

Kjeldahl method for determining nitrogen



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The behr program for the

Kjeldahl method for determining nitrogen

The behr program for the determination of nitrogen using the Kjeldahl method provides the user individually configurable complete solutions for the laboratory.

Digestion units

Kjeldahl block digestion systems

Block digestion systems with high-quality corrosion-resistant block housing made of stainless steel. Manual or with automatic lift.

- High-efficiency heating and extraction hood with exhaust collector
- behr single-knob control for particularly easy and fast programming
- Menu navigation in national language
- 10 freely configurable programs for block temperature and digestion time
- Applications can be saved

Standard systems

- Digestion vessels with 250 ml volume (8, 12 or 20 sample slots)

Micro-Kjeldahl systems

- Digestion vessels with 100 ml volume (16, 24 or 40 sample slots)

Infrared digestion systems

The digestion units of the behrotest® InKjel series are equipped with efficient quartz glass infrared heating.

The quality and positioning of the behr infrared heaters guarantees the user identical heating phases and digestion temperatures on all sample slots. This also applies to double-rowed arrangement in insert racks for 12 samples.

Direct sample heating by the infrared heaters prevents the agonisingly long heating and cooling times of conventional heating block systems.

The behrotest® InKjel is therefore the ideal rapid digestion system for the determination of nitrogen using the Kjeldahl method and other high-temperature digestion tests.

Scrubber

The two-stage behrosog scrubber – pre-separator plus safety stage – prevents any acid fumes whatsoever from reaching the environment.

Titration stations

The behrotest® STI manual titration station or an automatic titrator ensure reliable, safe and fast titration for completion of the nitrogen determination.



Areas of application

Dairies

Cocoa/drinking chocolate

Meat/sausages

Biogas plants

Preserves/
canned foods

Malt houses

Coffee

Spirits

Delicatessen

Feedstuffs

Nuts

Wastewater

Block digestion systems

behr Kjeldahl block digestion systems



K 12

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

Block digestion systems with high-quality corrosion-resistant block housing made of stainless steel. With 8, 12 or 20 sample slots for standard Kjeldahl digestion vessels with a volume of 250 ml. High-efficiency heating and extraction hood with exhaust collector.

- behr single-knob control for particularly easy and fast programming.
- Menu navigation in national language.
- 10 freely configurable programs for block temperature and digestion time.
- Applications can be saved.
- USB interface.
- The Windows software supplied enables the user to bidirectionally transfer application-specific time/temperature profiles between one or several units and a PC via the interface.
- The removable inspection door on the insertion rack enables the progress of the digestion to be observed.

Complete systems with digestion vessels, rack and extraction hood.

Standard Kjeldahl block digestion system

| Type | Product description | Art. No. |
|------|---|-------------|
| K 8 | with 8 sample slots, for digestion vessels with a volume of 250 ml | 80 48 49100 |
| K 12 | with 12 sample slots, for digestion vessels with a volume of 250 ml | 80 48 49101 |
| K 20 | with 20 sample slots, for digestion vessels with a volume of 250 ml | 80 48 49102 |



K 20

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

Block digestion systems with high-quality corrosion-resistant block housing made of stainless steel. With 16, 24 or 40 sample slots for micro Kjeldahl digestion vessels with a volume of 100 ml. High-efficiency heating and extraction hood with exhaust collector.

- behr single-knob control for particularly easy and fast programming.
- Menu navigation in national language.
- 10 freely configurable programs for block temperature and digestion time.
- Applications can be saved.
- USB interface.
- The Windows software supplied enables the user to bidirectionally transfer application-specific time/temperature profiles between one or several units and a PC via the interface.
- The removable inspection door on the insertion rack enables the progress of the digestion to be observed.

Complete systems with digestion vessels, rack and extraction hood.

Micro Kjeldahl block digestion system

| Type | Product description | Art. No. |
|------|---|-------------|
| K 16 | with 16 sample slots, for digestion vessels with a volume of 100 ml | 80 48 49150 |
| K 24 | with 24 sample slots, for digestion vessels with a volume of 100 ml | 80 48 49151 |
| K 40 | with 40 sample slots, for digestion vessels with a volume of 100 ml | 80 48 49152 |

