

# behr Labor-Technik

## Product Program





# behr Labor-Technik GmbH

Development, Production and Sales



behr Labor-Technik – over 50 years of experience in developing, producing and selling laboratory equipment. During this time the small family company has turned into a company operating on an international basis. Today users all over the world appreciate the quality, reliability and practical suitability of our equipment.

Our focus is placed on the production of laboratory equipment for environmental and food analysis:

In the meantime behr Labor-Technik has become one of the leading German suppliers. Their offering ranges from low-priced compact equipment to complete fully-automated workstations for testing in accordance with national and international standards (DIN/DEV, ISO/EN etc.)

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## Equipment for Food and Foodstuffs Analysis

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# The behr Programme for the Determination of Nitrogen with the Kjeldahl Method

The behr programme for determination of nitrogen with the Kjeldahl method provides the user with individually configurable complete solutions for the laboratory

## Digestion units

### Kjeldahl block digestion systems

Block digestion systems with high grade corrosion-resistant block casings of stainless steel. Manual or with automatic lift.

### Standard systems

- Digestion vessels with volumes of 250 ml (8, 12 or 20 sample positions)

### Micro Kjeldahl systems

- Digestion vessels with volumes of 100 ml (16, 24 or 40 sample positions)
- High power heater and extraction hood with exhaust gas collector
- behr one-button operation for extremely simple and fast programming
- Menu designed in language of the country
- 10 freely configurable programmes for block temperature and digestion time
- Applications storable
- Available with 230 V ~/50-60 Hz and 115 V ~/50-60 Hz

### Infrared digestion systems

The digestion units of the behrotest® InKjel series are fitted with a highly efficient infrared heater.

The quality and positioning of the behr infrared radiator guarantees the user identical heating phases and digestion temperatures at all sample positions. This also applies to double row arrangement in sample racks for 12 samples.

Direct sample heating by infrared radiator eliminates long heating up times with conventional heating block systems.

The behrotest® InKjel is therefore an ideal fast digestion system for determination of nitrogen with the Kjeldahl method and for other high temperature digestion processes.

## Steam distillation units

behr steam distillation units of the S series are an optimum supplement to the behr Kjeldahl block digestion systems as well as the behrotest® InKjel infrared rapid digestion units.

Depending on requirements the user can choose between one manual and four automatic steam distillation units. These are identical in basic construction but differ in operating comfort and degree of automation.

All behr steam distillation units have the following common features:

- efficiency and quickness
- practical suitability and user comfort
- exemplary safety and reliability
- favourable cost-effectiveness

## Process extraction system

The two-step behrosog process extraction system - preseparator plus safety step - keeps all acid vapours completely away from the environment.

## Titration station

The behrotest® hand titrating station STI or an automatic titrator ensure reliable, safe and fast titration at the end of the nitrogen determination.

## Exemplary safety during steam distillation

behr steam distillation units are not only highly efficient and reliable partners in everyday laboratory work. Safety of the user was also an important consideration during the development and construction of these units.

### Therefore all steam distillation apparatuses are provided with

- a protective (safety) switch as the main switch, which is automatically triggered in case of overloading and short-circuiting
- a mechanical excess pressure safety valve to prevent too high a pressure in the steam generator
- a vessel monitor (distillation is not possible without a vessel being inserted)
- A door contact switch, which switches the distillation units off automatically when the door is opened
- a resettable excess temperature thermostat (in case of water deficiency in the steam generator)
- a cooling cycle monitor by means of a pressure switch
- temperature controlled steam heating phase and pressure control via a solenoid valve

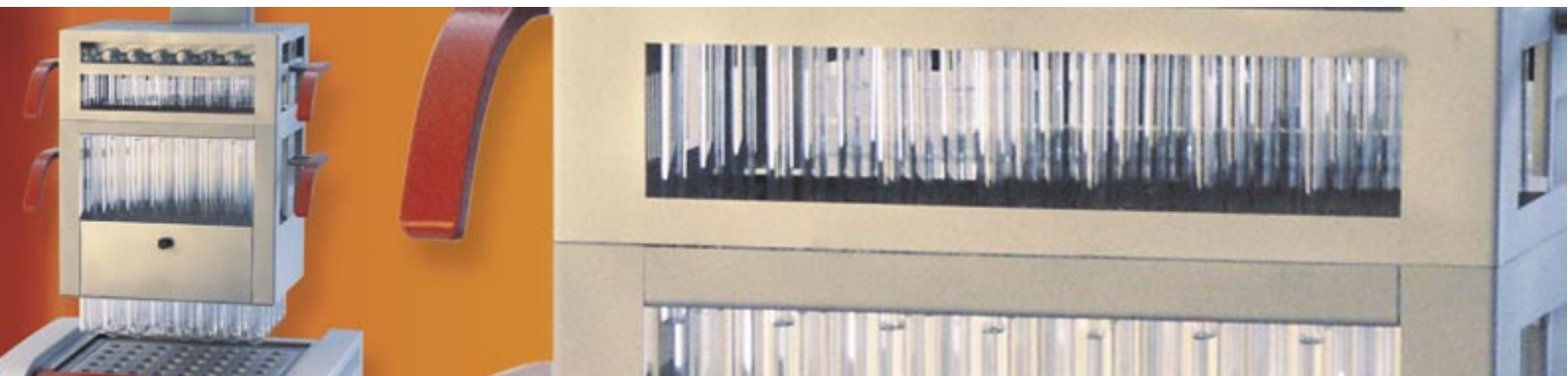
### Steam distillation units S 2, S 3, S 4 and S 5 are also provided with

- an automatic heating current monitor for the steam generator



# Kjeldahl Digestion

## behr Kjeldahl Block Digestion Systems



K 40

### Standard Kjeldahl block digestion systems behr K 8, K 12 and K 20

Block digestion systems with high grade corrosion-resistant block casing of stainless steel. With 8, 12 or 20 sample positions for standard Kjeldahl digestion vessels of volume 250 ml. High power heater and extraction hood with exhaust gas collector.

- behr one-button operation for extremely simple and fast programming
- Menu designed in language of the country
- 10 freely configurable programmes for block temperature and digestion time
- Applications storable

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 (K 8, K 12 and K 20) and a PC. A library with common applications is already included on the CD. 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.

Stable, robust construction. Both the block casing and the rack for the digestion vessels, as well as the extraction hood, are made of acid-resistant, stainless steel. Complete systems with digestion vessels, rack and extraction hood are available.

Available with 230 V ~/50-60 Hz and 115 V~/50-60 Hz.

#### Standard Kjeldahl block digestion systems

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
K 8	With 8 sample positions, for digestion vessels of volume 250 ml	804849100	8048491005
K 12	With 12 sample positions, for digestion vessels of volume 250 ml	804849101	8048491015
K 20	With 20 sample positions, for digestion vessels of volume 250 ml	804849102	8048491025
K 8 B	With 8 sample positions, for digestion vessels of volume 500 ml	804849110	8048491105



K 12



## Micro Kjeldahl block digestion systems behr K 16, K 24 and K 40

Block digestion systems with high grade corrosion-resistant block casing of stainless steel. With 16, 24 or 40 sample positions for micro Kjeldahl digestion vessels of volume 100 ml. High power heater and extraction hood with exhaust gas collector.

- behr one-button operation for extremely simple and fast programming
- Menu designed in language of the country
- 10 freely configurable programmes for block temperature and digestion time
- Application storable

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 (K 16, K 24 and K 40) and a PC. A library with common applications is already included on the CD. 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.

Stable, robust construction. Both the block casing and the rack for the digestion vessels, as well as the extraction hood, are made of acid-resistant, stainless steel. Complete systems with digestion vessels, rack and extraction hood are available

Available with 230 V ~/50-60 Hz and 115 V~/50-60 Hz.

### Micro-Kjeldahl block digestion system

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
K 16	With 16 sample positions, for digestion vessels of volume 100 ml	80 48 49150	80 48 491505
K 24	With 24 sample positions, for digestion vessels of volume 100 ml	80 48 49151	80 48 491515
K 40	With 40 sample positions, for digestion vessels of volume 100 ml	80 48 49152	80 48 491525



K 20

### Technical data for behr Kjeldahl block digestion systems

	K 8		K 12		K 16/K 24		K 20/K 40	
<b>Voltage</b>	230 VAC/115 VAC							
<b>Frequency</b>	50/60 Hz							
<b>Power consumption</b>	1000 W		1500 W		1500 W		2200 W	
<b>Voltage</b>	230 V	115 V	230 V	115 V	230 V	115 V	230 V	115 V
<b>Current consumption</b>	5 A	10 A	8 A	16 A	8 A	16 A	10 A	20 A
<b>Weight approx. (incl. vessels)</b>	approx. 28 kg		approx. 30 kg		approx. 30 kg		approx. 34 kg	
<b>Dimensions in cm (W x D x H)</b>	approx. 42 x 51 x 76,5				approx. 48 x 51 x 76,5			
<b>Temperature Range</b>	450 °C							

## behr Kjeldahl block digestion systems with fully automatic lift

behr Kjeldahl block digestion systems of the L series are fitted with a fully automatic lift. This relieves the user of handling the heavy sample unit and hot chemicals. The software controls both the sample lift and the behrosog 3, thus enabling practically fully automatic digestion to be carried out.

At the end of the digestion, the lift drives up the complete unit with the framework and suction hood. After a RAM-programmed cooling/suction time, it raises the suction hood and drives it into the final position.

- The temperature profiles and starting time are freely programmable
- behr one-button operation for extremely simple and fast programming

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 (K 12 L, K 20 L, K 24 L and K 40 L ) and a PC. A library with common applications is already included on the CD. 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.

Available with 230 V ~/50-60 Hz and 115 V~/50-60 Hz.

behr Kjeldahl block digestion systems with fully automatic lift

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
K 12 L	Automatic Kjeldahl block digestion system with lift. 12 sample positions, for digestion vessels of volume 250 ml	80 48 49160	80 48 491605
K 20 L	Automatic Kjeldahl block digestion system with lift. 20 sample positions, for digestion vessels of volume 250 ml	80 48 49161	80 48 491615
K 24 L	Automatic micro Kjeldahl block digestion system with lift. 24 sample positions for digestion vessels of volume 100 ml	80 48 49162	80 48 491625
K 40 L	Automatic micro Kjeldahl block digestion system with lift. 40 sample positions for digestion vessels of volume 100 ml	80 48 49163	80 48 491635



K 40 L

# Kjeldahl Digestion

## Infrared Rapid Digestion Units



### Digestion units

Digestion units of the behrotest® InKjel series are fitted with a high power infrared heater. The quality and positioning of the behr infrared heater guarantees the user identical heating phases and digestion temperatures at all sample positions. This also applies to the double-row arrangement in racks for 12 samples. The glass digestion vessels are suspended in the rack and are not deposited on the bottom of the digestion unit. Therefore the digestion vessels are less susceptible to breakage than in an aluminium heating block.

- Direct heating of the samples through the infrared radiator eliminates the endlessly long heating times required using conventional heating block systems
- High-quality quartz radiators, instead of the usual steel tubular heating elements, ensure particularly uniform heating at all sample positions
- behr one-button operation for extremely simple and fast programming
- Menu designed in language of the country

Therefore the behrotest® InKjel is the ideal digestion system for nitrogen determination with the Kjeldahl method and other high temperature digestion processes. In the Kjeldahl digestion the temperature is adjusted through the boiling point of sulphuric acid.

The basic units of the behrotest® InKjel series can accommodate racks for various vessel combinations:

- 12 reaction vessels of 100 ml in the InKjel 1210 (M or P)
- 6 reaction vessels of 250 ml in the InKjel 625 (M or P)
- 12 reaction vessels of 250 ml in the InKjel 1225 (M or P)
- 4 reaction vessels of 500 ml in the InKjel 450 (M or P)
- 4 reaction vessels of 750 ml in the InKjel 475 (M or P)

The models of the InKjel P series have 10 freely configurable programmes for power and digestion time. 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 (InKjel P) and a PC. A library with common applications is already included on the CD. 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.

If required the user can very simply convert his system for use with other glass sample vessels himself using various digestion cassettes (rack with fume extraction). The process extraction system behrosog 3 is used for extracting vapours during the digestion process. All InKjel systems are fitted completely with multi-level consoles, fume extraction unit, sample rack and glass digestion vessels.



InKjel 1225 P



InKjel 625 M

### Technical data for digestion systems

	InKjel M		InKjel P	
<b>Voltage</b>	230 VAC/115 VAC			
<b>Frequency</b>	50/60 Hz			
<b>Power consumption</b>	1500 W		1500 W	
<b>Voltage</b>	230 V	115 V	230 V	115 V
<b>Current consumption</b>	8 A	16 A	8 A	16 A
<b>Weight approx. (incl. vessels)</b>	approx. 20 kg		approx. 20 kg	
<b>Dimensions in cm (W x D x H)</b>	approx. 54 x 44 x 75		approx. 54 x 44 x 75	
<b>Power setting range</b>	0...100%, infinitely variable, manually adjustable		0...100%, in steps of 1%	
<b>Time setting range</b>	-		0...199 min., in steps of 1 min.	
<b>Programmes</b>	-		10	

### Digestion units

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
InKjel 625 M	Manually adjustable infrared digestion system for 6 glass vessels of 250 ml	80 48 49998	80 48 499985
InKjel 1210 M	Manually adjustable infrared digestion system for 12 glass vessels of 100 ml	80 48 49500	80 48 495005
InKjel 1225 M	Manually adjustable infrared digestion system for 12 glass vessels of 250 ml	80 48 49999	80 48 499995
InKjel 450 M	Manually adjustable infrared digestion system for 4 glass vessels of 500 ml	80 48 49450	80 48 494505
InKjel 475 M	Manually adjustable infrared digestion system for 4 glass vessels of 750 ml	80 48 49475	80 48 494755
InKjel 625 P	Programmable infrared digestion system for 6 glass vessels of 250 ml	80 48 50001	80 48 500015
InKjel 1210 P	Programmable infrared digestion system for 12 glass vessels of 100 ml	80 48 49501	80 48 495015
InKjel 1225 P	Programmable infrared digestion system for 12 glass vessels of 250 ml	80 48 50002	80 48 500025
InKjel 450 P	Programmable infrared digestion system for 4 glass vessels of 500 ml	80 48 50003	80 48 500035
InKjel 475 P	Programmable infrared digestion system for 4 glass vessels of 750 ml	80 48 50004	80 48 500045

## Kjeldahl Digestion

### Accessories

Model	Article description	Art.-No.
KT 1	Catalyst tablets (5,0 g $K_2SO_4$ ; 0,5 g $CuSO_4$ ), Box of 1000 tablets	80 48 40100
KT 2	Catalyst tablets (5,0 g $K_2SO_4$ ; 0,15 g $CuSO_4$ ; 0,15 g $TiO_2$ ), Box of 1000 tablets	80 48 40101
KT 3	Catalyst tablets (3,5 g $K_2SO_4$ ; 0,4 g $CuSO_4$ ), Box of 1000 tablets	80 48 40103
AFS	Antifoam tablets, Box of 1000 tablets	80 48 40102
SIST 100	Boiling stone for Kjeldahl digestion, content 100 g	80 48 30700
WB 1	Nitrogen-free weighing boats (58 mm x 10 mm x 10 mm) for Kjeldahl digestion, 100 boats	80 48 40104

Model	Article description	Art.-No.
SR 3i	Round bottom digestion vessel, 250 ml	80 48 41015
SR 4	Round bottom digestion vessel, 100 ml for Micro Kjeldahl	80 48 41016
KJ 500	Round bottom digestion vessel, 500 ml	80 48 51051
KJ 750	Round bottom digestion vessel, 750 ml for InKjel	80 48 51076
EG 12/100	Frame for 12 reaction vessels of 100 ml in the InKjel 1210 (M or P)	80 48 49964
EG 6	Frame for 6 reaction vessels of 250 ml in the InKjel 625 (M or P)	80 48 49983
EG 12	Frame for 12 reaction vessels of 250 ml in the InKjel 1225 (M or P)	80 48 49984
EG 4/500	Frame for 4 reaction vessels of 500 ml in the InKjel 450 (M or P)	80 48 49982
EG 4/750	Frame for 4 reaction vessels of 750 ml in the InKjel 475 (M or P)	80 48 49978
AE 4	Fume extraction unit for the InKjel 450 and InKjel 475 (M or P)	80 48 49985
AE 6	Fume extraction unit for the InKjel 625 (M or P)	80 48 49986
AE 12/100	Fume extraction unit for the InKjel 1210 (M or P)	80 48 49965
AE 12	Fume extraction unit for the InKjel 1225 (M or P)	80 48 49987

## Process extraction system

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
behrosog 3	Process extraction system with suction pump (40 l/h), condensation step and neutralisation step	80 48 40008	80 48 40085
ACS	Additional cooling system for behrosog 3	80 48 40009	

## Technical data for extraction system behrosog 3

<b>Voltage</b>	230 VAC/115 VAC
<b>Frequency</b>	50/60 Hz
<b>Current consumption</b>	80 W
<b>Weight</b>	approx. 18 kg
<b>Dimensions in cm (W x D x H)</b>	approx. 38 x 34 x 40
<b>Pump capacity</b>	max. 40 l/min without back pressure



behrosog 3

## SIMVAC

Model	Article description	Art.-No.
SIMVAC	Suction device with water jet pump and neutralisation bottle incl. hose and frame	80 48 40005



SIMVAC



# Kjeldahl Distillation

## behr Steam Distillation Units S 1 to S 5



S 1



S 2/S 3



S 4



S 5

### From manual to fully automatic

behr distillation units of the S series are the ideal supplement to the InKjel and K digestion units.

