



We understand water.

Residential Applications | Sanitary and Heating

General Catalogue

grünbeck

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Grünbeck water treatment – More than 60 years of experience

For more than 60 years Grünbeck Wasseraufbereitung has been one of the most renowned companies for water treatment in household, trade and industry in Europe. All around the globe, our customers trust in our expertise when it comes to ideal water qualities. The company's headquarters are located in the Bavarian city of Hoechstädt/Donau, approximately 100 km west of Munich, where all of Grünbeck's products are manufactured – high-class German workmanship with high standards of quality. We have a tight net of sales and service locations in Europe and thus not only ensure the proximity to our customers, but also have quick response times.

Grünbeck offers the entire spectrum of water treatment for drinking water installations and industrial applications. Our product range covers filtration, softening and corrosion protection up to disinfection and pure water generation. Furthermore, Grünbeck also is in the position to offer an ideal solution for the treatment of heating water.

General Catalogue 2016 · Edition 1.0

Valid from January 1, 2016. The information in this catalogue supersedes all previous information. For our additional product range, please refer to our separate catalogues.

All sales are subject to our German Standard Terms of Sale and Delivery.

Descriptions and illustrations in this catalogue are approximate and non-binding. Photographs may show products with special features or accessories that are not included in the standard product version. Grünbeck reserves the right to modify the products and deviate from the descriptions to the extent to which such modifications are reasonable and do not change the value of the product.

The regulations and directives indicated in this catalogue refer to either European or German standards.

We reserve the right to modifications and errors.

Field of Application	Products	Page	
Fine Filters, Backwash Filters	GENO®-fine filters FS-B	6	Fine Filters, Backwash Filters
	BOXER® filter series	7 - 10	
	KICKER® filter series	11	Safety Devices, Flushing and Sanitation, Dosing Technology
	GENO®-backwash filters MX/MXA	12 - 13	
	GENO®-fine filters FME/FM	14	
	GENO®-fine filters S-WW , accessories for GENO®-fine filters	15	
	Adapter sets and adjusting pieces	16	
	Replacement filter elements	17	
Safety Devices	GENO-STOP®	18 - 20	Alternative Anti-scaling
	System separators, system separation device	22 - 24	
Flushing and Sanitation of Pipes	Corrosion protection - sanitation	25	Softening Residential
	GENO®-flushing compressor and accessories	26	
	Flushing water relief tank and accessories	27	
	Dosing system MOBIdos , disinfectants and accessories	28	
	GENO®-flushing device , flow reversal, agents to remove scale and rust	29	
Dosing Technology	Mineral-based EXADOS®-agents	30 - 31	Softening Trade/Industry
	Dosing computer EXADOS®	32	
	Dosing systems GENODOS® DME/DM	33	
Alternative Anti-scaling	GENO-K4®	34 - 35	Disinfection Private Water Supply
Softening – Residential	softliQ , Weichwassermeister® GSX , accessories	36 - 41	
Softening – Trade/Industry	Single/twin/triple systems and accessories (Delta-p® , Weichwassermeister® GSX 10-I , WINNI-mat® , GENO-mat®)	42 - 50	
Disinfection	UV disinfection, dosing for disinfection	52 - 56	Heating Water Condensate Neutralisation
Private Water Supply	Nitrate reduction, filtration, deacidification Deferrisation, demanganisation and accessories	57 - 63	
Heating Water	GENO-therm® product series for the protection of heating systems Dosing agents Softening	64 - 74	Water Monitoring
Condensate Neutralisation	Condensate neutralisation and accessories	75 - 77	Commissioning and Maintenance, Index, Standard Terms of Sale and Delivery
Water Monitoring	Water test kits and accessories	78	
Commissioning and Maintenance Index (by order numbers) Standard Terms of Sale and Delivery		79 - 80 81 - 84 85 - 86	

Treatment of drinking water

Our water works provide us with drinking water that can be enjoyed without further treatment. However, only 2 - 5 % of the water used in a household is for drinking or cooking. Bathing and showering, flushing the toilet, washing, etc. account for a larger part of the water we need. When hard water is heated, this causes scaling. The scale deposits in the pipes lead to clogging,

energy losses and damage fittings. The corrosion in pipes caused by aggressive water can have expensive consequences. Depending on the natural composition of the water and the intended usage, water treatment to prevent scaling and protect against corrosion is a wise choice.

What do you need?	Dosing Technology EXADOS®	Alternative Anti-scaling System GENO-K4®	Water Softeners softliQ	Water Softeners GSX
Anti-scaling for water heating in boiler & hot water pipes	✓	✓	✓	✓
Anti-scaling without additives such as chemicals, phosphates or regeneration salt	✗	✓	✗	✗
Soft water <ul style="list-style-type: none"> savings in detergents effective protection against scaling in showers & at perlators reliable protection against scaling in washing machines and kitchen appliances (e.g. coffee maker, tea maker, etc.) 	✗	✗	✓	✓
24-hour continuous operation non-stop	✓	✓	✗	✓
Corrosion protection for metal pipes	✓	✗	✗	✗
Process	Dosing of minerals	Gentle electro-chemical formation of seed crystals	Ion exchange	Ion exchange



The water filter as the first stage of water treatment

The water filter always serves as the basis and first stage of a water treatment system. Further planning or later measures for corrosion protection, prevention of scale deposits, water softening, nitrate/sulphate reduction, partial or full demineralisation of process water for industrial use, deferrisation and demanganisation, etc. require the assistance of an expert for water treatment.

TIP

After the installation of a filter, Grünbeck also offers a complete filter service:

- Expert consulting with on-site visits and assessments
- 5 year warranty for filters (2 years for FME/FM and MX/MXA)
- Water analyses
- Corresponding filter elements available for 20 years
- More than 60 years of Grünbeck know-how

Therefore, always consider the experience and comprehensive service of an expert water treatment company when selecting a filter!

Reasons for installing a filter

DIN EN 806-2, B.4: "... At the beginning of the residential pipe system, filters as per EN 13443-1 should be used... The entry of small solid particles such as rust particles or sand grains into the drinking water installation must be prevented. These particles may interfere with the proper functioning of, for example, drinking water heaters, shower heads, etc. or may induce corrosion damage in the pipes due to pitting. ..."

DIN 1988-200, 12.1: "... Aspects regarding the treatment of drinking water are included in DIN EN 806-2, appendix B (informative). If they are also stipulated in the present section, they – in combination with additional requirements in the present standard – shall obtain the status of normative regulations."

Proper time for installing a filter

DIN EN 806-4, 6.1.1: "... The hot or cold water installation may only be filled with drinking water which does not contain any particles $\geq 150 \mu\text{m}$ (e.g. removal by means of mechanical filters as per EN 13443-1). ..."

Distinctive features

Filters which cannot be backwashed = replacement filters (fine filters, cartridge filters)

The filter element has to be replaced as needed (impurities and/or increased differential pressure). For hygienic reasons, the filter element (replacement element) must be replaced at least every six months (DIN EN 806-5, A).

Advantage: After the filter element has been replaced, the capacity is restored to a hundred per cent – "as new"! No special tools are required for the replacement of the filter element. Due to the follow-up business, the established contact with the end user can be maintained.

Filters which can be backwashed = backwash filters

During the backwash process, the filter elements are flushed with filtered drinking water. The particles collected in the filter are washed out of the system with the flushing water via an outlet. For hygienic reasons, a backwash must take place every 6 months at the latest (DIN EN 806-5, A).

Advantage: No need for a new filter element if the flushing removes the dirt at a hundred per cent. Disadvantage: For hygienic reasons in particular, persistent deposits may require a removal of the filter element and its additional cleaning and disinfection. The advantage of Grünbeck's **BOXER**® filters **R** and **A** is that the removal of the filter element is simple and may be performed without any major effort.



GENO®-fine filter FS-B 1"¹



GENO®-fine filter FS-B 2"¹

GENO®-fine filter FS-B

For the protection of residential water installations according to DIN EN 806-2

Fine filter made of high-strength industrial plastic, with integrated threaded brass connections for horizontal installation, flow-optimised, integrated 12-digit date indicator reminds of in-time replacement of the filter element (DIN EN 806-5), with transparent filter cylinder – resistant to household cleaners, including water meter screw connections and filter element; filter cylinder can be screwed on and off manually.

Specifications

- Nominal pressure PN 16
- Max. water temperature 30 °C
- Filter fineness according to DIN EN 13443-1: 0.08 mm (80 µm)
- May also be retrofitted with a filter fineness of 50 µm, 20 µm and 5 µm (1" + 1¼")
- May also be retrofitted with a filter fineness of 50 µm and 5 µm (1½" + 2")

GENO®-fine filter FS-B [R]	1"	1¼"	1½"	2"
Flow rate, Δp = 0.2 bar [m³/h]	3.7	4.0	11.1	13.9
Δp = 0.5 bar [m³/h]	6.0	6.2	19.9	23.3
Installation length without screw connections [mm]	100	100	160	160
with screw connections [mm]	182	191	283	277
Installation height [mm]	265	265	508	508
Height for replacement of filter element [mm]	150	150	390	390
Order quantity per pallet, 800 x 1.200 mm [pcs]	150	150	48	48
Order no. (RG-A)	101 170	101 175	101 180	101 185

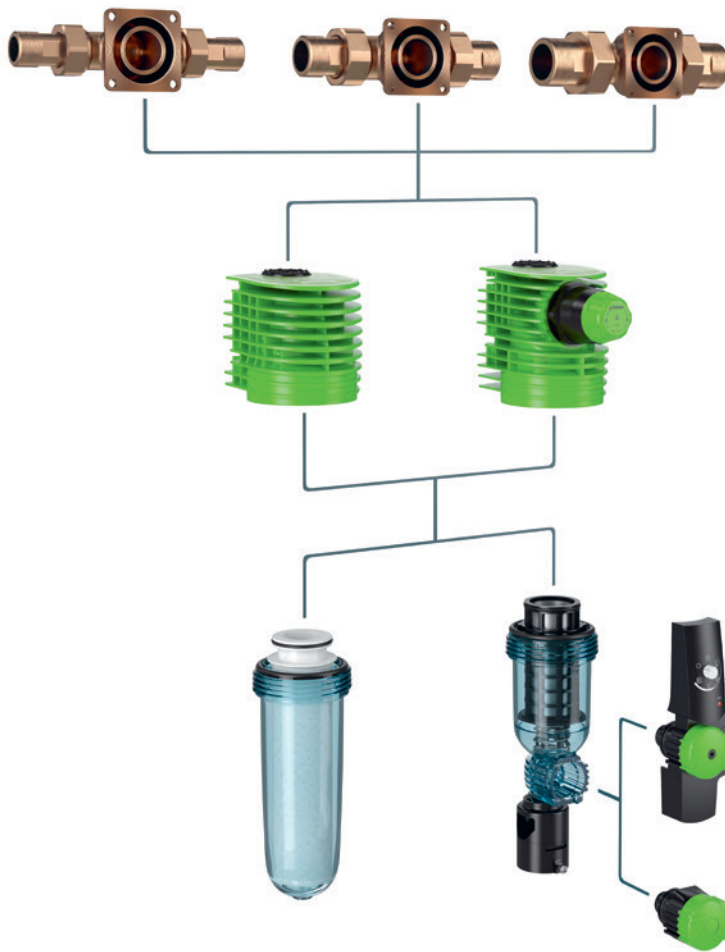
¹ For replacement filter elements, please refer to page 17.

· For GENO®-fine filters DN 50 - DN 200, please refer to page 14.

Pressure gauges

For indication of operating pressure (0 - 10 bar) with brass insert for inlet or outlet side, suitable for GENO®-fine filter FS-B.

	Order no. (RG-B)
Pressure gauge 1", to indicate operating pressure	100 860
Pressure gauge 1¼", to indicate operating pressure	100 865
Pressure gauge 1½", to indicate operating pressure	100 870
Pressure gauge 2", to indicate operating pressure	100 875



Fine Filters,
Backwash Filters

Modular design of the BOXER® filter series

With the BOXER®, Grünbeck offers a filter series for the protection of residential water installations according to DIN EN 806-2

The BOXER® features a modular design. It is very flexible and **can easily be converted** from a fine filter to a backwash filter, respectively to an automatic filter and vice versa. Even with a **minimum stock of spare parts**, an **enormous flexibility** is achieved due to the identical and interchangeable components.

The filter series benefits from a very compact design and low weight, which were achieved by the optimisation of the flow inside the filter housing. Furthermore, high-strength materials as

they are being used in the aerospace industry are incorporated in the filters, and the filter cylinder is resistant against standard household cleaners. Combined with the **attractive design**, the BOXER® can satisfy all demands. An innovative filter series in proven German quality at a fair price.

The BOXER® is available as **fine**, **backwash** or **automatic filter**, and a connection block is included in the scope of supply for all types.



Fine filter BOXER® K 1''¹



Fine filter BOXER® KD 1''¹

Fine filter BOXER® K

For the protection of residential water installations according to DIN EN 806-2.

Flow-optimised fine filter made of high-strength industrial plastic, integrated 12-digit date indicator as timely reminder of the required replacement of the filter element (DIN EN 806-5), with transparent blue filter cylinder – resistant against household cleaners, including rotatable connection flange for installation into vertical or horizontal pipes, including water meter screw connections, including filter element, filter cylinder can be screwed on and off manually.

Fine filter BOXER® KD

For the protection of residential water installations according to DIN EN 806-2.

As above, however, including pressure reducer (tested acc. to protection group 1), continuously adjustable from 1 to 6 bar, outlet pressure indication integrated in the filter head for shock-protection.

Specifications

- Nominal pressure PN 16
- Max. water temperature 30 °C
- Filter fineness acc. to DIN EN 13443-1: 0.08 mm (80 µm)
- May also be retrofitted with a filter fineness of 50 µm, 20 µm and 5 µm

Fine filter BOXER® K/KD [R]	¾"	1"	1¼"
Flow rate BOXER® K, Δp = 0.2 bar [m³/h]	2.8	3.7	4.0
Δp = 0.5 bar [m³/h]	4.5	6.0	6.3
Flow rate BOXER® KD, according to DIN EN 1567 [m³/h]	2.3	3.6	5.8
Installation length without screw connections [mm]	100	100	100
with screw connections [mm]	185	182	191
Installation height BOXER® K [mm]	260	260	260
Installation height BOXER® KD [mm]	277	277	277
Height for replacement of filter element [mm]	150	150	150
Order no. BOXER® K (RG-A)	101 205	101 210	101 215
Order no. BOXER® KD (RG-A)	101 255	101 260	101 265

¹ For replacement filter elements, please refer to page 17.



Backwash filter BOXER® R 1"



Backwash filter BOXER® RD 1"

Fine Filters,
Backwash Filters

Backwash filter BOXER® R

For the protection of residential water installations according to DIN EN 806-2.

Flow-optimised, manually operated backwash filter made of high-strength industrial plastic, integrated 12-digit date indicator as timely reminder of a required backwash (DIN EN 806-5), with transparent blue filter cylinder – resistant against household cleaners – and self-closing backwash valve which is low on water hammer, including rotatable connection flange for installation into vertical or horizontal pipes, including water meter screw connections and filter element, filter mesh made of stainless steel, outer filter cylinder can be screwed on and off manually, one-hand turning handle for easy release of backwash even in case of high water pressure, closes automatically, splash-proof drain connection according to DIN EN 1717.

Backwash filter BOXER® RD

For the protection of residential water installations according to DIN EN 806-2.

As above, however, including pressure reducer (tested acc. to protection group 1), continuously adjustable from 1 to 6 bar, outlet pressure indication integrated in the filter head for shock-protection.

Specifications

- Nominal pressure PN 16
- Max. water temperature 30 °C
- Filter fineness acc. to DIN EN 13443-1: 0.1 mm (100 µm)
- Operating pressure 2 - 16 bar

Backwash filter BOXER® R/RD [R]	¾"	1"	1¼"
Flow rate BOXER® R, Δp = 0.2 bar [m³/h]	2.9	3.8	4.2
Δp = 0.5 bar [m³/h]	4.7	5.9	6.7
Flow rate BOXER® RD, according to DIN EN 1567 [m³/h]	2.3	3.6	5.8
Installation length without screw connections [mm]	100	100	100
with screw connections [mm]	185	182	191
Installation height incl. outlet funnel DN 40 BOXER® R [mm]	280	280	280
Installation height incl. outlet funnel DN 40 BOXER® RD [mm]	298	298	298
Order no. BOXER® R (RG-A)	101 305	101 310	101 315
Order no. BOXER® RD (RG-A)	101 355	101 360	101 365



Automatic filter BOXER® A 1"



Automatic filter BOXER® AD 1"



Automatic filter BOXER® A

For the protection of residential water installations according to DIN EN 806-2.

Flow-optimised, automatic backwash filter made of high-strength industrial plastic, integrated 12-digit date indicator as timely reminder of a required maintenance (DIN EN 806-5), with transparent blue filter cylinder – resistant against household cleaners – and self-closing backwash valve which is low on water hammer, including rotatable connection flange for installation into vertical or horizontal pipes, including water meter screw connections, including filter element, filter mesh made of stainless steel, outer filter cylinder can be screwed on and off manually, automatic backwash with monitoring of battery capacity and LED display, 6 settings possible, one-hand turning handle for additional and easy release of backwash even in case of high water pressure, closes automatically, splash-proof drain connection according to DIN EN 1717, 9 V block battery.

Automatic filter BOXER® AD

For the protection of residential water installations according to DIN EN 806-2.

As above, however, including pressure reducer (tested acc. to protection group 1), continuously adjustable from 1 to 6 bar, outlet pressure indication integrated in the filter head for shock-protection.

Specifications

- Nominal pressure PN 16
- Max. water temperature 30 °C
- Filter fineness acc. to DIN EN 13443-1: 0.1 mm (100 µm)
- Power supply 9 V block battery
- Operating pressure 2 - 16 bar

Automatic filter BOXER® A/AD [R]	¾"	1"	1¼"
Flow rate BOXER® A, Δp = 0.2 bar [m³/h]	2.9	3.8	4.2
Δp = 0.5 bar [m³/h]	4.7	5.9	6.7
Flow rate BOXER® AD, according to DIN EN 1567 [m³/h]	2.3	3.6	5.8
Installation length without screw connections [mm]	100	100	100
with screw connections [mm]	185	182	191
Installation height incl. outlet funnel DN 40 BOXER® A [mm]	280	280	280
Installation height incl. outlet funnel DN 40 BOXER® AD [mm]	298	298	298
Order no. BOXER® A (RG-A)	101 405	101 410	101 415
Order no. BOXER® AD (RG-A)	101 455	101 460	101 465



Fine Filters,
Backwash Filters



Backwash filter KICKER®

Backwash filter KICKER®

For the protection of residential water installations according to DIN EN 806-2.

Manually operated backwash filter, degree of pollution easily detectable from the outside thanks to transparent filter cylinder. Housing including water meter screw connections (made of brass) with seals. Flow-optimised filter head made of high-strength industrial plastic. An integrated 12-digit date indicator reminds you that a backwash is due (DIN EN 806-5). Filter mesh made of stainless steel, transparent blue filter cylinder, resistant against common household cleaners, incl. one-hand turning handle for easy release of backwash even in case of high water pressure. Particularly low in wear and tear due to ceramic discs as well as child-proof backwash valve which closes automatically and splash-proof drain connection DN 50 according to DIN EN 1717.

Specifications

- Nominal pressure PN 16
- Max. water temperature 30 °C
- Filter fineness acc. to DIN EN 13443-1: 0.1 mm (100 µm)
- Operating pressure 2 - 16 bar

Backwash filter KICKER® [R]	1½"	2"
Nominal connection diameter [DN]	40	50
Flow rate, Δp = 0.2 bar [m³/h]	8.0	8.9
Δp = 0.5 bar [m³/h]	12.5	13.5
Upper/lower filter fineness [µm]	120/80	120/80
Installation length without screw connections [mm]	160	160
with screw connections [mm]	283	277
Distance to wall (centre of pipe) [mm]	65	65
Max. water temperature [°C]	30	30
Order no. (RG-A)	101 080	101 085

Pressure gauges

For indication of operating pressure (0 - 10 bar) with brass insert for inlet or outlet side, suitable for backwash filter KICKER®.

	Order no. (RG-B)
Pressure gauge to indicate operating pressure 1½"	100 870
Pressure gauge to indicate operating pressure 2"	100 875



GENO®-backwash filter MX with screw connections



GENO®-backwash filter MXA with screw connections

GENO®-backwash filter MX

Manual backwash protection filter according to DIN EN 806-2 for filtration of drinking water. All parts coming into contact with the medium are made of brass or high-grade industrial plastic. Modular filter element made of high-grade industrial plastic with stainless steel filter mesh, filter fineness 100 µm, brushes for supplementary mechanical cleaning of the filter element during backwash, including backwash water connection to clamp HT pipe DN 50, two pressure gauges.

GENO®-backwash filter MXA

Fully automatic version, with additional integrated drive unit and freely programmable GENO®-RS-tronic controller, error detection and voltage-free contact. Can be programmed as required with maintenance interval for service request, including connection cable and power cable with shock-proof plug, controlled via differential pressure and timer for release of backwash. Backwash process can also be released via an external, voltage-free contact or a button at the GENO®-RS-tronic.

Specifications

- Nominal pressure PN 16
- Drain connection DN 50
- Max. water temperature 90 °C
- Power supply 230 V, 50 Hz (MXA)

GENO®-backwash filter MX/MXA [R]	1"	1¼"	1½"	2"
Flow rate, Δp = 0.2 bar [m³/h]	8.5	12.0	22.0	27.0
Δp = 0.5 bar [m³/h]	13.0	18.5	30.0	38.5
K _v value [m³/h]	18	25	46	56
Installation length without screw connections [mm]	190	190	206	206
with screw connections [mm]	276	281	342	323
Order no. MX (RG-A)	107 400	107 405	107 410	107 415
Order no. MXA (RG-A)	107 450	107 455	107 460	107 465

GENO®-backwash filter MX Extra charge for versions with brushes and modified filter fineness

Order no.	Version	Designation	Filter type 1" - 1¼"	Filter type 1½" - 2"	Filter type DN 65	Filter type DN 80 - 100
Example			(RG-A)	(RG-A)	(RG-B)	(RG-B)
107 4xx	.11	50 µm				
	.21	200 µm				
	.31	500 µm				

· Please indicate the version number when ordering.



GENO®-backwash filter MX with flange connection



GENO®-backwash filter MXA with flange connection

Fine Filters,
Backwash Filters

GENO®-backwash filter MX/MXA [DN]	65	80	100
Flow rate, $\Delta p = 0.2$ bar [m ³ /h]	30	60	60
$\Delta p = 0.5$ bar [m ³ /h]	47	96.5	98
K _v value [m ³ /h]	69	124	138
Installation length without counter-flanges [mm]	220	250	250
Order no. MX (RG-B)	107 420	107 425	107 430
Order no. MXA (RG-B)	107 470	107 475	107 480

GENO®-backwash filter MXA Extra charge for versions with/without safety device (solenoid valve to interrupt the backwash in case of power failure) and brush

Order no.	Version	Designation	Filter type 1" - 1¼"	Filter type 1 1/2" - 2"	Filter type DN 65	Filter type DN 80 - 100
Example			(RG-A)	(RG-A)	(RG-B)	(RG-B)
107 4xx	.011	100 µm filter, with safety device				
	.110	50 µm filter, without safety device				
	.111	50 µm filter, with safety device				
	.210	200 µm filter, without safety device				
	.211	200 µm filter, with safety device				
	.310	500 µm filter, without safety device				
	.311	500 µm filter, with safety device				

Please indicate the version number when ordering.



GENO®-fine filter FME



GENO®-fine filter FM

GENO®-fine filter FME/FM

Stainless steel version, for commercial and industrial applications, from DN 50 - DN 200.

Protective filter with several filter elements and stainless steel housing. User-friendly cover fastener, discharge valve, deaeration, pressure gauges for raw and pure water, with initial equipment of filter elements 80 µm (50 µm for FM 200).

FME = pure stainless steel made of 1.4404 (DN 50, 65, 80, 100)

FM = inside and outside plastic-coated (DN 150, 200)

GENO®-fine filter FME/FM-WW

Identical to FME/FM, but hot water-resistant, coated for temperatures up to 90 °C at 6 bar.

GENO®-fine filter FME/FM-KW

Identical to FME/FM-WW, but with 500 µm stainless steel filter elements for cooling water and other special applications.

Specifications

- Nominal pressure PN 10 (PN 6 for the FME/FM-WW version), flange type as per DIN 2642
- Max. water temperature 30 °C (90 °C for the FME/FM-WW and FME/FM-KW version)
- Also available with a filter fineness of 50 µm, 100 µm and 500 µm

GENO®-fine filter	FME				FM	
[DN]	50	65	80	100	150	200
Flow rate, $\Delta p = 0.2 \text{ bar}$ [m ³ /h]	30	40	50	70	150	280
Installation length [mm]	360	360	360	484	690	690
Filter elements [pcs]	2	2	3	5	14	14 x 2 ¹
Empty weight [kg]	22	23	23.5	32.5	100	124
Order no. FME/FM (RG-B)	102 190	102 290	102 390	102 490	102 400	102 500
Order no. FME/FM-WW² (RG-B)	102 185	102 285	102 385	102 485	102 401	102 501
Order no. FME/FM-KW³ (RG-B)	102 195	102 295	102 395	102 495	102 470	102 570

¹ For FM-KW 200, only order the pack of 14 filter elements once.

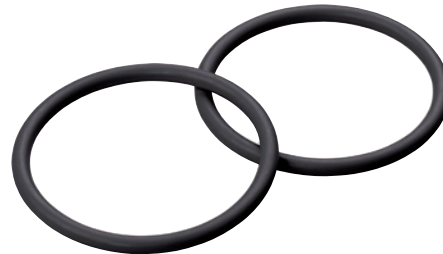
² Hot water

³ Cooling water

Accessories for cartridge and backwash filters

For connection of a visual and/or acoustic remote indicator to a building management system for required filter maintenance.

	Order no. (RG-B)
Differential pressure switch	102 870
Hose extension set for FM 150 - 200	102 850



Fine Filters,
Backwash Filters

GENO®-fine filter S-WW

Set of seals 1" + 1½"

GENO®-fine filter S-WW

Hot water fine filter for temperatures up to 90 °C, housing made of brass with ventilation screw, allows for connection of 2 pressure gauges, with stainless steel filter element 50 µm.

GENO®-fine filter S-WW [R]	1"	1½"
Flow rate, $\Delta p = 0.2$ bar [m ³ /h]	6.0	8.0
Nominal pressure PN [bar]	10	10
Installation length female thread [mm]	130	150
Height/centre female thread [mm]	262	272
Installation height [mm]	304	318
Order no. (RG-B)	101 810	101 710

For additional hot water filters up to 90 °C, please refer to pages 12 - 14.

Pressure gauge	Order no. (RG-B)
To indicate the operating pressure (0 - 10 bar), with brass insert for inlet and outlet side, suitable for fine filter S-WW	100 890

Accessories for GENO®-fine filters

Set of seals, suitable for filter type	PU	Order no. (RG-I)
Fine filter FS 1" + FSD 1"	3 sets	100 001
Fine filter FS 1¼" - 2" + FSD 1¼" - 2"	3 sets	100 002
Fine filter FS-B 1½" + 2"	1 set	101 639e
BOXER®/fine filter FS-B 1" + 1¼"	1 set	101 641e
KOMBI-filter GENO®-pur	1 set	108 601
KOMBI-backwash filter GENO®-jet / ASTRO	1 set	108 614
KOMBI-fine filter FSV	2 sets	107 660

Tools for filters	Order no. (RG-B)
Belt wrench for all filters up to R 2"	105 805
Spigot wrench for pressure reducers (wrench size 48)	104 805



Adapter set



Adjusting pieces

Adapter sets for the replacement of an older Grünbeck filter by a new Grünbeck filter	Extended by [mm]	Order no. (RG-B)
Adapter set from KOMBI to BOXER® 1" ¹	10	101 646e
Adapter set from FS 1" to BOXER® 1", FS-B 1"	37	101 647e
Adapter set from FS 1½" to FS-B, KICKER® 1½"	42	101 651e
Adapter set from FS 2" to BOXER®, FS-B, KICKER®	46	101 652e
Adapter set from FS 1¼" to BOXER® 1¼"	103	101 852
Adapter set from KOMBI to BOXER® ¾" ¹	10	101 862
Adapter set from KOMBI to BOXER® 1¼" ¹	10	101 864
Adapter set from KOMBI (V1) to BOXER® 1" ²	50	101 865
Adapter set from KOMBI (V1) to BOXER® 1¼" ²	50	101 866
Adapter set from MS DN 80 to MX/MXA DN 80	80	106 804e
Adapter set from MS DN 100 to MX/MXA DN 100	80	106 805e

¹ Kombi connection flange for filter series GENO®-pur, GENO®-PS, GB, ASTRO, GENO®-FSV

² Kombi connection flange (V1) with pressure reducer for filter series GBS, ASTRO, GB-D, GENO®-FSV-D, GENO®-PS-D

· For additional adapter sets, please inquire.

