

Catalogue

Residential Applications

Sanitary and Heating



Disinfection of drinking water pipes by means of MOBIdos - easy and convenient

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.



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Catalogue 2013 - Edition 1.0

Valid from January 1, 2013. The information in this catalogue supersedes all previous information. For our additional product range, please refer to our separate catalogues.

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

We reserve the right to technical modifications and errors.

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Fine Filters,
Backwash Filters

Safety Devices,
Flushing and Sanitation,
Dosing Technology

Alternative
Anti-Scaling

Softening
Residential

Softening
Trade/Industry

Membrane
Technology

Disinfection
Private Water Supply

Heating Water

Cooling Water
Treatment

Water Monitoring

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 products form deposits in 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.

Everything you need

	Dosing Technology EXADOS®	Alternative Anti-Scaling System GENO-K4®	Water Softeners VFX/VGX	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 ● no scaling in shower & at perlators ● no 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/sulfate reduction, partial or full demineralisation of process water for industrial use, deferrisation and demanganisation, etc. require the assistance of an expert for water treatment.

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

- Expert consulting with on-site examination and expertise
- 5 year warranty for filters (2 years for FM and MX/MXA)
- Water analyses
- 20 years of guaranteed spare parts supply for filter elements
- 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 filter installation

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.

Time for filter installation

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 > 150 µm (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)

You clean this type of filter by replacing the filter element (filter cartridge) so that the original filter fineness is restored (pressure loss). **For hygienic reasons, the filter cartridge (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 100 % – „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 and reach the drain 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 100 %. 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"



GENO®-fine filter FS-B 2"

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)
- Filter fineness of 50 µm, 20 µm and 5 µm can be retrofitted

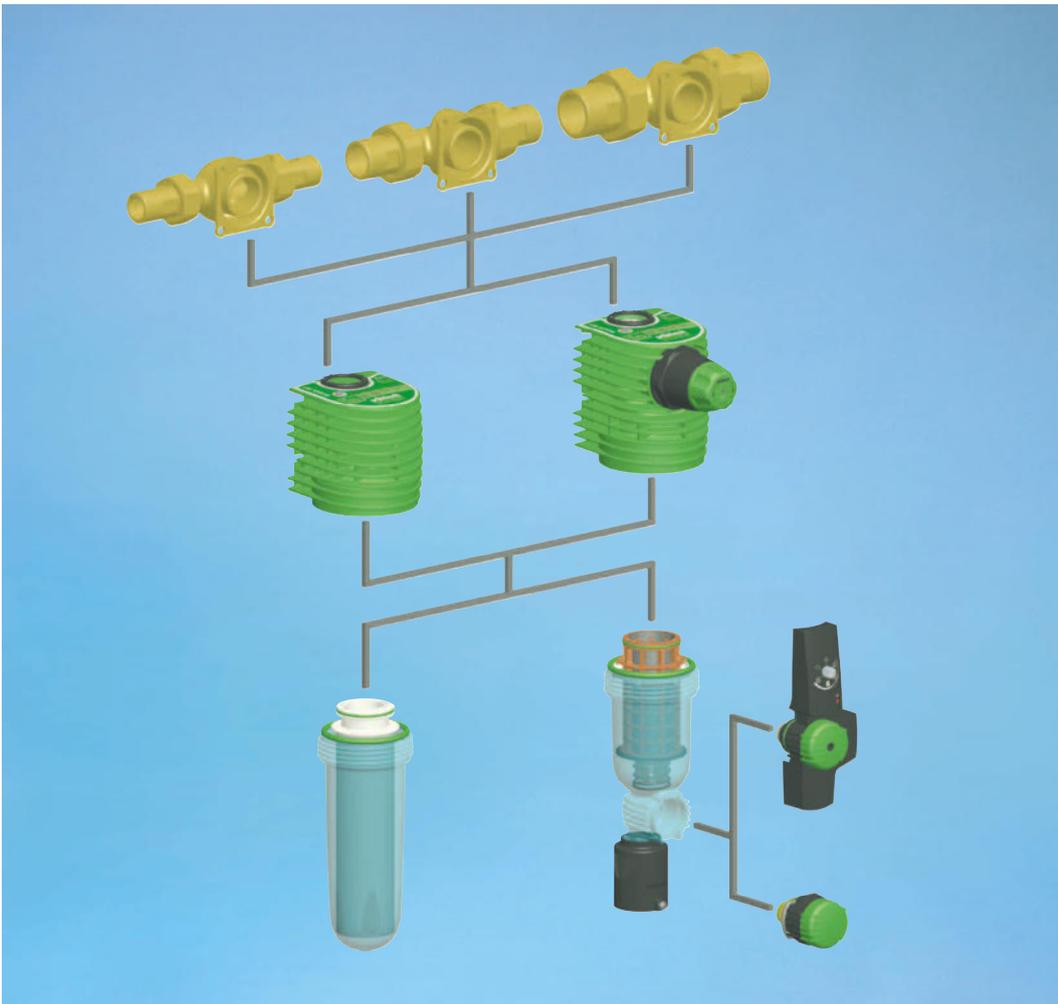
GENO®-fine filter FS-B (R)	1"	1 1/4"	1 1/2"	2"
Flow rate $\Delta p = 0.2$ bar [m ³ /h]	3.7	4.0	11.1	13.9
Flow rate $\Delta p = 0.5$ bar [m ³ /h]	6.0	6.2	19.9	23.3
Installation length without screw connections [mm]	100	100	160	160
Installation length with screw connections [mm]	182	191	283	277
Installation height [mm]	265	265	508	508
Height for replacement of filter element [mm]	150	150	390	390
Order quantity per pallet (800 mm x 1,200 mm)	150 pcs	150 pcs	48 pcs	48 pcs
Order no. (RG 8)	101 170	101 175	101 180	101 185

Refer to page 14 for GENO®-fine filters DN 50 - DN 200

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.
Pressure gauge 1", to indicate operating pressure	100 860
Pressure gauge 1 1/4", to indicate operating pressure	100 865
Pressure gauge 1 1/2", to indicate operating pressure	100 870
Pressure gauge 2", to indicate operating pressure	100 875
Pressure gauge for fine filter S-WW	100 890



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 cleaning agents.

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 delivery for all types.



Fine filter BOXER® K 1"



Fine filter BOXER® KD 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 cleaning agents, 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)
- Can also be retrofitted with filter elements of 50 µm, 20 µm and 5 µm fineness.

Fine filter BOXER® K/KD	3/4"	1"	1 1/4"
Flow rate BOXER® K, $\Delta p = 0.2$ (0.5) bar [m ³ /h]	2.8 (4.5)	3.7 (6.0)	4.0 (6.3)
Flow rate BOXER® KD, acc. to DIN EN 1567 [m ³ /h]	2.3	3.6	5.8
Installation length without screw connections [mm]	100	100	100
Installation length 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 8)	101 205	101 210	101 215
Order no. BOXER® KD (RG 8)	101 255	101 260	101 265



Backwash filter BOXER® R 1"



Backwash filter BOXER® RD 1"

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 cleaning agents – and self-closing non-return 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 fabric 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, incl. 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	3/4"	1"	1 1/4"
Flow rate BOXER® R, $\Delta p = 0.2$ (0.5) bar [m ³ /h]	2.9 (4.7)	3.8 (5.9)	4.2 (6.7)
Flow rate BOXER® RD, acc. to DIN EN 1567 [m ³ /h]	2.3	3.6	5.8
Installation length without screw connections [mm]	100	100	100
Installation length with screw connections [mm]	185	182	191
Installation height including outlet funnel DN 40 BOXER® R [mm]	280	280	280
Installation height including outlet funnel DN 40 BOXER® RD [mm]	298	298	298
Order no. for BOXER® R (RG 8)	101 305	101 310	101 315
Order no. for BOXER® RD (RG 8)	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 cleaning agents – and self-closing non-return 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 fabric 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 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, incl. 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	3/4"	1"	1 1/4"
Flow rate BOXER® A, $\Delta p = 0.2$ (0.5) bar [m ³ /h]	2.9 (4.7)	3.8 (5.9)	4.2 (6.7)
Flow rate BOXER® AD, acc. to DIN EN 1567 [m ³ /h]	2.3	3.6	5.8
Installation length without screw connections [mm]	100	100	100
Installation length with screw connections [mm]	185	182	191
Installation height including outlet funnel DN 40 BOXER® A [mm]	280	280	280
Installation height including outlet funnel DN 40 BOXER® AD [mm]	298	298	298
Order no. for BOXER® A (RG 8)	101 405	101 410	101 415
Order no. for BOXER® AD (RG 8)	101 455	101 460	101 465



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, resistant to dezincification) 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 cleaning agents, 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 according to DIN EN 13443-1: 0.1 mm (100 µm)
- Operating pressure 2 - 16 bar

Backwash filter KICKER® [R]	1 1/2"	2"
Nominal connection diameter [DN]	40	50
Flow rate, Δp 0.2 (0.5) bar [m³/h]	8.1 (13.5)	9.0 (15.0)
Upper/lower filter fineness [µm]	120/80	120/80
Nominal pressure (PN) [bar]	16	16
Installation height incl. outlet funnel DN 50	520	520
Installation length with/without screw connection [mm]	283/160	277/160
Distance to wall (centre of pipe) [mm]	65	65
Max. water temperature [°C]	30	30
Order no. (RG 8)	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.
Pressure gauge to indicate operating pressure 1 1/2"	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 dezincification-free 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 rinsing 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"	1 1/4"	1 1/2"	2"
Flow rate, $\Delta p = 0.2$ (0.5) bar [m ³ /h]	8.5 (13)	12.0 (18.5)	22.0 (30)	27.0 (38.5)
K _v value [m ³ /h]	18.0	25.0	46.0	56.0
Installation length without screw connections [mm]	190	190	206	206
Installation length with screw connections [mm]	276	281	342	323
Order no. MX (RG 8)	107 400	107 405	107 410	107 415
Order no. MXA (RG 8)	107 450	107 455	107 460	107 465

Extra charge for filter elements 50, 200 and 500 µm (RG 8)

Extra charge for safety device (RG 8) (only MXA), solenoid valve to interrupt backwash process in case of power failure.



GENO®-backwash filter MX with flange connection



GENO®-backwash filter MXA with flange connection

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 dezincification-free 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 rinsing water connection to clamp HT pipe DN 50, two pressure gauges.

GENO®-backwash filter MXA



Fully automatic version, with additionally 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
- Water temperature max. 90 °C
- Power supply 230 V, 50 Hz (MXA)

GENO®-backwash filter MX/MXA [DN]	65	80	100
Flow rate, $\Delta p = 0.2$ (0.5) bar [m ³ /h]	30 (47)	60 (96.5)	60 (98)
K _v value [m ³ /h]	69	124	138
Installation length without counter-flanges [mm]	220	250	250
Order no. MX (RG 13)	107 420	107 425	107 430
Order no. MXA (RG 13)	107 470	107 475	107 480

Extra charge for filter elements 50, 200 and 500 µm (RG 13)

Extra charge for safety device (RG 13) (only MXA), solenoid valve to interrupt backwash process in case of power failure.



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, inside and outside plastic-coated. User-friendly cover fastener, drain valve, deaeration, pressure gauges for raw and pure water, with initial equipment of filter elements 80 µm.

FME = pure stainless steel made of 1.4404 (DN 60, 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
- 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 [DN]	FME				FM	
	50	65	80	100	150	200
Flow rate, $\Delta p = 0.2$ bar [m ³ /h]	30	40	50	70	150	280
Installation length [mm]	360	360	360	484	690	690
Filter elements [pieces]	2	2	3	5	14	14 x 2*
Empty weight [kg]	22	23	23,5	32,5	100	124
Order no. FME/FM (RG 13)	102 190	102 290	102 390	102 490	102 400	102 500
Order no. FME/FM-WW** (RG 13)	102 185	102 285	102 385	102 485	102 401	102 501
Order no. FME/FM-KW*** (RG 13)	102 195	102 295	102 395	102 495	102 470	102 570

* For FM-KW 200, only order the 14-pack filter cartridges once. ** Warm water *** Cooling water

Accessories for cartridge and backwash filters

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

	Order no.	(RG 13)
Differential pressure switch	102 870	
Hose extension set for FM 150 - 200	102 850	



GENO®-fine filter S-WW

GENO®-fine filter S-WW

Hot water fine filter for temperatures up to 90 °C, housing made of high-grade 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"	1 1/2"
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 13)	101 810	101 710

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

Accessories for GENO®-fine filters

Set of seals, suitable for filter type	PU	Order no.	(RG 8)
Fine filter FS 1" + FSD 1"	3 sets	100 001	
Fine filter FS 1 1/4" - 2" + FSD 1 1/4" - 2"	3 sets	100 002	
Fine filter FS-B 1 1/2" + 2"	1 set	101 639e	
BOXER®/Fine filter FS-B 1" + 1 1/4"	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.
Belt wrench for all filters up to R 2"	105 805
Spigot wrench for pressure reducers (wrench size 48)	104 805

Adapter sets
Adapter sets for all filters

Replacement filter elements

Replacement filter elements	(size)		Order no. (RG 8)													
	FS-B 1" and FS-B 1 1/4"	FS 1" and FS-B 1 1/4"	FS 1 1/4" - 1 1/2"	BOXER® KKD	GENO® pur/GENO®-KOMBI G8	GENO®-KOMBI FSV	GN 3/4" : 1" : 1 1/2"	GN 1 1/4" and 2"	5 1" (up to model 1978)	5 1" WW (up to model 1978)	5 1" WW-K (up to model 1990)	5 1 1/4" (up to model 1990)	5 1 1/2" - 2" : FME/FM 50 - 150	FM 200	Packing unit:	Order no. (RG 8)
Suitable for filter type	(1)	(3)	(1)	(2)	(3)	(1)	(2)	(1)	(-)	(6)	(2)	(1)	(5)	(5)	(2)	(4)
With protective cylinder and O-ring																
80 µm with protective cylinder	X			X												103 007
80 µm with protective cylinder		X														103 008
80 µm with protective cylinder			X													103 009
50 µm with protective cylinder	X			X												103 001
50 µm with protective cylinder		X														103 002
50 µm with protective cylinder			X													103 003
20 µm with protective cylinder	X			X												103 067
5 µm with protective cylinder	X			X												103 061
5 µm with protective cylinder		X														103 062
5 µm with protective cylinder			X													103 063
Without protective cylinder																
80 µm without protective cylinder	X		X	X							X					103 075
80 µm without protective cylinder		X										X				103 076
80 µm without protective cylinder			X										X			103 077
50 µm without protective cylinder	X			X												103 068
50 µm without protective cylinder		X														103 069
50 µm without protective cylinder			X													103 070
50 µm without protective cylinder												X				103 044
50 µm without protective cylinder													X			103 100
50 µm without protective cylinder														X		103 153
20 µm without protective cylinder	X		X	X												103 071
5 µm without protective cylinder	X		X	X												103 081
5 µm without protective cylinder		X														103 082
5 µm without protective cylinder			X													103 083
100 µm without protective cylinder															X	103 150
100 µm without protective cylinder															X	103 110
500 µm without protective cylinder															X	103 111
500 µm without protective cylinder															X	103 151
Others																
100 µm without protective cylinder																100 651

Safety devices

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

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	●	●			

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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 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 dezincification-free brass up to type R 1 1/4" and of red bronze from type R 1 1/2". 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 dezincification-free 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 1/2" female thread to 3/4" male thread, three connection points for test pressure gauges for maintenance according to DIN EN 806-5.

GENO®-DK 2 [R]	1/2"	3/4"	1"	1 1/4"	1 1/2"	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 con. [mm]	153	153	187	187	274	274	83
Installation length with screw con. [mm]	227	227	280	280	387	395	130
Min. distance to wall [mm]	60	60	70	70	90	90	35
Installation height including 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 5)	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 with operating position indicator

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



System separator made of red bronze with flange connections 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**)

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				Sphero-cast coated		
Recommended max. flow [m ³ /h]	25	35	50	80	227	363	523
K _v value Δp = 1.0 bar [m ³ /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	103	111	142
Op. weight, approx. [kg]	16	19.8	33.1	34.2	123	150	201
Order no. (RG 13)	132 460	132 465	132 470	132 475	132 720	132 725	132 730

Operating position indicator for system separator GENO®-DK-Maxi

Enables fully automatic relief according to DIN EN 12729. The system separator can be set to separating position by means of an external contact (building management system) or by means of a button at the control electronics. Transmission of current operating position and error signals to building management system by means of voltage-free change-over contacts.

	Order no.
Operating position indicator for GENO®-DK-Maxi DN 150	132 845
Operating position indicator for GENO®-DK-Maxi DN 200/250	132 850

Service set for Euro system separators | suitable for all types

For pressure zone inspection according to DIN EN 12729 and maintenance according to DIN EN 806-5.

	Order no. (RG 13)
Service set for Euro system separators	132 095

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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 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, draining 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]	3/4"
Nominal connection diameter [DN]	20
Nominal capacity [m³/h]	2.0
Pressure control [bar]	4 (adjustable from 2.5 to 4)
Power supply [V, Hz, kW]	230, 50, 1.1
Order no. (RG 13)	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 flexible connection hoses 800 mm including seals and connecting pieces.

	Order no. (RG 13)
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 drinking water quality. Therefore, the system should be cleaned by means of flushing during start-up and afterwards – depending on the water hardness – appropriate steps to prevent scaling should be taken. 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 Drinking Water Ordinance.

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A 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 22)
- **Microbiologically contaminated water caused by dirty pipes**
 - Flushing of the pipes by means of a water/air mix (refer to page 22)
 - Disinfection of pipes (refer to page 24)
- **Scale deposits in parts and components**
(water heaters, heat exchangers, central heating boilers, cooling towers, ...)
 - Removal of scale and rust from parts and components (refer to page 25)
- **Rusty water flowing from galvanised pipes caused by corrosion**
 - Flushing of the pipes by means of a water/air mix (refer to page 22)
 - Sanitation of the pipes by dosing mineral-based agents (refer to page 26 - 29)
- **Preventive protection against scaling**
 - Hardness stabilisation by dosing mineral-based agents (refer to page 26 - 29)
 - Alternative anti-scaling (refer to page 34 - 35)
 - Softening by means of ion exchange (refer to page 36 - 52)

B Supportive tools for the planning, realisation and documentation of your requirements

- **Training**
 - Training courses
- **Planning and realisation**
 - Flushing and sanitation manual
- **Realisation and documentation**
 - Checklists, operation logs



GENO®-flushing compressor 1988 K



Case with connection fittings 3/4" up 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 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 82).