Depending on requirements the user can choose between one manual and four automatic steam distillation apparatuses. These are identical in the basic construction but differ in operating comfort and degree of automation. The top model behr S 5 is prepared for work with an external titrator.

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 (S 2 - S 4) 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.

All behr steam distillation units have the following common features:

- efficiency and quickness
- practical suitability and user comfort
- exemplary safety and reliability
- robust casing of polyurethane
- Practical quick clamping device which the user can operate even „with his eyes shut“
- Extremely simple, menu-controlled operation of the programmable units via one single operating element (behr one-button operation). Menu designed in language of the country
- Models S 2 to S 5 have a separate rinsing programme
- Steam generating capacity of the models S 2 to S 5 adjustable from 40 % - 100 %



## Equipment of the models

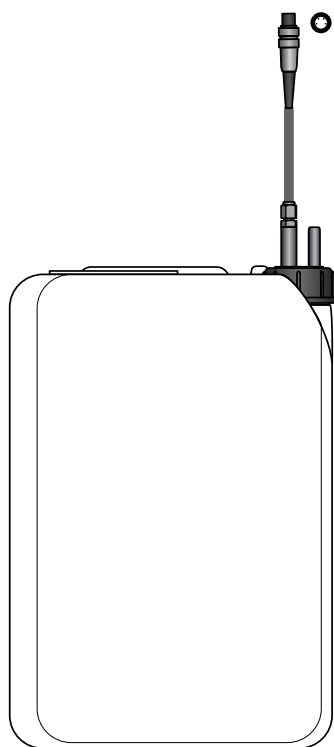
	S 1	S 2	S 3	S 4	S 5
Manual addition of H <sub>2</sub> O	-	+	+	+	+
Manual addition of NaOH	+	+	+	+	+
Manual addition of H <sub>3</sub> BO <sub>3</sub>	-	-	-	+	+
Automatic addition of H <sub>2</sub> O	-	+	+	+	+
Automatic addition of NaOH	+	+	+	+	+
Automatic addition of H <sub>3</sub> BO <sub>3</sub>	-	-	-	+	+
Programmable reaction time	+	+	+	+	+
Programmable distillation time	+	+	+	+	+
Steam generation automatic	+	+	+	+	+
Steam generating capacity adjustable (40% to 100%)	+	+	+	+	+
Automatic suction extraction of sample residues	-	-	+	+	+
Number of programmes	1	1	10	99	99
Separate rinsing programme	+	+	+	+	+
Language of display selectable	+	+	+	+	+
Optical fault alarms	+	+	+	+	+
Acoustic fault alarms	+	+	+	+	+
Door contact safety switch	+	+	+	+	+
Serial interface (RS232)	+	+	+	+	+
Stand-by operation between distillations	+	+	+	+	+
Filling level monitoring for can set	+	+	+	+	+
Various behrotest® glass digestion vessels usable	+	+	+	+	+
Connection possibility for titration	-	-	-	-	+

## Steam distillation units

Type	Article description	230 V ~ Art.-No.	115 V ~ Art.-No.
S 1	Steam distillation unit, manual operation	80 48 49001	80 48 490015
S 2	Steam distillation unit	80 48 49002	80 48 490025
S 3	Steam distillation unit, partly automated	80 48 49003	80 48 490035
S 4	Steam distillation unit, fully automatic	80 48 49004	80 48 490045
S 5	Steam distillation unit, fully automatic, prepared for external titrator (e.g. TB 1)	80 48 49005	80 48 490055
TB 1	Titration module for connection to steam distillation unit S 5	80 48 49006	80 48 490065
Titrimo 702	Metrohm titrator	80 48 49007	80 48 490075

## Technical data for steam distillation units

	S 1	S 2	S 3	S 4	S 5
<b>Voltage</b>	115 V~ 230 V~				
<b>Frequency</b>	50/60 Hz				
<b>Power consumption</b>	1700 W				
<b>Current consumption</b>	9 A/18 A				
<b>Cooling water consumption</b>	Approx. 5 l/min				
<b>Distillation time</b>	Approx. 2...3 min. per sample				
<b>Storage vessel</b>	In supply items	Any size. Recommendation: behrotest® can set KAS			
<b>Interface</b>	—	RS232			
<b>Display</b>	—	LCD			
<b>Programs</b>	—	1	1	100	100
<b>Dimensions (W x H x D in mm)</b>	410 x 675 x 410				
<b>Weight</b>	approx. 32 kg	approx. 34 kg	approx. 35 kg	approx. 35 kg	approx. 36 kg
<b>Connection for titrator</b>	No	No	No	No	Yes



Can with level sensor for NaOH

## Can sets

behr can sets are based on hazardous materials cans with UN approval

The level sensors form one unit with the screw caps. Therefore, if required, the user can also connect containers from the chemical industry without carrying out dangerous refilling operations.

### Can sets

Model	Article description	Art.-No.
KAS 20	Can set for S 2, consisting of 2 cans of 20 l incl. float type switch	80 48 49020
KAS 30	Can set for S 3 consisting of 3 cans of 20 l incl. float type switch	80 48 49030
KAS 40	Can set for S 4 and S 5, consisting of 4 cans of 20 l incl. float type switch	80 48 49040

## Manual titration station STI

The manual titration station STI consists of

- a burette with digital display and
- a magnetic stirrer with exactly fitting holder for a conical flask

A visual screen serves as a neutral background and enables the user to determine the colour change at the end of titration exactly. In this way he always carries out his titrations under similar optical conditions. This improves the accuracy and reproducibility of the results.

This is also aided by the exact positioning of the vessel in the holder on the upper side of the magnetic stirrer. The wings of the screen also protect against dazzle from the sides

Manual titration station STI

Model	Article description	230 V ~ Art.-No.	115 V ~ Art.-No.
STI	Manual titration station for nitrogen determination with Kjeldahl method	80 48 42020	80 48 420205

### Technical data for manual titration station STI

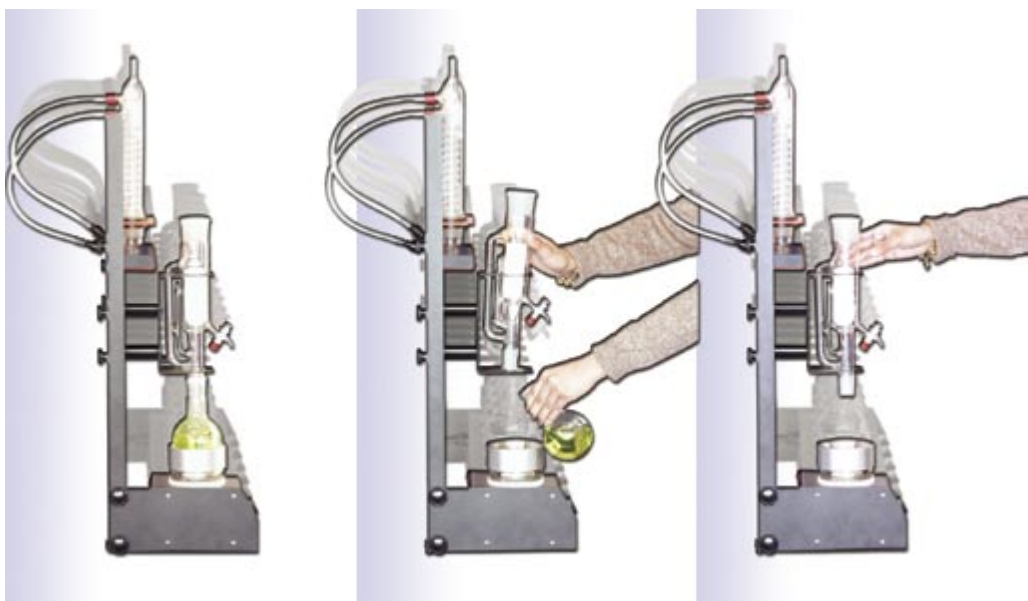
<b>Voltage</b>	230 VAC/115 VAC
<b>Frequency</b>	50/60 Hz
<b>Weight</b>	approx. 3,5 kg
<b>Dimensions in cm (W x D x H)</b>	approx. 33 x 20 x 60



STI

# Extraction

## The behr Range for Soxhlet Method



KEX 100 F

The Soxhlet method is the standard extraction method. behr equipment for Soxhlet extraction meets the most varying requirements of daily work in a laboratory.

- practical stand for holding the condensers securely between extractions
- extractor sizes from 30 ml to 2000 ml
- compact systems with a locator for 1 sample
- multi-sample extractors with locators for 4 or 6 samples
- extractors with a specially developed siphon tube ensure a uniform extraction process at all sample positions
- the use of extractors with a stopcock does away with the need for any additional distillation after extraction
- Condensers with screwed- on tubing nipples

Hydrolysis units (1, 4 or 6 sample places) for the acid digestion preceding the extraction when determining the total fat content according to Weibull and Stoldt.

### Complete compact extraction systems

Complete compact extraction systems with stand, heating module, mount, hoses and glass-ware (round-bottom reaction flask, extractor, Dimroth condenser for extraction). Infinitely variable heating regulation. After the extraction cycle the compact systems drain the solvent through a drain cock at the extractor directly into the reservoir.

Compact systems for the Soxhlet extraction

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
KEX 30	Compact system for the 30-ml extraction	80 48 00520	80 48 005205
KEX 100	Compact system for the 100-ml extraction	80 48 00521	80 48 005215
KEX 250	Compact system for the 250-ml extraction	80 48 00540	80 48 005405
KEX 500	Compact system for the 500-ml extraction	80 48 00542	80 48 005425

## Compact systems for the Soxhlet extraction

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
KEX 30 F	Compact system for the 30-ml extraction with stopcock	80 48 00541	80 48 005415
KEX 100 F	Compact system for the 100-ml extraction with stopcock	80 48 00522	80 48 005225
KEX 250 F	Compact system for the 250-ml extraction with stopcock	80 48 00536	80 48 005365
KEX 500 F	Compact system for the 500-ml extraction with stopcock	80 48 00543	80 48 005435
UK 12/400	Recirculating cooler, 380 W	80 48 40204	

## Specifications for the compact systems for Soxhlet extraction

	KEX 30	KEX 100	KEX 250
<b>Voltage</b>	230 VAC/115 VAC		
<b>Frequency</b>	50/60 Hz		
<b>Current consumption</b>	3 A /6 A		
<b>Power consumption</b>	450 W		
<b>Weight</b>	approx. 7,5 kg		
<b>Dimensions in cm (W x D x H)</b>	approx. 23 x 33 x 71,5	approx. 23 x 33 x 80	

## behrotest® serial heaters with energy control

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

## Multi-sample extractors for Soxhlet extraction

Model	Article description	Extractor volume ml	230 V~ Art.-No.
R 304	Multi-sample extractor, 4 sample positions	30	80 48 80031
R 306	Multi-sample extractor, 6 sample positions	30	80 48 80032
R 304 S	Multi-sample extractor, 4 sample positions with stopcock	30	80 48 80041
R 306 S	Multi-sample extractor, 6 sample positions with stopcock	30	80 48 80042
R 104 S	Multi-sample extractor, 4 sample positions with stopcock	100	80 48 80023
R 106 S	Multi-sample extractor, 6 sample positions with stopcock	100	80 48 80022
R 254 S	Multi-sample extractor, 4 sample positions with stopcock	250	80 48 80033
R 256 S	Multi-sample extractor, 6 sample positions with stopcock	250	80 48 80034

## Glass compositions

Extraction	Roundbottom flasks	Extractor	Condenser
30 ml	100 ml	30 ml	RFK 30
100 ml	250 ml	100 ml	RFK 100
250 ml	500 ml	250 ml	RFK 100



KEX 500 and  
UK 12/400



R 106 S

## Specifications for the multi-sample extractors

	4 sample positions		6 sample positions	
<b>Voltage</b>	230 VAC/115 VAC			
<b>Frequency</b>	50/60 Hz			
<b>Power consumption</b>	1140 W		2160 W	
<b>Current consumption</b>	8 A	16 A	10 A	20 A
<b>Weight (without glass)</b>	approx. 15,1 kg		approx. 19,8 kg	
<b>Dimensions in cm (W x D x H) (without glass)</b>	approx. 53 x 32 x 74		approx. 76 x 32 x 74	



HYDRO 6

### Hydrolysis unit, complete:

- Serial heating unit
- Rack for 4 or 6 funnels
- 4 or 6 glass funnels, 100 mm
- PE bottle, 500 ml, cap with squirt tube
- 100 fluted filters
- Boiling stones
- Cooling water distribution with condenser rack and hoses
- Beakers (600 ml), cold fingers
- Glass bar

## behrotest® hydrolysis units - preparation of samples for extraction

The Weibull-Stoldt method

The quantitative fat content in a foodstuff is determined by extraction with a solvent. The "free fat" is determined by direct extraction. The "total fat content" contains not only "free fat" but also the "bound fats", which are released by means of the acid digestion.

Hydrolysis units

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
HYDRO 1	Hydrolysis unit, complete, space for 1 sample	80 48 80028	80 48 800285
HYDRO 4	Hydrolysis unit, complete, rack spaces for 4 samples	80 48 80029	
HYDRO 6	Hydrolysis unit, complete, rack spaces for 6 samples	80 48 80030	

### Technical data

	HYDRO 1		HYDRO 4		HYDRO 6	
<b>Voltage</b>	230 VAC/115 VAC					
<b>Frequency</b>	50/60 Hz					
<b>Power consumption</b>	450 W		1440 W		2160 W	
<b>Current consumption</b>	3 A	6 A	8 A	16 A	10 A	20 A
<b>Weight</b>	approx. 7,5 kg		approx. 15,1 kg (without glas)		approx. 19,8 kg (without glas)	
<b>Dimensions in cm (W x D x H)</b>	approx. 71,5 x 33 x 23		approx. 53 x 32 x 74		approx. 76 x 32 x 74	

## behrotest® units for crude fibre digestion

Crude fibre digestion units with 4 or 6 sample positions. Ready-to-connect complete devices with all the necessary accessories.

behrotest® apparatus for crude fibre digestion

Model	Article description	230 V~ Art.-No.
EXR 4	Complete crude fibre digestion unit with 4 sample positions	80 48 80044
EXR 6	Complete crude fibre digestion unit with 6 sample positions	80 48 80046



# Extraction

## The behr Range for Twisselmann Method



The Twisselmann method of extraction is a continuous high-temperature extraction. It functions in a similar way to Soxhlet extraction. However in the Twisselmann extractor the temperature in the sample is very hot, i.e. close to the solvent's boiling point. This improves solubility and reduces the extraction time.

The extraction temperature is higher because the condensed solvent from above and the rising hot solvent vapour from below flow through the extraction thimble at the same time and mix there. The temperature of this mixture is a lot higher than that of the condensed solvent.