System separators	Extended by [mm]	Order no. (RG-B)
Adapter set from DK-standard ½" to DK 2	87	132 870
Adapter set from DK-standard ¾" to DK 2	87	132 875
Adapter set from DK-standard 1" to DK 2	103	132 880
Adapter set from DK-standard 1¼" to DK 2	103	132 885
Adapter set from DK-standard 1½" to DK 2	16	132 890
Adapter set from DK-standard 2" to DK 2	16	132 895

· For additional adapter sets, please inquire.

Adjusting pieces

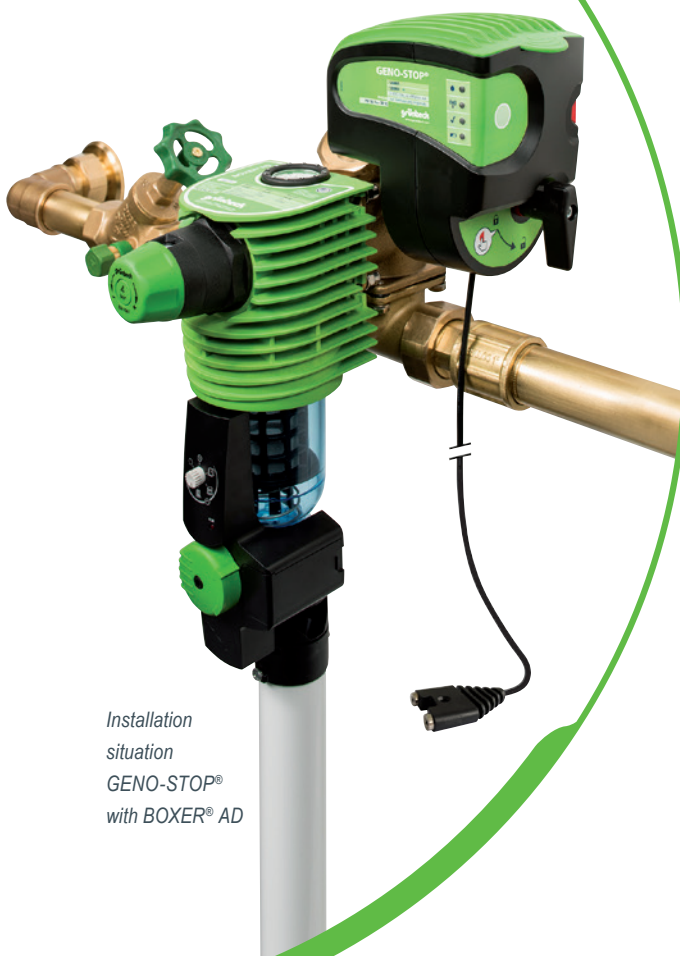
Adjusting pieces for installation downstream of the initial filter at the entry of the water supply pipe to the house, e.g. to connect a water softener, a dosing system or a flushing compressor; also used as intermediate installation to flush long pipes (screw connections and seals are included in the scope of supply).

Adjusting pieces	Order no. (RG-B)
Adjusting piece 1" (installation length without screw connection 190 mm)	128 001
Adjusting piece 1¼" (installation length without screw connection 190 mm)	128 401
Adjusting piece 1½" (installation length without screw connection 330 mm)	128 402
Adjusting piece 2" (installation length without screw connection 330 mm)	128 403

Size of filter element →	(1)	(3)	(1)	(2)	(3)	(1)	(1)	(1)	(-)	(6)	(2)	(1)	(5)	(5)	(1)	(2)	(3)	(4)	Order no. (RG-)	Packing unit [pcs]
Suitable for filter type →	FS-B 1" and FS-B 1 1/4"	FS-B 1 1/2" and 2"	FS 1"	FS 1 1/4" and 1 1/2"	FS 2"	BOXER® K / KD	GENO®-pur / GENO®-KOMBI GB	GENO®-KOMBI FSV	GBS	GN 3/4", 1", 1 1/2"	GN 1 1/4" and 2"	S 3/4" (up to year of const. 1978)	S 1" (up to year of const. 1978)	S 1" WW (up to year of const. 1990)	S 1" WW-K (up to year of const. 1990)	S 1 1/4"	S 1 1/2" and 2"; FME/FM 50 - 150	FM 200		
WITH protective cylinder and O-ring																				
80 µm			•					•											103 007	2
80 µm				•															103 008	2
80 µm					•														103 009	2
50 µm			•					•											103 001	2
50 µm				•				•											103 002	2
50 µm					•														103 003	2
20 µm			•					•											103 067	2
5 µm			•					•											103 061	2
5 µm				•															103 062	2
5 µm					•														103 063	2
WITHOUT protective cylinder																				
80 µm	•		•			•	•	•				•			•				103 075	2
80 µm				•												•			103 076	2
80 µm		•			•												•		103 077	2
50 µm	•		•			•	•	•				•			•				103 068	2
50 µm				•							•					•			103 069	2
50 µm		•			•												•		103 070	2
50 µm												•	•						103 044	2
50 µm									•										103 100	2
50 µm																	•		103 153	28
20 µm	•		•			•	•	•											103 071	2
5 µm	•		•			•	•	•				•			•				103 081	2
5 µm				•												•			103 082	2
5 µm		•			•												•		103 083	2
100 µm									•										100 651	2
100 µm																		•	103 150	14
100 µm																	•		103 110	2
500 µm																	•		103 111	2
500 µm																	•		103 151	14

Fine Filters,
Backwash Filters

Safety devices



Installation
situation
GENO-STOP®
with BOXER® AD

Optimum protection against water damage

Uncontrolled water leakages cause enormous costs in damage. Installing or retrofitting a safety fitting provides reliable protection. Thanks to water sensors, the **GENO-STOP®** safety fitting detects impending damage and shuts off the water pipe. The easy to install safety device is installed as pipe fitting and can also be combined with the **BOXER®** filter series. As it is operated by batteries, reliable monitoring is also ensured in case of a power failure.

Wireless water sensors broaden the areas to be monitored

By means of a wired sensor, the safety fitting monitors the installation site. In order to monitor an additional room, a second wired water sensor can be connected. In the Premium version, the **GENO-STOP®** can be completed to a cross-room monitoring station with up to five wireless water sensors. Thanks to the wireless connection, the water sensors can be placed at any location in the building (limit of application in a one-family home: max. two walls or one ceiling). This is how rooms that particularly need to be protected from the risk of water pipe damage, such as kitchen, bathroom, laundry room, can also be integrated in the monitoring – wireless and without any installation efforts! As an option, the safety fitting can also be operated with a power unit.



GENO-STOP® safety device

The GENO-STOP® can either be used as an independent safety device or in combination with the BOXER® filter series. If a BOXER® filter is already in place, its connection flange can be used for the installation of the GENO-STOP®. The GENO-STOP® offers maximum safety for buildings and appliances – conveniently and without the need for extensive maintenance.

Specifications

- Nominal pressure PN 16
- Optional power unit Micro-USB, 5 V, 1 A
- Batteries 4 x Mignon AA
- Conductivity of leakage water min. 20 µS/cm

GENO-STOP®	with connection flange			without connection flange
	¾"	1"	1¼"	
Nominal connection diameter [DN]	20	25	32	–
Range of application	applicable alone	applicable alone	applicable alone	in combination with BOXER® filter series
Height up to centre of connection [mm]	192	195	198	–
Centre of connection to centre of BOXER® [mm]	64	67	70	–
Installation length with screw connections [mm]	185	182	191	–
without screw connections [mm]	100	100	100	–
Min. distance to wall [mm]	60	60	60	–
Max. water temperature [°C]	30	30	30	30
Max. ambient temperature [°C]	40	40	40	40
Order no. GENO-STOP® (RG-A)	126 870	126 875	126 880	126 865
without wireless circuit board				
Order no. GENO-STOP® Premium (RG-A)	126 871	126 876	126 881	126 866
with wireless circuit board and 1 x wireless water sensor				



Installation situation GENO-STOP® safety device

Wireless water sensor for GENO-STOP®

GENO-STOP® safety device

The new GENO-STOP® safety device provides reliable and comprehensive protection against water damage. It may be installed in horizontal as well as vertical feed lines. The GENO-STOP® may be equipped with up to two wired sensors and five wireless water sensors (Premium version).

Benefits of the product

- True water stop with water sensors
- High reliability
- Easy operation
- Unique, flexible wireless water sensors

The GENO-STOP® is characterised by its simplicity and sturdiness. Its installation is absolutely unproblematic and operation by way of one single key is easy. As the power supply is provided by means of customary AA batteries, an electrical connection is not required. The service life of the batteries can be prolonged significantly, however, if the optional power unit is applied. The valve can be operated manually at any time.

Accessories	Order no.	RG-
Wireless circuit board for GENO-STOP®-control unit	126 801	A
Wireless water sensor GENO-STOP®	126 160	A
Wall power supply for GENO-STOP®	126 802	A
Water sensor with 2 m cable	126 805	A
Water sensor with 10 m cable	126 815	A
Angle-type flange for GENO-STOP® (for confined installation situations)	126 803	A
Fault indicator	126 170	B

Safety devices

Safety device		Liquid category				
		1	2	3	4	5
AA	Unobstructed free outlet	✓	✓	✓	✓	✓
AB	Free outlet with non-circular overflow (without restrictions), e.g. system separation device GENO®-G5	✓	✓	✓	✓	✓
BA	System separators with controllable intermediate pressure zone, e.g. Euro system separator GENO®-DK 2, GENO-therm® filling device	✓	✓	✓	✓	
HD	Pipe aerator for hose connections, combined with non-return valve (safety combination)	✓	✓	✓		
EA	Controllable non-return valve	✓	✓			

Safety devices prevent the drinking water from being polluted due to backflow. They must not be mixed up with safety fittings such as safety valves.

Backflow may occur for the following reasons:

- a) Return suction: due to low pressure
(decrease of pressure in the public water supply network)
- b) Back pressure: due to counter-pressure
(higher pressure than in the public water supply network)

Modified drinking water or liquids coming into contact with drinking water are classified into five categories. The higher the category, the higher the hazard and the stricter the measures that must be taken against the backflow (safety devices).

Category 1: Cold drinking water

Category 2: Modified drinking water without any health risks,
e.g. warm drinking water

Category 3: Health risks caused by toxic substances,
e.g. heating water without additives

Category 4: Health risks caused by highly toxic, radioactive or carcinogenic substances, e.g. heating water with additives

Category 5: Health risks caused by microbiology,
e.g. water originating from body care



Euro system separator GENO®-DK 2-Mini



Euro system separator GENO®-DK 2

System separators according to BA design of the DIN EN 12729. According to DIN EN 1717, they can protect facilities and systems which endanger the drinking water (up to danger class 4). They replace pipe separators EA 1 and EA 2. The units operate on the basis of the 3-chamber principle, using an admission pressure, centre pressure and back pressure zone. In case of relief, the centre pressure zone is unpressurised and opened to the atmosphere.

System separators of BA design may only be installed in combination with accessory fittings according to DIN EN 1717 in order to represent so-called safety devices. Seen in flow direction, the safety device consists of a shut-off valve, a dirt trap (**we recommend a fine filter – refer to the present catalogue, starting page 6**), the system separator itself and an additional shut-off valve.

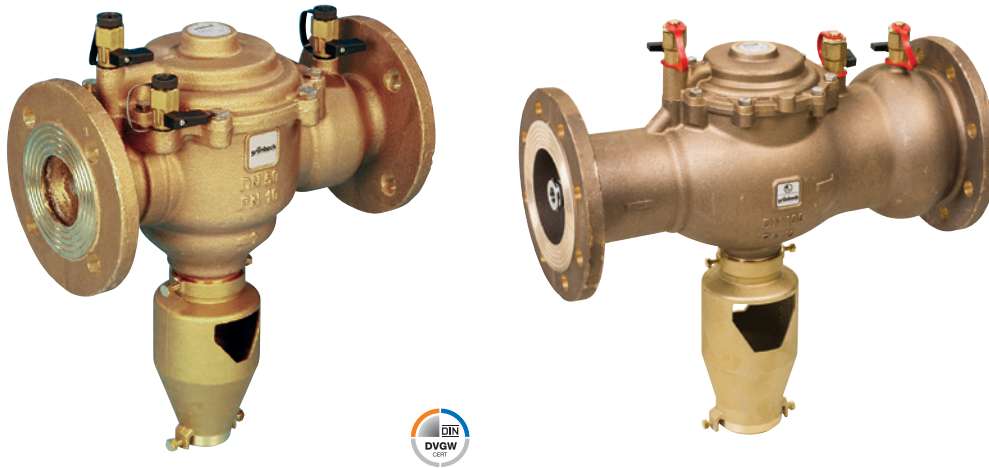
Euro system separator GENO®-DK 2

System separator made of brass up to type R 1¼" and of red bronze from type R 1½". Suitable for operating temperatures up to 65 °C at PN 10, with water inlet and outlet connecting pieces. Water meter screw connections made of brass with seals. Integrated non-return valve and dripping water connection. Includes three connection points for test pressure gauges.

Euro system separator GENO®-DK 2-Mini

System separator made of brass, suitable for operating temperatures up to 65 °C at PN 10, with water inlet and outlet connecting piece. Water meter screw connections made of brass, with seals and a prefilter, integrated non-return valve and dripping water connection. Particularly favourable dimensions and reductions from ½" female thread to ¾" male thread, three connection points for test pressure gauges for maintenance according to DIN EN 806-5.

GENO®-DK 2 [R]	½"	¾"	1"	1¼"	1½"	2"	DK 2-Mini
Nominal connection diameter [DN]	15	20	25	32	40	50	15/20
Recommended max. flow [m³/h]	1.9	3.3	5.2	7.2	13.5	21.0	1.4
K _v value Δp = 1.0 bar [m³/h]	3.5	4.5	7.6	9.4	22.2	32.5	2.0
Installation length							
without screw connections [mm]	153	153	187	187	274	274	83
with screw connections [mm]	227	227	280	280	387	395	130/150
Min. distance to wall [mm]	60	60	70	70	90	90	35
Installation height with outlet funnel [mm]	263	263	292	292	382	382	127
Operating weight, approx. [kg]	3.4	3.4	5.2	5.2	12.5	13.6	1.2
Order no. (RG-A)	132 510	132 520	132 530	132 540	132 560	132 570	133 100



Euro system separator GENO®-DK 2-Maxi

Euro system separator GENO®-DK-Maxi

Safety Devices,
Flushing and Sanitation,
Dosing Technology

Euro system separator GENO® DK 2-Maxi/DK-Maxi

System separator made of red bronze with flange connections (DIN EN 1092-1) for horizontal installation, two non-return valves and dripping water connection, as well as three test connection pieces (DVGW-certified up to and including DN 100).

Series	GENO®-DK 2-Maxi				GENO®-DK-Maxi		
	50	65	80	100	150	200	250
Nominal connection diameter [DN]	50	65	80	100	150	200	250
Housing material	Red bronze	Red bronze	Red bronze	Red bronze	Sphero-cast coated	Sphero-cast coated	Sphero-cast coated
Recommended max. flow [m³/h]	25	35	50	80	227	363	523
K _v value Δp = 1.0 bar [m³/h]	35	55	88	122	> 250	> 400	> 550
Max. water temp. [°C]	65	65	65	65	60	60	60
Min. flow pressure [bar]	1	1	1	1	1	1	1
Nominal pressure PN [bar]	10	10	10	10	10	10	10
Installation length without counter-flanges [mm]	302	305	470	470	600	780	930
Min. distance to wall [mm]	140	150	150	160	200	240	270
Installation height incl. outlet funnel [mm]	382	385	484	484	839	922	922
Empty weight, approx. [kg]	13.2	17.0	26.5	28.0	103	111	142
Operating weight, approx. [kg]	16.0	19.8	33.1	34.2	123	150	201
Order no. (RG-B)	132 460	132 465	132 470	132 475	132 720	132 725	132 730

Service set for Euro system separators

Suitable for all types and for compulsory pressure zone inspection according to DIN EN 12729 and maintenance according to DIN EN 806-5.

	Order no. (RG-B)
Service set for Euro system separators	132 095



Euro system separation device GENO®-G5

Euro system separation device GENO®-G5

The Euro system separation device **GENO®-G5** is a safety device to protect the drinking water network against liquids up to and including liquid category (danger class) 5, according to DIN EN 1717. The system is suited in particular for the dental sector to supply dental treatment units. In addition, we recommend the installation of the optional rinsing device. Furthermore, we suggest installing a **GENODOS® DM-B** dosing system downstream of the Euro system separation device for automatic disinfection.

The system separation device is a compact device, ready for connection, mounted on an aluminium profile rack with adjustable feet, completely piped and wired for connection, mainly consisting of:

Free outlet, (DIN EN 13077, family A, type B, DN 20) with supply tank including make-up water feed and overflow, pressure booster system, consisting of: pump with frequency controlled pressure regulation, dry run protection, fault alarm output, non-return valve, pressure gauge, pressure sensor, flow limiter, pressure expansion vessel, sampling valve with waste water discharge as well as set-up for optional rinsing device, water inlet and outlet with shut-off fittings, discharge valve at the supply tank, DIN-compatible waste water outlet HT-DN 50 with waterless odour and vermin barrier, for direct connection to drain on site.

Euro system separation device GENO®-G5 [R]	¾"
Nominal connection diameter [DN]	20
Nominal capacity [m³/h]	2.0
Pressure control [bar]	4 (adjustable from 2.5 - 4)
Power supply [V/Hz/kW]	230/50/1.1
Order no. (RG-B)	134 100

Accessories

Rinsing unit for **GENO®-G5** that washes the stagnant water to the drain when main switch of the dental office is turned on again after periods of standstill such as during the night, weekend or vacation. Optional connection set, consisting of 2 corrugated stainless steel pipes 800 mm including seals and connecting pieces.

	Order no. (RG-B)
Rinsing unit for GENO®-G5	134 805
Connection set for GENO®-G5	134 810

Flushing and sanitation – simple and effective

The subject of hygiene continuously gains in importance when it comes to the observance of the requirements on the drinking quality. Therefore, the system should be cleaned by means of flushing during start-up and afterwards appropriate steps to prevent scaling should be taken – depending on the water hardness. Furthermore, sanitation measures such as sanitation flushing, disinfection, scale and rust removal as well as the formation of protective layers by dosing mineral-based agents must be considered as a result of the current requirements stipulated in the effective standards as well as in the German Drinking Water Ordinance.

Solutions to your needs

Cleaning of new drinking water systems during start-up

Silted floor heating circuits

Flushing of the pipes by means of a water/air mix (refer to page 26 - 27)

Microbiologically contaminated water due to dirty pipes

Flushing of the pipes by means of a water/air mix (refer to page 26 - 27)

Chemical cleaning of components (refer to page 29)

Disinfection of drinking water pipes and installations (system disinfection) (refer to page 28)

Scale deposits in parts and components

(water heaters, heat exchangers, central heating boilers, cooling towers, ...)

Chemical cleaning of components (refer to page 29)

Rusty water flowing from galvanised pipes due to corrosion

Flushing of the pipes by means of a water/air mix (refer to page 26)

Sanitation of the pipes by dosing mineral-based agents (refer to page 30 - 33)

Preventive protection against scaling

Stabilisation by dosing mineral-based agents (refer to page 30 - 33)

Alternative anti-scaling (refer to page 34 - 35)

Softening by means of ion exchange (refer to page 36 - 49)

Supportive tools

for the planning, realisation and documentation of your tasks

- **Training**
Training courses, videos
- **Planning and realisation**
Flushing and sanitation manual
- **Realisation and documentation**
Operation logs



GENO®-flushing compressor 1988 K



Case with connection fittings 3/4" to 2"

GENO®-flushing compressor 1988 K

Compact, mobile device with oil-free compressor and electronic controller for automatic flushing, with flow indicator as well as two flexible connection hoses of 1.5 m in length with two transition pieces G 1 for the

- flushing of new drinking water systems by means of a water/air mix according to DIN EN 806-4 for pipes up to DN 50 and in case of parallel connection of several flushing compressors for pipes up to DN 80
- sanitation flushing of pipes up to DN 32 by means of a water/air mix and in case of parallel connection of several flushing compressors up to DN 50
- desludging of floor heating circuits
- disinfection of pipes according to DIN EN 806-4, with optional dosing system
- supply with oil-free, compressed air

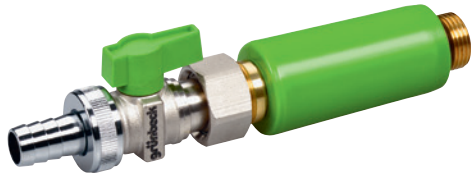
In addition, the compressor features a permanent air-blast function to increase the cleaning efficiency.

For the desludging of floor heating circuits, the heating water is conditioned with GENO®-safe A prior to the flushing in order to improve the cleaning effect (refer to page 77).

GENO®-flushing compressor	1988 K
Nominal connection diameter [G]	1
Max. flow [m ³ /h]	5
Operating mode	continuous operation S1
Power supply [V/Hz]	230/50
Order no. (RG-B)	151 200

Accessories	Order no. (RG-B)
Conversion kit for flushing compressors up to year of construction 2011 to adapt a GEKA connection to the current connection technology	151 850
Case with connection fittings 3/4", 1", 1 1/4", 1 1/2", 2" to connect the flushing compressor ¹	151 070
Case with connection fittings 1 1/2", 2", DN 65, DN 80 to connect two – in case of DN 80 up to three – flushing compressors in parallel ¹	151 080
Hose extension set ¹	151 820

¹ Also suitable for MOBIdos dosing system (please refer to page 28).



Flushing fitting with closing plug



Flushing water relief tank

Safety Devices,
Flushing and Sanitation,
Dosing Technology

Flushing water relief tank

Tank to discharge settled flushing water into a floor drain or a toilet bowl

The relief tank consists of two stackable plastic boxes (1 x relief tank and 1 x accessory box), 6 hose nipples with union nut G 3/4", 1 pipe as well as 1 HT elbow. Up to 6 flushing hoses may be fastened safely at the relief tank to discharge the flushing water. Thanks to the special construction, the water/air mix used in the flushing process may settle and then flow to the drain. The system separation integrated in the tank prevents back suction and furthermore, a lockable lid prevents the formation of aerosols. The success of the flushing process may be checked in the relief tank as well.

Flushing water relief tank		
Flow Q _{max} [m³/h]		5
Inlet connection		6 x hose nipple 13 mm (union nut G 3/4")
Outlet connection		HT pipe DN 100
Dimensions (without connections) (w x d) [mm]		400 x 300
Height of outlet connection	without lower "accessory box" [mm]	175
	with lower "accessory box" [mm]	498
Height of relief tank	without lower "accessory box" [mm]	340
	with lower "accessory box" [mm]	660
Height of inlet connection	without lower "accessory box" [mm]	258
	with lower "accessory box" [mm]	581
Order no. (RG-B)		151 020

Closing plugs and flushing fittings	Order no. (RG-B)
Case with closing plugs, 60 closing plugs 1/2", also suitable for the pressure test	151 160
Set of closing plugs with flushing fitting, box of 5 closing plugs	151 135
Set of closing plugs, box of 20 closing plugs 1/2"	151 170
Case with flushing fittings, 20 flushing fittings with accessories	151 180

• For adjusting pieces for installation or intermediate installation, please refer to page 16.

Separation device required as per "DVGW worksheet 557" to separate air from water



Dosing system MOBIidos



Disinfectants

Dosing system MOBIidos

Independent, compact system for mobile system disinfection by means of hydrogen peroxide, chlorine dioxide, chlorine.

The mobile dosing system **MOBIidos** is mounted on a plastic rack, ready for operation and secured for transport in a plastic carrier box. The system consists of a contact water meter controlled dosing pump GP 6/40 with pulse divider, dosing line and dosing valve, system separator DK 2, suction lance (gas-tight) with empty signal for 3, 10 and 20 l containers as well as a fastening device for the suction lance and the 3-litre bottle. An empty 3-litre bottle to flush the system with water, 2 flexible connection hoses of 1.5 m each with 2 transition pieces G1 and a pressure gauge for pressure monitoring are also included in the scope of supply. The carrier box may also be used as collecting basin for the disinfectant applied and for the dripping water.

Dosing system MOBIidos	
Flow Q_{max} [m ³ /h]	5
Power supply [V/Hz]	230/50
Nominal connection diameter [G]	1" (optional case with connection fittings ¾ - DN 80)
Dimensions (w x h x d) [mm]	600 x 340 x 400
Order no. (RG-B)	160 150

Disinfectants and accessories	Order no. (RG-B)
GENO®-Baktox (3 litres)	170 450
GENO®-Baktox (10 kg)	170 460
GENO®-Baktox (20 kg)	170 470
GENO®-Chlor A (25 kg)	210 012
GENO®-perox (1 litre)	170 320
GENO®-perox (10 kg)	170 325
GENO®-perox spray, 3 %, 250 ml (for spray disinfection of components)	156 861
Chlorine dioxide test 0.02 - 0.55 mg/l (300 analyses)	170 430
Digital test device Scuba II	211 235
Indicator for Scuba II, DPD1 (100 tablets)	211 213
Sodium bisuphite (5 kg)	170 306
Water test kit for chlorine 0.1 - 2 mg/l + pH value 6.9 - 8.2 (150 analyses)	170 128
Water test kit for chlorine, 10 - 160 mg/l (20 analyses)	170 138
Water test kit for peroxide, 100 - 1,000 mg/l (100 analyses)	170 167
Water test kit for peroxide test 0.5 - 25 mg/l (100 analyses)	170 136

Systems for temporary continuous disinfection of drinking and industrial water

GENO®-Chlor A	→ Dosing systems GENODOS® DM-T	(refer to page 59)
GENO®-Baktox	→ Dosing systems GENODOS® DM-B and DM-BO	(refer to page 60 - 61)
GENO®-Baktox	→ Chlorine dioxide generation systems GENO®-Baktox MRX/RX/X	

· For systems for continuous disinfection in drinking water systems by means of GENO®-UV devices, please refer to page 58.



GENO®-flushing device



Flow reversal

Safety Devices,
Flushing and Sanitation,
Dosing Technology

GENO®-flushing device

Compact flushing device for highly effective descaling of, for example, heat exchangers and warm water storage tanks (for agents, see table below). By means of a pump, the compact flushing device delivers the descaling agent into a loop between the product to be descaled and the flushing device.

Flushing device consisting of a self-priming impeller pump with stainless steel housing and a dirt filter with inspection window upstream of the pump, withdrawal point at pump outlet for sampling, pressure relief and draining, plastic tank with shut-off valve, refill orifice and large screw lid, return connection can be equipped with attached filter bags. Mounted on mobile carrier with telescopic handle and pneumatic tires. In addition, 2 connection hoses of 3 m each, 10 spare seals for connection hoses, an accessory bag and 10 filter bags for highly polluted or silted media are included in the scope of supply.