Macro-Kjeldahl block digestion systems, behr K 8 B

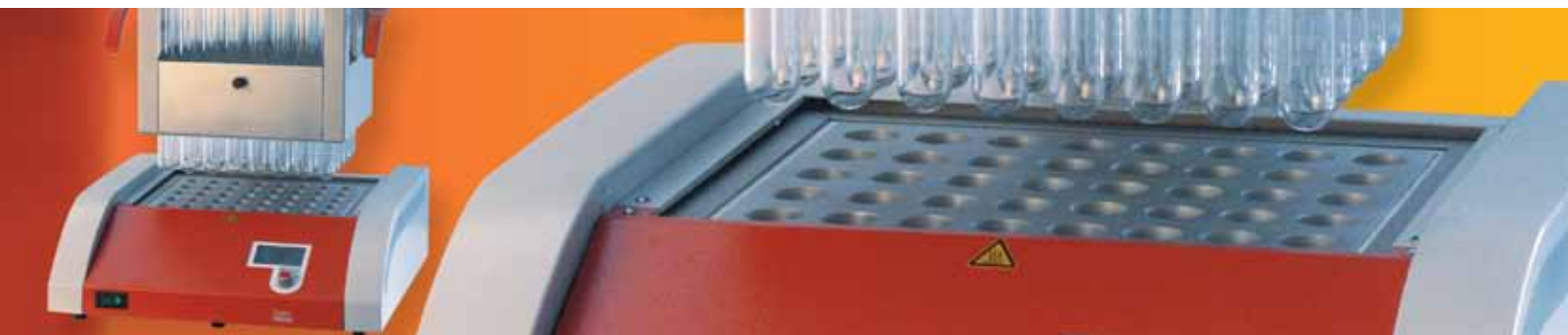
Block digestion systems with high-quality corrosion-resistant block housing made of stainless steel. With 8 sample slots, for macro Kjeldahl digestion vessels with a volume of 500 ml. High-efficiency heating and extraction hood with exhaust collector.

- behr single-knob control for particularly easy and fast programming.
- Menu navigation in national language.
- 10 freely configurable programs for block temperature and digestion time.
- Applications can be saved.
- USB interface.
- The Windows software enables the user to bidirectionally transfer application-specific time/temperature profiles between one or several units and a PC.
- The removable inspection door on the insertion rack enables the progress of the digestion to be observed.

Complete systems with digestion vessels, rack and extraction hood.

Macro Kjeldahl block digestion system

| Type | Product description | Art. No. |
|-------|--|-------------|
| K 8 B | with 8 sample slots, for digestion vessels with a volume of 500 ml | 80 48 49110 |



Technical data of the behr Kjeldahl block digestion systems

| | K 8 | K 12 | K 16/K 24 | K 20/K 40 |
|-------------------------------------|------------------------|---------------|------------------------|---------------|
| Voltage | 230 VAC | | | |
| Frequency | 50/60 Hz | | | |
| Power consumption | 1000 W | 1500 W | 1500 W | 2200 W |
| Current consumption | 5 A | 8 A | 8 A | 10 A |
| Weight (incl. vessels) | approx. 28 kg | approx. 30 kg | approx. 30 kg | approx. 34 kg |
| Dimensions in cm (W x D x H) | approx. 42 x 51 x 76.5 | | approx. 48 x 51 x 76.5 | |
| Temperature range | 450° | | | |



K 40 L

behr Kjeldahl block digestion systems with fully automatic lift

behr's L series Kjeldahl block digestion systems are equipped with a fully automatic lift. This enables the user to avoid handling the heavy samples unit and the hot chemicals. The software not only controls the sample lift but also the behrosog 3 and therefore enables largely automatic digestion.

At the end of the digestion the lift moves the complete unit upwards, including the rack and extraction hood. Following a freely programmable cooling/extraction time, it raises the extraction hood and moves it into the end position.

- Temperature profiles and the starting time of the digestion are freely programmable.
- behr single-knob control for particularly easy and fast programming.
- USB interface.
- The Windows software supplied enables the user to bidirectionally transfer application-specific time/temperature profiles via the interface between one or several units (K 12 L, K 20 L, K 24 L and K 40 L) and a PC.
- The removable inspection door on the insertion rack enables the progress of the digestion to be observed.

Available with 230 V~/50-60 Hz.

behr Kjeldahl block digestion systems with fully automatic lift

| Type | Product description | Art. No. |
|--------|--|-------------|
| K 12 L | Automatic Kjeldahl block digestion system with lift. 12 sample slots, for digestion vessels with a volume of 250 ml | 80 48 49160 |
| K 20 L | Automatic Kjeldahl block digestion system with lift. 20 sample slots, for digestion vessels with a volume of 250 ml | 80 48 49161 |
| K 24 L | Automatic micro Kjeldahl block digestions system with lift. 24 sample slots, for digestion vessels with a volume of 100 ml | 80 48 49162 |
| K 40 L | Automatic micro Kjeldahl block digestions system with lift. 40 sample slots, for digestion vessels with a volume of 100 ml | 80 48 49163 |

Fully automatic



Accessories for Kjeldahl block digestion systems

Digestion vessels for K blocks

| Type | Product description | Art. No. |
|-------|--|-----------|
| SR 3i | Round bottom digestion vessel, 250 ml | 804841015 |
| SR 4 | Round bottom digestion vessel, 100 ml for micro Kjeldahl | 804841016 |
| SR 5 | Round bottom digestion vessel, 500 ml for K 8 B | B00373170 |