GENO®-flushing compressor	1988 K
Nominal connection diameter [R]	1"
Max. flow [m ³ /h]	5
Operating mode	continuous operation S1
Power supply [V, Hz]	230, 50
Order no. (RG 13)	151 200

Accessories	Order no. (RG 13)
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	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*	151 080
Hose extension set (for flushing compressor and MOBIdos)	151 820

*Also suitable for MOBIdos dosing system (see page 24).



Flushing fitting with closing plug



Flushing water relief tank

Safety Devices,
Flushing and Sanitation,
Dosing Technology

NEW

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} [m ³ /h]	5
Inlet connection	6 x hose nipple 13 mm (union nut 3/4")
Outlet connection	HT pipe DN 100
Dimensions (without connections) (w x d) [mm]	400 x 300
Height of relief tank	340 mm
Height including lower "accessory box"	660 mm
Height of inlet connection (without/with lower box)	258/581 mm
Height of outlet connection (without/with lower bow)	175/498 mm
Order no. (RG 13)	151 020

Accessories

Order no. (RG 13)

Case with closing plugs, 60 closing plugs 1/2", also suitable for the pressure test, can be expanded by flushing fitting for the flushing process	151 160
Set of closing plugs, box of 20 closing plugs 1/2"	151 170
Case with flushing fittings, 20 flushing fittings with accessories, to be connected to the closing plug in order to perform the flushing	151 180
Adjusting piece* 1" (installation length without screw connection 190 mm)	128 001
Adjusting piece* 1 1/4" (installation length without screw connection 190 mm)	128 401
Adjusting piece* 1 1/2" (installation length without screw connection 330 mm)	128 402
Adjusting piece* 2" (installation length without screw connection 330 mm)	128 403

* 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 flushing compressor, a dosing system, a softener or as an intermediate component to flush long pipes (screw connections and seals are included in the scope of supply).



Dosing system MOBIdos



Disinfectants

NEW

Dosing system MOBIdos

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

The mobile dosing system MOBIdos 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 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 disinfectants applied and for the dripping water.

Dosing system MOBIdos

Flow Q_{max} [m ³ /h]	5
Nominal flow Q_{max} (m ³ /h)	3.5
Power supply	230 V, 50 Hz
Nominal connection diameter	1" (optional case with connection fittings 3/4" – DN 80)
Dimensions (w x h x d)	600 x 340 x 400 mm
Order no. (RG 13)	160 150

Disinfectants and accessories

Disinfectants and accessories	Order no.	
GENO®-Chlor A (25 kg)	210 012	(RG 14)
GENO®-perox (1 litre)	170 320	(RG 13)
GENO®-perox (10 litres)	170 325	(RG 13)
GENO®-Baktax (3 litres)	170 450	(RG 13)
GENO®-Baktax (10 litres)	170 460	(RG 13)
GENO®-Baktax (20 litres)	170 470	(RG 13)
Sodium sulphite (5 kg)	170 306	
Water test kit for chlorine, 10 – 160 mg/l (20 analyses)	170 138	(RG 13)
Water test kit for chlorine, 0.1 – 2 mg/l + pH value 6.9 – 8.2 (150 analyses)	170 128	(RG 13)
Water test kit for peroxide, 100 – 1,000 mg/l (100 analyses)	170 167	(RG 13)
Water test kit for peroxide, 0.5 – 25 mg/l (100 analyses)	170 136	(RG 13)
Water test kit for chlorine dioxide, 0.02 – 0.55 ppm (300 analyses)	170 430	(RG 13)
Digital test device Scuba +	211 145	
Indicator for Scuba+, DPD 1 (50 tablets)	211 221	

Systems for temporary continuous disinfection

of drinking and industrial water

- GENO®-Chlor A → Dosing systems GENODOS® DM-T (refer to page 63)
- GENO®-Baktax → Dosing systems GENODOS® DM-B and DM-BO (refer to page 64 - 65)
- GENO®-Baktax → Chlorine dioxide generation systems GENO®-Baktax Pro (refer to page 66)



Descaling flushing device



Flow reversal

Launch:
April 2013.

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NEW

Descaling 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 dry self-priming impeller pump with stainless steel housing
- a dirt filter with inspection window upstream of the pump
- a pressure relief valve at the outlet of the pump
- acid-resistant connections, suction and pressure hose of 3 m each
- a replaceable plastic canister with shut-off valve, incl. screw lid with return flow connection and pressure compensating valve
- a filter bag for highly polluted or silted media
- a carrier with telescopic handle and pneumatic tires.

	Order no.
Descaling flushing device	151 220

Flow reversal for descaling flushing device

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.

	Order no.
Flow reversal for descaling flushing device	151 225

NEW

Agents to remove scale and rust

For components such as drinking water heaters, heat exchangers, boilers, cooling towers. Do not use for covered (in-wall) or inaccessible components and pipes.

	Order no.	
GENO®-clean CP, 10 x 1 litre	170 022	(RG 14)
GENO®-clean CP, 22 kg (18.3 litres)	170 028	(RG 14)
GENO®-Kalklöser (scale remover), 11 kg	170 010	(RG 5)
GENO®-Kalklöser (scale remover), zinc-resistant, 10 x 1 litre	170 012	(RG 5)
GENO®-Passivierungspulver (passivation powder), 3.5 kg	170 015	(RG 5)
Neutralisation agent FNK, 20 kg	180 300	(RG 13)
Water test kit for pH 4.5 - 10	170 148	(RG 13)

Sales only after consultation
with Grünbeck.

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 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*
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)** up to 21 °dH Corrosion protection: 1 (soft) up to 8.4 °dH
spezial P	Corrosion protection in systems made of galvanised, ferrous materials which are already corroded by means of alkalinisation and formation of a protective silicate-phosphate layer.	1 (soft) up to 8.4 °dH
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 8.4 °dH
rot	Corrosion protection in systems made of metallic materials due to the formation of a stable, protective phosphate layer.	1 (soft) 3 up to 8.4 °dH <hr/> > 2 °dH 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 > 3 °dH; corrosion protection up to 60 °C.	1 - 2 (soft to medium) 3 up to 14 °dH <hr/> 2 up to 10 °dH 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) ** > 14 up to 21 °dH <hr/> 5 up to 15 °dH 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)** starting from 15 °dH
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)** up to 21 °dH

* 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.

** Starting from a hardness > 21 °dH, 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 with 3 l each**
- Order quantity per pallet (800 mm x 1,200 mm): 36 boxes (1 bottle is sufficient to treat 30 m³ of water)

Mineral-based dosing solution	Order no.	(RG 5)
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 canisters* (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 5)
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	

* 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



Dosing computer EXADOS® EK 6*



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 screw connections or flanges, control and pumping unit, mounting accessories for pipe-mounting or wall-mounting, 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, 24 V, 50 Hz
- Max. water temp. 30 °C at installation point
- 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 1 1/4"	R 1 1/2"	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 w. screw con. [mm]	276	276	280	312	356	–	–
Installation length with flanged connections [mm]	–	–	–	–	–	310	310
Order quantity per pallet [800 x 1200 mm]	16 pcs	16 pcs	16 pcs	16 pcs	6 pcs	–	–
Order no.	115 100 (RG 5)	115 200 (RG 5)	115 300 (RG 5)	115 400 (RG 5)	115 500 (RG 5)	115 501 (RG 13)	115 502 (RG13)

Accessories

	Order no.	(RG 5)
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** made of PE (100 l, Ø 465 mm, height 770 mm)	115 800	
Supply tank** made of PE (200 l, Ø 500 mm, height 1000 mm)	115 810	

* The dosing tank is not included in the scope of supply
 ** With suction lance and level control



Dosing system GENODOS® DME*



Dosing system GENODOS® DM

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Dosing systems GENODOS® DME



Volume-controlled dosing of mineral-based EXADOS®-agents in commercial and industrial buildings, as complete 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, with pump head made of chemical resistant plastic, synchronous motor 230 V, 50/60 Hz, 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 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: 8 bar up to DM/DME 30
6 bar starting from DM/DME 80
- Dosing capacity 100 ml/m³
- Min. temperature 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 1 1/4"	R 1 1/2"	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 5)	163 435	163 445	163 455	163 465	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. These accessories as well as the respective dosing tanks may be selected as required from the accessories indicated on pages 28, 30, 31, 32 and 33.

Dosing systems GENODOS® DM	6	10	20	30	80	100
Order no. (RG 13)	163 145	163 155	163 165	163 175	163 185	163 195

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



Suction lance for transportation canister



Dosing tank with automatic stirring device

Suction lances/Dosing tanks/Collecting tanks

The agents are withdrawn either by means of

- Suction lances for 10/20 kg transportation canisters or dosing tanks provided by others on site, made of PVC, with bottom filter, foot valve, 1.5 m suction and return hose as well as float switch with two switching points as pre-alarm and empty signal (dry run protection).
- Dosing tank with hand mixer or automatic stirring device with stirring controller and shock-proof plug, suction lance with bottom filter, foot valve, 1.5 m suction and return hose as well as float switch with two switching points as pre-alarm and empty signal (dry run protection).

	Order no.	RG
Suction lance for transportation canisters (465 mm long)	118 510	13
Suction lance for dosing tank (750 mm long) provided by others on site	118 520	13
Dosing tank 60 litres, outside diameter 450 mm, height 550 mm with suction lance and hand mixer	163 281	13
as above, but with automatic stirring device	163 291	13
Dosing tank 100 litres, outside diameter 465 mm, height 780 mm with suction lance and hand mixer	163 282	13
as above, but with automatic stirring device	163 292	13
Dosing tank 200 litres, outside diameter 560 mm, height 955 mm with suction lance and hand mixer	163 283	13
as above, but with automatic stirring device	163 293	13
Dosing tank 300 litres, outside diameter 680 mm, height 955 mm with suction lance and hand mixer	163 284	13
as above, but with automatic stirring device	163 294	13
Dosing tank 500 litres, outside diameter 800 mm, height 1070 mm with suction lance and hand mixer	163 285	13
as above, but with automatic stirring device	163 295	13
Chemical collecting basin for 20 l canisters	210 560	14
Chemical collecting basin for 35 l canisters	210 570	14
Chemical collecting basin for 60/100 l dosing tank	163 805	13



Dosing pump GENODOS® GP

Safety Devices,
Flushing and Sanitation,
Dosing Technology

Dosing pumps GENODOS® GP

As self-priming diaphragm pump, automatically deaerating against pressure, with pump head made of chemical resistant plastic, control electronics, synchronous motor with low noise level, fixing bracket for wall or floor mounting. Pump with operating indication, continuously adjustable stroke length 30 – 100 %, shock-proof plug 230 V, 50/60 Hz, with approx. 2 m power supply cable, suitable for manual and fully automatic operation, external pulse controller (e. g. feed water pump, contact water meter) can be connected, indication for internal dosing monitoring. In case of self-control, the dosing capacity may be adjusted by means of a frequency controller. Including voltage-free alarm signal output, pulse division and multiplication, control via analogue signals is possible.

Specifications

- Max. suction height 1.5 mWC
- Delivery rate (see table)
- Temperature min. 5 °C - max. 30 °C
- Power supply 230 V, 50/60 Hz, 18/21 W

Dosing pumps GENODOS® GP	-/40	-/40
Chemical resistance group*	standard	4G
GENODOS® GP 0/40 0.04 - 0.15 l/h at max. 10 bar	Order no. (RG 13) 118 150	118 1504G
GENODOS® GP 1/40 0.27 - 0.9 l/h at max. 10 bar	Order no. (RG 13) 118 200	118 2004G
GENODOS® GP 2/40 0.6 - 2.0 l/h at max. 10 bar	Order no. (RG 13) 118 250	118 2504G
GENODOS® GP 6/40 1.8 - 6.0 l/h at max. 8 bar	Order no. (RG 13) 118 300	118 3004G
GENODOS® GP 10/40 2.64 - 8.8 l/h at max. 6 bar	Order no. (RG 13) 118 350	118 3504G

* The choice of the pump depends on the dosing agent to be used.
Observe the information and instructions given for the dosing agents!



Dosing groups



Dosing groups

Dosing groups

To inject the dosing solution into the flow pipe, including 3 m connecting hose as well as the corresponding connection set for the GENODOS®-pump.

Dosing groups	Order no.	(RG 13)
2.21-St (max. 10 bar, 110 °C)	163 640	
2.25-St (max. 10 bar, 110 °C, injection pipe made of VA 1.4571)	163 645	
2.31-St (max. 10 bar, 140 °C with siphon)	163 680	
3.01	163 585	
2.60	163 590	
2/4	163 505	
4/6	163 510	

	Drinking water	Heating water	Steam boiler	Cooling water
	EXADOS®	GENO®-safe A	Sodium sulphite GENO®-phos Nr. 1	Cooling water chemicals
2.21 (PPE/Rg/GTW/St)	—	●	●	—
2.25 (PPE/Rg/GTW/St/1.4571)	—	—	●	—
2.31 (PPE/Rg/St/1.4571)	—	—	●	—
3.01 (PVC)	—	—	—	●
2.60 (PP/PVDF)	—	—	—	●
2/4 (PPE/FPM)	●	—	—	—
4/6 (PVC/FPM)	●	—	—	—

DVGW-certified dosing groups for GENODOS® DM



Dosing groups	Order no.	(RG 13)
2.71 (PVC/EPDM)	163 511	
2.73 (PVC)	163 512	
3.02 (PVC)*	163 513	
2/4 (PPE/EPDM)	163 514	
4/6 (PVC/EPDM/silicone)	163 515	

*Connection set already included in the scope of delivery of the GENODOS® pump



Contact water meter



Switch box „digital timer control“

Safety Devices,
Flushing and Sanitation,
Dosing Technology

Contact water meters

Contact water meters applied in dosing systems GENODOS® DME/DM (DVGW-certified dosing systems)



Connection diameter	R 3/4"	R 1"	R 1 1/4"	R 1 1/2"	R 2"	DN 80	DN 100
Pulse sequence [l]	0.33	0.33	0.5	0.93	1.33	3.80	3.80
Flow Max. [m ³ /h]	4	6	10	20	30	80	100
Pressure loss at max. flow [bar]	0.3	0.5	0.5	0.7	0.8	0.6	0.8
Order no. (RG 13)	119 780	119 720	119 730	119 740	119 750	119 760	119 770

Accessories

	Order no. (RG 13)
Switch box „digital timer control“ for the time-dependent control of dosing systems, wall-mounted box (100 x 74 x 135 mm), 1.5 m power supply cable with shock-proof connector plug, electronic timer, precise to the minute, freely programmable, with voltage-free output and 150 hour power reserve, incl. 3 m drive cable to the GENODOS®-pump	163 090
Additional controller for separate and voltage-free passing on of the pre-alarm level of the suction lance, with shock-proof connector plug	163 870
Connection cable with plug to pass on the voltage-free alarm signal to the central control station, length 3 m	116 219
PVC pressure maintaining valve for the dosing into unpressurised systems or tanks, adjustable from 1 to 10 bar, suitable for dosing line i.d. = 10 mm/o.d. = 16 mm	163 028
PVC overflow valve , to protect the dosing pump and the pressure lines from inadmissible pressure increase, adjustable from 3 to 10 bar, suitable for dosing line i.d. = 10 mm/o.d. = 16 mm	160 240
Document jacket to store operation manual, chemical data sheet, safety data sheet, preparation instructions, etc.	163 806
Safety package for caustic substances, consisting of safety goggles for protection from acids, eye rinsing bottle, gloves as well as warning and instruction signs	180 810
Connection cable for external activation (red) for GENODOS®-pump, length 3 m	116 094



What should a heating coil look like?

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, 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 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 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.

Patented process.

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.**



GENO-K4®

GENO-K4® duo

Alternative
Anti-Scaling

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 delivery: 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 flexible connection hoses, water test kit for carbonate hardness.

GENO-K4® duo

Consisting of: two compact devices with parallel piping, including connection kit.

	GENO-K4®	GENO-K4® duo
Suitable for ...-family homes	1 - 2	3 - 5
up to ... persons	8	12
Nominal connection diameter [R]	1"	1 1/4"
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]	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 power 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
Install. length of connection block without/with water meter screw connections [mm]	190/272	645/735
Order no. (RG 5)	157 100	

Accessories*

Water stop R 1" for GENO-K4®, consisting of water stop solenoid valve with 1.5 m cable, floor sensor with 2 m cable

Order no. (RG 5)

157 110

*Not suitable for GENO-K4® duo

TIP

Please consider this:
1 mm of scale deposits
≙ 10 % more energy
consumption!

Reasons for the installation of a classic water softener

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.

Excerpt from DIN 1988-200:

Calcium carbonate mass concentration [mmol/l]	Measures at $\Delta \leq 60 \text{ }^\circ\text{C}$	Measures at $\Delta > 60 \text{ }^\circ\text{C}$
< 1.5 (corresponds to < 8.4 °dH)	none	none
≥ 1.5 up to < 2.5 (corresponds to ≥ 8.4 °dH up to < 14 °dH)	none or stabilisation or softening	stabilisation or softening recommended
≥ 2.5 (corresponds to ≥ 14 °dH)	stabilisation or softening recommended	stabilisation or softening recommended

* Refer to § 7 of the Law on Detergents and Cleaning Agents

Determination of the dimensioning

- **1 to 2 family homes** (up to 5 persons)
Weichwassermeister® GSX 5, GSXplus or WINNI-mat® VFX 9
- **3 to 5 family homes** (up to 12 persons)
Weichwassermeister® GSX 10, GSXplus or WINNI-mat® VGX 14
- **6 to 8 family homes** (up to 20 persons)
Weichwassermeister® GSX 10, GSXplus or WINNI-mat® VGX 19

Single and twin systems

Single systems have only one exchanger tank. During the regeneration phase only hard water is available (WINNI-mat® VFX/VGX). Twin systems or alternating systems ensure continuous soft water supply since two exchanger tanks are used 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 packages). Systems with the DVGW-certificate or systems that are designed according to EN 14743 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 classic 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 Drinking Water Ordinance does not stipulate a limit value, however, we recommend a residual hardness of 3 – 6 °dH.

