	9.283 152	955	9.283 299	932	9.284 193	959	9.284 454	969	9.287 883	987	9.301 463	48
9.281 095	906	9.282 529	945	9.283 153	955	9.283 300	932	9.284 194	959	9.284 455	969	9.287 884	987	9.301 469	48
9.281 096	906	9.282 530	945	9.283 154	955	9.283 301	932	9.284 195	959	9.284 460	971	9.287 902	963	9.301 470	48
9.282 400	926	9.282 531	945	9.283 155	955	9.283 303	932	9.284 196	959	9.284 461	971	9.287 903	963	9.301 473	48
9.282 401	926	9.282 532	945	9.283 156	955	9.283 304	932	9.284 197	959	9.284 464	971	9.287 904	963	9.301 538	48
9.282 402	926	9.282 533	945	9.283 157	955	9.283 305	932	9.284 198	959	9.284 465	971	9.287 905	963	9.301 540	953
9.282 403	926	9.282 544	947	9.283 158	955	9.283 502	954	9.284 199	959	9.284 470	971	9.287 906	963	9.301 541	953
9.282 404	926	9.282 552	947	9.283 159	955	9.283 505	954	9.284 200	959	9.284 471	971	9.287 907	963	9.301 542	953
9.282 405	926	9.282 554	947	9.283 160	955	9.283 516	1333	9.284 201	959	9.284 474	971	9.287 908	963	9.301 553	953
9.282 406	926	9.282 555	947	9.283 161	955	9.283 517	1333	9.284 202	959	9.284 475	971	9.287 909	963	9.301 554	953
9.282 407	926	9.282 556	947	9.283 162	955	9.283 518	1333	9.284 203	959	9.284 480	971	9.287 951	963	9.301 555	953
9.282 408	926	9.282 570	947	9.283 163	955	9.283 576	1233	9.284 204	959	9.284 481	971	9.287 953	964	9.301 556	48
9.282 409	926	9.282 614	928	9.283 164	955	9.283 577	1233	9.284 205	959	9.284 482	981	9.287 954	964	9.301 566	48
9.282 410	926	9.282 615	928	9.283 165	955	9.283 578	1233	9.284 206	959	9.284 503	981	9.287 955	964	9.301 567	253
9.282 411	926	9.282 631	923	9.283 166	955	9.283 579	1233	9.284 207	958	9.284 504	981	9.287 956	964	9.301 568	253
9.282 412	926	9.282 632	923	9.283 167	955	9.283 580	935	9.284 210	959	9.284 510	63	9.287 957	964	9.301 569	253

9.301 641	48	9.303 876	515	9.305 352	1033	9.315 691	676	9.380 137	1345	9.400 290	42	9.401 052	750	9.404 052	247
9.301 643	48	9.303 877	515	9.305 353	1033	9.315 692	676	9.380 139	898	9.400 310	1398	9.401 053	750	9.404 065	248
9.301 645	48	9.303 878	515	9.305 367	609	9.315 693	676	9.380 139	1345	9.400 311	1398	9.401 054	750	9.404 066	248
9.301 647	48	9.303 879	515	9.305 368	609	9.315 694	676	9.380 421	674	9.400 312	1398	9.401 055	750	9.404 080	251
9.301 649	48	9.303 880	516	9.305 369	609	9.315 695	676	9.380 422	674	9.400 313	1398	9.401 060	746	9.404 080	1133
9.301 651	48	9.303 883	515	9.306 000	142	9.315 701	676	9.380 423	674	9.400 314	1398	9.401 061	746	9.404 099	247
9.301 655	48	9.303 884	516	9.306 001	142	9.315 702	676	9.380 431	898	9.400 315	1398	9.401 062	746	9.404 100	247
9.301 661	48	9.303 885	516	9.306 021	120	9.315 703	676	9.380 431	1345	9.400 316	1398	9.401 063	746	9.404 101	247
9.301 663	48	9.303 886	515	9.306 105	120	9.315 708	676	9.380 432	898	9.400 505	30	9.401 064	746	9.404 102	247
9.301 664	48	9.303 887	515	9.306 107	121	9.315 709	676	9.380 432	1345	9.400 505	675	9.401 065	746	9.404 103	247
9.303 000	1039	9.303 888	515	9.306 111	122	9.315 711	677	9.380 433	898	9.400 520	30	9.401 066	746	9.404 104	247
9.303 001	1039	9.303 910	517	9.306 115	122	9.315 712	677	9.380 433	1345	9.400 520	675	9.401 067	746	9.404 105	247
9.303 005	622	9.303 911	517	9.306 117	122	9.315 713	677	9.380 434	898	9.400 530	30	9.401 068	746	9.404 114	520
9.303 028	147	9.303 912	517	9.306 121	121	9.315 714	677	9.380 434	1345	9.400 530	675	9.401 070	746	9.404 115	520
9.303 029	147	9.303 913	517	9.306 125	121	9.315 716	677	9.380 435	898	9.400 532	30	9.401 071	746	9.404 116	520
9.303 031	1038	9.303 914	517	9.306 127	120	9.315 717	677	9.380 435	1345	9.400 532	675	9.401 072	746	9.404 117	520
9.303 032	1038	9.303 915	517	9.309 409	1104	9.315 718	677	9.380 436	898	9.400 562	30	9.401 073	746	9.404 118	520
9.303 039	149	9.303 919	517	9.309 410	1104	9.315 719	677	9.380 436	1345	9.400 562	675	9.401 074	746	9.404 119	520
9.303 043	434	9.303 933	526	9.309 411	1104	9.315 720	677	9.380 440	897	9.400 564	30	9.401 075	746	9.404 120	520
9.303 125	1039	9.303 935	526	9.309 412	1104	9.315 721	677	9.380 440	1345	9.400 564	675	9.401 080	896	9.404 121	520
9.303 433	1191	9.303 936	526	9.309 413	1104	9.315 723	677	9.380 441	897	9.400 565	30	9.401 081	896	9.404 122	520
9.303 436	1191	9.303 937	526	9.309 414	1104	9.315 724	677	9.380 441	1345	9.400 565	675	9.401 084	896	9.404 123	520
9.303 437	1191	9.303 938	526	9.309 415	1104	9.315 725	677	9.380 442	897	9.400 590	30	9.401 085	896	9.404 124	520
9.303 438	1191	9.303 939	526	9.309 416	1104	9.315 727	678	9.380 442	1345	9.400 590	675	9.401 090	755	9.404 125	520
9.303 710	514	9.303 941	526	9.309 417	1104	9.315 728	678	9.380 443	897	9.400 615	675	9.401 091	755	9.404 128	181
9.303 711	514	9.303 943	526	9.309 419	1104	9.315 729	678	9.380 443	1345	9.400 632	675	9.401 092	755	9.404 130	181
9.303 712	514	9.303 950	524	9.309 420	1104	9.315 732	677	9.380 453	898	9.400 664	675	9.401 093	755	9.404 140	181
9.303 713	514	9.303 951	524	9.309 421	1104	9.315 733	677	9.380 453	1346	9.400 665	675	9.401 094	755	9.404 150	181
9.303 714	514	9.303 955	524	9.309 423	1104	9.315 734	677	9.380 454	898	9.400 901	30	9.401 223	746	9.404 151	181
9.303 715	514	9.303 956	524	9.309 424	1104	9.315 738	677	9.380 454	1346	9.400 901	675	9.401 224	746	9.404 152	181
9.303 720	517	9.303 960	524	9.309 425	1104	9.315 739	677	9.380 455	898	9.400 908	30	9.401 272	749	9.404 153	181
9.303 722	517	9.303 961	524	9.309 426	1104	9.315 740	677	9.380 455	1346	9.400 908	675	9.401 274	749	9.404 160	181
9.303 728	517	9.303 965	524	9.309 427	1104	9.315 741	677	9.380 456	898	9.400 912	747	9.401 275	749	9.404 161	181
9.303 732	517	9.303 966	524	9.309 428	1104	9.315 763	678	9.380 456	1346	9.400 913	747	9.401 276	749	9.404 162	181
9.303 734	517	9.303 970	521	9.309 429	1104	9.315 764	678	9.380 457	898	9.400 927	754	9.401 278	749	9.404 163	181
9.303 736	517	9.303 975	521	9.310 010	134	9.315 810	673	9.380 457	1346	9.400 929	756	9.401 430	674	9.404 164	181
9.303 775	150	9.303 980	517	9.310 016	134	9.315 815	673	9.380 458	898	9.400 930	756	9.401 431	674	9.404 165	181
9.303 776	150	9.303 981	517	9.310 025	134	9.315 830	675	9.380 458	1346	9.400 932	756	9.401 432	674	9.404 166	181
9.303 777	150	9.303 982	517	9.310 116	134	9.315 831	675	9.390 090	179	9.400 933	756	9.401 433	674	9.404 167	181
9.303 778	150	9.303 983	517	9.310 120	134	9.315 832	674	9.390 091	179	9.400 935	766	9.401 805	41	9.404 171	181
9.303 779	150	9.303 984	517	9.310 122	134	9.315 833	674	9.390 092	179	9.400 941	747	9.401 810	45	9.404 172	181
9.303 780	150	9.303 985	517	9.310 125	134	9.315 834	675	9.390 093	179	9.400 942	747	9.401 812	45	9.404 173	181
9.303 781	150	9.303 986	517	9.310 130	134	9.316 062	674	9.390 330	1343	9.400 943	747	9.401 814	45	9.404 176	181
9.303 782	150	9.303 989	517	9.310 140	134	9.316 062	1334	9.390 331	1343	9.400 944	747	9.401 816	45	9.404 177	181
9.303 783	150	9.303 990	517	9.310 150	134	9.316 063	674	9.390 332	1343	9.400 945	758	9.401 820	41	9.404 178	181
9.303 784	150	9.303 991	517	9.310 160	134	9.316 063	1334	9.390 333	1343	9.400 946	754	9.401 822	41	9.404 179	181
9.303 785	150	9.303 992	517	9.310 285	134	9.316 064	674	9.390 345	1342	9.400 947	754	9.401 825	41	9.404 182	249
9.303 786	150	9.303 993	517	9.310 290	134	9.316 064	1334	9.390 346	1342	9.400 948	754	9.401 830	41	9.404 184	249
9.303 787	151	9.303 994	517	9.314 490	1311	9.316 065	674	9.390 348	1342	9.400 949	754	9.401 835	41	9.404 186	249
9.303 788	151	9.303 995	517	9.314 491	1311	9.316 065	1334	9.390 350	1342	9.400 950	747	9.401 838	41	9.404 220	247
9.303 789	151	9.303 996	517	9.314 492	1311	9.316 066	674	9.390 351	1342	9.400 953	756	9.401 840	41	9.404 221	247
9.303 790	151	9.303 997	517	9.314 494	1310	9.316 066	1334	9.390 356	1343	9.400 954	756	9.401 850	42	9.404 222	247
9.303 800	523	9.303 998	517	9.314 495	1310	9.316 067	674	9.390 401	1338	9.400 956	766	9.401 851	42	9.404 223	247
9.303 801	523	9.303 999	517	9.314 496	1311	9.316 067	1334	9.390 402	1338	9.400 957	766	9.401 852	42	9.404 224	247
9.303 802	523	9.304 038	1193	9.314 497	1311	9.318 021	98	9.390 403	1338	9.400 958	747	9.401 853	42	9.404 231	520
9.303 804	523	9.304 048	1193	9.314 498	1311	9.318 034	98	9.390 410	1338	9.400 967	747	9.401 854	42	9.404 232	520
9.303 806	523	9.304 050	1193	9.314 499	1311	9.318 036	98	9.390 411	1338	9.400 968	747	9.401 855	42	9.404 233	521
9.303 807	523	9.304 051	1193	9.314 500	1310	9.318 046	98	9.390 510	1255	9.400 969	747	9.402 310	43	9.404 234	520
9.303 810	523	9.304 170	1193	9.314 501	1310	9.318 052	98	9.390 511	1255	9.400 970	747	9.402 313	43	9.404 235	520
9.303 812	523	9.304 262	1194	9.314 502	1310	9.318 053	98	9.390 512	1255	9.400 971	747	9.402 318	43	9.404 236	520
9.303 814	523	9.304 272	1194	9.314 503	1310	9.318 068	98	9.390 513	1255	9.400 976	155	9.402 321	43	9.404 301	249
9.303 820	523	9.304 273	1194	9.315 000	1311	9.318 074	98	9.390 514	1254	9.400 978	757	9.402 324	43	9.404 303	249
9.303 822	523	9.304 280	1194	9.315 001	1311	9.318 077	98	9.390 515	1337	9.400 979	757	9.402 350	41	9.404 305	249
9.303 824	523	9.304 281	1194	9.315 010	671	9.318 080	98	9.390 550	1254	9.400 981	757	9.402 353	41	9.404 306	249
9.303 828	524	9.304 565	1173	9.315 011	671	9.318 107	98	9.390 551	1254	9.400 982	757	9.402 356	41	9.404 307	249
9.303 829	524	9.304 569	1173	9.315 014	671	9.318 134	98	9.390 552	1255	9.400 983	757	9.402 359	41	9.404 309	249
9.303 830	523	9.304 570	1173	9.315 017	671	9.318 136	98	9.390 553	1254	9.400 984	757	9.402 415	41	9.404 310	249
9.303 831	522	9.304 573	1174	9.315 024	671	9.318 146	98	9.390 554	1254	9.400 990	758	9.402 420	41	9.404 311	249
9.303 839	522	9.304 581	1173	9.315 026	671	9.318 168	98	9.390 555	1254	9.400 991	758	9.402 770	42	9.404 314	249
9.303 840	522	9.304 582	1173	9.315 036	671	9.318 201	98	9.390 556	1255	9.400 995	758	9.402 774	42	9.404 316	249
9.303 842	522	9.304 583	1173	9.315 201	672	9.318 203	98	9.390 557	1254	9.400 996	758	9.402 776	42	9.404 326	249
9.303 844	522	9.304 585	1173	9.315 203	672	9.318 205	98	9.390 600	749	9.400 997	758	9.402 782	42	9.404 952	183
9.303 845	522	9.304 586	1173	9.315 207	672	9.318 210	98	9.390 601	749	9.400 998	758	9.402 784	42	9.404 955	183
9.303 846	524	9.304 587	1174	9.315 210	672	9.318 221	98	9.390 710	1344	9.401 000	749	9.404 001	1278	9.405 101	201
9.303 850	515	9.304 588	1174	9.315 217	672	9.318 232	98	9.390 711	1344	9.401 002	749	9.404 002	1277	9.405 106	201
9.303 851	522	9.304 590	1174	9.315 220	672	9.318 407	98	9.390 712	1344	9.401 004	749	9.404 003	1277	9.405 116	230
9.303 854	522	9.305 319	1035	9.315 225	672	9.318 408	98	9.390 713	1344	9.401 013	749	9.404 004	1277	9.405 117	230
9.303 855	522	9.305 324	1035	9.315 237	672	9.318 409	98	9.390 714	1344	9.401 015	749	9.404 005	1277	9.405 118	230
9.303 858	514	9.305 329	1035	9.315 240	672	9.318 411	98	9.390 715	1344	9.401 030	749	9.404 006	1277	9.405 119	230
9.303 859	514	9.305 336	1035	9.315 245	672	9.380 123	898	9.400 211	42	9.401 032	749	9.404 007	1277	9.405 120	230
9.303 860	515	9.305 340	1035	9.315 329	676	9.380 123	1345	9.400 215	42	9.401 034	749	9.404 008	1277	9.405 121	230
9.303 862	515	9.305 341	1035	9.315 339	676	9.380 125	898	9.400 220	42	9.401 036	749	9.404 010	247	9.405 122	230
9.303 864	515	9.305 342	1035	9.315 340	676	9.380 125	1345	9.400 225	42	9.401 038	749	9.404 011	247	9.405 123	230
9.303 865	515	9.305 343	1035	9.315 412	672	9.380 131	898	9.400 230	42	9.401 040	749	9.404 012	247	9.405 124	230
9.303 866	515	9.305 344	1035	9.315 416	672	9.380 131	1345	9.400 235	42	9.401 042	749	9.404 013	247	9.405 125	230
9.303 868	514	9.305 345	1035	9.315 420	672	9.380 133	898	9.400 240	42	9.401 044	749	9.404 014	247	9.405 126	231
9.303 870	515	9.305 346	1035	9.315 421	672	9.380 133	1345	9.400 250	42	9.401 046	749	9.404 020	247	9.405 127	231
9.303 872	515	9.305 349	1033	9.315 509	671	9.380 135	898	9.400 260	42	9.401 048	749	9.404 030	248	9.405 128	231
9.303 874	515	9.305 350	1033	9.315 514	671	9.380 135	1345	9.400 270	42	9.401 050	750	9.404 050	247	9.405 129	231
9.303 875	515	9.305 351	1033	9.315 517	671	9.380 137	898	9.400 280	42	9.401 051	750	9.404 051	247	9.405 130	231