Accessories for the behr Kjeldahl digestion

| Type | Product description | Art. No. |
|----------|--|-----------|
| KT 1 | Catalyst tablets (5.0 g K_2SO_4 ; 0.5 g $CuSO_4$), tin with 1000 tablets (CX) | 804840100 |
| KT 2 | Catalyst tablets (5.0 g K_2SO_4 ; 0.15 g $CuSO_4$; 0.15 g TiO_2), tin with 1000 tablets (CT) | 804840101 |
| KT 3 | Catalyst tablets (3.5 g K_2SO_4 ; 0.4 g $CuSO_4$), tin with 1000 tablets (CK) | 804840103 |
| KT 4 | Catalyst tablets (3.5 g K_2SO_4 ; 3.5 g Se), tin with 1000 tablets (ST) | 804840103 |
| AFS | Anti-foam tablets, tin with 100 tablets for steam distillation | 804840102 |
| SIST 100 | Boiling stones for the Kjeldahl digestion, contents 100 g | 804830700 |
| WP | Weighing paper, block of 250 sheets, 95 x 110 mm | B00441136 |



KT 1



SIST 100

Infrared rapid detection units

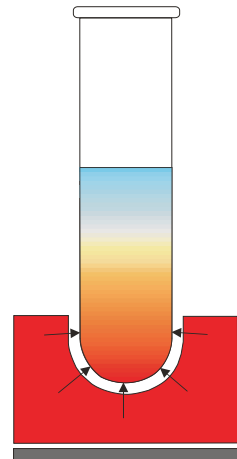
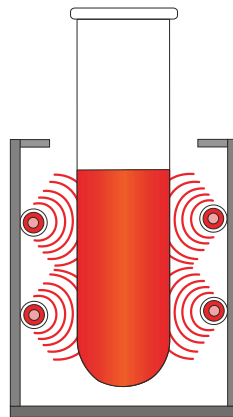
behrotest® InKjel



Infrared digestion compared to block digestion

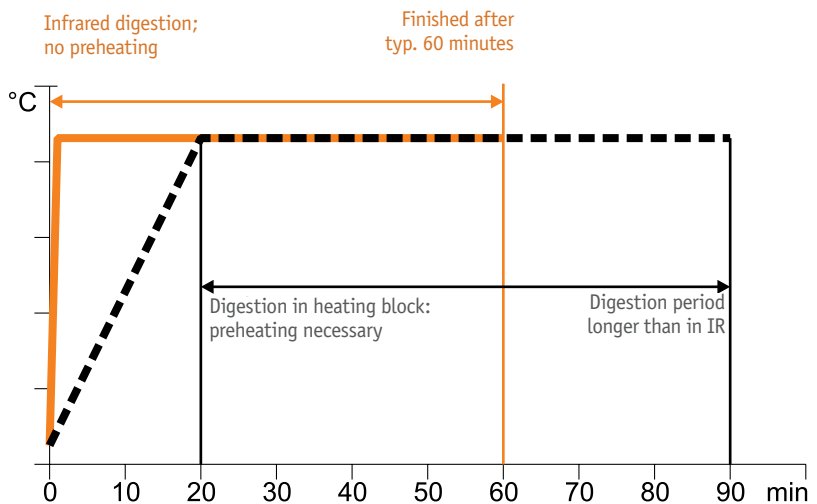
Particularly uniform heating of the samples using side heaters, therefore no zones with different temperatures. Hardly any boiling delays.

Samples are heated from underneath, therefore higher requirements for users to prevent boiling delays.



Quartz heaters:

- uniform effect along the entire length
- insulated from the housing, no energy loss through heat transfer
- full heat output within 1 minute, no preheating required



Digestion units

The digestion units of the behrotest® InKjel series are equipped with efficient infrared heating. The quality and positioning of the behr infrared heaters guarantees the user identical heating phases and digestion temperatures on all sample slots. This also applies to double-rowed arrangement in insert racks for 12 samples. The digestion tubes hang in the rack and do not touch the bottom of the digester. As a result, the digestion vessels are at less risk of breakage than in an aluminium heating block.

- Direct sample heating by the infrared heaters prevents the agonisingly long heating times of conventional heating block systems.
- High-quality quartz heaters instead of the usual steel tubular heating elements ensure particularly uniform heating of all sample slots
- behr single-knob control for particularly easy and fast programming
- Menu navigation in national language

The behrotest® InKjel is therefore the ideal digestion system for the determination of nitrogen using the Kjeldahl method and other high-temperature digestion tests. With the Kjeldahl digestion method, the temperature is set by the boiling temperature of the sulphuric acid.

InKjel 625 M rapid digestion system with manual energy control for 6 sample slots, 250 ml

Rapid digestion system with manual energy control and direct heating of the samples using high-quality quartz infrared heaters (1500 W).

