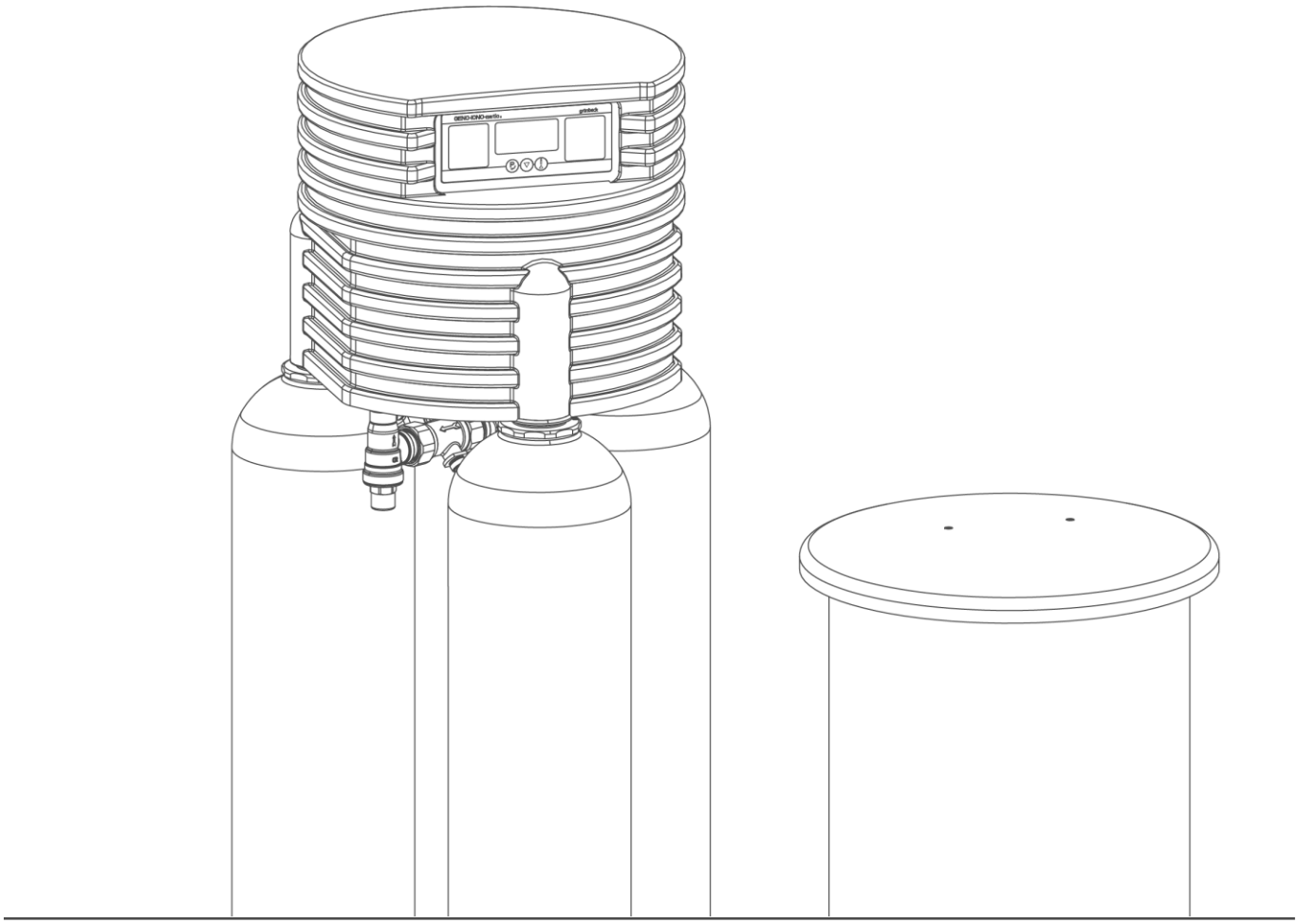
We understand water.



Water softener | Delta-p/Delta-p-I

Operation manual

grünbeck

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Availability
Monday to Thursday
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Friday
7:00 am – 4:00 pm

Original operation manual
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Order no.: TD3-BM001en_104

Table of contents

1 About this manual

1.1 Other applicable documents

For the water softener Delta-p/Delta-p-I, the following documents are regarded as applicable documents:

- Mounting instructions: Water softener Delta-p
  Order no.: 185 945
- For Grünbeck's technical customer service/authorised service company:
  - Technical service manual water softener Delta-p/Delta-p-I
    Order no.: 185 951
- The manuals of all accessories used.
- Operation manual of the optional dosing system GENODOS DME Delta-p

1.2 Target group

The intended audience for this manual is comprised of qualified specialists and owner-users.

1.3 Storage of documents

Keep this manual and all other applicable documents, so that they are available when needed.

1.4 Symbols used

This symbol identifies instructions that you must comply with for your personal safety as well as to avoid damage to property.

This symbol identifies information and instructions that you must comply with in order to avoid damage to property.

This symbol identifies important information about the product or its handling.

This symbol identifies work that is only allowed to be carried out by qualified specialist. In Germany, the installation company must be registered in an installation directory of a water supply company acc. to §12(2) AVB Wasser V (German Ordinance on General Conditions for the Supply of Water).

This symbol designates tasks that may only be performed by Grünbeck's technical service/authorised service company or by a qualified specialist trained by Grünbeck.

This symbol identifies work that may only be performed by an electronically qualified specialist in accordance with the VDE guidelines or according to the guidelines of similar local institutions.

1.5 Typographical conventions

The following typographical conventions are used in this manual:

Description	Depiction
Handling instruction One-step or chronological sequence of steps does not matter	► Action
Handling instruction multi-step and chronological sequence of action steps important	**1.** First action **a** first step **b** second step **2.** Second action
Result after a handling instruction	» Result
Lists	● List item • List sub-item
Display texts	Display text
Operating elements	Button/key

1.6 Validity of the manual

This manual applies to the following products:

- Water softener Delta-p 1"
- Water softener Delta-p 1¼"
- Water softener Delta-p 1½"
- Water softener Delta-p 2"
- Water softener Delta-p 1"-I
- Water softener Delta-p 1¼"-I
- Water softener Delta-p 1½"-I
- Water softener Delta-p 2"-I

This manual applies to the control unit GENO-IONO-matic³ as of software V3.05.

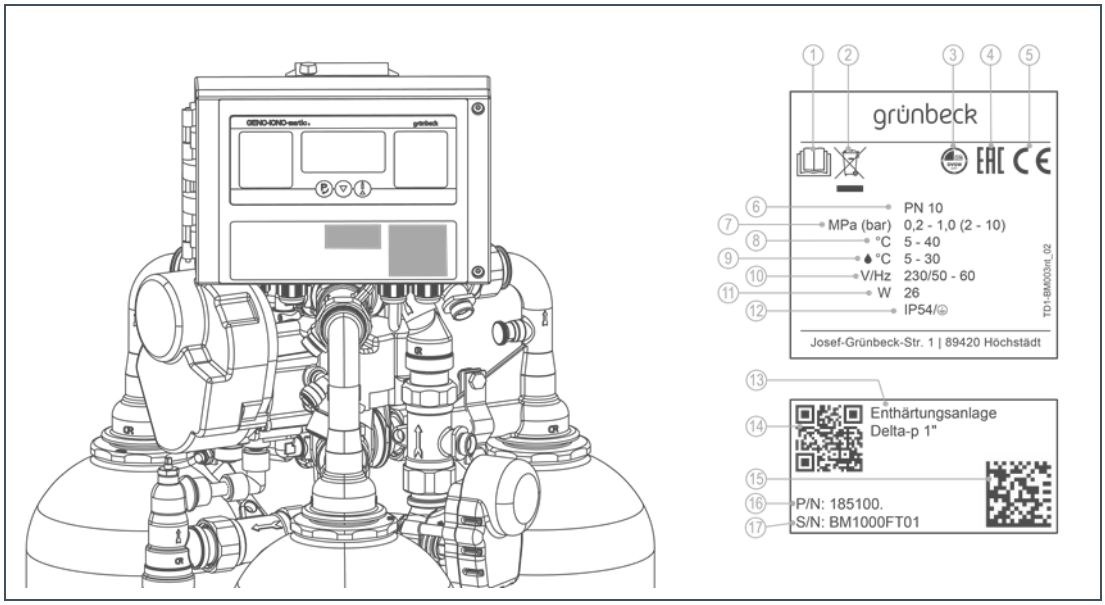
This manual also apply to the listed products which are mounted on a pedestal ready for connection.

1.7 Type plate

The type plate is located under the cover on the control unit.

Please specify the data shown on the type plate in order to speed up the processing of your enquiries or orders.

► Enter the necessary information in the table below to have it readily available whenever necessary.



Item	Designation	Item	Designation
1	Observe operation manual	2	Disposal information
3	DVGW test mark	4	EAC mark
5	CE mark	6	Nominal pressure
7	Operating pressure	8	Ambient temperature
9	Water temperature	10	Rated voltage/frequency
11	Electrical power consumption	12	Protection/protection class
13	Product designation	14	QR code
15	Data matrix code	16	Order no.
17	Serial no.		

- Product designation: Water softener _____
- Order no.: 185_____
- Serial no.: BM_____

2 Safety

WARNING: Contamination of drinking water due to incorrect handling.

- Risk of infectious diseases.

► Have the installation, commissioning and annual maintenance carried out by a qualified specialist.

2.1 Safety measures

- Carefully read this manual before operating your product.
- Only operate the product if all components are installed properly.
- Only have persons working on your product who have read and understood this manual and that are qualified to do such work on account of their vocational training.
- Keep your product permanently connected to the power and water supply.
- Safety devices must never be removed, bridged or otherwise tampered with.
- Do not operate any products which have a damaged power supply cable. This can lead to injuries due to electric shock.
- Have damaged power supply cables replaced without delay.
- Mains cables may only be replaced by the manufacturer or by authorised personnel.
- Observe the maintenance intervals (refer to chapter 8.2). Failure to comply can result in microbiological contamination of your drinking water installation.

2.2 Safety information

This manual contains instructions that you must comply with for your personal safety as well as to avoid damage to property. The information and instructions are highlighted by a warning triangle and have the following structure:

CAUTION: Type and source of danger.

- Possible consequences

► Measures for avoidance

The following signal words are defined depending on the degree of danger, and can be used in this document:

- **DANGER** means that serious or fatal injuries will result.
- **WARNING** means that serious or fatal injuries can result.
- **CAUTION** means that minor bodily injuries can occur.
- **NOTE** (without warning triangle) means that damage to property can occur.

2.3 Regulations

Comply with the following regulations and directives, amongst others, during installation, start-up and maintenance:

- Statutory regulations on environmental protection
- Provisions of the employers' liability insurance companies
- DIN EN 806 Specifications for installations inside buildings conveying water for human consumption
- VDI 6023 Part 5 – 7 Specifications for installations inside buildings conveying water for human consumption
- VDI/DVGW 6023 Part 6

2.4 Duties of the qualified specialist and/or the specialist company

Comply with the following instructions to ensure the proper and safe functioning of the product:

- Only perform activities described in this manual.
- Perform all activities in accordance with all applicable standards and regulations.
- Brief the owner/user on the function and operation of the product.
- Advise the owner/user of the maintenance of the product.

- Instruct the owner-user about possible dangers that can arise during operation of the product.
- Fill in the operation log (refer to chapter 14).

2.5 Duties of the owner/user

Comply with the following instructions to ensure the proper and safe functioning of the product:

- Arrange for a qualified specialist to carry out the installation, commissioning and maintenance.
- Have the product explained to you by a qualified specialist.
- Only perform activities described in this manual.
- Do not carry out any activities that are explicitly marked for a qualified specialist.
- Only use this product as intended.
- Make sure that the required inspection- and maintenance work is carried out.
- Keep this manual.