9.405 131	231	9.405 878	751	9.407 482	1257	9.409 135	36	9.409 386	1256	9.409 478	948	9.409 690	941	9.409 783	943
9.405 132	231	9.405 879	751	9.407 500	1230	9.409 136	36	9.409 387	1231	9.409 480	948	9.409 691	941	9.409 784	943
9.405 133	231	9.405 880	751	9.407 501	1226	9.409 137	36	9.409 387	1256	9.409 481	948	9.409 692	941	9.409 785	943
9.405 134	231	9.405 881	751	9.407 502	1226	9.409 138	937	9.409 390	39	9.409 482	948	9.409 693	941	9.409 786	943
9.405 135	231	9.405 882	751	9.407 503	1227	9.409 139	937	9.409 391	1230	9.409 483	948	9.409 694	941	9.409 804	1069
9.405 136	231	9.405 883	751	9.407 504	1226	9.409 140	938	9.409 392	1103	9.409 484	948	9.409 695	941	9.409 805	1069
9.405 137	231	9.405 890	753	9.407 505	1226	9.409 145	938	9.409 392	1113	9.409 485	948	9.409 696	941	9.409 806	1069
9.405 138	231	9.405 891	753	9.407 506	1231	9.409 146	938	9.409 392	1273	9.409 486	948	9.409 697	941	9.409 807	1069
9.405 139	231	9.405 892	753	9.407 507	1229	9.409 147	938	9.409 393	1103	9.409 487	948	9.409 698	941	9.409 808	1069
9.405 140	231	9.405 893	753	9.407 508	1255	9.409 148	938	9.409 393	1113	9.409 490	950	9.409 699	941	9.409 809	1069
9.405 141	231	9.405 894	753	9.407 509	1255	9.409 149	938	9.409 393	1273	9.409 491	950	9.409 700	941	9.409 810	1069
9.405 142	231	9.405 895	753	9.407 510	1256	9.409 191	940	9.409 394	1103	9.409 492	950	9.409 701	941	9.409 813	1069
9.405 143	231	9.405 896	753	9.407 511	1255	9.409 192	940	9.409 394	1113	9.409 493	950	9.409 702	941	9.409 814	1069
9.405 144	231	9.405 897	753	9.407 512	1256	9.409 199	940	9.409 394	1273	9.409 495	950	9.409 703	941	9.409 820	1071
9.405 145	231	9.405 898	753	9.407 513	1256	9.409 223	940	9.409 395	1103	9.409 496	950	9.409 704	941	9.409 841	1069
9.405 146	231	9.405 899	753	9.407 514	1227	9.409 238	901	9.409 395	1113	9.409 497	950	9.409 705	941	9.409 844	1069
9.405 147	231	9.405 900	753	9.407 515	1226	9.409 238	1148	9.409 395	1273	9.409 498	950	9.409 706	941	9.409 845	1069
9.405 148	231	9.405 901	753	9.407 516	1226	9.409 239	901	9.409 396	1103	9.409 501	116	9.409 707	941	9.409 846	1069
9.405 149	231	9.405 910	753	9.407 517	1256	9.409 239	1148	9.409 396	1113	9.409 558	951	9.409 708	941	9.409 911	1070
9.405 150	213	9.405 911	753	9.407 522	1227	9.409 280	1227	9.409 396	1273	9.409 559	951	9.409 709	941	9.409 915	1070
9.405 151	213	9.405 912	753	9.407 550	1236	9.409 281	1227	9.409 397	1103	9.409 560	951	9.409 712	941	9.409 916	1070
9.405 152	213	9.405 913	753	9.407 605	1334	9.409 282	1227	9.409 397	1113	9.409 561	951	9.409 713	941	9.409 918	1070
9.405 153	213	9.406 011	1111	9.407 606	1334	9.409 283	1227	9.409 397	1273	9.409 562	951	9.409 714	941	9.409 919	1070
9.405 154	213	9.406 011	1272	9.407 607	1334	9.409 284	1227	9.409 398	1103	9.409 563	951	9.409 715	941	9.409 920	1070
9.405 160	201	9.406 012	1111	9.407 608	1334	9.409 285	1227	9.409 398	1113	9.409 564	951	9.409 716	942	9.409 921	1070
9.405 161	201	9.406 012	1272	9.407 609	1334	9.409 286	1227	9.409 398	1273	9.409 565	951	9.409 717	942	9.409 922	1070
9.405 162	201	9.406 110	1112	9.407 610	1334	9.409 287	1227	9.409 399	1103	9.409 566	951	9.409 718	942	9.409 923	1070
9.405 165	201	9.406 111	1112	9.407 611	1334	9.409 301	1330	9.409 403	948	9.409 567	951	9.409 719	942	9.409 924	1070
9.405 205	215	9.406 114	1112	9.407 614	1256	9.409 303	1330	9.409 404	948	9.409 568	951	9.409 721	942	9.409 926	1070
9.405 206	215	9.406 115	1112	9.407 615	1256	9.409 306	1230	9.409 405	949	9.409 569	951	9.409 722	942	9.409 927	1070
9.405 207	215	9.406 118	1113	9.407 616	1257	9.409 307	1230	9.409 406	950	9.409 570	951	9.409 723	942	9.409 928	1070
9.405 211	215	9.406 118	1273	9.407 617	1257	9.409 308	34	9.409 407	948	9.409 571	951	9.409 724	942	9.409 929	1070
9.405 217	215	9.406 119	1113	9.407 618	1256	9.409 309	34	9.409 408	948	9.409 572	951	9.409 725	942	9.409 930	1070
9.405 220	215	9.406 119	1273	9.407 619	1256	9.409 310	1330	9.409 409	948	9.409 590	951	9.409 726	942	9.410 000	1406
9.405 235	215	9.406 120	1113	9.407 620	1231	9.409 311	1231	9.409 410	948	9.409 591	951	9.409 727	942	9.410 002	1406
9.405 236	215	9.406 120	1273	9.407 620	1257	9.409 312	34	9.409 411	948	9.409 592	951	9.409 728	942	9.410 005	1406
9.405 237	215	9.406 121	1113	9.407 621	1257	9.409 313	34	9.409 412	948	9.409 593	951	9.409 729	942	9.410 010	1406
9.405 238	215	9.406 121	1273	9.407 622	1256	9.409 314	34	9.409 413	948	9.409 594	951	9.409 730	942	9.410 020	1406
9.405 239	215	9.406 122	1113	9.407 623	1257	9.409 316	34	9.409 414	948	9.409 595	951	9.409 731	952	9.410 025	1406
9.405 286	214	9.406 122	1273	9.407 700	1331	9.409 317	1333	9.409 415	948	9.409 596	951	9.409 732	952	9.410 050	1406
9.405 287	214	9.406 123	1113	9.408 035	1274	9.409 320	1333	9.409 416	948	9.409 597	951	9.409 733	942	9.410 061	1406
9.405 288	214	9.406 123	1273	9.408 040	1274	9.409 321	34	9.409 417	948	9.409 620	1228	9.409 734	942	9.410 062	1406
9.405 289	214	9.406 124	1113	9.408 045	1274	9.409 323	34	9.409 418	948	9.409 621	1228	9.409 735	942	9.410 063	1406
9.405 290	214	9.406 124	1273	9.408 047	1274	9.409 324	1229	9.409 420	949	9.409 622	1228	9.409 736	942	9.410 064	1406
9.405 291	214	9.406 125	1113	9.408 094	1274	9.409 326	1229	9.409 421	949	9.409 623	1228	9.409 737	942	9.410 065	1406
9.405 351	215	9.406 125	1273	9.408 095	1274	9.409 327	1229	9.409 422	949	9.409 624	1228	9.409 738	942	9.410 066	1406
9.405 352	215	9.406 126	1113	9.408 905	943	9.409 328	1229	9.409 425	950	9.409 625	1228	9.409 739	942	9.410 101	1407
9.405 353	215	9.406 126	1273	9.408 909	943	9.409 329	1229	9.409 426	950	9.409 626	1228	9.409 740	942	9.410 102	1407
9.405 354	215	9.406 127	1113	9.408 970	1256	9.409 330	1229	9.409 427	950	9.409 627	1228	9.409 741	942	9.410 112	1407
9.405 355	215	9.406 127	1273	9.408 976	1253	9.409 331	1333	9.409 428	950	9.409 628	1228	9.409 742	942	9.410 114	1407
9.405 356	215	9.406 431	1111	9.408 983	1231	9.409 332	1333	9.409 429	950	9.409 629	1228	9.409 743	942	9.410 116	1407
9.405 357	215	9.406 432	1111	9.408 983	1256	9.409 333	1333	9.409 430	949	9.409 630	1228	9.409 744	942	9.410 118	1407
9.405 358	215	9.406 433	1111	9.409 000	36	9.409 334	1333	9.409 431	949	9.409 631	1228	9.409 745	942	9.410 120	1407
9.405 400	1280	9.406 434	1111	9.409 012	40	9.409 335	1333	9.409 432	949	9.409 632	1228	9.409 746	942	9.410 403	1407
9.405 401	1280	9.406 435	1111	9.409 013	40	9.409 336	1333	9.409 433	949	9.409 633	1228	9.409 747	942	9.411 015	896
9.405 410	1280	9.406 436	1111	9.409 014	40	9.409 337	1333	9.409 434	949	9.409 634	1228	9.409 748	942	9.411 020	896
9.405 750	1382	9.406 437	1111	9.409 023	1330	9.409 338	1333	9.409 435	949	9.409 635	1228	9.409 749	942	9.411 030	897
9.405 751	1383	9.406 438	1111	9.409 024	1330	9.409 339	1333	9.409 440	950	9.409 636	1228	9.409 750	942	9.411 031	897
9.405 753	1385	9.406 439	1112	9.409 025	1330	9.409 341	1333	9.409 441	950	9.409 637	1228	9.409 751	942	9.411 032	897
9.405 754	1387	9.406 440	1112	9.409 033	937	9.409 342	1333	9.409 442	950	9.409 653	957	9.409 752	942	9.411 033	897
9.405 756	1391	9.406 441	1112	9.409 034	937	9.409 343	1333	9.409 443	950	9.409 656	957	9.409 753	942	9.411 035	897
9.405 800	752	9.406 451	1114	9.409 035	937	9.409 344	1333	9.409 444	950	9.409 660	1233	9.409 754	942	9.411 038	897
9.405 801	752	9.407 027	1342	9.409 036	937	9.409 345	1333	9.409 445	950	9.409 661	1232	9.409 755	942	9.411 039	897
9.405 840	754	9.407 077	1342	9.409 037	937	9.409 346	1333	9.409 446	950	9.409 662	1081	9.409 756	942	9.411 215	905
9.405 841	754	9.407 100	1344	9.409 038	937	9.409 347	1333	9.409 447	950	9.409 663	952	9.409 757	940	9.411 220	905
9.405 842	754	9.407 101	1344	9.409 039	937	9.409 352	1333	9.409 448	950	9.409 664	952	9.409 758	940	9.411 240	905
9.405 843	754	9.407 102	1344	9.409 041	937	9.409 353	1333	9.409 450	948	9.409 665	952	9.409 759	940	9.411 242	902
9.405 844	754	9.407 103	1344	9.409 042	937	9.409 354	1333	9.409 451	948	9.409 666	952	9.409 760	940	9.411 246	902
9.405 845	754	9.407 104	1344	9.409 043	937	9.409 355	1333	9.409 452	948	9.409 667	952	9.409 761	940	9.411 252	904
9.405 846	754	9.407 105	1344	9.409 044	937	9.409 356	1333	9.409 453	948	9.409 669	940	9.409 762	940	9.411 253	904
9.405 847	754	9.407 106	1344	9.409 045	936	9.409 357	1333	9.409 454	948	9.409 670	940	9.409 763	941	9.411 254	904
9.405 848	754	9.407 107	1344	9.409 046	936	9.409 358	1333	9.409 455	948	9.409 671	940	9.409 764	941	9.411 255	904
9.405 849	754	9.407 108	1344	9.409 047	936	9.409 359	1333	9.409 456	948	9.409 672	940	9.409 765	941	9.411 256	904
9.405 850	754	9.407 109	1344	9.409 048	936	9.409 360	1231	9.409 457	948	9.409 673	940	9.409 766	941	9.411 258	904
9.405 851	754	9.407 110	1344	9.409 049	936	9.409 368	1229	9.409 460	949	9.409 674	940	9.409 767	941	9.411 260	903
9.405 852	754	9.407 111	1344	9.409 088	35	9.409 369	1231	9.409 461	949	9.409 675	940	9.409 768	941	9.411 265	904
9.405 855	754	9.407 112	1344	9.409 089	35	9.409 370	1227	9.409 462	949	9.409 676	940	9.409 769	940	9.411 266	904
9.405 860	751	9.407 113	1344	9.409 090	35	9.409 371	1227	9.409 463	949	9.409 677	940	9.409 770	940	9.411 267	904
9.405 861	751	9.407 114	1344	9.409 091	1334	9.409 372	1227	9.409 464	949	9.409 678	940	9.409 771	940	9.411 268	904
9.405 862	751	9.407 115	1344	9.409 092	1334	9.409 373	1228	9.409 465	949	9.409 679	940	9.409 772	940	9.411 270	904
9.405 863	751	9.407 393	1340	9.409 097	936	9.409 374	1228	9.409 466	949	9.409 680	940	9.409 773	940	9.411 271	904
9.405 864	751	9.407 395	1340	9.409 098	936	9.409 375	1228	9.409 467	949	9.409 681	940	9.409 774	940	9.411 273	904
9.405 870	751	9.407 398	1340	9.409 099	936	9.409 377	1227	9.409 470	948	9.409 682	940	9.409 775	940	9.411 274	904
9.405 871	751	9.407 399	1340	9.409 128	937	9.409 378	1229	9.409 471	948	9.409 683	940	9.409 776	941	9.411 275	904
9.405 872	751	9.407 400	1340	9.409 129	937	9.409 379	1233	9.409 472	948	9.409 684	940	9.409 777	941	9.411 276	904
9.405 873	751	9.407 471	1255	9.409 130	937	9.409 380	34	9.409 473	948	9.409 685	940	9.409 778	941	9.411 277	904
9.405 874	751	9.407 473	1337	9.409 131	36	9.409 381	1229	9.409 474	948	9.409 686	940	9.409 779	941	9.411 279	904
9.405 875	751	9.407 475	1337	9.409 132	36	9.409 383	1229	9.409 475	948	9.409 687	940	9.409 780	941	9.411 280	904
9.405 876	751	9.407 480	1255	9.409 133	36	9.409 384	1231	9.409 476	948	9.409 688	941	9.409 781	941	9.411 307	902
9.405 877	751	9.407 481	1255	9.409 134	36	9.409 386	1231	9.409 477	948	9.409 689	941	9.409 782	941	9.411 309	902