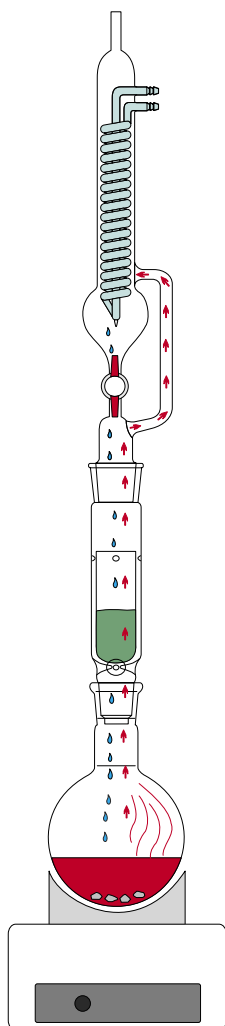
The Twisselmann extraction time is up to 50% shorter than the Soxhlet extraction time.

### 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).

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
KEX 100 T	Compact system for Twisselmann extraction	804800537	8048005375

R 106 T



### behrotest® multi-sample extractors for Twisselmann extraction

Economical and user-friendly units for extraction in accordance with Twisselmann:

- 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

Model	Article description	230 V~ Art.-No.
R 104 T	Multi-sample extractor for an extraction in accordance with Twisselmann, complete for 4 sample positions	804880045
R 106 T	Multi-sample extractor for an extraction in accordance with Twisselmann, complete for 6 sample positions	804880043

# Extraction

## Accessories

### Accessories for the extraction

Model	Article description	Art.-No.
EZ 30	Soxhlet-extractor, 30 ml	80 48 41031
PTFE 29	PTFE collars for EZ 30	80 48 30290
EX 30 HS	Extraction thimbles for EZ 30, pack with 25 pcs	80 48 41033
EZ 100	Soxhlet extractor, 100 ml	80 48 41032
EZ 100/ stopcock	Soxhlet extractor, 100 ml, with stopcock	80 48 41035
EX 100 HS	Extraction thimbles for EZ 100 (stopcock), pack with 25 pcs	80 48 41034
EZ 250	Soxhlet extractor, 250 ml	80 48 41039
EZ 250/ stopcock	Soxhlet extractor, 250 ml, with stopcock	80 48 41038
EX 250 HS	Extraction thimbles for EZ 250 (stopcock), pack with 25 pcs	80 48 41040
EZT	Extractor, 100 ml, for the Twisselmann extractors	80 48 41043
PTFE 45	PTFE collars for EZ 100 and EZ 100/stopcock, EZ 250 and EZ 250/stopcock	80 48 30450
RFKT	Condenser for 100-ml Twisselmann extractors	80 48 41044
RFK 30	Reflux condenser for 30-ml extractors	80 48 41011
RFK 100	Reflux condenser for 100-ml extractors (EZ 100 or EZ 100/stopcock)	80 48 51070

# Determination of Alcohol and Volatile Content

## Distillation Units

### Steam distillation units D 1 and D 2

- 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.

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
D 1	Steam distillation unit for determining alcohol content. Distillation into a pycnometer	80 48 49010	80 48 490105
D 2	Steam distillation unit for determining Volatile acid content. Distillation into an erlenmeyer flask 500 ml	80 48 49011	80 48 490115

### Technical data D 1

<b>Dimensions (W x H x D in cm)</b>	approx. 41 x 67,5 x 41	
<b>Weight</b>	approx. 32 kg	
<b>Nominal voltage</b>	230 VAC/ 115 VAC	50 Hz/ 60 Hz
<b>Power/ current consumption</b>	1700 W	9 A /18 A
<b>Cooling water consumption</b>	approx. 5 l/min	
<b>Storage container</b>	Any size, Recommendation: behrotest® set of canisters	
<b>Display</b>	LCD	
<b>Programs</b>	1	



D 1

### Distillation units behrotest® WE 1/H

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
WE 1/H	Single steam generator, 400 W, with additional heating	80 48 52200	80 48 522005

### Glassware for alcohol distillation in the WE 1/H

Model	Article description	Art.-No.
GSAB	Glassware for determining alcohol content. Distillation into a volumetric flask. incl. pycnometer	80 48 52102
GSABP	Glassware for determining alcohol content. Distillation into a pycnometer	80 48 52103

### Technical data WE 1/H

<b>Dimensions (W x H x D in mm)</b>	approx. 290 x 670 x 380	
<b>Weight</b>	approx. 12,8 kg	
<b>Nominal voltage</b>	230 VAC/ 115 VAC	50 Hz/ 60 Hz
<b>Power/current consumption</b>	400 W	3 A/ 6 A
<b>Cooling water consumption</b>	approx. 5 l/min	
<b>Distillation time</b>	approx. 10 min per sample	
<b>Storage container</b>	any size, Recommendation: behrotest® set of canisters	



WE 1/H + GSAB

# Food Analysis

## Miscellaneous Determinations

### Digestion unit RH 6 for the determination of hydroxyproline

In-line digestion unit for the determination of the hydroxyproline (connective tissue content) in meat and sausage products.



RH 6

Model	Article description	Art.-No.
RH 6	behrotest® digestion unit for determining hydroxyproline content. Locators for 6 samples. Complete, incl. glassware	80 48 80024

#### Technical data RH 6

<b>Dimensions in cm (W x H x D)</b>	approx. 76 x 74 x 32	
<b>Weight</b>	approx. 19,8 kg (without glass)	
<b>Nominal voltage</b>	230 VAC, 50/60 Hz	
<b>Power/current consumption</b>	1960 W	10 A/ 20 A

### Digestion units SMH 6, SMH 12 for the determination of hydroxyproline



SMH 12

Model	Article description	Art.-No.
SMH 6	behrotest® digestion unit for determining hydroxyproline, locators for 6 samples, complete with heating block, cooling water distribution, controller and glassware	80 48 80035
SMH 12	behrotest® digestion unit for determining hydroxyproline, locators for 12 samples, complete with heating block, cooling water distribution, controller and glassware	80 48 80036

#### Technical data SMH 6 and SMH 12

	SMH 6	SMH 12
<b>Dimensions in cm (W x H x D)</b>	approx. 40 x 100 x 65	
<b>Weight, complete</b>	approx. 32 kg	approx. 34 kg
<b>Nominal voltage heating block</b>	230 VAC/ 115 VAC, 50/60 Hz	
<b>Power consumption heating block</b>	800 W	1500 W
<b>Current consumption</b>	5 A/ 10 A	8 A/ 16 A

### UTI 1 electronic long duration timer

Ideal for automatically switching off devices after processes of long duration, such as e.g. an extraction. Times from 0.1 ... 999.9 min adjustable in steps of 6 sec. "Locking function" against accidental changes to the settings.



UTI 1

Model	Article description	Art.-No.
UTI 1	Electronic long duration timer	80 48 80101

#### Technical data UTI 1

<b>External dimensions in cm (W x H x D)</b>	approx. 14.5 x 9.5 x 20.5 with folding-out foot approx. 14.0 x 12.5 x 20.5	
<b>Voltage</b>	220 V/50 Hz, max. 2200 W	
<b>Switching capacity</b>	max. 2,2 kVA at 230 VACt	
<b>Connection of the devices</b>	via mains plug on the rear of the UTI 1	
<b>Time-setting range</b>	0.1 – 999.9 min, digitally adjustable in steps of 6 sec.	

Suitable behrotest® recirculating cooler can be found on Page 60

## Digestion units for the determination of the saponification number and the OH number

Digestion units with locators for 6 or 12 samples, e.g. for determining the saponification number or the OH number.

Model	Article description	230 V~ Art.-No.
BE 6	behrotest® digestion unit with locators for 6 samples. Complete with heating block, controller and glassware.	80 48 80025
BE 12	behrotest® digestion unit with locators for 12 samples. Complete with heating block, controller and glassware	80 48 80026

### Specifications

	BE 6	BE 12
<b>Dimensions in cm (W x H x D)</b>	approx. 31 x 90 x 38	
<b>Weight, complete</b>	approx. 28 kg	approx. 30 kg
<b>Nominal voltage heating block</b>	230 VAC, 50/60 Hz	
<b>Power consumption heating block</b>	800 W	1500 W



BE 6

## Determination of sulphurous acids

### Systems for determining sulphurous acids (Total SO<sub>2</sub>)

Equipment for releasing and distilling sulphurous acids. Locators for 1 or 6 samples, with magnetic stirrer). Systems with one or two absorption vessels available. Round-bottom reaction flasks 500 ml. Other sizes on request.

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
KSO 2	Compact system for determining sulphurous acids. 2 Absorption vessels. Magnetic stirrer	80 48 00501	80 48 005015
SO 2-6	System for determining sulphurous acid in up to 6 samples simultaneously. 2 absorption vessels. Magnetic stirrer	80 48 80027	80 48 800275
AKO 300	Heating unit for boiling the H <sub>2</sub> O <sub>2</sub> before titration, complete with Erlenmeyer flask	80 48 00502	80 48 005025

### Specifications

	KSO 2	SO 2-6
<b>Dimensions in cm (H x B x T)</b>	approx. 71,5 x 23 x 33	approx. 100 x 70 x 43
<b>Weight</b>	approx. 7,5 kg	approx. 48 kg (without glass)
<b>Nominal voltage</b>	230 VAC, 50/60 Hz	
<b>Power consumption</b>	450 W	2000 W



KSO 2



KWA 500

## Compact system for determining water content through azeotropic distillation

Complete compact system for determining water content through azeotropic distillation. Suitable for inhomogeneous, irregularly shaped food, such as e.g. dried fruit, sauerkraut etc. With stand, heating module, mount and glass apparatus.

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
KWA 500	behrotest® compact apparatus for determining water content. Complete with support, glassware, heating and hose connections	80 48 00500	80 48 005005
DBAS	DET basic unit for adding supplementary kits consisting of a heating block thermostat with five 65-mm-dia. holes for reaction vials, temperature range from 20 ... 300 °C, cooling water distributor and time-temperature controller	80 48 50020	80 48 500205
DWA 500	DWA 500 accessory set for determining the water content	80 48 50027	80 48 500275



KOL

## Compact system to determine essential oils

Complete compact system to determine the essential oils in the pharmaceutical products. With base frame, heating unit, mountings, condenser tubes and glassware.

Model	Article description	Art.-No.
KOL	Compact system to determine essential oils	80 48 00539

Complete compact system to determine the content of essential oils in citrus fruits and their derivatives according to Clevenger (Distillation flasks 3000 ml).

Model	Article description	Art.-No.
CLE	Compact system to determine essential oils in citrus fruits and their derivatives	80 48 00544

If you can't find a suitable device for a particular specification, please call us or send us a mail.



## Equipment for Water and Soil Analysis

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# Sampling, Transport and Storage

## behrotest® sampling scoops



PB 1000

To take scoop samples from the water surface. The clamping fixture and end bar of the sampling scoop are made of stainless steel. The scoop with receptacles made of borosilicate glass comply with the high requirements of DIN EN 1485/AOX standard. All devices together have the following characteristics:

- Sturdy, three-part supporting bar with telescopic racks
- Continuously adjustable in length between 1 m and 3.75 m
- Ideal for sampling even in waters that are difficult to access
- Continuously adjustable clamping fixture
- Beaker holder made of stainless steel

Model	Article description	Art.-No.
PB 1000	Special glass, 1 l	39 48 65012
PF 1000	High breast bottle, 1 l	39 48 65014
PP 1000	PP beaker, 1 l	39 48 65015
PT 1000	PTFE beaker, 1 l	39 48 65016
PV 1000	Stainless steel beaker, 1 l	39 48 65017



QMR 15

## 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.



QMR 2

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
QMR 2	Capacity 2 l 12V, with adapter for mains connection	80 48 65030	
QMR 5	Capacity 5 l 12V, with adapter for mains connection	80 48 65000	80 48 650005
QMR 10	Capacity 10 l 12V, with adapter for mains connection	80 48 65024	80 48 650245
QMR 15	Capacity 15 l 12V, with adapter for mains connection	80 48 65001	80 48 650015
QMR 20	Capacity 20 l 12V, with adapter for mains connection	80 48 65002	80 48 650025
QMR 25	Capacity 25 l 12V, with adapter for mains connection	80 48 65010	80 48 650105

## behrotest® FTB 1/8 and FTB 2/6 sample transport containers

Transport container with label holder for safe transport and practical storage of 8 DIN sampling bottles with 1 l or 6 sampling bottles with 2 l.

The containers are light and sturdy and can be stacked easily and in a space-saving manner due to standard dimensions. The inserts for bottles with 1 or 2 l content ensure thermal insulation and safe standing of the sampling bottles.

The containers are also suitable for storing samples so that they are protected from direct sunlight and at the same time provide low fluctuations in temperature.

Model	Article description	Art.-No.
FTB 1/8	for 8 sampling bottles with 1 l	23 48 65021
FTB 2/6	for 6 sampling bottles with 2 l	23 48 65022



FTB 1/8

## behrotest® ITB 1/8 and ITB 2/6 insulated transport containers for samples

The containers ITB 1/8 and ITB 2/6 are suitable for the safe transportation and practical storage of 8 DIN sampling bottles with 1 l or 6 sampling bottles with 2 l content.

They can be stacked simply and in a space-saving manner due to standard dimensions. To a great extent the insulated cladding eliminates influences on the samples from the ambient air temperature. In addition the containers can be provided with a cooling element in the lid.

Cooling by means of the lid element follows the proven principle: The cold air falls downwards from the cooling element and then cools the sample container there. The containers are suitable for storing samples so that they are protected from direct sunlight and at the same time provide low fluctuations in temperature.

Model	Article description	Art.-No.
ITB 1/8	for 8 DIN sampling bottles with 1 l	23 48 65030
ITB 2/6	for 6 DIN sampling bottles with 2 l	23 48 65032
KSP 1	Cold-storage plate for ITB 1/8 and ITB 2/6	23 48 65031



ITB 2/6 with  
KSP 1

## behrotest® sampling bottles and glass stoppers

In accordance with DIN 12036. With conical ground joint and compact glass stoppers with rounded ends. Made of borosilicate glass 3.3.

### The stoppers have two advantages

- no puffing at the end of the stopper when dipping into the sample liquid
- lower risk of breakage and cracking than in the case of wooden stoppers

Model	Article description	Art.-No.
PFL 500	Sampling bottles 500 ml	11 48 65027
PFL 1000	Sampling bottles 1000 ml	11 48 65028
PFL 2000	Sampling bottles 2000 ml	1148 65029
MST 24	Replacement stoppers NS 24	13 48 65023
MST 29	Replacement stoppers NS 29	13 48 65024



PFL 1000  
with MST 29



GSM 2 without the illustrated sedimentation funnel



RB GT



RK GT



PET bottles

## Frames for sedimentation vessels

Based on Imhoff, made of heavy PVC, grey, sturdy

Article description	Art.-No.
for 2 Imhoff funnels without stop-cock	23 48 17002
for 4 Imhoff funnels without stop-cock	23 48 17004
for 2 Imhoff funnels with stop-cock	23 48 17012
for 4 Imhoff funnels with stop-cock	23 48 17014

## Wide mouth bottles

### Amber glass

behroplast® Wide mouth bottles, amber glass. For storage and transport. Due to PTFE laminated screw caps, they are ideal e.g. for sampling.

Model	Content ml	Thread Ø mm	Art.-No.
RB 250 GT	250	55	80 48 86006
RB 500 GT	500	55	80 48 86007
RB 1000 GT	1000	68	80 48 86008

### Clear glass

Sampling bottle made of clear glass. PTFE laminated caps, therefore to a great extent inert.

Model	Content ml	Thread Ø mm	Art.-No.
RK 250 GT	250	55	12 48 20033
RK 500 GT	500	55	12 48 20034
RK 1000 GT	1000	68	12 48 20035

## Narrow mouth bottles

behroplast® PET bottles made of thermoplastic polyester (PET) are light and suitable for food use. They distinguish themselves by high chemical resistance and to a great extent are diffusion-proof and temperature resistant from -40 to +60°C. PET narrow mouth bottles, clear glass, with blue tamper-evident caps made of polypropylene. With screw-on caps.

Content ml	External Ø mm Height mm	Cap Ø mm	Art.-No.	Packaging Unit.
100	48 x 94	28	22 48 17001	10
200	55 x 125	28	22 48 17002	10
250	63 x 131	28	22 48 17003	10
500	80 x 180	32	22 48 17005	10
1000	90 x 250	32	22 48 17010	10



AQUABOX

## Flow-through measuring chamber for water

The AQUABOX flow-through measuring chamber for water for the correct and expert determination of the on-site parameters when collecting samples of ground water and waste water. The unit permits the simultaneous measurement (electrolytic and chemico-physical) of different parameters in the flow through under reproducible and optimal flow conditions.