2.6 Permitted regenerant

Delta-p/Delta-p-I water softeners are only allowed to be operated with the following regeneration agent:

- Salt tablets according to DIN EN 973 type A

2.7 Transport and storage

WARNING: Risk of tipping over in case of improper transport

- System may tip over when loading/unloading or transporting on uneven surface – Risk of crushing or bumping!

► Observe the following instructions for transport.

2.7.1 Transport

The water softener Delta-p/Delta-p-I without pedestal is delivered as an individually packed component on pallet.

► Transport the individual parts of the system only in their original packaging.

► Please note that the exchangers may only be transported in an upright position (see warning on the packaging).

The water softener Delta-p/Delta-p-I with pedestal is delivered on pallet ready for connection and with filled exchangers.

► Only transport the system by means of a forklift or lift truck with appropriate forks.

2.7.2 Storage

► Protect the product from the following impacts when storing it:

- Damp, moisture, environmental impacts such as wind, rain, snow, etc.
- Frost, direct sunlight, severe heat exposure
- Chemicals, dyes, solvents and their vapours

► Do not stack the individual components on top of each other.

3 Product description

The water softener is equipped with a control valve for the 3 exchangers, which are controlled depending on the volume.

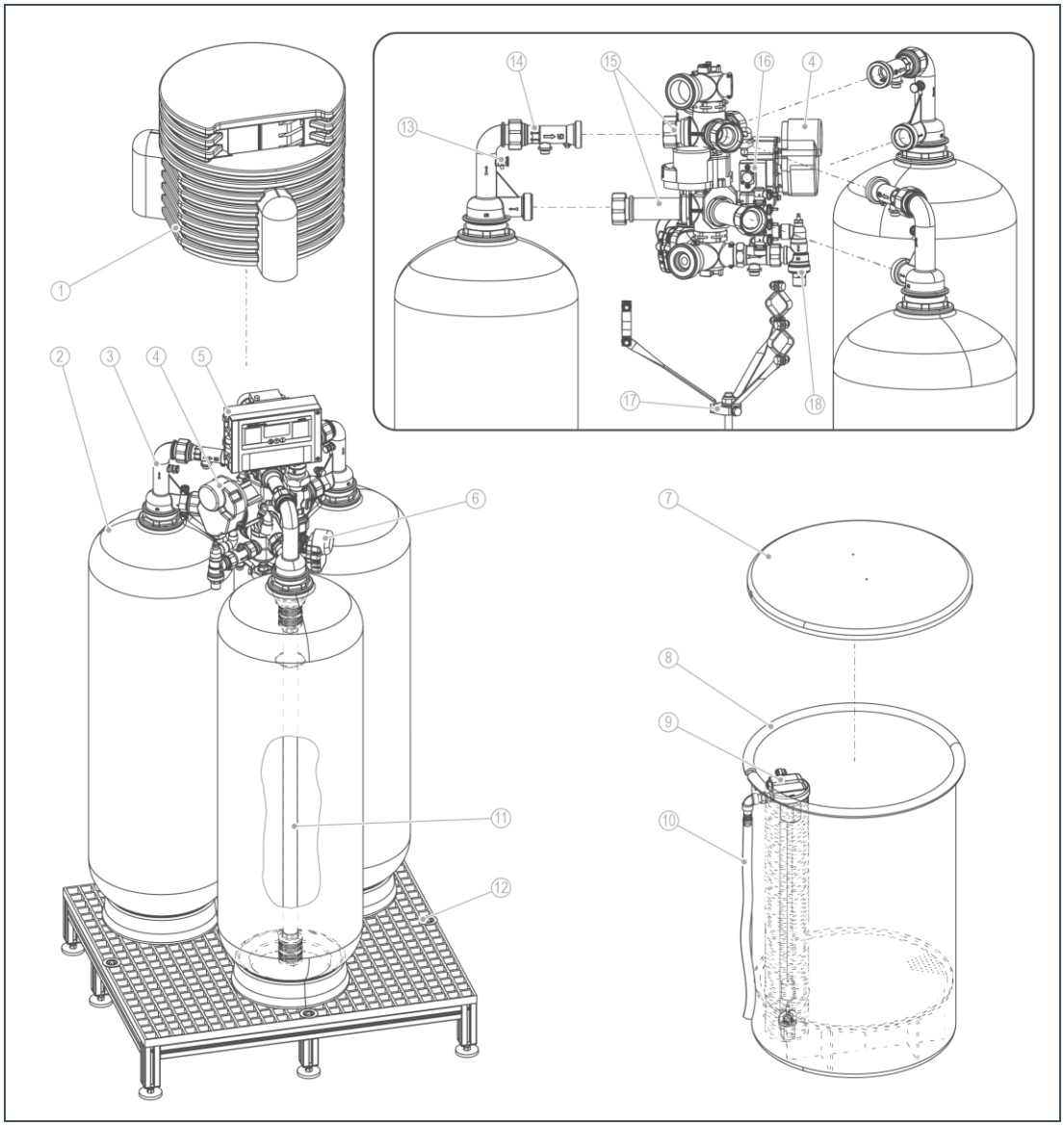
Regeneration is triggered when the next exchanger to be regenerated is exhausted or 50% of the next but one exchanger to be regenerated is exhausted. The water softener regenerates with raw water.

3.1 Intended use

The water softeners Delta-p/Delta-p-I have been developed for the continuous production of softened and partially softened water and can be used in the following areas:

- Softening and partial softening of:
  - Well water
  - Process water
  - Boiler feed water
  - Cooling water
  - Air-conditioning water
  - cold drinking water
  - industrial water

3.2 Product components



Item	Designation	Item	Designation
1	Cover	2	Exchanger tank (3x)
3	Bottle adapter	4	Regeneration valve
5	Control unit GENO-IONO-matic$_3$	6	Blending unit (electronic)
7	Brine tank lid	8	Brine tank
9	Suction unit brine valve	10	Overflow hose (Ø 19 mm)
11	Riser pipe	12	Pedestal*
13	Sampling valve	14	Water meter with Hall sensor
15	Transfer valves for raw water and soft water	16	Disinfection unit (chlorine cell with injector)
17	Mounting on pedestal*	18	Pressure reducer

* = only for pedestal version

3.3 Functional description

3.3.1 Ion exchange process

The water softener works according to the ion exchange principle. The exchange of calcium and magnesium ions for sodium ions causes the water to become soft.

Figure	Explanation
	The exchanger contains ion exchanger resin in the form of small resin beads. Sodium ions adhere to each resin bead.
	Hard water containing lots of calcium and magnesium ions flows through the exchanger. The ion exchanger resin absorbs calcium and magnesium ions from the water in exchange for sodium ions. This reaction is called ion exchange. The calcium and magnesium ions are retained in the exchanger. Soft water without calcium and magnesium ions, but containing sodium ions, leaves the exchanger. This process continues until no more sodium ions are available. The ion exchanger resin is exhausted.
	The exchange can be reversed if a large amount of sodium ions is added. The exchanger is rinsed with brine (water containing salt). By their sheer number, sodium ions displace calcium and magnesium ions on the ion exchanger resin. This water containing calcium and magnesium ions is discharged to the drain. The initial state is restored. The ion exchanger resin is regenerated, and thus ready for operation.
★ Sodium ion	● Calcium ion ▲ Magnesium ion

3.4 Accessories

You can retrofit accessories to your product. Please contact your local Grünbeck representative or Grünbeck's headquarters in Hoechstaedt for details.

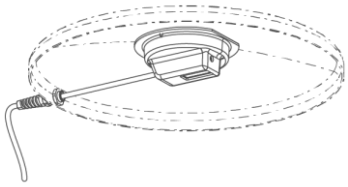
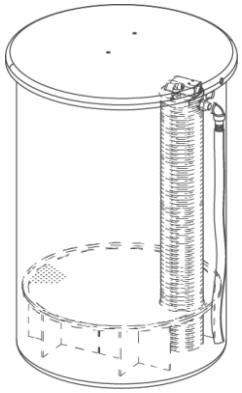
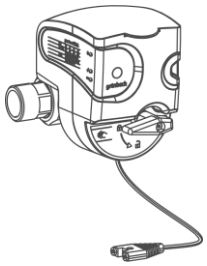
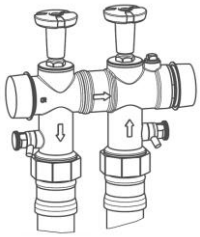
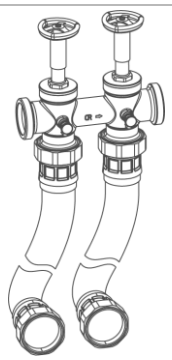
Illustration	Product	Order no.
	**Pre-alarm salt supply** For monitoring the salt supply by means of light sensor, is mounted on the underside of the brine tank lid.	**185 335**
	**Brine tank** **210 litres** **750 litres** Container with brine tank lid, suction unit with brine valve and safety overflow hose.	 **185 510** **185 525**
	**Safety device protectliQ:A20** Product for protection against water damage in one- and two-family homes. For other sizes, please inquire.	**126 400**
	**Connection kit** **1" - 1¼"** **1"-1¼"-I**	 **185 807** **185 808**
	**1½"-2"** **1½"-2"-I** • Compact valve block • Built-in overflow valve (not for Delta-p-I version) • Shut-off valves for hard and soft water • Sample valves for raw and soft water (only for 1"-1¼") • 2 flexible, pressure-resistant connection hoses (For Switzerland, connection hoses are not included in the scope of delivery. Install the fixed pipework on site.)	**185 823** **185 824**

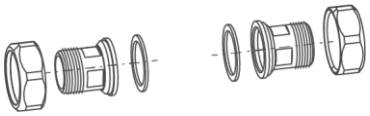
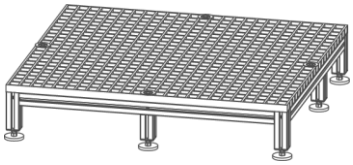
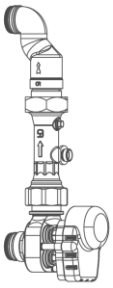
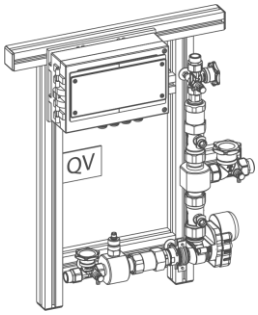
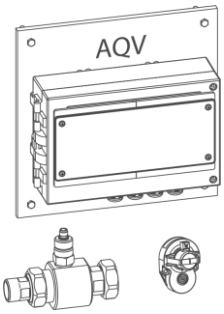
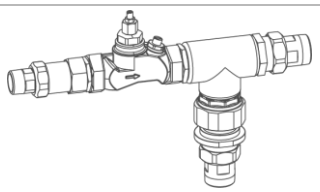
Illustration	Product	Order no.
	**Screw connection for connection block**	
	1"	**185 846**
	1¼"	**185 847**
	1½"	**185 848**
	2"	**185 849**
	Water meter screw connections with seals for pre-installation of the connection block.	
	**Pedestal Delta-p 1"-1¼"** 770 x 770 x 200 mm	**185 820**
	Pedestal Delta-p 1½"-2" 960 x 880 x 200 mm	**185 825**
	Frame made of aluminium sections with adjustable feet and grating.	
	**Blending with Delta-p**	
	1" - 1¼"	**185 023**
	1½"-2"	**185 006**
	Electronically controlled blending unit with water meter and pulse cable with Hall element.	
	**Quality-controlled blending unit (QV) for Delta p-I**	
	1"	**185 570**
	2"	**185 575**
	Downstream device for constant blending in proportion to quantity in the industrial/commercial sector.	
	**Upgrade kit quality-controlled blending unit (AQV) for Delta p-I**	
	1" - 1¼"	**189 511**
	1½"-2"	**189 512**
	Integrable variant of the quality-controlled blending unit.	
	**Mechanical blending with Delta-p**	
	1" - 1¼"	**185 385**
	1½"-2"	**185 395**
	Mechanical blending is a valve assembly which is installed in a bypass (parallel) to the water softener regardless of its position.	