9.411 318	902	9.411 646	918	9.413 216	1116	9.520 059	1277	9.524 548	766	9.535 925	1221	9.537 204	822	9.570 088	586
9.411 322	902	9.411 647	918	9.413 220	1127	9.520 060	1277	9.524 549	766	9.535 926	1216	9.537 928	819	9.570 089	586
9.411 327	902	9.411 650	918	9.413 224	1128	9.520 061	1277	9.524 550	766	9.535 926	1221	9.537 929	819	9.570 090	586
9.411 328	902	9.411 651	918	9.413 225	1128	9.520 062	1277	9.524 551	766	9.535 927	1216	9.537 932	819	9.570 091	586
9.411 333	902	9.411 652	918	9.413 245	238	9.520 063	1277	9.524 552	766	9.535 927	1221	9.537 933	819	9.570 092	586
9.411 344	902	9.411 653	918	9.413 246	238	9.520 064	1277	9.524 553	766	9.535 928	1216	9.537 934	819	9.570 093	586
9.411 345	902	9.411 654	918	9.413 247	238	9.520 065	1277	9.524 554	766	9.535 929	1216	9.537 935	819	9.570 096	586
9.411 357	902	9.411 655	918	9.413 248	238	9.520 066	1277	9.524 555	766	9.535 931	1221	9.537 936	819	9.570 097	586
9.411 440	903	9.411 661	921	9.414 011	239	9.520 067	1277	9.524 559	764	9.535 932	1216	9.537 937	819	9.570 098	585
9.411 449	917	9.411 665	921	9.414 012	239	9.520 170	1281	9.524 560	764	9.535 933	1216	9.537 938	819	9.570 099	586
9.411 473	919	9.411 667	921	9.414 013	239	9.520 171	1281	9.524 561	764	9.535 935	1221	9.537 939	819	9.570 104	566
9.411 474	919	9.411 669	921	9.414 014	239	9.520 172	1281	9.524 592	765	9.535 936	1216	9.537 940	819	9.570 105	566
9.411 475	919	9.411 672	921	9.414 021	236	9.520 174	1281	9.535 531	1215	9.535 937	1216	9.537 941	819	9.570 135	565
9.411 476	919	9.411 673	921	9.414 022	236	9.520 178	1281	9.535 532	1215	9.535 951	1215	9.537 942	819	9.570 136	565
9.411 477	919	9.411 674	921	9.414 023	236	9.520 180	1281	9.535 533	1215	9.535 957	1215	9.537 943	819	9.570 137	565
9.411 478	919	9.411 675	921	9.414 024	236	9.520 181	1281	9.535 534	1215	9.535 960	1219	9.537 944	819	9.570 138	565
9.411 479	919	9.411 682	921	9.414 025	236	9.520 182	1281	9.535 535	1215	9.535 960	1221	9.537 945	819	9.570 139	566
9.411 480	919	9.411 685	921	9.414 030	239	9.520 184	1281	9.535 536	1214	9.535 961	1218	9.537 946	819	9.570 140	566
9.411 481	919	9.411 708	921	9.414 040	239	9.520 185	1281	9.535 537	1214	9.535 961	1219	9.537 947	820	9.570 141	566
9.411 482	919	9.412 800	1126	9.414 041	239	9.520 186	1281	9.535 538	1214	9.535 961	1221	9.537 949	820	9.570 142	566
9.411 483	917	9.412 801	1126	9.414 042	239	9.520 190	1281	9.535 539	1214	9.535 963	1219	9.537 961	821	9.570 143	566
9.411 483	919	9.412 805	1126	9.414 046	236	9.520 191	1281	9.535 540	1214	9.535 966	1221	9.537 962	821	9.570 144	566
9.411 484	917	9.412 810	157	9.414 047	237	9.520 200	1280	9.535 541	1214	9.535 968	1219	9.537 963	821	9.570 145	566
9.411 484	919	9.412 811	157	9.414 048	237	9.520 201	1280	9.535 542	1214	9.535 969	1218	9.537 964	821	9.570 146	566
9.411 491	922	9.412 900	160	9.414 049	237	9.520 203	1280	9.535 543	1214	9.535 970	1221	9.537 965	821	9.570 147	566
9.411 492	922	9.412 901	160	9.414 050	239	9.520 204	1280	9.535 544	1214	9.535 971	1218	9.537 966	821	9.570 148	566
9.411 493	922	9.412 902	160	9.414 080	239	9.520 205	1279	9.535 545	1214	9.535 972	1221	9.537 967	821	9.570 149	566
9.411 494	922	9.412 903	160	9.414 090	238	9.520 205	1280	9.535 601	823	9.535 973	1221	9.537 968	821	9.570 150	566
9.411 501	917	9.412 904	160	9.414 091	238	9.520 206	1279	9.535 605	823	9.535 974	1218	9.537 969	822	9.570 151	566
9.411 501	919	9.412 905	160	9.414 092	238	9.520 206	1280	9.535 607	823	9.535 976	1219	9.537 970	822	9.570 152	566
9.411 502	917	9.412 906	160	9.414 093	238	9.520 530	1279	9.535 614	824	9.535 976	1221	9.537 971	822	9.570 153	566
9.411 502	919	9.412 907	160	9.414 094	238	9.521 783	1328	9.535 635	824	9.535 978	1215	9.537 972	822	9.570 223	568
9.411 503	919	9.412 908	160	9.414 100	238	9.521 787	1328	9.535 636	824	9.535 979	1215	9.537 973	822	9.570 224	568
9.411 504	922	9.412 909	160	9.414 101	238	9.521 801	1068	9.535 637	824	9.535 980	1215	9.537 974	822	9.570 225	568
9.411 505	922	9.412 910	160	9.414 102	238	9.521 802	1068	9.535 640	824	9.535 986	1221	9.537 975	822	9.570 226	568
9.411 509	960	9.412 915	160	9.414 103	238	9.521 940	1329	9.535 643	824	9.535 994	1216	9.537 976	822	9.570 227	568
9.411 510	960	9.412 916	160	9.414 104	238	9.521 941	1330	9.535 644	824	9.536 211	735	9.537 977	821	9.570 228	568
9.411 511	960	9.412 981	1131	9.414 105	238	9.521 942	1330	9.535 645	824	9.536 212	735	9.537 978	821	9.570 229	568
9.411 512	960	9.413 013	1130	9.414 351	236	9.521 943	1330	9.535 810	1218	9.536 213	735	9.537 979	821	9.570 230	568
9.411 513	960	9.413 014	1127	9.414 352	236	9.521 944	1330	9.535 811	1218	9.536 214	735	9.537 980	821	9.570 231	568
9.411 514	960	9.413 015	1127	9.414 353	236	9.521 945	1330	9.535 812	1218	9.536 215	735	9.537 981	821	9.570 232	568
9.411 520	961	9.413 017	1127	9.414 355	236	9.521 946	1330	9.535 813	1218	9.536 216	735	9.537 982	821	9.570 233	568
9.411 521	961	9.413 018	1130	9.414 356	236	9.521 947	1330	9.535 814	1218	9.536 217	735	9.537 983	821	9.570 480	658
9.411 522	961	9.413 019	1129	9.414 357	236	9.521 948	1330	9.535 815	1218	9.536 218	735	9.537 984	821	9.570 481	658
9.411 523	961	9.413 020	1127	9.414 371	236	9.524 500	764	9.535 816	1218	9.536 219	735	9.537 985	822	9.570 482	658
9.411 524	961	9.413 021	1127	9.414 373	236	9.524 501	764	9.535 817	1218	9.536 220	735	9.537 986	822	9.570 500	570
9.411 525	961	9.413 033	1127	9.414 375	236	9.524 502	764	9.535 818	1218	9.536 221	736	9.537 987	822	9.570 506	570
9.411 526	961	9.413 034	1129	9.414 377	236	9.524 503	765	9.535 819	1218	9.536 222	736	9.537 988	822	9.570 507	570
9.411 527	961	9.413 035	1129	9.414 379	236	9.524 504	765	9.535 823	1219	9.536 223	736	9.537 989	822	9.570 508	570
9.411 561	960	9.413 036	1129	9.414 415	237	9.524 505	765	9.535 824	1219	9.536 224	736	9.537 990	822	9.570 509	570
9.411 562	965	9.413 040	1116	9.414 417	237	9.524 506	763	9.535 825	1219	9.536 225	736	9.537 991	822	9.570 510	570
9.411 563	965	9.413 041	1116	9.414 419	237	9.524 507	763	9.535 826	1219	9.536 226	736	9.537 992	822	9.570 841	572
9.411 564	965	9.413 043	1129	9.414 600	225	9.524 508	763	9.535 827	1219	9.536 227	736	9.538 001	827	9.570 842	572
9.411 565	965	9.413 044	1128	9.414 601	225	9.524 509	763	9.535 828	1219	9.536 228	736	9.538 002	827	9.570 855	572
9.411 566	965	9.413 046	1129	9.414 602	225	9.524 510	763	9.535 829	1219	9.536 229	736	9.538 003	827	9.570 857	572
9.411 567	960	9.413 047	1129	9.414 605	225	9.524 511	763	9.535 830	1219	9.536 230	736	9.538 004	827	9.570 859	573
9.411 568	960	9.413 048	1130	9.414 606	225	9.524 512	763	9.535 860	1220	9.536 231	736	9.538 005	827	9.570 861	573
9.411 590	917	9.413 050	1130	9.414 607	225	9.524 513	763	9.535 861	1220	9.536 232	736	9.538 006	827	9.570 875	572
9.411 591	917	9.413 051	1130	9.414 608	226	9.524 514	763	9.535 862	1220	9.536 233	736	9.538 007	827	9.570 877	572
9.411 592	917	9.413 052	1130	9.414 609	226	9.524 515	763	9.535 863	1220	9.536 234	736	9.538 008	827	9.570 882	574
9.411 593	917	9.413 054	1128	9.414 610	226	9.524 516	763	9.535 864	1220	9.536 235	736	9.538 009	827	9.570 886	574
9.411 594	917	9.413 055	1130	9.414 611	226	9.524 517	763	9.535 865	1220	9.536 236	736	9.538 010	827	9.570 896	574
9.411 595	917	9.413 057	1130	9.414 612	227	9.524 518	763	9.535 866	1220	9.536 237	736	9.538 011	826	9.570 922	575
9.411 596	917	9.413 060	1130	9.414 613	227	9.524 519	763	9.535 867	1220	9.536 238	736	9.538 012	826	9.570 926	575
9.411 597	917	9.413 065	1128	9.414 617	227	9.524 520	764	9.535 868	1220	9.536 550	1362	9.538 013	828	9.570 940	571
9.411 598	917	9.413 070	1127	9.414 618	227	9.524 521	764	9.535 869	1220	9.536 551	1362	9.538 014	828	9.570 941	571
9.411 599	917	9.413 078	1128	9.414 619	227	9.524 522	764	9.535 870	1220	9.536 552	1362	9.538 015	828	9.570 942	571
9.411 620	917	9.413 081	1128	9.414 620	227	9.524 523	764	9.535 871	1220	9.536 553	1362	9.538 016	828	9.570 943	572
9.411 621	917	9.413 082	1128	9.414 650	228	9.524 524	765	9.535 872	1218	9.536 700	1360	9.538 017	828	9.570 944	572
9.411 622	917	9.413 083	1128	9.414 651	228	9.524 525	765	9.535 873	1218	9.536 701	1360	9.539 041	1480	9.570 945	572
9.411 623	917	9.413 086	1128	9.414 652	228	9.524 526	765	9.535 874	1218	9.536 702	1360	9.539 045	1478	9.570 946	572
9.411 624	917	9.413 091	1128	9.414 653	228	9.524 527	765	9.535 875	1217	9.536 703	1360	9.539 046	1478	9.570 947	572
9.411 625	917	9.413 094	1129	9.414 654	228	9.524 528	765	9.535 876	1217	9.536 704	1360	9.539 360	1479	9.570 948	572
9.411 626	917	9.413 095	1129	9.414 655	228	9.524 529	765	9.535 877	1217	9.536 705	1360	9.570 016	585	9.570 949	573
9.411 627	917	9.413 101	1131	9.414 656	228	9.524 530	765	9.535 878	1217	9.536 706	1360	9.570 017	585	9.570 950	573
9.411 628	917	9.413 102	1131	9.414 657	228	9.524 531	765	9.535 879	1217	9.536 707	1360	9.570 018	585	9.570 951	573
9.411 630	920	9.413 106	1131	9.414 658	228	9.524 532	765	9.535 880	1217	9.536 708	1360	9.570 073	585	9.570 952	574
9.411 631	920	9.413 107	1131	9.414 659	228	9.524 533	766	9.535 887	1217	9.536 709	1360	9.570 074	585	9.570 953	574
9.411 632	920	9.413 108	1131	9.414 660	229	9.524 534	766	9.535 888	1217	9.536 710	1361	9.570 075	586	9.570 954	574
9.411 633	920	9.413 152	244	9.414 661	229	9.524 535	766	9.535 889	1217	9.536 711	1361	9.570 077	586	9.570 959	571
9.411 634	920	9.413 152	1132	9.414 662	229	9.524 536	766	9.535 890	1217	9.536 712	1361	9.570 078	586	9.571 098	573
9.411 635	920	9.413 155	244	9.519 120	527	9.524 537	766	9.535 891	1217	9.536 713	1361	9.570 079	586	9.571 119	573
9.411 636	920	9.413 156	244	9.519 213	528	9.524 538	766	9.535 892	1217	9.536 714	1361	9.570 080	586	9.571 121	573
9.411 637	920	9.413 160	244	9.519 223	528	9.524 539	766	9.535 897	1218	9.536 760	1361	9.570 081	586	9.571 198	573
9.411 640	918	9.413 160	1278	9.520 050	1277	9.524 540	766	9.535 898	1218	9.536 761	1361	9.570 082	586	9.571 199	573
9.411 641	918	9.413 161	244	9.520 051	1277	9.524 541	766	9.535 922	1216	9.536 762	1360	9.570 083	586	9.571 200	573
9.411 642	918	9.413 161	1278	9.520 053	1277	9.524 542	766	9.535 923	1216	9.536 763	1360	9.570 084	586	9.571 201	573
9.411 643	918	9.413 210	1131	9.520 056	1277	9.524 543	766	9.535 923	1221	9.536 764	1360	9.570 085	586	9.571 207	573
9.411 644	918	9.413 211	1131	9.520 057	1277	9.524 544	766	9.535 924	1216	9.536 800	1363	9.570 086	586	9.571 301	531
9.411 645	918	9.413 215	1116	9.520 058	1277	9.524 547	766	9.535 925	1216	9.537 203	822	9.570 087	586	9.571 302	531