	Order no. (RG-B)
GENO®-flushing device	151 220
Flow reversal for GENO®-flushing device	151 225

Feature to regulate the flow and to reverse the flow direction of feed and return, resulting in improved flushing and more efficient removal of deposits

Agents to remove scale and rust	Material of the components to be cleaned										Order no.	RG-
	Aluminium	Stainless steel	Grey cast iron	Copper or copper alloys	Steel	Acid-resistant plastic	Acid-resistant enamel	Zinc and zinc-coated materials	Applicability with GENO®-flushing device	Max. operating temperature [°C]		
GENO®-clean M, 12 kg ¹	•	•	•	•	•	•	•	-	•	40	170 045	B
GENO®-clean M, 6 x 1 litre ¹	•	•	•	•	•	•	•	-	•	40	170 046	B
GENO®-clean CP, 10 x 1 litre	-	•	-	•	-	•	•	-	•	40	170 022	B
GENO®-clean CP, 22 kg (18.3 litres)	-	•	-	•	-	•	•	-	•	40	170 028	B
GENO®-Kalklöser (scale remover), 11 kg	•	•	-	•	•	•	•	-	-	40	170 010	I
GENO®-Kalklöser (scale remover), zinc-resistant, 11 kg	•	•	-	•	•	•	•	•	-	20	170 012	I
GENO®-Kalk- und Rostlöser (scale and rust remover), 11 kg	-	-	•	•	•	•	•	-	-	40	170 013	I
GENO®-Passivierungspulver (passivation powder), 3.5 kg	-	•	•	•	•	•	•	•	•	40	170 015	I
Neutralisation agent FNK, 20 kg									•		180 300	B
Water test kit for pH 4.5 - 10									•		170 148	B

GENO®-clean M and GENO®-clean CP are tested based on the stipulations of DVGW worksheet W 319

¹ Strong and odourless acid, readily biodegradable, good compatibility of materials.

Selection of mineral-based EXADOS®-agents

- The shelf-life of the mineral-based agents is at least 3 years (keep cool, protect against light).
- Use within 6 months after opening the container.
- We certify that the mineral substances contained in the liquid concentrates meet the requirements of the German Food Act, the Act on Handling Additives and the current version of the German Drinking Water Ordinance as well as all relevant standards (DIN EN 896, DIN EN 1198, DIN EN 1209, DIN EN 1212).
- The mineral-based agents are packed hygienically, they are sterile and sealed.
- Ready-to-use mineral-based agents adapted to pumping capacity (100 ml/m³) of the dosing computer.
- Chemical resistance group for **GENODOS®**: standard.

EXADOS®	Tasks and application purposes	Hardness range ¹
spezial	Sanitation and corrosion protection of systems made of galvanised, ferrous materials which are already corroded ("brown water") thanks to the quick formation of a protective silicate layer. Note: Switch to a different EXADOS®-product after the sanitation.	Sanitation: 1 - 3 (soft to hard) ² up to 3.75 mmol/l Corrosion protection: 1 (soft) up to 1.5 mmol/l
spezial P	Corrosion protection in systems made of galvanised, ferrous materials which are already corroded by means of alkalisation and formation of a protective silicate-phosphate layer.	1 (soft) up to 1.5 mmol/l
blau	Corrosion protection in systems made of metallic materials, for soft water with high carbon dioxide concentrations, corrosion protection due to the binding of free carbon dioxide and an increase of the pH value.	1 (soft) up to 1.5 mmol/l
rot	Corrosion protection in systems made of metallic materials due to the formation of a stable, protective phosphate layer.	1 (soft) 0.5 up to 1.5 mmol/l > 0.7 mmol/l carbonate hardness
grün ST	Corrosion protection and prevention of scaling in systems made of metallic materials by formation of a stable, protective phosphate layer; hardness stabilisation up to 80 °C; also suitable downstream of water softeners in case of a residual hardness of > 0.5 mmol/l; corrosion protection up to 60 °C.	1 - 2 (soft to medium) 0.5 up to 2.5 mmol/l 0.7 up to 3.6 mmol/l carbonate hardness
grün	Prevention of scaling and corrosion protection in systems made of metallic materials by formation of a stable, protective phosphate layer; hardness stabilisation up to 80 °C; also suitable in case of a fluctuating hardness range (water mixes); corrosion protection up to 60 °C.	2 - 3 (medium to hard) ² > 2.5 up to 3.75 mmol/l 1.8 mmol/l up to 5.4 mmol/l carbonate hardness
gelb	Prevention of scaling in systems up to 80 °C and in solar systems , in case of decentralised installation of the dosing technology in the warm water.	3 (hard) ² starting from 2.7 mmol/l
light	Prevention of scaling and corrosion protection in systems made of metallic materials by formation of a stable, protective phosphate layer; hardness stabilisation up to 80 °C; corrosion protection up to 60 °C. In addition to centralised dosing by water supplier.	1 - 3 (soft to hard) ² up to 3.75 mmol/l

¹ Depending on the intended application, mineral-based EXADOS®-agents may also be used for different hardness ranges. However, prior approval by Grünbeck's specialists is required.

² Starting from a hardness > 2.5 mmol/l, we primarily recommend installing a water softener. For a detailed product description, please refer to our product data sheets.



3 litre bottle



Disposable 20 kg canister

Safety Devices,
Flushing and Sanitation,
Dosing Technology

3 litre bottle for EXADOS® EK 6

- Packing unit: 1 box contains 2 bottles of 3 litres each
- Order quantity per pallet (800 mm x 1,200 mm): 76 boxes (1 bottle is sufficient to treat 30 m³ of water)

Mineral-based dosing solution	Order no. (RG-I)
EXADOS®-rot	114 051
EXADOS®-gelb	114 052
EXADOS®-grün	114 053
EXADOS®-grün ST	114 050
EXADOS®-spezial	114 054
EXADOS®-spezial P	114 049
EXADOS®-blau	114 055
EXADOS®-light	114 140

Disposable canisters¹ (10 or 20 kg) for dosing computer EXADOS® with suction lance

- Minimum order quantity: 6 containers of 10 or 20 kg each

Mineral-based dosing solution	Order no. (RG-I)
10 kg canister (order quantity per pallet 40 pcs)	
EXADOS®-rot	114 010
EXADOS®-gelb	114 011
EXADOS®-grün	114 012
EXADOS®-grün ST	114 017
EXADOS®-spezial	114 013
EXADOS®-spezial P	114 018
EXADOS®-blau	114 014
EXADOS®-light	114 160
20 kg canister (order quantity per pallet 24 pcs)	
EXADOS®-rot	114 020
EXADOS®-gelb	114 021
EXADOS®-grün	114 022
EXADOS®-grün ST	114 027
EXADOS®-spezial	114 023
EXADOS®-spezial P	114 028
EXADOS®-blau	114 024
EXADOS®-light	114 170

¹ Due to the different densities, the volumes (litres) per kg differ from type to type: for 10 kg from 8.4 to 9.6 litres, for 20 kg from 16.8 to 19.2 litres.
• For dosing solutions in 100 l and 200 l barrels, please inquire.



Dosing computer EXADOS® EK 6¹



Dosing computer EXADOS® ES 6



Dosing computer EXADOS®

Volume-controlled dosing of mineral-based EXADOS®-agents in residential buildings, as compact, all-inclusive dosing system for 3 litre bottles or 10/20 kg transportation canisters.

Contact water meter with pulse generator for volume control, with water meter screw connections or flanges, control and pumping unit, mounting accessories for wall-mounting or mounting at the water meter, power cable 1.5 m with plug, dosing line and valve, empty signal as dry run protection including visual indication and acoustic alarm, including dosing tank lift for 3 litre bottles for EXADOS® dosing computer EK respectively ES and EGS with suction lance for canisters.

Specifications

- Power supply 230 V, 50 Hz
- Operating voltage 24 V
- Max. water temperature 30 °C at installation site
- Nominal pressure PN 10
- Dosing capacity 100 ml/m³

Dosing computer EXADOS®	EK 6	ES 6	ES 12	EGS 20	EGS 30	EGS 80	EGS 100
Nominal connection diameter	R 1"	R 1"	R 1¼"	R 1½"	R 2"	DN 80	DN 100
Max. operating range [m ³ /h]	6	6	10	20	30	80	100
Dosing tank	bottle	canister	canister	canister	canister	canister	canister
Installation length with screw con. [mm]	272	272	280	312	356	–	–
Installation length with flanged con. [mm]	–	–	–	–	–	310	310
Order quantity per pallet (800 x 1,200 mm) [pcs]	16	16	16	16	6	–	–
Order no. (RG-A)	115 100	115 200	115 300	115 400	115 500		
Order no. (RG-B)						115 501	115 502

Accessories	Order no. (RG-A)
Switch box for voltage-free signal	115 700
Suction lance with empty signal for 100 l tank (by others)	115 545
Suction lance with empty signal for 200 l tank (by others)	115 548
Supply tank ² made of PE (volume 100 l, Ø 465 mm, height 770 mm)	115 800
Supply tank ² made of PE (volume 200 l, Ø 500 mm, height 1,000 mm)	115 810

¹ The dosing tank is not included in the scope of supply.

² Suction lance and level control included.



Dosing system GENODOS® DME¹

Dosing system GENODOS® DM

Safety Devices,
Flushing and Sanitation,
Dosing Technology

Dosing systems GENODOS® DME

Volume-controlled dosing of mineral-based EXADOS®-agents in commercial and industrial buildings, as all-inclusive dosing system for 10/20 kg transportation canisters.

Dosing pump GENODOS® GP-/40 as self-priming, low-noise and continuously adjustable diaphragm pump, automatically deaerating against pressure (pump head made of chemical resistant plastic) with synchronous motor, pump preset and under seal, with fixing bracket for wall or floor mounting, with connection options for activation via external pulse, empty signal, including voltage-free fault signal output, contact water meter with pulse cable to pump electronics, including water meter screw connections or flanges. Dosing line, dosing group as well as suction lance for 10/20 kg transportation canisters.

Specifications

- Max. suction height 1.5 mWC
- Max. delivery pressure 10 bar for DME/DM 6 & 10, 8 bar for DME/DM 20 & 30, 6 bar for DME/DM 80 & 100
- Dosing capacity 100 ml/m³
- Temperature min. 5 °C - max. 30 °C

Dosing system GENODOS® DME	6	10	20	30	80	100
Dosing pump type	1/40	2/40	6/40	6/40	10/40	10/40
Nominal connection diameter	R 1"	R 1¼"	R 1½"	R 2"	DN 80	DN 100
Standard capacity [m ³ /h]	6	10	20	30	80	100
Pressure loss at standard capacity [bar]	0.5	0.8	0.8	0.8	0.6	0.8
Order no. (RG-A)	163 435	163 445	163 455	163 465		
Order no. (RG-B)					163 475	163 485

Dosing systems GENODOS® DM

Volume-controlled dosing of mineral-based EXADOS®-agents in commercial and industrial buildings; depending on the needs, the dosing system may be equipped with additional accessories.

Description and technical specifications as for GENODOS® DME, however, without dosing line, dosing group and suction lance. For these accessories as well as the respective dosing tanks, please inquire.

Dosing system GENODOS® DM	6	10	20	30	80	100
Order no. (RG-B)	163 145	163 155	163 165	163 175	163 185	163 195

¹ The disposable canister is not included in the scope of supply.

Alternative anti-scaling



GENO-K4® duo

General description of the process technology

The alternative anti-scaling system **GENO-K4®** makes use of the low-voltage precipitation effect. The system is equipped with two electrodes. When voltage is applied, calcium carbonate crystals are generated on the electrode. The electrodes of the **GENO-K4®** system feature a surface specially designed for this process. Due to this surface, the formation of the calcium carbonate crystals starts at a minimum voltage level which is lower than the electrolysis voltage level of the water.

The regular reversal of poles of the electrodes leads to the release of the calcium carbonate crystals. They are flushed out of the **GENO-K4®** into the water network in the form of microscopically small seed crystals. In the drinking water system which is installed downstream of the **GENO-K4®**, scale deposits settle on these seed crystals instead of on the surface of the heating coils or on the pipes. The crystals which grow due to the scale deposits are removed from the system with the draining water. The effect of this process is a considerable reduction of scale deposits in hot water boilers and pipes.

The process is patented.

Advantages of the low-voltage precipitation

As the level of the direct voltage used is far lower than the electrolysis voltage level, Grünbeck refers to this kind of treatment as “a gentle electrochemical process”. The soft voltage precipitation in this low-voltage range is unique and offers a multitude of essential benefits:

- **There is no electrochemical decomposition of the water.**
- **Breakdown products such as CO₂, electrolytic gas or nitrite which are corrosive, explosive or harmful to health cannot form.**
- **High efficiency without negative effects on the drinking water quality.**



Patented process

Alternative Anti-scaling



GENO-K4®

GENO-K4®

The alternative anti-scaling system **GENO-K4®** is designed to reduce scale deposits. The **GENO-K4®** system offers high protection against scaling in hot water boilers and pipes without adding auxiliary substances such as chemicals, phosphates or regeneration salt. Within the system, seed crystals are generated from scale and then they are washed out. Further scaling preferably occurs on these seed crystals and thus the water composition remains unchanged. As the scale is washed out with the water flow, no scale deposits settle in the pipes or in the hot water boilers. High efficiency, without harmful side effects.

Scope of supply: ready-to-connect, compact device with integrated electronic controller, automatic flushing unit (DN 50 drain connection required), ready for optional water stop with controller for sensor and flow monitoring for high safety, mounting set R 1" including 2 ball-type shut-off valves and corrugated stainless steel hoses, water test kit for carbonate hardness.

GENO-K4® duo

Consisting of: two compact stand-alone devices with parallel piping, including connection set.

	GENO-K4®	GENO-K4® duo
Suitable for ...-family homes	1 - 2	3 - 5
up to ... persons	8	12
Recommended application – Carbonate hardness of the water [mmol/l] ¹	3.6 - 8.6	3.6 - 8.6
Nominal connection diameter [R]	1"	1½"
Nominal flow [m³/h]	2.5	5
Pressure loss at nominal flow (without/with water stop) [bar]	0.5/0.9	0.5/0.9
Nominal pressure PN [bar]	10	10
Operating pressure [bar]	1.0 - 10	1.0 - 10
Max. water/ambient temperature [°C]	30/40	30/40
Power supply [V/Hz]	230, 50/60	230, 50/60
Connected load (without/with water stop) [VA]	60/70	120/ -
Power consumption (without/with water stop) [kWh/m³]	approx. 0.8/approx. 1.1	approx. 1.6/ -
Dimensions, approx. (w x h x d) [mm]	450 x 1,130 x 470	900 x 1,400 x 500
Installation of connection block without/with water meter screw connections [mm]	190/272	645/735
Order no. (RG-A)	157 100	
Accessories²	Order no. (RG-A)	
Water stop R 1" for GENO-K4®, consisting of water stop solenoid valve with 1.5 m cable, floor sensor with 2 m cable	157 110	




¹ The total hardness must at least be 2.5 mmol/l (hardness range 3).

² Not suitable for GENO-K4® duo.

Water softeners for residential application

1 mm of scale deposits Δ
10 % more energy consumption!

Excerpt from DIN 1988-200:

Calcium carbonate mass concentration ¹ [mmol/l]		Category	Measures at $\Delta \leq 60 \text{ }^\circ\text{C}$	Measures at $\Delta > 60 \text{ }^\circ\text{C}$
≥ 2.5		hard	stabilisation or softening recommended	stabilisation or softening
≥ 1.5 up to < 2.5		medium	none or stabilisation or softening	stabilisation or softening recommended
< 1.5		soft	none	none

Application recommendations by Grünbeck

1 to 2 family homes (up to 5 persons) Weichwassermeister® GSX 5, GSXplus or softliQ:SC18

3 to 5 family homes (up to 12 persons) Weichwassermeister® GSX 10, GSXplus or softliQ:SC23

6 to 8 family homes (up to 20 persons) Delta-p®

¹ Refer to § 9, clause 2 of the Law on Detergents and Cleaning Agents

Single and twin systems

Single systems feature one exchanger tank. During the regeneration phase only hard water is available. Twin systems or alternating systems ensure a continuous soft water supply since two exchanger tanks are switched alternately (Weichwassermeister® GSX).

Fluctuating raw water hardness

In case of fluctuating raw water hardness, the Weichwassermeister® GSXplus may be applied for all three dimensions indicated above. Due to the accurate measuring of the conductivity and the temperature, the system is in the position to guarantee a constant water quality, even in case of fluctuating raw water hardness.

Regeneration with sodium chloride

Water softeners which work according to the principle of ion exchange are regenerated by means of sodium chloride (salt tablets in 25 kg bags). Systems with DVGW-certificate or systems that are designed according to EN 14743 and DIN 19636-100 standards are cost-effective, hygienic and environmentally safe due to the so-called economy salting and the disinfection device.

Water softening by means of membrane technology

Water softening is not only feasible by means of the conventional ion exchange, but with the GENO®-OSMO-MSR-NF system partial softening can also be achieved by nanofiltration without any need for regeneration agents or chemicals.

Residual hardness

As the water which has passed through the ion exchanger resin is completely softened, it must be mixed with hard water if it is to be used as drinking water. The new German Drinking Water Ordinance does not stipulate a limit value, however, we recommend a residual hardness of 0.5 - 1.1 mmol/l.

Systems for commercial and industrial applications

Usually, softened water of < 0.02 mmol/l is required for production or industrial water in commercial and industrial applications. The guidelines of DIN 19636-100 do not apply to this. For safety reasons, system separators must be installed unless the system is considered to be intrinsically safe (Weichwassermeister® GSX 10-I, Delta-p®-I).

Reasons for water softening

DIN EN 806-2, B.6: "... Water softeners working according to the ion exchange principle are used for the reduction or complete removal of the hardness contained in the water, if the water gives an indication of scaling. ..."

DIN 1988-200, 12.6.1: "Water softeners must comply with the standards DIN EN 14743 and DIN 19636-100."



NEW



Water softener softliQ:SC

Softening
Residential

Water softener softliQ:SC

Single water softener requiring little floor space, which automatically adapts the nominal capacity to the individual water consumption. Partial regeneration takes place at a time when the system is not in use - can also be adjusted manually. Intelligent control unit with very low power consumption, colour display and guided start-up program. Removable brine tank for easy and hygienically clean maintenance, lid with Soft-Close function. WI-FI interface and control via myGrünbeck app. An external dosing system can be connected via connection cable, voltage-free fault signal output and programmable digital input. Disinfection system, connection block R 1" with water meter screw connections, installation length 190 mm without screw connection, 271 mm with screw connection, non-return valve, overflow valve, two shut-off valves (bypass) and blending valve as well as dosing point for dosing computer (optional) and flexible connection hoses as well as a water test kit to determine the hardness. In addition for softliQ:SC23: Pre-alarm salt supply for continuous monitoring and early information as well as illuminated LED ring as a visual signal and for the illumination of the brine tank.

Specifications

- Dimensions (w x h x d) 360 x 815 x 430 mm
- Max. water/ambient temperature 30/40 °C
- Power supply 85 - 265 V, 50/60 Hz
- Nominal pressure PN 10
- Operating pressure min. 2 bar/max. 8 bar

Water softener	softliQ:SC18	softliQ:SC23 ¹
Nominal flow at a pressure loss of 1 bar K_v -value (DIN EN 14743) [m ³ /h]	1.8	2.3
at a pressure loss of 1 bar, from raw water of 3.5 mmol/l to blending water of 1.4 mmol/l [m ³ /h]	3.0	3.8
Application recommendation by Grünbeck for ...-family homes	1 - 2	3 - 5
up to ... persons	5	12
Nominal capacity, variable [mol]	1.1 - 2.5	2.0 - 4.1
Capacity of brine tank [kg]	35	35
Order quantity per pallet, 800 x 1,200 mm [pcs]	4	4
Order no. (RG-A)	188 500	188 550

¹ DVGW certification pending.

• For accessories, please refer on pages 40/41.

• The drain connection is not included in the scope of supply.



Weichwassermeister® GSX¹

Weichwassermeister® GSX

Water softener in compact design and modular technology.

PE housing consisting of two parts (technical component and brine tank which can be removed for maintenance purposes), transparent lid, two pressure tanks, one control valve, electronics component with controller, operating keys and back-lit LCD display, activation of external dosing system can be connected via connection cable (**EXADOS® GSX/VGX**), voltage-free fault signal output, simplified indication of the system functions via LEDs (red, yellow, green), disinfection system, connection block R 1" with water meter screw connections, installation length 190 mm without screw connection, 271 mm with screw connection, **non-return** valve, overflow valve, two shut-off valves (bypass) and blending valve, dosing point for dosing computer (optional) and flexible connection hoses to the softener, water test kit for determination of hardness.

Specifications

- Dimensions (w x h x d) 485 x 730 x 535 mm
- Max. water/ambient temperature 30/40 °C
- Power supply 85 - 265 V, 50/60 Hz
- Nominal pressure PN 10
- Operating pressure min. 2 bar/max. 8 bar
- Pressure loss at nominal flow 0.8 bar

Weichwassermeister® GSX	5	10
Application recommendation by Grünbeck		
for ...family homes	1 - 2	3 - 5
up to ... persons	5	12
Nominal capacity [mol]	0.9	1.8
Max. capacity of brine tank [kg]	65	65
sufficient for approx. ... regenerations	370	185
Order quantity per pallet (800 x 1,200 mm) [pcs]	2	2
Order no. (RG-A)	187 510	187 520

¹ The drain connection is not included in the scope of supply.

• For larger systems, please refer to the table on page 42.

• For accessories, please refer to pages 40/41.

Your advantages at a glance

- Ensures a constant water quality in case of fluctuating raw water hardness
- Programming of min./max. degrees of hardness as well as the conductivity value on site
- Exact determination of the conductivity by means of a combined conductivity and temperature measurement
- Effective operation due to two-point calibration
- Thanks to the electronic controller of the blending unit, a manual adjustment at the blending valve is superfluous



Weichwassermeister® GSXplus

Weichwassermeister® GSXplus

Water softener in compact design and modular technology with conductivity measurement for fluctuating raw water hardness. PE housing consisting of two parts (technical component and brine tank which can be removed for maintenance purposes), transparent lid, two pressure tanks, one control valve, electronics component with controller, operating keys and back-lit LCD display, activation of an external dosing system can be connected via connection cable (EXADOS® GSX/VGX), voltage-free fault signal output, simplified indication of the system functions via LEDs (red, yellow, green), disinfection system, connection block R 1" with water meter screw connections, installation length 190 mm without screw connections, 271 mm with screw connections, non-return valve, overflow valve, two shut-off valves (bypass) and automatically controlled blending valve, dosing point for dosing computer (optional) and flexible connection hoses to the softener, water test kit for the determination of hardness. Continuous measurement of conductivity including compensation of temperature by which fluctuating raw water qualities may be detected and the system capacity may be adapted accordingly.

Softening
Residential

Specifications

- Dimensions (w x h x d) 485 x 730 x 535 mm
- Max. water/ambient temperature 30/40 °C
- Power supply 85 - 265 V, 50/60 Hz
- Nominal pressure PN 10
- Operating pressure min. 2 bar/max. 8 bar
- Pressure loss at nominal flow 0.8 bar

Weichwassermeister® GSXplus

Application recommendation by Grünbeck	
for ...family homes	1 - 5
up to ... persons	12
Nominal capacity [mol]	1.6
Max. capacity of brine tank [kg]	65
sufficient for approx. ... regenerations	185
Order quantity per pallet (800 x 1,200 mm) [pcs]	2
Order no. (RG-A)	187 540

- For larger systems, please refer to the table on page 42.
- For accessories, please refer to pages 40/41.



Dosing computer EXADOS® EK 6-GSX/VGX/softliQ¹



Dosing computer EXADOS® ES 6-GSX/VGX/softliQ



Dosing computer EXADOS® GSX/VGX/softliQ¹

Electronically controlled dosing system to be used in combination with Weichwassermeister® GSX, the water softener WINNI-mat® VGX or the water softener softliQ for corrosion protection at a negative saturation index (pH value lower than equilibrium pH value) or for the stabilisation of residual hardness.

Pump with electronics in compact housing for wall-mounting. Pulse cable with dosing line and dosing valve to mounting block of the Weichwassermeister® GSX, the water softener WINNI-mat® VGX or the water softener softliQ, including 1.5 m power supply cable and dosing tank lift (EK) or suction lance with empty signal (ES).

EK 6-GSX/VGX/softliQ: compact device for 3 litre dosing canisters

ES 6-GSX/VGX/softliQ: device with suction lance for 10 kg and 20 kg containers

Specifications

- Nominal pressure PN 10
- Protection IP 54
- Power supply 230 V, 50 Hz
- Operating voltage 24 V

Dosing computer EXADOS®	EK 6 - GSX/VGX	ES 6 - GSX/VGX	EK 6 - softliQ	ES 6 - softliQ
Installation height [mm]	260	260	260	260
Suction height [mm]	–	1,200	–	1,200
Order no. (RG-A)	115 430	115 440	115 470	115 480

¹ The dosing canister is not included in the scope of supply.

• For 3 litre dosing canisters, as well as 10 and 20 kg canisters of mineral-based EXADOS®-agents, please refer to page 31.



Delivery pump for regeneration water



Connection angle 1"

Accessories for small-scale water softeners

GENO-STOP® without wireless circuit board

with connection flange [inch]	¾"	1"	1¼"	–
Order no. (RG-A)	126 870	126 875	126 880	126 865

GENO-STOP® Premium with wireless circuit board and 1 x wireless water sensor

Order no. (RG-A)	126 871	126 876	126 881	126 866
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· For additional information regarding the GENO-STOP®, please refer to pages 18 - 20.

Accessories	Order no.	RG-
Connection angle VGX/GSX 90°, 1" 1 pair for cramped installation positions, flexible connection hoses can be laid much closer alongside the system.	187 865	A
Delivery pump for regeneration water VGX/GSX/softliQ (max. 2.5 m) For the reliable discharge of the regeneration waste water volume into discharge pipes located at higher levels (max. 2.5 m), consisting of: delivery pump incl. connection cable to the control electronics of the water softener.	188 800	A
Drain connection DN 50 according to DIN EN 1717	188 880	A
Supplementary blending valve GSX/VGX/softliQ To generate a second blending hardness (e.g. for a separate pipe towards the kitchen, for technical applications, etc.)	187 870	A
Supplementary soft water outlet GSX/VGX/softliQ To easily branch off a 0 mmol/l pipe (e.g. for a separate pipe for technical applications, etc.)	187 875	A
Double screw connection	151 072	B
Extension set for connection hoses	187 860e	B
Insulation set for softliQ:SC	188 870	A
Maintenance kits for VGX and GSX		
Wearing parts required for the maintenance of the respective system model		
Maintenance kit for VGX 9/14/19	187 804	I
Maintenance kit for GSX 9/14/19, VGR	187 803	I

Softening
Residential



Selection Table – Water Softeners

System designation	Connection diameter R ["]	Max. continuous flow ¹ [m ³ /h] ² (Resid. hardness < 0.02 mmol/l)	Max. continuous flow [m ³ /h] ¹ (Resid. hardness 1.4 mmol/l)	Nominal capacity [mmol]	Full or economy salting	Single (1), twin (2) or triple (3) system	Volume control	Order no.	Page
softliQ:SC18	1			2.5	E	1	●	188 500	37
softliQ:SC23	1			4.1	E	1	●	188 550	37
WINNI-mat® VGX 50	1	1.3 ²	2.2 ²	8.9	E	1	●	188 400	47
WINNI-mat® VGX 80	1	1.5 ²	2.3 ²	14.3	E	1	●	188 410	47
WINNI-mat® VGX 14-H	1	0.5	–	2.4	F	1	●	188 250	74
Weichwassermeister® GSX 5	1			2 x 0.9	E	2	●	187 510	38
Weichwassermeister® GSX 10	1			2 x 1.8	E	2	●	187 520	38
Weichwassermeister® GSX 10-I	1	0.75	–	2 x 1.8	F	2	●	187 530	46
Weichwassermeister® GSXplus	1			2 x 1.6	E	2	●	187 540	39
GENO-mat® duo WE-X 65/50	1	2.0 ²	3.3 ²	12/9.5	F/E	2	●	186 100/186 200	48
GENO-mat® duo WE-X 150/130	1	3.0 ²	5.0 ²	26.6/20.9	F/E	2	●	186 110/186 210	48
GENO-mat® duo WE-X 300/230	1	5.0 ²	8.3 ²	53.9/42.3	F/E	2	●	186 120/186 220	48
GENO-mat® duo WE-X 450/330	1½	6.0 ²	10.0 ²	80.2/60	F/E	2	●	186 130/186 230	48
GENO-mat® duo WE-X 750/530	1½	9.5 ²	15.8 ²	133.2/95.2	F/E	2	●	186 140/186 240	48
Delta-p® 1" + Delta-p®-I 1"	1	3.0	5.0	8.2	E	3	●	185 100/185 200	43 - 45
Delta-p® 1¼" + Delta-p®-I 1¼"	1¼	5.0	8.3	13.2	E	3	●	185 110/185 210	43 - 45
Delta-p® 1½" + Delta-p®-I 1½"	1½	8.0	13.3	27.8	E	3	●	185 120/185 220	43 - 45
Delta-p® 2" + Delta-p®-I 2"	2	12.0	20.0	38.6	E	3	●	185 130/185 230	43 - 45

¹ At a raw water hardness of 3.5 mmol/l.