The AQUABOX is manufactured from a transparent, shock-resistant polyethylene compound (PETG). The transparent construction allows constant visual control of interferences such as e.g. contamination due to sand or mud. All water-bearing parts are glue-free and manufactured from PETG (vessel and lid) or PP (inlet and outlet tubing). The liquids being sampled are thus not affected by the material and construction (no adsorption and desorption behaviour). The lid is splash proof and easy to open and close by means of quick-release fasteners. It has 6 variable large, splash-proof electrode holders for measuring electrodes up to  $\varnothing$  25 mm (larger diameters available on request).

The sample water spirals upwards into the measuring chamber around the measuring electrodes, which are positioned in a circle, and flows out over the splash-proof outer housing of the vessel. Six electrode holders in the lid with variable diameters ensure that the measuring electrodes are held securely into the optimal flow area. On-site measurements cause no problems due to the impact-resistant material. The water flow can be adjusted by means of a valve. A valve in the bypass allows sampling in the water intake.

The AQUABOX is quick and easy to disassembly without tools for cleaning through a central threaded joint.

### Application areas of the AQUABOX

- In the laboratory and on site
- Online and stationary operation is also possible

Model	Art.-No.
AQUABOX	78 48 65056

# Water Analysis

behrotest® Units for COD Determination





## COD digestion units and workstations

### PA-CSB COD digestion units for sample digestion

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 vessel
- LK 1 COD air cooler
- LS Air cooler stands for LK COD air cooler

Model	230 V~ Art.-No.
PA-CSB 6	80 48 80000
PA-CSB 12	80 48 80001



PA-CSB 12

### PB-CSB/M COD workstations

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 cooler
- LS Air cooler stands for LK COD air cooler
- 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

Model	230 V~ Art.-No.
PB-CSB 6/M	80 48 80002
PB-CSB 12/M	80 48 80003



PB-CSB 12/M

For laboratories with a particularly high workload of samples, we also offer workstation configurations on the basis of the CSB 24/E 24-sample heating block (space for 24 samples).

# User Specific Special Developments

## For the Determination of COD

From practical experience – for experienced practitioners:

### 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.



IMR 10 CSB

Model	Article description	Art.-No.
KW 6/N	COD in acc. with ISO, DIN etc.: Cooling trough for E 6/B insert frame	80 48 30042
KW 12/N	COD in acc. with ISO, DIN etc.: Cooling trough for 2 E 12/B insert frame	80 48 30043
KW 24/N	COD in acc. with ISO, DIN etc.: Cooling trough for E 12/BV insert frame	80 48 30044
LS 6	COD in acc. with ISO, DIN etc.: Stands for 6 COD air coolers	80 48 30051
LS 12	COD in acc. with ISO, DIN etc.: Stands for 12 COD air coolers	80 48 30052

### 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.



KW 12/N

Model	Article description	Art.-No.
SM 12/N	COD in acc. with ISO, DIN etc.: Series magnetic stirrer for E 12/B insert frame	80 48 30048
IMR 10 CSB	COD in acc. with ISO, DIN etc. : COD magnetic stirrer for 1 reaction vessel	80 48 30050

### COD metering funnel

COD metering funnels, placed on top of the COD reaction vessels, simplify the addition of sulphuric acid to several samples simultaneously. The user fills the metering funnel with the standard volume of 30 ml. He/she can do this much more quickly than when metering straight into the sample. The sulphuric acid is then dripped onto the sample by means of a spindle stopcock. After adjusting once, the user can then meter the sulphuric acid evenly into a large number of samples comparatively quickly and without time-consuming manipulation.

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.



DT 30

Model	Article description	Art.-No.
DT 30	COD in acc. with ISO, DIN etc.: metering funnel, 30 ml, for sulphuric acid	80 48 30200

## HCl-absorber

To expel chloride, e.g. when determining the COD of sea water.

Model	Article description	Art.-No.
HCL 29	COD in acc. with ISO, DIN etc.: HCL absorber to expel chloride (without stopper)	80 48 30071

## 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.

behrotest® boiling stones are chemically pure and guarantee unadulterated results when determining the COD.

Model	Article description	Art.-No.
SIST 100	Boiling stones, contents 100 g	80 48 30700



HCL 29

## COD titration according to your requirements

### behrotest® HTI 1 manual titration station

The HTI 1 Manual titration station consists of

- 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.

Model	Article description	Art.-No.
HTI	COD in acc. with ISO, DIN etc.: Manual titration station, with digital burette and magnetic stirrer	80 48 30300

### Technical data HTI 1 manual titration station

<b>Voltage</b>	230 VAC/115 VAC
<b>Frequency</b>	50/60 Hz
<b>Weight</b>	approx. 3,5 kg
<b>Dimensions in cm (W x D x H)</b>	approx. 33 x 20 x 60



SIST 100



HTI 1

# Automation for Metering and Titration

## DS 20 Metering Unit and TS 20 Titrator



### behrotest® DS 20 automatic metering unit – behrotest® TS 20 automatic titrator

#### DS 20

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. 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

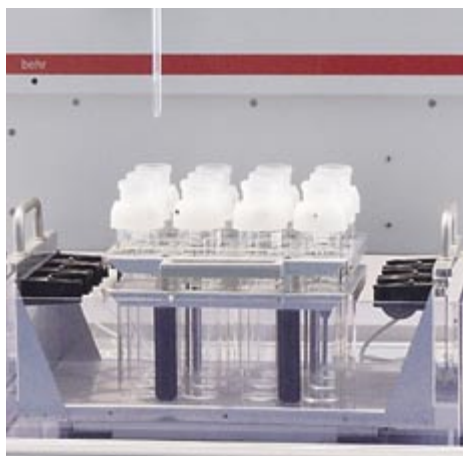
#### TS 20

Titration sample for the concluding titration when determining COD in 12 samples simultaneously. Connection to direct activation of the 12-position magnetic stirrer SM 12/P.

- 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

#### Both for behr DS 20 and also for behr TS 20:

- 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 and behr TS 20 is very easy to use and user-friendly with the Windows user interface



SM 12/P

Model	Article description	Art.-No.
DS 20	Fully automatic COD metering unit for up to 12 samples simultaneously, incl. burettes and cooling trough	80 48 24402
TS 20	Fully automatic COD titration sampler for up to 12 samples simultaneously, incl. burette and cooling trough	80 48 24403
SM 12/P	12-position inductive magnetic stirrer for direct connection to the DS 20	80 48 300481

## Technical data behrotest® DS 20

### Metering unit

Measurements and weights

<b>Dimension in cm (H x W x D)</b>	approx. 73 x 51 x 46
<b>Cooling trough</b>	12,5 dm <sup>3</sup> = 12,5 l (without series magnetic stirrer and frames)
<b>Weights:</b>	
<b>Metering unit</b>	approx. 12 kg
<b>Cooling trough</b>	approx. 3,0 kg
<b>Series magnetic stirrer</b>	approx. 5,5 kg
<b>Magnetic stirrer insert frame</b>	approx. 2,1 kg
<b>Complete system</b>	approx. 22,6 kg

Electrical characteristics

<b>Rated voltage</b>	90 - 240 VAC, 50 / 60Hz
<b>Power consumption</b>	80 VA
<b>Magnetic stirrer</b>	24 VAC (4-pole, socket)

### Burette module

TS 20

DS 20

Sensor system

<b>Measuring range</b>	± 2500 mV	-
<b>Max. resolution</b>	1 mV	-
<b>Electrode types:</b>		
<b>Acid-base titration</b>	Standard pH electrode	-
<b>Redox titration</b>	Standard grinding electrode REDOX electrodes with DIN plug (DIN 19262)	-

Burettes

<b>Quantity</b>	1	2
<b>Standard dosing syringes</b>	10 ml	
<b>Minimum dosing quantity</b>	10 µl	

Inputs

<b>Mains voltage</b>	90 - 240 VAC	
<b>Communication connection</b>	RS 232(D-Sub, 9-pole, socket)	
<b>Electrode connection</b>	Socket in acc. with DIN 19262	-

Outputs

<b>Waste pump</b>	230 VAC, 1 A (4-pole, socket)	
<b>Extension/external</b>	230 VAC, 1 A (4-pole, socket)	
<b>Internal Bus</b>	(5-pole, socket)	
<b>3 x Reagent monitors</b>	1 input	2 inputs

Measurements and weight

<b>Measurements in cm (H x W x D)</b>	approx. 37 x 22,5 x 24
<b>Weight</b>	approx. 10 kg

## The behrotest® COD product range at a glance

Model	Article description	Art.-No.
DOS 10	COD in acc. with ISO, DIN etc.: Universal dispenser to meter potassium chromate, 2 ... 10 ml	80 48 12004
DOS 50	COD in acc. with ISO, DIN etc.: Universal dispenser to meter sulphuric acid, 5 ... 50 ml	80 48 12005
DIT 50	COD in acc. with ISO, DIN etc.: Digital burette for titration, 50 ml volume	80 48 12010
TRS 300	Temperature and time control unit, microprocessor-controlled unit, up to 10 temperature/time combinations programmable	80 48 20300
CSB 6/E	COD in acc. with ISO, DIN etc.: Precision heating block thermostat for 6 RG reaction vessels, 20 ... 300 °C	80 48 21006
CSB 12/E	COD in acc. with ISO, DIN etc.: Precision heating block thermostat for 12 RG reaction vessels, 20 ... 300 °C	80 48 21012
CSB 24/E	COD in acc. with ISO, DIN etc.: Precision heating block thermostat for 24 RG reaction vessels, 20 ... 300 °C	80 48 21024
DT 10	Fully automatic metering unit/titrator for COD determination in acc. with ISO, DIN etc. Metering and titration in maximum 12 samples simultaneously. With automatic suction of the titrated samples	80 48 24400
E 6/B	COD in acc. with ISO, DIN etc.: Insert/yoke type frame for CSB 6/E	80 48 30001
E 12/B	COD in acc. with ISO, DIN etc.: Insert/yoke type frame for CSB 12/E	80 48 30002
E 12/BV	COD in acc. with ISO, DIN etc.: Insert/yoke type frame for CSB 24/E	80 48 30003
RG 1	COD in acc. with ISO, DIN etc.: Reaction vessel with NS 29, 175 ml volume, 100 ml marking	80 48 30011
RG 2	COD in acc. with ISO, DIN etc.: Reaction vessel with vessel adapter, NS 29 and 100 ml marking	80 48 30012
KM 1	COD reaction vessel with vessel adapter, 250 ml volume for DIN 38409 H 43	80 48 30014
LK 1	COD in acc. with ISO, DIN etc.: COD air cooler	80 48 30031
KW 6/N	COD in acc. with ISO, DIN etc.: Cooling trough for E 6/B insert frame	80 48 30042
KW 12/N	COD in acc. with ISO, DIN etc.: Cooling trough for E 12/B insert frame	80 48 30043
KW 24/N	COD in acc. with ISO, DIN etc.: Cooling trough for E 12/BV insert frame	80 48 30044
SM 12/N	COD in acc. with ISO, DIN etc.: Series magnetic stirrer for E 12/B insert frame	80 48 30048
IMR 10 CSB	COD in acc. with ISO, DIN etc.: COD magnetic stirrer for 1 RG	80 48 30050
LS 6	COD in acc. with ISO, DIN etc.: Stand for 6 COD air coolers	80 48 30051
LS 12	COD in acc. with ISO, DIN etc.: Stand for 12 COD air coolers	80 48 30052
HCL 29	COD in acc. with ISO, DIN etc.: HCL absorber to expel chloride	80 48 30071
TS 12 CSB	COD in acc. with ISO, DIN etc.: Transport stand for insert frames E 6/B, E 12/B, E 12/BV	80 48 30095
CSB-PRÜF	COD in acc. with ISO, DIN etc.: Test unit to control the heating temperature	80 48 30199
DT 30	COD in acc. with ISO, DIN etc.: Metering funnel, 30 ml, for sulphuric acid	80 48 30200
PTFE 29	PTFE collars for RG 2, SR 2 and SR 2 Q, Set of 12 collars	80 48 30290
HTI 1	COD in acc. with ISO, DIN etc.: Manual titration station, with digital burette and magnetic stirrer	80 48 30300
SIST 100	Boiling stones, content 100 g	80 48 30700
MRST 2	COD in acc. with ISO, DIN etc.: Magnetic stirring rod – set of 12 rods for RG	80 48 30800
UK 12/400	Re-circulating cooler, 380 W power (see page 60)	80 48 40204
UK 12/600	Re-circulating cooler, 580 W power (see page 60)	80 48 40200
UK 12/1000	Re-circulating cooler, 980 W power (see page 60)	80 48 40201
UK 12/2000	Re-circulating cooler, 1900 W power (see page 60)	80 48 40203



# Determination of the Biochemical Oxygen Demand (BOD)



## BOD mixing equipment

behrotest® BOD mixing equipment is reliable and easy to use. Complete workstations can be assembled with the suitable supplementary devices – ranging from dilution water containers with cooling coil to the thermostatic circulator and the precision metering unit for allylthiourea. When determining the BOD<sub>5</sub> in acc. with ISO 5815-1, DIN EN 1899-1 (=DEV H 51), manpower requirements are reduced distinctly and thus also the costs.

## BSB 2

1 graduated mixing column with 1 l content, magnetic stirrer, three-way stopcock made of PTFE to supply dilution water which is free of air bubbles from below

Model	Art.-No.
BSB 2	80 48 01002

### Technical data BSB 2

<b>Weight</b>	approx. 9 kg (without pump)
<b>Dimensions in cm (W x D x H)</b>	approx. 26 x 30 x 75

## BSB 4 A

like BSB 2, however semi-automatic with level shutoff and rinsing device

Model	Art.-No.
BSB 4A	80 48 01003

### Technical data BSB 4 A

<b>Weight</b>	approx. 12 kg (without pump)
<b>Dimensions in cm (W x D x H)</b>	approx. 26 x 35 x 75



BSB 4A



BSB Bottle  
Accessories are  
not included



Karlsruhe Bottle

## BSB 31

like BSB 4 A, however with three graduated mixing columns with 1 l content, firmly installed hose pump, level shutoff and rinsing device

Model	Art.-No.
BSB 31	804801004

### Technical data BSB 31

<b>Weight</b>	approx. 37 kg
<b>Dimension in cm (B x T x H)</b>	approx. 91 x 45 x 85

## DSA

Dosing mechanism complete with dispenser and holder for BOD mixing equipment

Model	Art.-No.
DSA	804801010

### Technical data DSA

<b>Weight</b>	approx. 0,5 kg
<b>Dimension in cm (Ø x H)</b>	approx. 10 x 30

## 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.

Content ml	Length mm	Art.-No.
100	20	804802130
100	60	804802160
250	20	804802030
250	60	804802060

Model	Art.-No.
BOD bottles with stopper, 100 ml, NS 19	804802200

## BOD dilution water container

Including ventilation facility, level display and drain cock. Coloured (protection against light), with lid for easy cleaning.

Model	Content l	Article description	Art.-No.
VD 30	30	blue, with distribution frits and compressed air connection	80 48 03030
VD 60	60	blue, with distribution frits and compressed air connection	80 48 03060
VD 120	120	blue, with distribution frits and compressed air connection	80 48 03120
VDT 30	30	like VD 30, however with internal stainless steel cooling coil and connection for thermostatic circulator	80 48 04030
VDT 60	60	like VD 60, however with internal stainless steel cooling coil and connection for thermostatic circulator	80 48 04060
VDT 120	120	like VD 120, however with internal stainless steel cooling coil and connection for thermostatic circulator	80 48 04120



VD and VDT

## Diaphragm pump

Continuously adjustable diaphragm pump to aerate the dilution water in containers with content of up to 60 l.

	MP 300	MP 500
max. capacity (l/h) approx.	300	500
max. capacity (mWs) approx.	3,1	3,3
Voltage (V)	220-240	220-240
Frequency (Hz)	50	50
Power consumption (W)	4	8



Diaphragm pumps

Model	230 V~ Art.-No.	115 V~ Art.-No.
MP 300	80 48 06001	80 48 060015
MP 500	80 48 06002	80 48 060025

## UT 12 thermostatic circulator

Maintains the temperature of the BOD dilution water. Regulation by cooling or heating the BOB dilution water to +20°C. Connection for external temperature sensors.