Systems for commercial and industrial applications

Usually, softened water of < 0.1 °dH is required for production or industrial water in commercial and industrial applications. The DIN 19636-100 regulations do not apply in such cases. For safety reasons system separators must be installed unless the system is considered to be intrinsically safe (Weichwassermeister® GSX 10-I, Delta-p®-I).



Water softener WINNI-mat® VFX*



Water softener WINNI-mat® VGX 14/19*

Water softeners WINNI-mat® VFX/VGX

Single system in compact design, volume controlled, with integrated contact water meter as well as economy salting, automatic disinfection and blending device.

Compact PE housing with filling opening and safety overflow, salt supply tank, brine valve, 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, possible connection for external dosing system via connection cable (EXADOS® GSX/VFX/VGX), voltage-free alarm output, disinfection system acc. to the electrolysis principle, complete with connection block R 1" with water meter screw connections, installation length 190 mm without screw connections, 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 determination of hardness.

Specifications

- Dimensions (w x h x d) 330 x 640 x 530 mm
- Max. water/ambient temperature 30/40 °C
- Power supply 230 V, 50/60 Hz
- Nominal pressure PN 10
- Operating pressure min. 2.0 bar/max. 8.0 bar
- Pressure loss at nominal flow max. 0.8 bar

Water softener WINNI-mat®	VFX 9	VGX 14	VGX 19
Suitable for ...-family homes up to ... persons	1 - 2 5	3 - 5 12	6 - 8 20
Nominal capacity [mol]	1.6	2.4	3.2
Nominal capacity [°dH x m³]	9.0	13.4	18.0
Max. capacity of brine tank [kg]	38	38	38
sufficient for approx. ... regenerations	108	71	50
Order quantity per pallet (800 mm x 1,200 mm)	4 pcs	4 pcs	4 pcs
Order no. (RG 5)	188 120	188 200	188 300

* 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 page 41.

Softening
Residential



Weichwassermeister® GSX*

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 cover, two pressure tanks, one control valve, electronics component with controller, operating keys and back-lit LCD display, possible connection for activation of external dosing system via connection cable (EXADOS® GSX/VFX/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, length 190 mm without screw connections, non-return valve, overflow valve, two shut-off valves (bypass) and blending valve, dosing point for dosing computer (option) 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. 2.0 bar/max. 8.0 bar
- Pressure loss at nominal flow 0.8 bar

Weichwassermeister® GSX	5	10
Suitable for ...-family homes	1 - 2	3 - 8
up to ... persons	5	20
Nominal capacity [mol]	0.9	1.8
Nominal capacity [°dH x m³]	5.0	10.0
Capacity of brine tank [kg]	65	65
sufficient for approx. ... regenerations	370	185
Order quantity per pallet [800 mm x 1,200 mm]	2 pcs	2 pcs
Order no. (RG 5)	187 510	187 520

* 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 page 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 by means of two-point calibration
- Thanks to the electronic controller of the blending unit, a manual adjustment at the blending valve is superfluous



Weichwassermeister® GSXplus

Softening
Residential**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 cover, two pressure tanks, one control valve, electronics component with controller, operating keys and back-lit LCD display, possible connection for activation of an external dosing system via connection cable (EXADOS® GSX/VFX/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, length 190 mm without screw connections, non-return valve, overflow valve, two shut-off valves (bypass) and automatically controlled blending unit, dosing point for dosing computer (option) 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.

Specifications

- Dimensions (l 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 2.0 bar min./8.0 bar max.
- Pressure loss at nominal flow 0.8 bar

Weichwassermeister® GSXplus

Suitable for ...- family homes	1 - 8
up to ... persons	20
Nominal capacity [mol]	1.6
Nominal capacity [°dH x m³]	9.0
Max. capacity of brine tank [kg]	65
sufficient for ... regenerations	185
Order quantity per pallet [800 x 1,200 mm]	2 pcs
Order no.	187 540

For larger systems, please refer to the table on page 42.
For accessories, please refer to page 41.



Dosing computer EXADOS® EK 6-GSX/VFX/VGX*



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

Dosing computer EXADOS® GSX/VFX/VGX



Electronically controlled dosing system to be used in combination with Weichwassermeister® GSX

or the water softener WINNI-mat® VFX/VGX, 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 mounting on pipe or wall. Pulse cable with dosing line and dosing valve to mounting block of the Weichwassermeister® GSX or the water softener WINNI-mat® VFX/VGX, including 1.5 m power supply cable and dosing tank lift (EK) or suction lance with empty signal (ES).

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

ES 6-GSX/VFX/VGX: 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/VFX/VGX	ES 6-GSX/VFX/VGX
Installation height [mm]	260	260
Suction height [mm]	–	1,200
Order no. (RG 5)	115 430	115 440

For 3-litre bottles as well as 10 kg and 20 kg canisters of mineral-based EXADOS®-agents, please refer to pages 26 and 27.

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



Delivery pump for regeneration water



Water stop

Accessories for small-scale water softeners

Softening
Residential

Connection angle 90°, 1", 1 pair	Order no. (RG 5)
For cramped installation positions, flexible connection hoses can be laid much closer alongside the system.	187 865
Delivery pump for regeneration water VFX/VGX/GSX (max. 2.5 m)	Order no. (RG 5)
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
Drain connection DN 50	Order no. (RG 5)
Connection accessories for a DIN-compatible waste water connection	187 840
Water stop	Order no. (RG 13)
For the reliable protection against water damage if no floor drain is available, consisting of a leakage water sensor, a solenoid valve and an automatic switch-off with acoustic alarm. Installation length for 1": 95 mm female thread, installation length for 1 1/2": 132 mm female thread	
Water stop G1"	126 855
Water stop G 1 1/2"	126 860
Maintenance kits for VFX/VGX and GSX	Order no. (RG 5)
Wearing parts required for the respective system model	
Maintenance kit for VFX/VGX 9/14/19	187 804
Maintenance kit for GSX 9/14/19, VGR	187 803
Supplementary blending valve GSX/VFX/VGX	Order no. (RG 5)
To generate a second blending hardness (e. g. for a separate pipe towards the kitchen, for technical applications, etc.)	187 870
Supplementary soft water outlet GSX/VFX/VGX	Order no. (RG 5)
To easily branch off a 0° dH pipe (e. g. for a separate pipe towards the heating systems, for technical applications, etc.)	187 875

NEW

NEW

NEW

System description	Connection diameter R ["]	Max. continuous flow* [m ³ /h] **	Max. continuous flow* [m ³ /h] ** (Resid. hardness < 0.1 °dH)	Nominal capacity [°dH x m ³]	Full or economy salting	Single (1), twin (2) or triple (3) system	Timer or volume control	Order no.	Page
WINNI-mat® VGX 9	1			9	E	1	V	188 100	35
WINNI-mat® VGX 14	1			13,4	E	1	V	188 200	35
WINNI-mat® VGX 19	1			18	E	1	V	188 300	35
WINNI-mat® VGX 50	1	1.3**	2.2**	50	E	1	V	188 400	44
WINNI-mat® VGX 80	1	1.5**	2.3**	80	E	1	V	188 410	44
WINNI-mat® VGX 14-H	1	0.5	–	13,4	F	1	V	188 250	81
Weichwassermeister® GSX 5	1			2 x 5	E	2	V	187 510	36
Weichwassermeister® GSX 10	1			2 x 10	E	2	V	187 520	36
Weichwassermeister® GSX 10-I	1	0.75	–	2 x 10	F	2	V	187 530	52
Weichwassermeister® GSXplus	1			2 x 9	E	2	V	187 540	37
GENO-mat® ZF 65	1	2.0**	–	67	F	1	T	181 100	46
GENO-mat® ZF 150	1	3.0**	–	149	F	1	T	181 150	46
GENO-mat® ZF 300	1	5.0**	–	302	F	1	T	181 200	46
GENO-mat® ZF 450	1 1/2	6.0**	–	449	F	1	T	181 250	46
GENO-mat® ZF 750	1 1/2	9.5**	–	764	F	1	T	181 300	46
GENO-mat® ZFW 65	1	2.0**	–	67	F	1	T	181 120	45
GENO-mat® ZFW 150	1	3.0**	–	149	F	1	T	181 170	45
GENO-mat® WFW 65	1	2.0**	–	67	F	1	V	182 110	45
GENO-mat® WFW 150	1	3.0**	–	149	F	1	V	182 130	45
GENO-mat® duo WEW 65	1	2.0	–	2 x 67	F	2	V	184 110	45
GENO-mat® duo WEW 150	1	3.0	–	2 x 149	F	2	V	184 130	45
GENO-mat® duo WE 65/50	1	2.0**	3.3**	67/53	F/E	2	V	184 100/184 200	48
GENO-mat® duo WE 150/130	1	3.0**	5.0**	149/117	F/E	2	V	184 120/184 220	48
GENO-mat® duo WE 300/230	1	5.0**	8.3**	302/237	F/E	2	V	184 140/184 240	48
GENO-mat® duo WE 450/330	1 1/2	6.0**	10.0**	449/336	F/E	2	V	184 160/184 260	48
GENO-mat® duo WE 750/530	1 1/2	9.5**	15.8**	746/533	F/E	2	V	184 180/184 280	48
GENO-mat® WF 65/50	1	2.0**	3.3**	67/53	F/E	1	V	182 100/182 200	47
GENO-mat® WF 150/130	1	3.0**	5.0**	149/117	F/E	1	V	182 120/182 220	47
GENO-mat® WF 300/230	1	5.0**	8.3**	302/237	F/E	1	V	182 140/182 240	47
GENO-mat® WF 450/330	1 1/2	6.0**	10.0**	449/336	F/E	1	V	182 160/182 260	47
GENO-mat® WF 750/530	1 1/2	9.5**	15.8**	746/533	F/E	1	V	182 180/182 280	47
Delta-p® 1" + Delta-p®-I 1"	1	3.0	5.0	48	E	3	V	185 100/185 200	40 - 43
Delta-p® 1 1/4" + Delta-p®-I 1 1/4"	1 1/4	5.0	8.3	79	E	3	V	185 110/185 210	40 - 43
Delta-p® 1 1/2" + Delta-p®-I 1 1/2"	1 1/2	8.0	13.3	165	E	3	V	185 120/185 220	40 - 43
Delta-p® 2" + Delta-p®-I 2"	2	12.0	20.0	229	E	3	V	185 130/185 230	40 - 43

* At a raw water hardness of 20 °dH.

** Peak flow for single units during operation

Grünbeck water softeners for commercial/industrial applications – 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 internal components, high-grade ion exchanger filling, control valve made of dezincification-resistant brass or red bronze, with an electro-mechanical actuator. Microprocessor controller (types ZF and ZFW, with timer control only). Regeneration can be activated fully automatically or manually. Brine tank with cover, integrated brine valve, safety valve and brine-buffer technology. Water test kit for determination of hardness.

Triple water softeners Delta-p®

Water softeners working according to the ion exchange principle have been well proven state-of-the-art for several decades and have mainly been used in large housing estates, building complexes or industrial applications with high water consumptions. Certain pressure losses caused by the softening and the considerable expenses regarding installation and dimensioning of the systems, however, always proved to be disadvantageous. With the triple water softener Delta-p®, Grünbeck Wasseraufbereitung GmbH has found a completely new solution for these problems.

The patented control valve of the triple water softener Delta-p® guarantees an uninterrupted supply of soft water at a minimum pressure loss.

Triple softening

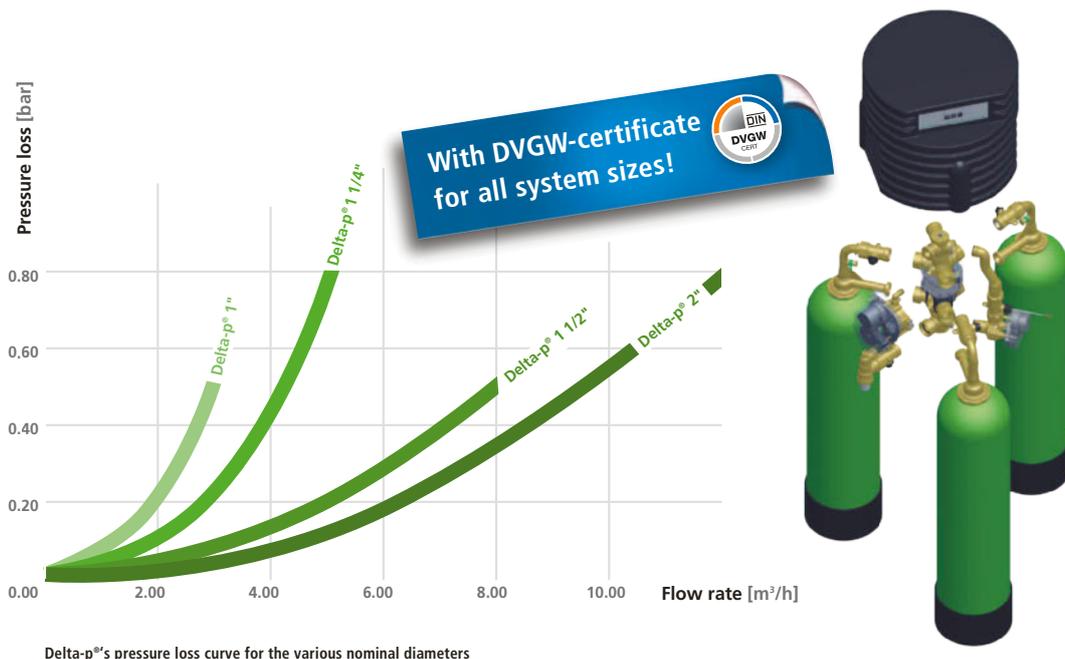
Thanks to its significant benefits, the **Delta-p®** series convinces trade and builders alike. As a triple system, the unit continuously provides soft water and sets new standards due to its low pressure loss and extra low consumption of operating materials. The fresh water guarantee with its automatic rinsing 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", 1 1/4", 1 1/2" and 2" for either drinking water or industrial applications. A low-on-salt alarm 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.

Softening
Trade/Industry





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 dezincification-resistant 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 for automatic, proportional blending, disinfection unit for automatic disinfection according to the electrolysis principle after each regeneration, PE brine tank with cover, 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 < 0.1 °dH, 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 10 PN
- Operating pressure 2 bar min./10 bar max.
- Operating voltage 24 V

Delta-p®/Delta-p®-I	1"	1 1/4"	1 1/2"	2"
Nominal connection diameter [DN]	25	32	40	50
Nominal flow [m³/h]	3	5	8	12
Nominal flow blending water [m³/h]*	5	8.3	13.3	20.0
Pressure loss at nominal flow [bar]	0.5	0.8	0.5	0.8
Capacity per kg regeneration salt [mol/kg]	5.7	5.7	5.7	5.7
Max. capacity of brine tank** [kg]	75	75	200	200
Salt consumption per regeneration, approx. [kg]	1.5	2.5	5.2	7.2
Salt consumption per m³* [kg]	0.36	0.36	0.36	0.36
Order no. Delta-p® (RG 13)	185 100	185 110	185 120	185 130
Order no. Delta-p®-I (RG 13)	185 200	185 210	185 220	185 230

* In case of a raw water hardness of 20 °dH and a soft water hardness of 8 °dH (not Delta-p®-I).

** For larger brine tanks, please inquire.



Delta-p® 2" on pedestal



Connection set 1" - 1 1/4"

Water softeners Delta-p®/Delta-p®-I mounted on pedestal, ready for installation

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

Delta-p®/Delta-p®-I*	1"	1 1/4"	1 1/2"	2"
Dimensions [mm] (w x h x d)	770 x 1,500 x 770		960 x 1,800 x 880	
Brine tank** diameter [mm]	410		570	
Brine tank** height [mm]	670		860	
Order no. Delta-p® (RG 13)	185 105	185 115	185 125	185 135
Order no. Delta-p®-I (RG 13)	185 205	185 215	185 225	185 235

* Mounted and ready for connection

** Brine tank not mounted on pedestal

Accessories

Delta-p®	Order no.	(RG 13)
Connection set Delta-p® 1" - 1 1/4" installation length 190 mm*	185 800	
Connection set Delta-p® 1 1/2" - 2" installation length 330 mm*	185 805	
Connection set Delta-p®-I 1" - 1 1/4" installation length 190 mm*	185 801	
Connection set Delta-p®-I 1 1/2" - 2" installation length 330 mm*	185 806	
Pedestal for Delta-p® 1" - 1 1/4" (also for Delta-p®-I)	185 820	
Pedestal for Delta-p® 1 1/2" - 2" (also for Delta-p®-I)	185 825	
Low-on-salt alarm (pre-alarm)	181 880	
Profibus DP	185 890	

*Screw connection not included.

For additional accessories, refer to pages 51 – 52.

Softening
Trade/Industry



Water softener WINNI-mat® VGX 50**

Water softeners WINNI-mat® VGX 50, 80

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

Compact PE housing with filling opening, safety overflow, salt supply 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 micro-processor controller, operating keys and digital display, possible connection to trigger an external dosing system via connection cable (EXADOS® GSX/VFX/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 connections, 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.