- 6 glass digestion tubes of 250 ml
- Quartz infrared heaters reach 830°C in 1 min.
- Uniform heating of all sample slots
- Energy savings compared to aluminium block

Complete system with tiered rack, fume removal unit, insert rack and glass digestion tubes.

| Type | Product description | Art. No. |
|--------------|---|-------------|
| InKjel 625 M | Manually controllable infrared digestion system for 6 glass tubes of 250 ml | 80 48 49998 |



InKjel 625 M

InKjel 625 P rapid digestion system with 10 freely configurable programs for energy and digestion time for 6 sample slots, 250 ml

Rapid digestion system with 10 freely configurable programs for energy and digestion time and direct heating of the samples using high-quality quartz infrared heaters (1500 W).

- 6 glass digestion tubes of 250 ml
- Quartz infrared heaters reach 830°C in 1 min.
- Uniform heating of all sample slots
- Windows software enables the user to bidirectionally transfer application-specific time/temperature profiles between one or several units and a PC via the USB interface.
- Energy savings compared to aluminium block

Complete system with tiered rack, fume removal unit, insert rack and glass digestion tubes.

| Type | Product description | Art. No. |
|--------------|--|-------------|
| InKjel 625 P | Programmable infrared digestion system for 6 glass tubes of 250 ml | 80 48 50001 |



InKjel 625 P

InKjel 1210 M rapid digestion system with manual energy control for 12 sample slots, 100 ml

Rapid digestion system with manual energy control and direct heating of the samples using high-quality quartz infrared heaters (1500 W).

- 12 glass digestion tubes of 100 ml
- Quartz infrared heaters reach 830°C in 1 min.
- Uniform heating of all sample slots
- Energy savings compared to aluminium block

Complete system with tiered rack, fume removal unit, insert rack and glass digestion tubes.

| Type | Product description | Art. No. |
|---------------|--|-------------|
| InKjel 1210 M | Manually controllable infrared digestion system for 12 glass tubes of 100 ml | 80 48 49500 |

InKjel 1210 P rapid digestion system with 10 freely configurable programs for energy and digestion time for 12 sample slots, 100 ml

Rapid digestion system with 10 freely configurable programs for energy and digestion time and direct heating of the samples using high-quality quartz infrared heaters (1500 W).

- 12 glass digestion tubes of 100 ml
- Quartz infrared heaters reach 830°C in 1 min.
- Uniform heating of all sample slots
- Windows software enables the user to bidirectionally transfer application-specific time/temperature profiles between one or several units and a PC via the USB interface.
- Energy savings compared to aluminium block

Complete system with tiered rack, fume removal unit, insert rack and glass digestion tubes.

| Type | Product description | Art. No. |
|---------------|---|-------------|
| InKjel 1210 P | Programmable infrared digestion system for 12 glass tubes of 100 ml | 80 48 49501 |

InKjel 1225 M rapid digestion system with manual energy control for 12 sample slots, 250 ml

Rapid digestion system with manual energy control and direct heating of the samples using high-quality quartz infrared heaters (1500 W).

- 12 glass digestion tubes of 250 ml
- Quartz infrared heaters reach 830°C in 1 min.
- Uniform heating of all sample slots
- Energy savings compared to aluminium block

Complete system with tiered rack, fume removal unit, insert rack and glass digestion tubes.

| Type | Product description | Art. No. |
|---------------|--|-------------|
| InKjel 1225 M | Manually controllable infrared digestion system for 12 glass tubes of 250 ml | 80 48 49999 |

InKjel 1225 P rapid digestion system with 10 freely configurable programs for energy and digestion time for 12 sample slots, 250 ml

Rapid digestion system with 10 freely configurable programs for energy and digestion time and direct heating of the samples using high-quality quartz infrared heaters (1500 W).

- 12 glass digestion tubes of 250 ml
- Quartz infrared heaters reach 830°C in 1 min.
- Uniform heating of all sample slots
- Windows software enables the user to bidirectionally transfer application-specific time/temperature profiles between one or several units and a PC via the USB interface.
- Energy savings compared to aluminium block

Complete system with tiered rack, fume removal unit, insert rack and glass digestion tubes.

| Type | Product description | Art. No. |
|---------------|---|-------------|
| InKjel 1225 P | Programmable infrared digestion system for 12 glass tubes of 250 ml | 80 48 50002 |



InKjel 1225 P

InKjel 450 M rapid digestion system with manual energy control for 4 sample slots, 500 ml

Rapid digestion system with manual energy control and direct heating of the samples using high-quality quartz infrared heaters (1500 W).

- 4 glass digestion tubes of 500 ml
- Quartz infrared heaters reach 830°C in 1 min.
- Uniform heating of all sample slots
- Energy savings compared to aluminium block

Complete system with tiered rack, fume removal unit, insert rack and glass digestion tubes.

| Type | Product description | Art. No. |
|--------------|---|-------------|
| InKjel 450 M | Manually controllable infrared digestion system for 4 glass tubes of 500 ml | 80 48 49450 |



InKjel 450M

InKjel 450 P rapid digestion system with 10 freely configurable programs for energy and digestion time for 4 sample slots, 500 ml

Rapid digestion system with 10 freely configurable programs for energy and digestion time and direct heating of the samples using high-quality quartz infrared heaters (1500 W).