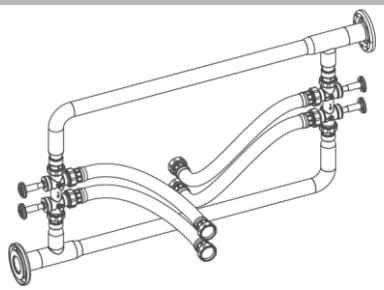
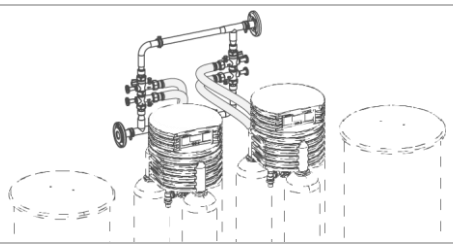
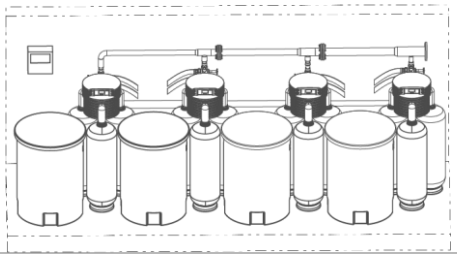
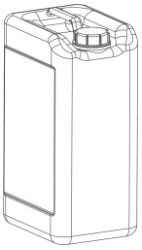
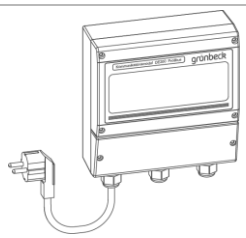
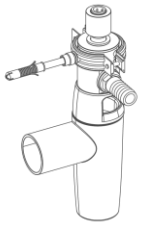
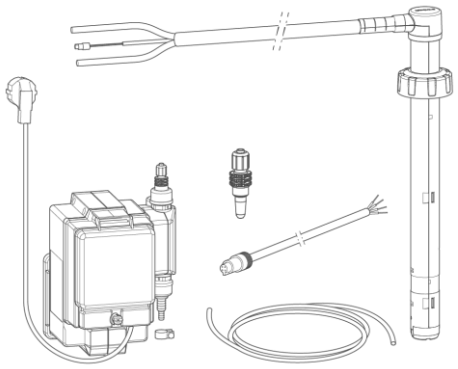
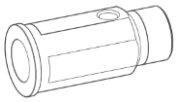
Illustration	Product	Order no.
	**Parallel piping Delta-p**	
	2x1" PVC	**185 450**
	2x1¼" PVC	**185 455**
	2x1½" PVC	**185 460**
	2x2" PVC	**185 465**
	3x2" PVC	**185 470**
	2x1" VA	**185 400**
	2x1¼" VA	**185 405**
	2x1½" VA	**185 410**
	2x2" VA	**185 415**
	Example: Parallel piping (Tichelmann-piping) of two or several triple water softeners, including all the necessary connection pieces and connection sets.	
	**Cascade control Delta-p**	
	1"-1¼" – double	**185 360**
	1½"-2" – double	**185 365**
	2" – triple	**185 370**
	2" – quadruple	**185 375**
	Cascade control for parallel-piped water softeners Delta-p. The cascade control is required in conjunction with water softeners Delta-p in parallel piping.	
without illustration	**M-Bus measuring transducer D-DAM complete**	**115 850**
	Transmitting the flow and meter readings, as well as statistical values of the turbine water meter via M Bus (IEC 870). The pulse output is proportional to the flow rate at the analogue output and relay contact of the Grünbeck control. Dimensions: 160x240x160 mm	
	**Disinfection kit Delta-p**	
	1" - 1¼"	**185 830**
	1½"-2"	**185 835**
	Disinfection of the water softener, e.g. after long periods of stagnation or contamination. With GENO-perox, canister and personal protective equipment.	
	**Communication module DE200 Profibus**	**185 890**
	The measured values and status information indicated on the display of the control unit Delta-p (control unit IONO-matic$_3$) are available at the Profibus-DP interface for collection and further processing by a Profibus-DP master on site. Profibus-DP slave module, including GSD file.	
	**Drain connection DN 50**	**185 775**
	For professional installation acc. to DIN EN 1717 with fastening material. For use with Delta-p 1"-1¼" with adapter and 1½"-2" without adapter.	

Illustration	Product	Order no.
	**Dosing system GENODOS DME Delta-p**	**163000010000**
	For addition of mineral-based exaliQ solutions into the drinking water in proportion to quantity. The water softener Delta-p sends the dosing signal.	
	Optional **insert with injection point G¼"** for the soft water outlet of the Delta-p	
	for Delta-p 1"	185000010000
	for Delta-p 1¼"	185000020000
	for Delta-p 1½"	185000030000
	for Delta-p 2"	185000040000

4 Control unit

The water softeners Delta-p/Delta-p-I are quantity and/or time-controlled. They are operated and monitored by means of the control unit GENO-IONO-matic$_3$. The operating and regeneration operations are automatically controlled depending on the selected operating mode, water consumption, daily interval and time.

The controller has the following contacts for communication with interfaces provided by the customer:

- Programmable input
- programmable output
- Input for accessory "pre-alarm salt supply"

4.1 Operating principle

In the control unit, the different parameters for the different system types are stored in data records.

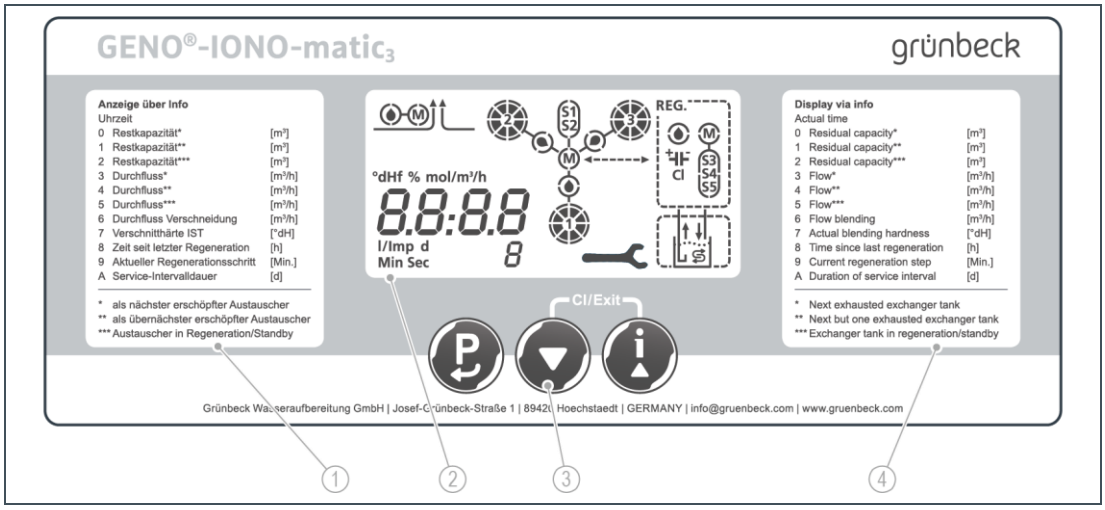
The operating data (step times, capacity figure, operating mode, monitoring times, special functions) are stored in the respective data record, so that the system is ready for operation after the data record has been selected.

4.2 Definition of the operating states

The following definitions apply to the exchangers (AT):

Definition	Explanation
Exchanger*	Is in operation and usually has the lower remaining capacity. It will be exhausted next and is the next for regeneration.
Exchanger**	Is in operation and usually has the higher remaining capacity. It will be exhausted next but one and is the next but one for regeneration.
Exchanger***	Is already regenerated (standby)."

4.3 Keypad film



Item	Designation	Item	Designation
1	Display via Info (German)	2	Display indication
3	Buttons	4	Display via Info (English)

4.4 Display indication

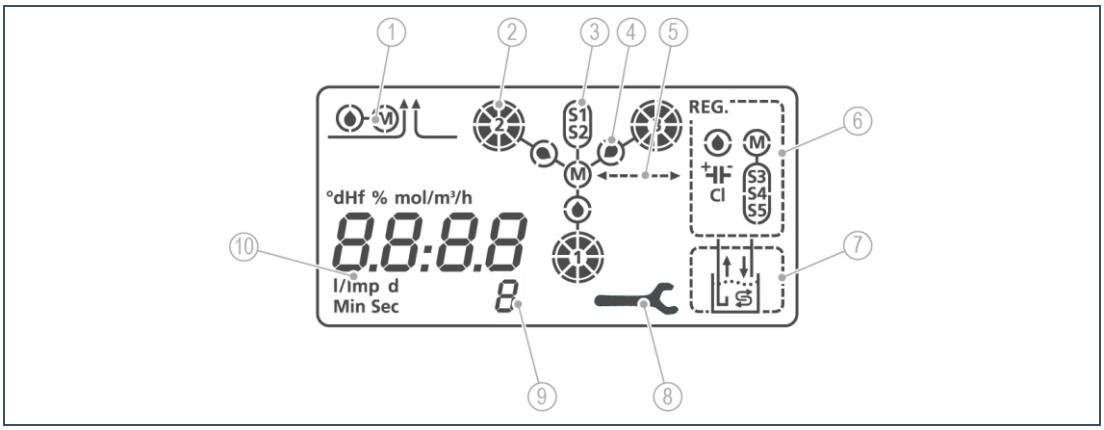
4.4.1 Backlight

► Press any button to activate the backlight.

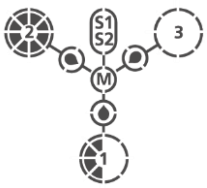
The backlight turns off 10 minutes after the last button press.
The backlight flashes when faults or warnings are displayed.

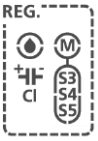
4.4.2 Display symbols

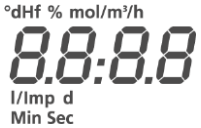
Depending on the operating situation, the display shows the following symbols:



Item	Designation	Item	Designation
1	Blending valve	2	Exchanger tank
3	Transfer valve	4	Drop symbol
5	Flow arrow	6	Regeneration valve
7	Brine tank	8	Maintenance interval
9	Index	10	Numbers and unit display

Symbol	Description
Blending valve (not with Delta-p-I)	
	Flashes during water withdrawal (ratio of raw water).
	Motor is active in order to maintain a constant blending hardness in case of a variable withdrawal volume.
Exchanger tank	
	**In the basic display:** The two exchangers in operation are displayed with their number and remaining capacity. The eight circle segments each represent 12.5 % remaining capacity.
	Residual capacity between 100% and 87.5%
	Residual capacity between 50 % and 37.5 %
	Exchanger exhausted
	In the Info level: Remaining capacity and flow rate displayed in the numeric display refer to the exchanger which has its number displayed.

Symbol		Description
Transfer valve		
		Microswitches (S1, S2) indicate which exchangers are in operation or in regeneration.
		Motor is active to switch to the next exchanger pair.
Drop symbol		
		Flashes when there is flow at the corresponding turbine water meter 1, 2 or 3.
Flow arrow		
		Indicates the direction of flow when there is flow between the regeneration and transfer valves. **First filtrate:** Transfer valve -> Regeneration valve; waste water to the drain **Salting/slow rinsing:** Regeneration valve -> Transfer valve, brine or water to the exchanger **Backwash:** Regeneration valve -> Transfer valve, waste water to the drain **Filling the brine tank:** No water is flowing through this connection, direction arrow not active
Regeneration valve		
		Display during the entire regeneration.
		**Regeneration step fill brine tank:** Drop symbol flashes when there is flow at the turbine water meter.
		**Regeneration step – salting:** Symbol appears if the electrolysis current for chlorine production (disinfection of the exchanger) is OK. Symbol flashes if the current is too low.
		Motor is active for switching to the next regeneration step. Microswitches (S3, S4, S5) indicate the current regeneration step.