Specifications

- Max. water/ambient temperature 30/40 °C
- Power supply 230 V, 50/60 Hz
- Nominal pressure PN 10
- Operating pressure min. 2.0 bar/max. 8.0 bar
- Pressure loss at nominal flow max. 0.8 bar

Water softener WINNI-mat® VGX	50	80
Nominal connection diameter [R]	1"	1"
Nominal flow* [m³]	2.2	2.3
Nominal capacity [mol]	8.9	14.3
Nominal capacity [°dH x m³]	50	80
Max. capacity of brine tank [kg]	90	90
sufficient for approx. ... regeneration cycles	45	27
Order no. (RG 13)	188 400	188 410

* At a raw water hardness of 20 °dH and blending to 8 °dH

Accessories

Drain connection DN 50

acc. to DIN EN 1717 for small-scale water softeners

Order no. (RG 5)

187 840

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



Water softener GENO-mat® ZFW



Water softener GENO-mat® duo WEW

Hot water softeners GENO-mat®

ZFW

Single system with timer-controlled regeneration

WFW

Single system with volume-controlled regeneration

duo WEW

Twin system with central control valve and volume-controlled regeneration

Fully automatic water softener which works according to the principle of ion exchange

Consisting of:

Salt supply tank made of PE with cover and sieve bottom, special brine valve with connection line enables maximum continuous flows, hot water-resistant, stainless steel exchanger tank, ion exchanger filling and distribution system, control valve made of red bronze, hot water-resistant contact water meter (only for WFW and duo WEW).

Specifications

- Full salting for residual hardness of ≤ 0.1 °dH
- Nominal pressure PN 10
- Operating pressure min. 2 bar/max. 8 bar
- Max. water temperature 80 °C
- Power supply 230 V, 50 Hz
- Operating voltage 24 V

GENO-mat®	ZFW 65	ZFW 150	WFW 65	WFW 150	duo WEW 65	duo WEW 150
Nominal connection diameter [DN]	25 male	25 male	25 male	25 male	25 female	25 female
Peak flow [m³/h]	2.0	3.0	2.0	3.0	2.0	3.0
K _v valve $\Delta p = 1.0$ bar [m³/h]	2.8	2.9	2.7	2.8	2.6	2.7
Nominal capacity [mol]	12.0	26.6	12.0	26.6	12.0	26.6
Nominal capacity [°dH x m³]	67	149	67	149	67	149
Max. capacity of brine tank [kg]	130	190	130	190	130	190
Salt consumption/regen. [kg]	4.1	8.2	3.6	8.0	3.6	8.0
Order no. (RG 13)	181 120	181 170	182 110	182 130	184 110	184 130

Softening
Trade/Industry



Water softeners GENO-mat® ZF

Water softeners GENO-mat® ZF

Fully automatic single water softener which works according to the principle of ion exchange, with timer-controlled regeneration.

Consisting of:

PE salt supply tank with cover and sieve bottom, special brine valve with connection line enables maximum continuous flows, ion exchanger tank made of pressure-resistant plastic with ion exchanger filling and distribution system, control valve made of red bronze.

Specifications

- Full salting for residual hardness ≤ 0.1 °dH
- Nominal pressure PN 10
- Operating pressure min. 2 bar/max. 8 bar
- Water temperature 30 °C
- Power supply 230 V, 50 Hz
- Operating voltage 24 V

GENO-mat® ZF	65	150	300	450	750
Nominal connection diameter [DN]	25 male	25 male	25 male	40 female	40 female
Peak flow [m³/h]	2.0	3.0	5.0	6.0	9.5
K _v value $\Delta p = 1.0$ bar [m³/h]	2.8	2.9	3.5	5.0	6.8
Nominal capacity [mol]	12.0	26.6	53.9	80.2	133.2
Nominal capacity [°dH x m³]	67	149	302	449	746
Max. capacity of brine tank [kg]	130	190	285	485	760
Salt consumption/regeneration [kg]	4.1	8.2	16.3	27.3	42.2
Order no. (RG 13)	181 100	181 150	181 200	181 250	181 300



Water softener GENO-mat® WF

Specifications

- Full salting for residual hardness ≤ 0.1 °dH (GENO-mat® WF 65, 150, 300, 450, 750)
- Economy salting for residual hardness ≥ 2.0 °dH (GENO-mat® WF 50, 130, 230, 330, 530)
- Nominal pressure PN 10
- Operating pressure min. 2 bar/max. 8 bar
- Water temperature 30 °C
- Power supply 230 V, 50/60 Hz
- Operating voltage 24 V

Water softeners GENO-mat® WF

Consisting of:

PE salt supply tank with cover and sieve bottom, special brine valve with connection line enables maximum continuous flows, exchanger tank made of pressure-resistant plastic with ion exchanger filling and distribution system, control valve made of red bronze, microprocessor controller with simple 3-key operation with voltage-free alarm contact, contact water meter with water meter screw connections.

Fully automatic single water softener which works according to the principle of ion exchange, to generate fully softened water, with volume-controlled regeneration.

GENO-mat® WF	65	150	300	450	750
Nominal connection diameter [DN]	25 male	25 male	25 male	40 female	40 female
Peak flow [m³/h]	2.0	3.0	5.0	6.0	9.5
K_V value $\Delta p = 1.0$ bar [m³/h]	2.7	2.8	3.3	4.9	6.4
Nominal capacity [mol]	12.0	26.6	53.9	80.2	133.2
Nominal capacity [°dH x m³]	67	149	302	449	746
Max. capacity of brine tank [kg]	130	190	285	485	760
Salt consumption/regeneration [kg]	3.6	8.0	16.2	25.3	40.0
Order no. (RG 13)	182 100	182 120	182 140	182 160	182 180

Fully automatic single water softener which works according to the principle of ion exchange, particularly suitable for the generation of partially softened water, with blending valve (option), with volume-controlled regeneration, economy salting for residual hardness of ≥ 2.0 °dH, with integrated disinfection device according to the electrolysis principle.

GENO-mat® WF	50	130	230	330	530
Nominal connection diameter [DN]	25 male	25 male	25 male	40 female	40 female
Peak flow* [m³/h]	3.3	5.0	8.3	10.0	15.8
K_V value* $\Delta p = 1.0$ bar [m³/h]	4.5	4.7	5.5	8.2	10.7
Nominal capacity [mol]	9.5	20.9	42.3	60.0	95.2
Nominal capacity [°dH x m³]	53	117	237	336	533
Max. capacity of brine tank [kg]	65	130	190	285	285
Salt consumption/regeneration [kg]	1.8	4.0	8.1	11.5	16.0
Order no. (RG 13)	182 200	182 220	182 240	182 260	182 280

* With blending to 8 °dH and a raw water hardness of 20 °dH.

Softening
Trade/Industry

FULL SALTING

ECONOMY SALTING



Water softener GENO-mat® duo WE

Specifications

- Full salting for residual hardness of ≤ 0.1 °dH (GENO-mat® duo WE 65, 150, 300, 450, 750)
- Economy salting for residual hardness ≥ 2.0 °dH (GENO-mat® duo WE 50, 130, 230, 330, 530)
- Nominal pressure PN 10
- Operating pressure min. 2 bar/max. 8 bar
- Water temperature 30 °C
- Power supply 230 V, 50/60 Hz
- Operating voltage 24 V

Water softeners GENO-mat® duo WE

Consisting of:

PE salt supply tank with cover and sieve bottom, special brine valve with connection line enables maximum continuous flows, exchanger tank made of pressure-resistant plastic with ion exchanger filling and distribution system, control valve made of red bronze, microprocessor controller with simple 3-key operation with voltage-free alarm contact, contact water meter with water meter screw connections.

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

GENO-mat® duo WE	65	150	300	450	750
Nominal con. diameter [DN]	25 fem.	25 fem.	25 fem.	40 fem.	40 fem.
Max. cont. 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
Nominal capacity [°dH x m³]	67	149	302	449	746
Reg. salt supply [kg]	130	190	285	485	760
Salt consumption/reg. [kg]	3.6	8.0	16.2	25.3	40.0
Order no. (RG 13)	184 100	184 120	184 140	184 160	184 180

FULL SALTING

Fully automatic twin water softener which works according to the principle of ion exchange, suitable for the generation of partially softened water, with integrated blending valve up to type 230, starting from type 330 as option, with volume-controlled regeneration, economy salting for residual hardness ≥ 2.0 °dH, with disinfection device according to the electrolysis principle.

GENO-mat® duo WE	50	130	230	330	530
Nominal con. diameter [DN]	25 fem.	25 fem.	25 fem.	40 fem.	40 fem.
Max. cont. flow* [m³/h]	3.3	5.0	8.3	10.0	15.8
K _v value* $\Delta p = 1.0$ bar [m³/h]	4.3	4.5	5.2	7.5	9.3
Nominal capacity [mol]	9.5	20.9	42.3	60.0	95.2
Nominal capacity [°dH x m³]	53	117	237	336	533
Reg. salt supply [kg]	65	130	190	285	285
Salt consumption/reg. [kg]	1.8	4.0	8.1	11.5	16.0
Order no. (RG 13)	184 200	184 220	184 240	184 260	184 280

ECONOMY SALTING

* With blending to 8 °dH and a raw water hardness of 20 °dH.



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 13)
Mounting set 1 for GENO-mat®	125 845	

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

- 1 connection block R 1" (installation length 190 mm without screw connections)
 - non-return valve
 - Water meter screw connections
- 2 flexible reinforced stainless steel hoses R 1", length 600 mm

	Order no.	(RG 13)
Mounting set 2 for GENO-mat®	125 850	

Accessories

Overflow valve to cover peak consumptions by adding hard water, e. g. for flushing valves, pool showers, etc. (installation length 100 mm without water meter screw connections)

	Order no.	(RG 13)
Overflow valve R 1" [0.8 bar]	125 855	

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

	Order no.	(RG 13)
Contact water meter with roller-type counter R 1"	163 080	
Contact water meter with roller-type counter R 1 1/2"	163 085	
Contact water meter with roller-type counter R 2"	119 758	

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 1" : 95 mm female thread, installation length for 1 1/2" : 132 mm female thread).

	Order no.	(RG 13)
Water stop G 1"	126 855	
Water stop G 1 1/2"	126 860	

Softening
Trade/Industry



Electronic blending unit 1"



Blending valve 1"

Accessories

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

	Order no.	(RG 13)
Blending valve R 1"	126 001	
Blending valve R 1 1/4"	126 003	
Blending valve R 2"	126 002	

Electronically controlled blending units for the generation of a defined residual hardness in the soft water. In case of single blending, one residual hardness can be set, in case of double blending, two different values for the residual hardness may be entered.

	Order no.
Electronic blending unit 1" single	185 850
Electronic blending unit 1" double	185 855
Electronic blending unit 2" single	185 860
Electronic blending unit 2" double	185 865

Voltage-free signal to transmit the operating status to the building management system

	Order no.	(RG 13)
Voltage-free signal for ZF; WF	126 885	
Voltage-free signal for duo WE	126 890	

Circulation device to reduce the counter ion effect in case of longer periods of standstill

	Order no.	(RG 13)
Circulation device suitable for all types (except ZF/Delta-p®)	181 850	

Automatic empty signal for brine tank (pre-alarm system) for all GENO-mat® water softeners with Ionomatic₂ + Ionomatic₃

	Order no.	(RG 13)
Low-on-salt alarm (pre-alarm)	181 880	

Boiler feed water shut-off valve for single water softeners GENO-mat® WF (refer to page 47), consisting of a solenoid valve with control cable to shut off the soft water pipe during regeneration

	Order no.	(RG 13)
Hard water stop R 1"	182 810	



The process

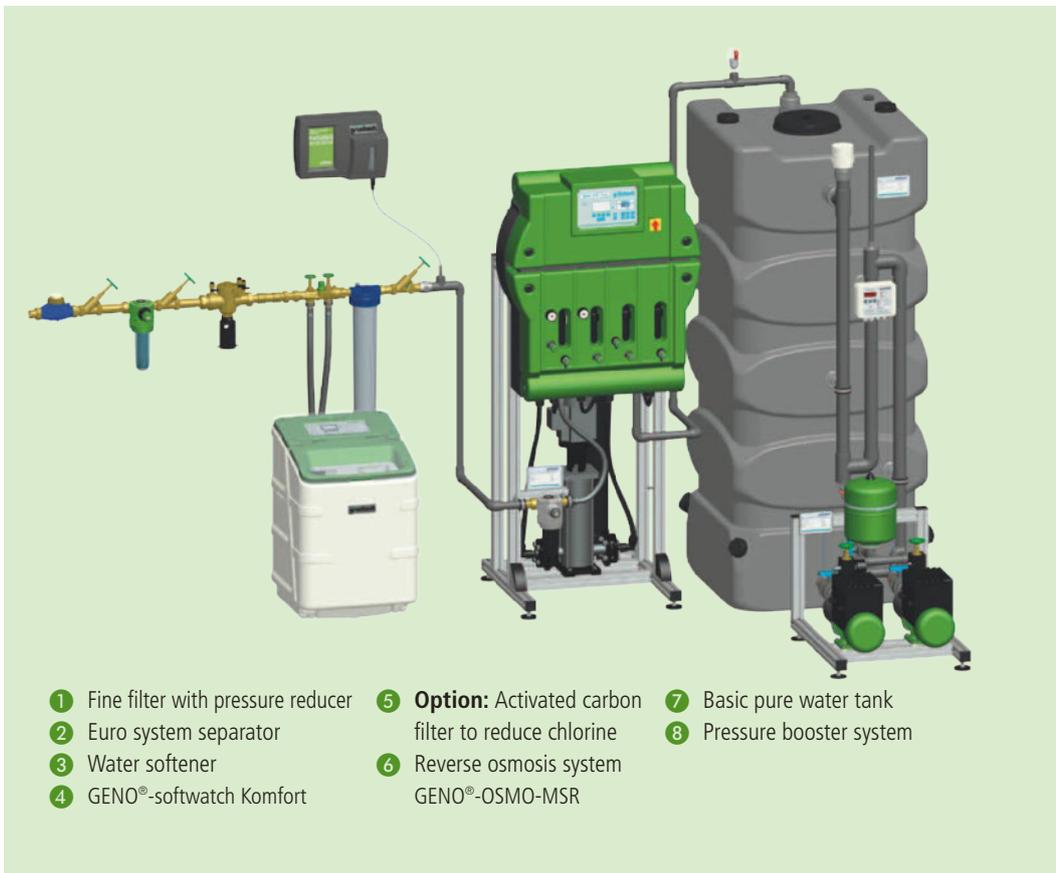
Membrane separation processes use a membrane in order to separate solutions, ions, molecules and particles in the submicron range. Conventional separation processes such as filtration only reach a cut-off of approx. 40 µm (sand filter) to approx. 0.2 µm. The membrane-based systems described in this catalogue require pressure to be applied to the medium so that it can be transported through the membrane.

Reverse osmosis

The reverse osmosis process (e. g. GENO[®]-OSMO-MSR) retains all substances contained in the water with the exception of a residual salt concentration of approx. 1 % to 5 % in the permeate. By means of a mixed-bed exchanger (reusable GENO-therm[®] cartridge) used as a final stage, the residual conductivity can be reduced to < 1 µS/cm. The concentrate of the separated substances can be discharged to the drain as waste water and does not need any further treatment.

Standard system layout GENO[®]-OSMO-MSR

with water softener as pre-treatment and activated carbon filter for reduction of chlorine



- | | | |
|-------------------------------------|---|---------------------------|
| 1 Fine filter with pressure reducer | 5 Option: Activated carbon filter to reduce chlorine | 7 Basic pure water tank |
| 2 Euro system separator | 6 Reverse osmosis system | 8 Pressure booster system |
| 3 Water softener | 4 GENO [®] -softwatch Komfort | |

Membrane
Technology



Weichwassermeister® GSX-I*



GENO-mat® duo WE-MSR

Weichwassermeister® GSX-I „industrial version“

Compact water softener, with full salting in modular technology.

As pre-stage for reverse osmosis systems. For soft water < 0.1 °dH (system separator required), without blending valve and overflow valve. For description and specifications, refer to page 38.

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

* At a raw water hardness of 20 °dH

Water softeners GENO-mat® duo WE-MSR

Compact water softener, with full salting in modular technology.

As pre-stage for reverse osmosis systems. For soft water < 0.1 °dH (system separator required), without GENO®-lonomatic control system. Control via MSR control electronics. For description and specifications, refer to page 50.

GENO-mat® duo WE-MSR	65	150	300	450	750
Max. continuous flow** [m³/h]	2.0	3.0	5.0	6.0	9.5
Nominal capacity [mol]	11.6	26.8	53.6	80.4	133.9
Nominal capacity [°dH x m³]	67	149	302	449	746
Max. capacity of brine tank [kg]	130	190	285	485	760
Max. salt consumption/reg. [kg]	3.6	8.0	16.2	25.3	40.0
Order no.	184 600	184 605	184 610	184 615	184 620

GENO®-activated carbon filter AKF

GENO®-activated carbon filter	Order no.
AKF 250 for MSR 125	R 3/4" 109 010
AKF 500 for MSR 250	R 3/4" 109 015
AKF 1000 for MSR 500 - 750	2 x R 3/4" 109 011
AKF 1500 for MSR 1000	R 1 1/2" 109 460
AKF 3000 for MSR 1500 - 2000	R 2" 109 240
Replacement filter element for activated carbon filter MKCA	109 615
Replacement filter element for activated carbon filter 9-EPS-10 (initial equipment)	109 640

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

** At a raw water hardness of 20 °dH.



GENO®-OSMO RO 125K

- **Compact system TS**
with integrated permeate tank and pressure booster system
- **Microprocessor controller**
with LCD panel
- **Little space required**
- **5 µm fine filter**
incl. pressure reducer in soft water inlet
- **Compact system TL**
may be combined with pure water tank and pressure booster system as an option (refer to pages 58 - 59)
- **Optional blending unit**

Reverse osmosis systems GENO®-OSMO RO 125K

Specifications

- Total salt concentration (NaCl) in feed water max. 500 ppm
- Salt rejection > 95 %
- Required inlet pressure of feed water min. 2.5 bar
- Min. water temperature 10 °C, max. 30 °C
- Protection IP 54
- Power supply 230 V, 50 Hz

GENO®-OSMO RO	125K-TS	125K-TL
Permeate capacity at 15 °C [l/h]	125	125
Permeate capacity at 10 °C [l/h]	105	105
Permeate supply [l]	38	–
Permeate output capacity [l/h/bar]	100 l/h at 4.2 bar, 900 l/h at 2.1 bar	
Number of modules [pieces]	1	1
Connected power load [kW]	0.7	0.6
Dimensions (w x h x d) [mm]	450 x 1,120 x 430	450 x 1,120 x 430
Operating weight approx. [kg]	75	30
Order no.	752 100	752 110

Accessories

	Order no.
Blending unit for RO 125K/AVRO 125 ¹⁾	752 800
Connection set for RO 125K/AVRO 125	752 830
Connection block for RO 125K/AVRO 125 ²⁾	752 840
Conductivity meter for RO 125K/AVRO 125 ¹⁾	752 820
Solenoid valve/forced outflow for RO 125K/AVRO 125 ³⁾	752 810
External alternating current power unit 2.2 kW ⁴⁾	212 254

¹⁾ The combination of blending unit/conductivity meter is only possible up to a conductivity of < 99 µS/cm.