Model	Article description	Art.-No.
UT 12	Thermostatic circulator	80 48 40202



UT 12

# Biodegradability

Laboratory Purification Plants for Water Analysis



## Laboratory purification plants to determine the biodegradability

e.g. for the Coupled Units Test in acc. with OECD 303 A, complete.

### 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

Model	Article description	Art.-No.
KA 1	Laboratory purification plant, complete	80 48 62001
KA 1/SR	Laboratory purification plant, complete, with oxygen entry control	80 48 62005
KLD 4	Laboratory purification plant, complete, with denitrification step	80 48 62003
KLD 4/SR	Laboratory purification plant, complete, with denitrification step and oxygen entry control	80 48 62006
KLD 4 N	Like KLD 4, with continual sludge recirculation	80 48 62007
KLD 4N/SR	Like KLD 4/SR, with continual sludge recirculation	80 48 62008

### Technical data

Measurements and weights

<b>KA 1</b>	
<b>Dimensions in cm (W x D x H)</b>	approx. 70 x 60 x 170
<b>Weight</b>	approx. 40 kg
<b>KA 1/SR</b>	
<b>Dimensions in cm (W x D x H)</b>	approx. 90 x 60 x 185
<b>Weight</b>	approx. 49 kg
<b>KLD 4</b>	
<b>Dimensions in cm (W x D x H)</b>	approx. 120 x 60 x 185
<b>Weight</b>	approx. 56 kg
<b>KLD 4/SR</b>	
<b>Dimensions in cm (W x D x H)</b>	approx. 140 x 60 x 185
<b>Weight</b>	approx. 40 kg
<b>KLD 4 N</b>	
<b>Dimensions in cm (W x D x H)</b>	approx. 120 x 60 x 185
<b>Weight</b>	approx. 58 kg
<b>KLD 4 N/SR</b>	
<b>Dimensions in cm (W x D x H)</b>	approx. 140 x 60 x 185
<b>Weight</b>	approx. 67 kg



KA 1



KA 1/SR



# Cyanide Determination

## Decomposition and Separation Equipment



### Equipment for cyanide distillation

As specified in all relevant standards for cyanide determination, the gas flow for behr units is provided exclusively by diaphragm vacuum pumps. Consequently the systems work with vacuum. And therefore working on the systems is safer.

#### Low cost units: Sample preparation for up to two samples

Complete compact system for sample preparation for cyanide determination according to the standards. With base frame, heating unit, flow meter(s), mounting(s), hoses and glassware.

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
KTC	Compact system for distillation when determining total cyanide	80 48 00524	80 48 005245
KLFC	Compact system for air stripping of easily liberatable cyanide	80 48 00525	80 48 005255
KLFC 2	Compact system for air stripping of easily liberatable cyanide, 2 spaces for samples	80 48 00526	80 48 005265



### Technical data

	KTC	KLFC	KLFC 2
<b>Dimension in cm (H x W x D)</b>	approx. 71,5 x 23 x 33	approx. 71,5 x 23 x 33	approx. 71,5 x 28 x 33
<b>Weight</b>	approx. 7,5 kg	approx. 6,2 kg	approx. 6,8 kg
<b>Current consumption</b>	3 A/ 6 A	-	-
<b>Frequency</b>	50 / 60 Hz		
<b>Rated voltage</b>	230 VAC / 115 VAC	-	-
<b>Nominal power</b>	450 W		

KTC



## Compact decomposition and separation equipment

Excellent recovery rates even with difficult sample matrices for water and soil analyses: Simultaneous heating and stirring with the compact distillation equipment with magnetic stirrer for cyanide determination.

With the integrated magnetic stirrer, the hanging absorption vessel and the dropping funnel for adding reagents, the equipment corresponds to the manuscript draft for the new DIN/ EN/ ISO specifications. With base frame, heating unit, flow meter, mounting, hoses and glassware.

Model	Article description	Art.-No.
KTC-MR	Compact decomposition and separation equipment with magnetic stirrer to determine the total cyanide	80 48 00532
KTC-MR-B	Compact decomposition and separation equipment with magnetic stirrer to determine the total cyanide in soils (40 ml absorption vessel)	80 48 00538
KLFC-MR	Compact decomposition and separation equipment with magnetic stirrer to determine easily liberatable cyanides	80 48 00533

### Technical data

	KTC-MR (MR-B)	KLFC-MR
<b>Dimensions in cm (H x W x D)</b>	approx. 71,5 x 23 x 33	approx. 71,5 x 23 x 33
<b>Weight</b>	approx. 8,2 kg	approx. 7,8 kg
<b>Current consumption</b>	3 A/6 A	-
<b>Frequency</b>	50/60 Hz	-
<b>Rated voltage</b>	230 VAC, 50/60 Hz	-
<b>Nominal power</b>	220 W	-

## Reliable cyanide distillation for a high quantity of samples: Workstations with space for five samples

This distillation equipment is based on our tried and tested DET heating block system and consists of the following components:

### DET basic unit

The DET basic unit consists of a heating block thermostat with 5 holes for reaction vessels with a diameter of 65 mm. The heating blocks have a temperature range of 20 to 300 °C. In addition the basic unit includes a cooling water distribution system and a temperature and time control unit.



KTC-MR



KLFC 2



DBAS with DGC

#### DET supplementary kit for total cyanide

Supplementary kit for DET basic unit with all required accessories for distillation when determining the total cyanide.

optional:

#### DET extension kit for easily liberatable cyanides

■ Round-bottomed vessels and special electrodes to determine easily liberatable cyanides

Model	Article description	Art.-No.
DBAS	DET basic unit as basis for supplementary kits	80 48 50020
DGC	DET supplementary kit, total cyanide	80 48 50021
DLFC	DET extension kit, easily liberatable cyanide	80 48 50022

#### Technical data

	Workstation for total cyanide (DBAS + DGC)
<b>Dimensions in cm (H x W x D)</b>	approx. 71,5 x 23 x 33
<b>Weight</b>	approx. 37 kg
<b>Rated voltage of heating block</b>	230 VAC, 115 VAC, 50 / 60 Hz
<b>Nominal power of heating block</b>	1500 W
<b>Current consumption</b>	8 / 16 A

Professional sample preparation for cyanide determination in waters and soils with 6 spaces for samples: Simultaneous heating and stirring guarantee high recovery rates and exact analysis results



CN 6

Model	Article description	Art.-No.
CN 6	Decomposition and separation equipment to determine total cyanide in maximum 6 round-bottomed or flat-bottom vessels simultaneously. Stirring and heating take place simultaneously due to integrated magnetic stirrer	80 48 50000
CN 6-B	Like CN 6, however with 40 ml absorption vessels for cyanide determination in soils	80 48 60000
CE 1	pH electrode for distillation when determining easily liberatable cyanides	80 48 51010

#### Technical data

<b>Dimensions in cm (B x H x T)</b>	approx. 70 x 100 x 43
<b>Weight of complete system</b>	approx. 48 kg
<b>Rated voltage of heating block</b>	230 VAC, 50 / 60 Hz
<b>Nominal power of heating block</b>	2000 W

## The behr product range for cyanide distillation in detail

### Devices

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
KTC	Complete compact system for distillation when determining total cyanide, 1 sample location, without vacuum pump	80 48 00524	80 48 005245
KTC-MR	Compact decomposition and separation equipment with magnetic stirrer to determine total cyanide, 1 sample location, without vacuum pump	80 48 00532	
KTC-MR-B	Compact decomposition and separation equipment with magnetic stirrer to determine the total cyanide in soils, with 40 ml absorption vessel	80 48 00538	
DBAS	DET Basic unit as basis for supplementary kits, consisting of heating block thermostat with 5 holes for reaction vessels Ø 65 mm, Temperature range from 20 ... 300 °C, Cooling water distribution system, ET 2 Temperature and time control unit	80 48 50020	80 48 500205
DGC	Supplementary kit for DET basic unit DBAS with all required accessories for distillation when determining the total cyanide	80 48 50021	
CN 6	Decomposition and separation equipment to determine the total cyanide in maximum 6 samples simultaneously	80 48 50000	
CN 6-B	Like CN 6, however with 40 ml absorption vessels for cyanide determination in soils	80 48 60000	
KLFC	Compact system for air stripping of easily liberatable cyanides, 1 sample location, without vacuum pump and electrode	80 48 00525	
KLFC 2	Compact system for air stripping of easily liberatable cyanides, 2 spaces for samples, without vacuum pump and electrode	80 48 00526	
KLFC-MR	Compact decomposition and separation equipment with magnetic stirrer to determine the easily liberatable cyanides	80 48 00533	
DLFC	Extension kit for DGC: Round-bottomed vessels and special electrode to determine the easily liberatable cyanides	80 48 50022	

### Accessories

Model	Article description	Art.-No.
CE 1	pH electrode for cyanide distillation (Easily liberatable cyanides in systems with 5 or 6 spaces for samples)	80 48 51010
CE 2	pH electrode for cyanide distillation (Easily liberatable cyanides in systems with 1 and 2 spaces for samples)	80 48 81000
DES 5	Glassware stands, 5 place (e.g. for DBAS with DGC)	80 48 52010



DLFC



DES 5



DES 6



DES 6-29

## Accessories

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
DES 6	Glassware stands, 6 place (for CN 6/CN 6-B)	80 48 52015	
MVP 200	Diaphragm vacuum pump for compact equipment	80 48 51072	80 48 510725
MVP 400	Diaphragm vacuum pump, suitable for DGC and DGC with DLFC	80 48 51011	80 48 510115
MVP 700	Diaphragm vacuum pump, suitable for CN 6/CN 6-B	80 48 51078	80 48 510785
DES 6-29	Stands for 6 absorption units	80 48 52016	

## Glass

Model	Article description	Art.-No.
CY 500	Reaction vessels, round bottom, for easily liberatable cyanides in the DET heating block and for cyanide distillation in the CN 6/CN 6-B	80 48 51050
65/500	Reaction vessel, 500 ml, for total cyanide in 5 sample distillation systems	80 48 51001
RAK 500	Reaction flasks, 500 ml volume, with 3 necks, for compact systems	80 48 81003
ASH/CY	Absorption unit: ASH/CY absorption vessel complete, with MV 2914 adapter tube and SKL 14 joint clamp and TL 1 glass hose connection	80 48 41019
ASH	Absorption unit for cyanide determination in soils: ASH absorption vessel for up to 40 ml contents, complete with MV 2914 adapter tube, SKL 14 joint clamp and TL 1 glass hose connection	80 48 41018
CGL 3	Adapter for 65/500 and CY 500	80 48 51031
MGL 3/500	Gas inlet tube for the cyanide distillation in the CN 6	80 48 51067
GLT 1	Funnel tube for cyanide determination in the DET heating block	80 48 51030
GLT 2	Funnel tube for cyanide determination with KTC and KLFC	80 48 81004
TT 50	Funnel tube with stopcock for cyanide distillation in the CN 6/CN 6-B and KTC-MR/KTC-MR-B	80 48 51068
RFK 2	Reflux condenser for distillation when determining the total cyanide	80 48 51002
GW 250	Gas washing bottle, 250 ml, without frits	80 48 51041

# The Determination of the Dissolved and Easily Liberatable Sulphides



KSTA

## Compact air stripping equipment

Complete compact system to determine the dissolved and easily liberatable sulphides. With base frame, flow meter, mounting, hoses and glassware.

Model	Article description	Art.-No.
KSTA	Compact system for air stripping dissolved and easily liberatable sulphide. 1 sample location	80 48 00527
KSTA 2	Compact system for air stripping dissolved and easily liberatable sulphide. 2 sample locations	80 48 00528

## Technical data

	KSTA	KSTA 2
<b>Dimensions in cm (H x W x D)</b>	approx. 71,5 x 23 x 33	approx. 71,5 x 28 x 33
<b>Weight</b>	approx. 6,2 kg	approx. 6,8 kg

## behrotest® air stripping equipment to determine the dissolved and the easily liberatable sulphide in acc. with international standards

The equipment is mounted on a steady laboratory stand made of powder-coated sheet steel. It only requires little space in the laboratory, but holds five pieces of glassware.

The complete five place air stripping equipment consists of :

- Basic stand
- Holding beam
- System mounting
- Gas distribution with flow meters
- Reaction flasks
- Cork rings
- Metering funnel with graduation and stopcock
- Adsorption vessels
- Ground stoppers and joint clamps

Model	Article description	Art.-No.
STA	Air stripping equipment for solute sulphide, spaces for 5 samples	80 48 00360

## Technical data

<b>Dimensions in cm (H x W x D)</b>	approx. 55 x 40 x 100
<b>Weight</b>	approx. 20 kg



# Water Analysis

## Miscellaneous Determinations

### Distillation Equipment for phenol and ammonium nitrogen

#### behrotest® WE 1/H

Water vapour is available virtually immediately, i.e. after a period of maximum 30 seconds. The maximum duration of the water vapour supply – and thus the duration of the distillation – is not specified by a storage vessel inside the unit, but is only dependent on the size of the external container used by the user.

Model	230 V~ Art.-No.	115 V~ Art.-No.
WE 1/H	80 48 52200	80 48 52205

#### Glass kit for phenol distillation in the WE 1/H

Model	Art.-No.
GSPH	80 48 52201

#### Glass kit for ammonium nitrogen distillation in the WE 1/H

Model	Art.-No.
GSAS	80 48 52202

#### Technical data behrotest® WE 1/H

<b>Dimensions in cm (B x H x T)</b>	approx. 29 x 67 x 38	
<b>Weight</b>	approx. 12,8 kg	
<b>Rated voltage</b>	230 VAC/ 115 VAC	50 Hz/ 60 Hz
<b>Power / Current consumption</b>	400 W	3 A/ 6 A
<b>Cooling water flow rate</b>	approx. 5 l/min	
<b>Distillation time</b>	approx. 10 min for each sample	
<b>Storage containers</b>	any size, recommendation: behrotest® Storage tank	



WE 1/H with GSPH



## behrotest® distillation equipment to determine the phenol index and the ammonium nitrogen in accordance with international standards in up to 5 samples simultaneously

International standards specify the distillation of a large liquid quantity within a short period both for the determination of the phenol index and also for ammonium nitrogen. To comply with these provisions it is necessary to have efficient distillation equipment particularly when processing several samples simultaneously.

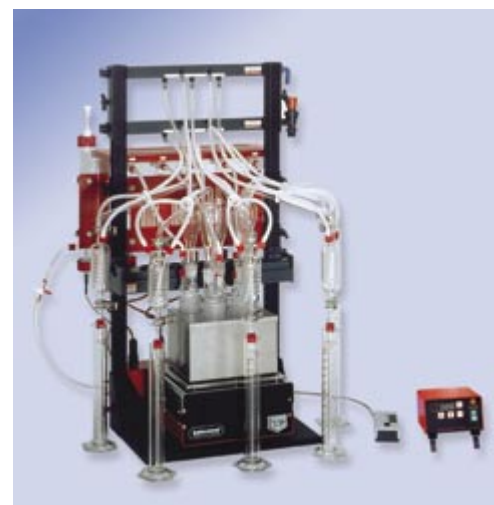
The behrotest® WE 5 Five-in-a-line multiple steam generator provides the simultaneously rapid and gentle distillation of up to five samples. The discharge of steam into the samples guarantees a particularly uniform distillation and thus a high reproducibility of the recovery rates over the entire range.

The five-in-a-line multiple steam generator with a central water supply and level control has been specially developed for this purpose and a patent has been applied for.