Symbol	Description
Numbers and unit display	
	**In the basic display:** Indicates the time **In the Info level and operator programming level:** Indicates the numerical value of the parameter in the menu; if available with physical unit. **In the case of malfunctions / warnings:** Displays the current malfunction or warning.
Index	
8	Displays the consecutive number of the current index for guidance.
Maintenance	
	Appears when the maintenance interval has elapsed.
Brine tank	
	Displayed during regeneration. Appropriate arrow for the corresponding regeneration step appears:
	↑ Brine is drawn out of the tank.
	↓ Raw water is fed into brine tank.
	Pre-alarm salt supply (as accessory): Symbol appears when salt needs to be refilled.

4.5 Operating elements

Key	Description
 P	**In the basic display:** • activates operator programming level • acknowledges malfunctions **In the operator programming level:** • opens parameters to change • stores the settings and closes the parameter
 ▼	• decreases numerical values **In the basic display:** • starts a manual regeneration **In the operator programming level and Info level:** • switches to the previous parameter • decreases numerical values

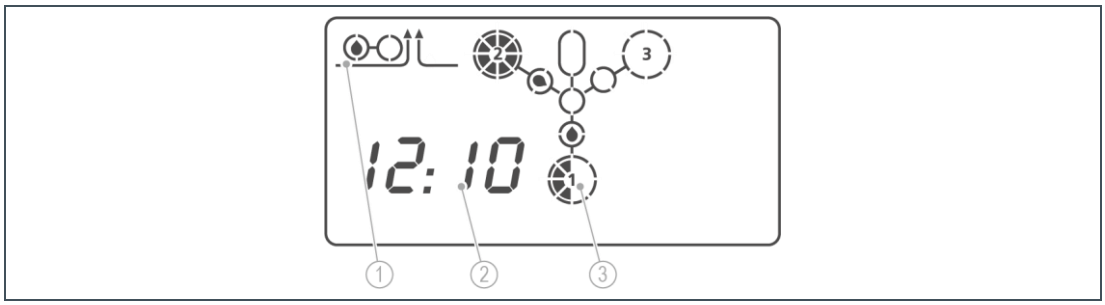
Key	Description
 ▲	• increases numerical values **In the basic display:** • activates the Info level • increases the index **In the operator programming level:** • switches to the next parameter
 ▼ ▲ simultaneously	**In the operator programming level:** • closes opened parameters without saving • return to the basic display

4.6 Level structure

You can activate the following levels from the basic display:

- Info level
- User programming level
- Installer level
  - Installer level 113
  - Installer level 290
  - Installer level 999

4.7 Basic display

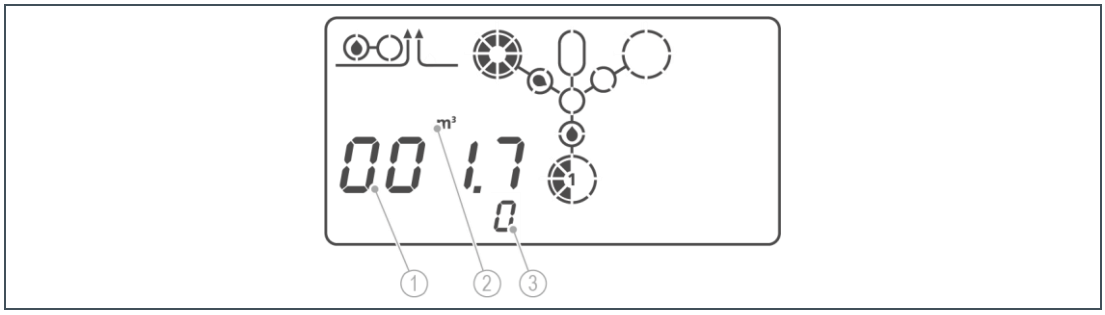


Item	Designation	Item	Designation
1	Blending valve	2	Time
3	Exchanger tank		

To return to the basic display:

► Press ▼ and ▲ simultaneously.

4.8 Info level



Item	Designation	Item	Designation
1	Parameters	2	Unit
3	Index		

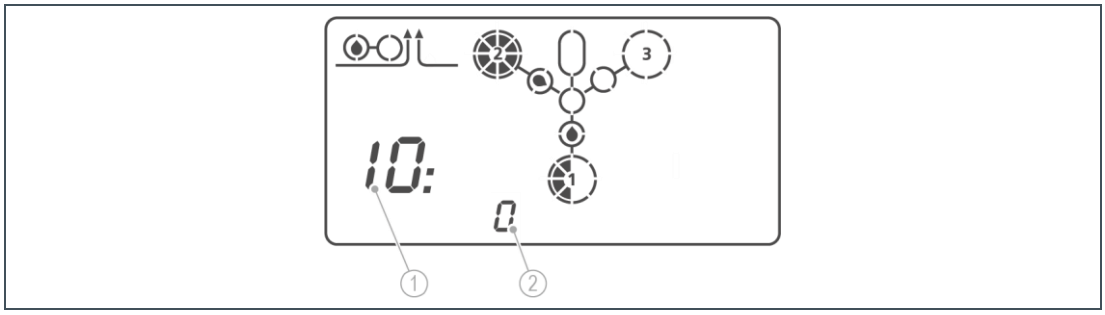
To activate the Info level:

- ► Press ▲.
- ► Navigate with ▲ and ▼.

4.8.1 Overview of parameters

Index	Parameter/unit		Description
0	Remaining capacity exchanger *	[m³]	In operation
1	Remaining capacity exchanger **	[m³]	
2	Remaining capacity exchanger ***	[m³]	In regeneration/standby
3	Flow rate exchanger *	[m³/h]	In operation
4	Flow rate exchanger **	[m³/h]	
5	Flow rate exchanger ***	[m³/h]	In regeneration/standby
6	Flow rate blending	[m³/h]	Only with blending valve and programmed soft water hardness > 0 °dH (0 °f; 0 mmol/l)
7	Blending hardness actual value	[°dH]	
8	Time since last regeneration	[h]	
9	Current regeneration step		X: Regeneration step YY: Step time remaining [min], at step 4 flow [m³/h] fill brine tank
A	Time until maintenance is due	[d]	

4.9 User programming level



Item	Designation	Item	Designation
1	Parameters	2	Index

To activate the operator programming level:

► Press P for more than 1 second.

4.9.1 Overview of parameters

Index	Parameter/unit	
0	Time hours	
1	Time minutes	
2	Raw water hardness	°dH
3	Soft water hardness	°dH

4.10 Installer level

4.10.1 Installer level 113

The settings described here are only permitted to be performed by a qualified specialist.

To activate the installer level 113:

1. Press P and ▼ simultaneously for more than 1 second.
» The display changes to C.000.
2. Set C.113 with ▼ or ▲ .
3. Confirm with P.

Overview of parameters

Index	Parameter/unit	Remark	Factory settings	Setting range
0	Programmable input function (Terminals 28/29)	0 = No function 1 = External release of regeneration 2 = External lock of regeneration 3 = External 3-way regeneration triggering 4 = reserved function e.g. optional pressure monitoring step "salting" (Er G, is only stored in the error memory)	0	0 ... 4
1	Programmable output function (Terminals 42 … 44)	0 = No function 1 = Closed during regeneration step 1 "Salting" 2 = Closed during the entire regeneration 3 = Closed if flow rate with flow at exchanger * and exchanger ** = 0 m³/h or with bottle changeover (transfer) or in case of malfunction 80/210 = reserved function	0	0 ... 3/80/210
2	Delay time for programmable output with setting = 3 [min.]	After the bottle changeover has been completed, the contact opens again with a delay.	0.5	0.1 … 9.9
3	Delay time for automatic pre-alarm salt supply (Terminals 18/19) [min.]	0 = is not evaluated 1 … 999 = reserved function The time starts to count down at the end of regeneration step 4 Fill brine tank. Signal of the float switch must be present within this time, otherwise warning Er A will appear.	0	1 ... 999/L
	Activation Pre-alarm salt supply	L = Infrared-light sensor detects the filling level in the brine tank. If no object is detected within the adjustable switching gap for longer than 5 min, warning Er A + symbol "Pre-alarm salt supply" appears		
4	External communication via RS 485	0 = no external communication or system data printout/software update 1 = external communication with optional communication module "DE200 Profibus" (order no. 185 890) 2 = external communication via Modbus RTU protocol with OSMO-X	0	0 … 2
		For system data printout or software update, proceed as follows: 1. Program parameter to 0. 2. Disconnect the existing on-site cable from the RS 485 interface of the GENO-IONO-matic3. 3. Plug in the interface adapter and perform a system data printout/software update. 4. Unplug interface adapter. 5. Reconnect the existing, on-site cable to the RS 485 interface. 6. Set the parameter back to the previously set value. Alternative: Enter the system data manually in the parameter list.		

4.10.2 Installer level 290

The settings described here are only permitted to be performed by a qualified specialist.

To activate the installer level 290:

1. Press P and ▼ simultaneously for more than 1 second.
» The display changes to C.000.
2. Set C.290 with ▼ or ▲ .
3. Confirm with P.
» You can change the parameters and values.

Overview of parameters

Index	Parameter/unit	Remark	Factory settings	Settings
0	Hardness unit	Configuration of the display for hardness values with corresponding unit. Applies to raw and soft water hardness as well as the capacity value.	0	0 = °dH 1 = °f 2 = mol/m³
1	Data record	**Change only permitted by Grünbeck's technical service/authorised service company.** CA30: Freely programmable data record – the factory settings from the previously active data record apply. CA31: Delta-p 1" CA32: Delta-p 1¼" CA33: Delta-p 1½" (DN 40 water meter) CA34: Delta-p 2" (DN 40 water meter) CA35: Delta-p 1½" (DN 25 water meter) CA36: Delta-p 2" (DN 25 water meter)	Depending on system (nominal diameter)	
2	Capacity rate [m³x°dH]	CA31: 48 CA32: 79 CA33: 165 CA34: 229 CA35: 165 CA36: 229	Depending on system (nominal diameter)	Indication only
3	Turbine water meter constant exchanger [l/pulse]	CA31: 0.0314 CA32: 0.0314 CA33: 0.0773 CA34: 0.0773 CA35: 0.0314 CA36: 0.0314		Indication only
4	Turbine water meter constant regeneration valve [l/pulse] Valid for regeneration type = metering make-up water (code 290, A = F)	CA31: 0.0313 CA32: 0.0313 CA33: 0.0325 CA34: 0.0325 CA35: 0.0325 CA36: 0.0325	Depending on system (nominal diameter)	Indication only
4	Turbine water meter constant regeneration valve [pulse/l] Valid for regeneration type = metering brine volume (code 290, A = b)	CA31: 920 CA32: 900 CA33: 785 CA34: 790 CA35: 785 CA36: 790		

Index	Parameter/unit	Remark	Factory settings	Settings
5	Turbine water meter constant blending valve [l/pulse]	CA31: 0.0309 CA32: 0.0309 CA33: 0.0773 CA34: 0.0773 CA35: 0.0309 CA36: 0.0309		Indication only
6	Activation time [hh:]	Applies to regeneration over a daily interval	00:	00: ... 23:
7	Activation time [:mm]	Applies to regeneration over a daily interval	:00	:00 ... :59
8	Disinfection program	Is started by reprogramming to value 1. Only relevant if daily interval ≥ 24 h *Observe the instructions of the disinfection chemical!*	0	0 ... 1
9	Triple manual regeneration	Is started by reprogramming to value 1/2/3. All 3 exchangers are regenerated 1x in succession up to 3x. The waiting time between the individual regenerations is 15 minutes. If the exchanger AT* is exhausted during the pause between two regenerations, the pending regeneration is triggered immediately.	0	0 ... 3
A	Regeneration type	**Change only permitted by Grünbeck's technical service/authorised service company.** F = Metering make-up water Make-up water volume at step "Fill brine tank" b = Brine volume metering Suction volume with step "Salting"	F	F, b