- 4 glass digestion tubes of 500 ml
- Quartz infrared heaters reach 830°C in 1 min.
- Uniform heating of all sample slots
- Windows software enables the user to bidirectionally transfer application-specific time/temperature profiles between one or several units and a PC via the USB interface.
- Energy savings compared to aluminium block

Complete system with tiered rack, fume removal unit, insert rack and glass digestion tubes.

| Type | Product description | Art. No. |
|--------------|--|-------------|
| InKjel 450 P | Programmable infrared digestion system for 4 glass tubes of 500 ml | 80 48 50003 |



InKjel 475 M

InKjel 475 M rapid digestion system with manual energy control for 4 sample slots, 750 ml

Rapid digestion system with manual energy control and direct heating of the samples using high-quality quartz infrared heaters (1500 W).

- 4 glass digestion tubes of 750 ml
- Quartz infrared heaters reach 830°C in 1 min.
- Uniform heating of all sample slots
- Energy savings compared to aluminium block

Complete system with tiered rack, fume removal unit, insert rack and glass digestion tubes.

| Type | Product description | Art. No. |
|--------------|---|-------------|
| InKjel 475 M | Manually controllable infrared digestion system for 4 glass tubes of 750 ml | 80 48 49475 |

InKjel 475 P rapid digestion system with 10 freely configurable programs for energy and digestion time for 4 sample slots, 750 ml

Rapid digestion system with 10 freely configurable programs for energy and digestion time and direct heating of the samples using high-quality quartz infrared heaters (1500 W).

- 4 glass digestion tubes of 750 ml
- Quartz infrared heaters reach 830°C in 1 min.
- Uniform heating of all sample slots
- Windows software enables the user to bidirectionally transfer application-specific time/temperature profiles between one or several units and a PC via the USB interface.
- Energy savings compared to aluminium block

Complete system with tiered rack, fume removal unit, insert rack and glass digestion tubes.

| Type | Product description | Art. No. |
|--------------|--|-------------|
| InKjel 475 P | Programmable infrared digestion system for 4 glass tubes of 750 ml | 80 48 50004 |

Digestion vessels for InKjel

| Type | Product 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 |

Accessories for behr InKjel

| Type | Product description | Art. No. |
|-----------|---|-----------|
| EG 12/100 | Insert rack for 12 digestion vessels of 100 ml in the InKjel 1210 (M and P) | 804849964 |
| EG 6 | Insert rack for 6 digestion vessels of 250 ml in the InKjel 625 (M and P) | 804849983 |
| EG 12 | Insert rack for 12 digestion vessels of 250 ml in the InKjel 1225 (M and P) | 804849984 |
| EG 4/500 | Insert rack for 4 digestion vessels of 500 ml in the InKjel 450 (M and P) | 804849982 |
| EG 4/750 | Insert rack for 4 digestion vessels of 750 ml in the InKjel 475 (M and P) | 804849978 |
| AE 4 | Fume removal equipment for InKjel 450 and InKjel 475 (M and P) | 804849985 |
| AE 6 | Fume removal equipment for InKjel 625 (M and P) | 804849986 |
| AE 12/100 | Fume removal equipment for InKjel 1210 (M and P) | 804849965 |
| AE 12 | Fume removal equipment for InKjel 1225 (M and P) | 804849987 |