Model	Article description	Art.-No.
WE 5	Five-in-a-line multiple steam generator, with control group and automatic distillation water supply, including standing frame, cooler deposit panel and cooling water distribution strip	80 48 51043
BGWE 5	Basic distillation glassware for WE 5, consisting of 5 reaction vessels 65/750, 5 CGL 3 adapters, 5 MGL 3/750 steam inlet tube, 5 ST 14 cap plugs and 5 PWD 29 distillation bridges	80 48 51060
DET 5	DET 5 Precision heating block with 5 holes of 65 mm	80 48 50005
ET 2	Control unit with decode switch	80 48 20002
WH 5/750	Thermal insulation hood for 750 ml vessels DET 2	80 48 51028
DES 5	Stand for DET 5 glassware	80 48 52010
AGPH 5	Extension glass kit for phenol, consisting of 5 AR 30 inlet tubes, 5 joint clamps and 5 ME 500 graduated cylinders	80 48 51062
AGAS 5	Extension glass kit for ammonium nitrogen, consisting of 5 AR 50 inlet tubes, 5 joint clamps and 5 ME 250 graduated cylinders	80 48 51061

### Technical data for distillation equipment

<b>Voltage</b>	230 VAC
<b>Frequency</b>	50/60 Hz
<b>Current consumption for heating block</b>	8 A
<b>Current consumption for steam generator</b>	10 A
<b>Power consumption for heating block</b>	1500 W
<b>Power consumption for steam generator</b>	2000 W
<b>Weight (incl. glass)</b>	approx. 56 kg
<b>Dimensions in cm (W x D x H)</b>	approx. 50 x 50 x 100



WE 5  
ammonium  
nitrogen



WE 5 phenol



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.

Model	Article description	Art.-No.
EX 1000	Extraction unit	80 48 00202

### CUS 2 clean-up-station

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.

Model	Article description	Art.-No.
CUS 2	Clean-up station consisting of: Stand, 2 graduated reducing flask, 100 ml, 2 columns, pore size 2	80 48 00203

#### Technical data CUS 2

<b>Weight</b>	approx. 3 kg
<b>Dimensions in cm (W x D x H)</b>	approx. 23 x 27 x 50

### KOSTA 2 nitrogen station

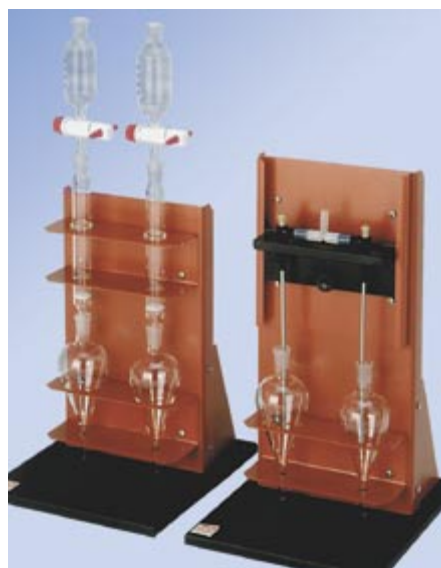
The two-stage concentration of the organic phase is concluded by reducing the extract down to less than 1 ml under a mild nitrogen flow.

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.

Model	Article description	Art.-No.
KOSTA 2	Nitrogen station	80 48 00204

#### Technical data KOSTA 2

<b>Weight</b>	approx. 4 kg
<b>Dimensions in cm (W x D x H)</b>	approx. 23 x 27 x 50



CUS 2 w/o  
illustrated  
dropping funnel

KOSTA 2 w/o  
illustrated  
glassware

## Determination of the inorganic total fluoride

### 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.

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
FBA	Distillation unit	80 48 00320	80 48 003205

#### Technical data FBA

	FBA
Rated voltage	230 VAC/115 VAC
Power consumption for heating mantles	max. 120 W
Power consumption for steam generator	400 W
Weight	approx. 16 kg
Dimensions in cm (L x B x H)	approx. 55 x 40 x 100
Ambient temperature	5 °C - 40 °C
Laboratory relay for status indication	LED
Laboratory relay for fuses	2 pcs. T 10 L 250 V
Laboratory relay for contact thermometer load	approx. 1mA
Laboratory relay for connectable power	max. 2200 W



FBA

## Arsenic determination

### Compact system for arsenic determination

Complete compact system for sample digestion for arsenic determination in acc. with ISO 11969, with base frame, heating unit, mountings and glassware.

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
KAS	Compact system for arsenic determination	80 48 00535	80 48 005355

#### Technical data

	KAS
Voltage	230 VAC/115 VAC
Frequency	50/60 Hz
Current consumption	3 A /6 A
Power consumption	450 W
Weight	approx. 7,5 kg
Dimensions in cm (W x D x H)	approx. 23 x 33 x 80



KAS

Suitable behrotest® recirculating cooler can be found on Page 60

# Flocculation Test Units

## To Optimise the Flocculation Conditions

### Flocculation test unit

To optimise the flocculation conditions when cleaning waste water and determining the impact of flocculation aids.

- Wide range of speeds
- P.I.D. speed control
- Keypad with two digital displays for: test times (1 ... 999 min), speed (15 ... 300 rpm)
- Continuously adjustable, self-locking stirrer shaft with special stirrer blades
- Good visibility due to illuminated background in combination with black base
- Supply: 220 V/50 Hz



JF/4

Model	Article description	Art.-No.
JF/4	Flocculation unit with 4 stirring positions	804800011
JF/6	Flocculation unit with 6 stirring positions	804800012

### Technical data

	JF/4	JF/6
<b>Dimensions in cm (L x W x H)</b>	approx. 65 x 25 x 56	approx. 98 x 28 x 50
<b>Stirring positions</b>	4	6

### Portable flocculation unit

Portable multiple stirrer for flocculation tests in maximum 4 samples.

- Range of speeds from 20 to 300 min<sup>-1</sup>
- Uniform speed for all stirring points provides the same conditions and constant speed on all sample locations
- Suitable for beakers with a high and low shape (Content 1 l)
- Central illumination and optional black base plate for good visibility of the samples
- Continuously adjustable, self-locking stirring shaft with special stirrer blades
- Supply: 220 V/50 Hz



JT/4

Model	Article description	Art.-No.
JT/4	Manual flocculation plant	804800013
AFP-R	Rotating base plate	804800014

### Technical data

	JT/4	AFP-R
<b>Dimensions in cm (L x W x H)</b>	approx. 23 x 26 x 33	-

# Elution Equipment

## For Soil Analysis



### behrotest® column elution unit for the elution of soil samples

#### 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 Teflon 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
- Teflon tubes between columns and collection vessels
- Flow rate 0.003 to 35 ml/min
- Range of speed 2 to 100 min<sup>-1</sup>
- 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

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
SEB 32 R	Column elution unit	80 48 86100	80 48 861005
QS-SEB	Silica sand for column elution unit	80 48 86004	
QW-SEB	Fibreglass for column elution unit	80 48 86005	
GS 950	Glass column 60 x 320 mm	80 48 86002	

### Technical data

Complete system

<b>Dimensions in cm (W x D x H)</b>	approx. 55 x 40 x 100
<b>Weight</b>	approx. 22 kg



KEB

## behrotest® compact equipment for elution of solid matters

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

Model	Article description	Art.-No.
KEB	Complete equipment, elution of solid matters for one sample w/ GS 950 glass column. Incl. two-channel hose pump and 2 tubes for different flow rates (Art.- No. 80 48 86017 and 80 48 86018)	80 48 86020
KEBE	Add-on unit w/ GS 950 glass column. With 2 pump tubes for different flow rates (Art.- No. 80 48 86017 and 80 48 86018) w/o hose pump	80 48 86016
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 (Art.- No. 80 48 86017 and 80 48 86018)	80 48 86021
KEBE 101	Add-on unit w/ GS 101 glass column. With 2 pump tubes for different flow rates (Art.- No. 80 48 86017 and 80 48 86018) w/o hose pump	80 48 86022
GS 101	Glass column, 90 x 500 x 5 mm, thread GL 100	80 48 86019
GS 950	Glass column 60 x 320 mm	80 48 86002
SRR	Tube set, 4 pump tubes made of Tygon, flow rate of 0.25 - 12 ml/min	80 48 86017
SVV	Tube set, 4 pump tubes made of Tygon, flow rate 0.66 - 33 ml/min	80 48 86018



## behrotest® TRO 30 RWG and RWP equipment

behrotest® equipment to examine PAH and phenols in prepared samples of road construction waste.

The trough method is a special variant of the eluate test. It is used for the elution of solidified samples up to a weight of approx. 2.5 kg and to examine uncombined samples up to a grain size of 33 mm.

- The trough with lid is made from borosilicate glass 3.3 and has a volume of 30 l. Eluate is withdrawn by means of a spindle stopcock
- The stable frame made of PVC provides secure standing and exact centering of the trough below the stirring unit
- The sturdy stirring unit is fixed to a stable support construction and hung centrally over the trough
- The polypropylene frame with filter insert made of fluoroplastics guarantees thorough and regular rinsing with deionised water

The conception and materials of the TRO 30 prevent the transfer of undesirable contaminants in the eluate and provide reliable and exact test results.

Model	Article description	Art.-No.
TRO 30 RWG	with glass frame	804884020
TRO 30 RWP	with PP frame	804884030



TRO 30 RWP

## behrotest® TRO 30 equipment

behrotest equipment to examine PAH and phenols in prepared samples of road construction waste

The trough method is a special variant of the eluate test. It is used for the elution of solidified samples up to a weight of approx. 2.5 kg and to examine uncombined samples up to a grain size of 33 mm.

- The trough with lid is made of borosilicate glass 3.3 and has a volume of 30 l. Eluate is withdrawn by means of a spindle stopcock
- The stable frame made of powder-coated sheet steel provides secure standing and exact centering of the trough above the magnetic stirrer
- The magnetic stirrer has a generous size for a stirred volume of 30 l. The speed is continuously adjustable
- A special glass frame with filter insert made of fluoroplastics guarantees thorough and regular rinsing of the test specimens with deionised water

The concept and material of the TRO 30 prevent the transfer of undesirable contaminants in the eluate and provide reliable and exact test results.

Model	Article description	Art.-No.
TRO 30	with glass frame	804884000
TRO 30 PP	with PP frame	804884010



TRO 30

# Digestion Systems

## For Heavy Metal Determination



SMA ARM 12

### SMA-ARB workstations

The behrotest® SMA-ARB workstations offer the complete standard equipment for the digestion of heavy metal with aqua regia in 6 or 12 samples simultaneously.

#### The components

- SMA precision heating block with spaces for 6 or 12 samples for round-bottom digestion glasses with Ø 41.8 mm, temperature range 20 to 300°C
- ET 2 external controller, temperature range 20 to 450°C, times adjustable from 10 to 999 minutes or continuous heating operation
- 6 or 12 SR 2 round-bottom digestion glasses, 250 ml, with NS 29 standard ground and vascular ring made of PVDF
- 6 or 12 SFK 50 Allihn reflux condensers
- 6 or 12 AS 1 absorption vessels
- SG/B insert /yolk type frame made of stainless steel for 6 or 12 reaction vessels
- Base frame with cooling water distribution and cooler support with space for 6 or 12 samples

Model	Article description	230 V~ Art.-No.
SMA-ARB 6	for heavy metal digestion with aqua regia in maximum 6 samples simultaneously. Basic equipment	80 48 80009
SMA-ARB 12	for heavy metal digestion with aqua regia in maximum 12 samples simultaneously. Basic equipment	80 48 80010

#### Technical data

	SMA-ARB 6	SMA-ARB 12
<b>Weight</b>	approx. 30 kg	approx. 39 kg
<b>Dimensions in cm (W x D x H)</b>	approx. 45 x 65 x 100	approx. 45 x 65 x 100

### SMA-ARM workstations

The behrotest® SMA-ARM workstations are equipped with a programmable, microprocessor controller and a hood to collect the nitrous fumes. This means the user has more convenience and functions in the day-to-day work in the laboratory.

#### Like SMA-ARB, but

- instead of the ET 2 control unit the TRS 300 external microprocessor controller, temperature range 20 to 399°C, times adjustable from 1 to 999 minutes, comparison of target and actual temperature or time during digestion, up to 10 temperature time intervals can be programmed and in addition
- PTFE collars for glassware
- SG/B insert/yolk type frame made of stainless steel for 6 or 12 reaction vessels
- TS transport stand to prepare and transport samples
- Base frame with cooling water distribution system and cooling support with spaces for 6 or 12 samples
- AH hood to collect the nitrous fumes from 6 or 12 samples, to connect suitable suction and cleaning equipment (e.g. behrosog 3)

Model	Article description	230 V~ Art.-No.
SMA-ARM 6	Heavy metal digestion with aqua regia in maximum 6 samples simultaneously. Microprocessor controller	80 48 80011
SMA-ARM 12	Heavy metal digestion with aqua regia in maximum 12 samples simultaneously. Microprocessor controller	80 48 80012

### Technical data

	<b>SMA-ARM 6</b>	<b>SMA-ARM 12</b>
<b>Weight</b>	approx. 35 kg	approx. 44 kg
<b>Dimensions in cm (W x D x H)</b>	approx. 45 x 65 x 100	approx. 45 x 65 x 100

### Compact equipment for heavy metal digestion

Complete compact system for heavy metal digestion with aqua regia. With base frame, heating unit, mountings, tubes and glassware.

Model	230 V~ Art.-No.	115 V~ Art.-No.
KSMA	80 48 00523	80 48 005235

### Technical data

	<b>KSMA</b>
<b>Voltage</b>	230 VAC/115 VAC
<b>Frequency</b>	50/60 Hz
<b>Current consumption</b>	3 A /6 A
<b>Power consumption</b>	450 W
<b>Weight</b>	approx. 6 kg
<b>Dimensions in cm (W x D x H)</b>	approx. 23 x 33 x 80



KSMA

### behrotest® PFA 130 pressure sample digestion system

Pressure sample digestion units with PFA reaction tubes for trace analysis without adsorption or desorption behaviour of the material. Distinctly increased detection limits for AAS, ICP etc. It can be operated in the drying cabinet without additional heating system.

- No conditioning work
- No carryover of substances
- No memory effect
- 1 digester for all heavy metal determinations, increasing the confidence level
- Multiple and repeat analyses can be dispensed with, therefore greater cost-effectiveness

Pressure tank made of anodised aluminium with an integrated, factory pre-stressed pressure safety system. Hose connection for controlled overpressure release.

	<b>PFA 130</b>
<b>Reaction vessel</b>	100 ml
<b>Max. permissible operating pressure</b>	50 bar
<b>Max. permissible operating temperature</b>	170°C
<b>Ø x height in cm</b>	approx. 9 x 16,5
<b>Weight</b>	approx. 2,1 kg

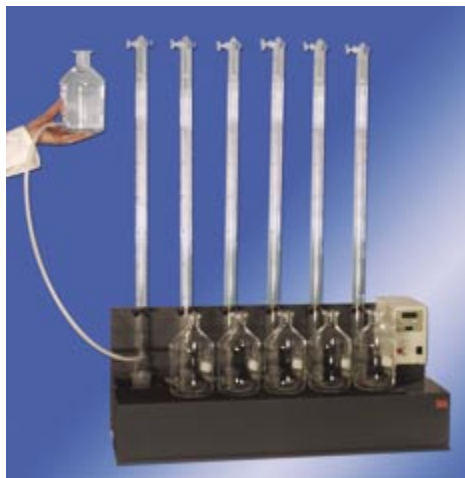
Model	Art.-No.
PFA 130	27 48 00530



PFA 130

# Determination of the Anaerobic Digestion

## In Sludge and Sediment



FH 6

### Equipment to determine anaerobic digestion

The complete equipment consists of

- Tempering bath with thermostat for 6 eudiometer units incl. clamping device for eudiometer tubes
- 6 eudiometer units with laboratory bottles, 500 ml, eudiometer tubes with graduation, stopcock and connecting tube and levelling bulb

Model	Article description	Art.-No.
FH 6	Tempering bath made of PVC incl. thermostat for 6 eudiometer units	80 48 00054
FH 10	Eudiometer unit. Eudiometer tube, laboratory and levelling bottle	80 48 00050
RM 6	Series magnetic stirrer, for use in water bath to stir 6 bottles each with 500 ml, including separate control unit	80 48 00055

### Technical data

	<b>FH 6</b>
<b>Weight</b>	approx. 16 kg
<b>Dimension in cm (W x D x H)</b>	approx. 85 x 33 x 36

# Recirculating Coolers

## UK Series

### behrotest® UK recirculating coolers

behrotest® recirculating coolers in the UK series are ideal for use with the behr digester and distillation systems.

They are however also suitable in general

- as a substitute for cooling systems, which are cooled with water for industrial use
- to discharge process heat.
- to control the temperature of equipment such as centrifuges, microscopes, spectrometers, analysers, distillation equipment, rotating evaporators, electrophoresis, reaction vessels.

All recirculating coolers can be used as open or closed systems.