4.10.3 Installer level 999

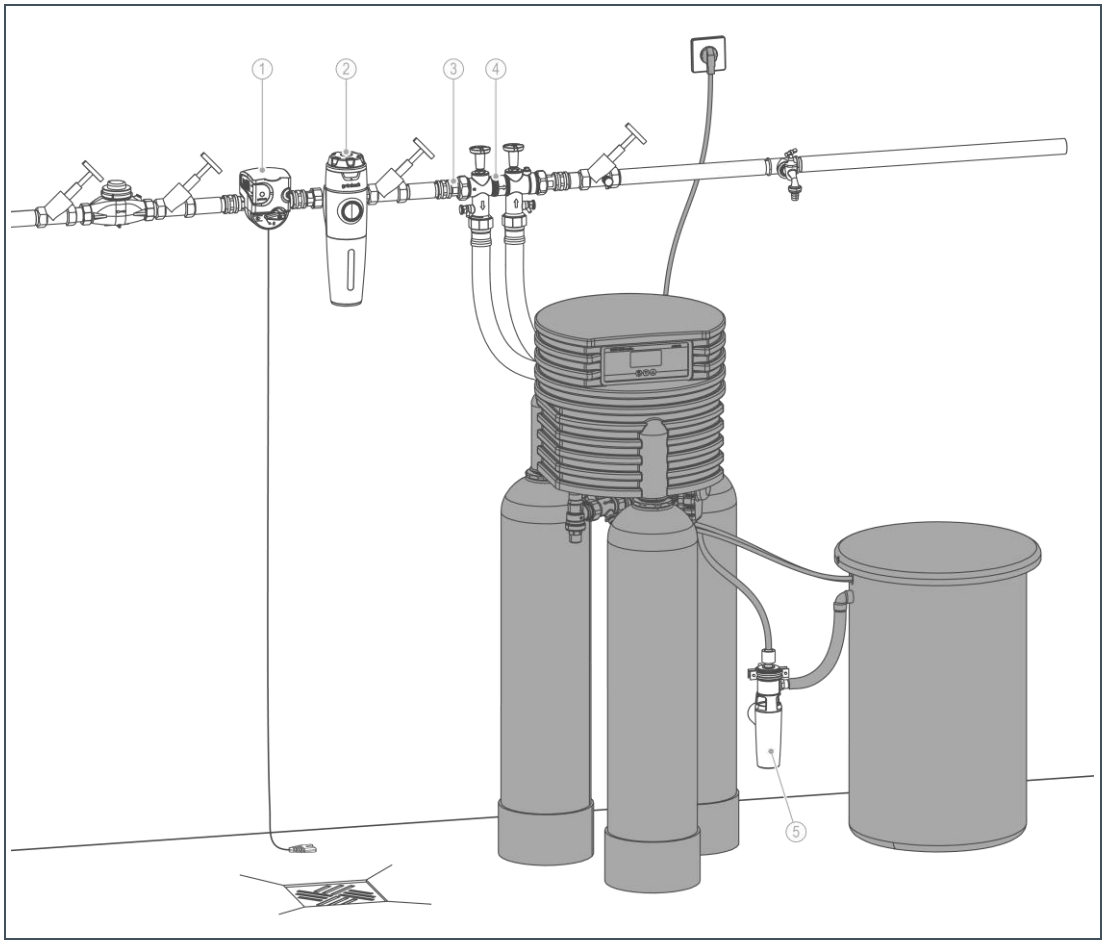
The software version programmed in the control unit can be called up on installer level 999.

To activate the installer level 999:

1. Press P and ▼ simultaneously for more than 1 second.
» The display changes to C.000.
2. Set C.999 with ▼ or ▲ .
3. Confirm with P.
» You can read off the programmed software version.

5 Installation

The installation of a water softener represents a major intervention into the drinking water system and only a qualified specialist should install these systems.



Item	Designation	Item	Designation
1	Safety device protectliQ	2	Drinking water filter pureliQ
3	Screw connection	4	Connection kit with flexible connection hoses
5	Drain connection Delta-p, DN 50 acc. to DIN EN 1717		

5.1 Requirements for the installation site

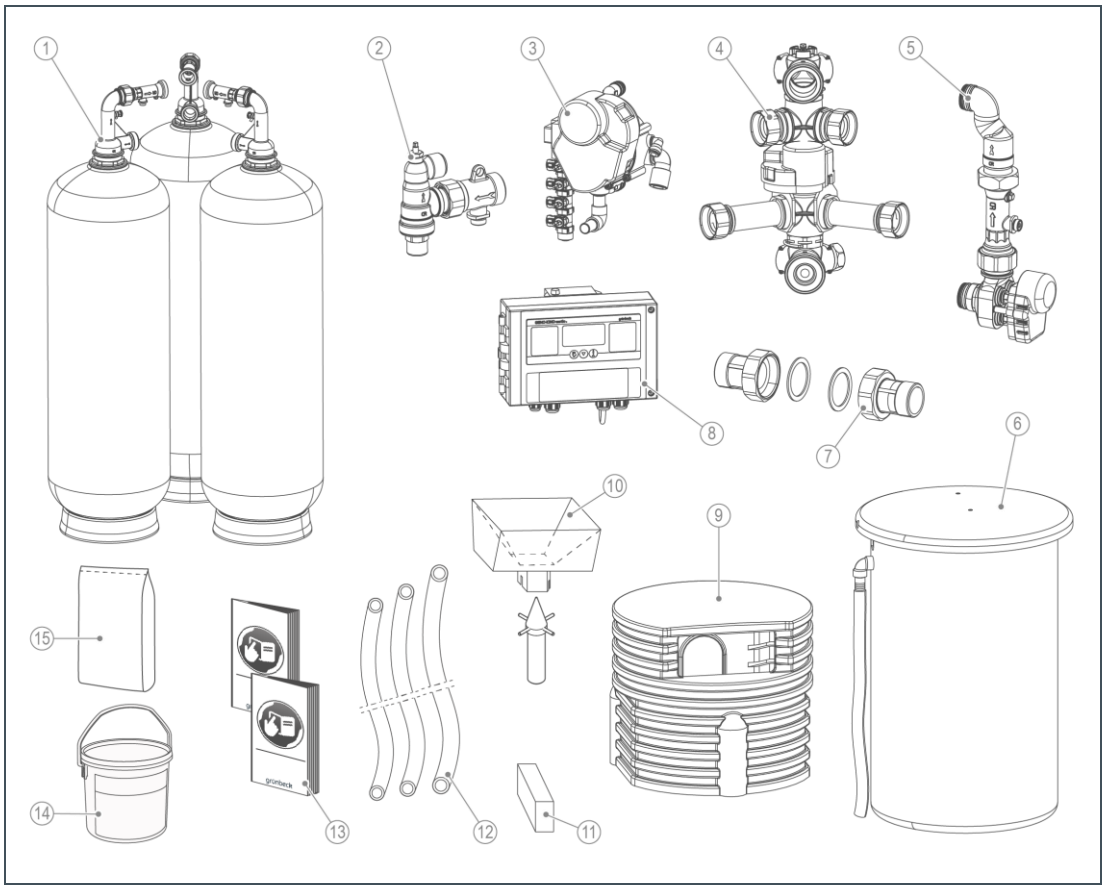
Observe local installation directives, general guidelines and technical specifications.

- The installation site must be frost-proof and ensure the product is protected from chemicals, dyes, solvents and their vapours.
- The floor at the installation site must be level.
- If the softened water is intended for human consumption in the sense of the German Drinking Water Ordinance, the ambient temperature must not exceed 25 °C. For applications that are purely technical, the ambient temperature must not exceed 40 °C.
- Always install a drinking water filter and, if required, a pressure reducer (e.g. fine filter pureliQ:KD) upstream of the product.
- A shock-proof socket is required within a distance of approx. 1.2 m of the system. The socket requires a permanent power supply and must not be connected to light switches, emergency heating switches or similar devices.
- A drain connection (DN 50) must be available to discharge the regeneration water.
- There must be a water withdrawal point near the product.
- A floor drain suitable for the system size must be available at the installation site or a protection device e.g. protectliQ or a protection device with water stop of the same quality must be installed.
- Make sure that lifting systems are saltwater-proof.
- The soft water side of the system must be made of corrosion-resistant material or a corrosion inhibitor must be used.

If you require a constant soft water hardness (e.g. boiler feed water), we recommend installing an automatic water analysis device.

5.2 Checking the scope of supply

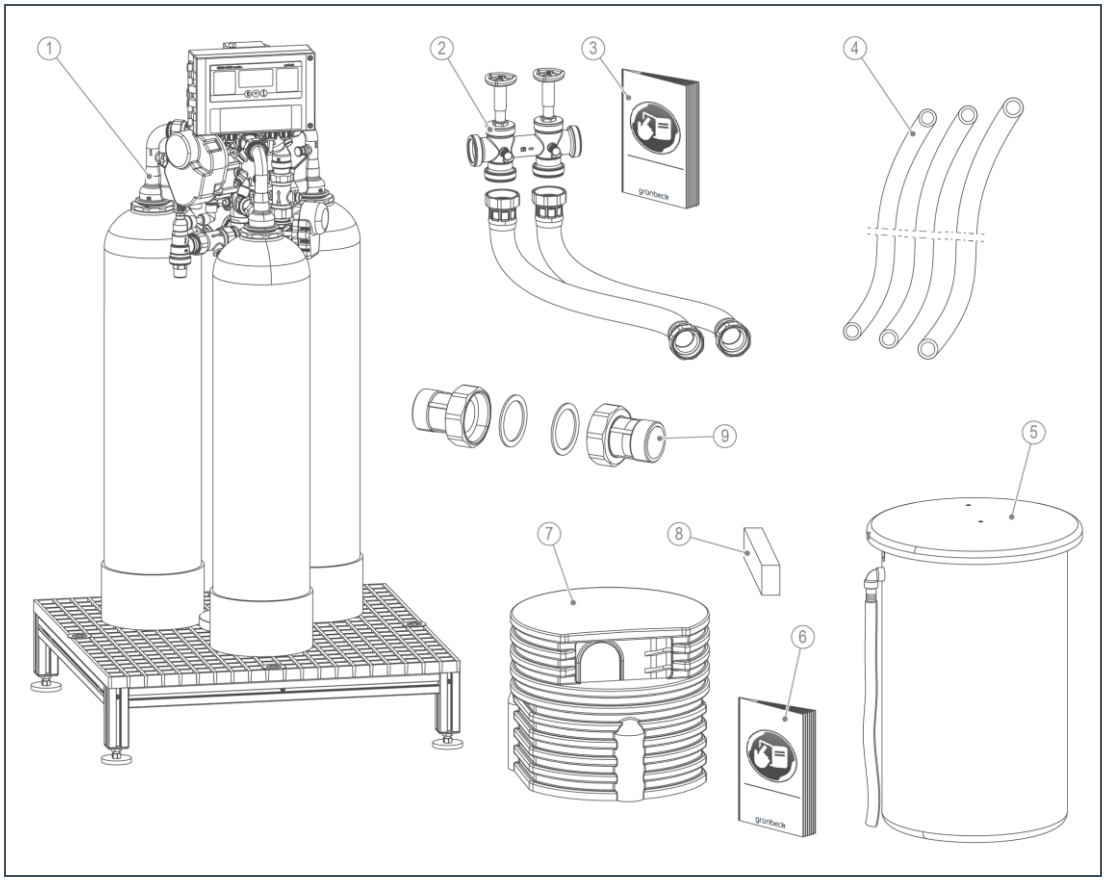
5.2.1 Delta-p without pedestal



Item	Designation	Item	Designation
1	Exchanger (3 x with bottle adapter, water meter)	2	Pressure reducer with water meter
3	Regeneration valve	4	Control valve
5	Blending unit (not with Delta-p-I)	6	Brine tank with overflow hose
7	Screw connection	8	Control unit
9	Cover	10	Funnel with riser pipe cover
11	Water test kit "Total hardness"	12	Hoses
13	Operation manual and mounting instructions	14	Support material glass balls (only for Delta-p 1½", Delta-p 2", Delta-p 1½"-I, Delta-p 2"-I)
15	Exchanger resin (only for Delta-p 1½", Delta-p 2", Delta-p 1½"-I, Delta-p 2"-I)		

► Check the scope of supply for completeness and damage.