9.571 303	531	9.584 755	1246	9.603 652	1321	9.620 433	1165	9.642 630	865	9.645 744	861	9.650 236	581	9.651 860	1315
9.571 304	531	9.584 756	1246	9.603 653	1321	9.620 434	1165	9.642 654	866	9.645 747	861	9.650 238	582	9.651 861	1315
9.571 305	531	9.584 757	1246	9.603 654	1321	9.620 436	1165	9.642 660	865	9.645 748	861	9.650 239	580	9.651 862	1315
9.571 308	531	9.584 758	1246	9.603 655	1321	9.620 437	1165	9.642 670	866	9.645 781	861	9.650 240	580	9.651 863	1315
9.571 309	531	9.584 759	1246	9.603 656	1321	9.620 438	1165	9.642 671	866	9.645 782	861	9.650 241	580	9.651 864	1315
9.571 350	575	9.584 760	1246	9.603 657	1321	9.620 439	1165	9.642 672	866	9.645 785	861	9.650 242	580	9.651 865	1315
9.571 490	569	9.584 761	1246	9.603 658	1321	9.620 441	1165	9.642 673	866	9.645 786	861	9.650 243	580	9.651 866	1315
9.571 491	569	9.584 762	1246	9.603 659	1321	9.620 442	1165	9.642 674	866	9.645 787	861	9.650 244	580	9.651 867	1315
9.571 492	567	9.584 763	1246	9.603 660	1321	9.620 443	1165	9.642 720	865	9.645 814	813	9.650 245	580	9.651 868	1315
9.571 492	1316	9.584 764	1242	9.603 661	1321	9.620 446	1165	9.642 721	865	9.645 815	813	9.650 246	580	9.651 869	1315
9.571 493	567	9.584 765	1242	9.603 662	1321	9.620 447	1165	9.642 722	865	9.645 816	813	9.650 247	580	9.651 870	1315
9.571 494	568	9.584 766	1242	9.603 663	1321	9.620 448	1165	9.642 723	865	9.645 820	813	9.650 248	580	9.695 000	759
9.571 494	1317	9.584 767	1242	9.604 024	705	9.620 449	1165	9.642 724	865	9.645 824	862	9.650 249	580	9.695 001	759
9.571 495	532	9.584 768	1242	9.604 061	714	9.620 470	1167	9.642 725	865	9.645 827	862	9.650 250	580	9.695 002	759
9.580 201	744	9.584 770	1244	9.604 061	1350	9.620 471	1167	9.642 726	865	9.645 828	862	9.650 253	580	9.695 003	759
9.580 202	744	9.584 771	1244	9.604 076	715	9.620 472	1167	9.642 727	865	9.645 829	862	9.650 254	580	9.695 004	759
9.580 203	744	9.584 772	1244	9.604 076	1322	9.620 473	1167	9.642 728	865	9.645 831	862	9.650 258	580	9.695 005	759
9.580 204	744	9.584 773	1244	9.604 201	717	9.620 474	1167	9.642 729	865	9.645 832	862	9.650 260	581	9.695 006	759
9.580 205	744	9.584 774	1236	9.604 201	1323	9.620 475	1167	9.642 750	865	9.645 833	862	9.650 261	581	9.695 007	759
9.580 211	745	9.584 775	1236	9.604 202	717	9.642 401	863	9.642 751	865	9.645 950	421	9.650 262	581	9.695 020	759
9.580 212	745	9.584 776	1263	9.604 202	1323	9.642 402	863	9.642 752	865	9.645 951	422	9.650 264	581	9.695 021	759
9.580 213	745	9.584 777	1263	9.604 204	714	9.642 403	863	9.642 753	865	9.645 954	429	9.650 265	581	9.698 525	789
9.580 214	745	9.584 790	1243	9.604 204	1321	9.642 404	863	9.642 754	865	9.645 955	429	9.650 267	581	9.698 530	789
9.580 221	745	9.584 791	1243	9.604 210	718	9.642 405	863	9.642 755	865	9.645 956	432	9.650 268	581	9.698 531	789
9.580 222	745	9.584 792	1243	9.604 210	1320	9.642 406	863	9.642 756	865	9.645 957	432	9.650 269	580	9.698 532	789
9.580 223	745	9.584 793	1243	9.604 211	718	9.642 407	863	9.642 757	865	9.645 958	432	9.650 271	582	9.698 533	789
9.580 224	745	9.584 795	1261	9.604 211	1320	9.642 408	863	9.642 758	865	9.645 959	430	9.650 273	579	9.698 534	789
9.580 225	745	9.584 796	1261	9.604 212	718	9.642 409	863	9.643 033	866	9.645 960	430	9.650 275	579	9.698 535	789
9.584 651	1240	9.584 803	1262	9.604 212	1320	9.642 410	863	9.643 034	866	9.645 961	430	9.650 276	579	9.698 536	789
9.584 652	1260	9.584 804	1262	9.604 213	718	9.642 411	863	9.643 035	866	9.645 962	430	9.650 277	579	9.698 537	789
9.584 653	1261	9.595 290	1232	9.604 213	1320	9.642 412	863	9.643 036	866	9.645 963	430	9.650 281	582	9.698 538	789
9.584 654	1260	9.595 291	1232	9.604 214	718	9.642 413	863	9.643 037	866	9.645 964	430	9.650 282	582	9.698 539	789
9.584 655	1239	9.595 316	1234	9.604 214	1320	9.642 440	863	9.643 038	866	9.645 965	430	9.650 290	1147	9.698 540	789
9.584 656	1239	9.595 319	1234	9.604 215	718	9.642 441	863	9.643 039	866	9.645 966	430	9.650 291	1147	9.698 541	789
9.584 657	1240	9.595 341	1234	9.604 215	1320	9.642 442	863	9.643 072	867	9.645 967	430	9.650 292	1147	9.698 542	790
9.584 658	1240	9.595 345	1245	9.604 216	718	9.642 443	863	9.643 073	867	9.645 968	430	9.650 293	1147	9.698 543	790
9.584 659	1240	9.595 346	1245	9.604 216	1320	9.642 444	863	9.643 074	867	9.645 969	430	9.650 294	1147	9.698 544	790
9.584 660	1240	9.595 501	1235	9.604 222	717	9.642 445	863	9.643 075	867	9.645 970	430	9.650 294	1148	9.698 545	790
9.584 661	1240	9.595 502	1235	9.604 222	1320	9.642 446	863	9.643 081	867	9.645 971	430	9.650 295	1147	9.698 546	790
9.584 662	1240	9.595 503	1235	9.604 223	717	9.642 500	864	9.643 083	867	9.645 972	431	9.650 300	1147	9.698 547	790
9.584 663	1240	9.595 504	1235	9.604 223	1320	9.642 501	864	9.643 122	867	9.645 973	431	9.650 303	1148	9.698 548	790
9.584 664	1240	9.595 505	1235	9.604 224	717	9.642 502	864	9.643 123	867	9.645 974	431	9.650 304	1148	9.698 549	790
9.584 665	1240	9.595 506	1235	9.604 224	1320	9.642 503	864	9.643 124	867	9.645 975	421	9.650 305	1148	9.698 550	789
9.584 666	1240	9.595 507	1235	9.604 226	717	9.642 504	864	9.643 125	867	9.645 976	420	9.650 306	1148	9.698 551	790
9.584 667	1240	9.595 508	1235	9.604 226	1320	9.642 505	864	9.643 126	867	9.645 977	420	9.650 307	1148	9.698 653	730
9.584 670	1241	9.595 509	1235	9.604 227	718	9.642 506	864	9.643 127	867	9.645 978	421	9.650 308	1148	9.698 654	730
9.584 671	1241	9.595 510	1235	9.604 227	1320	9.642 507	864	9.645 280	1329	9.645 979	421	9.650 311	1147	9.698 655	730
9.584 672	1241	9.595 511	1235	9.604 228	718	9.642 508	864	9.645 281	1329	9.645 980	421	9.650 312	1147	9.698 656	730
9.584 673	1241	9.595 512	1235	9.604 228	1320	9.642 509	864	9.645 295	439	9.645 981	422	9.650 313	1147	9.698 677	732
9.584 674	1241	9.595 513	1235	9.604 307	714	9.642 510	864	9.645 296	439	9.645 982	422	9.650 314	1147	9.698 680	734
9.584 675	1241	9.595 514	1235	9.604 307	1321	9.642 511	864	9.645 297	419	9.645 985	430	9.651 050	1310	9.698 681	734
9.584 676	1241	9.600 105	903	9.604 345	713	9.642 520	864	9.645 316	859	9.645 986	430	9.651 051	1310	9.698 682	732
9.584 677	1241	9.600 110	903	9.604 383	714	9.642 521	864	9.645 317	859	9.645 987	431	9.651 052	1310	9.698 683	734
9.584 680	1239	9.600 120	903	9.604 383	1350	9.642 522	864	9.645 320	859	9.645 990	421	9.651 053	1310	9.698 684	734
9.584 681	1239	9.600 122	903	9.604 389	714	9.642 523	864	9.645 321	859	9.645 991	421	9.651 560	1319	9.698 685	732
9.584 682	1239	9.600 125	903	9.604 389	1350	9.642 524	864	9.645 322	509	9.645 992	429	9.651 564	1319	9.698 686	733
9.584 683	1239	9.600 140	903	9.604 394	714	9.642 525	864	9.645 323	509	9.645 996	421	9.651 637	1314	9.698 687	733
9.584 684	1239	9.600 150	903	9.604 394	1350	9.642 526	864	9.645 324	509	9.646 000	431	9.651 638	1314	9.698 688	733
9.584 685	1239	9.600 199	903	9.604 395	714	9.642 527	864	9.645 325	509	9.646 001	1354	9.651 639	1314	9.698 689	733
9.584 686	1239	9.600 210	903	9.604 395	1350	9.642 528	864	9.645 326	509	9.646 010	432	9.651 641	1314	9.698 690	732
9.584 690	1239	9.600 222	903	9.604 701	264	9.642 529	864	9.645 327	509	9.646 011	434	9.651 642	1314	9.698 691	732
9.584 692	1239	9.600 240	903	9.604 702	264	9.642 530	864	9.645 328	509	9.646 035	420	9.651 643	1314	9.698 692	733
9.584 693	1239	9.600 299	903	9.604 703	264	9.642 531	864	9.645 329	509	9.646 036	420	9.651 656	1314	9.698 693	733
9.584 695	1243	9.603 181	712	9.604 704	265	9.642 540	864	9.645 331	859	9.646 040	445	9.651 657	1314	9.698 694	737
9.584 696	1243	9.603 205	712	9.604 705	265	9.642 541	864	9.645 335	439	9.646 041	421	9.651 658	1314	9.698 695	737
9.584 697	1243	9.603 212	713	9.604 706	265	9.642 542	864	9.645 335	858	9.646 042	421	9.651 659	1314	9.698 696	737
9.584 699	1242	9.603 224	713	9.620 404	1165	9.642 545	864	9.645 338	859	9.646 043	421	9.651 660	1314	9.698 697	733
9.584 720	1241	9.603 250	715	9.620 405	1165	9.642 546	864	9.645 342	439	9.646 044	421	9.651 661	1314	9.698 698	733
9.584 721	1241	9.603 250	1321	9.620 406	1165	9.642 547	864	9.645 342	858	9.646 045	421	9.651 674	1314	9.698 708	754
9.584 722	1241	9.603 252	715	9.620 407	1165	9.642 548	864	9.645 343	439	9.650 160	577	9.651 675	1314	9.698 709	754
9.584 723	1241	9.603 252	1321	9.620 408	1165	9.642 600	863	9.645 344	439	9.650 165	580	9.651 676	1314	9.698 710	754
9.584 724	1241	9.603 290	716	9.620 409	1165	9.642 601	863	9.645 346	836	9.650 166	580	9.651 677	1314	9.698 711	754
9.584 725	1241	9.603 290	1319	9.620 410	1165	9.642 602	863	9.645 347	836	9.650 170	578	9.651 678	1314	9.698 712	754
9.584 726	1241	9.603 500	716	9.620 411	1165	9.642 603	863	9.645 350	835	9.650 175	578	9.651 689	1314	9.698 746	756
9.584 727	1241	9.603 500	1322	9.620 413	1165	9.642 604	863	9.645 350	1308	9.650 180	577	9.651 690	1314	9.698 960	757
9.584 730	1260	9.603 501	716	9.620 414	1164	9.642 605	863	9.645 351	836	9.650 185	577	9.651 691	1314	9.698 961	757
9.584 731	1260	9.603 501	1322	9.620 415	1164	9.642 606	863	9.645 351	1307	9.650 190	581	9.651 692	1314	9.698 962	756
9.584 732	1260	9.603 502	716	9.620 416	1164	9.642 607	863	9.645 510	858	9.650 195	579	9.651 693	1314	9.698 963	756
9.584 733	1260	9.603 502	1322	9.620 417	1164	9.642 608	863	9.645 590	862	9.650 204	579	9.651 694	1314	9.698 964	756
9.584 734	1260	9.603 503	716	9.620 418	1164	9.642 609	863	9.645 591	862	9.650 205	579	9.651 695	1314	9.698 965	756
9.584 735	1260	9.603 503	1322	9.620 419	1164	9.642 610	863	9.645 592	862	9.650 208	579	9.651 850	1315	9.698 966	756
9.584 736	1261	9.603 510	716	9.620 420	1165	9.642 620	863	9.645 593	862	9.650 209	579	9.651 851	1315	9.698 967	756
9.584 737	1261	9.603 510	1322	9.620 421	1165	9.642 621	863	9.645 594	862	9.650 217	579	9.651 852	1315	9.698 968	756
9.584 738	1261	9.603 520	716	9.620 423	1165	9.642 622	863	9.645 595	862	9.650 218	579	9.651 853	1315	9.698 969	757
9.584 739	1261	9.603 520	1322	9.620 424	1165	9.642 623	863	9.645 616	858	9.650 223	581	9.651 854	1315	9.698 970	757
9.584 740	1261	9.603 581	702	9.620 425	1165	9.642 624	863	9.645 711	860	9.650 224	581	9.651 855	1315	9.698 971	757
9.584 741	1261	9.603 584	702	9.620 426	1165	9.642 625	863	9.645 712	860	9.650 225	582	9.651 856	1315	9.698 972	757
9.584 742	1261	9.603 585	702	9.620 427	1165	9.642 626	863	9.645 714	860	9.650 228	581	9.651 857	1315	9.698 973	757
9.584 753	1262	9.603 650	1321	9.620 429	1165	9.642 627	863	9.645 715	860	9.650 229	581	9.651 858	1315	9.698 974	757
9.584 754	1262	9.603 651	1321	9.620 432	1165	9.642 628	863	9.645 740	861	9.650 235	581	9.651 859	1315	9.698 975	757

9.698 976	757	9.699 310	738	9.700 436	996	9.718 202	379	9.720 501	426	9.721 077	1351	9.728 815	511	9.730 111	504
9.698 980	734	9.699 311	738	9.700 437	996	9.718 203	379	9.720 539	427	9.721 078	1351	9.728 820	481	9.730 112	504
9.698 981	734	9.699 312	738	9.700 438	996	9.718 222	379	9.720 540	427	9.721 079	1302	9.728 820	497	9.730 113	504
9.699 001	730	9.699 313	739	9.700 442	996	9.718 230	379	9.720 541	427	9.721 080	1302	9.728 821	481	9.730 114	504
9.699 002	730	9.699 314	738	9.700 443	996	9.718 667	397	9.720 542	427	9.721 081	491	9.728 821	497	9.730 115	1317
9.699 003	730	9.699 315	738	9.704 000	286	9.718 668	397	9.720 545	427	9.721 201	477	9.728 830	482	9.730 116	1317
9.699 004	730	9.699 318	738	9.704 001	286	9.720 085	419	9.720 547	427	9.721 202	477	9.728 831	482	9.730 117	1317
9.699 038	826	9.699 319	738	9.704 002	286	9.720 090	419	9.720 548	427	9.721 205	479	9.728 840	482	9.730 118	1317
9.699 038	1192	9.699 320	740	9.704 003	316	9.720 091	419	9.720 595	427	9.721 205	837	9.728 840	492	9.730 119	1317
9.699 039	826	9.699 321	740	9.704 004	316	9.720 092	419	9.720 618	427	9.721 205	1308	9.728 841	482	9.730 120	466
9.699 039	1192	9.699 322	740	9.704 006	316	9.720 093	419	9.720 624	428	9.721 207	480	9.728 841	492	9.730 121	466
9.699 040	826	9.699 323	740	9.704 010	313	9.720 094	419	9.720 625	428	9.721 207	1309	9.728 842	482	9.730 221	506
9.699 040	1192	9.699 340	741	9.704 012	313	9.720 095	419	9.720 636	427	9.721 208	480	9.728 842	492	9.730 222	474
9.699 041	826	9.699 341	741	9.704 013	313	9.720 096	419	9.720 637	427	9.721 208	1309	9.728 843	482	9.730 223	474
9.699 041	1192	9.699 342	741	9.704 014	313	9.720 097	419	9.720 650	428	9.721 211	478	9.728 843	492	9.731 800	263
9.699 042	826	9.699 343	741	9.704 016	314	9.720 098	419	9.721 000	465	9.721 211	480	9.728 851	836	9.731 801	263
9.699 042	1192	9.699 344	741	9.704 017	326	9.720 130	440	9.721 001	655	9.721 211	1309	9.728 852	836	9.731 802	263
9.699 043	826	9.699 345	741	9.704 018	326	9.720 131	436	9.721 003	655	9.721 212	481	9.728 854	836	9.731 803	263
9.699 043	1192	9.699 380	741	9.704 078	326	9.720 133	418	9.721 004	656	9.725 094	869	9.728 890	444	9.731 804	263
9.699 044	826	9.699 381	741	9.704 079	326	9.720 135	418	9.721 005	656	9.725 320	869	9.728 891	444	9.731 805	262
9.699 044	1192	9.699 382	741	9.704 081	326	9.720 137	418	9.721 006	656	9.725 321	869	9.728 892	444	9.731 806	262
9.699 045	826	9.699 383	741	9.704 083	326	9.720 138	418	9.721 007	656	9.725 322	869	9.728 893	444	9.731 807	262
9.699 045	1192	9.699 384	741	9.704 103	288	9.720 145	436	9.721 008	656	9.725 323	869	9.728 894	444	9.731 808	262
9.699 085	770	9.699 385	741	9.704 104	288	9.720 156	436	9.721 009	1296	9.725 363	869	9.728 895	444	9.731 809	262
9.699 086	770	9.699 447	742	9.704 105	289	9.720 157	438	9.721 010	1296	9.725 378	869	9.728 896	444	9.731 810	262
9.699 087	770	9.699 448	742	9.704 106	289	9.720 163	437	9.721 011	500	9.725 381	868	9.728 897	444	9.731 811	262
9.699 092	771	9.699 449	742	9.704 107	317	9.720 164	437	9.721 013	501	9.725 382	868	9.729 900	469	9.731 812	262
9.699 093	771	9.699 451	742	9.704 108	317	9.720 167	418	9.721 014	500	9.725 383	868	9.729 901	469	9.731 813	262
9.699 094	771	9.699 452	742	9.704 109	318	9.720 168	437	9.721 015	496	9.725 394	869	9.729 902	469	9.731 814	262
9.699 095	771	9.699 453	742	9.704 112	329	9.720 169	437	9.721 016	504	9.725 395	869	9.729 907	469	9.732 200	261
9.699 096	770	9.699 454	743	9.704 114	329	9.720 183	436	9.721 017	501	9.726 403	395	9.729 908	469	9.732 201	261
9.699 100	774	9.699 456	743	9.704 123	318	9.720 184	436	9.721 018	476	9.726 404	395	9.729 914	469	9.732 202	261
9.699 101	774	9.699 457	743	9.704 147	293	9.720 208	426	9.721 019	476	9.726 405	396	9.729 915	470	9.732 203	261
9.699 110	772	9.699 458	743	9.704 148	293	9.720 210	425	9.721 021	476	9.726 407	388	9.729 931	467	9.732 204	262
9.699 130	771	9.699 459	743	9.704 149	322	9.720 211	424	9.721 021	835	9.726 408	399	9.729 932	467	9.732 208	262
9.699 131	771	9.699 495	742	9.704 150	322	9.720 220	422	9.721 022	835	9.726 410	400	9.729 933	467	9.732 209	262
9.699 132	771	9.699 497	742	9.704 160	295	9.720 222	426	9.721 023	476	9.726 411	387	9.729 936	466	9.733 644	262
9.699 133	771	9.699 501	742	9.704 161	295	9.720 226	426	9.721 023	835	9.726 412	387	9.729 938	468	9.733 653	262
9.699 134	771	9.699 502	742	9.704 162	295	9.720 231	441	9.721 024	476	9.726 413	387	9.729 939	468	9.733 654	262
9.699 135	771	9.699 503	742	9.704 163	295	9.720 232	441	9.721 024	835	9.726 416	387	9.729 942	469	9.733 655	261
9.699 136	771	9.699 504	742	9.704 164	324	9.720 233	441	9.721 026	471	9.726 417	387	9.729 943	469	9.733 658	262
9.699 137	771	9.699 565	743	9.704 165	324	9.720 241	443	9.721 028	505	9.726 420	400	9.729 944	469	9.733 680	261
9.699 138	771	9.699 630	767	9.704 166	324	9.720 242	443	9.721 029	505	9.726 423	383	9.729 945	469	9.733 681	261
9.699 139	771	9.699 631	767	9.704 301	288	9.720 250	435	9.721 030	505	9.726 424	383	9.729 946	469	9.733 682	261
9.699 140	771	9.699 632	767	9.704 302	317	9.720 257	443	9.721 031	505	9.726 425	383	9.729 947	469	9.733 755	199
9.699 141	771	9.699 633	767	9.704 324	329	9.720 261	441	9.721 032	505	9.726 426	383	9.729 948	469	9.733 778	199
9.699 165	770	9.699 634	770	9.704 325	329	9.720 262	441	9.721 033	1303	9.726 427	383	9.729 949	469	9.733 779	199
9.699 226	1178	9.699 640	768	9.704 326	318	9.720 263	441	9.721 036	1302	9.726 428	383	9.729 950	467	9.733 786	199
9.699 227	1178	9.699 641	768	9.704 327	318	9.720 276	443	9.721 038	505	9.726 531	398	9.729 951	468	9.733 787	198
9.699 228	1178	9.699 642	768	9.704 328	289	9.720 306	425	9.721 039	505	9.726 533	398	9.729 952	468	9.733 788	197
9.699 229	1178	9.699 643	768	9.704 350	296	9.720 348	441	9.721 040	505	9.726 560	398	9.729 953	468	9.733 788	198
9.699 230	1179	9.699 644	768	9.704 351	296	9.720 349	441	9.721 041	1302	9.727 000	1064	9.729 954	468	9.733 793	197
9.699 231	1178	9.699 645	768	9.704 352	296	9.720 350	441	9.721 042	1302	9.727 001	1064	9.729 955	468	9.733 793	198
9.699 231	1179	9.699 646	768	9.704 353	296	9.720 351	441	9.721 043	1302	9.727 002	1060	9.729 956	468	9.733 794	197
9.699 231	1179	9.699 647	768	9.704 354	325	9.720 352	441	9.721 044	1302	9.727 003	1060	9.729 957	468	9.733 808	245
9.699 235	1178	9.699 648	768	9.704 355	325	9.720 365	423	9.721 045	505	9.727 004	1061	9.729 958	468	9.733 809	245
9.699 236	1178	9.699 649	768	9.704 356	325	9.720 411	440	9.721 046	505	9.727 005	1061	9.729 959	468	9.733 810	200
9.699 238	1191	9.699 650	768	9.704 357	343	9.720 412	440	9.721 047	505	9.727 007	1062	9.729 960	468	9.733 811	200
9.699 239	1191	9.699 651	768	9.704 358	343	9.720 413	440	9.721 048	505	9.727 008	1062	9.729 970	511	9.733 812	200
9.699 240	1178	9.699 652	768	9.704 359	343	9.720 414	440	9.721 049	476	9.727 009	1062	9.729 971	511	9.733 816	197
9.699 240	1179	9.699 653	768	9.704 360	343	9.720 415	440	9.721 049	835	9.727 010	1062	9.729 972	511	9.733 817	197
9.699 240	1179	9.699 654	768	9.704 364	344	9.720 416	440	9.721 050	1302	9.727 011	1064	9.729 973	511	9.733 817	197
9.699 243	1178	9.699 655	768	9.704 403	263	9.720 417	440	9.721 052	1302	9.727 012	1064	9.729 982	510	9.733 817	198
9.699 244	1178	9.699 656	768	9.704 404	263	9.720 418	440	9.721 053	1302	9.727 013	1063	9.729 983	510	9.733 819	200
9.699 246	1178	9.699 657	768	9.704 405	264	9.720 419	165	9.721 054	1302	9.727 014	1063	9.729 984	499	9.733 825	245
9.699 247	1177	9.699 658	768	9.704 406	264	9.720 421	440	9.721 055	1302	9.727 015	1062	9.729 985	499	9.733 998	284
9.699 247	1178	9.699 659	768	9.704 407	264	9.720 422	440	9.721 056	834	9.727 015	1359	9.729 986	499	9.737 780	552
9.699 264	1179	9.699 660	768	9.704 409	264	9.720 423	440	9.721 057	1268	9.727 016	1062	9.729 987	499	9.737 781	552
9.699 266	1178	9.699 661	768	9.704 410	264	9.720 424	440	9.721 058	1351	9.727 016	1359	9.730 017	437	9.737 782	552
9.699 267	1178	9.699 662	768	9.705 078	1057	9.720 441	442	9.721 059	1296	9.727 022	1065	9.730 018	437	9.737 783	552
9.699 273	1179	9.699 663	768	9.705 088	1057	9.720 442	442	9.721 060	835	9.727 025	1061	9.730 019	465	9.737 784	552
9.699 275	286	9.699 664	768	9.705 170	1066	9.720 443	442	9.721 061	491	9.727 026	1061	9.730 021	474	9.737 785	552
9.699 276	286	9.699 665	768	9.705 175	1066	9.720 444	442	9.721 061	835	9.727 027	1061	9.730 040	465	9.737 787	552
9.699 277	286	9.699 666	768	9.705 176	1066	9.720 445	442	9.721 062	491	9.727 030	1062	9.730 041	465	9.737 788	552
9.699 280	1177	9.699 667	768	9.705 177	1066	9.720 446	442	9.721 062	835	9.727 030	1359	9.730 042	465	9.737 789	552
9.699 281	1177	9.699 668	768	9.705 202	1066	9.720 447	442	9.721 063	491	9.727 031	1062	9.730 045	474	9.737 790	550
9.699 282	1177	9.699 669	768	9.705 220	1066	9.720 448	442	9.721 063	835	9.727 031	1359	9.730 060	466	9.737 791	550
9.699 283	1177	9.699 670	768	9.705 221	1066	9.720 449	442	9.721 064	491	9.727 032	1058	9.730 090	471	9.737 801	550
9.699 284	1177	9.699 671	768	9.705 225	1066	9.720 470	423	9.721 064	835	9.727 033	1058	9.730 091	475	9.737 805	551
9.699 285	1177	9.700 400	263	9.705 226	1066	9.720 480	433	9.721 065	505	9.727 034	1064	9.730 100	1317	9.737 806	551
9.699 286	1177	9.700 401	263	9.705 230	1066	9.720 481	433	9.721 066	1296	9.728 800	497	9.730 101	1317	9.737 807	551
9.699 287	1177	9.700 410	1205	9.705 231	1066	9.720 482	433	9.721 067	779	9.728 800	502	9.730 102	504	9.737 815	551
9.699 288	1177	9.700 411	1205	9.705 272	1066	9.720 483	433	9.721 068	1268	9.728 801	497	9.730 103	504	9.737 816	551
9.699 289	1177	9.700 420	995	9.718 002	372	9.720 484	433	9.721 070	1236	9.728 801	502	9.730 104	504	9.737 817	551
9.699 290	1177	9.700 421	995	9.718 011	379	9.720 493	424	9.721 071	1302	9.728 802	497	9.730 105	504	9.737 818	551
9.699 291	1177	9.700 422	995	9.718 011	379	9.720 494	424	9.721 072	1302	9.728 802	502	9.730 106	504	9.737 828	551
9.699 292	315	9.700 423	995	9.718 020	379	9.720 495	424	9.721 073	1302	9.728 810	511	9.730 107	504	9.737 829	551
9.699 295	335	9.700 430	995	9.718 020	379	9.720 496	860	9.721 074	471	9.728 811	511	9.730 108	504	9.737 830	551
9.699 301	1195	9.700 433	996	9.718 200	379	9.720 497	860	9.721 075	1351	9.728 812	511	9.730 109	504	9.737 831	551
9.699 302	1195	9.700 435	996	9.718 201	379	9.720 498	860	9.721 076	1351	9.728 813	511	9.730 110	504	9.737 832	551