UK 12/1000

Model	Article description	Art.-No.
UK 12/ 400	Refrigerating capacity 380 Watt with circulating pump and digital temperature control to control the temperature and to cool individual or several pieces of equipment.	80 48 40204
UK 12/ 600	Refrigerating capacity 580 watt with circulating pump and digital temperature control to control the temperature and to cool individual or several pieces of equipment.	80 48 40200

Model	Article description	Art.-No.
UK 12/1000	Refrigerating capacity 980 watt with circulating pump and digital temperature control to control the temperature and to cool individual or several pieces of equipment.	804840201
UK 12/2000	Refrigerating capacity 1900 watt with circulating pump and digital temperature control to control the temperature and to cool individual or several pieces of equipment.	804840203

### Technical data

	UK 12/400	UK 12/600
<b>Refrigerating capacity in watt</b>		
at +30°	380	580
at +10°	270	480
at -10°	30	180
<b>Workspace</b>	-10° to +40° C	-10° to +40° C
<b>Recirculating pump</b>		
<b>Output</b>	4 l/min	20 l/min
<b>Delivery height</b>	1,5 mWs	6 mWs
<b>Electrical connection</b>		
<b>Volt</b>	230	230
<b>Hz</b>	50	50
<b>Amp</b>	1.5	2.8
<b>Ext. measurements in cm (W x L x H)</b>	approx. 26 x 37 x 40	approx. 27 x 32 x 50
<b>Weight</b>	approx. 36 kg	approx. 36 kg

### Technical data

	UK 12/1000	UK 12/2000
<b>Refrigerating capacity in watt</b>		
at +30°	980	1900
at +10°	780	1500
at -10°	320	600
<b>Workspace</b>	-10° bis +40° C	-10° bis +40° C
<b>Recirculating pump</b>		
<b>Output</b>	13 l/min	13 l/min
<b>Delivery height</b>	27 mWs	30 mWs
<b>Electrical connection</b>		
<b>Volt</b>	230	230
<b>Hz</b>	50	50
<b>Amp</b>	4.0	7.5
<b>Ext. measurements in cm (W x L x H)</b>	approx. 30 x 36 x 60	approx. 40 x 43 x 75
<b>Weight</b>	approx. 36 kg	approx. 78 kg

# Control Units

## For behrotest® Heating Blocks



ET 2

### ET 2 temperature and time control unit

#### Control unit for behrotest® digester blocks

Connection of loads up to 2200 W by means of integrated coupler socket. Temperature 20... 450 °C adjustable digitally via keypad. PID controller with anti-drift system. Time setting 1 ... 999 min or continuous heating.

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
ET 2	Temperature and time control unit, microprocessor controlled	80 48 20002	80 48 200025

#### Technical data ET 2

<b>External measurements (W x H x D in cm)</b>	approx. 14.0 x 10.0 x 27.0 with folding-out foot approx. 14.0 x 13.5 x 2.0
<b>Weight</b>	approx. 17 kg
<b>Voltage</b>	220 V/50 Hz, max. 2200 W
<b>Switching capacity</b>	max. 2200 W Ohm resistive load
<b>Connection of the heating units</b>	Power supply socket on back of unit (4-pole special plug with screw coupling)
<b>Sensors</b>	PT 100 – 3-wire circuit, connection via 3-pole diode plug with screw thread
<b>Control mode</b>	PID with anti-drift system
<b>Temperature control range</b>	20 – 450 °C, digitally adjustable in steps of 1 °C
<b>Control accuracy</b>	± 1 K
<b>Time setting range</b>	1 – 999 min, digitally adjustable in steps of 1 min indefinite (continuous heating)



TRS 300

### TRS 300 programmable temperature and time control unit

#### Programmable control unit for behrotest® digester blocks

behrotest 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 DIN/DEV and/or ISO, 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.

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
TRS 300	Temperature and control unit, microprocessor controlled unit, up to 10 temperature/time combinations can be programmed	80 48 20300	80 48 203005

### Technical data TRS 300

<b>Dimensions (W x H x D in cm) Height with erected frame</b>	approx. 15.0 x 17.5 x 32.0 Support and mounting frame engages in 30° steps
<b>Voltage</b>	220 V/50 Hz
<b>Switching capacity</b>	max. 2200 W Ohm resistive load
<b>Connection of the heating units</b>	Power supply socket on back of unit (4-pole special plug with screw coupling)
<b>Sensors</b>	PT 100 – 3-wire circuit, connection via 3-pole diode switch
<b>Temperature control range</b>	0 – 450 °C, digitally adjustable
<b>Time setting range</b>	1 – 999 min, digitally adjustable
<b>Programs</b>	11 (incl. integrated COD program)
<b>Display</b>	LCD

## Laboratory Devices

### Pumps

#### behrotest® hose pumps for laboratories

Compact laboratory hose pumps with continually adjustable flow rate, pump motor with two squeezing rollers and four guide rolls. Easy changing of hose without tools or other aids. AC motors 220V~, 50 Hz.

Model	Flow Rate l/h	230 V~ Art.-No.	115 V~ Art.-No.
PLP 33	0,4 - 2	58 48 70102	58 48 701025
PLP 66	1,0 - 4	58 48 70104	58 48 701045
PLP 330	4,0 - 24	58 48 70120	58 48 701205
PLP 1000	15 - 60	58 48 70160	58 48 701605



PLP



KP 1 (Accessories are not included in the scope of supply.)



HB 4

## behrotest<sup>®</sup> heating units

### behrotest<sup>®</sup> heating elements with metal protective grill

Controllable heating elements for general tasks in the laboratory. A metal grill protects users from accidental contact with the hot heating element.

Model	Article description	230 V~ Art.-No.	115 V~ Art.-No.
KP 1	Heating element with metal protective grill, controllable, Ø 90 mm, 500 W, 230 V	80 48 00504	80 48 005045
KP 2	Heating element with metal protective grill, controllable, Ø 145 mm, 1100 W, 230 V	80 48 00505	80 48 005055

#### Technical data

	KP 1	KP 2
<b>Weight</b>	approx. 1,2 kg	approx. 1,3 kg

### behrotest<sup>®</sup> serial heating units

Serial heating units with individually controllable heating points. Brackets for support rods available optionally.

Model	Article description	Art.-No.
HB 4	Serial heating element, 4 individually controllable heating points, Ø 94 mm	80 48 00506
HB 6	Serial heating element, 6 individually controllable heating points, Ø 94 mm	80 48 00507
HBS 4	Brackets for HB 4 incl. 4 support rods	80 48 00508
HBS 6	Brackets for HB 6 incl. 6 support rods	80 48 00509

#### Technical data

	HB 4	HB 6
<b>Dimensions in cm (W x H x D)</b>	approx. 53 x 74 x 32	approx. 76 x 74 x 32
<b>Weight of total system</b>	approx. 15,1 kg	approx. 19,8 kg
<b>Rated voltage</b>	230 V~, 50/60 Hz	
<b>Nominal power</b>	1440 W	2160 W

## The behr IRF 10 programmable infrared furnace

The behr IRF 10 programmable infrared furnace – the optimum solution for many tasks in the laboratory, e.g.:

- Thermal oxidative or reductive digestion of different sample materials for sample quantities of 10 mg to 1 g (depending on the sample material)
- Thermoanalysis
- Selective fractionated desorption of organic compounds of substrates
- Pyrolysis
- Drying
- Selective evaporation of sample ingredients and sample materials

The flue gas can be transferred in an absorption liquid for further analysis (e.g. ion chromatography, coulometry). In addition, transfer to the online analysis (e.g. infrared spectroscopy) is possible. The behr IRF 10 heats with radiant heat.

There is an infrared heater in the focal line of a cylinder with elliptical cross-section. Its radiation is reflected on the gold-plated interior surface of the cylinder and focused in the second focal line. There is a silica combustion tube as substrate for the sample material.

The user can transfer the sample with a sample boat made of silica glass, ceramics or another inert material into the silica tube.

The temperature is measured by a Ni-CrNi thermocouple. It is located on the outside wall of the silica combustion tube in the interior of the kiln cylinder.

- Temperature range up to 1150 °C
- Extremely short heating period (e.g. from room temperature to 1000 °C in 10 sec)
- Up to 5 ramps and 5 heating rates can be programmed optionally. The program controls the individual analysis phases exactly and in a reproducible manner, in the meantime the sample boat remains in the same place
- Cooling with heat pipes – no coolant required
- Quick cooling down with the heat pipe technique and opening of the kiln
- Combustion chamber which can be viewed by the user: The user can push back the upper cylindrical shell (furnace lid) on rollers
- The use of silica combustion tubes with different dimensions allows adaptation to different applications, sample materials and sample quantities
- Two flow meters to connect 2 type of gas, e.g. oxygen and an inert gas
- RS232 serial interface
- Control via PC possible

Model	Art.-No.
IRF 10, programmable infrared furnace, with silica tube	
For silica tubes with external diameter of 18 - 20 mm	804890017
For silica tubes with external diameter of 22 - 24 mm	804890041
For silica tubes with external diameter of 26 - 28 mm	804890042

### Technical data

<b>Dimension in cm (B x H x T)</b>	approx. 36 x 44 x 42
<b>Rated voltage</b>	230 VAC/ 115 VAC
<b>Radiation output</b>	max. 1,5 kW
<b>IR furnace temperature along the focal line</b>	max. 1150 °C
<b>Tube diameter, external</b>	18 mm to 28 mm
<b>IR furnace length (heated length)</b>	200 mm
<b>Communication connection</b>	RS 232 (D-Sub, 9-pole, socket)



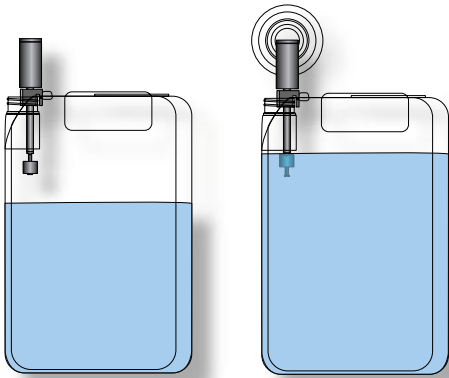
IRF 10

We can provide you with the suitable silica combustion tube for your application.

We would be pleased to give you advice!

# The monitors: behrotest® Sensors

## To Monitor the Liquid Level in the Vessels



### Sensors to monitor the maximum liquid level

Sensors to monitor the maximum liquid level help to protect against damage due to overflowing vessels.

A float closes a reed contact, and an acoustic warning signal indicates the maximum liquid level, so that the user can stop the vessel being filled as early as possible.

#### Technical data

Model	FS 001	FS 002
Material	PVC	PP
Art.-No.	58 48 99990	58 48 99991
Sensor to monitor the maximum liquid quantity		



Monitors



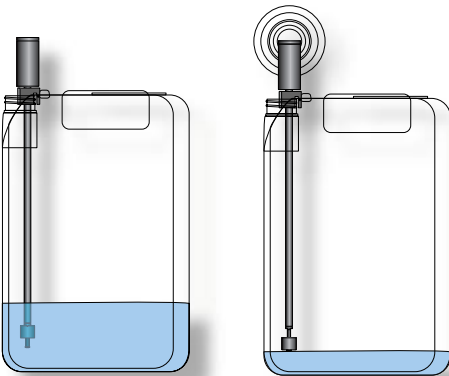
Sensor

### Sensors to monitor a minimum level

Sensors to monitor a minimum level help to protect against interruptions or deficiencies when continually withdrawing liquid from vessels.

They emit an acoustic signal if the contents in a vessel run shorts.

The sensors are available in different lengths for different vessels sizes. If the level in the vessel falls below a specific point, then the float on the sensor sinks and opens a reed contact. An acoustic warning signal notifies the user of the risk of running empty.



#### Technical data

	<b>FS 003</b>	<b>FS 007</b>	<b>FS 004</b>	<b>FS 008</b>
Material	PVC	PP	PVC	PP
Art.-No.	58 48 99992	58 48 99996	58 48 99993	58 48 99997
Sensor lengths	320 mm		400 mm	
Suitable for canisters	5 ... 10 l		20 ... 30 l	
	<b>FS 005</b>	<b>FS 009</b>	<b>FS 006</b>	<b>FS 010</b>
Material	PVC	PP	PVC	PP
Art.-No.	58 48 99994	58 48 99998	58 48 99995	58 48 99999
Sensor lengths	650 mm		1000 mm	
Suitable for canisters	60 l		120 l / 220 l (vats)	
<b>Sensor to monitor the minimum level</b>				

## Glass encapsulated behrotest<sup>®</sup> sensors with PTC thermistor

During a test with a continual consumption of reagents (amongst others titration), an untimely lack of reagents could be annoying and expensive.

The user knows of course which reagent volumes he/she will need for a specific titration if the worst comes to the worst.

It would be advantageous if he/she could always be sure that at least this quantity is in the vessel as a minimum storage quantity at the beginning of the test.

A test, which only fails because somewhere along the line the reagents are consumed, is at the very least annoying. It could even be quite expensive. And in the worst case it could be an irreparable loss.



Sensors

## behrotest<sup>®</sup> reagents monitors protect the user against a lack of reagents

Simply put the power supply adapter into the socket and insert the glass-coated measuring element on the cable into the bottle so that the lower end is at the same level as the required minimum level for the reagent. Due to the glass encapsulation, the monitors are also suitable for all aggressive reagents (e.g. acids, alkaline solutions) with a flash point > 200 °C.

A semiconductor device with positive temperature coefficients (PTC) ensures that the user gets a visual and acoustic warning if the liquid falls short of this level. An additional transistor switching output offers the possibility of controlling units with a suitable input.

Failed attempts due to a lack of reagents are definitely a thing of the past with a behrotest<sup>®</sup> reagent monitor.

### Technical data

	<b>RW 300</b>
<b>Sensor length</b>	300 mm
<b>Rated voltage</b>	230 V/ 115 V
<b>Art.-No.</b>	80 48 00390
<b>Reagent monitor for acids and alkaline solutions</b>	



RW 300

# Water Deionizers

## Mixed-bed Ion Exchangers

### Ion exchangers for depressurised operation

#### behropur® water deionizer for depressurised operation

Thick-walled, robust and practical mixed-bed ion exchangers made of blue polyethylene with free output to the storage tank. Ideal also for subsequent demineralization of reverse osmosis system or for an ambitious aquarist.

- Can be connected directly to the water supply and is immediately ready for use
- Automatic deaeration due to the water being supplied from the bottom
- Minimum risk of microbial contamination due to slit nozzles in the raw water supply
- Nozzles are sturdy and easy to clean, no risk of damage due to mechanical stress
- Extremely secure and leakproof sealing of the nozzles due to the manufacturer's own welding process
- Conductivity meter is mounted directly on top
- B5 and B10 can also be used as wall units (mounting brackets included in the scope of supply)
- Also available with shutoff when the limit value is reached and level control
- Conductance is controlled directly on the unit (installed measuring equipment) or with remote location meter

#### Specifications

	<b>B5</b>	<b>B10</b>
<b>Exchange capacity* at 10°dH</b>	500 l	1.000 l
<b>Flow max. l/h</b>	50	100
<b>Ø in cm</b>	16	21
<b>Height in cm</b>	53	63

Model	Article description	Art.-No.
B5	Water deionizer, complete with conductivity meter	93 48 20005
B10	Water deionizer, complete with conductivity meter	93 48 20010
B5Z	Spare cartridge for water deionizer	93 48 20050
B10Z	Spare cartridge for water deionizer	93 48 20110
B5A	Water deionizer, conductivity meter with limit switch and electrovalve	93 48 50005
B10A	Water deionizer, conductivity meter with limit switch and electrovalve	93 48 50010

\* Limit value 20 µS/cm





## Pressure resistant ion exchangers

### behropur® water deionizer made of nylon

Convenient and safe mixed-bed ion exchanger for small to medium-sized quantities of high purity water. To supply laboratory glassware washers, for general laboratory maintenance and for small industrial consumers. For subsequent demineralization of reverse osmosis systems.