5.2.2 Delta-p with pedestal



Item	Designation	Item	Designation
1	Delta-p on pedestal	2	Connection kit
3	Mounting instructions connection kit	4	Hoses
5	Brine tank with overflow hose	6	Operation manual
7	Cover	8	Water test kit "Total hardness"
9	Screw connection		

► Check the scope of supply for completeness and damage.

5.3 Preparing the product

The Water softeners on a pedestal are pre-assembled ready for connection.

► For water softeners on a pedestal, continue with chapter 5.4.

NOTE: Large temperature difference at the installation site when the product is installed.

- Malfunction of the control unit possible during initial commissioning due to moisture precipitation on the electronic components within the control unit.

► Unpack the product before installation and leave it unused at the installation site for 1 hour.

» Possible moisture formation on electronic components inside the control unit will be able to dry off.

5.3.1 Filling exchanger

The exchangers of the following water softeners must be filled:

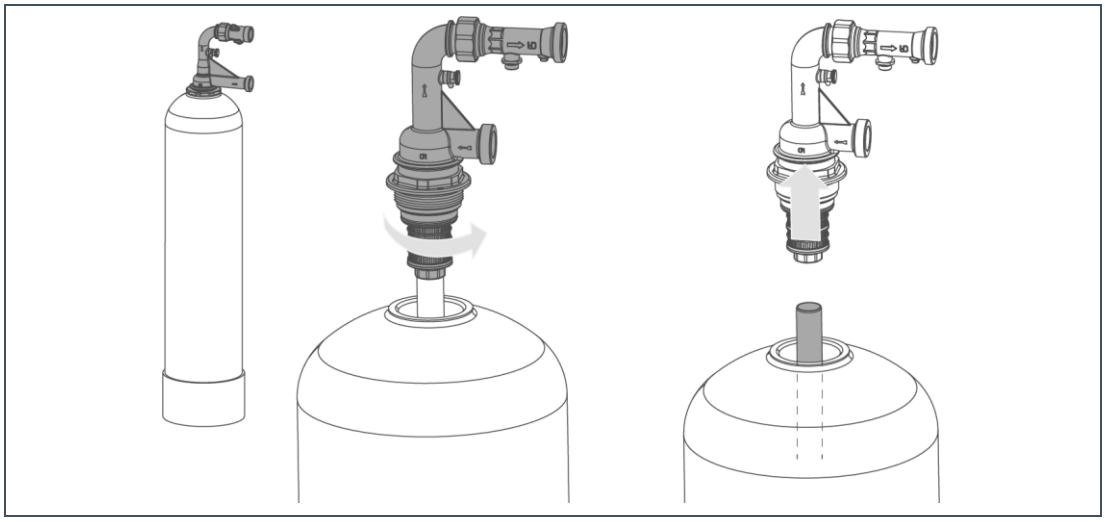
- Water softener Delta-p 1½"
- Water softener Delta-p 2"
- Water softener Delta-p 1½"-I
- Water softener Delta-p 2"-I

► Only carry out a wet filling immediately before commissioning.

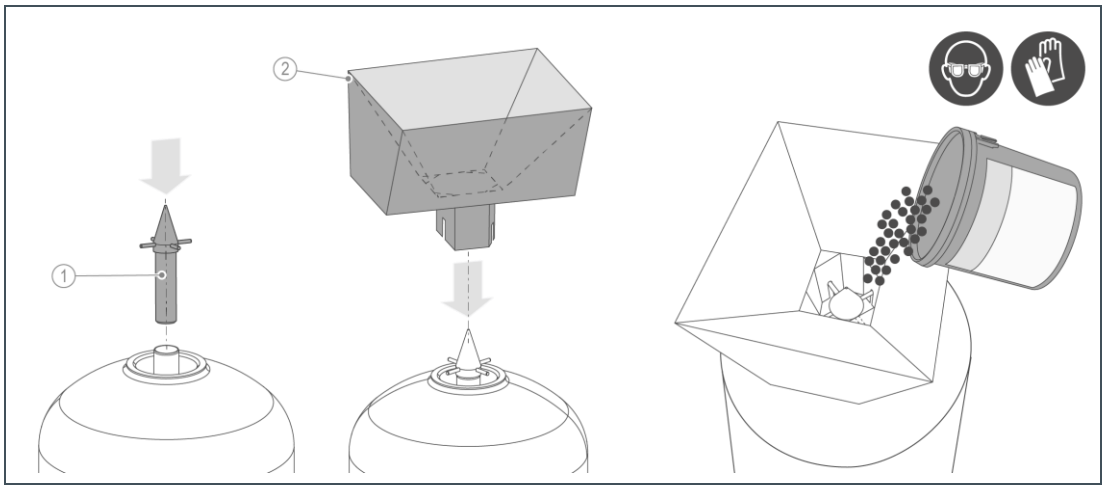
CAUTION: Exchanger can tip or fall over

- Risk of impact and crushing.

► Secure the exchanger against tipping over.



1. Unscrew the bottle adapter.



Item	Designation	Item	Designation
1	Riser pipe cover	2	Funnel

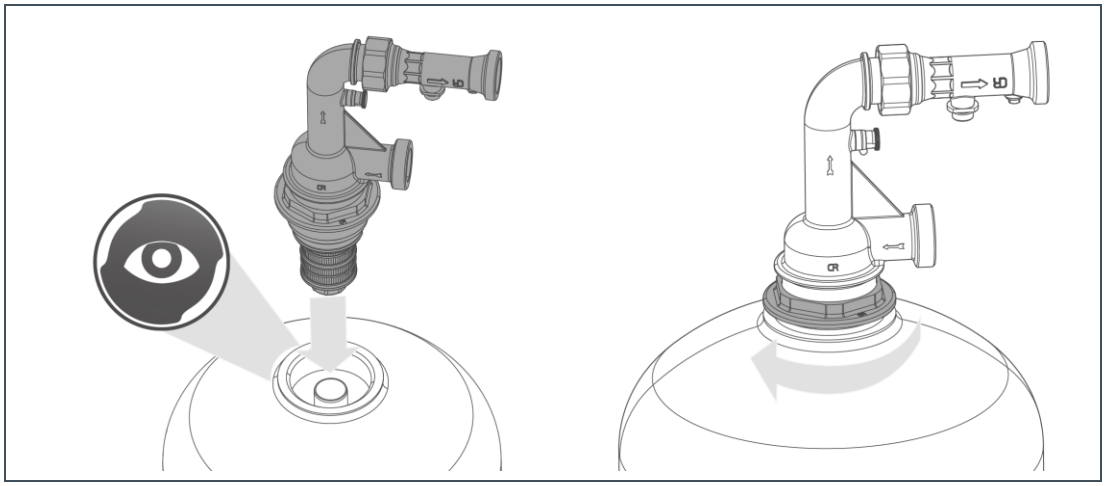
2. Insert the riser pipe cover into the riser pipe.
3. Put the funnel on top of the riser pipe cover – put slots on pins..

» The funnel is fixated.

Filling volume per exchanger:

		1½"	2"
Glass balls	[l]	10	15
Exchanger resin	[l]	75	100

4. Fill in the glass balls.
5. Fill in the exchanger resin.
6. Remove the funnel and the riser pipe cover.



7. Clean the threads and sealing surfaces on the exchanger to remove any glass balls and exchanger adhering to them.
8. Push the bottle adapter onto the riser pipe.

9. Screw on the bottle adapter firmly.

5.3.2 Assembling components

For installation, please observe the mounting instructions Delta-p/Delta-p-I (order no. 185 945), for instance.

Electrical connections may only be installed by an electrical specialist .

For an overview of the electrical connections refer to chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**.

5.4 Installing the product

WARNING: Danger of contaminated drinking water due to stagnation.

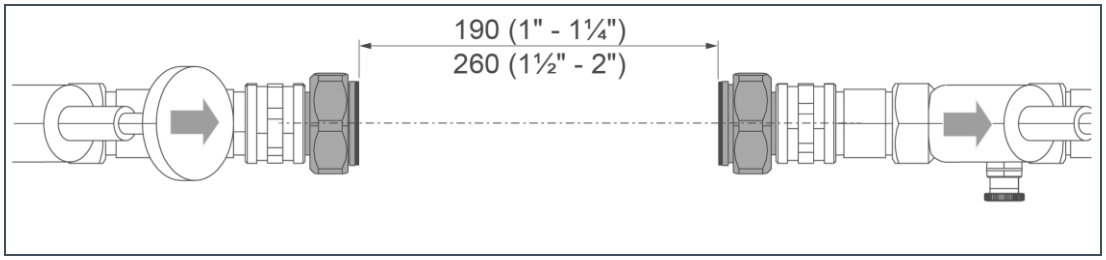
- Bacterial growth in the drinking water. Risk of infectious diseases.
- ► Do not connect the product to the drinking water installation until directly before commissioning.
- ► Only fill the system with raw water immediately before operation.
- ► Only carry out the leakage test during start-up.

The following options are available for installing the water softener Delta-p/Delta-p-I:

- with connection kit Delta-p
- with on-site fixed piping

Several water softeners can be connected by parallel piping (refer to chapter 3.4).

5.4.1 With connection kit Delta-p



1. Install the screw connection into the pipe.
2. Mount the connection kit Delta-p using the mounting instructions.

Installing the connection hoses

NOTE: Incorrect assembling of the connection hoses

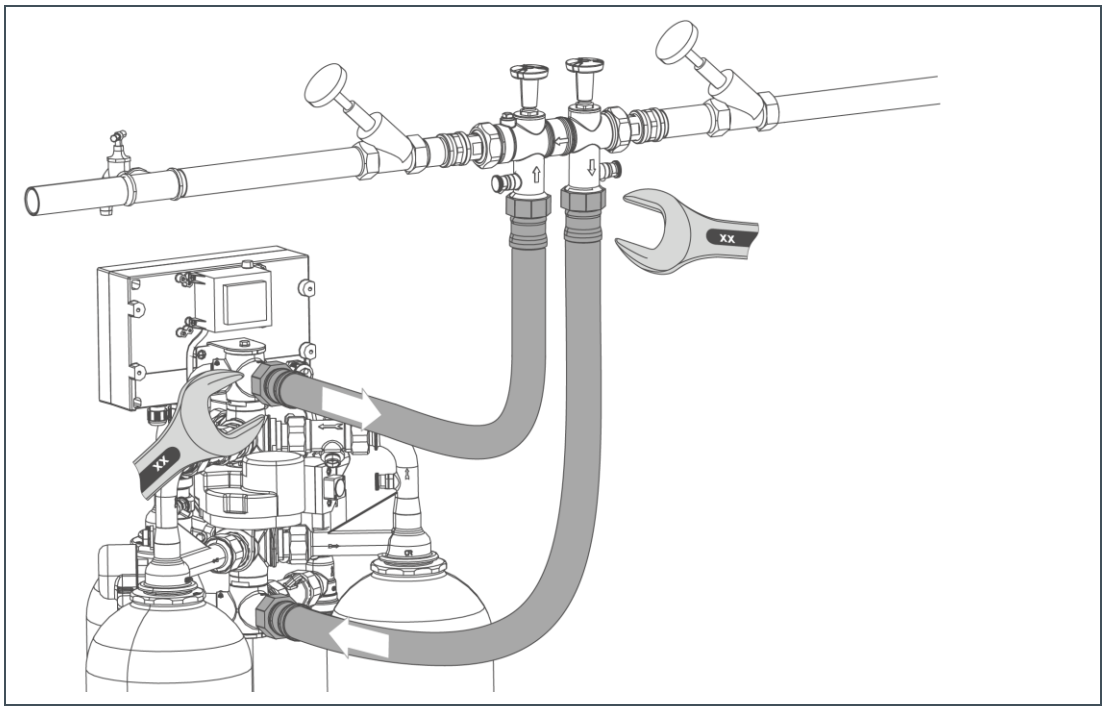
- Risk of damage/impairment of the system function in case of incorrect assembling.