9.738 151	538	9.738 405	541	9.738 774	527	9.739 070	536	9.739 333	549	9.773 863	340	9.775 434	1097	9.776 742	662
9.738 170	538	9.738 407	541	9.738 811	535	9.739 071	536	9.739 335	549	9.773 919	291	9.775 434	1101	9.776 743	662
9.738 172	538	9.738 408	541	9.738 815	536	9.739 072	536	9.739 340	549	9.773 920	284	9.775 435	1097	9.776 744	662
9.738 173	538	9.738 414	541	9.738 816	536	9.739 074	535	9.739 341	549	9.773 921	284	9.775 436	1097	9.776 745	662
9.738 174	538	9.738 417	542	9.738 817	536	9.739 080	539	9.739 343	547	9.773 921	334	9.775 436	1101	9.776 746	663
9.738 200	543	9.738 418	542	9.738 818	536	9.739 080	1318	9.739 345	547	9.773 930	283	9.775 437	1101	9.776 747	662
9.738 211	543	9.738 419	541	9.738 823	539	9.739 081	534	9.739 346	547	9.773 931	283	9.775 438	1101	9.776 750	663
9.738 216	542	9.738 419	542	9.738 827	539	9.739 083	535	9.739 347	547	9.773 932	283	9.775 440	1096	9.776 751	662
9.738 217	542	9.738 420	541	9.738 829	539	9.739 091	539	9.739 350	549	9.773 932	284	9.775 441	1096	9.776 752	663
9.738 218	542	9.738 421	549	9.738 833	539	9.739 091	1318	9.739 351	549	9.773 932	311	9.775 442	1098	9.776 760	661
9.738 219	542	9.738 424	549	9.738 835	539	9.739 093	527	9.739 500	560	9.773 933	283	9.775 443	1098	9.776 761	661
9.738 220	542	9.738 425	542	9.738 839	539	9.739 098	527	9.739 600	555	9.773 934	284	9.775 450	1100	9.776 762	661
9.738 221	542	9.738 426	542	9.738 846	541	9.739 147	563	9.739 601	555	9.773 934	311	9.775 451	1100	9.776 763	661
9.738 222	542	9.738 427	542	9.738 847	541	9.739 160	547	9.739 603	536	9.773 944	283	9.775 452	1100	9.776 764	663
9.738 223	542	9.738 428	542	9.738 847	542	9.739 162	547	9.739 604	536	9.773 945	283	9.775 453	1100	9.776 765	663
9.738 224	542	9.738 429	549	9.738 848	539	9.739 163	547	9.739 605	536	9.773 946	283	9.776 451	1248	9.776 766	663
9.738 226	542	9.738 429	549	9.738 849	539	9.739 165	547	9.739 606	536	9.773 947	283	9.776 465	1248	9.776 785	663
9.738 227	542	9.738 432	549	9.738 852	539	9.739 165	547	9.739 607	535	9.773 948	283	9.776 487	657	9.776 786	663
9.738 231	546	9.738 433	549	9.738 854	536	9.739 166	547	9.739 608	535	9.773 950	283	9.776 487	661	9.776 787	663
9.738 232	546	9.738 435	549	9.738 855	536	9.739 200	563	9.739 609	540	9.773 953	284	9.776 487	663	9.776 788	663
9.738 235	543	9.738 437	549	9.738 856	536	9.739 201	563	9.739 610	540	9.773 959	284	9.776 488	657	9.776 789	663
9.738 240	543	9.738 441	549	9.738 857	536	9.739 202	563	9.739 611	540	9.773 978	285	9.776 488	661	9.776 790	663
9.738 278	548	9.738 442	549	9.738 858	536	9.739 203	563	9.739 612	540	9.773 979	285	9.776 488	663	9.776 791	663
9.738 279	548	9.738 449	549	9.738 860	541	9.739 204	563	9.739 613	540	9.773 981	339	9.776 488	1248	9.776 792	663
9.738 281	548	9.738 453	546	9.738 861	541	9.739 205	563	9.739 614	540	9.773 982	284	9.776 490	1248	9.777 000	1351
9.738 282	548	9.738 454	546	9.738 863	541	9.739 208	537	9.739 615	540	9.773 987	311	9.776 496	1248	9.777 001	1351
9.738 283	548	9.738 455	546	9.738 864	539	9.739 209	537	9.739 616	540	9.773 992	326	9.776 500	657	9.777 005	1351
9.738 284	548	9.738 456	546	9.738 866	541	9.739 210	537	9.739 617	540	9.773 993	326	9.776 501	657	9.777 007	1351
9.738 285	548	9.738 457	546	9.738 868	541	9.739 211	537	9.764 503	854	9.773 994	339	9.776 504	657	9.777 008	1351
9.738 286	548	9.738 458	546	9.738 869	539	9.739 212	537	9.764 504	854	9.773 995	334	9.776 504	661	9.777 009	1351
9.738 287	548	9.738 459	546	9.738 870	541	9.739 213	537	9.764 505	854	9.773 996	334	9.776 504	663	9.777 010	1351
9.738 288	548	9.738 460	546	9.738 871	541	9.739 218	537	9.764 506	854	9.773 997	330	9.776 504	1248	9.777 120	1305
9.738 289	548	9.738 461	546	9.738 873	541	9.739 222	537	9.764 507	854	9.773 999	330	9.776 521	657	9.777 121	1305
9.738 290	548	9.738 500	537	9.738 874	539	9.739 223	553	9.764 508	854	9.774 117	290	9.776 522	657	9.777 122	1305
9.738 291	548	9.738 501	537	9.738 875	539	9.739 224	553	9.764 509	854	9.774 118	290	9.776 533	1248	9.777 123	1305
9.738 292	548	9.738 502	537	9.738 877	541	9.739 226	555	9.764 510	857	9.774 317	289	9.776 534	1248	9.777 125	1305
9.738 293	548	9.738 503	537	9.738 879	541	9.739 227	555	9.764 511	857	9.774 318	290	9.776 601	1103	9.777 128	1305
9.738 294	548	9.738 504	537	9.738 880	539	9.739 228	555	9.764 512	857	9.774 319	290	9.776 604	1103	9.777 129	1305
9.738 298	548	9.738 505	537	9.738 885	539	9.739 229	555	9.764 513	857	9.774 329	290	9.776 608	1103	9.777 130	1305
9.738 299	548	9.738 506	537	9.738 888	541	9.739 230	555	9.764 514	857	9.774 337	290	9.776 608	1272	9.777 132	1305
9.738 300	544	9.738 507	537	9.738 905	534	9.739 231	555	9.764 515	857	9.774 340	330	9.776 609	1103	9.777 133	1305
9.738 310	564	9.738 508	537	9.738 909	534	9.739 235	561	9.764 516	857	9.774 343	330	9.776 620	1248	9.777 134	1305
9.738 311	542	9.738 509	537	9.738 912	535	9.739 236	561	9.764 518	857	9.774 350	331	9.776 621	1248	9.777 138	1306
9.738 313	564	9.738 510	537	9.738 914	534	9.739 237	561	9.764 521	857	9.774 351	331	9.776 622	1248	9.777 142	1306
9.738 314	564	9.738 512	544	9.738 915	534	9.739 238	559	9.764 522	857	9.774 354	289	9.776 623	1248	9.777 143	1306
9.738 315	544	9.738 514	544	9.738 916	534	9.739 239	561	9.764 523	857	9.774 355	290	9.776 624	1248	9.777 144	1306
9.738 316	564	9.738 515	544	9.738 917	534	9.739 240	561	9.764 537	854	9.774 356	290	9.776 671	1306	9.777 145	1306
9.738 317	564	9.738 516	544	9.738 960	539	9.739 241	553	9.764 538	854	9.774 357	331	9.776 672	1306	9.777 146	1306
9.738 318	564	9.738 518	544	9.738 961	539	9.739 242	554	9.764 539	854	9.774 358	319	9.776 673	1301	9.777 147	1306
9.738 319	564	9.738 522	544	9.738 962	539	9.739 243	559	9.764 540	854	9.774 367	289	9.776 673	1306	9.777 148	1306
9.738 320	542	9.738 524	544	9.738 963	539	9.739 248	537	9.764 541	854	9.774 372	319	9.776 674	1301	9.777 149	1305
9.738 321	542	9.738 525	544	9.738 964	539	9.739 250	555	9.764 542	854	9.774 375	290	9.776 674	1306	9.777 172	1353
9.738 325	542	9.738 526	544	9.738 965	539	9.739 251	555	9.764 543	854	9.774 376	289	9.776 675	1301	9.777 173	1352
9.738 327	542	9.738 528	544	9.738 966	539	9.739 252	537	9.764 575	855	9.774 377	290	9.776 675	1306	9.777 174	1352
9.738 328	542	9.738 532	544	9.738 970	533	9.739 253	555	9.764 576	855	9.774 378	330	9.776 687	1301	9.777 175	1353
9.738 329	548	9.738 535	544	9.738 971	533	9.739 254	537	9.764 577	855	9.774 379	319	9.776 687	1306	9.777 176	1353
9.738 338	542	9.738 536	544	9.738 972	533	9.739 255	555	9.764 578	855	9.774 390	320	9.776 688	1301	9.777 177	1353
9.738 339	542	9.738 538	544	9.738 973	533	9.739 256	555	9.764 579	855	9.774 391	320	9.776 688	1306	9.777 178	1353
9.738 340	542	9.738 552	545	9.738 974	533	9.739 257	555	9.764 580	855	9.774 398	319	9.776 689	1301	9.777 179	1353
9.738 342	542	9.738 554	545	9.738 975	533	9.739 258	465	9.764 581	856	9.774 399	319	9.776 689	1306	9.777 180	1353
9.738 344	542	9.738 555	545	9.738 976	533	9.739 259	465	9.764 582	856	9.774 400	320	9.776 691	1301	9.777 181	1353
9.738 345	542	9.738 556	545	9.738 977	533	9.739 260	555	9.764 583	856	9.774 401	320	9.776 691	1306	9.777 185	1353
9.738 380	542	9.738 556	547	9.738 978	533	9.739 261	555	9.764 584	856	9.774 402	320	9.776 695	1300	9.777 186	1353
9.738 381	541	9.738 558	545	9.738 979	533	9.739 262	555	9.764 585	856	9.774 403	319	9.776 696	1301	9.777 200	1304
9.738 381	542	9.738 560	547	9.738 980	533	9.739 265	555	9.764 586	856	9.774 404	319	9.776 696	1306	9.777 202	1304
9.738 382	541	9.738 560	547	9.738 981	533	9.739 266	555	9.764 587	856	9.774 405	319	9.776 697	1301	9.777 204	1305
9.738 382	542	9.738 562	545	9.738 982	533	9.739 267	555	9.764 588	856	9.774 406	330	9.776 697	1306	9.777 206	1305
9.738 383	541	9.738 564	545	9.738 983	533	9.739 268	555	9.764 589	856	9.774 407	331	9.776 698	1301	9.777 208	1305
9.738 383	542	9.738 565	545	9.738 984	533	9.739 269	555	9.764 590	856	9.774 409	320	9.776 699	1301	9.777 210	1305
9.738 384	541	9.738 566	545	9.738 987	533	9.739 270	541	9.764 591	856	9.775 160	1101	9.776 699	1306	9.777 212	1299
9.738 384	542	9.738 568	545	9.738 990	533	9.739 271	541	9.764 592	856	9.775 160	1269	9.776 700	660	9.777 214	1299
9.738 385	542	9.738 572	545	9.739 001	543	9.739 273	553	9.770 106	1085	9.775 161	1101	9.776 702	660	9.777 220	1352
9.738 386	542	9.738 574	545	9.739 002	543	9.739 274	541	9.770 108	1085	9.775 162	1101	9.776 705	660	9.777 221	1352
9.738 387	541	9.738 575	545	9.739 003	543	9.739 275	541	9.773 701	323	9.775 163	1101	9.776 710	661	9.777 222	1352
9.738 387	542	9.738 576	545	9.739 006	543	9.739 277	553	9.773 702	294	9.775 164	1101	9.776 711	661	9.777 223	1352
9.738 388	542	9.738 578	545	9.739 007	543	9.739 278	553	9.773 703	294	9.775 165	1101	9.776 712	661	9.777 224	1352
9.738 389	542	9.738 582	545	9.739 020	534	9.739 279	555	9.773 711	323	9.775 166	1101	9.776 713	661	9.777 225	1352
9.738 390	542	9.738 584	545	9.739 021	534	9.739 281	540	9.773 712	323	9.775 167	1101	9.776 721	661	9.777 226	1352
9.738 391	542	9.738 585	545	9.739 022	534	9.739 286	540	9.773 720	316	9.775 171	1102	9.776 722	661	9.777 227	1352
9.738 392	542	9.738 586	545	9.739 030	538	9.739 287	540	9.773 721	316	9.775 171	1270	9.776 723	661	9.777 228	1352
9.738 393	542	9.738 588	545	9.739 031	538	9.739 292	540	9.773 722	328	9.775 411	1095	9.776 724	661	9.777 250	501
9.738 394	542	9.738 660	535	9.739 032	538	9.739 296	555	9.773 723	328	9.775 411	1271	9.776 730	662	9.777 251	501
9.738 395	542	9.738 662	535	9.739 033	538	9.739 297	540	9.773 724	328	9.775 412	1095	9.776 731	662	9.777 252	501
9.738 396	542	9.738 665	535	9.739 034	538	9.739 298	540	9.773 850	291	9.775 412	1271	9.776 732	662	9.777 253	476
9.738 397	542	9.738 670	535	9.739 055	536	9.739 299	540	9.773 851	292	9.775 416	1097	9.776 733	662	9.777 254	476
9.738 398	542	9.738 671	535	9.739 064	533	9.739 299	1318	9.773 852	292	9.775 420	1097	9.776 734	662	9.777 256	476
9.738 399	542	9.738 770	527	9.739 065	533	9.739 300	549	9.773 855	291	9.775 424	1097	9.776 735	662	9.777 259	476
9.738 402	544	9.738 771	527	9.739 066	533	9.739 305	563	9.773 857	340	9.775 430	1095	9.776 736	662	9.777 262	476
9.738 403	541	9.738 772	527	9.739 067	535	9.739 321	549	9.773 859	340	9.775 430	1097	9.776 737	662	9.777 263	476
9.738 404	544	9.738 773	527	9.739 069	535	9.739 331	549	9.773 861	340	9.775 430	1101	9.776 740	662	9.777 271	1304