- Optimum exploitation of the ion exchanger capacity due to absolute uniform water distribution in the unit
- Can be connected to the raw water network directly and without a pressure reducer
- Resistant to alternating pressure
- Conductance is controlled directly on the unit (installed measuring equipment) or with remote location meter
- Also available with shutoff when the limited value is reached and limit control
- Pressure resistant to 8 bar

#### Specifications

	<b>B10dN</b>	<b>B22dN</b>	<b>B45dN</b>
<b>Exchange capacity* at 10° dH</b>	1.200 l	2.400 l	5.500 l
<b>Flow max. l/h</b>	300	500	800
<b>Ø in cm</b>	21	21	26
<b>Height incl. LF in cm</b>	68	112	125
<b>Height of cartridge alone in cm</b>	55	98	110

Model	Article description	Art.-No.
B10dN	Pressure resistant mixed-bed unit made of nylon, permanent pressure resistant to 8 bar, complete with conductivity meter	93 48 30011
B10dNZ	Pressure resistant mixed-bed unit made of nylon, permanent pressure resistant to 8 bar, spare cartridge	93 48 30111
B10dNA	Pressure resistant mixed-bed unit made of nylon, permanent pressure resistant to 8 bar, conductivity meter with limit switch and electrovalve	93 48 50112
B22dN	Pressure resistant mixed-bed unit made of nylon, permanent pressure resistant to 8 bar, complete with conductivity meter	93 48 30023
B22dNZ	Pressure resistant mixed-bed unit made of nylon, permanent pressure resistant to 8 bar, spare cartridge	93 48 30123
B22dNA	Pressure resistant mixed-bed unit made of nylon, permanent pressure resistant to 8 bar, conductivity meter with limit switch and electrovalve	93 48 50123
B45dN	Pressure resistant mixed-bed unit made of nylon, permanent pressure resistant to 8 bar, complete with conductivity meter	93 48 30046
B45dNZ	Pressure resistant mixed-bed unit made of nylon, permanent pressure resistant to 8 bar, spare cartridge	93 48 30146
B45dNA	Pressure resistant mixed-bed unit made of nylon, permanent pressure resistant to 8 bar, conductivity meter with limit switch and electrovalve	93 48 50146



B22dN

\* Limit value 20 µS/cm

## Mixed-bed ion exchanger made of stainless steel – pressure resistant to 10 bar

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.

- Optimum exploitation of the ion exchanger capacity due to absolute uniform water distribution in the unit
- Flow rates up to 700 l/h
- 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
- Conductance is controlled directly on the unit (installed measuring equipment) or with remote location meter
- Also available with shutoff when the limited value is reached and limit control

### Specifications

	<b>E 28</b>	<b>E 40d</b>
<b>Exchange capacity* at 10°dH</b>	2.800 l	4.000 l
<b>Flow max. l/h</b>	500	700
<b>Ø in cm</b>	24	24
<b>Height incl. LF in cm</b>	74	84
<b>Height of cartridge alone in cm</b>	60	70



Model	Article description	Art. Nr.
E28d	Pressure resistant mixed-bed unit made of V 4A special alloy, permanent pressure resistant to 10 bar, complete with conductivity meter	93 48 40028
E40d	Pressure resistant mixed-bed unit made of V 4A special alloy, permanent pressure resistant to 10 bar, complete with conductivity meter	93 48 40040
E28dZ	Pressure resistant mixed-bed unit made of V 4A special alloy, permanent pressure resistant to 10 bar, spare cartridge	93 48 40128
E40dZ	Pressure resistant mixed-bed unit made of V 4A special alloy, permanent pressure resistant to 10 bar, spare cartridge	93 48 40140
E28dA	Pressure resistant mixed-bed unit made of V 4A special alloy, permanent pressure resistant to 10 bar, conductivity meter with limit switch and electrovalve	93 48 50128
E40dA	Pressure resistant mixed-bed unit made of nylon, permanent pressure resistant to 8 bar, conductivity meter with limit switch and electrovalve	93 48 50140

\* Limit value 20 µS/cm

## Particularly robust: Polyurethane-coated stainless steel cartridges

Mixed-bed ion exchanger made of V4A stainless steel with CFC-free polyurethane coating. Top choice when using in unfavourable environmental conditions. The cartridges are impact-resistant, better protected against dents and not exposed to surface rust.

- Optimum exploitation of the ion exchange capacity due to absolute uniform water distribution in the unit
- Flow rate up to 500 l/h
- 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
- Conductance is controlled directly on the unit (installed measuring equipment) or with remote location meter
- Also available with shutoff when the limited value is reached and limit control

### Specifications

	<b>E 10dK</b>	<b>E 28dK</b>	<b>E 60dK</b>
<b>Exchange capacity* at 10° dH</b>	1.200 l	2.800 l	6.000 l
<b>Flow max. l/h</b>	300	500	500
<b>Ø in cm</b>	24	24	37
<b>Height incl. LF in cm</b>	48	71	76
<b>Height of cartridge alone in cm</b>	32	56	61

Model	Article description	Art. Nr.
E10dK	Pressure-resistant mixed-bed unit made of plastic-coated V 4A special alloy, permanent pressure resistant to 10 bar, complete with conductivity meter	93 48 40010
E28dKZ	Pressure-resistant mixed-bed unit made of plastic-coated V 4A special alloy, permanent pressure resistant to 10 bar, complete with conductivity meter	93 48 40280
E60dK	Pressure-resistant mixed-bed unit made of plastic-coated V 4A special alloy, permanent pressure resistant to 10 bar, complete with conductivity meter	93 48 40060
E10dKZ	Pressure-resistant mixed-bed unit made of plastic-coated V 4A special alloy, permanent pressure resistant to 10 bar, spare cartridge	93 48 40110
E29dKZ	Pressure-resistant mixed-bed unit made of plastic-coated V 4A special alloy, permanent pressure resistant to 10 bar, spare cartridge	93 48 40228
E60dKZ	Pressure-resistant mixed-bed unit made of plastic-coated V 4A special alloy, permanent pressure resistant to 10 bar, spare cartridge	93 48 40160
E10dKA	Pressure-resistant mixed bed unit, permanent pressure resistant to 10 bar, conductivity meter with limit switch and electrovalve	93 48 50111
E28dKA	Pressure-resistant mixed bed unit, permanent pressure resistant to 10 bar, conductivity meter with limit switch and electrovalve	93 48 50280
E60dKA	Pressure-resistant mixed bed unit, permanent pressure resistant to 10 bar, conductivity meter with limit switch and electrovalve	93 48 50160

\* Limit value 20 µS/cm



E28dK

# Safe and User Friendly

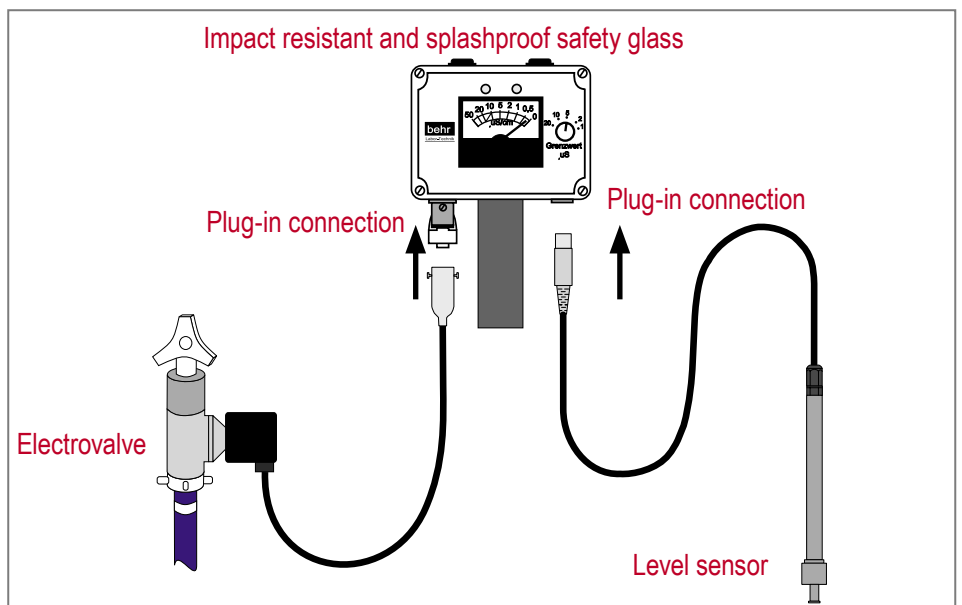
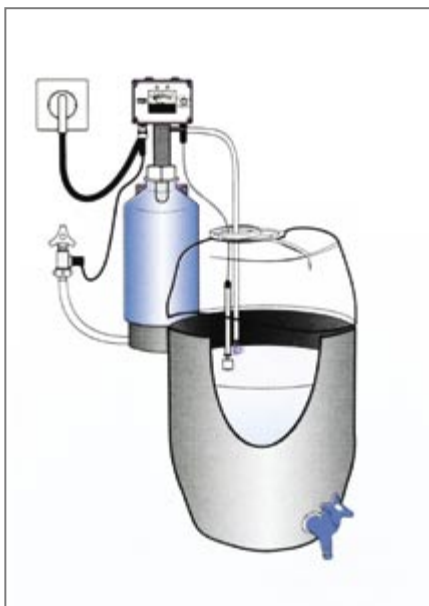
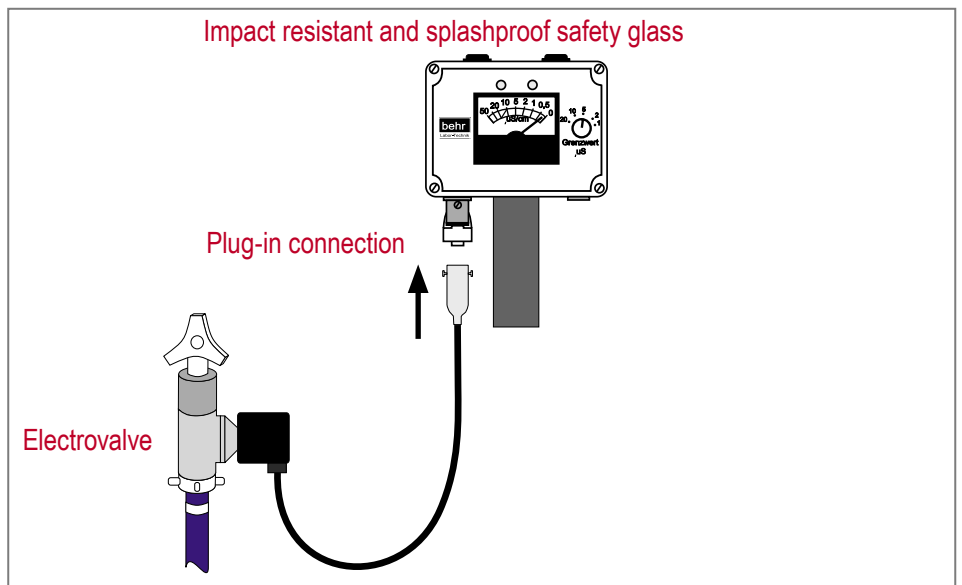
## behropur<sup>®</sup> Conductivity Meter with Automatic Shutoff

### For your safety:

- Indicating instrument and control behind impact resistant and splashproof safety glass
- External operating controls under watertight membrane
- Connections for electrovalve and level sensor secured against unintentional release
- Connections for electrovalve and level sensor protected to a large extent against humidity

### User friendly due to

- Pluggable connections for electrovalve and level sensor – instead of the commonly used locking screws
- Colour-coded analog display, which allows a direct orientation of the conductance value. The standard digital number displays require a great deal more attentiveness from the user.
- Setting of the limit value by means of simple control dials



# Optimum Water Quality

## With behropur® mixed-bed Ion Exchanger



FG 130

behropur® mixed-bed ion exchangers provide deionised water in acc. with the following specifications:

- Quality class 3 in terms of the classification for DIN ISO 3696:1987 – Water for analytical purposes
- Pharmaceutical specification in acc. with VDI guidelines (VDI – Association of German Engineers) VDI 2083 – cleanroom technology, quality, production and distribution of ultra pure water
- European and German Pharmacopoeia (DAB)
- behropur® mixed-bed ion exchangers have resins of certified quality

The optimum exploitation of the ion exchanger capacity due to absolute uniform water distribution in the unit guarantees water with a very low conductance over the full capacity of the water deionizer.

## Particle-free water

Do you need water which is free of particles?

The behropur® FG 130 filter guarantees this with the corresponding filter insert. 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 inform yourself of the state of the filter insert at any time and at a glance.

Depending on the requirements, you can use a universal filter (5 $\mu$ ) or a carbon filter (20 $\mu$ ). Downstream filters may only be used on pressure-resistant behropur® ion exchangers. Pressure-free exchangers are destroyed by the counter pressure. It could also result subsequently in expensive damage.

### Filter for behropur® mixed-bed ion exchanger

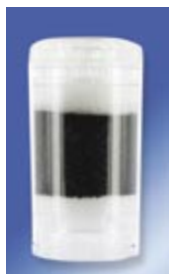
Model	Article description	Art.-No.
FG 130	behropur® filter housing for filter inserts with a length of 5". Transparent casing made of PP. Connections 3/4", maximum operating pressure 8 bar, max. temp. 50°C	93 48 60260
FE 130	behropur® filter insert, PP, 5 $\mu$ , length 5", max. pressure 6 bar, max. temp. 80 °C	93 48 60261
AF 130	behropur® filter insert, carbon, 20 $\mu$ , length 5", max. pressure 6 bar, max. temp. 50 °C	93 48 60262



FG 130 plus AF 130



FE 130



AF 130

## Optimum safety with behropur® water deionizer

You are safety-conscious. You always turn off the water supply of course if you leave your deionizing unit unsupervised for a longer period of time.

On the other hand: Depending on the application, water deionizers often have to work unsupervised. It is in the nature of things. However it also bears risks.

If you have to leave your behropur® water deionizer to work unsupervised, then you need the behropur® leak detector set with leak sensor.

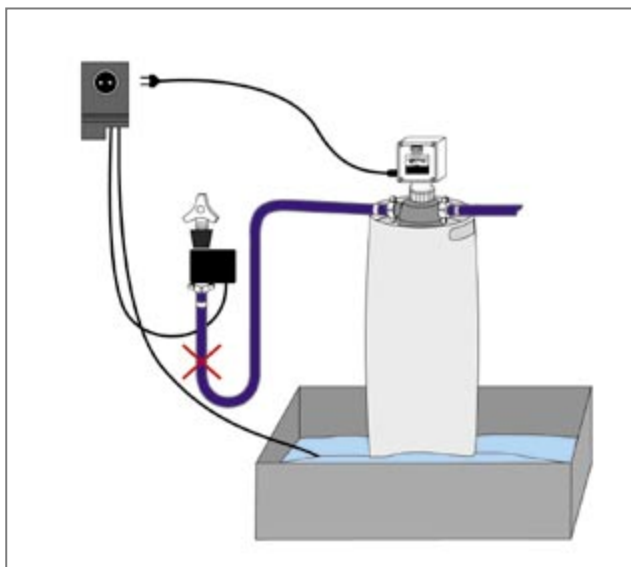
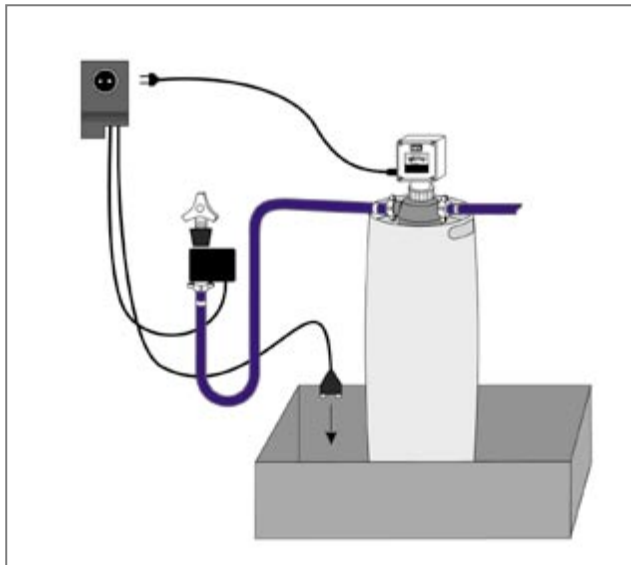
If your ion exchanger should have a leak, then the vat collects the leaking water. The sensor is activated and interrupts the water flow.

You thus avoid costly damages caused by water.

### behropur® Leak detector set

Model	Article description	230 V~ Art.-No.
LS 191	behropur® leak detector set including control unit, water sensor, electrovalve, alarm buzzer	93 4850701

### User of the leak detector set





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From the simple elementary analysis to OC/EC determination in diesel exhaust particulates

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- Convenient software to control and evaluate the results of the analysis



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