► When connecting, make sure that the connection hoses are not crushed, kinked or twisted.

► Hold the connection hoses tight while tightening the union nuts.

► Make sure that the bending radius of the connection hoses is not too small (at least 10 x Ø hose).

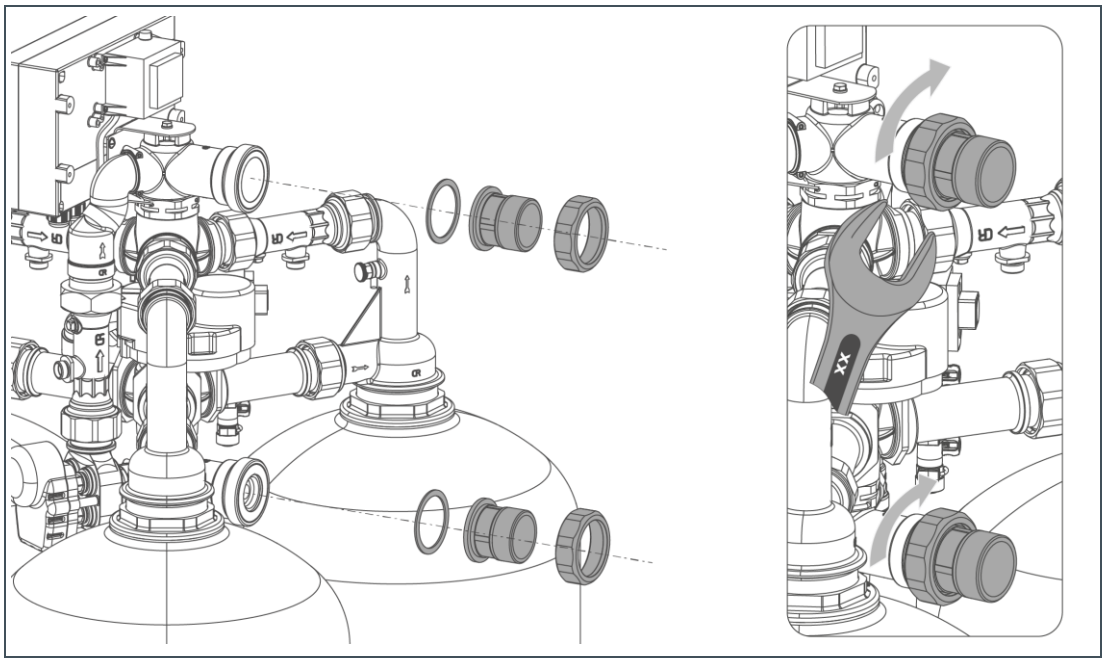
1. Observe the flow direction indicated by arrows on the connection block and on the cover.
   (in = raw water inlet; out = soft water outlet)
2. Remove the cover.



3. Mount the connection hoses on the connection block and on the connections of the Delta-p.

5.4.2 With on-site fixed piping

You have the possibility to use the screw connection as transition to the fixed piping.



► Fit the connection fittings to the inlet and outlet connections of the Delta-p.

Observe the following points for an installation with fixed piping:

- Install shut-off valves for raw water inlet and soft water outlet.
- Install sample valves for raw water and soft water.
- The nominal connection diameter and connection diameter must match.

5.4.3 Establish waste water connection as per DIN EN 1717

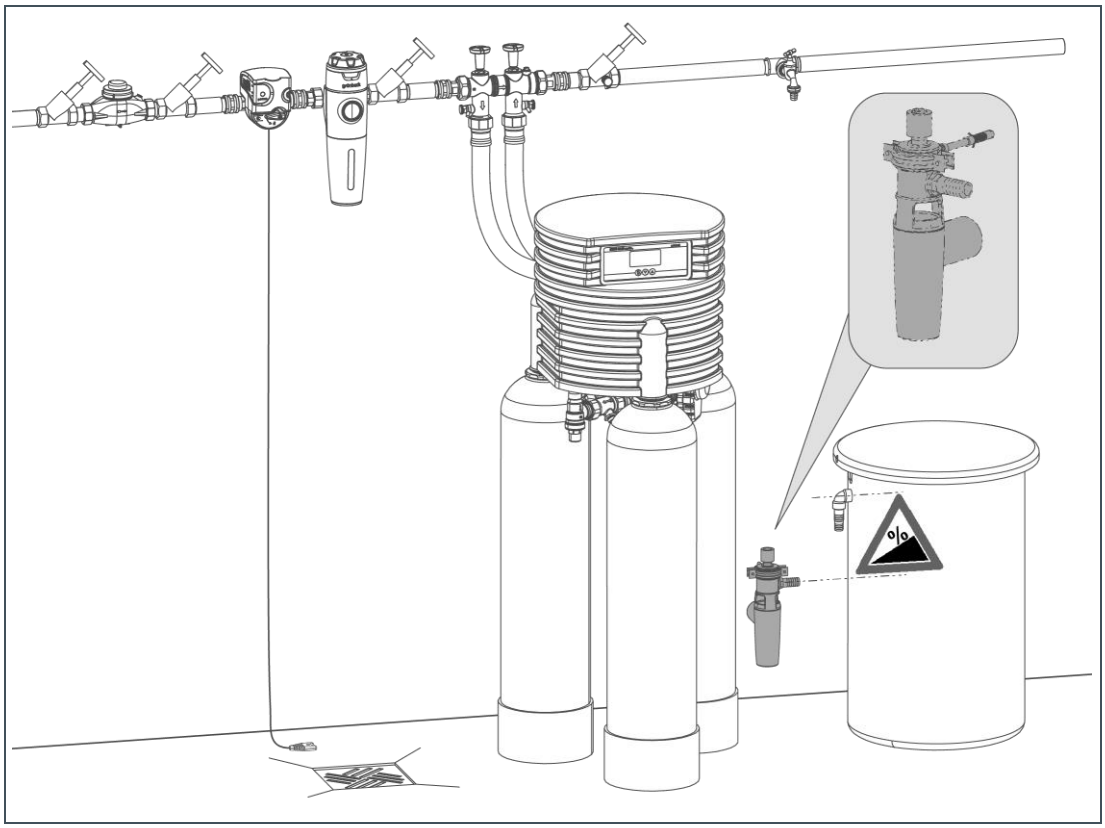
The duct connection facilitates DIN-compliant connection (refer to chapter 3.4).

NOTE: Incorrect discharge of regeneration water.

- Health risk due to contamination of the drinking water.

► Only use the black hose supplied to discharge the regeneration water to the drain connection.

► When installing a discharge line for the regeneration water, do not connect any devices directly to the drain outlet of the water softener.



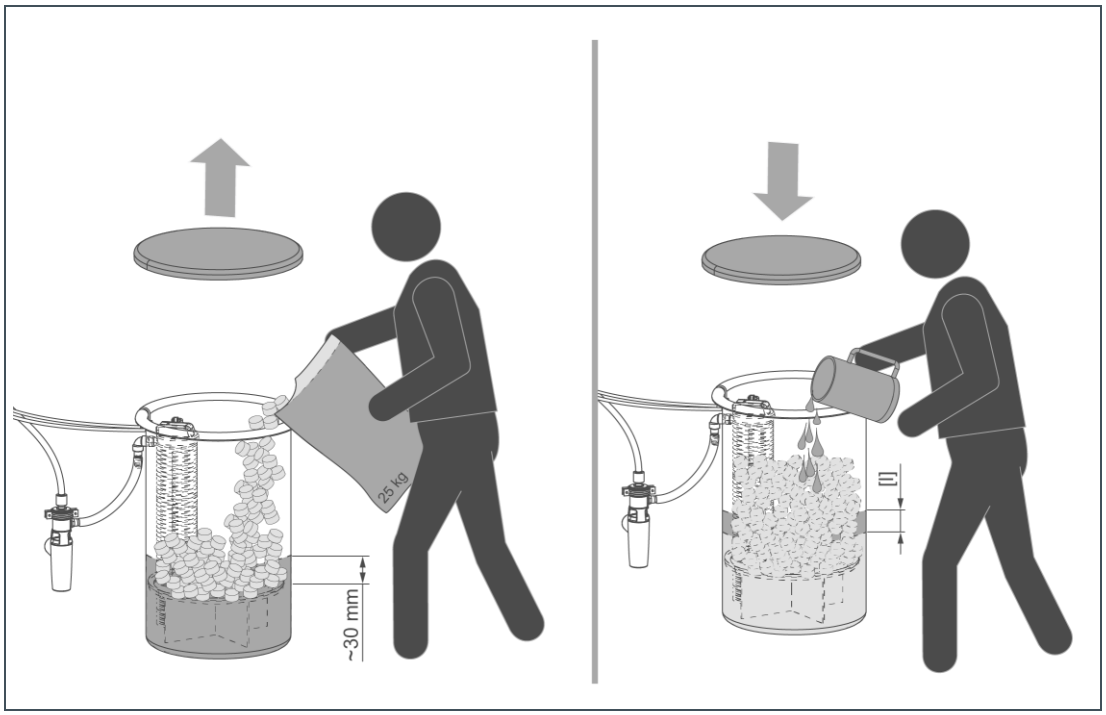
1. Place the brine tank in close proximity to the water softener.
2. Note the length of the hoses from the brine tank and from the water softener.
3. Run the overflow hose to the drain with a downward slope.
4. Establish a waste water connection as per DIN EN 1717.

If other drain connections are used, a free outlet and backflow-free discharge of the flushing and regeneration water must be ensured.

6 Start-up

The installation may only be carried out by a specialist.

6.1 Filling the brine tank



1. Open the lid of the brine tank.
2. Fill the brine tank with raw water until the water level is about 30 mm above the sieve bottom.
3. Fill in salt tablets.