²⁾ Only in combination with order no. 752 830.

³⁾ Only possible with TS.

⁴⁾ Only required for TL.

Membrane
Technology



Reverse osmosis system AVRO 125



Sectional drawing of AVRO module

**WORLD INNOVATION!
PATENTED**

Reverse osmosis systems AVRO 125

In the AVRO module, the water flowing onto the membrane is treated with low direct current and from the calcium and hydrogen carbonate ions contained in the water calcium carbonate seed crystals are formed at the specially developed cathode. These crystals are washed out and consequently, the membrane is reliably protected from scaling. Thus, the AVRO 125 does not need any pre-treatment in the form of a water softener or an antiscalant dosing system.

For specifications and accessories, please refer to GENO®-OSMO RO 125K on page 55.

Reverse osmosis system AVRO	125 TS	125 TL
Order no.	752 105	752 115



GENO®-OSMO-MSR

- **combi-cap pressure vessels**
With optimum flow distribution and quick-acting plug-in couplings for single, series and block mounting
- **MSR-tronic control system**
With graphical display for the process visualisation of the water softener duo WE-MSR, the reverse osmosis, the pressure booster pump with permeate storage tank. Option: additional stages
- **Eco line**
Up to 33 % energy saving due to innovative, flux optimised ultra-low-energy spiral-wound membrane in combination with a high pressure pump, energy efficiency class IE 3

Reverse osmosis systems GENO®-OSMO-MSR

- Compact system on self-supporting rack
- For the environmentally friendly demineralisation of softened drinking water according to Drinking Water Ordinance

Compact system consisting of:

5 µm fine filter, including pressure reducer in soft water inlet, low-noise, vertical stainless steel high pressure pump with electrical motor energy efficiency class IE 3, osmosis module(s) with spiral-wound membrane(s) and pressure vessel(s), micro-processor controller with process visualisation, German/English/French optional, RS 232-interface, patented MSR hydro-module made of PA 6.6 with 4 sections for the routing, control and monitoring of all liquid flows, PE system housing, complete system mounted on a system rack made of anodised, high precision aluminium profile, ready for operation.

Specifications

- Total salt concentration (NaCl) of feed water max. 500 ppm
- Salt rejection > 95 %
- Required inlet pressure of feed water min. 2.5 bar
- Water temperature min. 10 °C, max. 30 °C
- Protection IP 54
- Power supply 3 x 380 - 415 V, 50 Hz

GENO®-OSMO-MSR	125	250	500	750	1000	1500	2000
Permeate capacity at 15 °C [l/h]	125	250	500	750	1000	1500	2000
Permeate capacity at 10 °C [l/h]	105	210	420	630	850	1275	1700
Number of modules [pieces]	1	1	2	3	4	6	8
Connected power load [kW]	0.75	0.75	2.2	2.2	2.2	2.2	2.2
Dimensions [mm] (w x h x d)	750 x 1,700 x 800					750 x 2,400 x 800	
Operating weight [kg]	100	115	145	170	195	240	290
Order no.	750 460	750 436	750 430	750 440	750 450	750 470	750 480

Pre-treatment by means of water softener, system separator DK and pre-filter (acc. to example given on page 53 „system layout“) required.

Accessories

	Order no.
Single alarms (cannot be combined with Profibus DP)	750 725
Conductivity/temperature sensor in raw water*	750 720
Pre-assembled conductivity/temperature sensor	750 026
Analogue input for level measurement by others	750 715
Profibus DP (cannot be combined with single alarms)	750 710
Alarm signal to telefax machine or mobile phone (analogue)	750 730
Alarm signal to telefax machine or mobile phone (ISDN)	750 735

* Only in combination with order no. 750 026

Membrane Technology



Pure water tank with sterile air filter

Pure water tanks

For intermediate storage of the unpressurised permeate/filtrate from reverse osmosis and ultrafiltration systems and as separation tank for separation according to class 5

Pre-assembled tank with PVC overflow pipe, drain valve as well as connections for inlet and pressure booster system, level control as filling level measuring device with digital display and pressure transducer as well as four programmable switching contacts for make-up water feed ON/OFF and "tank empty" signal as dry-run protection, additional tank (without level control and overflow loop) with connection set for basic tank.

Specifications

- Volume 1 m³
- Dimensions (w x h x d) 780 x 2,000 x 1,000 mm plus connecting pieces

Pure water tanks	Order no.
Basic tank	712 410
Additional tank*	712 405
Pure water tank with sterile air filter	712 400

* A maximum of 3 additional tanks is possible. For larger tanks, please inquire.



Single pressure booster system GENO®-HR



Single pressure booster system GENO®-FU

Pressure booster systems GENO®-HR and GENO®-FU

Pressure booster systems for low-noise water supply of small or medium-sized water distribution networks in buildings with raw water, softened water and partially softened water (permeate) originating from reverse osmosis systems. The systems are also suitable for continuous operation. Multi-stage, horizontal centrifugal pump(s) with standard suction, mounted on aluminium system rack with adjustable, levelling feet, pump control system, pressure gauge, non-return valve, shut-off valves on suction and pressure side. In case of multi-branched supply networks or considerable fluctuations in demand, a corresponding pressure expansion vessel must be provided by others on site.

The **pressure booster pumps GENO®-HR** are automatically controlled via pressure and flow controllers. Start and stop functions of the pump are controlled by the actual water outflow. A low-on water protection is integrated. Due to the switch-on pressure, a max. counterpressure of 25 mWC is admissible.

The **pressure booster pumps GENO®-FU** are speed-controlled by means of pressure sensor and frequency converter and therefore highly energy saving. Smooth start and stop of the pump prevents water hammer and keeps the set pressure that can be adjusted continuously via a potentiometer quite constant. The info display with LEDs and a voltage-free fault signal output inform about current operating modes.

Specifications

- Power supply 230 V/50 Hz
- Protection IP 55
- Power consumption per pump HR 1 kW/FU 1.07 kW
- Medium/ambient temperature 5 - 35 °C/5 - 40 °C
- Nominal diameter on suction/pressure side DN 32/DN 25
- Capacity of HR 1.2 m³/h at 45.6 mWC, 4.2 m³/h at 18.2 mWC
- Capacity of FU 1.2 m³/h at 51 mWC, 4.2 m³/h at 20.5 mWC

Pressure booster systems GENO®-HR/FU	Order no.
Pressure booster system GENO®-HR 2/40-1 N 10 (single system)	730 440
Pressure booster system GENO®-HR 2/40-2 N 10 (twin system)	730 445
Pressure booster system GENO®-FU 2/40-1 N 10 (single system)	730 505
Pressure booster system GENO®-FU 2/40-2 N 10 (twin system)	730 515
Power supply unit MSR 230 V for single system*	750 485
Power supply unit MSR 230 V for twin system*	750 486
Power supply unit 230 V for single system**	212 254
Time/load switchover for twin system**	730 375

* Required if pressure booster system is combined with GENO®-MSR-tronic or GENO®-EDI-tronic (for installation)

** Required if pressure booster system is combined with RO/AVRO 125 TL, HL 300 or in case of independent operation (incl. housing)

Membrane
Technology

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. The disinfection technology is installed downstream of the water treatment systems and represents 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 European standard EN 806) and depend on the respective specifications and fields of application.

UV light

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

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

Dosing of disinfectants

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

- Dosing of GENO®-Chlor A (GENODOS® DM-T)
- Dosing of GENO®-Baktax (GENODOS® DM-B/BS/BO)
- Generation and dosing of chlorine dioxide



GENO®-UV-60 S

For disinfection of clear water which is free of turbidities, iron and manganese and only slightly loaded, for application in households and private water supply. The systems are certified according to DVGW work sheet. Provided they are operated according to standards, the GENO®-UV systems provide a guaranteed room irradiation of min. 400 J/m²; this corresponds to a reduction rate of min. 99.99 %.

GENO®-UV systems „Drinking water version“



Scope of delivery:

Electropolished stainless steel pipe, centred high-intensity UV lamp, 2 flushing/drain valves for cleaning the system, 2 water meter screw connections, flow limiter, calibrated UV-C system sensor for automatic monitoring. Protective quartz pipe can be dismantled, flow distribution device, control unit GENO®-Multi BS with operating hour meter and switch-on counter, indication of the irradiation intensity in W/m², voltage-free output for external operating and alarm signal, analogue signal 0 – 10 V for irradiation intensity and power output for connection of a safety valve (required for a DVGW-conform operation of the UV system), as well as a temperature-controlled flushing valve, max. 10 bar operating pressure, power supply 230 V, 50 Hz.

GENO®-UV-	60 S	120 S	200 S
Nominal connection diameter [R]	1"	1 1/2"	2"
Installation position	horizontal, outlet at the top, self-deaerating		
SSK ₂₅₄ max. [m ⁻¹]		2,7	
Max. flow at 5 – 30 °C [m ³ /h]	3.3	8.0	12.0
Max. flow at 30 – 70 °C [m ³ /h]	–	–	8.0
Inlet water temperature [°C]		5 – 30	
Ambient temperature [°C]		5 – 40	
Connected power load [VA]	75	135	215
Number of lamps [pieces]		1	
Max. service life of lamp [h]		18,000	
Total length incl. screw connections [mm]	795	1,185	1,430
Order no.	523 110	523 120	523 130

For additional GENO®-UV systems for industrial and special applications, please inquire – ready-for-connection ex works!

For accessories, please refer to page 62.

Disinfection
Private Water Supply



GENO®-UV-120 I

GENO® UV-systems „industrial version“

For disinfection of process water and swimming pool water which is mostly free of turbidity and slightly contaminated.

UV system, consisting of:

Electropolished stainless steel pipe, centred high-intensity UV lamp, 2 flushing/drain valves for cleaning the system, 2 water meter screw connections, detachable protective quartz pipe, flow distribution device, control unit with operating hour meter and electrical ballast, voltage-free relay contact.

Advantages:

- Hydraulic component with tested flow capacity
- Use of special long-life lamps with a service life of up to 18,000 h
- With retrofitting equipment for conversion to DVGW-certified standard possible

Specifications:

- Power supply 230 V/50 Hz
- Protection IP 54
- Max. operating pressure 10 bar

GENO®-UV	60 l	120 l	200 l
Nominal connection diameter [R]	1"	1 1/2"	2"
Flow rate [m ³ /h]*	3.3	8.0	12.0
Inlet water temperature** [°C]	5 - 30	5 - 30	5 - 30
Ambient temperature [°C]	5 - 40	5 - 40	5 - 40
Connected power load [VA]	75	135	215
Installation length with screw connections [mm]	561	973	1,220
Order no.	523 210	523 220	523 230

* Nominal flow at a guaranteed room irradiation of 400 J/m² and a SSK (254 nm) of 2.7 m⁻¹.

** If UV-120 I is used for pool water, the application limit is T_{max} = 40 °C.

Accessories	Order no.
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	523 825
UV protection goggles	522 810
Stainless steel connection set 1"	520 070
Stainless steel connection set 2"	520 075
Wall fastening for UV systems GENO®-UV-60 S/60 l up to 200 S/200 l	523 800
Floor rack for GENO®-UV-120 S/120 l	523 805
Floor rack for GENO®-UV-200 S/200 l	523 810
USB data logger for UV systems GENO®-UV 60 - 200 S	523 830
Flushing set to clean the UV system by means of GENO®-clean CP	520 020 (RG 14)
Cleaning agent GENO®-clean CP (10 x 1 litre)	170 022 (RG 14)



GENODOS® DM-T 6



GENODOS® DM-T 20

Sales only after consultation with Grünbeck. Water analysis required!

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.

Dosing pump 1/40 4G, low-noise operation, self-priming diaphragm pump, automatically deaerating against pressure, continuously adjustable 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, diaphragm defect indicator, 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
- Min. temp. 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*	R 1"	R 1 1/4"	R 1 1/2"	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 [l]	20	20	60	60	200	200
Order no. (RG 13)	163 140	163 150	163 160	163 170	163 180	163 190

* With contactor as submerged type

Disinfectant

GENO®-Chlor A (20 l) for all pipes, except for stainless steel	Order no. (RG 14) 210 012
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Accessories

Test device for chlorine and pH-value in drinking water [Measuring range: Chlorine: 0.1 - 2.0 mg/l; pH: 6.9 - 8.2]	Order no. (RG 13) 170 128
PVC dosing group 2.72 with non-return valve and ball valve	163 220

Disinfection
Private Water Supply

Sales only after consultation with Grünbeck. Water analysis required!



GENODOS® DM-B 6*



GENODOS® DM-B 10*

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 divider for GENODOS®-pump and injection valve; gas-tight suction lance with integrated pre-empty signal, pressure maintaining valve; the DM-BS has an additional flow stabiliser.

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

Dosing systems GENODOS® DM-B/DM-BS

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)

Dosing system GENODOS® DM-B/BS	6	10	20	30
Nominal connection diameter [R]	1"	1 1/4"	1 1/2"	2"
Nominal flow Q_N [m ³ /h] (DM-B/DM-BS)	3/3.5	5/3.5	10/3.5	15/3.5
Flow Q_{max} [m ³ /h] (DM-B/DM-BS)	6/5.1	10/5.1	20/5.1	30/5.1
Pressure loss at Q_{max} [bar] (DM-B/DM-BS)	0.5/0.8	0.5/0.8	0.7/0.8	0.8/0.8
Nominal pressure PN [bar]	8	8	8	8
Order no. DM-B (RG 13)	163 820	163 825	163 830	163 835
Order no. DM-BS (RG 13)	163 840	163 845	163 850	163 855

* GENO®-Baktox as well as water test kit not included in scope of delivery. For disinfectants, please refer to page 65.

Accessories

Water test kit	Order no.
Chlorine dioxide test 0.02 - 0.55 mg/l	170 430 (RG 13)
Chemicals collecting basin for 20 kg container	210 560 (RG 14)
M-Bus measuring transducer D-DAM, complete	115 850 (RG 13)



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-empty alarm, pressure maintaining valve.

Dosing system GENODOS® DM-BO	6	10	20	30
Nominal connection diameter [R]	1"	1 1/4"	1 1/2"	2"
Nominal flow Q_N [m ³ /h]	3	5	10	15
Flow Q_{max} [m ³ /h]	6	10	20	30
Pressure loss at Q_{max} [bar]	0.5	0,5	0.7	0.8
Nominal pressure PN [bar]	8	8	8	8
Dimensions (w x h x d) [mm]	785 x 1,100 x 480			
Order no. * (RG 13)	163 865	163 875	163 885	163 895

* GENO®-Bakttox as well as water test kit not included in scope of delivery. For specifications and accessories, please refer to page 64.

Disinfectants

1 Litre GENO®-Bakttox 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

Disinfectant	Order No.	(RG 13)
GENO®-Bakttox (3 litres)	170 450	
GENO®-Bakttox (10 kg)	170 460	
GENO®-Bakttox (20 kg)	170 470	

Note:

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

Disinfection
Private Water Supply



Sales only after consultation with Grünbeck.
Water analysis required!

- with online chlorine dioxide measurement
- with blending module

GENO®-Baktox Pro

Chlorine dioxide generation systems GENO®-Baktox Pro

For continuous generation and volume controlled dosing of chlorine dioxide to disinfect drinking and industrial water.

Generation system as “plug and play” system, completely pre-assembled on aluminium rack, with control unit, voltage-free output for external fault signal, two chemical pumps with suction lances, two safety collecting basins, compensation tank, activated carbon filter, 5 µm pre-filter to supply dilution water, self-priming diaphragm dosing pump, automatically deaerating against pressure, pressure maintaining valve, contact water meter as pulse transmitter, innovative blending module with integrated online chlorine dioxide measurement and injection valve.

Specifications

- Nominal pressure PN 8
- Dimensions (w x h x d) 780 x 1,850 x 570 mm
- Water/ambient temperature max. 30/35 °C
- Power supply 230 V, 50/60 Hz, max. 180 VA

GENO®-Baktox Pro	6	10	20	30	50/1	50/2
Generation capacity [g/h]	5	5	5	10	10	10
Nominal connection diameter of water meter	R 1"	R 1 1/4"	R 1 1/2"	R 2"	DN 80	DN 100
Flow Q _{max} [m ³ /h]	6	10	20	30	50	50
Pressure loss at Q _{max} [bar]	0.5	0.5	0.7	0.8	0.5	0.5
Order no.	569 200	569 210	569 220	569 230	569 240	569 250

Consumable chemicals for the generation of chlorine dioxide

	Order no.	(RG 13)
GENO®-Baktox blau, 20 kg container	170 490	
GENO®-Baktox rot, 20 kg container	170 480	

Accessories

	Order no.
Adhesive safety stickers GENO®-Baktox	569 810
Personal safety set GENO®-Baktox	569 815
Test device Scuba+ (determination of chlorine dioxide)	211 145
Indicator (determination of chlorine dioxide)	211 221
Room air monitoring for chlorine dioxide, chlorine and ozone	569 820
USB data logger	569 825

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 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 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, attention should be paid to the required pH value which should be > 7.4 for the reaction to take place.



Nitrate filter WINNI-mat® VGX-N 50*



Nitrate filter WINNI-mat® VGX-N 400*

Sales only after consultation with Grünbeck. Water analysis required!

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 tank 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/VFX/VGX). In case of VGX-N 400 and VGX-N 650, the salt supply tank may be separated from the exchanger tank 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 (option), two shut-off valves (bypass), as well as two flexible connection hoses to the system and a water test kit for the nitrate determination are included in the scope of delivery.