² Peak flow for single units during operation.

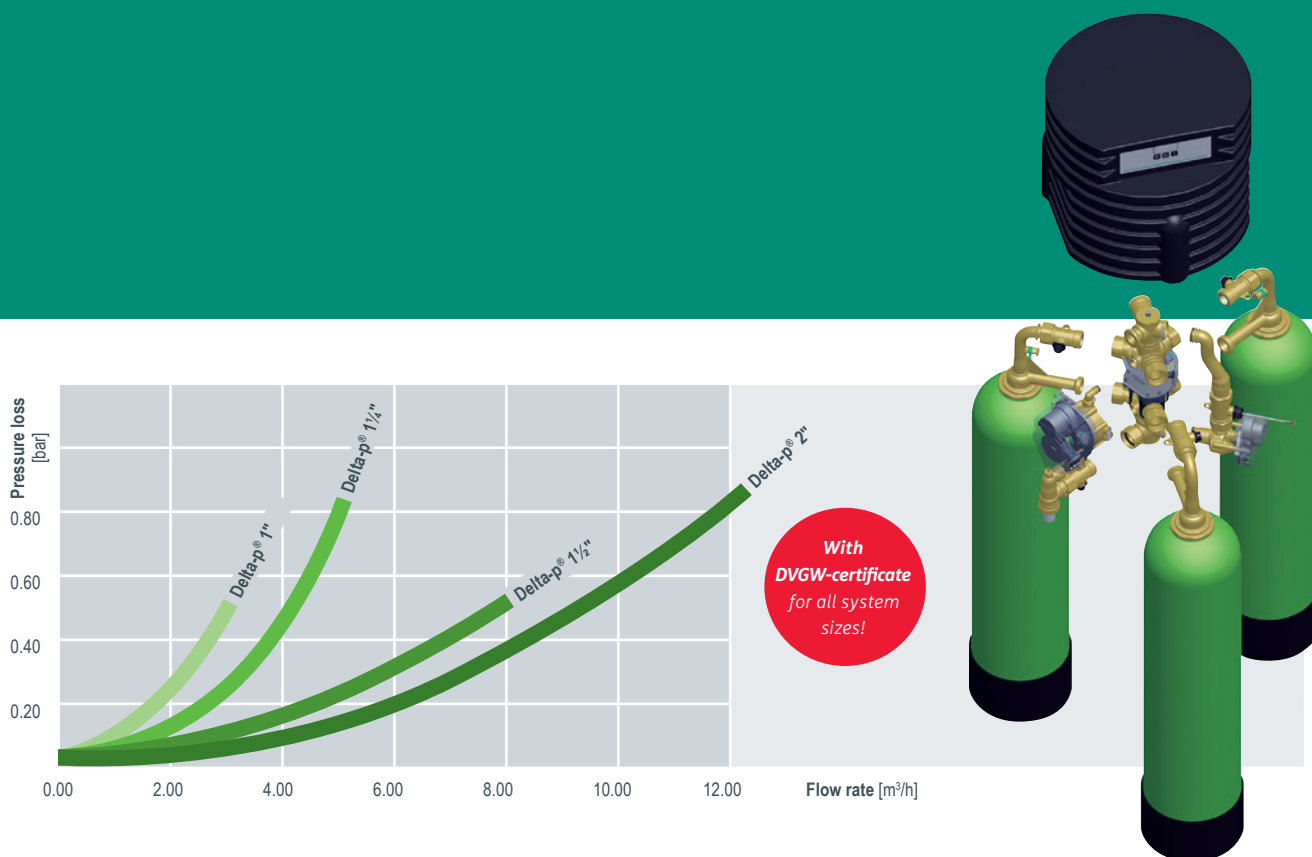
Grünbeck water softeners for trade and industry – general design information

Fully automatic ion exchangers for softening of drinking water for commercial and industrial applications, according to DIN EN 1717 **GENO-mat®** systems must be installed with system separators. Complete systems with plastic exchanger tank, including built-in parts, high-grade ion exchanger filling, control valve made of brass or red bronze, with electro-mechanical actuator. Microprocessor controller (types ZF and ZFW, with timer control only).

Regeneration can be activated fully automatically or manually. Brine tank with lid, integrated brine valve, safety valve and brine buffer technology.

Water test kit for the determination of hardness.

Water Softeners for Trade and Industry



Triple water softeners Delta-p®

Water softeners based on the ion exchange principle have been regarded as the tried and tested standard for many years now and have essentially been used to date in large residential buildings, building complexes and industrial applications which consume large volumes of water. Pressure losses caused by the softening and the extremely costly and time-consuming installation and dimensioning of the systems, however, always proved to be disadvantageous. With the triple water softener **Delta-p®**, Grünbeck Wasseraufbereitung GmbH has developed a completely innovative solution to these problems. The patented control valve of the triple water softener **Delta-p®** guarantees the uninterrupted supply of soft water with only a minimum loss of pressure.

Triple softening

Thanks to its significant benefits, the **Delta-p®** series convinces trade and builders alike. As a triple system, the unit continuously provides soft water and sets new standards due to its low pressure loss and extra low consumption of operating materials. The fresh water guarantee with its automatic flushing

of the bottle content prior to the activation of the exchanger tank in standby mode ensures the hygienic operation of the system. The selection of the system size depends on the dimension of the pipes laid in the building, therefore extensive calculations of capacity and peak volume flows become superfluous. A completely illustrated instruction manual simplifies the installation of the system. Thanks to the electronically controlled blending unit, the setting of the required residual hardness becomes child's play.

The **Delta-p®** system is available in sizes 1", 1¼", 1½" and 2" for either drinking water or industrial applications. A pre-alarm salt supply for the timely reminder of a necessary salt refill can also be connected. Apart from the standard brine tanks with a max. capacity of 75 or 200 kg, larger brine tanks can be provided as well. Connection sets with shut-off valves, overflow valve and flexible connection hoses are available for the easy connection to the drinking water installation. All connection hoses are suitable for drinking water and have certification according to KTW category A and W270.



Delta-p® 1"

Delta-p® 2"

Water softeners Delta-p®

Fully automatic triple water softeners working according to the ion exchange principle for the generation of fully/partially softened water with volume-controlled regeneration.

3 exchanger tanks made of pressure-resistant plastics with a filling of ion exchanger material, distribution system and adjustable height adapters, central control valve made of brass for hard, soft and regeneration water, microprocessor controller with simple 3-key operation and voltage-free signal contact and additional fault signal contact, 5 contact water meters (the industrial version only has 4) to transmit the water flow rates to the controller, electronically controlled blending valve, disinfection unit for automatic disinfection according to the electrolysis principle, PE brine tank with lid, sieve bottom and special brine valve, including operation manual.

Water softeners Delta-p®-I "industrial version"

As above, however without blending unit, for the generation of fully softened water < 0.02 mmol/l, intrinsically safe system (direct connection to the drinking water installation is admissible).

Specifications

- Max. water temperature 30 °C
- Power supply 230 V, 50/60 Hz
- Nominal pressure PN 10
- Operating pressure min. 2 bar/max. 10 bar
- Operating voltage 24 V

Delta-p®/Delta-p®-I	1"	1¼"	1½"	2"
Nominal connection diameter [DN]	25	32	40	50
Nominal flow [m³/h]	3	5	8	12
Nominal flow of blending water [m³/h] ¹	5.0	8.3	13.3	20.0
Pressure loss at nominal flow [bar]	0.5	0.8	0.5	0.8
Capacity per kg of regeneration salt [mol/kg]	5.7	5.7	5.7	5.7
Max. capacity of brine tank [kg] ²	75	75	200	200
Salt consumption per regeneration, approx. [kg]	1.5	2.5	5.2	7.2
Salt consumption per m³ [kg] ¹	0.36	0.36	0.36	0.36
Order no. Delta-p® (RG-B)	185 100	185 110	185 120	185 130
Order no. Delta-p®-I (RG-B)	185 200	185 210	185 220	185 230

¹ In case of a raw water hardness of 3.5 mmol/l and a soft water hardness of 1.4 mmol/l (not Delta-p®-I).

² For larger brine tanks, please inquire.



Delta-p® 2" on pedestal



Connection set 1" - 1¼"

Water softeners Delta-p®/Delta-p®-I

mounted on pedestal, ready for connection

Triple water softeners as described on pages 43 and 44 – mounted on pedestal, including connection set.

Delta-p®/Delta-p®-I	1"	1¼"	1½"	2"
Dimensions (w x d) [mm]	770 x 770	770 x 770	960 x 880	860 x 880
System height [mm]	1,500	1,500	1,840	1,960
Brine tank diameter [mm] ¹	410	410	570	570
Brine tank height [mm] ¹	670	670	860	860
Order no. Delta-p® (RG-B)	185 105	185 115	185 125	185 135
Order no. Delta-p®-I (RG-B)	185 205	185 215	185 225	185 235

¹ Brine tank not mounted on pedestal.

Accessories Delta-p®	Order no. (RG-B)
Connection set Delta-p® 1" - 1¼", installation length 190 mm ¹	185 800
Connection set Delta-p® 1½" - 2", installation length 330 mm ¹	185 805
Connection set Delta-p®-I 1" - 1¼", installation length 190 mm ¹	185 801
Connection set Delta-p®-I 1½" - 2", installation length 330 mm ¹	185 806
Pedestal for Delta-p® 1" - 1¼" (also for Delta-p®-I)	185 820
Pedestal for Delta-p® 1½" - 2" (also for Delta-p®-I)	185 825
Pre-alarm salt supply	185 335
Profibus-DP	185 890

¹ Screw connection not included.

• For additional accessories, please refer to pages 48 and 49.

Softening
Trade/Industry



Weichwassermeister® GSX 10-I'

Weichwassermeister® GSX 10-I “industrial version”

Compact water softener, with full salting in modular technology.

As pre-stage for reverse osmosis systems. For soft water < 0.02 mmol/l (system separator required), without blending valve and overflow valve. For description and specifications, please refer to page 38.

Weichwassermeister®	GSX 10-I
Max. continuous flow [m³/h]²	0.75
Salt consumption/reg. approx. [kg]	0.7
Order no. (RG-B)	187 530



Specifications

- Max. water/ambient temperature 30/40 °C
- Power supply 230 V, 50/60 Hz
- Nominal pressure PN 10
- Operating pressure min. 2 bar/max. 8 bar
- Max. pressure loss at nominal flow 0.8 bar

Water softener WINNI-mat® VGX 50¹

Water softeners WINNI-mat® VGX 50, 80

Single system in compact design, volume controlled, with detachable brine tank, including integrated contact water meter as well as economy salting, automatic disinfection and blending unit.

Compact PE housing with filling opening, safety overflow, salt chamber and brine valve which may be removed from the exchanger tank and the control unit for maintenance work. Pressure tank with ion exchanger material, control valve with ceramic discs, hydraulic distribution system and integrated contact water meter, electronics component with microprocessor controller, operating keys and digital display, activation of an external dosing system can be connected via connection cable (EXADOS® GSX/VGX), voltage-free fault signal output, disinfection system according to the electrolysis principle, complete with mounting block R 1" with water meter screw connections, length 190 mm without screw connection, 271 mm with screw connection, non-return valve, overflow valve, two shut-off valves (bypass) and blending valve as well as dosing point for dosing computer (option) and flexible connection hoses to the softener, water test kit for the determination of hardness.

Water softener WINNI-mat® VGX	50	80
Nominal connection diameter [R]	1"	1"
Nominal flow [m ³] ²	2.2	2.3
Nominal capacity [mol]	8.9	14.3
Max. capacity of brine tank [kg]	90	90
sufficient for approx. ... regenerations	45	27
Order no. (RG-B)	188 400	188 410

Accessories

Drain connection DN 50 acc. to DIN EN 1717 for small-scale water softeners	
Order no. (RG-A)	188 880

¹ The drain connection is not included in the scope of supply.

² At a raw water hardness of 3.5 mmol/l and blending to 1.4 mmol/l.

Softening
Trade/Industry

Specifications

- Full salting for residual hardness of ≤ 0.02 mmol/l (GENO-mat® duo WE-X 65, 150, 300, 450, 750)
- Economy salting for residual hardness ≥ 0.35 mmol/l (GENO-mat® duo WE-X 50, 130, 230, 330, 530)
- Nominal pressure PN 10
- Operating pressure min. 2 bar/max. 8 bar
- Water temperature 30 °C
- Power supply 85 - 250 V, 50/60 Hz
- Operating voltage 24 V DC



Water softener GENO-mat® duo WE-X

Water softeners GENO-mat® duo WE-X

Fully automatic twin water softener working according to the principle of ion exchange for the generation of fully softened water with volume-controlled regeneration.

Consisting of:

PE brine tank with lid and sieve bottom, special brine valve with connection line (enables maximum continuous flow), exchanger tank made of pressure-resistant plastic with ion exchanger filling and distribution system, central control valve made of red bronze, microprocessor controller with simple 3-key operation with voltage-free signal/fault signal contact as well as programmable input. Control unit with LCD graphic display (backlit), integrated SD-card to record operating data. Contact water meter with water meter screw connections.

GENO-mat® duo WE-X (full salting)	65	150	300	450	750
Nominal connection diameter [DN]	25 fem	25 fem	25 fem	40 fem	40 fem
Max. continuous flow [m³/h]	2.0	3.0	5.0	6.0	9.5
K _v value $\Delta p = 1.0$ bar [m³/h]	2.6	2.7	3.1	4.5	5.6
Nominal capacity [mol]	12.0	26.6	53.9	80.2	133.2
Max. capacity of brine tank [kg]	130	190	285	485	760
Salt consumption/reg. [kg]	3.6	8.0	16.2	25.3	40.0
Order no. (RG-B)	186 100	186 110	186 120	186 130	186 140

Fully automatic twin water softener working according to the principle of ion exchange, with volume-controlled regeneration, particularly suitable for the generation of partially softened water, with integrated blending valve up to type 230, starting from type 330 available as an option, economy salting for residual hardness ≥ 0.35 mmol/l.

GENO-mat® duo WE-X (economy salting)	50	130	230	330	530
Nominal connection diameter [DN]	25 fem	25 fem	25 fem	40 fem	40 fem
Max. continuous flow [m³/h] ¹	3.3	5.0	8.3	10.0	15.8
K _v value $\Delta p = 1.0$ bar [m³/h] ¹	4.3	4.5	5.2	7.5	9.3
Nominal capacity [mol]	9.5	20.9	42.3	60.0	95.2
Max. capacity of brine tank [kg]	65	130	190	285	285
Salt consumption/reg. [kg]	1.8	4.0	8.1	11.5	16.0
Order no. (RG-B)	186 200	186 210	186 220	186 230	186 240



Mounting set 1



Contact water meter

Mounting set for water softeners R 1"

Mounting set 1 for GENO-mat®

1 compact valve block, R 1" female thread

(installation length 218 mm, female thread)

- 1 integrated bypass with shut-off valve
- shut-off valves hard water – soft water
- 1 outlet with plug for hard water (e.g. garden pipe)

2 flexible reinforced stainless steel hoses R 1", length 600 mm

Order no. (RG-B) 125 845

Mounting set 2 for GENO-mat® incl. overflow valve

1 connection block R 1"

(installation length without screw connection 190 mm, with screw connection 270 mm)

- non-return valve
- water meter screw connections

2 flexible reinforced stainless steel hoses R 1", length 600 mm

Order no. (RG-B) 125 850

Softening
Trade/Industry

Accessories

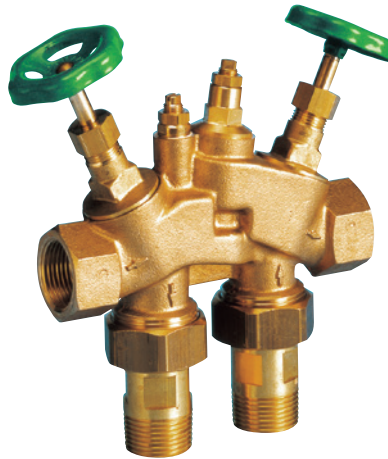
Overflow valve to cover peak consumptions by adding hard water, e.g. for flushing valves, wide shower jets, etc.

(installation length without water meter screw connections 100 mm)

	Order no. (RG-B)
Overflow valve R 1" [0.8 bar]	125 855

Contact water meter with roller-type counter, to read off the volume of soft water flow through

	Order no. (RG-B)
Contact water meter with roller-type counter R 1"	163 080
Contact water meter with roller-type counter R 1½"	163 085
Contact water meter with roller-type counter R 2"	119 758



Blending valve 1"

Accessories

Blending valves for the automatic addition of raw water to generate any residual hardness required in the softened water.

Blending valves	Order no. (RG-B)
Blending valve R 1"	126 001
Blending valve R 1¼"	126 003
Blending valve R 2"	126 002
Additional accessories	
Voltage-free signal for duo WE to transmit the operating status to the building management system	126 890
Circulation device to reduce the counter ion effect in case of longer periods of standstill, suitable for all WE types (except ZF/Delta-p®)	181 850
Pre-alarm salt supply	185 335

	Connection flange	Size	Order no. (RG-A)
GENO-STOP® without wireless circuit board	•	¾"	126 870
	•	1"	126 875
	•	1¼"	126 880
	-	-	126 865
GENO-STOP® Premium with wireless circuit board and one wireless water sensor	•	¾"	126 871
	•	1"	126 876
	•	1¼"	126 881
	-	-	126 866

· For additional information regarding the GENO-STOP®, please refer to pages 18 - 20.

Water stop for reliable protection against water damage caused by missing floor drain, consisting of sensor for leakage water, solenoid valve and automatic switch-off with acoustic alarm (installation length for 1½": 132 mm female thread).

	Order no. (RG-B)
Water stop G 1½"	126 860



Disinfection

Reasons for disinfection

The disinfection of the water aims at the elimination of pathogens such as viruses or bacteria that might be contained in the water – a goal which can either be achieved by dosing disinfectants (e.g. chlorine or chlorine dioxide) or by UV-C treatment. Disinfection procedures are installed downstream of the water treatment systems and represent the last step in the process. Limit and reference values for microbiological substances that may be contained in the water are indicated in legal stipulations (e.g. the German Drinking Water Ordinance 2011 or the European standard EN 806) and technical rules (e.g. the German VDI 6022) depend on the respective specifications and fields of application.

UV light

The devitalising effect of the UV light (**GENO®-UV units**) is due to the application of a special kind of lamp whose light – similar to sunlight – destroys organic cells.

- **GENO®-UV units** (for residential and industrial applications)
- Elimination of legionellae
- Combined process of air washer and disinfection (**GENO®-LUWADES₂**)

Dosing of disinfectants

In order to eliminate pathogens, liquid disinfectants are dosed by means of volume-controlled dosing pumps. There is the option of adding a ready-made dosing solution (**GENO®-Chlor A**), a dosing solution prepared on site (**GENO®-Bakttox**) or a continuously generated disinfection solution (chlorine dioxide).

- Dosing of **GENO®-Chlor A** (**GENODOS® DM-T**)
- Dosing of **GENO®-Bakttox** (**GENODOS® DM-B/BS/BO**)
- Generation and dosing of chlorine dioxide (**GENO®-Bakttox MRX/RX/X**)

Sales only after consultation with Grünbeck. Water analysis required!



GENO®-UV-60 S

GENO®-UV systems “Drinking water version”

For disinfection of clear drinking water which is free of turbidities, iron and manganese and that only carries a slight microbiological load, for application in households and private water supply systems. The systems are certified according to DVGW worksheet W 294-2.

Scope of supply: Electropolished stainless steel pipe with high-intensity UV lamps, 2 flushing/discharge valves, 2 water meter screw connections, flow limiter, calibrated UV-C system sensor. Protective quartz pipe, flow distribution device, control unit **GENO®-Multi BS** with operating hour meter and switch-on counter, indication of the irradiation intensity in W/m², power output for connection of an optional safety valve (required for a DVGW-compliant operation of the UV system), as well as an optional temperature-controlled flushing device.

Specifications

- Max. service life of lamp 16,000 h
- SAC₂₅₄ max. 2.7 m⁻¹
- Max. operating pressure 10 bar
- Power supply 230 V, 50 Hz

GENO®-UV-	60 S	120 S	200 S
Nominal connection diameter [R]	1"	1½"	2"
Installation position	horizontal, outlet at the top, self-deaerating		
Max. flow at 5 - 30 °C [m³/h]	3.3	8.0	12.0
Max. flow at 30 - 70 °C [m³/h]	–	–	8.0
Inlet water temperature [°C]	5 - 30	5 - 30	5 - 30
Ambient temperature [°C]	5 - 40	5 - 40	5 - 40
Power supply [VA]	75	135	215
Total length incl. screw connections [mm]	795	1,185	1,430
Order no. (RG-B)	523 110	523 120	523 130

Accessories	Order no. (RG-B)
Safety device for GENO®-UV-60 S	523 870
Safety device for GENO®-UV-120 S	523 875
Safety device for GENO®-UV-200 S	523 880
Temperature-controlled flushing for GENO®-UV-S	523 825
Stainless steel connection set 1" for GENO®-UV-60 S	520 070
Stainless steel connection set 2" for GENO®-UV-120 S / 200 S	520 075
Wall fastening for UV systems GENO®-UV-60 S up to 200 S	523 800
USB data logger for UV systems GENO®-UV-60 S up to 200 S	523 830
Flushing set to clean the UV system by means of GENO®-clean CP	520 020
Cleaning agent GENO®-clean CP (10 x 1 litre)	170 022

Disinfection
Private Water Supply

Please inquire about **additional GENO®-UV systems** for special applications – **ex works and ready for connection!**



GENODOS® DM-T 20

Sales only
after consultation
with Grünbeck.
Water analysis
required!



GENODOS® DM-T 6

Dosing systems GENODOS® DM-T

For flow-dependent dosing of GENO®-Chlor A from transportation canisters or dosing tanks for the disinfection of drinking water and industrial water.

Low-noise dosing pump 1/40 4G, self-priming and automatically deaerating against pressure, continuously adjustable diaphragm pump with pump head made of chemical-resistant plastic, synchronous motor, with fixing bracket for wall or floor mounting, with connection for control via external pulse, empty signal with pre-alarm, indicator for membrane breakage, including voltage-free alarm output. Contact water meter with pulse cable to the pump electronics, including water meter screw connections or flanges, PVC dosing group 2.70 with non-return valve, pressure maintaining valve DHV 4, factory-set to 4 bar, dosing line made of PTFE.

- PVC suction lance for transportation canisters (DM-T 6 and DM-T 10)
- Dosing tank 60 litres (black) with suction lance (DM-T 20 and DM-T 30)
- Dosing tank 200 litres (black) with suction lance (DM-T 80 and DM-T 100)

Specifications

- Nominal pressure PN 10
- Temperature min. 5 °C - max. 30 °C
- Power supply 230 V, 50/60 Hz, 18/21 W

Dosing system GENODOS®	DM-T 6	DM-T 10	DM-T 20	DM-T 30	DM-T 80	DM-T 100
Water meter ¹	R 1"	R 1¼"	R 1½"	R 2"	DN 80	DN 100
Max. operating range [m³/h]	6	10	20	30	80	100
Pressure loss at max. flow [bar]	0.5	0.5	0.8	0.8	0.6	0.8
Tank volume [litres]	20	20	60	60	200	200
Order no. (RG-B)	163 140	163 150	163 160	163 170	163 180	163 190

¹ With contactor as submerged type.

Disinfectants	Order no. (RG-B)
GENO®-Chlor A (20 litres) for all pipes, except for stainless steel	210 012

Accessories	Order no. (RG-B)
PVC dosing group 2.72 with non-return valve and ball valve	163 220
Water test kit for chlorine and pH-value in drinking water (measuring range: chlorine: 0.1 - 2.0 mg/l; pH: 6.9 - 8.2)	170 128



GENODOS® DM-B 10¹

GENODOS® DM-B 6¹

Dosing systems GENO®-Baktox

For temporary continuous disinfection of drinking and industrial water and for sanitising disinfection.

Self-priming diaphragm dosing pump, automatically deaerating against pressure, continuously adjustable, with synchronous motor; with connection for empty signal, external control and voltage-free alarm signal output; pump factory-set and under seal; contact water meter with pulse cable and pulse division for GENODOS®-pump and dosing valve; gas-tight suction lance with integrated pre-alarm and empty signal, pressure maintaining valve; DM-BS with additional flow stabiliser.

Dosing systems GENODOS® DM-B/DM-BS

Dosing system DM-B/DM-BS 6 pre-assembled on mounting plate, dosing system DM-B/DM-BS 10 - 30 consisting of individual components.

Specifications

- Power supply 230 V, 50/60 Hz
- Water temperature 5 - 30 °C
- Ambient temperature 5 - 20 °C
(in case of ambient temperatures of > 20 °C, the service life of the disinfectant is considerably shorter)
- Nominal pressure PN 8

Dosing system	GENODOS® DM-B				GENODOS® DM-BS			
	6	10	20	30	6	10	20	30
Nominal connection diameter [R]	1"	1¼"	1½"	2"	1"	1¼"	1½"	2"
Nominal flow Q _N [m³/h]	3	5	10	15	3.5	3.5	3.5	3.5
Flow Q _{max} [m³/h]	6	10	20	30	5.1	5.1	5.1	5.1
Pressure loss at Q _{max} [bar]	0.5	0.5	0.7	0.8	0.8	0.8	0.8	0.8
Order no. (RG-B) ¹	163 820	163 825	163 830	163 835	163 840	163 845	163 850	163 855

Accessories for chlorine dioxide test kit	Order no. (RG-B)
Chlorine dioxide test 0.02 - 0.55 mg/l	170 430
Chemicals collecting basin for 20 kg container	210 560
M-Bus measuring transducer D-DAM, complete	115 850

¹ GENO®-Baktox as well as water test kit not included in scope of supply.
 • For disinfectants, please refer to page 61.
 • For dosing systems with order no. 163 820 and 163 840, only 3 litre canisters are suited.

Disinfection
Private Water Supply



Sales only
after consultation
with Grünbeck.
Water analysis
required!

GENODOS® DM-BO with online measurement

Dosing systems GENODOS® DM-BO with online measurement

For temporary continuous disinfection of drinking and industrial water.

"Plug and play" dosing system, completely pre-assembled on aluminium rack, self-priming and continuously adjustable diaphragm dosing pump, automatically deaerating against pressure, with synchronous motor, pump factory-set and under seal, contact water meter with pulse cable and pulse division for GENODOS®-pump, online chlorine dioxide measurement, blending module with integrated dosing valve, gas-tight suction lance with integrated pre-alarm and empty signal, pressure maintaining valve.

Specifications

- Power supply 230 V, 50/60 Hz
- Water temperature 5 - 30 °C
- Ambient temperature 5 - 20 °C
(in case of ambient temperatures of > 20 °C, the service life of the disinfectant is considerably shorter)
- Nominal pressure PN 8

Dosing system GENODOS® DM-BO	6	10	20	30
Nominal connection diameter [R]	1"	1¼"	1½"	2"
Nominal flow Q_N [m³/h]	3	5	10	15
Flow Q_{max} [m³/h]	6	10	20	30
Pressure loss at Q_{max} [bar]	0.5	0.5	0.7	0.8
Dimensions (w x h x d) [mm]	785 x 1,100 x 480	785 x 1,100 x 480	785 x 1,100 x 480	785 x 1,100 x 480
Order no. (RG-B)	163 865	163 875	163 885	163 895

¹ GENO®-Baktox as well as water test kit not included in scope of supply.

• For specifications and accessories, please refer to page 60.

• For the dosing system with order no. 163 865, only 3 litre canisters are suited.