9.777 272	1304	9.801 313	1087	9.812 456	644	9.816 708	452	9.828 376	1009	9.828 672	998	9.837 912	503	9.838 192	495
9.777 273	1304	9.801 317	1093	9.812 457	644	9.816 709	452	9.828 377	1007	9.828 674	998	9.837 913	498	9.838 193	495
9.777 274	1304	9.801 325	1093	9.812 458	644	9.816 710	452	9.828 378	1007	9.828 675	998	9.837 914	498	9.838 195	471
9.777 275	1305	9.801 333	1087	9.812 459	644	9.816 711	452	9.828 378	1009	9.828 676	998	9.837 915	484	9.839 701	475
9.777 276	1305	9.801 344	1089	9.812 460	644	9.816 712	454	9.828 379	1007	9.828 677	998	9.837 916	493	9.839 702	475
9.777 277	1305	9.801 348	1087	9.812 461	644	9.816 713	454	9.828 380	1007	9.828 678	998	9.837 917	484	9.839 703	475
9.777 278	1305	9.801 351	1087	9.812 462	644	9.816 714	454	9.828 381	1007	9.828 681	1001	9.837 918	493	9.839 704	475
9.777 279	1305	9.801 359	1087	9.812 463	644	9.816 715	453	9.828 391	1006	9.828 682	1001	9.837 919	485	9.839 797	473
9.777 280	1305	9.801 362	1088	9.812 464	644	9.816 716	453	9.828 391	1009	9.828 684	1001	9.837 920	485	9.839 799	473
9.777 281	1305	9.801 369	1089	9.812 465	644	9.816 717	453	9.828 394	1006	9.828 685	1001	9.837 925	506	9.839 800	500
9.777 282	1305	9.801 373	1090	9.812 476	646	9.816 718	453	9.828 395	1006	9.828 686	1001	9.837 926	833	9.839 801	473
9.777 283	1299	9.801 374	1090	9.812 477	647	9.816 719	453	9.828 396	1006	9.828 688	1001	9.837 927	833	9.839 802	491
9.777 284	1299	9.801 375	1088	9.812 477	1025	9.816 720	453	9.828 420	1015	9.828 689	1001	9.837 929	833	9.839 804	500
9.777 285	1299	9.801 376	1089	9.812 478	647	9.816 735	456	9.828 421	1015	9.828 690	1001	9.837 931	507	9.839 805	506
9.777 286	1299	9.801 377	1089	9.812 478	1025	9.816 736	456	9.828 422	1015	9.828 691	1001	9.837 935	486	9.839 806	506
9.777 287	501	9.801 378	1089	9.812 479	646	9.816 801	1300	9.828 423	1015	9.828 693	1001	9.837 936	485	9.839 807	506
9.777 288	501	9.801 379	1089	9.812 480	646	9.816 802	1300	9.828 424	1015	9.828 694	1001	9.837 936	833	9.839 808	474
9.777 289	501	9.801 381	1088	9.812 520	651	9.816 803	1300	9.828 425	1015	9.828 695	1001	9.837 937	486	9.839 809	474
9.777 290	501	9.801 382	1088	9.812 521	651	9.816 804	1300	9.828 430	1015	9.828 696	1001	9.837 938	487	9.839 810	465
9.777 291	476	9.801 383	1088	9.812 522	651	9.816 805	1300	9.828 432	1015	9.828 697	1001	9.837 960	808	9.839 811	474
9.777 292	476	9.801 386	1090	9.812 523	651	9.816 806	1300	9.828 433	1015	9.828 698	1001	9.837 966	808	9.839 812	474
9.778 950	457	9.801 390	1090	9.812 524	651	9.816 807	1300	9.828 434	1015	9.828 699	1001	9.837 967	808	9.839 813	474
9.778 951	457	9.801 398	1093	9.812 525	651	9.816 808	1300	9.828 435	1015	9.828 700	1001	9.837 968	808	9.839 814	474
9.778 952	457	9.801 420	1089	9.812 526	651	9.816 809	1300	9.828 470	1009	9.828 701	1001	9.837 970	486	9.839 816	474
9.778 953	457	9.801 422	1089	9.812 527	651	9.816 810	1300	9.828 471	1009	9.828 703	1001	9.837 971	486	9.839 817	474
9.778 954	457	9.803 702	1151	9.812 528	651	9.816 811	1300	9.828 472	1009	9.828 704	1001	9.837 972	485	9.839 818	474
9.778 960	457	9.803 717	1152	9.812 529	651	9.816 812	1300	9.828 473	1009	9.828 705	1001	9.837 973	486	9.839 819	474
9.778 961	457	9.803 721	1152	9.812 530	651	9.822 551	333	9.828 474	1009	9.828 706	1001	9.837 974	486	9.839 820	474
9.778 962	457	9.803 723	1152	9.812 531	651	9.822 560	333	9.828 475	1009	9.828 710	999	9.837 975	486	9.839 821	474
9.778 963	457	9.803 724	1152	9.812 539	651	9.826 131	559	9.828 480	1010	9.828 711	999	9.837 976	486	9.839 822	474
9.778 964	457	9.803 727	1152	9.812 553	651	9.826 132	559	9.828 481	1010	9.828 712	999	9.837 977	486	9.839 823	474
9.779 003	458	9.803 728	1152	9.812 555	651	9.826 133	559	9.828 482	1010	9.828 714	999	9.837 978	486	9.839 826	474
9.779 005	458	9.803 729	1152	9.812 556	651	9.826 134	559	9.828 483	1010	9.828 716	999	9.837 979	486	9.839 827	474
9.779 006	458	9.803 730	1152	9.812 558	651	9.826 401	556	9.828 484	1010	9.828 717	999	9.837 980	485	9.839 830	470
9.779 013	458	9.803 731	1152	9.812 751	643	9.826 402	556	9.828 485	1010	9.828 718	999	9.837 980	833	9.839 831	470
9.779 014	458	9.803 732	1152	9.812 753	643	9.826 403	556	9.828 487	1010	9.829 240	1001	9.837 981	487	9.839 832	470
9.779 052	458	9.803 735	1152	9.812 755	643	9.826 404	556	9.828 510	1005	9.829 241	1001	9.837 982	486	9.839 833	472
9.779 065	458	9.803 743	1152	9.813 001	648	9.826 405	556	9.828 511	1015	9.829 242	1002	9.837 983	485	9.839 835	472
9.779 320	458	9.803 766	1152	9.813 002	648	9.826 406	556	9.828 512	1006	9.829 243	1002	9.837 983	808	9.839 837	473
9.779 321	459	9.803 775	1152	9.813 003	648	9.826 444	556	9.828 513	1009	9.829 244	1002	9.837 983	834	9.839 838	470
9.779 322	459	9.803 776	1152	9.813 004	650	9.826 446	556	9.828 514	1009	9.829 245	1002	9.837 984	485	9.839 839	473
9.779 323	459	9.803 890	1152	9.813 005	650	9.826 447	556	9.828 515	1009	9.829 250	1003	9.837 984	808	9.839 841	474
9.779 324	459	9.812 217	588	9.813 006	650	9.826 449	556	9.828 516	1009	9.829 251	1003	9.837 984	834	9.839 842	474
9.779 325	459	9.812 217	653	9.813 007	650	9.826 450	556	9.828 520	1006	9.829 252	1003	9.837 985	485	9.839 844	474
9.779 326	460	9.812 365	647	9.813 008	650	9.826 939	556	9.828 521	1006	9.829 253	1003	9.837 985	808	9.839 851	473
9.779 331	460	9.812 365	1025	9.813 011	649	9.826 940	556	9.828 530	1006	9.829 254	1003	9.837 985	834	9.839 853	491
9.779 332	460	9.812 377	647	9.813 013	649	9.826 943	556	9.828 533	1006	9.829 255	1003	9.837 986	485	9.839 855	496
9.779 333	460	9.812 377	1025	9.813 100	641	9.828 142	1010	9.828 541	1007	9.829 256	1003	9.837 986	808	9.839 856	496
9.779 334	460	9.812 378	647	9.813 101	641	9.828 144	1010	9.828 601	997	9.829 285	1004	9.837 986	834	9.839 857	500
9.801 101	1091	9.812 378	1025	9.816 389	447	9.828 146	1010	9.828 602	997	9.829 286	1004	9.837 987	485	9.839 859	500
9.801 102	1091	9.812 385	647	9.816 395	448	9.828 152	1010	9.828 603	997	9.829 287	1004	9.837 987	808	9.839 861	474
9.801 103	1091	9.812 385	1025	9.816 396	448	9.828 154	1010	9.828 604	997	9.829 288	1004	9.837 987	834	9.839 862	474
9.801 104	1091	9.812 395	646	9.816 397	448	9.828 156	1010	9.828 605	997	9.829 289	1004	9.837 988	485	9.839 863	474
9.801 105	1091	9.812 398	646	9.816 398	448	9.828 215	1006	9.828 606	998	9.829 290	1004	9.837 988	808	9.839 864	474
9.801 110	1092	9.812 399	646	9.816 400	447	9.828 216	1006	9.828 607	998	9.829 291	1004	9.837 988	834	9.839 865	474
9.801 116	1088	9.812 400	646	9.816 402	447	9.828 307	1014	9.828 608	1000	9.829 292	1004	9.837 989	485	9.839 866	474
9.801 117	1088	9.812 405	647	9.816 508	449	9.828 308	1014	9.828 609	1000	9.830 133	414	9.837 989	808	9.839 869	474
9.801 121	1086	9.812 405	1025	9.816 510	447	9.828 309	1014	9.828 610	1000	9.830 160	413	9.837 989	834	9.839 870	474
9.801 123	1086	9.812 406	647	9.816 512	449	9.828 344	1014	9.828 611	1000	9.830 430	412	9.837 990	833	9.839 871	474
9.801 124	1086	9.812 406	1025	9.816 562	449	9.828 344	1014	9.828 612	1000	9.830 441	411	9.837 991	485	9.839 875	837
9.801 127	1086	9.812 410	643	9.816 563	449	9.828 345	1014	9.828 613	1000	9.830 442	411	9.837 991	834	9.839 876	837
9.801 130	1086	9.812 411	643	9.816 564	449	9.828 346	1008	9.828 614	999	9.830 443	411	9.838 040	489	9.839 877	837
9.801 142	1086	9.812 412	643	9.816 566	449	9.828 347	1008	9.828 615	999	9.830 445	411	9.838 040	495	9.839 878	837
9.801 149	1086	9.812 413	643	9.816 595	460	9.828 348	1008	9.828 635	997	9.830 446	411	9.838 041	489	9.840 514	270
9.801 150	1086	9.812 414	643	9.816 596	460	9.828 349	1008	9.828 636	997	9.830 447	411	9.838 041	495	9.840 514	271
9.801 151	1086	9.812 415	643	9.816 597	460	9.828 350	1008	9.828 639	997	9.830 447	413	9.838 045	490	9.840 514	272
9.801 185	1087	9.812 416	643	9.816 598	460	9.828 351	1008	9.828 640	997	9.830 448	411	9.838 046	490	9.840 514	273
9.801 190	1094	9.812 417	643	9.816 599	460	9.828 352	1008	9.828 643	997	9.830 451	411	9.838 047	490	9.840 532	270
9.801 200	1086	9.812 420	643	9.816 622	449	9.828 353	1008	9.828 644	997	9.830 463	411	9.838 048	490	9.840 532	271
9.801 201	1086	9.812 421	643	9.816 630	455	9.828 354	1008	9.828 646	997	9.830 463	413	9.838 049	490	9.840 532	272
9.801 202	1086	9.812 422	643	9.816 631	455	9.828 355	1008	9.828 647	997	9.830 469	411	9.838 050	490	9.840 532	273
9.801 241	1086	9.812 423	643	9.816 632	455	9.828 356	1008	9.828 649	997	9.837 870	509	9.838 063	494	9.840 588	267
9.801 242	1086	9.812 424	643	9.816 633	455	9.828 357	1008	9.828 650	997	9.837 871	509	9.838 074	488	9.840 607	274
9.801 244	1086	9.812 425	643	9.816 691	450	9.828 358	1008	9.828 651	997	9.837 881	844	9.838 075	488	9.840 608	274
9.801 245	1086	9.812 426	643	9.816 692	450	9.828 359	1008	9.828 653	998	9.837 882	844	9.838 080	495	9.840 609	274
9.801 246	1086	9.812 427	643	9.816 693	450	9.828 360	1008	9.828 654	998	9.837 883	844	9.838 091	490	9.840 610	274
9.801 247	1086	9.812 430	643	9.816 694	454	9.828 361	1008	9.828 655	998	9.837 884	844	9.838 092	490	9.840 612	272
9.801 249	1086	9.812 431	643	9.816 695	454	9.828 362	1008	9.828 656	998	9.837 885	844	9.838 093	490	9.840 614	272
9.801 250	1086	9.812 432	643	9.816 696	454	9.828 363	1008	9.828 657	998	9.837 886	844	9.838 094	490	9.840 616	270
9.801 251	1086	9.812 433	643	9.816 697	450	9.828 364	1008	9.828 658	998	9.837 890	845	9.838 095	490	9.840 616	271
9.801 252	1086	9.812 434	643	9.816 698	450	9.828 365	1008	9.828 659	998	9.837 891	845	9.838 150	487	9.840 616	272
9.801 253	1086	9.812 435	643	9.816 699	450	9.828 366	1006	9.828 660	998	9.837 892	846	9.838 151	487	9.840 616	273
9.801 254	1086	9.812 436	643	9.816 700	451	9.828 367	1005	9.828 661	998	9.837 893	846	9.838 160	488	9.840 616	274
9.801 255	1086	9.812 437	643	9.816 701	451	9.828 368	1015	9.828 662	998	9.837 894	846	9.838 161	488	9.840 619	272
9.801 256	1086	9.812 450	644	9.816 702	451	9.828 370	1008	9.828 663	998	9.837 895	846	9.838 162	488	9.840 626	272
9.801 257	1092	9.812 451	644	9.816 703	451	9.828 371	1006	9.828 665	998	9.837 896	846	9.838 163	488	9.840 627	267
9.801 258	1092	9.812 452	644	9.816 704	451	9.828 372	1006	9.828 666	998	9.837 897	846	9.838 175	488	9.840 628	267
9.801 301	1087	9.812 453	644	9.816 705	451	9.828 373	1006	9.828 667	998	9.837 905	484	9.838 176	488	9.840 650	270
9.801 306	1087	9.812 454	644	9.816 706	452	9.828 375	1007	9.828 668	998	9.837 906	493	9.838 185	494	9.840 650	271
9.801 312	1087	9.812 455	644	9.816 707	452	9.828 376	1007	9.828 671	998	9.837 911	503	9.838 191	495	9.840 650	272