Specifications

- Connection block – intallation length without water meter screw connections 190 mm
- Max. water/ambient temperature 30/40 °C
- Power supply 230, 50/60 Hz
- Nominal pressure of PN 10
- Operating pressure 2.0 bar min./8.0 bar max.
- 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 [m ³ /h]	1.3	1.3	1.5
Nominal capacity nitrate [mol]	0.8	6.5	10.5
Nominal capacity nitrate [g x m ³]	50	400	650
Max. capacity of brine tank max. [kg]	38	90	90
sufficient for approx. ... regenerations	35	33	20
Order no. (RG 13)	188 140	188 450	188 460

Accessories

Drain connection DN 50

acc. to DIN EN 1717

Order no. (RG 5)

187 840

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

Sales only after consultation with Grünbeck. Water analysis required!



GENO-mat® KF-Z

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 1 1/2" female thread

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.

Application areas

- Sand filter (quartz sand) 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 sand in various grain sizes (KF-Z), quartz sand and hydroanthrasite (MS-Z), quartz sand 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 sand* [kg]	33	75	108	148	200	311	390
Order no. (RG 13)	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 sand* [kg]	17	43	70	112	110	247	367
Hydroanthrasite [kg]	8	30	26	24	64	52	78
Order no. (RG 13)	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 sand [kg]	9	15	20	20	20	30	30
Activated carbon [kg]	10	23	25	40	50	90	140
Order no. (RG 13)	129 800	129 805	129 810	129 815	129 820	129 825	129 830

* In various grain sizes
 Refer to page 70 for consumables for filter systems

Disinfection
 Private Water Supply

Sales only after consultation with Grünbeck. Water analysis required!



GENO-mat® TE-Z

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 1 1/2" female thread

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 $\leq 1.0 \text{ mol/m}^3$ (3 °dH) 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"	1 1/2"	1 1/2"	1 1/2"	1 1/2"
Max. nominal flow [m³/h]	0.5	1.0	1.5	2.0	2.5	3.0	4.0
Tank diameter [mm]	210	257	335	370	405	550	610
Total tank height [mm]	1,360	1,620	1,620	1,895	1,900	1,865	2,095
Quartz sand [kg]	9	15	20	20	20	30	30
Hydrolit-Ca [kg]	20	25	70	90	120	220	320
Order no. (RG 13)	129 850	129 855	129 860	129 865	129 870	129 875	129 880

For mounting set refer to page 71.

Consumables for filter systems

	Order no. (RG 13)
Quartz sand 3.0 - 5.6 (all filter systems) 25-kg bag	170 208
Quartz sand 1.0 - 2.2 (KF-Z/MS-Z) 25-kg bag	170 207
Filter sand 04. - 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



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 internal components, filling of high-grade special filter material. Control valve 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.

Specifications

- Op. pressure min. 2.5 bar, max. 6.0 bar, nom. pressure PN 8
- Power supply 230 V, 50 Hz
- Max. water temperature 30 °C
- 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.

Deferrisation systems GENO-mat® FE-Z

- Special filter material GENO®-Ferrocacat

FE-Z	20/10	25/13	30/14	40/17	40/18	50/19	60/20
Nominal con. diameter [R]	1"	1"	1"	1 1/2"	1 1/2"	1 1/2"	1 1/2"
Nominal flow* [m ³ /h]	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Max. daily capacity* [m ³]	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 [m ³ /h]	1.6	1.6	1.6	3.4	3.4	5.7	5.7
GENO®-Ferrocacat [kg]	20	40	60	80	100	160	260
Support sand [kg]	–	–	25	25	25	50	50
Order no. (RG 13)	153 210	153 220	153 230	153 240	153 250	153 260	153 270

Accessories/Consumables

	Order no. (RG 13)
Mounting set R 1" (up to type 30/14)	125 845
Regeneration tank 100 l**	153 094
Regeneration tank 300 l**	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***	170 016
GENO®-special granulate 5 kg***	170 017
Potassium permanganate 5 kg (standard)***	170 041
Film material GENO® Ferrocacat 28 litres (approx. 18 kg)	170 170

* Depending on the iron concentration

** For the regeneration of deferrisation systems

*** 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 mg/l can be reduced to below 0.05 mg/l at pH values of > 7.2.

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

Deferrisation and 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 internal components, filling of high-grade special filter material, control valve 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.

Specifications

- Operating pressure min. 2.5 bar, max. 6.0 bar, nominal pressure PN 8
- Max. water temperature 30 °C
- Power supply 230 V, 50 Hz,
- Protective low voltage 24 V/10 VA

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"	1 1/2"	1 1/2"	1 1/2"	1 1/2"
Nominal flow* [m³/h]	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Max. daily capacity* [m³]	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	257	335	370	405	550	610
Total height of system [mm]	1,360	1,620	1,620	1,895	1,900	1,865	2,095
Order no. (RG 13)	153 410	153 420	153 430	153 440	153 450	153 460	153 470

Replacement filter fillings MN-Z

Order no. (RG 13)	153 020	153 022	153 024	153 026	153 028	153 030	153 032
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* Depending on the iron and manganese concentration
 Accessories/consumables refer to page 71.



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, overflow valve, dosing group 3.01 and 5 m dosing line.

Dosing system GENODOS®	DM-oxi 1"	DM-oxi 1 1/2"
Dosing pump GP type	2/40	6/40
Flow Q_{max} [m ³ /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 13)	163 420	163 430

Dosing agent

	Order no.	(RG 13)
GENO®-oxi plus 20 kg (standard)	170 029	

Disinfection
Private Water Supply



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.

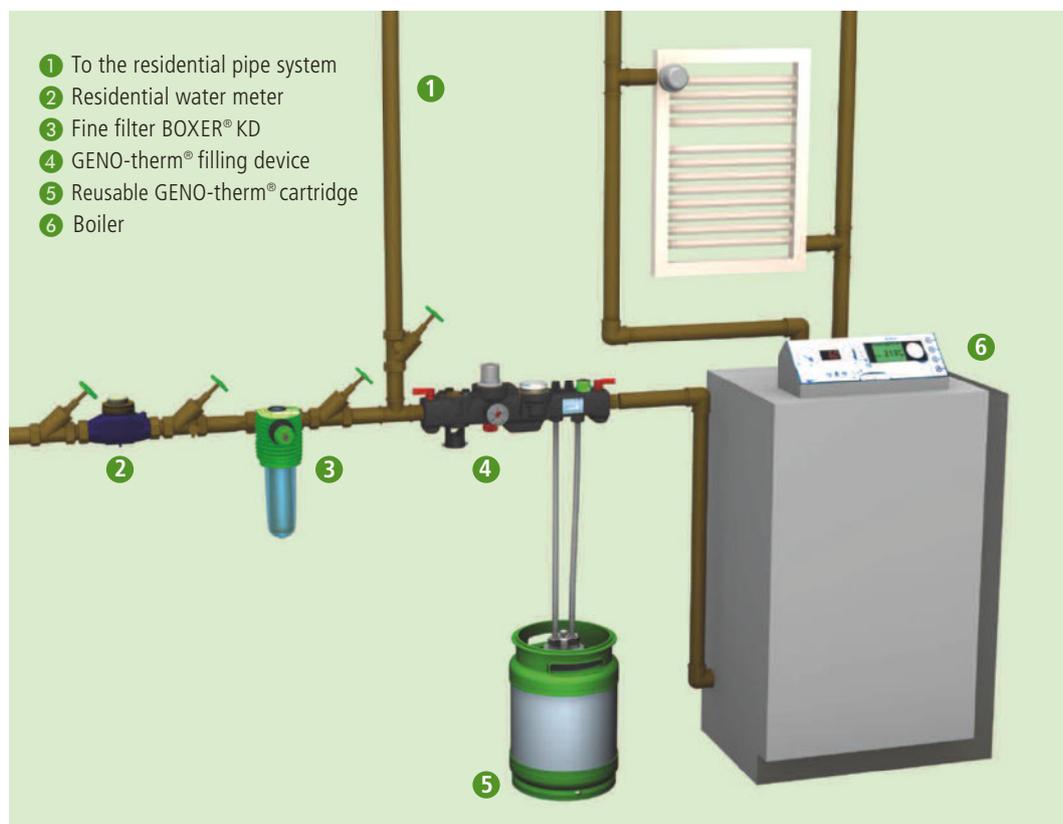
The solution is quite simple: Only fully demineralised water (demi water) provides ideal conditions to prevent annoying deposits and corrosion in the heating cycle – and in general, even without the need for additional chemicals.

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 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). The VDI 2035 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.



Installation example of a heating system



GENO-therm® filling device Basic



GENO-therm® filling device Premium

GENO-therm® filling devices



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

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

Filling device Basic

Filling device consisting of: prefilter, shut-off valves, system separator, pressure reducer (0.2 - 4 bar) with pressure gauge, setting scale and integrated slide for maintenance, 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; starting from a conductivity of 50 µS/cm, a red diode is blinking and signals that the full demineralisation unit needs to be replaced.

Filling device Premium

As for filling device Komfort, however, with digital water meter; connection to external controller possible.

GENO-therm® filling devices

Nominal connection diameter [DN]	15
Max. filling capacity at 1.5 bar [m³/h]	2.65 (varies depending on the cartridge used – disposable or reusable cartridge)
Operating pressure [bar]	10
Water temperature [°C]	65
Installation length with water meter screw connections [mm]	495
Installation length without water meter screw connections [mm]	447
Drain connection, HT pipe [mm]	40
Distance to wall [mm]	87

GENO-therm® filling devices

	Order no. (RG 13)
Basic	707 120
Komfort	707 130
Premium	707 140



Disposable GENO-therm® cartridge 100 without adapter



Disposable GENO-therm® cartridge 110 with adapter (with cardboard box as support)



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 73), 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 dezincification-resistant 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 type 110	without adapter	with adapter
Nominal connection diameter of the adapter	3/4"	3/4"
Max. flow [l/h]	400	400
Max. nominal pressure [bar]	6	6
Max. water temperature [°C]	30	30
Weight, resin included [kg]	4.5	4.5
Order no. (RG 13)	707 155	707 150

Accessories

	Order no.	(RG 13)
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
- $110/500 = 0.22 \text{ m}^3$ (equals 220 litres)

Result: At the current conductivity, 220 litres of water may be fully demineralised by this type of disposable cartridge.



Reusable GENO-therm® cartridge

Reusable GENO-therm® cartridge

NEW

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 pedestal, non-return valve and flow stabiliser, deaeration valves, nominal connection diameter $\frac{3}{4}$ " , max. operating pressure 10 bar, max. water temperature 60 °C

Reusable GENO-therm® cartridge*	290	570	825	1160	1615
Nominal connection diameter	3/4"	3/4"	3/4"	3/4"	3/4"
Max. 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 13)	707 050	707 060	707 070	707 080	707 090

*In order to connect the reusable cartridge to the filling device, the GENO-therm® hose set is required.

Sample calculation:

- Conductivity of the filling water: 500 $\mu\text{S}/\text{cm}$
- Cartridge used: reusable GENO-therm® cartridge 825
- $825/500 = 1.65 \text{ m}^3$ (equals 1,650 litres)

Result: 1,650 litres of water can be fully demineralised by means of this type of cartridge.



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 50 $\mu\text{S}/\text{cm}$, 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.

Consisting of:

Control unit GENO®-Multi-LF with transformer and cable as well as measuring cell adapter (with conductivity and temperature measuring cell), analogue water meter, GENO-therm® hose set, solenoid valve, twin screw connections (3/4") and twin nipples (3/4")

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 $\mu\text{S}/\text{cm}$, a red diode lights up and indicates that the full demineralisation unit must be replaced. By means of the analogue water meter which is included, the filling water volume can be documented.

Consisting of:

GENO-therm® conductivity measuring cell with adapter (battery operated), analogue water meter, GENO-therm® hose set, a twin screw connection (3/4") and a twin nipple (3/4").



GENO-therm® analysis case including molybdenum test kit



GENO-therm® service case

GENO-therm® analysis and service cases



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® 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 13)
Basic case	707 160
Premium case	707 170
Service case	707 180
Analysis case with water test kit for molybdenum	707 190
Analysis case without water test kit for molybdenum	707 192
Conductivity cell with adapter	707 195

WORLD INNOVATION!



Mobile reverse osmosis system AVRO-flex 250



GENO-therm® filling case

NEW

Mobile reverse osmosis system AVRO-flex 250

The mobile reverse osmosis system AVRO-flex 250 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. 500 ppm
- Salt rejection rate > 95 %
- Inlet pressure of feed water min. 2.5 bar
- Water temperature min. 10 °C, max. 30 °C
- Protection IP 54
- Power supply 230 V, 50 Hz

Mobile reverse osmosis system AVRO-flex 250

Nominal connection diameter	3/4" or GEKA coupling
Permeate capacity at 10/15 °C [l/h]	210/250
Permeate capacity/day [l]	6,000
Permeate supply	170 l/h at 4.0 bar, 250 l/h at 3.7 bar
Connected load [kW]	0.7
Dimensions [mm] [l x h x d]	700 x 1,450 x 600
Operating weight, approx. [kg]	80
Order no.	752 200

NEW

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. 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 13)
707 165



Combined measuring device for pH and conductivity



GENO-therm® conductivity measuring cell with adapter

Accessoires

NEW

	Order no.	
GENO®-dosing unit H 5	150 100	(RG 13)
GENO®-manual pump H	150 210	(RG 13)
Water test kit for molybdenum	170 140	(RG 13)
Water test kit for total hardness	170 145	(RG 13)
Combined measuring device for pH and conductivity without calibration solutions	170 178	(RG 13)
Calibration solution for conductivity	203 624	
Calibration solution pH 4	203 627	
Calibration solution pH 7	203 628	
Conductivity meter GENO®-Multi-LF (measuring range 0 – 99.9 µS/cm, incl. temp)	702 842	(RG 13)
Analogue water meter with connection accessories	702 845	(RG 13)
Refill of mixed-bed resin GDX-K 500, 5 litres	702 885	(RG 13)
Stainless steel solenoid valve (24 V/50 Hz)	707 055	(RG 13)
Blending housing (for filling device Basic)	707 056	(RG 13)
Hose adapter to convert from a 3/4" male thread connection to quick-coupling	707 059e	(RG 13)
Twin nipple 3/4"	707 124	(RG 13)
Adapter for GENO-therm® cartridge	707 127	(RG 13)
GENO-therm® conductivity measuring cell	707 185	(RG 13)
GENO-therm® conductivity measuring cell with adapter	707 195	(RG 13)
Filling group	707 700	(RG 13)
Sludge strainer GENO-therm® with magnet DN 20	707 705	(RG 13)
Sludge strainer GENO-therm® with magnet DN 25	707 710	(RG 13)
Sludge strainer GENO-therm® with magnet DN 32	707 715	(RG 13)
Sludge strainer GENO-therm® with magnet DN 40	707 720	(RG 13)
Sludge strainer GENO-therm® with magnet DN 50	707 725	(RG 13)
Digital water meter	707 805	
GENO-therm® hose set (2 pcs)	707 850	(RG 13)
Booklet for warm water heating system	825 52 110	
Twin screw connection 3/4"	855 01 851	(RG 13)
Replacement electrode for combined measuring device	170 605e	

Heating Water

Dosing agents

Product	Applications	Characteristics
GENO®-safe A full heating protection	Warm water heating systems	Full heating protection for single-family and apartment 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 systems as well as cooling cycles, heat pumps and solar systems	Corrosion and frost 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 ● > 20 % of the system volume up to - 10 °C ● > 30 % of the system volume up to - 18 °C Not suitable for use with aluminium heating systems and aluminium components!
GENO®-phos Nr. 1	Steam boiler systems and warm water heating systems with metal pipes and radiators	Trisodium phosphate (granulate), precipitation of residual hardness, alkalinisation by means of pH increase, preparation in soft water. Not suitable for use with aluminium heating systems and aluminium components!
GENO®-phos Nr. 2	Steam boiler systems, with too high alkalinity	Sodium hydrogen orthophosphate (granulate), to reduce high alkalinity, pH reduction, precipitation of residual hardness
Sodium sulphite	Steam boiler systems, warm water and hot water cycles	Oxygen binding agent (granulate), activated, for chemical oxygen binding in water, not steam-volatile, approved for steam boilers in food applications.

GENO®-safe A

Chemicals for heating systems	Order no. (RG 5)
GENO®-safe A, box with 18 cartridges of 0.310 litre each (standard)	180 520
GENO®-safe A, 1 litre	180 530
GENO®-safe A, box 10 x 1 litre (standard)	180 540
GENO®-safe A, canister 11 kg (standard)	180 550
Chemicals for heating and solar systems	Order no. (RG 5)
GENO®-heating protection FSK (20 kg) (standard)	180 230
Chemicals for boiler plants	Order no. (RG 13)
GENO®-phos Nr. 1 (500 g) (standard)	170 001
GENO®-phos Nr. 1 (3.5 kg) (standard)	170 002
GENO®-phos Nr. 1 (25 kg) (standard)	170 052
GENO®-phos Nr. 2 (3.5 kg) (standard)	170 003
GENO®-phos Nr. 2 (25 kg) (standard)	170 053
Sodium sulphite (6 kg) (standard)	170 004
Sodium sulphite (25 kg) (standard)	170 054
Sodium hydroxide (5 kg) (standard)	170 005
Sodium hydroxide (25 kg) (standard)	170 055
GENO®-amin (20 kg) (standard)	170 008
GENO®-SW 2000 (30 kg) (standard)	180 400
GENO®-SW 2010 (20 kg) (standard)	180 415
GENO®-SW 2010 (100 kg) (standard)	180 420
GENO®-SW 2040 (25 kg) (Standard)	180 440



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 18 °dH x m³, soft water capacity at a raw water hardness of 20 °dH 900 litres.

Water softener HEH 9*	Order no.	(RG 13)
	190 570	

Accessories	Order no.	(RG 13)
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 (13.4 °dH x m³) 2.4 mol, regeneration salt supply 38 kg, salt consumption/regeneration approx. 0.85 kg, nominal flow (at 0 °dH) 0.5 m³/h.

Water softener WINNI-mat® VGX 14-H*	Order no.	(RG 13)
	188 250	

Accessories	Order no.	(RG 5)
Drain connection DN 50 acc. to DIN EN 1717 for small-scale water softeners	187 840	

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 150 °dH x m³, soft water capacity at a raw water hardness of 20 °dH 7.5 m³, nominal pressure PN 10 bar, flow pressure min./ma. 2.0/8.0 bar, regeneration salt supply 190 kg.