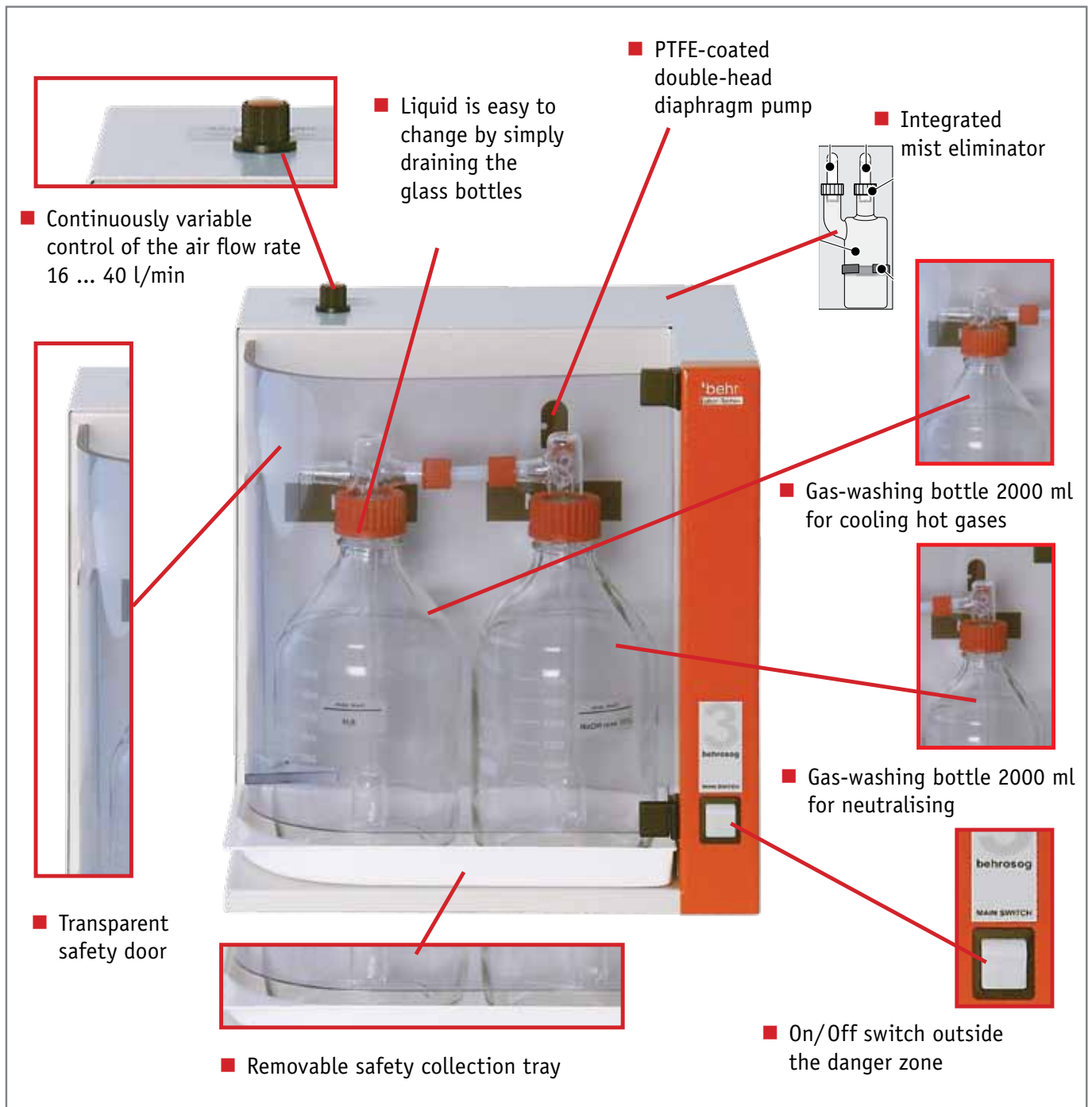


Technical data for digestion systems

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

behrosog 3 Scrubber

Scrubber



Scrubber

The two-stage behrosog process extraction system (scrubber) – pre-separator plus safety stage – prevents any acid fumes whatsoever from reaching the environment. Compact process extraction system for extracting and neutralising aggressive acid fumes, especially from the Kjeldahl digestion method for nitrogen determination. An upstream two-stage pre-separator washes out the toxic substances. The process extraction system is equipped with a vacuum pump 40 l/min. There is no need to connect to the water supply.

- Efficient running costs
- Continuously variable intake flow
- Both cleaning stages (condensation and neutralisation stage) prevent the emission of toxic substances into the environment

Optionally, the additional cooling system for the behrosog 3 ACS can be connected to the system, consisting of stand, bottles and cooler.

Scrubber

| Type | Product description | Art. No. |
|------------|---|-------------|
| behrosog 3 | Scrubber with suction pump (40 l/min), cooling stage, neutralisation stage and drip catcher | 80 48 40008 |
| ACS | Additional cooling system for behrosog 3, for samples with high water content | 80 48 40009 |

Technical data for the behrosog 3 scrubber

| | |
|-------------------------------------|------------------------------------|
| Voltage | 230 VAC |
| Frequency | 50/60 Hz |
| Power consumption | 80 W |
| Weight | approx. 18 kg |
| Dimensions in cm (W x D x H) | approx. 38 x 34 x 40 |
| Pump delivery rate | max. 40 l/min without backpressure |



behrosog 3



behrosog 3
with ACS

behr steam distillers S 1 to S 5

Customised features



Exemplary safety for the steam distillation

behr steam distillers are not only efficient and reliable partners in everyday laboratory life. An important issue during the development and design of the equipment was also the safety of users.

Therefore, all steam distillers have:

- a protection switch as master switch, which automatically trips in the event of overload and short-circuit
- a mechanical overpressure safety valve to prevent excessive pressure in the steam generator
- vessel monitoring (distillation is not possible until a vessel has been inserted)
- a door contact switch, which automatically switches off the distiller if the door is open
- a resettable excess temperature thermostat (in the event of lack of water in the steam generator)
- cooling circuit monitoring by means of pressure switches
- temperature-controlled steam heating phase and pressure control via solenoid valve

Steam distillers

behr S series steam distillers are the optimum addition to the behr Kjeldahl digestion system. Depending on the requirements, the user can choose between five automatic steam distillers. These have identical basic designs, however, their ease of use and degree of automation differ. The top of the range unit, the behr S 5, is prepared for work with an external titrator.