9.840 650	273	9.843 769	1201	9.851 879	1156	9.857 124	795	9.857 426	774	9.858 063	785	9.859 233	781	9.867 709	1356
9.840 651	274	9.843 770	1201	9.851 885	1156	9.857 125	795	9.857 427	774	9.858 064	785	9.859 234	781	9.867 710	830
9.840 681	270	9.843 771	1201	9.851 886	1156	9.857 126	795	9.857 428	774	9.858 066	784	9.859 235	781	9.867 710	1356
9.840 682	270	9.843 773	1201	9.851 888	1155	9.857 127	795	9.857 429	774	9.858 071	785	9.859 236	781	9.867 711	830
9.840 687	275	9.843 775	1201	9.851 893	1155	9.857 128	795	9.857 474	774	9.858 072	785	9.859 237	782	9.867 711	1356
9.840 688	275	9.843 776	1201	9.851 894	1155	9.857 129	795	9.857 476	774	9.858 075	784	9.859 238	782	9.867 712	830
9.840 689	273	9.843 777	1197	9.851 895	1155	9.857 130	795	9.857 477	774	9.858 086	785	9.859 239	782	9.867 712	1356
9.840 690	273	9.843 778	1197	9.851 896	1155	9.857 131	795	9.857 478	774	9.858 087	785	9.859 240	782	9.867 713	830
9.840 691	273	9.843 779	1197	9.851 897	1155	9.857 132	795	9.857 479	774	9.858 088	785	9.859 241	783	9.867 713	849
9.840 692	273	9.843 780	1204	9.851 899	1155	9.857 145	796	9.857 592	787	9.858 089	785	9.859 242	783	9.867 713	849
9.840 693	272	9.843 781	1204	9.851 919	380	9.857 146	796	9.857 659	787	9.858 105	777	9.859 243	782	9.867 713	1356
9.840 694	272	9.843 782	1204	9.851 924	399	9.857 147	796	9.857 717	787	9.858 106	777	9.859 244	783	9.867 717	822
9.840 695	271	9.843 786	1197	9.851 925	399	9.857 148	796	9.857 804	777	9.858 107	777	9.859 245	783	9.867 722	830
9.840 696	271	9.843 800	1170	9.851 928	382	9.857 149	796	9.857 805	777	9.858 108	777	9.859 246	783	9.867 722	1356
9.840 697	271	9.843 801	1170	9.851 929	382	9.857 150	796	9.857 806	777	9.858 109	777	9.859 247	783	9.867 725	849
9.840 698	271	9.843 802	1170	9.851 935	399	9.857 151	796	9.857 807	777	9.858 110	776	9.859 248	783	9.867 726	849
9.840 699	270	9.843 803	1203	9.851 936	399	9.857 152	796	9.857 808	777	9.858 111	778	9.859 249	783	9.867 726	849
9.840 700	270	9.843 806	1169	9.851 937	399	9.857 153	796	9.857 810	777	9.858 112	778	9.859 250	783	9.867 727	849
9.840 701	273	9.843 813	1203	9.851 938	399	9.857 154	796	9.857 812	778	9.858 113	778	9.859 251	783	9.867 727	849
9.840 702	273	9.843 814	1203	9.851 948	399	9.857 155	796	9.857 820	778	9.858 114	778	9.859 252	783	9.867 729	849
9.841 501	1094	9.843 815	1203	9.851 949	399	9.857 156	796	9.857 824	778	9.858 115	784	9.859 253	783	9.867 729	849
9.841 504	1094	9.843 816	1203	9.851 954	399	9.857 157	796	9.857 831	778	9.858 117	784	9.859 254	783	9.867 730	849
9.841 515	1091	9.843 817	1203	9.851 955	399	9.857 176	796	9.857 832	778	9.858 121	784	9.859 255	783	9.867 730	849
9.842 013	1153	9.843 818	1203	9.851 957	399	9.857 177	796	9.857 833	778	9.858 122	784	9.859 301	788	9.867 731	830
9.842 014	1153	9.843 824	1198	9.851 959	399	9.857 178	796	9.857 841	784	9.858 400	794	9.859 302	788	9.867 731	1356
9.842 017	1154	9.843 825	1200	9.851 996	380	9.857 179	796	9.857 842	784	9.858 404	794	9.859 303	788	9.867 732	829
9.842 018	1154	9.843 826	1200	9.851 997	370	9.857 180	796	9.857 843	784	9.858 455	785	9.859 304	788	9.867 732	1355
9.842 025	1154	9.843 827	1198	9.851 998	380	9.857 181	796	9.857 844	784	9.858 456	785	9.859 305	788	9.867 733	829
9.842 061	1155	9.843 828	1198	9.851 999	370	9.857 182	796	9.857 846	784	9.858 458	785	9.859 306	788	9.867 733	1355
9.842 410	1158	9.843 830	1204	9.852 000	398	9.857 183	796	9.857 847	784	9.858 459	785	9.859 307	788	9.867 734	829
9.842 411	1158	9.843 831	1204	9.852 001	398	9.857 184	796	9.857 848	784	9.858 460	785	9.859 308	788	9.867 734	1355
9.842 412	1158	9.843 832	1203	9.852 002	398	9.857 185	796	9.857 849	784	9.858 462	786	9.859 309	788	9.867 735	830
9.842 413	1158	9.843 833	1200	9.852 003	398	9.857 186	796	9.857 857	784	9.858 463	786	9.859 310	788	9.867 735	1356
9.842 414	1158	9.843 834	1200	9.852 004	398	9.857 187	796	9.857 858	784	9.858 464	786	9.859 311	788	9.867 736	830
9.842 415	1158	9.843 835	1197	9.852 005	398	9.857 188	796	9.857 859	784	9.858 465	786	9.859 312	788	9.867 736	1356
9.842 416	1158	9.843 836	1197	9.852 006	398	9.857 189	796	9.857 862	784	9.858 466	786	9.859 313	788	9.867 737	830
9.842 417	1158	9.843 837	1197	9.852 007	398	9.857 190	796	9.857 863	784	9.858 467	786	9.859 314	788	9.867 737	1356
9.842 418	1160	9.843 838	1197	9.852 008	398	9.857 191	796	9.857 867	785	9.858 473	786	9.859 315	788	9.867 738	830
9.842 420	1158	9.843 839	1197	9.852 120	483	9.857 192	796	9.857 870	785	9.858 474	786	9.859 316	788	9.867 738	1356
9.842 421	1158	9.843 844	1200	9.852 120	492	9.857 193	796	9.857 872	785	9.858 476	786	9.863 130	983	9.867 739	830
9.842 422	1158	9.843 845	1200	9.852 121	483	9.857 194	796	9.857 878	785	9.858 479	786	9.863 131	983	9.867 739	1356
9.842 423	1158	9.843 850	1168	9.852 121	492	9.857 195	796	9.857 888	786	9.859 101	792	9.863 132	983	9.867 740	830
9.842 424	1158	9.843 851	1168	9.852 122	483	9.857 196	796	9.857 889	786	9.859 102	792	9.863 150	984	9.867 740	1356
9.842 425	1158	9.843 852	1168	9.852 122	492	9.857 197	796	9.857 898	786	9.859 105	792	9.863 151	984	9.867 741	830
9.842 426	1158	9.843 900	1202	9.852 123	483	9.857 198	796	9.857 899	786	9.859 106	792	9.863 152	984	9.867 741	1356
9.842 427	1160	9.843 901	1202	9.852 123	492	9.857 199	796	9.857 900	786	9.859 107	792	9.863 153	984	9.867 742	830
9.842 428	1160	9.843 902	1202	9.852 125	483	9.857 200	796	9.857 901	786	9.859 108	792	9.863 154	986	9.867 742	1356
9.842 429	1160	9.843 903	1202	9.852 126	483	9.857 201	796	9.857 902	786	9.859 109	793	9.863 155	986	9.867 743	830
9.842 430	1160	9.843 904	1202	9.852 127	483	9.857 202	796	9.857 903	786	9.859 110	793	9.863 156	986	9.867 743	1356
9.842 431	1160	9.843 905	1202	9.852 128	483	9.857 206	796	9.857 904	786	9.859 111	793	9.863 157	986	9.867 744	830
9.842 432	1160	9.843 922	1200	9.852 129	483	9.857 207	796	9.857 915	793	9.859 113	793	9.863 158	986	9.867 744	1356
9.842 433	1160	9.843 923	1200	9.852 130	483	9.857 208	796	9.857 916	793	9.859 115	793	9.863 159	986	9.867 745	830
9.842 801	1156	9.843 924	1200	9.852 131	483	9.857 209	796	9.857 917	793	9.859 116	792	9.863 160	985	9.867 745	1356
9.842 802	1157	9.843 925	1169	9.852 132	483	9.857 210	796	9.857 918	793	9.859 117	792	9.863 161	985	9.867 746	830
9.842 803	1156	9.843 926	1200	9.852 133	483	9.857 211	796	9.857 919	793	9.859 118	792	9.863 162	985	9.867 746	1356
9.842 804	1156	9.843 927	1200	9.852 134	483	9.857 212	796	9.858 000	776	9.859 119	792	9.863 163	985	9.867 747	830
9.842 805	1157	9.843 928	1170	9.852 135	483	9.857 213	796	9.858 001	776	9.859 120	792	9.863 170	986	9.867 747	1356
9.842 806	1156	9.843 929	1170	9.852 136	483	9.857 214	795	9.858 003	776	9.859 121	792	9.863 171	986	9.867 748	830
9.842 807	1157	9.843 930	1170	9.852 137	483	9.857 215	795	9.858 004	776	9.859 122	792	9.863 172	986	9.867 748	849
9.842 808	1156	9.843 931	1170	9.852 138	483	9.857 216	795	9.858 010	777	9.859 124	793	9.863 173	986	9.867 748	1356
9.842 809	1156	9.843 932	1170	9.852 139	483	9.857 217	795	9.858 011	777	9.859 125	793	9.863 174	986	9.867 749	830
9.842 810	1157	9.843 949	1199	9.852 140	510	9.857 218	795	9.858 012	777	9.859 126	792	9.863 175	986	9.867 749	1356
9.842 811	1156	9.843 950	1199	9.852 141	510	9.857 219	795	9.858 016	777	9.859 170	791	9.863 205	982	9.867 750	830
9.842 812	1157	9.851 019	395	9.852 142	510	9.857 220	795	9.858 017	777	9.859 171	791	9.863 206	982	9.867 750	1356
9.842 813	1156	9.851 020	390	9.852 143	510	9.857 299	792	9.858 025	777	9.859 201	772	9.863 207	982	9.867 755	830
9.842 814	1156	9.851 021	389	9.852 144	510	9.857 315	793	9.858 028	777	9.859 202	772	9.863 208	982	9.867 756	822
9.842 815	1156	9.851 022	368	9.852 145	510	9.857 316	793	9.858 029	777	9.859 203	774	9.863 210	983	9.867 757	822
9.842 816	1157	9.851 023	382	9.852 300	1298	9.857 317	788	9.858 030	777	9.859 204	774	9.863 211	983	9.867 758	822
9.842 817	1156	9.851 027	392	9.852 301	1298	9.857 318	788	9.858 031	778	9.859 205	774	9.863 212	983	9.867 759	822
9.842 818	1157	9.851 028	370	9.852 302	1298	9.857 361	787	9.858 032	778	9.859 206	774	9.867 693	849	9.868 006	848
9.842 819	1156	9.851 029	370	9.852 303	1298	9.857 362	787	9.858 034	778	9.859 207	774	9.867 693	849	9.868 010	850
9.842 820	1156	9.851 098	369	9.852 305	1297	9.857 363	787	9.858 035	778	9.859 208	774	9.867 696	803	9.868 011	850
9.842 821	1157	9.851 299	379	9.852 306	1297	9.857 364	787	9.858 036	778	9.859 209	774	9.867 701	849	9.868 015	849
9.843 741	1169	9.851 300	379	9.852 307	1297	9.857 365	787	9.858 037	778	9.859 210	774	9.867 702	830	9.868 016	849
9.843 744	1169	9.851 315	379	9.852 308	1297	9.857 366	787	9.858 040	795	9.859 211	774	9.867 702	1356	9.868 017	849
9.843 745	1169	9.851 324	378	9.852 309	1297	9.857 367	787	9.858 040	804	9.859 212	774	9.867 703	829	9.868 021	847
9.843 750	1201	9.851 325	378	9.852 310	1297	9.857 369	787	9.858 044	779	9.859 213	775	9.867 703	1355	9.868 022	847
9.843 751	1201	9.851 348	379	9.852 311	1297	9.857 370	787	9.858 047	779	9.859 220	775	9.867 704	829	9.868 023	847
9.843 752	1201	9.851 349	379	9.852 312	1297	9.857 399	789	9.858 048	779	9.859 221	775	9.867 704	1355	9.868 120	816
9.843 753	1201	9.851 352	379	9.852 314	1297	9.857 400	783	9.858 049	779	9.859 222	775	9.867 705	829	9.868 130	816
9.843 754	1201	9.851 716	379	9.852 315	1298	9.857 401	783	9.858 050	779	9.859 223	775	9.867 705	1355	9.868 140	816
9.843 756	1201	9.851 717	379	9.857 045	795	9.857 402	783	9.858 051	779	9.859 224	775	9.867 706	830	9.868 150	816
9.843 757	1201	9.851 720	379	9.857 046	795	9.857 403	782	9.858 052	779	9.859 225	780	9.867 706	1356	9.868 155	816
9.843 758	1201	9.851 723	379	9.857 047	795	9.857 404	780	9.858 054	779	9.859 226	780	9.867 707	830	9.868 160	816
9.843 759	1201	9.851 871	1155	9.857 048	795	9.857 405	780	9.858 056	778	9.859 227	780	9.867 707	849	9.868 170	816
9.843 760	1201	9.851 872	1156	9.857 049	795	9.857 406	780	9.858 057	778	9.859 228	780	9.867 707	1356	9.868 180	816
9.843 765	1187	9.851 873	1156	9.857 050	788	9.857 407	780	9.858 058	778	9.859 229	780	9.867 708	830	9.869 681	815
9.843 766	1201	9.851 875	1156	9.857 053	788	9.857 408	780	9.858 059	778	9.859 230	780	9.867 708	849	9.869 682	815
9.843 767	1201	9.851 876	1156	9.857 121	795	9.857 409	780	9.858 060	778	9.859 231	780	9.867 708	1356	9.869 683	815
9.843 768	1201	9.851 877	1156	9.857 122	795	9.857 425	774	9.858 062	784	9.859 232	781	9.867 709	830	9.869 684	815