Mobile water softener*	MEH	Regeneration station
Order no. (RG 13)	707 250	707 240

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



GENO®-Neutra FNH-420-R*

Condensate neutralisation for gas and oil condensing boilers

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 tank where it is circulated and the pH value is monitored and increased by means of the dosing of 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
△ nominal capacity for condensing boilers 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 at 420 l/h [m]	3
Power supply [V, Hz]	2 x power cable 230/50
Neutralisation agent	GENO®-Neutrox
Order no. (RG 13)	410 540

Accessories

	Order no.	(RG 13)
Voltage-free level signal „pre-warning“ 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**	180 355	
GENODOS®-suction lance, 750 mm	118 520	

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

** Here, the GENODOS®-suction lance 750 mm (order no. 118 520) is required.



GENO®-Neutra N-70



GENO®-Neutra NO-5

Condensate neutralisation for gas and oil condensing boilers



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, N210

Flow-through neutralisation for condensate originating from gas condensing boilers, consisting of 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 consisting of 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 a 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*	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 13)	410 440	410 450	410 320	410 230	410 240	410 250

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

Heating Water



GENO®-Neutra NO-24



Waste water pumping system AH-300

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 drain 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, 0.33 A
- 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 13)
Waste water lifting system AH-300	420 150	

Accessories for condensate neutralisation

	for type	Order no.	(RG 13)
Activated carbon filter GENO® AF-5*		410 435	
Overflow alarm switch	N-14, N-70, N-210, NO-5,	410 680	
Alarm delay**	NO-12, NO-24***, AF-5	410 285	
Maintenance set (incl. GENO®-Neutralit Hz)	N-14	410 801	
Maintenance set (incl. GENO®-Neutralit Hz)	N-70	410 802	
Maintenance set (incl. GENO®-Neutralit Hz)	N-210	410 803	
Maintenance set (incl. GENO®-Neutralit Hz)	NO-5	410 805	
Maintenance set (incl. GENO®-Neutralit Hz)	NO-12	410 806	
Maintenance set (incl. GENO®-Neutralit Hz)	NO-24	410 807	
Maintenance set for activated carbon filter	AF-5	410 824	
Inlet filter with activated carbon	Neutrabox GENO® I-25 and G-25	410 012	
Replacement box	Neutrabox GENO® I-25	410 780	
GENO®-Neutralit Hz, 3 kg	Neutrabox GENO® G-25, N-14, NO-5	410 770	
GENO®-Neutralit Hz, 8 kg	N-14, N-70, N-210, NH-140, NO-12, NO-24	410 011	
GENO®-Neutralit Hz, 25 kg	NH-140 und N-210, NO-12, NO-24	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	

* The activated carbon filter GENO® AF-5 is suitable for the filtration of condensate originating from oil and gas burning heating 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.

** Only in combination with overflow alarm switch.

*** For NO-24, two units are required.



Installation example for cooling water treatment systems

Dosing agents

To prevent scale deposits, corrosion and algae growth.

When using dosing agents against algae growth (biocide), a shock treatment with 100 – 300 g/m³ is required. Due to the danger of foaming, an anti-foaming agent (KW 41) should be at hand when performing shock treatments. Chlorine may only be used as a biocide for pH values below 7.5. When using biocides, appendix 31, paragraph 2 of the German Waste Water Guideline (Rahmen-Abwasser VwV) must be observed.

Cooling water chemicals and biocides are an integral part of optimised cooling water treatment. For reasons of economic efficiency, functionality and in view of the service life of cooling cycles, chemicals and biocides are added in order to prevent corrosion and scaling and to keep the growth of micro-organisms at acceptable levels. The agents complement the technical measures of water treatment.

Suitable dosing systems

- GENODOS® with accessories (pages 30 – 33)

Dosing systems GENODOS® BZ

Dosing system to add biocide, consisting of:

Dosing pump 10/40-4G, external drive cable, suction lance B 10/20, dosing group 3.01 and dosing line 5 m; switch box „digital timer control“ only for timer-controlled BZ 10/40

Dosing system GENODOS®	BZ 10/40 (timer-controlled)	BZ 10/40 (controlled via KWA-tronic)
Order no. (RG 13)	164 220	164 230

Accessories for cooling water

	Order no.	(RG 13)
Corrosion measuring test section incl. 4 coupons	553 200	
Corrosion coupon for steel*	553 210	
Corrosion coupon for copper*	553 212	
Corrosion coupon for brass*	553 214	
Corrosion coupon for aluminium*	553 216	
Corrosion coupon for stainless steel 1.4306*	553 217	
Corrosion coupon for stainless steel 1.4404*	553 218	

* Lab analysis included



GENO®-KWA-50k



GENO®-KWA-60i

Automatic salt reduction systems GENO®-KWA

For the automatic salt reduction in cooling cycles and air washers.

At your choice either with conductive (KWA-50k) or inductive (KWA-60i) conductivity sensor. According to the requirements of the German Waste Water Guideline (AbwV), appendix 31, the automatic salt reduction system features a stopping device for the salt reduction during the biocide dosing.

Scope of delivery:

Compact system, ready for connection, with microprocessor controller GENO®-KWA-tronic₂, temperature and conductive or inductive conductivity sensor, in case of power failure self-closing salt reduction valve as motor-driven ball valve DN 25 with exchangeable flow orifice, pipework with manually operated flow restrictor. All components are completely assembled and wired on a mounting plate, including 2 m power supply cable with shock-proof plug.

Among others, the GENO®-KWA-tronic₂ offers the following functions:

- Integrated timer control with preliminary salt reduction and stopping of salt reduction in case of an optional biocide dosing
- Standby or automatic operation via external signal or key button
- Stopping of salt reduction function via external signal
- Analogue output 0(4) - 20 mA
- Voltage-free collective fault contact (change-over contact)
- Optional: Data logger with memory card (refer to page 89)

Connections for optional components:

- Biocide dosing system
- Spray pump
- Flow control of circulation
- pH-controlled salt reduction
- UV system
- Water softener GENO-mat® duo WE-KWA
- Circulation pump
- Waste water meter
- Monitoring of the irradiation intensity of the UV systems

GENO®-KWA	50k	60i
Measuring method	conductive	inductive
Power supply [V, Hz]	230, 50	
Dimensions (w x h x d) [mm]	500 x 750 x 230	
Order no. (RG 13)	164 270	164 280



GENO®-LUWADES₂

Compact air washer system GENO®-LUWADES₂

For quality-controlled salt reduction and disinfection in air washer systems.

Compact system, ready for connection, consisting of: microprocessor controller GENO®-KWA-tronic₂, conductive temperature and conductivity sensor, in case of power failure self-closing salt reduction valve as motor-driven ball valve DN 25 with exchangeable flow orifice, circulation pump with flow control, UV disinfection system GENO®-UV module 40 S with monitoring of the irradiation intensity, manually operated flow restrictor, pressure gauge and coarse dirt strainer. All components completely assembled and wired on a mounting plate, including 2 m power supply cable with shock-proof plug.

In the LUWADES₂, the microprocessor controller GENO®-KWA-tronic₂ serves as measuring, control and regulating electronics for various parameters, in particular for the treatment of the circulation water in air washers. Via the flow-controlled circulation pump, circulation water is continuously withdrawn from the basin of the air washer and returned to the basin via the UV system. The UV system and the sensors are protected by a coarse dirt strainer. The salt reduction may be controlled via the conductivity of the circulation water and the irradiation intensity of the UV system, resulting in a temperature compensation of the conductivity value.

There are additional control options, e. g. biocide dosing system, dosing system for additional make-up water conditioning, etc.

Compact air washer system	GENO®-LUWADES ₂
Nominal connection diameter inlet/outlet	DN 32 (female thread 1 1/4")/DN 25 (female thread 1")
Power supply [V, Hz]	230, 50
Dimensions, approx. (w x h x d) [mm]	700 x 1,200 x 400
Ambient/water temperature [°C]	0 - 40/5 - 35
Order no.	521 200

For dosing units for cooling water systems, refer to page 87.

For dosing agents for cooling water systems, refer to page 90.

Accessories

	Order no.	(RG 13)
Data logger with memory card for KWA-tronic ₂	164 820	
pH monitoring for GENO®-KWA-tronic ₂	164 810	
System rack for GENO®-LUWADES ₂ for stand-alone installation	521 035	

	Cooling water products										Order no. (RG 13)			
	Chemical resistance group		Copper corrosion protection		Aluminium corrosion protection		Hardness corrosion protection		pH range		Circulation concentration [g/m ³]	Analyt. detection via molybdenum peroxide test	Analyt. detection via org.-P04	Canister volume [kg]
	Steel corrosion protection	Copper corrosion protection	Aluminium corrosion protection	Hardness corrosion protection	Dispersion	Biocide	pH range	Circulation concentration [g/m ³]	Analyt. detection via molybdenum peroxide test	Analyt. detection via org.-P04	Canister volume [kg]	Order no. (RG 13)		
closed systems														
KW 0	+++	+++	+	++	-	-	7.5 - 10	1000 - 3000	+	-	20	160 605		
KW 0	+++	+++	+	++	-	-	7.5 - 10	1000 - 3000	+	-	5	160 604		
KW 1000	+++	+++	+	+	-	-	7.5 - 10	3000 - 5000	-	+	20	160 634		
KW 1700	++	+++	++	++	-	-	7.5 - 9	2000 - 5000	+	-	20	160 655		
KW 1700	++	+++	++	++	-	-	7.5 - 9	2000 - 5000	+	-	5	160 648		
open systems														
KW 11	+++	+	++	-	-	-	6 - 8	20 - 35	-	+	20	160 601		
KW 12	++	+	+	-	-	-	7.3 - 7.8	45 - 60	-	+	20	160 602		
KW 1300	++	+	+	++	-	-	7.8 - 8.5	30 - 50	+	-	20	160 612		
KW 1510	++	-	+++	+++	-	-	7 - 10	5 - 30	-	+	20	160 643		
KW 1600	++	+	+	+	-	-	7.5 - 9	80 - 120	-	+	20	160 641		
KW 1620	++	++	+	++	-	-	6.5 - 8.5	50 - 80	-	+	20	160 644		
KW 1830	++	+	+++	+++	-	-	7 - 10	30 - 50	-	+	20	160 647		
KW 5510	+	-	++	-	++	-	6 - 10	30 - 50	-	+	20	160 652		
Biocide														
KW 4000	-	-	-	-	+++	-	6 - 10	100 - 300	-	-	20	160 649		
KW 4500	-	-	-	-	+++	-	6 - 10	50 - 100	-	-	20	160 658		
KW 4130	-	-	-	-	++	-	6 - 10	200 - 300	-	+	30	160 654		
Air washers														
LW 1	+	-	+	+	++	-	7.5 - 9	400 - 600	-	+	20	160 607		
GENO®-perox	standard	standard	standard	standard	standard	standard	6 - 10	450 - 600	-	+	10	170 325		

The values shown above are standard values. You must also take into account all other water parameters. Please inquire about cooling water chemicals for special application areas! We recommend consulting the Grünbeck consultation service before making your decision!

+++ very suitable
 ++ quite suitable
 + suitable
 - unsuitable



GENO®-softwatch Komfort



GENO®-control with differential pressure transmitter R 3/4"

Automatic water analysis system GENO®-softwatch Komfort



Fully automatic analysis system to monitor the residual/total hardness. The measuring range is determined by the indicator selected. The electronic control unit for the microprocessor-controlled analysis sequence, with functions monitoring in case of lack of indicator, automatic monitoring of measuring chamber/lack of water/turbidity, offer a multitude of analysis and control alternatives. The system is approved for operation without constant supervision.

Specifications

- Nominal connection diameter 6/8 mm
- Dimensions (w x h x d) 350 x 250 x 140 mm
- Power supply 85 - 264 V, 47 - 63 Hz
- Operating pressure 0.5 - 5 bar

Automatic water analysis system	Order no.	(RG 13)
GENO®-softwatch Komfort	172 500	

Indicators* for GENO®-softwatch Komfort

	Order no.	(RG 13)
Residual total hardness 500 ml SWK each 0 - 0.1	172 201	
Residual total hardness 500 ml SWK each 0 - 0.3	172 202	
Residual total hardness 500 ml SWK each 0 - 0.5	172 203	
Residual total hardness 500 ml SWK each 1.0 - 10	172 204	

*Service life: 2 years For additional indicators, please inquire.

Residual hardness monitoring system GENO®-control

For continuous monitoring of residual hardness in soft water, compact device for connection to a differential pressure transmitter (accessories).

To protect against break-through of hardness downstream of ion exchangers. Short-term, minor break-through of hardness (e.g. when the complete system is started) do not cause alarms (observe application areas and application limits!). Hardness meter with shut-off valves and hose connections, control unit with visual operating and hardness indication and output for visual/acoustic signal and/or shut-down function of a system downstream. Measuring hose with connections, replacement sensor.

Specifications

- Nominal connection diameter R 3/4" - R 2"
- Dimensions (w x h x d) 280 x 300 x 140 mm
- Power supply 230 V, 50 Hz

Residual hardness monitoring system	Order no.	(RG 13)
GENO®-control, without differential pressure transmitter	172 300	
Differential pressure transmitter R 3/4"	172 303	
Differential pressure transmitter R 1 1/4"	172 305	
Differential pressure transmitter R 2"	172 309	
Replacement sensor for GENO®-control	172 304	



Water sample cooler



Wall mounted cabinet, 2 doors

Water sample cooler

To cool hot water samples.

Cooling container with integrated cooling coil, completely made of stainless steel (material 1.4301), container with welded collecting bowl for water samples, shut-off valves, container diameter 80 mm, container casing height 520 mm.

Water sample cooler	Order no.	(RG 13)
Version for 16 bar (op)	160 450	
Version for 40 bar (op)	160 460	



Analyses case for boiler water



Analyses case for heating water

Wall cabinet/analyses cases

	Order no.	(RG 13)
Wall cabinet with two doors, made of formica with work plate, without test kit (w x h x d) 640 x 625 x 250 mm	170 120	
Wall cabinet with one door, without test kit (w x h x d) 350 x 570 x 260 mm	170 130	
Analyses cabinet for boiler water (w x h x d) 310 x 380 x 190 mm with test kits for hardness, p and m values, phosphate and sulphite concentration, pH value and conductivity	170 196	
Analyses case for boiler water with test kits for hardness, p and m values, phosphate and sulphite concentrations, pH value and conductivity	170 195	
Analyses case for heating water with test kits for phosphate, sulphite, total hardness and pH value	170 190	



Hardness determination in drinking water



pH measuring strips

Water test kits

Drinking water

	Order no.	(RG 13)
Hardness determination in drinking water	170 145	
Determination of carbonate hardness in drinking water	170 169	
pH measuring strips, 100 pcs (4.5 – 10)*	170 148	
Water test kit for chlorine and pH value (0.1 – 2.0 mg/l, 6.9 – 8.2)*	170 128	
Determination of nitrate (0 – 500 mg/l)*	170 131	
Determination of iron (0 – 0.8 and 1 – 10 mg/l)*	170 150	
Determination of manganese (0.03 – 0.5 mg/l)*	170 124	
Determination of peroxide (0.5 – 25 mg/l)*	170 136	
Combined measuring device for pH and conductivity incl. calibration solutions	170 181	

Heating water, boiler feed water

	Order no.	(RG 13)
pH measuring strips, 100 pcs (7 - 14)*	170 147	
pH measuring strips, 100 pcs (4.5 - 10)*	170 148	
pH measuring strips, 3 boxes of 100 pcs each (pH 0 - 6/4.5 - 10/7 - 14)*	170 106	
Water test kit for molybdenum (5 - 250 mg/l MO^{6+})*	170 140	
GENO®-heating protection FSK	170 141	
Hardness, p and m value for boiler feed water	170 109	
Hardness determination GENO®-plex for boiler water	170 121	
Hardness determination B for boiler water sufficient for approx. 100 analyses	170 149	
Ortho-phosphate concentration (2 - 15 mg/l as PO_4^{3-})*	170 103	
Sulphite measuring strips (100 pcs) (10 - 40 mg/l)*	170 535	
Sulphite excess in boiler water (0.5 - 20 mg/l)*	170 107	
Oxygen test kit (0 - 100 ppb)*	170 144	

Replacement reagents for phosphate and sulphite test kits	Order no.	(RG 13)
Phosphate reagent 1 (250 ml)	170 501	
Phosphate reagent 2 (250 ml)	170 502	
Sulphite reagent 1, 2, 3 (15/15/50 ml – small package)	170 520	
Sulphite reagent 1, 2, 3 (100/100/250 ml – large package)	170 525	

* Measuring range

Commissioning and maintenance

When performed by Grünbeck's customer 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 Order no.	Maintenance 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	943 162	942 162
Dosing systems GENODOS® DM-BO	943 163	942 163
Alternative anti-scaling		
GENO-K4®	943 157	942 803
Softeners with DVGW certification		
Water softeners GSX 5, 10, 10-I	943 187	942 187
Single systems	943 120	942 120
Twin systems GSX 9, 14, 19		942 121
Delta-p® 1" - 1 1/4"	943 085	942 085
Delta-p® 1 1/2" - 2"	943 185	942 185
Disinfection Delta-p® 1" - 1 1/4"	944 085	
Disinfection Delta-p® 1 1/2" - 2"	944 185	
Extended start-up Delta-p® 1" - 1 1/4"	943 285	
Extended start-up Delta-p® 1 1/2" - 2"	943 385	
Systems without DVGW certification (including system separators)		
Single systems R 1"	943 122	942 122
Single systems R 1 1/2"	943 123	942 123
Single systems R 2"	943 124	942 124
Twin systems R 1"	943 125	942 125
Twin systems R 1 1/2"	943 126	942 126
Twin systems R 2"	943 127	942 127
Twin systems > R 2"	943 128	942 128
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