The Windows software supplied enables the user to bidirectionally transfer application-specific distillation parameters between one or several units and a PC via the USB interface. The CD includes a library with common applications. During operation, data can be transferred from the unit to the PC via the USB interface. If necessary, the user can save the data and print it out as a graphic diagram.

Steam distiller S 1 with automatic addition of NaOH

- Exemplary safety and reliability
- Robust and insensitive housing made of polyurethane
- Distillation time approx. 3 min per sample
- Detection limit 0.2 mg N
- Retrieval rate > 99.5%
- Reproducibility $\pm 1\%$
- Adjustable steam output (40% - 100%)
- Particularly easy, menu-driven operation using a single control (behr single-knob control)
- Programmable reaction time
- Programmable distillation time
- USB interface
- Level monitoring for the canister set
- Practical quick-release clamping device, which the user can also easily operate with their left hand

S 1

| Type | Product description | Art. No. |
|--------|--|-------------|
| S 1 | Steam distiller, semi-automated | 80 48 49001 |
| KAS 20 | Canister set for S 1 and S 2, consisting of 2 canisters à 20 l, incl. float switches | 80 48 49020 |



S 1

Steam distiller S 2 with automatic addition of NaOH and H₂O

- Exemplary safety and reliability
- Robust and insensitive housing made of polyurethane
- Distillation time approx. 3 min per sample
- Detection limit 0.2 mg N
- Retrieval rate > 99.5%
- Reproducibility $\pm 1\%$
- Adjustable steam output (40% - 100%)
- Particularly easy, menu-driven operation using a single control (behr single-knob control)
- Programmable reaction time
- Programmable distillation time
- USB interface
- Level monitoring for the canister set
- Practical quick-release clamping device, which the user can also easily operate with their left hand

S 2

| Type | Product description | Art. No. |
|--------|--|-------------|
| S 2 | Steam distiller, semi-automated | 80 48 49002 |
| KAS 20 | Canister set for S 1 and S 2, consisting of 2 canisters à 20 l, incl. float switches | 80 48 49020 |



S 2



S 3

Steam distiller S 3 with automatic addition of NaOH and H₂O with automatic extraction of the sample residues and with 10 programs

- Exemplary safety and reliability
- Robust and insensitive housing made of polyurethane
- Distillation time approx. 3 min per sample
- Detection limit 0.2 mg N
- Retrieval rate > 99.5%
- Reproducibility ± 1%
- Adjustable steam output (40% - 100%)
- Particularly easy, menu-driven operation using a single control (beh single-knob control)
- Programmable reaction time
- Programmable distillation time
- USB interface
- Level monitoring for the canister set
- Practical quick-release clamping device, which the user can also easily operate with their left hand

S 3

| Type | Product description | Art. No. |
|--------|--|-------------|
| S 3 | Steam distiller, semi-automated | 80 48 49003 |
| KAS 30 | Canister set for S 3, consisting of 3 canisters à 20 l, incl. float switches | 80 48 49030 |



S 4

Steam distiller S 4 with automatic addition of NaOH, H₂O and H₃BO₃ with automatic extraction of the sample residues and with 99 programs

- Exemplary safety and reliability
- Robust and insensitive housing made of polyurethane
- Distillation time approx. 3 min per sample
- Detection limit 0.2 mg N
- Retrieval rate > 99.5%
- Reproducibility ± 1%
- Adjustable steam output (40% - 100%)
- Particularly easy, menu-driven operation using a single control (beh single-knob control)
- Programmable reaction time
- Programmable distillation time
- USB interface
- Level monitoring for the canister set
- Practical quick-release clamping device, which the user can also easily operate with their left hand

S 4

| Type | Product description | Art. No. |
|--------|--|-------------|
| S 4 | Steam distiller, fully automatic | 80 48 49004 |
| KAS 40 | Canister set for S 4 and S 5, consisting of 4 canisters à 20 l, incl. float switches | 80 48 49040 |

Steam distiller S 5 with automatic addition of NaOH, H₂O and H₃BO₃ with automatic extraction of the sample residues, with 99 programs and a connection option for external titrator

- Exemplary safety and reliability
- Robust and insensitive housing made of polyurethane
- Distillation time approx. 3 min per sample
- Detection limit 0.1 mg N
- Retrieval rate > 99.5%
- Reproducibility ± 1%
- Adjustable steam output (40% - 100%)
- Particularly easy, menu-driven operation using a single control (behrr single-knob control)
- Programmable reaction time
- Programmable distillation time
- USB interface
- Level monitoring for the canister set
- Practical quick-release clamping device, which the user can also easily operate with their left hand



S 5

S 5

| Type | Product description | Art. No. |
|---------|--|-------------|
| S 5 | Steam distiller, fully automatic, prepared for external titrator (e.g. TB 1) | 80 48 49005 |
| KAS 40 | Canister set for S 4 and S 5, consisting of 4 canisters à 20 l, incl. float switches | 80 48 49040 |
| TB 1 | Titration module for connection to the S 5 steam distilling apparatus | 80 48 49006 |
| SRP-275 | Bixelon dot matrix printer | B00 218 038 |