Disinfectants

1 litre of GENO®-Baktox is sufficient for:

- Standard dosing (DM-B, DM-BO) for a water volume of 10 m³
- Sanitation dosing (DM-BS) for a water volume of 1 m³

Disinfectants	Order no. (RG-B)
GENO®-Baktox (3 litres)	170 450
GENO®-Baktox (10 kg)	170 460
GENO®-Baktox (20 kg)	170 470

Note: In order to ensure an efficient disinfection, the prepared GENO®-Baktox solution should be used up within 2 months' time.

Water treatment for private water supply

Nowadays, water treatment is gaining more and more importance. Large water supply companies are installing expensive measuring and control technology. In the comparatively small systems for a private water supply, other processes must be used in order to make the water treatment cost-effective.

Reduction of nitrate

By nature, the nitrate concentration in ground water is not very high. However, in territories with intensive agricultural manuring, nitrate values of > 50 mg/l can be found. In order to reduce the nitrate concentration of well or ground water to the drinking water limit value, ion exchange systems are commonly used. In this process, nitrate is replaced by chloride (similar to the softening process where calcium and magnesium is replaced by sodium). As soon as the ion exchange material is exhausted, a fully automatic regeneration process takes place. Thereby the nitrate ions are washed out and flow into the drain, and the resin is re-loaded with chloride ions. The system is regenerated by means of sodium chloride.

Deacidification

Depending on the soil the water flows through, ground or well water can have a very low pH value (which can even be lower than the limit value for drinking water of 6.5) and therefore it reacts acidic. These low pH values are caused by an excess of carbon dioxide. From the hygienic point of view and with regard to health, such acid water can be consumed without objections. For technical applications, however, the water must be deacidified. The corrosion

behavior of acid water, in particular, is considerable and this kind of water will damage any metal installation in the long run. Deacidification in small systems can mainly be done with two methods: dosing of lye or reaction filtration with calcium carbonate. A combination of both methods would also be possible.

Deferrisation/Demanganisation

Ground water containing iron and manganese has a brown, unappetising colour. It leaves brown, hardly removable stains on the sanitary installations and discolours clothes. In ground water, iron and manganese mostly occur in bivalent, soluble form. During treatment they must be oxidised to trivalent iron and tetravalent manganese in order to be able to filtrate them as iron-III-hydroxide and as manganese dioxide. Optimum pH values and sufficient oxidants must be available so that this reaction can take place.

A frequently used process for deferrisation and demanganisation – mainly in small systems – is the utilisation of potassium permanganate for oxidation. However, the required pH value which should be > 7.4 for the reaction to take place must be taken into consideration.



Nitrate filter WINNI-mat® VGX-N 50¹

Nitrate filter WINNI-mat® VGX-N 400¹

Nitrate filter WINNI-mat® VGX-N

Compact, volume-controlled single system for nitrate reduction in cold drinking water.

Compact PE housing with filling opening, safety overflow, salt supply chamber and brine valve, pressure vessel with ion exchanger material and distribution system, control valve with ceramic discs and integrated contact water meter, electronics with microprocessor controller, operating keys, digital display, voltage-free alarm output and connection option for the control of an external dosing unit via connection cable (**EXADOS® GSX/VGX**). In case of **VGX-N 400** and **VGX-N 650**, the brine tank may be removed from the exchanger tank and controller for maintenance work.

Furthermore, a connection block R1" with water meter screw connections, non-return valve, overflow valve, blending valve, dosing point for dosing computer (optional), two shut-off valves (bypass), as well as two flexible connection hoses to the system and a water test kit for the determination of nitrate are included in the scope of supply.

Specifications

- Connection block – installation length without water meter screw connections 190 mm
- Max. water/ambient temperature 30/40 °C
- Power supply 230 V, 50/60 Hz
- Nominal pressure PN 10
- Operating pressure min. 2 bar/max. 8 bar
- Max. pressure loss 0.8 bar at nominal flow

Nitrate filter WINNI-mat® VGX-N	50	400	650
Nominal connection diameter [R]	1"	1"	1"
Nominal flow [m³/h]	1.3	1.3	1.5
Nominal capacity nitrate [mol]	0.8	6.5	10.5
Nominal capacity nitrate [g x m³]	50	400	650
Max. capacity of brine tank [kg]	38	90	90
Order no. (RG-B)	188 140	188 450	188 460

Accessories	Order no. (RG-A)
Drain connection DN 50 acc. to DIN EN 1717	188 880

¹ The drain connection is not included in the scope of supply.



Sales only after consultation with Grünbeck. Water analysis required!

Specifications

- Power supply 230 V, 50 Hz
- Operating pressure min. 2.5 bar/max. 6 bar
- Nominal pressure PN 8
- Nominal connection diameter
Size 20/10 - 30/14: R 1" male thread;
Size 40/17 - 60/20: R 1½" female thread

GENO-mat® KF-Z

Filter systems GENO-mat® KF-Z/MS-Z/AK-Z

Filter systems GENO-mat® are used if filtration by means of a cartridge filter or a backwash filter is impossible due to a particularly high degree of pollution.

Range of application

- Gravel filter (quartz gravel) in case of mechanical impurities (KF-Z)
- Multi-layer filtration for increased efficiency (MS-Z)
- Dechlorination, odour and taste improvement by means of activated carbon (AK-Z)

System description

- Plastic filter tank with internal distribution system
- Filter filling: quartz gravel in various grain sizes (KF-Z), quartz gravel and hydroanthrasite (MS-Z), quartz gravel and activated carbon (AK-Z)
- Central control valve with operation and backwash function, including timer control and power supply cable

GENO-mat® KF-Z	20/10	25/13	30/14	40/17	40/18	50/19	60/20
Max. nominal flow [m³/h]	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Quartz gravel [kg] ¹	33	75	108	148	200	311	390
Order no. (RG-B)	129 500	129 505	129 510	129 515	129 520	129 525	129 530

GENO-mat® MS-Z	20/10	25/13	30/14	40/17	40/18	50/19	60/20
Max. nominal flow [m³/h]	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Quartz gravel [kg] ¹	17	40	70	112	110	247	367
Hydroanthrasite [l]	8	18	26	24	64	50	78
Order no. (RG-B)	129 550	129 555	129 560	129 565	129 570	129 575	129 580

GENO-mat® AK-Z	20/10	25/13	30/14	40/17	40/18	50/19	60/20
Max. nominal flow [m³/h]	0.25	0.5	1.0	1.2	1.5	2.0	3.0
Quartz gravel [kg] ¹	9	15	20	20	20	30	30
Activated carbon [kg]	10	16	25	40	50	90	140
Order no. (RG-B)	129 800	129 805	129 810	129 815	129 820	129 825	129 830

¹ In various grain sizes.
· Regarding consumables for filter systems, please refer to page 65.

Disinfection
Private Water Supply

Sales only
after consultation
with Grünbeck.
**Water analysis
required!**



Specifications

- Power supply 230 V, 50 Hz
- Operating pressure min. 2.5 bar/max. 6 bar
- Nominal pressure PN 8
- Nominal connection diameter
Size 20/10 - 30/14: R 1" male thread;
Size 40/17 - 60/20: R 1½" female thread

GENO-mat® TE-Z

Deacidification systems GENO-mat® TE-Z

Filter systems **GENO-mat® TE-Z** are used for partial deacidification and calcium carbonate hardness increase in case of soft and acidic water. Free carbon dioxide is bound so that the pH value increases. The filter systems can be used up to a carbonate hardness of $\leq 1.0 \text{ mol/m}^3$ and a carbon dioxide concentration of $\leq 35 \text{ mg/l}$.

System description

- Plastic filter tank with internal distribution system
- Filter filling: Hydrolit-Ca with support layer
- Central control valve with operation and backwash function, including timer control and power supply cable

GENO-mat® TE-Z	20/10	25/13	30/14	40/17	40/18	50/19	60/20
Nominal con. diameter [R]	1"	1"	1"	1½"	1½"	1½"	1½"
Max. nominal flow [m³/h]	0.5	1.0	1.5	2.0	2.5	3.0	4.0
Tank diameter [mm]	210	260	340	370	420	550	620
Total height of system [mm]	1,360	1,620	1,620	1,900	1,900	1,870	2,100
Quartz gravel [kg]	9	15	20	20	20	30	30
Hydrolit-Ca [kg]	20	25	70	90	120	220	320
Order no. (RG-B)	129 850	129 855	129 860	129 865	129 870	129 875	129 880

Regarding mounting set, please refer to page 66.

Consumables for filter systems	Order no. (RG-B)
Quartz gravel 3.0 - 5.6 (all filter systems) 25 kg bag	170 208
Quartz gravel 1.0 - 2.2 (KF-Z / MS-Z) 25 kg bag	170 207
Filter sand 0.4 - 0.8 (KF-Z) 25 kg bag	170 205
Hydroanthrasite (MS-Z) 50 litre container (approx. 25 kg)	170 220
Activated carbon (AK-Z) 20 kg bag	170 253
Hydrolit-Ca (TE-Z) 24 kg bag	170 230

Specifications

- Operating pressure min. 2.5 bar/max. 6 bar
- Nominal pressure PN 8
- Max. water temperature 30 °C
- Power supply 230 V, 50 Hz
- Protective low voltage 24 V/10 VA

In case of high ammonium values, it is possible to install an additional oxidation step that provides extra air, including a compressor and control system.



Sales only after consultation with Grünbeck. Water analysis required for the technical process design. If operation conforms to specification, iron values of max. 3 mg/l can be reduced to below 0.1 mg/l at pH values of > 7,4

GENO-mat® FE-Z with regeneration tank as accessory

Deferrisation systems

Fully automatic filter system for the reduction of dissolved and undissolved iron in private water supply systems. Complete system with plastic ion exchanger tank including built-in components, filling of high-grade, special filter material. Control head made of red bronze with electromechanical actuator and timer control. Power supply cable 1.5 m with shock-proof plug, protection IP 54. Water test kit for iron.

Deferrisation systems GENO-mat® FE-Z

- Special filter material GENO®-Ferrocatt

FE-Z	20/10	25/13	30/14	40/17	40/18	50/19	60/20
Nominal con. diameter [R]	1"	1"	1"	1½"	1½"	1½"	1½"
Nominal flow [m³/h] ¹	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Max. daily capacity [m³] ¹	3.0	4.0	6.0	8.0	10.0	12.0	16.0
Regeneration agent required (quantity to be prepared) [l/reg.]	30	50	60	100	100	200	300
Backwash capacity [m³/h]	1.6	1.6	1.6	3.4	3.4	5.7	5.7
GENO®-Ferrocatt [l]	28	52	72	100	112	224	308
Support gravel [kg]	–	–	25	25	25	50	50
Order no. (RG-B)	153 210	153 220	153 230	153 240	153 250	153 260	153 270

Accessories/Consumables	Order no. (RG-B)
Mounting set R 1" (up to type 30/14)	125 845
Regeneration tank 100 l ²	153 094
Regeneration tank 300 l ²	153 095
Water test kit for iron (measuring ranges: 0 - 0.8 and 1 - 10)	170 150
GENO®-oxi plus 20 kg (standard)	170 029
Water test kit for manganese (measuring range: 0.03 - 0.5)	170 124
GENO®-special granulate 1 kg ³	170 016
GENO®-special granulate 5 kg ³	170 017
Potassium permanganate 5 kg (standard) ³	170 041
Filter material GENO®-Ferrocatt 28 litres (approx. 18 kg)	170 170

¹ Depending on the iron concentration.

² For the regeneration of deferrisation systems.

³ Has to be registered with the Federal Opium Authorities acc. to the law for the monitoring of basic elements (for consumption amounts of more than 100 kg/year)

Disinfection
Private Water Supply

Sales only
after consultation with
Grünbeck. Water analysis required
 for the technical process design. If
 operation conforms to specification, iron
 values of max. 3 mg/l can be reduced to
 below 0.1 mg/l and manganese values
 of max. 1.0 mg/l can be reduced
 to below 0.05 mg/l at pH
 values of > 7.4.



Specifications

- Operating pressure min. 2.5 bar/max. 6 bar
- Nominal pressure PN 8
- Max. water temperature 30 °C
- Power supply 230 V, 50 Hz
- Protective low voltage 24 V/10 VA

GENO-mat® MN-Z with regeneration tank as accessory

Demanganisation systems

Fully automatic filter system for the reduction of dissolved and undissolved iron/manganese in private water supply systems. Complete system with plastic ion exchanger tank including built-in components, filling of high-grade, special filter material, control head made of red bronze with electromechanical actuator and timer control. Power supply cable 1.5 m with shock-proof plug, protection IP 54; test kit for manganese.

Demanganisation systems GENO-mat® MN-Z

- Special filter material GENO®-Fermanit
- Dosing of an oxidant is obligatory for demanganisation

MN-Z type	20/10	25/13	30/14	40/17	40/18	50/19	60/20
Nominal con. diameter [R]	1"	1"	1"	1½"	1½"	1½"	1½"
Nominal flow [m³/h] ¹	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Max. daily capacity [m³] ¹	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Regeneration agent required (quantity to be prepared) [l/reg.]	30	50	60	100	100	200	300
Backwash capacity [m³/h]	1.6	2.3	2.3	3.4	3.4	5.7	5.7
Tank diameter [mm]	210	260	340	370	420	550	620
Total height of system [mm]	1,360	1,620	1,620	1,900	1,900	1,870	2,100
Order no. (RG-B)	153 410	153 420	153 430	153 440	153 450	153 460	153 470

Replacement filter fillings MN-Z

Order no. (RG-B)	153 020	153 022	153 024	153 026	153 028	153 030	153 032
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¹ Depending on the iron and manganese concentration.
 • For accessories/consumables, please refer to page 66.



GENODOS® DM-oxi 1"

Dosing systems GENODOS® DM-oxi

For the dosing of GENO®-oxi plus

Consisting of: Dosing pump GP-/40, contact water meter, suction lance for 20 kg transportation dosing container, dosing valve 4/6 and 4 m dosing line.

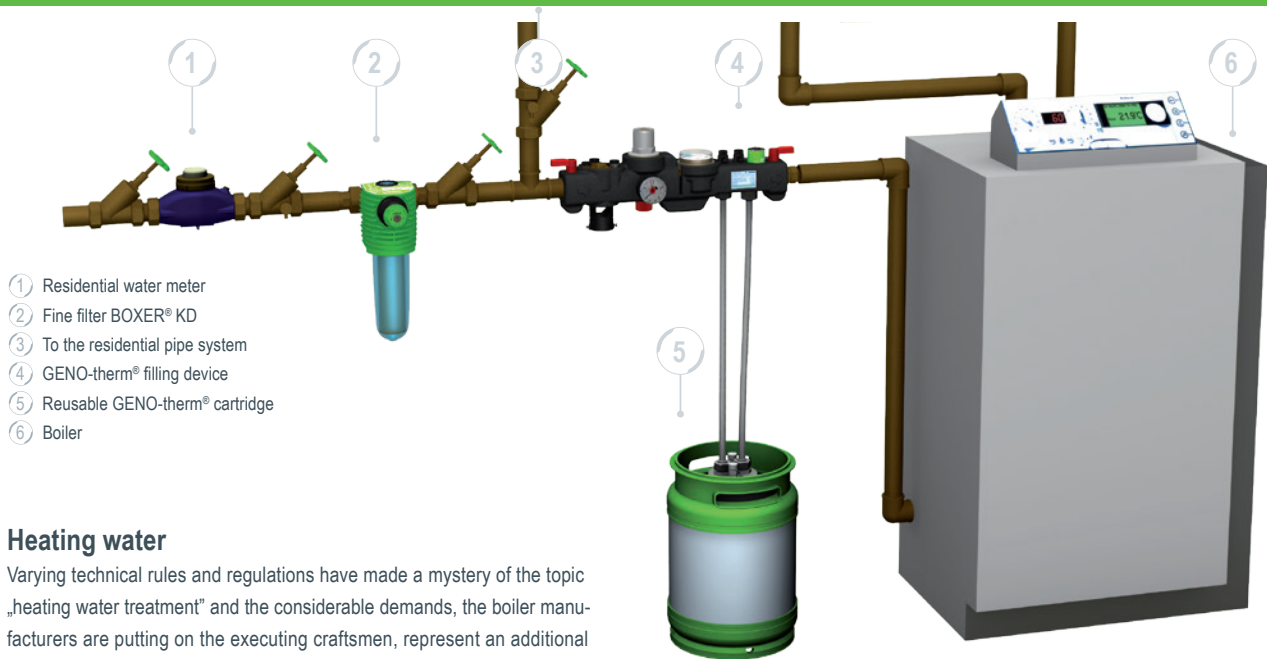
Dosing system GENODOS®	DM-oxi 1"	DM-oxi 1½"
Dosing pump GP type	2/40	6/40
Flow Q_{max} [m³/h]	6.0	20.0
Pulse sequence [l/pulse]	0.33	0.25
Delivery rate (2 bar counter-pressure) [l/h]	2.3	7.1
Delivery rate (6 bar counter-pressure) [l/h]	2.2	6.4
Max. water pressure [bar]	10	8
Max. water temperature [°C]	30	30
Power supply [V/Hz]	230/50	230/50
Order no. (RG-B)	163 420	163 430

Dosing agent	Order no. (RG-B)
GENO®-oxi plus 20 kg (standard)	170 029

Accessories	Order no. (RG-B)
Overflow valve GENODOS® DM-oxi 1", 1½"	163 790
Dosing point for GENODOS® DM-oxi 1"	163 860
Dosing point for GENODOS® DM-oxi 1½"	163 880

Disinfection
Private Water Supply

Heating water



Heating water

Varying technical rules and regulations have made a mystery of the topic „heating water treatment“ and the considerable demands, the boiler manufacturers are putting on the executing craftsmen, represent an additional challenge. Modern materials, complex components and a compact design with small pipe cross-sections extremely increase the demands on the filling water. Heating systems – no matter whether oil, gas or pellets – can only work effectively if their efficiency is not reduced by deposits.

The solution is quite simple: Only fully demineralised water (demi water) provides ideal conditions to prevent annoying deposits and corrosion in the heating circuit – and in general, even without the need for additional chemicals.

The VdTÜV (the German Association of Technical Inspection Agencies) recommends using fully demineralised water as the ideal solution for the treatment of heating water. In most cases, filling the heating system with demineralised water is an adequate measure. Technical guidelines such as the VDI 2035 or the joint worksheet by the BDH (Federal Industrial Association of Germany - House, Energy and Environmental Technology) and the ZVSHK (Central Association of the German HVAC Trade) require a check of the pH value after approx. 8 to 12 weeks. In exceptional cases, however, the dosing of **GENO®-safe A** may be required.

Product series for heating protection GENO-therm®

The **GENO-therm®** series consistently focuses on fully demineralised water (demi water/low-salt operation). All the requirements stipulated in the VDI 2035, sheet 1 and 2, as well as the joint worksheet by the BDH (Federal Industrial Association of Germany – House, Energy and Environmental Technology) and the ZVSHK (Central Association of the German HVAC Trade) are met. Fully demineralised water ensures the protection from scale and corrosion.

Thus, fully demineralised water offers the installer total legal certainty. The heating protection series **GENO-therm®** allows the professional filling of the heating system either by means of disposable or reusable cartridges or by means of a mobile reverse osmosis system. All components are harmonised with each other and match perfectly. Thanks to **GENO-therm®**, the complicated system layout based on boiler capacity, system volume and materials is a thing of the past.



GENO-therm® filling device Basic



GENO-therm® connection block Komfort

GENO-therm® filling devices

For the simple and convenient initial filling and feed of make-up water in closed heating systems.

Device made of brass for installation in horizontal pipes, nominal connection diameter DN 15, max. water temperature 65 °C, operating pressure 10 bar.

Filling device Basic

Consisting of: prefilter, shut-off valves, system separator according to DIN EN 1717, pressure reducer (0.2 - 4 bar) with pressure gauge, setting scale and integrated slide to indicate that maintenance is due, analogue water meter, wall bracket, deaeration valves and pre-formed insulation of the device, including water meter screw connections.

Filling device Komfort

As for filling device Basic, however, with conductivity measuring cell; at a conductivity below 10 µS/cm, the green diode is flashing, between 10 - 50 µS/cm the yellow diode is flashing and starting from 50 µS/cm, the red light-emitting diode indicates the required replacement of the full demineralisation unit.

Connection block Basic

The connection block is a retrofitting option for existing filling devices and consists of: shut-off valve, analogue water meter, wall bracket, deaeration valves and pre-formed insulation of the device, including water meter screw connections.

Connection block Komfort

As for connection block Basic, however, with conductivity measuring cell; at a conductivity below 10 µS/cm, the green diode is flashing, between 10 - 50 µS/cm the yellow diode is flashing and starting from 50 µS/cm, the red light-emitting diode indicates the required replacement of the full demineralisation unit.

GENO-therm®	Filling device		Connection block	
	Basic	Komfort	Basic	Komfort
Nominal connection diameter [DN]	15	15	–	–
Max. filling capacity at 1.5 bar [m³/h] ¹	2.65	2.65	–	–
Operating pressure [bar]	10	10	–	–
Water temperature [°C]	65	65	–	–
Installation length with water meter screw connections [mm]	495	495	334	334
without water meter screw connections [mm]	447	447	246	246
Drain connection, HT pipe [mm]	40	40	–	–
Distance to wall [mm]	87	87	–	–
Order no. (RG-B)	707 120	707 130	707 020	707 030

¹ Varies depending on the cartridge used - disposable or reusable cartridge.

Heating Water
Condensate Neutralisation



Disposable GENO-therm® cartridge 110 without adapter



Disposable GENO-therm® cartridge 110 with adapter

Disposable GENO-therm® cartridge 110

Cartridge for full demineralisation by means of mixed-bed resin which can be connected directly to the **GENO-therm® filling devices** (refer to page 70), designed for the full demineralisation of water of drinking water quality or the residual demineralisation of partially demineralised water (e.g. for the initial filling of smaller heating systems or the feed of make-up water in heating systems).

Specifications

- HDPE cartridge
- For vertical installation only
- Adapter made of brass

Disposable cartridge with adapter

With adapter for direct connection to the **GENO-therm® filling device**, including non-return valve and flow stabiliser. As an alternative, the connection may also be made by means of flexible hoses (**GENO-therm®** hose set).

Disposable cartridge without adapter

Replacement cartridge (an adapter is required to make the connection which is either available as individual accessory or together with the disposable cartridge).

Disposable GENO-therm® cartridge 110	without adapter	with adapter
Nominal connection diameter adapter	–	3/4"
Capacity < 10 µS/cm [l]	80	80
Nominal flow [l/h]	400	400
Nominal pressure PN	6	6
Max. water temperature [°C]	30	30
Weight, resin included [kg]	4.5	4.5
Order no. (RG-B)	707 155	707 150

Accessories	Order no. (RG-B)
Mixed-bed resin for disposable GENO-therm® cartridge 110	707 680



Sample calculation

- Conductivity of the filling water: 500 µS/cm
- Cartridge used: disposable GENO-therm® cartridge 110
- $80/500 = 0.16 \text{ m}^3$ (equals 160 litres at 10 µS/cm)
- $110/500 = 0.22 \text{ m}^3$ (equals 220 litres at 50 µS/cm)



Reusable GENO-therm® cartridge

Reusable GENO-therm® cartridges

Compact mixed-bed ion exchanger system for the full demineralisation of water of drinking water quality or residual demineralisation of partially demineralised water, e.g. for the initial filling or feed of make-up water in heating systems. Stainless steel cartridge with high-quality mixed-bed resin, internal distribution system, plastic ring with carrying handles, plastic foot, non-return valve and flow stabiliser, deaeration valves, nominal connection diameter 3/4", max. operating pressure 10 bar, max. water temperature 60 °C.

Reusable GENO-therm® cartridge ¹	290	570	825	1160	1615
Nominal connection diameter	3/4"	3/4"	3/4"	3/4"	3/4"
Capacity < 10 µS/cm [l]	245	490	700	940	1,250
Nominal flow [m³/h]	0.2	0.5	0.9	1.2	1.6
Weight upon delivery [kg]	11	19	26	34	45
Order no. (RG-B)	707 050	707 060	707 070	707 080	707 090

¹ For the connection to the filling device, the GENO-therm® hose set is required.

Accessories	Order no. (RG-B)
GENO-therm® hose set	707 850



Sample calculation

- Conductivity of the filling water: 500 µS/cm
- Cartridge used: reusable GENO-therm® cartridge 825
- $700/500 = 1.4 \text{ m}^3$ (equals 1,400 litres at 10 µS/cm)
- $825/500 = 1.65 \text{ m}^3$ (equals 1,650 litres at 50 µS/cm)

GENO-therm® cartridges

As above, however with ion exchanger resin to soften heating water.

	Softening capacity	Order No. (RG-B)
GENO-therm® softening cartridges		
100 - max. 60°C	18 m³ x mmol/l at < 0.02 mmol/l	707 730
135 - max. 60°C	24 m³ x mmol/l at < 0.02 mmol/l	707 735
180 - max. 60°C	32 m³ x mmol/l at < 0.02 mmol/l	707 740
Reusable GENO-therm® cartridges for full demineralisation		
825 - GENO®-VARIO mini		707 075
1160 - GENO®-VARIO mini		707 085
1615 - GENO®-VARIO mini		707 095

Heating Water
Condensate Neutralisation



GENO-therm® case Premium



GENO-therm® case Basic

GENO-therm® cases Premium and Basic

The **GENO-therm® cases** have been thoroughly tried and tested and perfectly fit into the Sortimo in-vehicle equipment. They are, of course, compatible with all other **GENO-therm®** products.

GENO-therm® case Premium

The conductivity meter **GENO®-Multi-LF** which is included in the **GENO-therm® case Premium** measures the water's conductivity (with temperature compensation), detects when the cartridge is exhausted and starting from a conductivity of e.g. 10 µS/cm, activates the solenoid valve also included in the **GENO-therm® case Premium**. Thus, filling is automatically prevented and therefore, the manual monitoring of the remaining residual capacities is no longer required. Furthermore, the filling water volume may be documented by means of the analogue water meter which is included.

GENO-therm® case Basic

The **GENO-therm® case Basic** includes a **GENO-therm®** conductivity measuring cell by which the water's conductivity can be checked manually. Starting from a conductivity of 50 µS/cm, a red diode lights up and indicates that the full demineralisation unit has to be replaced. Furthermore, the filling water volume may be documented by means of the analogue water meter which is included.

GENO-therm® case	Premium	Basic
GENO®-Multi-LF controller with corded transformer	✓	
Measuring cell adapter with conductivity and temperature measuring cell	✓	
Measuring cell adapter, battery-operated		✓
Analogue water meter	✓	✓
GENO-therm® hose set	✓	✓
Double screw connections (¾")	✓	✓
Double nipple (¾")	✓	✓
Solenoid valve	✓	



GENO-therm® analysis case including test kit for molybdenum



GENO-therm® service case

GENO-therm® analysis and service case

The GENO-therm® cases have been thoroughly tried and tested and perfectly fit into the Sortimo in-vehicle equipment.

GENO-therm® analysis case

By means of the GENO-therm® analysis case, the parameters for heating and feed water can be determined properly. The case contains test kits for total hardness, conductivity and pH value. For calibration and sampling purposes, the case also provides three test cups. Two versions (with and without test kit for molybdenum) of the analysis case are available. The test kit for molybdenum is designed to determine the efficiency of the GENO®-safe A agent.

GENO-therm® service case

The GENO-therm® service case is designed for the conditioning of heating water by means of GENO®-safe A and includes 3 cartridges of GENO®-safe A containing 310 ml each (sufficient for a system volume of 200 litres), a practical applicator gun to fill in the agent directly from the cartridges and a pressure hose of 0.5 m in length with union nut.