Devices, systems, services	Commissioning Order no.	Maintenance Order no.
Deferrisation, demanganisation		
without regeneration tank	943 154	942 154
with regeneration tank	943 153	942 153
Reduction of nitrate		
Single systems	943 129	943 129
Reverse osmosis		
GENO®-OSMO-MSR (with storage tank and pressure booster pump)	943 700	942 700
GENO®-OSMO-RO 125K-TS	943 703	942 703
GENO®-OSMO-RO 125K-TL	943 704	942 704
AVRO 125 TS	943 720	942 720
AVRO 125 TL, AVRO-flex 250	943 820	942 820
Mixed-bed demineralisation		
Reusable GENO-therm® cartridge, mixed-bed cartridge GDX	943 702	942 702 <small>(without regeneration costs)</small>
Safety devices		
System separators DK 2-Mini/DK 2 1/2" - 2"	943 132	942 132
System separators DN 50 - DN 250	943 133	942 133
GENO®-G5	943 134	942 134
UV disinfection		
Types 60 I, 120 I, 200 I	943 520	942 520
Types 60 S, 120 S, 200 S	943 521	942 521
Heating technology		
Neutrabox GENO® G-25, I-25		942 410
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
Cooling water		
Cooling water salt reduction KWA-50k/60i	943 524	942 524
Compact air washer system GENO®-LUWADES ₂	943 522	942 522 <small>(without spare lamp)</small>
Monitoring devices for hardness		
GENO®-control	943 721	942 721
GENO®-control SP		942 722
GENO®-softwatch Comfort	943 723	942 723
Miscellaneous		Order no.
Regeneration of mixed-bed cartridges GDX, reusable GENO-therm® cartridges		
Mixed-bed cartridge GDX 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
Site inspection/lump sum (e. g. reverse osmosis, boiler feed water systems)		943 900
Water analyses/lump sum (free of charge, if order is placed)		943 910

Ord. no.	Item	RG	Page	Ord. no.	Item	RG	Page
100001	Set of seals for FS 1" + FSD 1", 3 pcs	8	15	103002	GENO-RFE 50 µm, 2-pack, size 2 with protective cylinder	8	16
100002	Set of seals for FS/FSD 1 1/4"-2", 3 pcs	8	15	103003	GENO-RFE 50 µm, 2-pack, size 3 with protective cylinder	8	16
100651	Filter element with O-ring	8	16	103007	GENO-RFE 80 µm, 2-pack, size 1 with protective cylinder	8	16
100860	Pressure gauge to indicate operating pressure		6	103008	GENO-RFE 80 µm, 2-pack, size 2 with protective cylinder	8	16
100865	Pressure gauge to indicate operating pressure		6	103009	GENO-RFE 80 µm, 2-pack, size 3 with protective cylinder	8	16
100870	Pressure gauge to indicate operating pressure		6, 11	103044	GENO-RFE 50 µm, 2-pack, size 5 without protective cylinder	8	16
100875	Pressure gauge to indicate operating pressure		6, 11	103061	GENO-RFE 5 µm, 2-pack, size 1 with protective cylinder	8	16
100890	Pressure gauge to indicate operating pressure		6	103062	GENO-RFE 5 µm, 2-pack, size 2 with protective cylinder	8	16
101080	KICKER 1 1/2", backwash filter	8	11	103063	GENO-RFE 5 µm, 2-pack, size 3 with protective cylinder	8	16
101085	KICKER 2", backwash filter	8	11	103067	GENO-RFE 20 µm, 2-pack, size 1 with protective cylinder	8	16
101170	GENO-fine filter FS-B 1"	8	6	103068	GENO-RFE 50 µm, 2-pack, size 1 without protective cylinder	8	16
101175	GENO-fine filter FS-B 1 1/4"	8	6	103069	GENO-RFE 50 µm, 2-pack, size 2 without protective cylinder	8	16
101180	GENO-fine filter FS-B 1 1/2"	8	6	103070	GENO-RFE 50 µm, 2-pack, size 3 without protective cylinder	8	16
101185	GENO-fine filter FS-B 2"	8	6	103071	GENO-RFE 20 µm, 2-pack, size 1 without protective cylinder	8	16
101205	BOXER K 3/4", fine filter	8	8	103075	GENO-RFE 80 µm, 2-pack, size 1 without protective cylinder	8	16
101210	BOXER K 1", fine filter	8	8	103076	GENO-RFE 80 µm, 2-pack, size 2 without protective cylinder	8	16
101215	BOXER K 1 1/4", fine filter	8	8	103077	GENO-RFE 80 µm, 2-pack, size 3 without protective cylinder	8	16
101255	BOXER KD 3/4", fine filter	8	8	103081	GENO-RFE 5 µm, 2-pack, size 1 without protective cylinder	8	16
101260	BOXER R 1", fine filter	8	8	103082	GENO-RFE 5 µm, 2-pack, size 2 without protective cylinder	8	16
101265	BOXER RD 1 1/4", fine filter	8	8	103083	GENO-RFE 5 µm, 2-pack, size 3 without protective cylinder	8	16
101305	BOXER R 3/4", backwash filter	8	9	103100	GENO-RFE 50 µm, 2-pack, size 6 without protective cylinder	8	16
101310	BOXER R 1", backwash filter	8	9	103110	GENO-RFE 100 µm, 2-pack without protective cylinder	8	16
101315	BOXER R 1 1/4", backwash filter	8	9	103111	GENO-RFE 500 µm, 2-pack without protective cylinder	8	16
101355	BOXER RD 3/4", backwash filter	8	9	103150	GENO-RFE 100 µm, 14-pack, size 4		16
101360	BOXER RD 1", backwash filter	8	9	103151	GENO-RFE 500 µm, 14-pack, size 4		16
101365	BOXER RD 1 1/4", backwash filter	8	9	103153	GENO-RFE 50 µm, 28-pack, size 4		16
101405	BOXER A 3/4", automatic backwash filter	8	10	104805	Spigot wrench for pressure reducer		15
101410	BOXER A 1", automatic backwash filter	8	10	105805	Belt wrench for diameters up to 170 mm		15
101415	BOXER A 1 1/4", automatic backwash filter	8	10	107400	GENO-backwash filter MX 1"	8	12
101455	BOXER AD 3/4", automatic backwash filter	8	10	107405	GENO-backwash filter MX 1 1/4"	8	12
101460	BOXER AD 1", automatic backwash filter	8	10	107410	GENO-backwash filter MX 1 1/2"	8	12
101465	BOXER AD 1 1/4", automatic backwash filter	8	10	107415	GENO-backwash filter MX 2"	8	12
101639e	Set of seals for FS-B, 1 1/2", 2", 2 pcs	8	15	107420	GENO-backwash filter MX DN 65	13	13
101641e	Set of seals for BOXER, FS-B 1", 1 1/4" 2 pcs	8	15	107425	GENO-backwash filter MX DN 80	13	13
101710	GENO-fine filter S-WW 1 1/2"	13	15	107430	GENO-backwash filter MX DN 100	13	13
101810	GENO-fine filter S-WW 1"	13	15	107450	GENO-backwash filter MXA 1"	8	12
102185	GENO-fine filter FME-WW 50 (stainless steel version)	13	14	107455	GENO-backwash filter MXA 1 1/4"	8	12
102190	GENO-fine filter FME 50 (stainless steel version)	13	14	107460	GENO-backwash filter MXA 1 1/2"	8	12
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1. SUBJECT MATTER AND CONCLUSION OF THE CONTRACT

Delivery, performances of contract and quotations are made exclusively upon the terms and conditions set out hereinafter. These terms and conditions shall also apply to all future business with the Purchaser, even if they have not been expressly agreed upon again by the parties. The Purchaser's stipulations of terms and conditions contrary to the provisions hereof are hereby agreed to be inapplicable to this agreement. This shall also apply if such stipulations are not contrary to these terms and conditions of sale and delivery, but only complement such terms and conditions. Alterations of and modifications to the provisions contained herein shall not be binding unless confirmed in writing by Grünbeck. The Purchaser shall be bound to his order for a period of 4 (four) weeks. For a Purchaser's order to be legally binding for Grünbeck, such order must be confirmed in writing by Grünbeck unless Grünbeck delivers within the aforementioned period. Additional or collateral agreements, modifications and amendments shall only be binding if confirmed in writing by Grünbeck.

2. COPYRIGHT

We reserve the copyright to any drawings we may have to create in performing the contract. Such drawings shall at all times remain the property of Grünbeck, with all rights reserved, and shall not be provided, submitted or disclosed to third parties unless such is necessary to perform the contract.

3. INCOMPLETE DELIVERIES

The Purchaser shall be entitled to complaints concerning an incomplete delivery only for a period of 8 (eight) days commencing the day the Purchaser receives the delivery.

4. PRICES

Prices are net price ex works, not including value-added tax, sales tax or other taxes and charges applying in the country of the Purchaser. The price agreed upon shall be increased on the basis of the list prices of Grünbeck if delivery is made in accordance with the contract after a period of more than 4 (four) months after the date of the contract and if such increases in the list prices are the result of cost increases of materials, wages, VAT or increases in applicable federal, state and local rates, tariffs or taxes. Orders amounting to less than EUR 50.00 or the equivalent in any foreign currency shall be subject to a handling charge of EUR 10.00 plus shipping and freight charges.

5. PAYMENT TERMS

The price shall become due and payable in full immediately after the delivery of the goods or services, as the case may be, and at the invoice date. The following shall be deemed to be agreed upon: payment shall be made according to the agreement. No discounts shall be deducted from the cost of wages, packaging, freight or shipping. If payment is made by means of a Bill of Exchange or other non-cash payment (which shall be accepted in fulfillment), all costs incurred in connection with such payment shall be borne by the Purchaser. If a Bill of Exchange is not cashed, the entire invoice amount shall become due for payment immediately.

In the event the Purchaser defaults in payment, the overdue amount shall be subject to interest at a rate of the base rate plus 5 (five) percent or the base rate plus 8 (eight) percent in the case of business which does not involve a consumer.

6. COUNTER CLAIMS

The Purchaser shall only have the right to set off counter claims which are either legal or accepted by Grünbeck.

7. DELIVERY PERIODS

Delivery dates or periods agreed upon shall be extended by a fair and reasonable period if unforeseeable events prevent Grünbeck from delivering promptly and if the consequences of such events could only be remedied at unreasonable costs.

8. ADDITIONAL PERIOD

If Grünbeck does not deliver the goods or services within contract time, the Purchaser shall have the right to hold us in delay. A period of 4 (four) weeks shall be deemed to be a reasonable additional period.

9. SHIPPING

The Purchaser shall bear all risks of transportation from the moment the goods leave Grünbeck's plant. Grünbeck is exempted from the mandatory freight forwarders' insurance (SLVS waiver customer).

10. ADDITIONAL TERMS

Grünbeck's special conditions, made available to the Purchaser, shall apply if the Purchaser orders mounting, starting-up or maintenance work for facilities. The delivery of whirlpools and diving basins shall additionally be subject to the special terms and conditions for whirlpools and diving basins. If the provisions hereto and the provisions set forth in the special terms and conditions for whirlpools and diving basins are conflicting, the provisions set forth in the special terms and conditions for whirlpools and diving basins shall apply.

11. WARRANTY

- If goods and services are supplied which are obviously defective, the Customer must report such defects within 8 (eight) days after receipt of such goods and services in order to maintain the liability claims.
- If the defect is of such a nature that only a spare part needs to be replaced, Grünbeck shall have the right to request the Purchaser to replace the new part delivered by us if the costs for sending a technician to the Purchaser's site are unreasonably high.
- The warranty periods are:
 - two years: for devices for private use (natural persons)
 - one year: for devices for industrial or commercial use (companies) two years: for all DVGW-tested devices, also for industrial or commercial use within the framework of the liability agreement with the ZVSHK. after delivery/acceptance. This excludes electrical parts and parts which are subject to wear and tear. The warranty period shall only apply if the operating instructions are observed meticulously, if the device is mounted, commissioned, operated and maintained properly, and/or if a maintenance contract is made within six months. If these requirements are not met, the warranty shall be void.

The warranty shall be void if the purchaser uses dosing agents or chemicals supplied by other manufacturers and if the quality and composition of such dosing agents or chemicals is beyond Grünbeck's control. Grünbeck shall not be liable for defects or damages resulting from inept handling or operation.

- Grünbeck shall only be liable if the Customer performs the maintenance work as stated in the operating instructions or has the maintenance work performed in such a way and if the Customer uses spare parts supplied or recommended by Grünbeck.
- Grünbeck shall not be liable for damages resulting from frost, water or electrical over-voltage or from parts which are subject to wear and tear. This applies in particular to electrical parts.
- The claims of the Purchaser are limited to repair or replacement, as the case may be, at the discretion of Grünbeck. Grünbeck shall have the right to several attempts to repair. If Grünbeck fails to repair or replace the defective delivery within a reasonable time, the customer shall have the right to either cancel the contract or demand an appropriate reduction of the purchase price.
- In case of complaints with regard to systems that are not installed in Germany, the warranty claim will be settled by the local technical customer service authorised by Grünbeck. If no technical customer service is designated in the specific country, the assignment of Grünbeck's technical customer service shall end at the German border. All additional cost, apart from the material required, shall be borne by the customer.

12. LIMITED LIABILITY

- Damages resulting from death or injuries to the body or the health shall not be subject to a limitation of liability.
- Liability claims against Grünbeck or Grünbeck's vicarious agents and officers shall be excluded, unless such liability claims are the result of at least gross negligence on the part of Grünbeck or of a malicious act or at least gross negligence on the part of a legal representative or a vicarious agent or officer of Grünbeck. The liability of Grünbeck shall be limited to a maximum of EUR 5,000.00 in all cases to which this limitation of liability does not apply. Grünbeck shall not be liable for untypical, unforeseeable damages.

13. TERMINATION OF THE CONTRACT

If the Customer terminates the contract for reasons beyond the control of Grünbeck, the Customer shall have the obligation to pay compensation amounting to 40 (forty) percent of the net price of the order. The Customer shall have to pay this compensation without Grünbeck having to provide evidence of the amount of the damage. The provision set forth above shall not apply if Grünbeck can provide evidence of a greater damage. The Customer shall have the right to provide evidence that no damage at all has been incurred or that a lesser damage has been incurred.

14. RETENTION OF OWNERSHIP

- All goods shall remain the exclusive property of Grünbeck until payment in full of all current and future claims (including all open accounts) against the Customer has been made by the Customer. Further processing or refinement of the delivered goods shall always be made on behalf of Grünbeck as the manufacturer, but without obligation to Grünbeck. If the delivery item is permanently integrated into another product not belonging to Grünbeck, Grünbeck shall acquire co-ownership of the new item proportional to the invoice value. The Customer shall hold in custody for Grünbeck the resulting sole ownership or co-ownership free of charge. Goods to which Grünbeck has the right of sole ownership or co-ownership shall be referred to as reserved goods hereinafter.
- The Customer shall have the right to process and resell such reserved goods within the framework of normal business activities as long as the Customer is not defaulting in payment. The goods shall not be pledged or encumbered. As a security, the Customer shall assign all claims (including all open accounts) resulting from the resale or any other reason (affidavit, tortious act) in connection with reserved goods to Grünbeck at the contract date. Grünbeck entitles the Customer to collect such assigned receivables on account of and on behalf of Grünbeck. This right to collect such receivables shall only be revoked if the Customer fails to meet his payment obligations as per contract.
- In the event of seizure by third parties, the Customer shall forthwith disclose Grünbeck's reservation of title, right and property to such goods and shall forthwith notify Grünbeck of such seizure.
- In the event of breach of contract by the Customer of the terms and conditions hereto and, in particular, default in payment as herein before provided, Grünbeck shall be entitled to take back the reserved goods or demand the assignment of the claims of the Customer against the third party, as the case may be. The seizure or the pledge of such reserved goods by Grünbeck shall not constitute a termination of the contract unless the German Consumer Credit Act is applicable.

15. RETURN OF GOODS

Goods shall only be returned with the express consent of Grünbeck. If returns are authorised by Grünbeck, the customer shall pay a charge of 20 (twenty) percent of the net value of the goods, or at least an amount of EUR 20.00. Grünbeck shall not credit returned goods with a value of less than EUR 20.00. All refurbishing costs shall be charged separately. Freight for returned goods must be prepaid (to Grünbeck or delivering plant).

16. GERMAN/INTERNATIONAL LAW, PLACE OF JURISDICTION, PLACE OF PERFORMANCE AND CONTRACT INTERPRETATION

The contract shall be governed by German law to the exclusion of the UN Convention on Contracts for the International Sale of Goods. For Non-EU countries the UN Convention on Contracts for the International Sale of Goods is applicable, unless special export terms and conditions are stipulated in the contract.

Place of jurisdiction for any kind of disputes arising from or relating to the terms of the contract is Dillingen/Donau (Germany).

Place of performance is Hoehsttaedt/Donau (Germany).

In the event that any one of the contractual provisions is invalid, the remaining provisions of the contract shall not in any way be affected by such invalidity.

Edition : August 2006

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
- Sea and brackish water desalination
- Private water supply



Headquarters of
Grünbeck Wasseraufbereitung GmbH
in Hoechststadt/Germany

Company profile

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Internet	www.gruenbeck.com
Email	info@gruenbeck.de
General managers	Dr. Günter Stoll (chairman) Peter Lachenmeir
Staff	approx. 470
Entire organisation	approx. 750
Sales org. Germany	Subsidiaries and representatives
Customer service	Assigned to representations
International sales org.	Representations in all EU member countries, associated partners world-wide
Target groups	Specialised retailers, small trade, municipal organisations, commercial trade and industry
Certifications	DIN EN ISO 9001, ISO 14001, SCC* by TÜV Management Service, DIN EN ISO 13485 Quality Management System – Medical Products by TÜV Product Service, OHRIS Authorised specialist company according to § 19 WHG I (Water Resources Law)
Product approvals	DVGW, SVGW, ACS, GOST-TR
Welding certifications	Certified manufacturer according to DIN EN 13480 in combination with DIN EN ISO 3834-3, specialised welding company according to DIN 18800-7 class B, qualification to produce pressure equipment according to the Pressure Equipment Directive 97/23/EC

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grünbeck

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ISO 9001, DIN EN ISO 14001,
DIN EN ISO 13485 and SCC*

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