9.869 685	815	9.877 539	1144	9.877 699	1141	9.880 314	993	9.880 688	1018	9.881 370	1030	9.882 512	1032	9.883 566	852
9.869 686	815	9.877 540	1139	9.877 700	1141	9.880 315	993	9.880 828	1028	9.881 371	1030	9.882 513	1032	9.883 567	852
9.869 687	815	9.877 551	1139	9.877 701	1141	9.880 350	1013	9.880 828	1029	9.881 380	1031	9.882 514	1032	9.883 568	825
9.869 688	815	9.877 552	1146	9.877 702	1141	9.880 351	1013	9.880 832	1028	9.881 381	1031	9.882 515	1032	9.883 569	825
9.869 689	816	9.877 570	1143	9.877 702	1145	9.880 352	1013	9.880 837	1028	9.881 911	1031	9.882 617	1033	9.883 570	825
9.869 690	816	9.877 571	1143	9.877 703	1141	9.880 353	1013	9.880 837	1029	9.881 915	1031	9.882 618	1033	9.883 571	825
9.869 691	816	9.877 572	1143	9.877 703	1146	9.880 360	994	9.880 844	1028	9.881 921	1031	9.882 619	1033	9.883 572	825
9.869 692	816	9.877 573	1143	9.877 712	1145	9.880 361	994	9.880 852	1024	9.881 922	1031	9.882 620	1033	9.883 573	853
9.869 693	816	9.877 575	1143	9.877 713	1145	9.880 380	1011	9.880 883	1020	9.881 930	1020	9.882 848	1023	9.883 574	853
9.869 694	816	9.877 577	1143	9.877 715	1146	9.880 381	1011	9.880 884	1020	9.881 932	1020	9.882 848	1038	9.883 575	853
9.869 695	816	9.877 579	1141	9.877 716	1146	9.880 382	1011	9.880 885	1020	9.882 101	1194	9.882 849	1023	9.883 576	853
9.869 696	816	9.877 582	1143	9.877 717	1144	9.880 383	1011	9.880 886	1020	9.882 102	1194	9.882 849	1037	9.883 579	851
9.869 697	815	9.877 583	1143	9.877 717	1146	9.880 384	1011	9.880 887	1020	9.882 103	1194	9.882 849	1038	9.883 580	818
9.869 698	815	9.877 584	1143	9.877 720	1142	9.880 510	1018	9.880 888	1020	9.882 104	1194	9.882 850	1023	9.883 581	818
9.869 699	815	9.877 585	1143	9.877 721	1142	9.880 515	1018	9.880 889	1020	9.882 114	1210	9.882 850	1037	9.883 582	851
9.869 700	815	9.877 586	1143	9.877 731	1144	9.880 519	1018	9.880 890	1020	9.882 115	1210	9.882 850	1038	9.883 583	851
9.869 701	815	9.877 587	1143	9.877 733	1144	9.880 530	1018	9.880 891	1020	9.882 116	1210	9.882 851	1038	9.883 584	851
9.869 702	815	9.877 597	1142	9.877 735	1144	9.880 531	1018	9.880 892	1020	9.882 117	1210	9.882 852	1023	9.883 599	825
9.869 703	815	9.877 600	1142	9.877 745	581	9.880 532	1018	9.880 893	1020	9.882 118	1210	9.882 852	1038	9.883 603	825
9.869 704	815	9.877 600	1144	9.877 746	1144	9.880 533	1018	9.880 894	1022	9.882 119	1210	9.882 853	1023	9.883 604	825
9.869 705	816	9.877 600	1145	9.877 746	1144	9.880 534	1018	9.880 895	1022	9.882 120	1210	9.882 853	1037	9.883 605	825
9.869 706	816	9.877 601	1142	9.877 781	1144	9.880 535	1018	9.880 896	1022	9.882 121	1210	9.882 853	1038	9.883 606	825
9.869 707	816	9.877 602	1142	9.877 784	1144	9.880 536	1018	9.880 897	1022	9.882 122	1210	9.882 854	1023	9.883 607	825
9.869 708	816	9.877 603	1142	9.877 784	1144	9.880 537	1018	9.880 898	1022	9.882 123	1210	9.882 854	1037	9.883 620	831
9.869 709	816	9.877 604	1142	9.877 800	1144	9.880 538	1018	9.880 899	1022	9.882 124	1210	9.882 854	1038	9.883 620	1357
9.869 710	816	9.877 605	1142	9.877 801	1144	9.880 539	1018	9.880 900	1022	9.882 125	1210	9.882 855	1034	9.883 625	825
9.869 711	816	9.877 606	1142	9.877 802	1144	9.880 540	1018	9.880 901	1022	9.882 126	1210	9.882 856	1034	9.883 630	851
9.869 712	816	9.877 606	1144	9.877 803	1144	9.880 541	1018	9.880 910	1028	9.882 127	1210	9.882 859	1037	9.883 640	852
9.870 301	1450	9.877 607	1142	9.877 804	1144	9.880 543	1018	9.880 911	1028	9.882 128	1210	9.882 860	1037	9.883 641	852
9.870 302	1450	9.877 608	1142	9.877 804	1145	9.880 544	1018	9.880 912	1028	9.882 206	1036	9.882 861	1037	9.883 642	852
9.870 303	1450	9.877 608	1146	9.877 806	1144	9.880 545	1018	9.880 913	1028	9.882 207	1036	9.882 866	1037	9.883 663	739
9.870 308	1450	9.877 610	1142	9.877 830	1140	9.880 546	1018	9.880 914	1028	9.882 209	1035	9.882 867	1037	9.883 664	739
9.870 311	1450	9.877 611	1142	9.877 831	1140	9.880 547	1018	9.880 915	1028	9.882 221	1035	9.882 869	1037	9.883 670	740
9.870 312	1450	9.877 612	1142	9.877 832	1140	9.880 548	1018	9.880 916	1028	9.882 221	1036	9.882 870	1037	9.883 673	740
9.870 313	1450	9.877 613	1142	9.877 833	1140	9.880 549	1027	9.880 917	1028	9.882 221	1037	9.882 924	1031	9.883 674	740
9.870 314	1450	9.877 614	1142	9.877 834	1140	9.880 550	1027	9.880 918	1028	9.882 225	1353	9.882 925	1031	9.883 675	740
9.870 331	1451	9.877 615	1142	9.877 835	1140	9.880 551	1027	9.880 919	1028	9.882 226	1353	9.883 101	162	9.883 676	740
9.870 332	1451	9.877 616	1142	9.877 836	1140	9.880 552	1027	9.880 920	1028	9.882 227	1353	9.883 103	162	9.883 677	740
9.870 333	1451	9.877 617	1142	9.877 837	1140	9.880 553	1018	9.880 921	1028	9.882 228	1353	9.883 104	162	9.883 682	740
9.870 334	1451	9.877 617	1145	9.877 838	1140	9.880 554	1018	9.880 922	1028	9.882 229	1353	9.883 107	162	9.883 683	740
9.870 335	1451	9.877 617	1146	9.877 839	1140	9.880 560	1012	9.880 923	1028	9.882 230	1353	9.883 108	162	9.883 684	740
9.870 336	1451	9.877 620	1142	9.877 840	1140	9.880 561	1012	9.880 924	1028	9.882 235	1030	9.883 109	162	9.883 685	740
9.870 337	1451	9.877 621	1142	9.877 841	1140	9.880 562	1012	9.880 925	1028	9.882 235	1051	9.883 110	162	9.883 686	740
9.870 338	1451	9.877 622	1142	9.877 842	1140	9.880 563	1012	9.880 926	1022	9.882 236	1030	9.883 151	1051	9.883 687	740
9.870 339	1451	9.877 622	1145	9.877 848	1140	9.880 564	1012	9.880 927	1249	9.882 239	1031	9.883 152	1051	9.883 688	740
9.870 340	1451	9.877 622	1146	9.877 849	1140	9.880 565	1012	9.880 928	1249	9.882 240	1023	9.883 153	1052	9.883 689	740
9.870 389	1454	9.877 622	1148	9.877 850	1140	9.880 566	1012	9.880 930	1019	9.882 240	1031	9.883 154	1249	9.883 701	831
9.870 390	1454	9.877 623	1142	9.877 851	1140	9.880 567	1012	9.880 931	1019	9.882 240	1353	9.883 155	1249	9.883 701	1357
9.870 391	1454	9.877 624	1142	9.877 852	1140	9.880 568	1012	9.880 932	1019	9.882 243	1353	9.883 161	1249	9.883 702	831
9.870 392	1454	9.877 626	1142	9.877 853	1140	9.880 569	1012	9.880 934	1019	9.882 401	1032	9.883 162	1249	9.883 702	1357
9.870 393	1454	9.877 626	1145	9.877 854	1140	9.880 570	1012	9.880 935	1019	9.882 402	1032	9.883 163	1249	9.883 703	831
9.870 394	1454	9.877 626	1146	9.877 855	1140	9.880 597	1013	9.880 936	1019	9.882 403	1032	9.883 164	1249	9.883 703	1357
9.870 404	1453	9.877 628	1142	9.877 857	1140	9.880 598	1013	9.880 938	1020	9.882 404	1032	9.883 165	1249	9.883 704	831
9.870 405	1453	9.877 628	1145	9.877 860	1140	9.880 599	1013	9.880 939	1020	9.882 411	1032	9.883 168	1250	9.883 704	1357
9.870 406	1453	9.877 628	1146	9.877 862	1140	9.880 600	1013	9.880 940	1020	9.882 412	1032	9.883 169	1250	9.883 706	831
9.870 407	1453	9.877 630	1141	9.877 863	1140	9.880 612	1018	9.880 943	1022	9.882 413	1032	9.883 170	1250	9.883 706	1357
9.870 408	1453	9.877 631	1141	9.877 864	1141	9.880 613	1018	9.880 947	1019	9.882 414	1032	9.883 171	1250	9.883 707	831
9.870 409	1453	9.877 632	1141	9.877 865	1140	9.880 614	1018	9.880 948	1019	9.882 415	1032	9.883 172	1250	9.883 707	1357
9.870 410	1453	9.877 633	1141	9.877 866	1140	9.880 615	1019	9.880 949	1020	9.882 416	1032	9.883 173	1250	9.883 708	831
9.870 411	1453	9.877 634	1141	9.877 867	1140	9.880 616	1019	9.880 950	1020	9.882 417	1032	9.883 174	1250	9.883 708	1357
9.870 412	1452	9.877 635	1141	9.877 868	1140	9.880 617	1019	9.880 951	1020	9.882 418	1032	9.883 175	1250	9.883 709	831
9.870 413	1452	9.877 636	1141	9.877 869	1140	9.880 621	1026	9.880 952	1020	9.882 419	1032	9.883 176	1250	9.883 709	1357
9.870 414	1452	9.877 637	1141	9.877 870	1140	9.880 622	1026	9.880 953	1020	9.882 420	1032	9.883 528	825	9.883 710	852
9.870 415	1452	9.877 642	1143	9.877 871	1140	9.880 623	1026	9.880 954	1020	9.882 421	1032	9.883 529	817	9.883 711	852
9.877 021	1139	9.877 642	1145	9.877 911	1148	9.880 624	1026	9.880 955	1022	9.882 441	1032	9.883 530	817	9.883 712	852
9.877 051	1139	9.877 642	1146	9.877 912	1148	9.880 625	1026	9.880 956	1022	9.882 442	1032	9.883 531	820	9.883 713	852
9.877 052	1139	9.877 643	1143	9.877 914	1148	9.880 626	1026	9.880 957	1022	9.882 443	1032	9.883 532	820	9.883 714	852
9.877 100	1139	9.877 643	1145	9.877 915	1148	9.880 627	1026	9.880 958	1022	9.882 444	1032	9.883 533	820	9.883 720	831
9.877 101	1139	9.877 643	1146	9.880 080	1019	9.880 628	1026	9.880 959	1022	9.882 451	1032	9.883 535	853	9.883 720	1357
9.877 103	1139	9.877 644	1142	9.880 083	1019	9.880 629	1026	9.880 960	1022	9.882 452	1032	9.883 540	820	9.883 721	831
9.877 105	1144	9.877 645	1142	9.880 101	1030	9.880 631	1026	9.880 968	1028	9.882 453	1032	9.883 541	820	9.883 721	1357
9.877 106	1139	9.877 650	1141	9.880 102	1030	9.880 632	1026	9.880 969	1028	9.882 454	1032	9.883 542	820	9.883 722	831
9.877 106	1144	9.877 651	1142	9.880 104	1030	9.880 633	1026	9.880 970	1028	9.882 490	1032	9.883 543	817	9.883 722	1357
9.877 107	1144	9.877 653	1142	9.880 120	1030	9.880 634	1026	9.880 976	1028	9.882 491	1032	9.883 544	817	9.883 723	831
9.877 108	1139	9.877 655	1142	9.880 121	1030	9.880 636	1026	9.881 320	1023	9.882 492	1032	9.883 545	817	9.883 723	1357
9.877 114	1139	9.877 657	1142	9.880 123	1030	9.880 637	1026	9.881 321	1023	9.882 493	1032	9.883 546	817	9.883 724	831
9.877 155	1139	9.877 658	1142	9.880 123	1051	9.880 638	1026	9.881 322	1023	9.882 494	1032	9.883 548	817	9.883 724	1357
9.877 156	1139	9.877 661	1143	9.880 124	1030	9.880 639	1026	9.881 323	1023	9.882 495	1032	9.883 549	817	9.883 725	831
9.877 256	1139	9.877 664	1143	9.880 124	1052	9.880 640	1026	9.881 329	1023	9.882 496	1032	9.883 550	817	9.883 725	1357
9.877 510	1139	9.877 666	1143	9.880 125	1030	9.880 641	1018	9.881 330	1023	9.882 497	1032	9.883 551	817	9.883 800	817
9.877 511	1139	9.877 667	1143	9.880 300	993	9.880 642	1018	9.881 333	1023	9.882 498	1032	9.883 552	817	9.883 801	817
9.877 512	1139	9.877 680	1143	9.880 301	993	9.880 643	1026	9.881 334	1023	9.882 499	1032	9.883 553	817	9.883 802	817
9.877 515	1139	9.877 681	1143	9.880 302	993	9.880 645	1022	9.881 335	1023	9.882 501	1032	9.883 554	817	9.883 803	817
9.877 516	1139	9.877 682	1143	9.880 303	993	9.880 660	1018	9.881 336	1023	9.882 502	1032	9.883 555	817	9.883 804	817
9.877 528	1139	9.877 683	1143	9.880 304	993	9.880 664	1018	9.881 337	1023	9.882 503	1032	9.883 556	825	9.883 808	817
9.877 528	1144	9.877 684	1143	9.880 305	993	9.880 670	1018	9.881 338	1023	9.882 504	1032	9.883 557	825	9.884 140	857
9.877 529	1139	9.877 685	1143	9.880 310	993	9.880 675	1018	9.881 339	1023	9.882 505	1032	9.883 560	852	9.884 141	857
9.877 530	1145	9.877 694	1141	9.880 311	993	9.880 680	1018	9.881 346	1023	9.882 507	1032	9.883 563	852	9.884 142	857
9.877 537	1139	9.877 697	1141	9.880 312	993	9.880 685	1018	9.881 368	1030	9.882 510	1032	9.883 564	852	9.884 143	857
9.877 538	1144	9.877 698	1141	9.880 313	993	9.880 687	1018	9.881 369	1030	9.882 511	1032	9.883 565	852	9.900 785	361

9.900 786	361	9.901 466	351	9.905 805	806	9.906 423	809	9.910 602	1207	9.915 736	1211	9.920 493	1196	9.920 926	1182
9.900 787	361	9.901 467	351	9.905 806	806	9.906 424	810	9.910 604	1207	9.915 737	1211	9.920 509	1193	9.920 927	1183
9.900 788	360	9.901 468	351	9.905 807	806	9.906 425	810	9.910 608	1207	9.915 738	1211	9.920 513	1193	9.920 928	1183
9.900 789	361	9.902 130	347	9.905 808	806	9.906 426	810	9.910 612	1207	9.920 000	1189	9.920 514	1193	9.920 929	1183
9.900 791	361	9.902 131	347	9.905 809	805	9.906 431	810	9.910 642	1208	9.920 001	1189	9.920 515	1193	9.920 930	1183
9.900 800	361	9.902 132	347	9.905 811	806	9.906 432	810	9.910 644	1208	9.920 003	1189	9.920 523	1187	9.920 931	1183
9.900 801	360	9.902 133	347	9.905 812	806	9.906 433	810	9.910 648	1208	9.920 010	1190	9.920 540	1186	9.920 932	1183
9.900 893	361	9.902 134	347	9.905 813	806	9.906 434	810	9.910 661	1209	9.920 011	1190	9.920 541	1186	9.920 933	1183
9.900 894	361	9.902 135	347	9.905 815	806	9.906 530	803	9.910 662	1209	9.920 025	1191	9.920 542	1186	9.920 934	1182
9.900 895	361	9.902 136	347	9.905 816	806	9.906 531	803	9.910 663	1209	9.920 045	333	9.920 543	1186	9.920 935	1182
9.900 896	361	9.902 137	347	9.905 817	806	9.906 532	803	9.910 664	1209	9.920 046	338	9.920 546	1204	9.920 936	1182
9.900 945	352	9.902 138	347	9.905 818	806	9.906 533	803	9.910 665	1209	9.920 047	338	9.920 547	1204	9.920 939	1183
9.900 946	352	9.902 139	347	9.905 819	805	9.906 534	803	9.910 666	1209	9.920 048	338	9.920 548	1204	9.920 940	1183
9.900 947	352	9.902 141	347	9.905 830	798	9.906 537	803	9.910 667	1209	9.920 049	338	9.920 565	1187	9.920 941	1183
9.900 948	352	9.902 142	347	9.905 831	798	9.906 550	803	9.910 668	1209	9.920 050	338	9.920 584	1203	9.920 942	1183
9.900 949	352	9.902 143	347	9.905 832	798	9.906 551	803	9.910 669	1209	9.920 051	338	9.920 585	1203	9.920 943	1183
9.900 955	353	9.902 144	347	9.905 833	798	9.906 552	803	9.910 672	1208	9.920 052	338	9.920 598	1168	9.920 944	1183
9.900 956	353	9.902 145	347	9.905 834	798	9.906 553	803	9.910 673	1208	9.920 053	338	9.920 599	1168	9.920 945	1183
9.900 957	353	9.902 146	347	9.905 835	798	9.906 554	803	9.910 674	1208	9.920 054	338	9.920 600	1168	9.920 946	1182
9.900 958	353	9.902 147	347	9.905 836	798	9.906 555	803	9.910 675	1208	9.920 055	338	9.920 602	1168	9.920 948	1183
9.900 959	353	9.902 151	353	9.905 837	798	9.906 561	803	9.910 676	1208	9.920 056	338	9.920 605	1168	9.920 949	1182
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9.900 991	346	9.902 155	353	9.905 842	798	9.906 566	803	9.914 442	1212	9.920 059	338	9.920 640	1169	9.920 952	1183
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9.901 462	351	9.905 801	806	9.906 417	809	9.910 320	495	9.915 732	1211	9.920 204	1179	9.920 921	1182	9.945 729	670
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9.945 912	671	9.950 222	345	9.950 379	507	9.951 018	695	9.951 179	711	9.951 255	701	9.951 661	1297	9.971 912	1244
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9.947 208	1171	9.950 301	1407	9.950 398	413	9.951 038	697	9.951 191	703	9.951 269	701	9.951 669	1297	9.971 923	1479
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9.947 282	1171	9.950 305	1406	9.950 408	434	9.951 042	697	9.951 195	703	9.951 278	701	9.951 733	1258	9.971 929	1247
9.947 283	1171	9.950 306	1406	9.950 409	434	9.951 043	697	9.951 196	703	9.951 335	1199	9.951 950	1259	9.971 930	1247
9.947 284	1171	9.950 307	1406	9.950 410	434	9.951 044	697	9.951 197	703	9.951 336	1199	9.951 951	1259	9.971 935	1244
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9.947 287	1171	9.950 310	1477	9.950 531	1185	9.951 047	697	9.951 200	703	9.951 339	1199	9.961 000	122	9.971 938	1244
9.947 300	345	9.950 311	1477	9.950 533	1185	9.951 048	697	9.951 201	703	9.951 340	1199	9.971 703	61	9.972 060	287
9.947 302	345	9.950 312	1477	9.950 534	1185	9.951 049	697	9.951 202	703	9.951 341	1199	9.971 704	61	9.972 061	287
9.947 316	354	9.950 313	1477	9.950 535	1185	9.951 061	702	9.951 203	703	9.951 342	1199	9.971 704	1445	9.972 062	287
9.947 334	1172	9.950 314	1477	9.950 979	694	9.951 062	702	9.951 204	703	9.951 343	1199	9.971 704	1445	9.972 070	294

Drop Technology

It's the light inside

The Decisive Step Towards the Future, *tiny* drops yield oceans of data

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Drop Technology

Drop Technology Ltd is a newly formed company which develops innovative products based on fundamental drop science and empirical research knowledge. Presently the company is launching its first family of patented products based on proven science and techniques around drop analysis. Its aim is to offer the market higher levels of accuracy and reproducibility in its product range than is available presently.



TLDA® (Transmitted Light Drop Analyser)

The TLDA® (transmitted light drop analyser) from Drop Technology is an innovative microvolume UV-Visible drop spectrophotometer that is new to the market whereby the cuvette is replaced with a small volume drop. It is a patented drop sample retention technology that uses the surface tension of liquids to hold and measure microvolume samples on an optical plinth without the use of cuvettes or capillaries. Volumes as small as 1µL are pipetted onto the optical surface.

Upon closing the lid, the light source and spectrometer are aligned through the focusing drop and a vertical optical path is formed. The TLDA® systems are designed for a wide range of applications, from nucleic acids and protein quantification to any general UV-Visible measurements.

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$TLDA_{\mu V}$®

This instrument uses drop science and a unique sampling method to provide microvolume UV-Visible analysis.



$TLDA_{Ocean}$®

This system is a unique microvolume accessory to existing OEM spectrometer and light source instruments.



$TLDA_{C50}$®

This is an accessory to the Cary50 / Cary60 spectrophotometer which enhances its capability to allow microvolume analysis.

The TLDA® instruments offer the following:

- Quality Instrumentation and Measurements
- Simple to use
- Very high accuracy and reproducibility of results
- Spectral range is 200 to 800nm
- Require a small sample volume - down to 1µL
- Less than 5 Second detection time
- Rotating lid design for operation by either right or left handed users
- No cuvettes or capillaries are required
- The samples are also recoverable after quantitation
- No regular recalibration required
- Minimal maintenance and set-up requirements due to the robust hardware and precision engineered optics
- No measurable sample carryover
- Cleaning kit and calibration standards (traceable to NIST primary materials) available
- Developed and based on the theory of drop science
- Small instrument footprint

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