GENO-therm® cases	Order no. (RG-B)
Basic case	707 160
Premium case	707 170
Service case	707 180
Analysis case (pH value + conductivity, total hardness, molybdenum)	707 190
Analysis case (pH value + conductivity, total hardness)	707 192
Conductivity cell with adapter	707 195

Heating Water
Condensate Neutralisation

- Suitable for closed heating and cooling cycles
- No loss in the cycle as the water is treated within the system
- To fill new installations or to sanitise existing systems
- For filtration and demineralisation of partial flows or softening of partial flows
- Option: separate dosing system to set a specific pH value



Mobile heating water treatment system GENO®-VARIO mini incl. GENO®-Multi-LF

Mobile heating water treatment system GENO®-VARIO mini

for closed heating and cooling cycles, to fill new systems, to sanitise existing systems and to demineralise partial flows or soften partial flows in existing systems. Compact mobile system, pre-assembled and ready for connection, consisting of:

- Water cycle with circulation pump, non-return valve, deaeration, fine filter with deep-bed filter element, pressure gauge and discharge respectively sampling valve, water meter with reset function and flow indicator, connection block with bypass and sampling valve, 2 shut-off valves for connection to heating and cooling cycles, temperature monitoring of water cycle with pre-selection of the temperature 60/80°C for shut-off of the circulation pump as well as the integrated mains socket for connection of external circulation pump(s).
- Drinking water make-up feed with system separator to secure the drinking water network as well as pressure reducer and pressure gauge to protect the heating and cooling cycles
- System rack made of anodised aluminium profile with wheels and fastening brackets to receive the optional softening or demineralisation cartridges of various sizes. The resin is a consumable that has to be replaced after every application.
- Version with GENO®-Multi-LF featuring a conductivity sensor and solenoid valve to monitor the conductivity during the automatic salt reduction
- 2 flexible hoses for connection to the heating circuit, 2 flexible hoses to connect the exchanger tank

GENO®-VARIO mini	without GENO®-Multi-LF	incl. GENO®-Multi-LF
Nominal connection diameter [DN (thread)]	20 (¾ male)	20 (¾ male)
Nominal pressure (drinking water inlet) [PN]	10	10
Nominal pressure (circuit) [PN]	6	6
Water temperature (circuit) [°C]	5 - 80	5 - 80
Ambient temperature min./max. [°C]	5 - 40	5 - 40
Order no. (RG-B)	707 550	707 550.01

Accessories	Order no. (RG-B)
Hose sets DN 20, union nut ¾", 1,5 m, 2 hoses, 2 double nipples, incl. seals	
straight/straight	707 840
straight/90°	707 845
Deep-bed filter elements 2 pcs in cardboard box	
25 µm	707 570
50 µm	707 575
100 µm	707 580
150 µm	707 585

· For reusable GENO-therm® cartridges and softening cartridges, please refer to page 67.



Mobile reverse osmosis system AVRO-flex 400

GENO-therm® filling case

Mobile reverse osmosis system AVRO-flex 400

The mobile reverse osmosis system AVRO-flex 400 is designed for the direct filling of heating systems, district heating networks and other systems with low-salt water. Thanks to the patented AVRO-technology, a pretreatment by means of a water softener or an anti-scaling dosing is not required while the membranes used nevertheless have a long service life and a high recovery due to the innovative operating process. By means of a selector switch, the system can be put into two simple operating modes. In the filling mode, the system automatically switches off as soon as a certain counter-pressure is achieved. In the unique “shop” mode, no extensive preservation efforts have to be made during periods of standstill thanks to regular rinsing procedures.

Specifications

- Total salt concentration (NaCl) of the feed water max. 1,000 ppm
- Salt rejection rate 95 - 99 %
- Inlet pressure of feed water min. 2.5 bar
- Feed water temperature min. 10 °C, max. 30 °C
- Protection class I
- Protection IP 54
- Power supply 230 V, 50 Hz

Mobile reverse osmosis system AVRO-flex 400

Nominal connection diameter	¾" and GEKA coupling
Permeate capacity at 10/15 °C [l/h]	340/400
Connected load [kW]	1.8
Operating weight, approx. [kg]	80
Order no. (RG-B)	752 250

GENO-therm® filling case

Portable, robust case made of PP to fill up heating systems, pre-assembled including GENO-therm® filling device Komfort and GENO-therm® hose set; for direct connection to the system to be filled (separation of drinking water from heating water according to DIN EN 1717 is observed). Included in the scope of supply: Disposable GENO-therm® cartridge 110 with adapter (is also connected to the filling device). Optional: reusable GENO-therm® cartridges may also be connected.

GENO-therm® filling case	Order no. (RG-B)
	707 165

Heating Water
Condensate Neutralisation



Combined measuring device for pH and conductivity



GENO-therm® conductivity measuring cell with adapter

Accessories	Order no. (RG-B)
Analogue water meter with connection accessories	702 845
System log for hot water heating system	825 52 110
Digital hot meter	707 805
Double nipple 3/4"	707 124
Double screw connection 3/4"	855 01 851
Replacement electrode for combined measuring device	170 605e
Adapter for GENO-therm® cartridge	707 127
Filling group	707 700
GENO-therm® conductivity measuring cell with adapter	707 195
GENO-therm® conductivity measuring cell	707 185
Sludge strainer GENO-therm® with magnet DN 20	707 705
Sludge strainer GENO-therm® with magnet DN 25	707 710
Sludge strainer GENO-therm® with magnet DN 32	707 715
Sludge strainer GENO-therm® with magnet DN 40	707 720
Sludge strainer GENO-therm® with magnet DN 50	707 725
GENO-therm® hose set (2 pcs)	707 850
GENO®-dosing unit H 5	150 100
GENO®-manual pump H	150 210
Conductivity meter GENO®-Multi-LF (measuring range 0 - 99.9 µS/cm, incl. temp.)	702 842
Calibration solution for conductivity	203 624
Calibration solution pH 4	203 627
Calibration solution pH 7	203 628
Potassium chloride solution [3 mol/l]	203 631
Combined measuring device for pH and conductivity, complete with calibration solutions	170 181
Stainless steel solenoid valve (24 V/50 Hz)	707 055
Refill of mixed-bed resin GDX-K 500, 5 litres	702 885
Hose adapter to convert from a 3/4" male thread connection to quick-acting coupling	707 059e
Blending housing (for filling device Basic)	707 056
Water test kit for pH 7 - 14	170 147
Sulphite test strips, 100 pcs	170 535
Water test kit for total hardness mmol/l	170 095
Water test kit for molybdenum	170 140

Dosing agents

Product	Applications	Characteristics
GENO®-safe A full heating protection	Hot water heating systems as per VDI 2035	Full heating protection for one-family and multi-family homes as well as industrial buildings. Combination product for hardness stabilisation and corrosion protection, suitable for all heating systems and materials. The required quantity is 1 litre for every 200 l of filling volume.
GENO®-heating protection FSK	All heating system as well as cooling cycles, heat pumps and solar systems	Corrosion and anti-freeze protection as combined agent. Full corrosion and scaling protection is guaranteed if at least a minimum of 20 % of the system volume is added <ul style="list-style-type: none"> • Minimum quantity to be added: 10 % of the system volume • starting from 20 % of the system volume up to -10 °C • starting from 30 % of the system volume up to -18 °C In case of aluminium and aluminium components, a pH value of 8.2 - 8.5 has to be observed.
GENO®-phos Nr. 1	Steam boiler systems and hot water heating systems as per VDI 2035 with metal pipes and radiators	Trisodium phosphate (granulate), precipitation of residual hardness, alkalisation by means of pH increase, preparation in soft water. In case of aluminium and aluminium components, a pH value of 8.2 - 8.5 has to be observed.
GENO®-phos Nr. 2	Steam boiler systems, with too high alkalinity	Sodium hydrogen ortho-phosphate (granulate), to reduce high alkalinity, pH reduction, precipitation of residual hardness
Sodium sulphite	Steam boiler systems, warm water and hot water circuit	Oxygen binding agent (granulate), activated, for chemical oxygen binding in water, not steam-volatile, approved for steam boilers in food applications.
Full heating protection		Order no. (RG-I)
GENO®-safe A, box with 18 cartridges of 0.31 litre each		180 520
GENO®-safe A, 1 litre		180 530
GENO®-safe A, box 10 x 1 litre		180 540
GENO®-safe A, canister 11 kg		180 550
Full heating protection with anti-freeze protection		Order no. (RG-I)
GENO®-heating protection FSK (20 kg)		180 230
Chemicals to increase the pH value		Order no. (RG-B)
GENO®-phos Nr. 1 (granulate) [500 g]		170 001
GENO®-phos Nr. 1 (granulate) [3.5 kg]		170 002
GENO®-phos Nr. 1 (granulate) [25 kg]		170 052
GENO®-SW 2010 (liquid) [20 kg]		180 415
GENO®-SW 2010 (liquid) [100 kg]		180 420
Chemicals to decrease the pH value		Order no. (RG-B)
GENO®-phos Nr. 2 (granulate) [3.5 kg]		170 003
GENO®-phos Nr. 2 (granulate) [25 kg]		170 053
Chemicals to bind oxygen		Order no. (RG-B)
Sodium sulphite (granulate) [6 kg]		170 004
Sodium sulphite (granulate) [25 kg]		170 054
GENO®-SW 2000 (liquid) [20 kg]		180 405
Combined product to increase the pH value and to bind oxygen		Order no. (RG-B)
GENO®-SW 2040 (liquid) [25 kg]		180 440

Heating Water
Condensate Neutralisation



Water softener HEH 9



Mobile water softener MEH

Water softener HEH 9

Water softener to generate softened filling and make-up water for heating systems

Consisting of: flexible connection hoses, softener cartridge with exchanger resin, sampling valve, dosing point to add **GENO®-safe A** and water test kit for total hardness, connection 3/4", nominal flow 0.3 m³/h, max. operating pressure 10 bar, operating temperature 30 °C, nominal capacity 3.2 mol, soft water capacity at a raw water hardness of 3.5 mmol/l x 900 litres.

	Order no. (RG-B)
Water softener HEH 9 ¹	190 570
Refill exchanger resin (4 litres)	190 575

Water softener WINNI-mat® VGX 14-H

Volume-controlled single water softener in compact design, including integrated water meter as well as full salting with pulse generator, connection hoses, nominal capacity 2.4 mol, regeneration salt supply 38 kg, salt consumption/regeneration approx. 0.85 kg, nominal flow (at 0 mmol/l) 0.5 m³/h.

Water softener WINNI-mat® VGX 14-H ¹	Order no. (RG-B)
	188 250

Accessories	Order no. (RG-A)
Drain connection DN 50 acc. to DIN EN 1717	188 880

Mobile Water softener MEH

Mobile water softener with wheels for filling and make-up water, with water meter to monitor the capacity of the water softener. The regeneration of the MEH is carried out by means of a regeneration station, nominal connection diameter MEH 1" GK coupling (regeneration station 1/2"), nominal flow 1.4 m³/h, nominal capacity 26.8 mol, soft water capacity at a raw water hardness of 3.5 mmol/l x 7.5 m³, nominal pressure PN 10, flow pressure min. 2.0/max. 8.0 bar, maximum capacity of brine tank 190 kg.

Mobile water softener ¹	MEH	Regeneration station
Order no. (RG-B)	707 250	707 240

¹ Connection via GENO-therm® filling device Basic is possible.

Note: In case of heating systems with aluminium components, we do not recommend any softening.



GENO®-Neutra FNH-420-R¹

Condensate neutralisation for gas and oil condensing boilers

According to ATV-DVWK-A 251, DIN 4716-1, DVGW VP 114

The GENO®-Neutra FNH-420-R system is designed for the neutralisation (increase of pH value to more than 6.5) of condensate from gas and oil condensing heat generators (condensing boilers) and/or exhaust systems made of aluminium, stainless steel, plastic, graphite, glass and ceramics. Via the condensate inlet filter, the condensate flows into the neutralisation box where it is circulated and the pH value is monitored and increased by dosing neutralisation agents. When the admissible pH value (> 6.5) is reached, the condensate is pumped to the drain. The control unit GENO®-Neutra-matic controls and monitors all major functions of the system. Among others, the pH value of the condensate, the levels and the current states of the outputs are indicated in the display of the GENO®-Neutra-matic.

GENO®-Neutra	FNH-420-R
Max. neutralisation capacity [l/h]	420
± nominal capacity for condensing boilers with gas burning (at 0.14 l/kWh) max. [kW]	3,000
with oil burning (at 0.08 l/kWh) max. [kW]	5,250
Condensate temperature [°C]	5 - 40
Inlet/overflow/outlet hose [DN]	25/25/12
Height inlet/overflow connection [mm]	105
Delivery height of pump 420 l/h [m]	3
Power supply [V/Hz]	2 x power cable 230/50
Neutralisation agent	GENO®-Neutrox ¹
Order no. (RG-B)	410 540

Accessories	Order no. (RG-B)
Voltage-free level signal "pre-alarm" for GENODOS®-pump	163 870
Safety package for caustic substances: gloves, protective goggles, eye rinsing bottle, symbolic signs (warning against caustic substances, use gloves, use eye protection)	180 810
Condensate pre-filtration box with activated carbon filling w x h x l = 300 x 340 x 400 mm, hose connection DN 25	410 135
Oil binding mats (20 pcs), oil absorption 100 ml/mat, water-repellent	410 585
GENO®-Neutrox, 25 kg	180 350
GENO®-Neutrox, 75 kg ²	180 355
GENODOS®-suction lance, 750 mm	118 505

¹ The neutralisation agent GENO®-Neutrox is not included in the scope of supply.

² The GENODOS®-suction lance 750 mm (order no. 118 505) is required here.

Heating Water
Condensate Neutralisation



GENO®-Neutra N-70



GENO®-Neutra NO-5

Condensate neutralisation for gas and oil condensing boilers

According to ATV-DVWK-A 251, DIN 4716-1, DVGW VP 114 (subject to type)

These neutralisation systems are designed for the neutralisation (increase of pH value to more than 6.5) of condensed water from gas and oil condensing heat generators and/or exhaust systems made of stainless steel, plastic, graphite, glass and ceramics.

GENO®-Neutra N-14, N-70, N-210

Flow-through neutralisation for condensate originating from gas condensing boilers (DVGW VP 114), consisting of a plastic neutralisation box with integrated sedimentation zone for impurities, pH indicator strips, connection hose, connecting material, initial filling of neutralisation granulate **GENO®-Neutralit Hz**, N-210 in addition with variable adaption of filling volume to boiler capacity.

GENO®-Neutra NO-5, NO-12, NO-24

Flow-through neutralisation for condensate originating from oil condensing boilers (DIN 4716-1), consisting of a plastic neutralisation box with integrated sedimentation zone for impurities, regeneration system for neutralisation granulate, pH indicator strips, connection hose, connecting material, initial filling of activated carbon and neutralisation granulate **GENO®-Neutralit Hz** (NO-5 with built-in siphon at the inlet connection).

If direct draining of the waste water via a natural gradient is not feasible, the waste water lifting system AH-300 may be installed downstream of all systems.

GENO®-Neutra	N-14	N-70	N-210	NO-5	NO-12	NO-24
Gas condensate up to max. [l/h]	14	70	210	–	–	–
≙ boiler capacity at 0.14 l/kW max. [kW]	100	500	1,500	–	–	–
Oil condensate up to max. [l/h]	–	–	–	4.4	12.8	25.6
≙ boiler capacity at 0.08 l/kW max. [kW]	–	–	–	55	160	320
Power supply [V/Hz]	–	–	–	230/50	230/50	2 x 230/50
Condensate temperature [°C]	5 - 60	5 - 60	5 - 60	5 - 60	5 - 60	5 - 60
Inlet/outlet hose [DN]	20	20	25 ¹	20	20	20
Height of inlet/outlet [mm]	110	110	80	110	110	110
Condensate backwater level [mm]	120	120	90	120	120	120
Filling volume of GENO®-Neutralit Hz [kg]	3	8	24	3	8	16
Order no. (RG-B)	410 440	410 450	410 320	410 230	410 240	410 250

¹ In addition, an inlet hose connection (DN 20) is included in the scope of supply.



GENO®-Neutra NO-24



Waste water lifting system AH-300

Accessories for condensate neutralisation

Waste water lifting system AH-300

To convey neutralised condensate and condensate of gas condensing boilers with a pH value of > 3, clear water or slightly polluted industrial water. Not suitable for salt water (e.g. from water softeners) or water containing chlorine. Collecting container with inlet connection for hoses DN 20 and DN 25, level-controlled pump with filter basket, non-return valve and 6 m outlet hose DN 12, level switch with voltage-free change-over contact for fault signal (overflow warning).

Specifications

- Delivery height 4 m at 300 l/h
- Operating mode S1 (suitable for continuous operation)
- Power supply 230 V, 50 Hz
- Height of inlet connection 50 mm
- Height of pump switch-on point approx. 80 mm
- Dimensions without hose connection (w x h x d) 300 x 270 x 400 mm

	Order no. (RG-B)
Waste water lifting system AH-300	420 150

Accessories for condensate neutralisation	for type	Order no. (RG-B)
Activated carbon filter GENO® AF-5 ¹		410 435
Overflow alarm switch	N-14, N-70, N-210, NO-5, NO-12, NO-24 ³ , AF-5	410 680
Alarm delay ²	N-14, N-70, N-210, NO-5, NO-12, NO-24 ³ , AF-5, AH-300	410 285
Maintenance kit (incl. GENO®-Neutralit Hz)	N-14	410 801
Maintenance kit (incl. GENO®-Neutralit Hz)	N-70	410 802
Maintenance kit (incl. GENO®-Neutralit Hz)	N-210	410 803
Maintenance kit (incl. GENO®-Neutralit Hz)	NO-5	410 805
Maintenance kit (incl. GENO®-Neutralit Hz)	NO-12	410 806
Maintenance kit (incl. GENO®-Neutralit Hz)	NO-24	410 807
Maintenance kit for activated carbon filter	AF-5	410 824
GENO®-Neutralit Hz, 3 kg	Neutrabox GENO® G-25, N-14, NO-5	410 770
GENO®-Neutralit Hz, 8 kg	N-70, N-210, NH-140, NO-12, NO-24	410 011
GENO®-Neutralit Hz, 25 kg	NH-140 and N-210	170 249
Neutralisation agent FNK, 20 kg (liquid)	FN 400 M	180 300
pH indicator strips 4.5 - 10 (3 pcs)	all types	170 173

¹ The activated carbon filter GENO® AF-5 is suitable for the filtration of condensate originating from oil and gas burning heat generators (oil and gas condensing boilers) and/or their exhaust systems and may be used if there is no obligation to neutralise. It may also be used as a prefilter upstream of a neutralisation system.

² Only in combination with overflow alarm switch.

³ For NO-24, two units are required.

Heating Water
Condensate Neutralisation



Water test kit for total hardness mmol/l

pH measuring strips

Water test kits

Drinking water	Order no. (RG-B)
Water test kit for chlorine and pH value (0.1 - 2.0 mg/l, 6.9 - 8.2) ¹	170 128
Water test kit for total hardness mmol/l	170 095
Determination of carbonate hardness in drinking water	170 169
Combined measuring device for pH and conductivity incl. calibration solutions	170 181
Determination of manganese (0.03 - 0.5 mg/l) ¹	170 124
Determination of iron (0 - 0.8 and 1 - 10 mg/l) ¹	170 150
Determination of nitrate (0 - 500 mg/l) ¹	170 131
Determination of peroxide (0.5 - 25 mg/l) ¹	170 136
pH measuring strips, 100 pcs (4.5 - 10) ¹	170 148

Heating water, boiler feed water	Order no. (RG-B)
Hardness, p and m value for boiler feed water	170 109
Hardness determination B for boiler water, sufficient for approx. 100 determinations	170 149
Hardness determination GENO [®] -plex for boiler water	170 121
Ortho-phosphate concentration (2 - 15 mg/l as PO ₄ ³⁻) ¹ , 250 determinations	170 103
Ortho-phosphate concentration (1 - 20 mg/l as PO ₄ ³⁻) ¹ , 75 determinations	170 554
pH measuring strips, 100 pcs (4.5 - 10) ¹	170 148
pH measuring strips, 100 pcs (7 - 14) ¹	170 147
pH measuring strips, 3 boxes of 100 pcs each (pH 0 - 6/4.5 - 10/7 - 14) ¹	170 106
Oxygen test kit (0 - 100 ppb) ¹	170 144
Sulphite measuring strips, 100 pcs (10 - 1000 mg/l) ¹	170 535
Sulphite excess in boiler water (0.5 - 20 mg/l) ¹ , drip test	170 107
Water test kit GENO [®] -FSK (anti-freeze protection)	170 141
Water test kit for molybdenum (5 - 250 mg/l Mo ⁶⁺) ¹	170 140

Replacement reagents for phosphate and sulphite test kits	Order no. (RG-B)
Phosphate reagent 1 (250 ml)	170 501
Phosphate reagent 2 (250 ml)	170 502
Sulphite reagent 1, 2, 3 (100/100/250 ml – large package)	170 525
Sulphite reagent 1, 2, 3 (15/15/50 ml – small package)	170 520

¹ Measuring range

Commissioning and maintenance when performed by Grünbeck's technical service

Grünbeck products are made of high-quality materials in order to ensure long, trouble-free operation. In order to guarantee the maximum process performance for many years after the installation, maintenance of the systems is required at regular intervals. With regard to residential applications, this is regulated by the DIN standard EN 806-5. A maintenance contract ensures the functionality of your system for many years beyond the warranty period. Maintenance work and supply of consumables, chemicals, etc. should be performed by authorised experts. Please inquire about commissioning and maintenance prices.

Devices, systems, services	Commissioning	Maintenance
Designation	Order no.	Order no.
Travel expenses	943 905	943 905
Filters		
Cartridge filters up to 2"	943 101	942 101
Backwash filters BOXER®, KICKER®	943 103	942 103
Backwash filters up to 2"	943 105	942 105
Cartridge filters FME/FM DN 50 - DN 200	943 107	942 107
Backwash filters DN 65 - DN 100	943 108	942 108
Automatic backwash filters 1" - DN 100	943 109	942 109
Dosing		
Dosing computer EXADOS®	943 114	942 114
Dosing computer with supply tank	943 115	942 115
Dosing systems GENODOS® DM, DME, DM-T, DM-oxi	943 161	942 161
Dosing systems GENODOS® DM-B, MOBldos	943 162	942 162
Dosing systems GENODOS® DM-BO	943 163	942 163
Alternative anti-scaling		
GENO-K4®	943 157	942 803
Water softeners with DVGW certification		
softliQ:SC	943 188	942 188
Single systems		942 120
Twin systems GSX 5, 10, 10-I	943 187	942 187
Twin system GSX plus	943 287	942 287
Delta-p® 1" - 1¼"	943 085	942 085
Delta-p® 1½" - 2"	943 185	942 185
Disinfection Delta-p® 1" - 1¼"	944 085	
Disinfection Delta-p® 1½" - 2"	944 185	
Extended start-up Delta-p® 1" - 1¼"	943 285	
Extended start-up Delta-p® 1½" - 2"	943 385	
Water softeners without DVGW certification (incl. system separators)		
Single systems R 1"	943 122	942 122
Twin systems R 1"	943 125	942 125
Twin systems R 1½"	943 126	942 126
Filter systems		
GENO-mat® KF-Z	943 110	942 110
GENO-mat® MS-Z	943 111	942 111
GENO-mat® AK-Z	943 112	942 112
GENO-mat® TE-Z	943 113	942 113
Deferrisation, demanganisation		
without regeneration tank	943 154	942 154
with regeneration tank	943 153	942 153

Commissioning
and Maintenance,
Index, Standard Terms
of Sale and Delivery

Devices, systems, services Designation	Commissioning Order no.	Maintenance Order no.
Reduction of nitrate		
Single systems	943 129	942 129
GENO-therm®		
Reusable GENO-therm® cartridge, mixed bed cartridge GDX	943 702 <i>(regeneration costs not included)</i>	942 702
AVRO-flex	943 820	942 820
GENO®-VARIO mini	943 807	
Safety devices		
System separators DK 2-Mini, DK 2½" - 2"	943 132	942 132
System separators DN 50 - DN 250	943 133	942 133
GENO®-G5	943 134	942 134
GENO-STOP®	943 226	942 226
GENO-STOP® Premium	943 326	942 326
UV disinfection		
Types 60 S, 120 S, 200 S	943 521	942 521
Heating technology		
GENO®-Neutra N-14 up to N-210, NO-5 up to NO-12	943 414	942 414
GENO®-Neutra FNH-420-R	943 413	942 413

Note: Required consumables, chemicals and regeneration salt will be charged separately.

Analyses packages		
Public water supply	943 911	
Well water	943 912	
Swimming pool water	943 913	
Dimensioning of osmosis systems	943 914	
Heating water	943 915	
Local/district heating, biogas systems	943 916	
Cooling water	943 917	
Pipe sampling / deposits / corrosion coupons	943 920	

Note: In individual cases, additional cost may occur (e.g. analyses for the dimensioning of UV systems, analyses of the conditioning agent, etc.).