Technical data for steam distillers

| | S 1 | S 2 | S 3 | S 4 | S 5 |
|-------------------------------------|---|---------------|---------------|---------------|---------------|
| Voltage | 230 VAC/115 VAC | | | | |
| Frequency | 50/60 Hz | | | | |
| Power consumption | 1700 W | | | | |
| Current consumption | 9 A/18 A | | | | |
| Cooling water consumption | approx. 5 l/min | | | | |
| Distillation time | approx. 2 - 4 min per sample | | | | |
| Storage container | Any size required. Recommendation: behrotest® KAS canister sets | | | | |
| Interface | USB | | | | |
| Display | LCD | | | | |
| Programs | 1 | 1 | 10 | 100 | 100 |
| Dimensions (W x H x D in cm) | approx. 41 x 67.5 x 41 | | | | |
| Weight | approx. 32 kg | approx. 34 kg | approx. 35 kg | approx. 35 kg | approx. 36 kg |
| Titrator connection | no | no | no | no | yes |



Features of the various units

| | S 1 | S 2 | S 3 | S 4 | S 5 |
|--|-----|-----|-----|-----|-----|
| Automatic addition of H ₂ O | - | + | + | + | + |
| Automatic addition of NaOH | + | + | + | + | + |
| Automatic addition of H ₃ BO ₃ | - | - | - | + | + |
| Manual addition of H ₂ O | - | + | + | + | + |
| Manual addition of NaOH | + | + | + | + | + |
| Manual addition of H ₃ BO ₃ | - | - | - | + | + |
| Automatic extraction of the sample residues | - | - | + | + | + |
| Number of programs | 1 | 1 | 10 | 99 | 99 |
| Titration connection option | - | - | - | - | + |
| Programmable reaction time | | | + | | |
| Programmable distillation time | | | + | | |
| Automatic steam generation | | | + | | |
| Adjustable steam output (40% – 100%) | | | + | | |
| Separate purging program | | | + | | |
| Display language selectable by user | | | + | | |
| Optical error indications | | | + | | |
| Acoustic error indications | | | + | | |
| Door safety contact switch | | | + | | |
| USB interface | | | + | | |
| Standby mode between distillations | | | + | | |
| Level monitoring for the canister set | | | + | | |
| Different glass digestion tubes can be used | | | + | | |

Adapter for the use of different digestion vessels

| Product description | Art. No. |
|---------------------|-------------|
| Microadapter 100 ml | B 0023 2266 |
| Büchi adapter | B 0023 2254 |

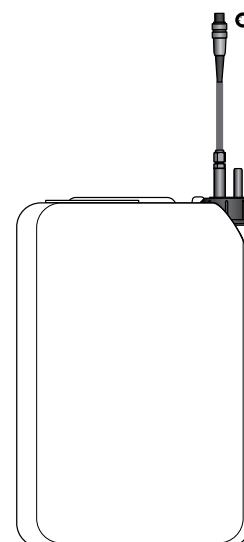
Canister sets

Behr canister sets are based on hazardous goods canisters with UN approval.

The level sensors form a unit with the screw caps. If necessary, the user can therefore also directly connect commercial chemical containers without any need for dangerous refilling or transfer actions.

Canister sets

| Type | Product description | Art. No. |
|--------|--|-------------|
| KAS 20 | Canister set for S 1 and S 2, consisting of 2 canisters à 20 l, incl. float switches | 80 48 49020 |
| KAS 30 | Canister set for S 3, consisting of 3 canisters à 20 l, incl. float switches | 80 48 49030 |
| KAS 40 | Canister set for S 4 and S 5, consisting of 4 canisters à 20 l, incl. float switches | 80 48 49040 |



Canister with level sensor for NaOH

Manual titration station STI

The STI manual titration station consists of:

- a burette with digital display and
- a magnetic stirrer with precise fitting holder for an Erlenmeyer flask

A screen serves as a neutral background and enables the user to precisely determine the colour alteration at the end of the titration. This means that the titrations are always performed under similar optical conditions. This improves the accuracy and reproducibility of the results.

The precise positioning of the vessel in the holder at the top of the magnetic stirrer also contributes towards this. The angular sides of the screen provide additional protection against lateral glare.

Manual titration station STI

| Type | Product description | Art. No. |
|------|---|-------------|
| STI | Manual titration system for the determination of nitrogen using the Kjeldahl method | 80 48 42020 |
| TS | Tashiro mixed indicator, 1 l | 80 48 49148 |

Technical data for the manual titration station STI

| | |
|-------------------------------------|----------------------|
| Voltage | 230 VAC |
| Frequency | 50/60 Hz |
| Weight | approx. 3.5 kg |
| Dimensions in cm (W x D x H) | approx. 33 x 20 x 60 |



STI



TS



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