Regeneration costs¹	
Mixed-bed cartridge GDX-K 500	702 520ak
Mixed-bed cartridge GDX 1000	702 440ak
Mixed-bed cartridge GDX 2000	702 450ak
Mixed-bed cartridge GDX 3000	702 460ak
Mixed-bed cartridge GDX 4000	702 470ak
Mixed-bed cartridge GDX 6500	702 480ak
Reusable GENO-therm® cartridge 290	707 050ak
Reusable GENO-therm® cartridge 570	707 060ak
Reusable GENO-therm® cartridge 825	707 070ak
Reusable GENO-therm® cartridge 1160	707 080ak
Reusable GENO-therm® cartridge 1615	707 090ak

¹ Plus costs for roundtrip resp. roundtrip by shipping company

Ord. no.	Item	RG-	Page
100001	Set of seals for FS 1" + FSD 1", 3 pcs	I	15
100002	Set of seals for FS 1¼" - 2", 3 pcs	I	15
100651	Filter element with O-ring	I	17
100860	Pressure gauge to indicate operating pressure	B	6
100865	Pressure gauge to indicate operating pressure	B	6
100870	Pressure gauge to indicate operating pressure	B	6, 11
100875	Pressure gauge to indicate operating pressure	B	6, 11
100890	Pressure gauge to indicate operating pressure	B	15
101080	KICKER 1½", backwash filter	A	11
101085	KICKER 2", backwash filter	A	11
101170	GENO-fine filter FS-B 1"	A	6
101175	GENO-fine filter FS-B 1¼"	A	6
101180	GENO-fine filter FS-B 1½"	A	6
101185	GENO-fine filter FS-B 2"	A	6
101205	BOXER K ¾", fine filter	A	8
101210	BOXER K 1", fine filter	A	8
101215	BOXER K 1¼", fine filter	A	8
101255	BOXER KD ¾", fine filter	A	8
101260	BOXER KD 1", fine filter	A	8
101265	BOXER KD 1¼", fine filter	A	8
101305	BOXER R ¾", backwash filter	A	9
101310	BOXER R 1", backwash filter	A	9
101315	BOXER R 1¼", backwash filter	A	9
101355	BOXER RD ¾", backwash filter	A	9
101360	BOXER RD 1", backwash filter	A	9
101365	BOXER RD 1¼", backwash filter	A	9
101405	BOXER A ¾", automatic backwash filter	A	10
101410	BOXER A 1", automatic backwash filter	A	10
101415	BOXER A 1¼", automatic backwash filter	A	10
101455	BOXER AD ¾", automatic backwash filter	A	10
101460	BOXER AD 1¼", automatic backwash filter	A	10
101465	BOXER AD 1½", automatic backwash filter	A	10
101710	GENO-fine filter S-WW 1½"	B	15
101810	GENO-fine filter S-WW 1"	B	15
101852	Adapter set from FS 1¼" to BOXER 1¼"	B	16
101862	Adapter set KOMBI-BOXER ¾"	B	16
101864	Adapter set KOMBI-BOXER 1¼"	B	16
101865	Adapter set KOMBI (V1) BOXER 1"	B	16
101866	Adapter set KOMBI (V1) BOXER 1¼"	B	16
102185	GENO-fine filter FME-WW 50 (stainless steel version)	B	14
102190	GENO-fine filter FME 50 (stainless steel version)	B	14
102195	GENO-fine filter FME-KW 50 (stainless steel version)	B	14
102285	GENO-fine filter FME-WW 65 (stainless steel version)	B	14
102290	GENO-fine filter FME 65 (stainless steel version)	B	14
102295	GENO-fine filter FME-KW 65 (stainless steel version)	B	14
102385	GENO-fine filter FME-WW 80 (stainless steel version)	B	14
102390	GENO-fine filter FME 80 (stainless steel version)	B	14
102395	GENO-fine filter FME-KW 80 (stainless steel version)	B	14
102400	GENO-fine filter FM 150	B	14
102401	GENO-fine filter FM-WW 150	B	14
102470	GENO-fine filter FM-KW 150	B	14
102485	GENO-fine filter FME-WW 100 (stainless steel version)	B	14
102490	GENO-fine filter FME 100 (stainless steel version)	B	14
102495	GENO-fine filter FME-KW 100 (stainless steel version)	B	14
102500	GENO-fine filter FM 200	B	14
102501	GENO-fine filter FM-WW 200	B	14
102570	GENO-fine filter FM-KW 200	B	14
102850	Hose extension set, 500 mm	B	14
102870	GENO-differential pressure switch K 0.16 – 1.6	B	14
103001	GENO-RFE 50 µm, 2-pack, size 1 with protective cylinder	I	17
103002	GENO-RFE 50 µm, 2-pack, size 2 with protective cylinder	I	17
103003	GENO-RFE 50 µm, 2-pack, size 3 with protective cylinder	I	17
103007	GENO-RFE 80 µm, 2-pack, size 1 with protective cylinder	I	17
103008	GENO-RFE 80 µm, 2-pack, size 2 with protective cylinder	I	17
103009	GENO-RFE 80 µm, 2-pack, size 3 with protective cylinder	I	17
103044	GENO-RFE 50 µm, 2-pack, size 5 without protective cylinder	I	17
103061	GENO-RFE 5 µm, 2-pack, size 1 with protective cylinder	I	17
103062	GENO-RFE 5 µm, 2-pack, size 2 with protective cylinder	I	17
103063	GENO-RFE 5 µm, 2-pack, size 3 with protective cylinder	I	17

Ord. no.	Item	RG-	Page
103067	GENO-RFE 20 µm, 2-pack, size 1 with protective cylinder	I	17
103068	GENO-RFE 50 µm, 2-pack, size 1 without protective cylinder	I	17
103069	GENO-RFE 50 µm, 2-pack, size 2 without protective cylinder	I	17
103070	GENO-RFE 50 µm, 2-pack, size 3 without protective cylinder	I	17
103071	GENO-RFE 20 µm, 2-pack, size 1 without protective cylinder	I	17
103075	GENO-RFE 80 µm, 2-pack, size 1 without protective cylinder	I	17
103076	GENO-RFE 80 µm, 2-pack, size 2 without protective cylinder	I	17
103077	GENO-RFE 80 µm, 2-pack, size 3 without protective cylinder	I	17
103081	GENO-RFE 5 µm, 2-pack, size 1 without protective cylinder	I	17
103082	GENO-RFE 5 µm, 2-pack, size 2 without protective cylinder	I	17
103083	GENO-RFE 5 µm, 2-pack, size 3 without protective cylinder	I	17
103100	GENO-RFE 50 µm, 2-pack, size 6 without protective cylinder	I	17
103110	GENO-RFE 100 µm, 2-pack without protective cylinder	I	17
103111	GENO-RFE 500 µm, 2-pack without protective cylinder, VA	I	17
103150	GENO-RFE 100 µm, 14-pack, size 4	I	17
103151	GENO-RFE 500 µm, 14-pack, size 4, VA	I	17
103153	GENO-RFE 50 µm, 28-pack, size 4	I	17
104805	Spigot wrench for pressure reducer	B	15
105805	Belt wrench for diameters up to 170 mm	B	15
107400	GENO-backwash filter MX 1" / standard	A	12
107405	GENO-backwash filter MX 1¼" / standard	A	12
107410	GENO-backwash filter MX 1½" / standard	A	12
107415	GENO-backwash filter MX 2" / standard	A	12
107420	GENO-backwash filter MX DN 65 / standard	B	13
107425	GENO-backwash filter MX DN 80 / standard	B	13
107430	GENO-backwash filter MX DN 100 / standard	B	13
107450	GENO-backwash filter MXA 1" / standard	A	12
107455	GENO-backwash filter MXA 1¼" / standard	A	12
107460	GENO-backwash filter MXA 1½" / standard	A	12
107465	GENO-backwash filter MXA 2" / standard	A	12
107470	GENO-backwash filter MXA DN 65 / standard	B	13
107475	GENO-backwash filter MXA DN 80 / standard	B	13
107480	GENO-backwash filter MXA DN 100 / standard	B	13
107660	Set of seals for GENO-fine filter FSV, 2 pcs	I	15
108601	Set of seals for KOMBI-filter GENO-pur	I	15
108614	Set of seals for KOMBI-backwash filter	I	15
114010	Dosing solution EXADOS-rot 10 kg	I	31
114011	Dosing solution EXADOS-gelb 10 kg	I	31
114012	Dosing solution EXADOS-grün 10 kg	I	31
114013	Dosing solution EXADOS-spezial 10 kg	I	31
114014	Dosing solution EXADOS-blau 10 kg	I	31
114017	Dosing solution EXADOS-grün ST 10 kg	I	31
114018	Dosing solution EXADOS-spezial P 10 kg	I	31
114020	Dosing solution EXADOS-rot 20 kg	I	31
114021	Dosing solution EXADOS-gelb 20 kg	I	31
114022	Dosing solution EXADOS-grün 20 kg	I	31
114023	Dosing solution EXADOS-spezial 20 kg	I	31
114024	Dosing solution EXADOS-blau 20 kg	I	31
114027	Dosing solution EXADOS-grün ST 20 kg	I	31
114028	Dosing solution EXADOS-spezial P 20 kg	I	31
114049	Dosing solution EXADOS-spezial P, 2 x 3 l	I	31
114050	Dosing solution EXADOS-grün ST, 2 x 3 l	I	31
114051	Dosing solution EXADOS-rot, 2 x 3 l	I	31
114052	Dosing solution EXADOS-gelb, 2 x 3 l	I	31
114053	Dosing solution EXADOS-grün, 2 x 3 l	I	31
114054	Dosing solution EXADOS-spezial, 2 x 3 l	I	31
114055	Dosing solution EXADOS-blau, 2 x 3 l	I	31
114140	Dosing solution EXADOS-light, 2 x 3 l	I	31
114160	Dosing solution EXADOS-light, 10 kg	I	31
114170	Dosing solution EXADOS-light, 20 kg	I	31
115100	Dosing computer EXADOS type EK 6 - 1"	A	32
115200	Dosing computer EXADOS type EK 6 - 1"	A	32
115300	Dosing computer EXADOS type ES 12 - 1½"	A	32
115400	Dosing computer EXADOS type EGS 20 - 1½"	A	32
115430	Dosing computer EXADOS EK 6 - GSX/VGX	A	40
115440	Dosing computer EXADOS ES 6 - GSX/VGX	A	40
115470	Dosing computer EXADOS EK 6 - softIQ	A	40
115480	Dosing computer EXADOS ES 6 - softIQ	A	40
115500	Dosing computer EXADOS type EGS 30 - 2"	A	32

Ord. no.	Item	RG-	Page
115501	Dosing computer EXADOS type EGS 80 with water meter	B	32
115502	Dosing computer EXADOS type EGS 100 with water meter	B	32
115545	Suction lance with empty signal for 100 l	A	32
115548	Suction lance with empty signal for 200 l	A	32
115700	Switch box for voltage-free signal	A	32
115800	Supply tank 100 l with longer suction lance	A	32
115810	Supply tank 200 l with longer suction lance	A	32
115850	M-Bus measuring transducer D-DAM, complete	B	55
118505	GENODOS-suction lance B 10/20, l = 750 mm/PE	B	75
119758	Contact water meter with roller-type counter, WZ 2"	B	49
125845	Mounting set 1 for GENO-mat G 1	B	49, 61
125850	Mounting set 2 for GENO-mat G 1"	B	49
125855	Overflow valve R1	B	49
126001	Blending valve OVP R1	B	50
126002	Automatic blending valve OVP 2", complete	B	50
126003	Blending valve OVP 1½", complete	B	50
126160	Wireless water sensor GENO-STOP	A	20
126170	Fault indicator	B	20
126801	Wireless circuit board for GENO-STOP control unit	A	20
126802	Wall power supply for GENO-STOP	A	20
126803	Angle-type flange for GENO-STOP	A	20
126805	Water sensor with 2 m cable	A	20
126815	Water sensor with 10 m cable	A	20
126860	Water stop G 1½"	B	50
126865	GENO-STOP without connection flange	A	19, 41, 50
126866	GENO-STOP Premium without connection flange	A	19, 41, 50
126870	GENO-STOP ¾"	A	19, 41, 50
126871	GENO-STOP ¾" Premium	A	19, 41, 50
126875	GENO-STOP 1"	A	19, 41, 50
126876	GENO-STOP 1" Premium	A	19, 41, 50
126880	GENO-STOP 1¼"	A	19, 41, 50
126881	GENO-STOP 1¼" Premium	A	19, 41, 50
126890	Voltage-free signal for duo WE	B	50
128001	Adjusting piece l = 190 mm, connection 1"	B	16
128401	Adjusting piece l = 190 mm, connection 1½"	B	16
128402	Adjusting piece l = 330 mm, connection 1½"	B	16
128403	Adjusting piece l = 330 mm, connection 2"	B	16
129500	Gravel filter GENO-mat KF-Z 20/10	B	59
129505	Gravel filter GENO-mat KF-Z 25/13	B	59
129510	Gravel filter GENO-mat KF-Z 30/14	B	59
129515	Gravel filter GENO-mat KF-Z 40/17	B	59
129520	Gravel filter GENO-mat KF-Z 40/18	B	59
129525	Gravel filter GENO-mat KF-Z 50/19	B	59
129530	Gravel filter GENO-mat KF-Z 60/20	B	59
129550	Multilayer filter GENO-mat MS-Z 20/10	B	59
129555	Multilayer filter GENO-mat MS-Z 25/13	B	59
129560	Multilayer filter GENO-mat MS-Z 30/14	B	59
129565	Multilayer filter GENO-mat MS-Z 40/17	B	59
129570	Multilayer filter GENO-mat MS-Z 40/18	B	59
129575	Multilayer filter GENO-mat MS-Z 50/19	B	59
129580	Multilayer filter GENO-mat MS-Z 60/20	B	59
129800	Activated carbon filter GENO-mat AK-Z 20/10	B	59
129805	Activated carbon filter GENO-mat AK-Z 25/13	B	59
129810	Activated carbon filter GENO-mat AK-Z 30/14	B	59
129815	Activated carbon filter GENO-mat AK-Z 40/17	B	59
129820	Activated carbon filter GENO-mat AK-Z 40/18	B	59
129825	Activated carbon filter GENO-mat AK-Z 50/19	B	59
129830	Activated carbon filter GENO-mat AK-Z 60/20	B	59
129850	Filter for partial deacidification GENO-mat TE-Z 20/10	B	60
129855	Filter for partial deacidification GENO-mat TE-Z 25/13	B	60
129860	Filter for partial deacidification GENO-mat TE-Z 30/14	B	60
129865	Filter for partial deacidification GENO-mat TE-Z 40/17	B	60
129870	Filter for partial deacidification GENO-mat TE-Z 40/18	B	60
129875	Filter for partial deacidification GENO-mat TE-Z 50/19	B	60
129880	Filter for partial deacidification GENO-mat TE-Z 60/20	B	60
132095	Service set for DK Mini/Standard/Maxi	B	23
132460	Euro system separator GENO-DK 2-Maxi DN 50	B	23
132465	Euro system separator GENO-DK 2-Maxi DN 65	B	23
132470	Euro system separator GENO-DK 2-Maxi DN 80	B	23

Ord. no.	Item	RG-	Page
132475	Euro system separator GENO-DK 2-Maxi DN 100	B	23
132510	Euro system separator GENO-DK 2, ½"	A	22
132520	Euro system separator GENO-DK 2, ¾"	A	22
132530	Euro system separator GENO-DK 2, 1"	A	22
132540	Euro system separator GENO-DK 2, 1¼"	A	22
132560	Euro system separator GENO-DK 2, 1½"	A	22
132570	Euro system separator GENO-DK 2, 2"	A	22
132720	Euro system separator GENO-DK-Maxi DN 150	B	23
132725	Euro system separator GENO-DK-Maxi DN 200	B	23
132730	Euro system separator GENO-DK-Maxi DN 250	B	23
132870	Adapter set DK-standard ½" to DK 2	B	16
132875	Adapter set DK-standard ¾" to DK 2	B	16
132880	Adapter set DK-standard 1" to DK 2	B	16
132885	Adapter set DK-standard 1¼" to DK 2	B	16
132890	Adapter set DK-standard 1½" to DK 2	B	16
132895	Adapter set DK-standard 2" to DK 2	B	16
133100	Euro system separator GENO-DK 2-Mini	A	22
134100	Euro system separation device GENO-G5	B	24
134805	Rinsing unit for GENO-G5	B	24
134810	Connection set for GENO-G5	B	24
150100	GENO-dosing unit type H 5	B	72
150210	GENO-hand pump type H	B	72
151020	Flushing water relief tank	B	27
151070	Case with connection fittings ¾" - 2"	B	26
151072	Double screw connection G 1¼, incl. seal	B	41
151080	Case with connection fittings 1½" - DN 80	B	26
151135	Set of closing plugs with flushing fitting, box of 5 pcs	B	27
151160	Case with closing plugs, 60 closing plugs ½"	B	27
151170	Set of closing plugs, box of 20 closing plugs ½"	B	27
151180	Case with flushing fittings, 20 flushing fittings with accessories	B	27
151200	GENO-flushing compressor 1988 K	B	26
151220	GENO-flushing device	B	29
151225	Flow reversal for GENO-flushing device	B	29
151820	Hose extension set for flushing compressor/MOBIldos	B	26
151850	Conversion kit for flushing compressor up to year of construction 2011	B	26
153020	Filter filling, complete for. MN-Z 20/10	B	62
153022	Filter filling, complete for MN-Z 25/13	B	62
153024	Filter filling, complete for MN-Z 30/14	B	62
153026	Filter filling, complete for MN-Z 40/17	B	62
153028	Filter filling, complete for MN-Z 40/18	B	62
153030	Filter filling, complete for MN-Z 50/19	B	62
153032	Filter filling, complete for MN-Z 60/20	B	62
153094	Regeneration tank for FE/MN system, 100 l tank	B	61
153095	Regeneration tank for FE/MN system, 300 l tank	B	61
153210	Deferrisation system GENO-mat FE-Z 20/10	B	61
153220	Deferrisation system GENO-mat FE-Z 25/13	B	61
153230	Deferrisation system GENO-mat FE-Z 30/14	B	61
153240	Deferrisation system GENO-mat FE-Z 40/17	B	61
153250	Deferrisation system GENO-mat FE-Z 40/18	B	61
153260	Deferrisation system GENO-mat FE-Z 50/19	B	61
153270	Deferrisation system GENO-mat FE-Z 60/20	B	61
153410	Demanganisation system GENO-mat MN-Z 20/10	B	62
153420	Demanganisation system GENO-mat MN-Z 25/13	B	62
153430	Demanganisation system GENO-mat MN-Z 30/14	B	62
153440	Demanganisation system GENO-mat MN-Z 40/17	B	62
153450	Demanganisation system GENO-mat MN-Z 40/18	B	62
153460	Demanganisation system GENO-mat MN-Z 50/19	B	62
153470	Demanganisation system GENO-mat MN-Z 60/20	B	62
156861	GENO-perox spray, 250 ml	B	28
157100	GENO-K4	A	35
157110	Water stop 1" for GENO-K4	A	35
160150	Dosing system MOBIldos	B	28
163080	Contact water meter with roller-type counter WZ 1"	B	49
163085	Contact water meter with roller-type counter WZ 1½"	B	49
163140	Dosing system GENODOS DM-T 6	B	54
163145	Dosing system GENODOS DM 6	B	33
163150	Dosing system GENODOS DM-T 10	B	54
163155	Dosing system GENODOS DM 10	B	33

Ord. no.	Item	RG-	Page
163160	Dosing system GENODOS DM-T 20	B	54
163165	Dosing system GENODOS DM 20	B	33
163170	Dosing system GENODOS DM-T 30	B	54
163175	Dosing system GENODOS DM 30	B	33
163180	Dosing system GENODOS DM-T 80	B	54
163185	Dosing system GENODOS DM 80	B	33
163190	Dosing system GENODOS DM-T 100	B	54
163195	Dosing system GENODOS DM 100	B	33
163220	Dosing group 2.72, PVC	B	54
163420	Dosing system GENODOS Typ DM-oxi 1"	B	63
163430	Dosing system GENODOS Typ DM-oxi 1½"	B	63
163435	Dosing system GENODOS DME 6	A	33
163445	Dosing system GENODOS DME 10	A	33
163455	Dosing system GENODOS DME 20	A	33
163465	Dosing system GENODOS DME 30	A	33
163475	Dosing system GENODOS DME 80	B	33
163485	Dosing system GENODOS DME 100	B	33
163790	Overflow valve GENODOS DM-oxi 1", 1½"	B	63
163820	Dosing system GENODOS type DM-B 6	B	55
163825	Dosing system GENODOS type DM-B 10	B	55
163830	Dosing system GENODOS type DM-B 20	B	55
163835	Dosing system GENODOS type DM-B 30	B	55
163840	Dosing system GENODOS type DM-BS 6	B	55
163845	Dosing system GENODOS type DM-BS 10	B	55
163850	Dosing system GENODOS type DM-BS 20	B	55
163855	Dosing system GENODOS type DM-BS 30	B	55
163860	Dosing point for GENODOS DM-oxi 1"	B	63
163865	Dosing system GENODOS DM-BO 6	B	56
163870	Voltage-free level signal GENODOS, complete	B	75
163875	Dosing system GENODOS DM-BO 10	B	56
163880	Dosing point for GENODOS DM-oxi 1½"	B	63
163885	Dosing system GENODOS DM-BO 20	B	56
163895	Dosing system GENODOS DM-BO 30	B	56
170001	GENO-phos Nr. 1, 0.5 kg container	B	73
170002	GENO-phos Nr. 1, 3.5 kg bucket	B	73
170003	GENO-phos Nr. 2, 3.5 kg bucket	B	73
170004	Sodium sulphite bucket: 6.0 kg	B	73
170010	GENO-Kalklöser, scale remover, 11 kg	I	29
170012	GENO-Kalklöser, zinc-resistant scale remover, 11 kg	I	29
170013	GENO-Kalk- und Rostlöser, scale and rust remover, 11 kg	I	29
170015	GENO-Passivierungspulver, passivation powder, 3.5 kg	I	29
170016	GENO-special granulate, 1 kg	B	61
170017	GENO-special granulate, 5 kg	B	61
170022	GENO-clean CP, 10 x 1 litre	B	29, 57
170028	GENO-clean CP, 22 kg (18.3 l)	B	29
170029	GENO-oxi plus , 20 kg (19.7 l)	B	61, 63
170041	Potassium permanganate, 5 kg	B	61
170045	GENO-clean M, 12 kg	B	29
170046	GENO-clean M, 6 x 1 litre	B	29
170052	GENO-phos Nr. 1, 25 kg bag	B	73
170053	GENO-phos Nr. 2, 25 kg bag	B	73
170054	Sodium sulphite, 25 kg bag	B	73
170095	Water test kit for total hardness mmol/l	B	72, 78
170103	Water test kit for ortho-phosphate	B	78
170106	Water test kit for pH value	B	78
170107	Water test kit to determine sulphite concentration	B	78
170109	Water test kit for hardness, p and m value	B	78
170121	Water test kit for hardness	B	78
170124	Water test kit for manganese, 0.03 - 0.5 mg/l	B	61, 78
170128	Water test kit for chlorine + pH value	B	28, 54, 78
170131	Water test kit for nitrate	B	78
170136	Water test kit for peroxide test	B	28, 78
170138	Water test kit for chlorine, 10 - 160 mg/l	B	28
170140	Water test kit for molybdenum	B	72, 78
170141	Water test kit for GENO FSK	B	78
170144	Water test kit for residual oxygen	B	78
170147	Water test kit pH value 7 - 14	B	72, 78
170148	Water test kit for pH value 4.5 - 10	B	29, 78
170149	Water test kit for the determination of hardness	B	78

Ord. no.	Item	RG-	Page
170150	Water test kit for the determination of iron	B	61, 78
170167	Water test kit for peroxide test	B	28
170169	Water test kit for carbonate hardness	B	78
170170	Filter material GENO-Ferrocatt (28 litres)	B	61
170173	Indicator strips for pH 4.5 - 10.0	B	77
170181	Combined measuring device for pH and conductivity, complete	B	72, 78
170205	Filter sand SB 0.4 - 0.8 T	B	60
170207	Quartz sand SB 1.0 - 2.2 T	B	60
170208	Quartz sand SB 3.0 - 5.6 T	B	60
170220	Hydroanthrasite H, grain size l: 0.6 - 1.6 mm	B	60
170230	Hydrolit-Ca 1.0 - 3.0 mm	B	60
170249	GENO-Neutralit Hz, 25 kg	B	77
170253	Hydraffin CC 08x30, 0.5 - 2.5 mm	B	60
170306	Sodium bisulphite, 5.0 kg bucket	B	28
170320	GENO-perox, content: 1 l	B	28
170325	GENO-perox, content: 10 kg	B	28
170430	Chlorine dioxide test 0.02 - 0.55 ppm	B	28, 55
170450	GENO-Baktox 3 l	B	28, 56
170460	GENO-Baktox 10 kg	B	28, 56
170470	GENO-Baktox 20 kg complete	B	28, 56
170501	Phosphate reagent I, 250 ml	B	78
170502	Phosphate reagent II, 250 ml	B	78
170520	Sulphite reagent 1/2/3, small package	B	78
170525	Sulphite reagent 1/2/3, large package	B	78
170535	Sulphite measuring strips, 100 pcs	B	72, 78
170554	Water test kit for ortho-phosphate	B	78
180230	GENO heating protection FSK 20 kg	I	73
180300	Neutralisation agent FNK, 20 kg	B	29, 77
180350	GENO-Neutrox, 25 kg canister	B	75
180355	GENO-Neutrox, 75 kg canister	B	75
180405	GENO SW 2000, canister: 20 kg	B	73
180415	GENO SW 2010, canister: 20 kg	B	73
180420	GENO SW 2010, canister: 100 l barrel	B	73
180440	GENO SW 2040, 25 kg canister	B	73
180520	GENO-safe A, 18 x 0.31 l cartridge	I	73
180530	GENO-safe A, 1 l	I	73
180540	GENO-safe A, 10 x 1 l	I	73
180550	GENO-safe A, 11 kg (10 l)	I	73
180810	Safety package for caustic substances	B	75
181850	Circulation device for GENO-mat	B	50
185100	Water softener Delta-p 1"	B	44
185105	Water softener Delta-p 1" with pedestal	B	45
185110	Water softener Delta-p 1¼"	B	44
185115	Water softener Delta-p 1¼" with pedestal	B	45
185120	Water softener Delta-p 1½"	B	44
185125	Water softener Delta-p 1½" with pedestal	B	45
185130	Water softener Delta-p 2"	B	44
185135	Water softener Delta-p 2" with pedestal	B	45
185200	Water softener Delta-p 1" - I	B	44
185205	Water softener Delta-p 1" I with pedestal	B	45
185210	Water softener Delta-p 1¼" - I	B	44
185215	Water softener Delta-p 1¼" I with pedestal	B	45
185220	Water softener Delta-p 1½" - I	B	44
185225	Water softener Delta-p 1½" I with pedestal	B	45
185230	Water softener Delta-p 2" - I	B	44
185235	Water softener Delta-p 2" I with pedestal	B	45
185335	Pre-alarm salt supply	B	45, 50
185800	Connection set for Delta-p 1" - 1¼"	B	45
185801	Connection set for Delta-p 1" - 1¼" - I	B	45
185805	Connection set for Delta-p 1½" - 2"	B	45
185806	Connection set for Delta-p 1½" - 2" - I	B	45
185820	Pedestal for Delta-p 1" - 1¼"	B	45
185825	Pedestal for Delta-p 1½" - 2"	B	45
185890	Communication module DE200 Profibus	B	45
186100	Water softener GENO-mat duo WE-X 65	B	48
186110	Water softener GENO-mat duo WE-X 150	B	48
186120	Water softener GENO-mat duo WE-X 300	B	48
186130	Water softener GENO-mat duo WE-X 450	B	48
186140	Water softener GENO-mat duo WE-X 750	B	48

Ord. no.	Item	RG-	Page
186200	Water softener GENO-mat duo WE-X 50	B	48
186210	Water softener GENO-mat duo WE-X 130	B	48
186220	Water softener GENO-mat duo WE-X 230	B	48
186230	Water softener GENO-mat duo WE-X 330	B	48
186240	Water softener GENO-mat duo WE-X 530	B	48
187510	Weichwassermeister GSX 5	A	38
187520	Weichwassermeister GSX 10	A	38
187530	Weichwassermeister GSX 10-I	B	46
187540	Weichwassermeister GSXplus	A	39
187803	Maintenance kit for GSX 9/14/19, VGR	I	41
187804	Maintenance kit for VGX 9/14/19, GS 2,G 2	I	41
187865	Connection angle 90°, 1" (content: 2 pcs)	A	41
187870	Supplementary blending valve GSX/VGX	A	41
187875	Supplementary soft water outlet GSX/VGX	A	41
188140	Nitrate filter WINNI-mat VGX-N 50	B	58
188250	Water softener WINNI-mat VGX 14-H	B	74
188400	Water softener WINNI-mat VGX 50	B	47
188410	Water softener WINNI-mat VGX 80	B	47
188450	Nitrate filter WINNI-mat VGX-N 400	B	58
188460	Nitrate filter WINNI-mat VGX-N 650	B	58
188500	Water softener softliQ:SC18	A	37
188550	Water softener softliQ:SC23	A	37
188800	Delivery pump for regeneration water	A	41
188870	Insulation set softliQ:SC	A	41
188880	Drain connection DN 50 acc. to DIN EN 1717	A	41, 47, 58, 74
190570	Water softener HEH 9	B	74
190575	Resin refill pack for water softening HEH, 4 l	B	74
203624	Calibration solution for conductivity 1413 µS/cm, 50 ml	B	72
203627	Calibration solution for pH 4, 50 ml	B	72
203628	Calibration solution for pH 7, 50 ml	B	72
203631	Potassium chloride solution, KCL 3 mol/l, 50ml	B	72
210012	GENO-Chlor A, content of canister: 25 kg	B	28, 54
210560	Chemicals collecting basin for 20 l canister	B	55
211213	Indicator DPD 1, 100 tablets	B	28
211235	Digital test device Scuba II	B	28
410011	GENO-Neutralit Hz, content: 8 kg	B	77
410135	Condensate prefiltration box DN 25	B	75
410230	GENO-Neutra NO-5	B	76
410240	GENO-Neutra NO-12	B	76
410250	GENO-Neutra NO-24	B	76
410285	GENO alarm delay relay	B	77
410320	GENO-Neutra N-210	B	76
410435	Activated carbon filter GENO AF-5	B	77
410440	GENO-Neutra N-14	B	76
410450	GENO-Neutra N-70	B	76
410540	GENO-Neutra FNH-420-R	B	75
410585	Oil binding mats, 20 pcs, oil absorption	B	75
410680	Overflow alarm switch for GENO-Neutra	B	77
410770	GENO-Neutralit Hz, 3 kg	B	77
410801	Maintenance kit for GENO-Neutra N-14	B	77
410802	Maintenance kit for GENO-Neutra N-70	B	77
410803	Maintenance kit for GENO-Neutra N-210	B	77
410805	Maintenance kit for GENO-Neutra NO-5	B	77
410806	Maintenance kit for GENO-Neutra NO-12	B	77
410807	Maintenance kit for GENO-Neutra NO-24	B	77
410824	Maintenance kit for activated carbon filter GENO AF-5	B	77
420150	Waste water lifting system AH-300	B	77
520020	Flushing set for UV disinfection system	B	53
520070	Connection set for UV disinfection UV-60	B	53
520075	Connection set for UV disinfection UV-120/200	B	53
523110	GENO-UV-60 S, DVGW	B	53
523120	GENO-UV-120 S, DVGW	B	53
523130	GENO-UV-200 S, DVGW	B	53
523800	Wall bracket for UV systems (DVGW & I)	B	53
523825	Temperature-controlled flushing for GENO-UV	B	53
523830	USB data logger for GENO-Multi BS	B	53
523870	Safety device for UV 60 S with Multi BS	B	53
523875	Safety device for UV 120 S with Multi BS	B	53

Ord. no.	Item	RG-	Page
523880	Safety device for UV 200 S with Multi BS	B	53
702842	GENO-Multi-LF	B	72
702845	Water meter with connection equipment	B	72
702885	Refill mixed-bed resin GDX-K 500, 5 l	B	72
707020	GENO-therm connection block Basic	B	65
707030	GENO-therm connection block Komfort	B	65
707050	Reusable GENO-therm cartridge 290	B	67
707055	GENO-therm solenoid valve complete	B	72
707056	GENO-therm blending housing, complete	B	72
707060	Reusable GENO-therm cartridge 570	B	67
707070	Reusable GENO-therm cartridge 825	B	67
707075	Reusable GENO-therm cartridge 825 - GENO-VARIO mini	B	67
707080	Reusable GENO-therm cartridge 1160	B	67
707085	Reusable GENO-therm cartridge 1160 - GENO-VARIO mini	B	67
707090	Reusable GENO-therm cartridge 1615	B	67
707095	Reusable GENO-therm cartridge 1615 - GENO-VARIO mini	B	67
707120	GENO-therm filling device Basic	B	65
707124	Double nipple for F-NT and OV G ¾"x28	B	72
707127	Adapter for GENO-therm cartridge	B	72
707130	GENO-therm filling device Komfort	B	65
707150	Disposable GENO-therm cartridge 110 with adapter	B	66
707155	Disposable GENO-therm cartridge 110 without adapter	B	66
707160	GENO-therm case Basic	B	69
707165	GENO-therm filling case	B	71
707170	GENO-therm case Premium	B	69
707180	GENO-therm service case	B	69
707185	GENO-therm conductivity measuring cell with O-ring	B	72
707190	Analysis case (pH value + conductivity, total hardness, molybdenum)	B	69
707192	Analysis case (pH value + conductivity, total hardness)	B	69
707195	GENO-therm conductivity measuring cell with adapter	B	69, 72
707240	Regeneration station MEH	B	74
707250	Mobile water softener MEH	B	74
707550	GENO-VARIO mini	B	70
707550.01	GENO-VARIO mini incl. GENO-Multi-LF	B	70
707570	Deep-bed filter element 25 µm 2 pcs in cardboard box	B	70
707575	Deep-bed filter element 50 µm 2 pcs in cardboard box	B	70
707580	Deep-bed filter element 100 µm 2 pcs in cardboard box	B	70
707585	Deep-bed filter element 150 µm 2 pcs in cardboard box	B	70
707680	Refill pack of mixed-bed resin for GENO-therm	B	66
707700	Filling group	B	72
707705	GENO-therm sludge strainer DN 20 complete	B	72
707710	GENO-therm sludge strainer DN 25 complete	B	72
707715	GENO-therm sludge strainer DN 32 complete	B	72
707720	GENO-therm sludge strainer DN 40 complete	B	72
707725	GENO-therm sludge strainer DN 50 complete	B	72
707730	GENO-therm softening cartridge 100, GENO-VARIO mini	B	67
707735	GENO-therm softening cartridge 135, GENO-VARIO mini	B	67
707740	GENO-therm softening cartridge 180, GENO-VARIO mini	B	67
707805	Digital water meter GENO-therm	B	72
707840	Hose set DN 20 straight/straight	B	70
707845	Hose set DN 20 straight/90°	B	70
707850	GENO-therm hose set DN 12 (2 pcs)	B	67, 72
752250	Mobile reverse osmosis system AVRO-flex 400	B	71
101639e	Set of seals for FS-B, 1½", 2", 2 pcs	I	15
101641e	Set of seals for BOXER, FS-B 1", 1¼", 2 pcs	I	15
101646e	Adapter set KOMBI-BOXER 1"	B	16
101647e	Adapter set from FS 1" to BOXER 1", FS-B 1"	B	16
101651e	Adapter set from FS 1½" to FS-B, KICKER 1½"	B	16
101652e	Adapter set FS 2" BOXER, FS-B, KICKER	B	16
106804e	Adapter set from MS to MX/MXA DN 80	B	16
106805e	Adapter set from MS auf MX/MXA DN 100	B	16
170605e	Replacement pH electrode for combined measuring device	B	72
187860e	Extension set for connection hoses	B	41
707059e	Hose adapter G ¾ - quick-acting coupling	B	72
82552110	System log for hot water heating system		72
85501851	Double screw connection ¾" x ¾"	B	72

Standard Terms of Sale and Delivery of Grünbeck Wasseraufbereitung GmbH

1. APPLICATION, SUBJECT MATTER OF CONTRACT AND CONCLUSION OF CONTRACT

1.1 These Standard Terms of Sale and Delivery (hereinafter: "STS") apply for the sale of goods ("Delivery") as well as for the provision of services or work contract services ("Service"). Our STS apply for all (including future) business relationships with our customers (hereinafter: "Purchaser") and irrespective of whether we manufacture the object ourselves or obtain it from suppliers or perform the service or work contract service ourselves or through third parties. We do not accept standard business terms of the Purchaser. We object to their application. The STS also apply if we, having knowledge of conflicting standard business terms of the Purchaser, carry out deliveries without reservation.

1.2 As far as not otherwise mentioned in an offer, our offers are subject to change and non-binding. An order of the Purchaser is deemed to be a binding offer of contract. As far as the order does not indicate to the contrary, we are entitled to accept the Purchaser's order within four (4) calendar weeks after receipt. The acceptance shall occur through confirmation or by delivery of the order to the Purchaser.

1.3 Individual terms deviating from these STS are only valid if they are confirmed in writing. Legally binding declarations or notices of the Purchaser after conclusion of the contract (e.g. setting of deadlines, notice of defects, declaration of rescission or reduction of price) must be made in writing.

1.4 The minimum order value amounts to EUR 100.00 net. In the case of orders under EUR 100.00 we are entitled to apply a reduced quantity charge of EUR 20.00 for the processing costs.

2. SERVICES

2.1 We provide services within the scope of our existing technical and operational possibilities. The services include in particular assembly, start-up operation, customer service and maintenance.

2.2 In the case of services to be provided by us including (but not limited to) development services and/or analysis services, in general no particular result is owed. In connection with the performance of services we do not assume any responsibility for a particular result and are entitled to perform the services through subagents (subcontractors). This shall not apply upon conclusion of a separate contractual agreement.

2.3 If exceptionally an acceptance is stipulated for our services, the Purchaser shall accept the work contract services as provided by us, including partial work contract services, without delay and declare the acceptance or partial acceptance as far as there are no defects in the services which materially impair the suitability or the function.

2.4 If after the making available for acceptance or partial acceptance no objection of substantial defects is made within seven (7) calendar days or if the Purchaser uses the work services or partial work contract services which were made available, the acceptance (partial acceptance) shall be deemed to have occurred as far as the Purchaser is a merchant.

3. SPECIAL PROVISIONS FOR ASSEMBLY, START-UP OPERATION, CUSTOMER SERVICE AND MAINTENANCE

In the event that the order includes assembly, start-up operation, customer service and/or maintenance, the following terms have supplementary application. In the case of contradictions the provisions of this Section 3 have priority over the other provisions of these STS.

3.1 Assembly works

As far as the order includes assembly works, the Purchaser shall ensure at the construction site at his expense that at the start of and during the assembly works

3.1.1 there is freedom to build, i.e. we can perform the contractually owed services without being obstructed by third parties;

3.1.2 suitable access possibilities and openings to bring in items exist in the size specified by us such that the installation can be transported with all necessary vehicles to the site where it is to be set up; the transport path shall not be obstructed;

3.1.3 all terminal points of supply for power supply and signal transmission exist at the agreed location according to the agreed specifications;

3.1.4 the assembly site is protected against weather influences and damaging influences by animals and is secured against unauthorized access;

3.1.5 a power connection of 230/400 V, 50 Hz in accordance with the VDE regulations respectively exists at the assembly site and/or there is an assembly room with such a connected wattage;

3.1.6 appropriate load-bearing points exist on the building and/or ceiling structure to affix hoists;

3.1.7 the interfaces to connect to existing systems, including if applicable necessary isolation valves, are implemented.

3.2 Start-up operation, customer services and maintenance

As far as the order includes the start-up operation, customer service works and/or the maintenance of the installation or individual components, the Purchaser shall at his expense and having regard to the cooperation duty applicable in 3.1 ensure that at the start of and during such works in addition

3.2.1 there is freedom to build, i.e. we can perform the contractually owed services without being obstructed by third parties;

3.2.2 all necessary operating media with the necessary volume power and flow pressure are available ready for operation;

3.2.3 the water quality (product water, waste water) produced

by the installation is accepted with the relevant volume streams;

3.2.4 the air volume streams necessary for the operation of the installation can be and are permitted to be discharged;

3.2.5 all electrical voltages necessary for the operation of the installation are ready for operation together with the necessary connected wattage;

3.2.6 in the case of swimming pools the basin is filled with water; 3.2.7 all signals necessary for the operation of the installation together with third parties and/or agreed signals are available for operation;

3.2.8 suitable climate conditions of the assembly site

3.2.9 location for individual components and/or operating resources are complied with.

3.3 Works abroad

As far as the services are to be performed abroad and our technical personnel requires a residence and/or work permit for that purpose, the Purchaser shall, subject to agreement in a particular case, support us free of charge in the necessary scope in relation to the local authorities in the application for, the extension of or the change of the permit required for the performance of the service.

4. INTELLECTUAL PROPERTY RIGHTS, KNOW-HOW

The Purchaser recognizes our know-how as well as our intellectual property rights. As far as not stipulated otherwise, we reserve our rights of ownership and copyrights to illustrations, drawings and other documents. They may not be made accessible to third parties. This applies in particular for confidential documents. As far as not expressly stipulated elsewhere, e.g. in the order, we do not grant to the Purchaser any rights of use to the know-how or intellectual property rights which arose in connection with our services.

5. DELIVERY, TIME LIMITS, SCOPE OF SERVICE, DEFAULT

5.1 The delivery shall be made EXW "Ex Works" (Incoterms 2010). The place of performance is Höchstädt/Donau. At the request of the Purchaser the goods shall be sent to another destination at his expense. As far as not stipulated otherwise, we are entitled to ourselves to determine the manner of shipment (in particular shipping company, shipping route, packaging). The risk passes to the Purchaser upon delivery to the shipping agent or upon collection at the factory site, as far as the Purchaser is a merchant. If the Purchaser is a consumer, the transfer of risk is governed by the respective statutory provisions. Please note that we are exempted from mandatory freight forwarders' insurance (SLVS-Verzichtskunde).

5.2 Delivery and service deadlines are non-binding unless their binding effect is expressly stipulated.

5.3 We are not responsible for delays which arise through the fact that we do not receive timely or proper supplies from our supplier if we have carefully selected the supplier and have timely placed an order with him such that timely delivery was to be expected. The same applies in the case of delays of services if we have carefully selected the subcontractor and have timely engaged him such that timely service was to be expected.

5.4 The contract fulfillment including compliance with time limits is subject to the condition that there are no conflicting hindrances on the basis of German, US as well as other applicable national, EU or international foreign trade regulations and no embargos or other sanctions.

5.5 Our goods correspond to German safety and quality guidelines. The compliance with foreign guidelines is not ensured as far as not stipulated in a particular case. The purchaser of the goods agrees to inform himself of the regulations under the law to be complied with concerning distribution and the use of our goods in the country of destination and shall comply therewith. If we require information or the participation of the Purchaser in connection with the export or import of the goods in the country of destination, the Purchaser agrees to provide them upon request without delay at his expense.

5.6 The compliance with deadlines for our deliveries or services require the timely receipt of all documents to be provided by the Purchaser, the performance of the cooperation services as well as the compliance with the agreed payment terms and other obligations. If these conditions are not timely fulfilled, the delivery or service time limits shall be reasonably extended.

5.7 If we cannot meet delivery or service deadlines we shall inform the Purchaser thereof without delay and at the same time indicate the probable new deadline or a new date.

5.8 Any rights due to delay, delivery or service can only be asserted by the Purchaser after an unsuccessful warning notice with the setting of a reasonable time limit. A reasonable time limit is considered to be four (4) weeks.

5.9 Partial deliveries and partial services are permissible in a scope which can be reasonably expected and can be brought to account as such. We can provide partial services for acceptance (hereinafter "partial acceptance"). This includes self-contained phases to fulfill the contractually agreed services and self-contained functioning parts.

5.10 In the event that the Purchaser does not timely accept the delivery or service the statutory provisions on delay of acceptance apply. The Purchaser shall in such a case in particular bear the additional costs (e.g. for a second delivery) involved therewith.

5.11 Rules concerning exchange of pallets if the Purchaser is a merchant

5.11.1 As far as nothing is stipulated otherwise, for the shipping of the goods by a shipping company Euro Pool

exchange pallets according to the Cologne Pallet Exchange shall be used.

5.11.2 The Purchaser is obligated upon delivery of the palletized goods to return the same amount of exchangeable pallets of the same type and quality. The UIC standard 435-4 of the International Union of Railways applies for the exchangeability.

5.11.3 The Purchaser must provide a receipt for the number and type of the loaded pallets and note in writing the reservations concerning the quality, provide empty pallets in the same number and type in exchangeable condition, obtain a receipt for the delivery and note reservations concerning the quality, as well as in the event of non-exchange, if no pallets of the same type and quality or not of a sufficient quantity are provided or the acceptance is rejected as not being capable of exchange, to confirm this.

5.11.4 In the case of non-exchange if no pallets of the same type and quality or not of a sufficient quantity are provided or the acceptance is rejected as not being capable of exchange, we will invoice the procurement of replacements for missing or non-exchangeable pallets.

6. PRICES

6.1 As far as not agreed otherwise, our prices are for delivery ex works, including packaging without VAT. The VAT and other costs shall be separately stated in the invoice.

6.2 As far as not agreed otherwise, the provision of the services shall occur Monday to Friday during our usual business hours (max. 8h/day) and the calculation of the services according to the time spent by us, at the hourly rates respectively currently applied by us plus the respectively applicable material prices and as far as relevant plus travel expenses (in particular, but without limitation, travel to and from the site, accommodation). If at the request of the Purchaser our employees work overtime, the overtime compensation shall be borne by the Purchaser. The same applies for extra pay for Sunday and holiday work. Overtime, Sunday and holiday work shall be charged in accordance with the respectively applicable collective bargaining provisions of the Bavarian metal industry. The Purchaser agrees to verify and countersign working hours certificates which are prepared by our employees. If compensation at a fixed price is agreed, we are entitled to make a down payment for self-contained parts of the service or after completion of a project phase (e.g. contract commencement, initial partial delivery, making available for acceptance, acceptance).

6.3 Costs increases which arise on the basis of requests for change by the Purchaser, in particular delays involved therewith shall be borne by the Purchaser.

6.4 Reasonable price changes in accordance with our price list are reserved if the delivery occurs in accordance with the contract more than four (4) months after conclusion of the contract and as far as the list price increase is attributable to a subsequent increase of the acquisition costs (prices for raw, auxiliary or operating materials, such as material price increases, collective bargaining wage increases or other preliminary services necessary for the subject matter of the contract) on which we have based our price indication upon conclusion of the contract.

7. PAYMENT TERMS

7.1 The agreed compensation shall become due without deduction immediately after performance has been provided and an invoice issued. As far as in a particular case a discount was agreed, no discount can be deducted from wage, packaging and freight costs.

7.2 Upon default of the Purchaser the respectively outstanding residual amount shall bear interest of 5 percentage points above the base interest rate and in the case of legal transactions in which no consumer is involved, 9 percentage points above the base interest rate. In the case of a default by a Purchaser who is a merchant, we are in addition entitled to charge a collection fee of EUR 40.00. The collection fee shall be set off against any damages which are owed as far as the damages are based on costs of the pursuit of legal rights.

7.3 If the Purchaser despite a warning notice does not comply with the payment terms or if the financial circumstances of the Purchaser deteriorate such that there are justified doubts as to his ability to make payments or creditworthiness, we can make further deliveries/services dependant on the Purchaser providing sufficient security. If the Purchaser is not in a position to do so, we are entitled to rescind the contract, if appropriate after setting a time limit.

7.4 The Purchaser is only entitled to apply set-off and to assert a right of retention based on claims which have been finally adjudicated or which are undisputed. This does not apply for the reciprocal claims which are characteristic for the exchange of the main performance and counter-performance under the contract. The right of retention is limited to a counterclaim arising from the same contractual relationship.

8. INFORMATION, WARRANTY

8.1 The information in our catalogues, brochures, list of types, data sheets and other advertising writings, in specifications, specification sheets and other technical delivery terms, in certificates and other forms or documents are not guarantees which go beyond the normal warranty.

8.2 In the case of any reliability information (useful life, long-term stability, etc.) statistically determined average values are involved. They are provided according to best knowledge and belief, but in a particular case may be

Commissioning
and Maintenance,
Index, Standard Terms
of Sale and Delivery

exceeded or not reached.

8.3 For the rights of the Purchaser in the case of physical defects and defects in title (including incorrect and insufficient delivery as well as improper assembly or defective assembly instructions), the statutory provisions apply as far as nothing is stipulated otherwise below. A defect in particular does not exist to the extent that we have performed our services in accordance with the illustrations proved by the Purchaser or data provided by the Purchaser.

8.4 If the Purchaser is a merchant, he shall inspect or cause to be inspected the delivery or service without delay after receipt as to proper delivery or service, completeness and apparent defects.

8.5 If the Purchaser is a merchant, he loses the right to refer to a defect if he does not notify us thereof within seven (7) calendar days after the day on which he determines it or should have determined it, and exactly specifies the manner of non-compliance with the contract. The timely sending of the notice is sufficient to comply with the time limit.

8.6 If the Purchaser objects to a defect, he must provide to us the allegedly defective parts or devices or allow us a review of such parts in his premises during the usual business hours and provide us with the necessary time and opportunity for the replacement performance.

8.7 If the delivery or a work service is defective, we can initially choose whether we provide a replacement performance through elimination of the defect (improvement) or through delivery of a defect-free item (replacement). Depending on a particular case we are entitled to at least three (3) improvement attempts.

8.8 If only an individual part of the facility is to be exchanged, we can request that the Purchaser himself replaces that part of the installation which is provided to him by us if the costs for the sending of the technical personnel are disproportionately high.

8.9 The warranty period is

8.9.1 two years, if the Purchaser is a consumer.

8.9.2 one year, if the Purchaser is a merchant.

8.9.3 two years for all DVGW-certified devices, including for industrial and commercial use, as far as the special stipulation of the SHK liability assumption agreement with the German Sanitation, Heating and Air-Conditioning Association (ZVSHK) applies to the contractual relationship between us and the Purchaser. All requirements of that agreement must be fulfilled, in particular the compliance with the applicable operation manual as well as the proper assembly, start-up and maintenance.

8.9.4 one year in the case of used goods (consumer and merchant).

8.10 The warranty does not – as far as not stipulated otherwise in this Section 8 – cover wear-and-tear parts such as sealings, ion exchange resins, membranes, etc. and damages which arose through excessive electrical voltage, frost or improper treatment, operation and maintenance, in particular in deviation from the operation manual. Our liability is also excluded for damages which arose through the use of unsuitable dosing solutions and chemicals.

8.11 Services which do not serve to remove defects in connection with the warranty shall be invoiced separately to the Purchaser.

8.12 After an unsuccessful replacement performance, in relation to the defect removal the Purchaser retains the right at his option to rescind the contract or to reduce the agreed compensation. The right to damages instead of performance shall not be affected thereby.

8.13 The place of performance for the replacement performance is in the case of companies the place of the registered office of Grünbeck, unless the defective products or parts thereof cannot be disassembled. In that case the place of performance of the replacement performance is the agreed place of delivery of the affected product/installation.

8.14 In cases of breach of warranty concerning installations which are not installed in Germany, the warranty service shall be undertaken by the local customer service authorized by Grünbeck as far as it exists. If in a particular country no customer service exists, the customer service of Grünbeck ends at the German border in cases in which the Purchaser is a merchant. All other costs arising in this connection, except material, shall be borne by the Purchaser.

9. RETURNS

9.1 The return of new goods with original packaging can only occur after prior agreement and only within twelve (12) months after the delivery date. The return fee amounts to

20 % of the net merchandise value. No credit note can be issued for returns which have a net merchandise value of EUR 50.00 after deduction of the return fee. Any necessary processing costs shall be charged separately. The return must be made free of charge to the address mentioned by us.

9.2 A return of goods with a limited expiry date (e.g. chemicals) will not be accepted by us. The same applies for the return of goods which are manufactured according to the Purchaser's specifications.

9.3 After prior agreement defective goods can also be returned. Repairs shall be made after a cost estimate. If the Purchaser does not respond to our cost estimate within 8 weeks, we are entitled to return the defective goods to the Purchaser at his expense and to charge the expense incurred by us to the Purchaser.

9.4 For the purpose of the return the Purchaser shall receive an RMA number which must be indicated at the time of return.

10. LIMITATION OF LIABILITY

10.1 If nothing is stipulated to the contrary, the following exclusions and limitations of liability apply for our liability, regardless of the legal grounds, subject to the other statutory claim requirements, and which also apply for our employees, agents and other third parties whom we engage for the performance of the contract.

10.2 The following liability limitations however do not apply as far as we have fraudulently concealed a defect, provided a guarantee for the quality of the merchandise, claims of the Purchaser exist under the Product Liability Act or injury to body or health are caused.

10.3 We are liable for damages as far as we are responsible for intentional actions or gross negligence. In the case of simple negligence we are only liable for damages arising from injury to life, limb or health and for damages arising from the breach of a material contractual duty (obligation the fulfillment of which first makes possible the proper performance of the contract and on the fulfillment of which the contractual partner as a rule relies and is entitled to rely). Where there is a breach of substantial contractual obligations, in the case of simple negligence our liability is limited to the indemnification of the foreseeable, typically arising damages.

10.4 If the Purchaser is a merchant, we are liable – except in the case of liability for intentional acts – for any damages which do not result from injury to life, limb or health or under the German Product Liability Act and only up to a maximum amount of EUR 250,000.00 per calendar year. If our insurance company pays a higher amount for the claims asserted by the Purchaser than this maximum amount, this higher paid out amount constitutes the maximum amount.

10.5 The Purchaser may only rescind or terminate the contract due to a breach of duty which does not constitute a defect if we are responsible for the breach of duty. Other rights of termination of the Purchaser are excluded.

11. FORCE MAJEURE

11.1 We are not liable for force majeure events which make the performance of the contractual services substantially more difficult for us, which temporarily obstruct or make impossible the proper implementation of the contract. Force majeure shall be deemed to be all circumstances which cannot be foreseen or influenced by us and the Purchaser and which arise after conclusion of the contract, including but without limitation natural catastrophes, blockades, war and other military conflicts, mobilization, strikes or lock-outs.

11.2 As far as we are prevented from the fulfillment of the contractually agreed obligations through force majeure, this shall not be deemed to be a contractual violation and the contractually agreed deadlines shall be reasonably extended in accordance with the duration of the hindrance. The same applies as far as services are performed by third parties and they provide performance to us with delay due to force majeure. If the force majeure circumstances or circumstances outside the sphere of influence of the contracting party last longer than two (2) months, the contracting parties shall reach an agreement on the continuation of the contract within one (1) week.

12. RESERVATION OF TITLE

12.1 Until the fulfillment of all claims (including all outstanding balance claims based on the current account) to which we are entitled for any legal reasons against the Purchaser now or in the future, the goods remain our property.

12.2 The goods which are subject to the reservation of title

may not be pledged to third parties nor transferred by way of assignment until complete payment of the secured claims. The Purchaser shall inform us in writing without delay if and the extent seizures of the goods belonging to us made are made by third parties. In the case of seizures by third parties of the goods which are subject to a reservation of title, the Purchaser shall refer to our ownership and inform us without delay.

12.3 The Purchaser is entitled to resell and/or process in the ordinary course of business the goods which are subject to the reservation of title. In this case the following provisions have supplementary application.

12.3.1 The reservation of title extends to the processing of products created through the processing, mixing or combination of our goods in their full value; we shall be deemed to the manufacturer. If in the case of processing, mixing or combination with the goods of third parties their right of ownership remains in place, we shall acquire co-ownership in the ratio of the invoice values of the processed, mixed or combined goods. In other respects the same applies for the created product as for the goods delivered subject to the retention of title.

12.3.2 The claims against third parties arising from the resale of the goods or the created product are hereby assigned to us by the Purchaser in full or in the amount of any co-ownership in accordance with Section 12.3.1 above by way of security. We accept the assignment. The obligations of the Purchaser mentioned in Section 12.2. also apply with respect to the assigned claims.

12.3.3 The Purchaser remains entitled to collect the claim in addition to us. We do not agree to collect the claim as long as the Purchaser complies with his payment obligations toward us, does not default on payment, no application for the commencement of an insolvency proceeding has been made and there is no other deficiency in his payment capability. If this is however the case, we can request that the Purchaser disclose the claims assigned and the debtors thereof, provide all information necessary for collection, deliver the associated documents and inform the debtors (third parties) of the assignment.

12.3.4 If the realizable value of the security exceeds our claims by more than 10 %, we shall at the request of the Purchaser release security of our selection.

13. CONFIDENTIALITY

Each contracting party shall keep secret the information received from the respective other party. This also applies after fulfillment of the delivery or services. This obligation does not apply (i) for information which was legitimately known to the receiving party upon receipt without a duty of confidentiality or (ii) thereafter legitimately becomes known without a duty of confidentiality or (iii) which are or become generally known without a breach of contract by one of the parties. The same applies for information which is developed by a contracting party independently of the information received in connection with the delivery or fulfillment of services. Each party reserves ownership and any rights to the documents or data carriers provided. Duplications and the passing on of such documents or data carriers is only permissible with the consent of the providing contracting party.

14. APPLICABLE LAW, PLACE OF JURISDICTION, SEVERABILITY

14.1 The law of the Federal Republic of Germany, with the exception of the UN law on the sale of goods (CISG), has exclusive application.

14.2 The exclusive place of jurisdiction for all disputes arising directly or indirectly in connection with the contractual relationship is Dillingen/Donau. We are however entitled to also raise claims against the Purchaser at the place of the registered office of the Purchaser.

14.3 As far as individual provisions of this agreement are or become invalid in whole or in part, the validity of the remaining contractual provisions shall not be affected thereby. In place of the void or invalid provision the parties shall agree on a valid provision which comes as close as possible to it in a commercial sense as far as a supplementary interpretation of contract does not have priority or is not possible. The same applies accordingly as far as the contract contains a lacuna not intended by both contracting parties.

Status: January/2016

Product range

- Water filters
- Dosing
- Softening
- Alternative anti-scaling
- Heating water treatment
- System separators
- Automatic flushing systems for initial flushing and sanitation
- UV disinfection
- Chemical disinfection systems to fight legionella
- Partial and full demineralisation systems
- Selective ion exchangers
- Microfiltration
- Ultrafiltration
- Nanofiltration
- Reverse osmosis
- Cooling water treatment
- Condensate cleaning
- Drinking and industrial water treatment
- Deferrisation, demanganisation and deacidification
- Arsenic removal
- Brewing water treatment
- Boiler feed water treatment
- Water treatment for district heating systems
- Swimming pool technology
- Whirlpools
- Waste water and recycling technology
- River water treatment
- Brackish water desalination
- Private water supply



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Company profile

Grünbeck Wasseraufbereitung GmbH
Josef-Grünbeck-Str. 1
89420 Hoehstaedt
GERMANY

General managers
Dr. Günter Stoll (chairman)
Peter Lachenmeir

Staff
Headquarters: approx. 550
Entire organisation: approx. 800

Sales organisation
Subsidiaries and authorised representations
in Germany, representations in all EU
member countries as well as associated
partners world-wide

Certifications
DIN EN ISO 9001, ISO 14001,
SCC® by TÜV Management Service,
OHRIS

Product approvals
DVGW, SVGW, ACS, EAC

Approvals
for welding, specialised welding company
according to DIN EN ISO 3834-2.
Manufacturing of pressure equipment
according to the Pressure Equipment Directive
97/23/EC as per AD 2000 data sheet HPO
and DIN EN 13480. Manufacturer of steel
constructions according to DIN EN 1090
and DIN 18800-7



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