		1"	1¼"	1½"	2"
Salt supply standard-Brine tank max.	[kg]	75	75	200	200

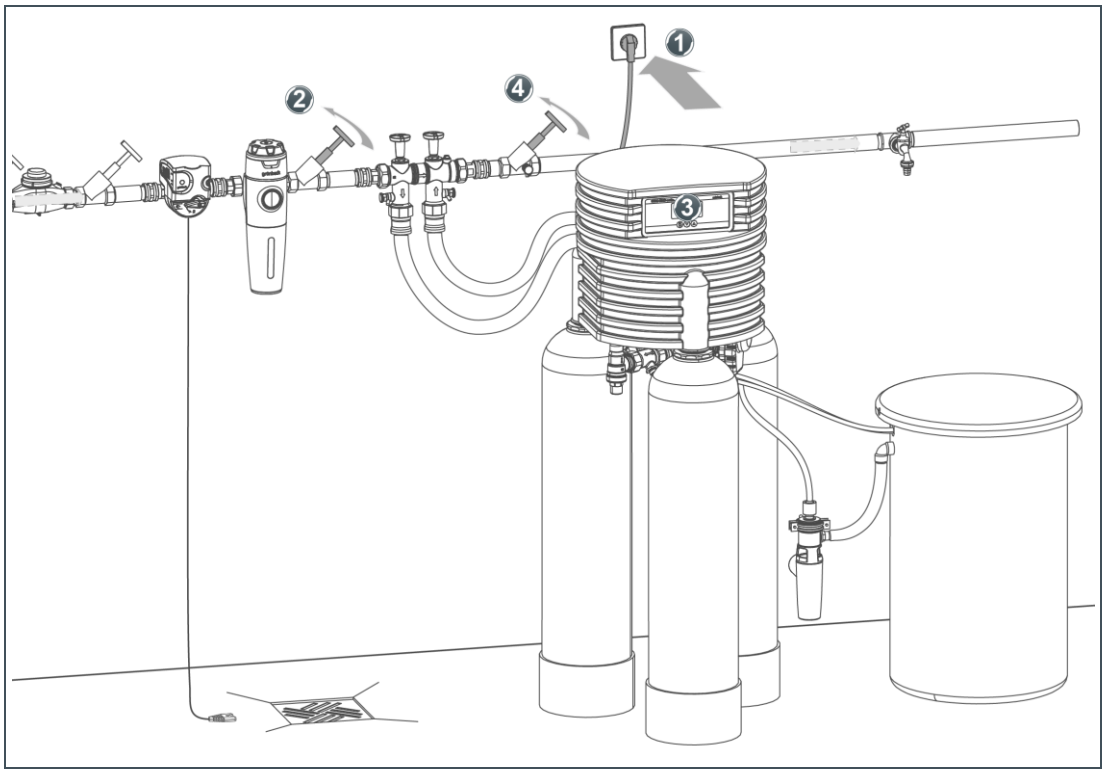
4. Fill in the active water volume (raw water).

		1"	1¼"	1½"	2"
Active water volume, approx.	[l]	4	7	14	20

5. Close the brine tank lid.

► Dispose of the fine fraction from the bag in the residual waste.

6.2 Venting the product



1. Plug in the mains plug.
2. Open the client's shut-off valve at the raw water inlet.
3. Start a manual regeneration for all 3 exchangers (refer to chapter 7.4).
4. Wait until the manual regeneration is finished.
5. Open the client's shut-off valve at the soft water outlet.

» The system is vented.

6.3 Checking the product

1. Check the system for leaks.
2. Check the soft water meter for pulse output.
3. Check the regeneration water meter for pulse output.
4. Fill in the start-up log (refer to chapter 14).

» This completes the start-up.

6.4 Setting the control unit

- ► Set the time (refer to chapter 7.5).
- ► Set the raw water hardness (refer to chapter 7.2).
- ► Set the soft water hardness (refer to chapter 7.3).
- ► Check on installer level 290 whether the correct data record is set for index 1 (refer to chapter 4.10.2).

6.5 Handing over the product to the owner/user

- ► Explain to the owner/user how the water softener works.
- ► Use the manual to brief the owner/user, and answer any questions.
- ► Inform the owner/user about the need for inspections and maintenance.
- ► Hand over all documents to the owner/user for storage.

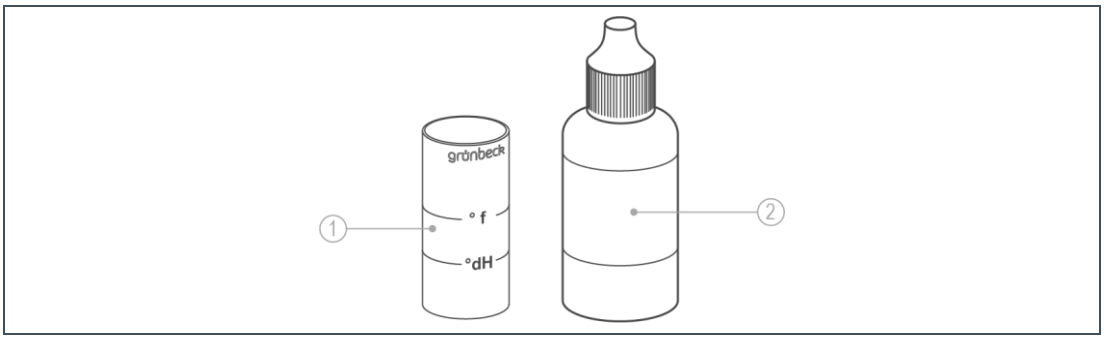
7 Operation

NOTE: The valves of the system are operated electrically.

- Water can flow to the drain if there is a power failure during regeneration.
- ► If there is a power failure, check your product and shut off the water supply, if necessary.

7.1 Measure water hardness

The water test kit is designed for the determination of the water hardness in °dH or in °f. The unit mol/m³ (= mmol/l) can be converted from °f.



Item	Designation	Item	Designation
1	Test tube	2	Titration solution

7.1.1 Taking a water sample

Open the water withdrawal point for cold water fully. A flow rate between 400 l/h and 600 l/h must be attained in order to produce a correct result. You can read the flow rate on the touch-screen display.

1. Open a water withdrawal point for cold water.
   - **a** In order to take a raw water sample, use a water withdrawal point for cold water upstream of the water softener.
   - **b** In order to take a soft water sample, use a water withdrawal point for cold water downstream of the water softener.
   - **c** For a 0°dH water sample, use the sample valve on the bottle adapter of exchanger* or exchanger**.
2. Let the water flow for at least 30 seconds.

3. Take a water sample with the test tube:
   a Fill the test tube up to the °dH mark to determine the water hardness in °dH.
   b Fill the test tube up to the marking °f (x 0.1 = mol/m³) in order to determine the water hardness in °f, mol/m³ or mmol/l.

7.1.2 Determining the water hardness in °dH/°f

1. Add one drop of titration solution (1 drop = 1 °dH = 1 °f).
2. Shake the test tube until the titration solution is mixed with the water.
3. In case of red colouring, repeat steps 1 and 2 and count the drops until the colour changes to green.

» If the colour changes from red to green, the water hardness has been determined.

The number of drops corresponds to the degree of hardness in °dH or °f.
Example:
- Test tube filled up to the °dH mark: 6 drops = 6 °dH.
- Test tube filled up to the °f mark: 6 drops = 6 °f.

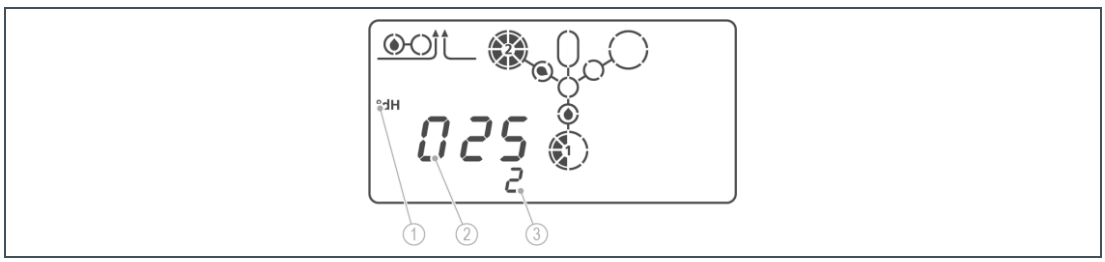
7.1.3 Determining the water hardness in mol/m³ (mmol/l)

1. Determine the water hardness in °f as described.
2. Divide the value in °f by 10.

The water hardness in °f divided by 10 corresponds to the degree of hardness in mol/m³ (= mmol/l).
Example:
6 drops = 6 °f = 0.6 mol/m³ = 0.6 mmol/l.

» You get the water hardness in mol/m³.

7.2 Entering raw water hardness



Item	Designation	Item	Designation
1	Hardness unit	2	Parameters for raw water hardness
3	Index		

1. Press P for more than 1 second.
2. Press ▲ twice to activate index 2.

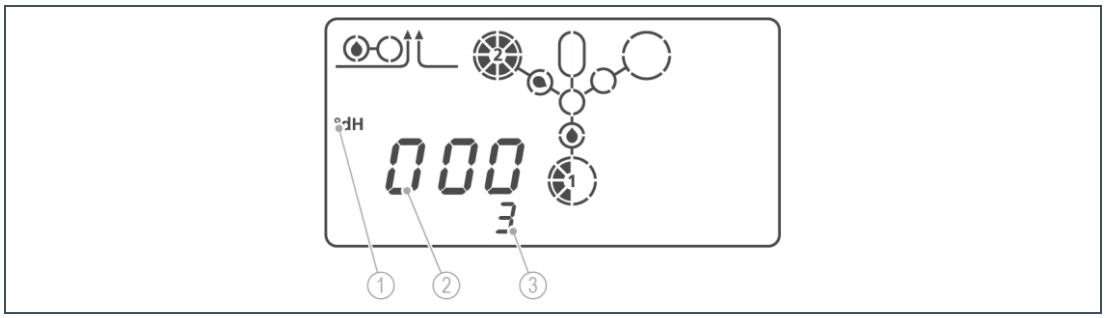
» The parameter for raw water hardness is displayed.

3. Press P to change the value.
4. Set the desired value using ▼ and ▲.
5. Press P to save the set value.

» The raw water hardness is set.

7.3 Entering soft water hardness

This value must not be changed on water softeners Delta-p-I.
The setting must remain at 000.



Item	Designation	Item	Designation
1	Hardness unit	2	Parameters for soft water hardness
3	Index		

1. Press P for more than 1 second.
2. Press ▲3 times to activate index 3.

» The parameter for soft water hardness is displayed.

3. Press P to change the value.
4. Set the desired value using ▼ and ▲.
5. Press P to save the set value.

» The soft water hardness is set.

7.4 Starting a manual regeneration

A manual regeneration is necessary in the following cases:

- If water softeners are run in operating mode b 1 and the maximum soft water volume is reached before the set regeneration interval has been reached.
- The product resumes operation after a longer period of standstill.
- After maintenance and repair work has been performed.
- After a longer power failure.

In manual regeneration, until a residual capacity of < 50% is reached, exchanger AT* and exchanger AT** have the same residual capacity and 4 or 3 segments of a circle.

During each manual regeneration, the chlorine cell is active if the chlorine current is not generally switched off.

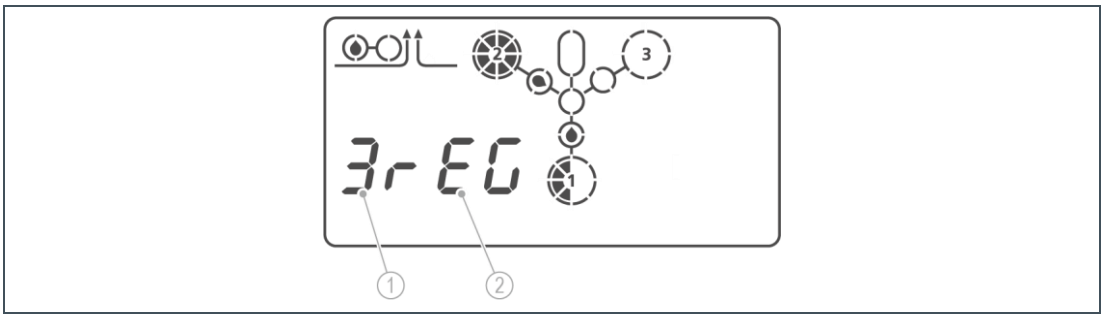
Manual regeneration via operating button always has priority.

If there is an external regeneration lock (prog. input) = active, the manual regeneration via Profibus or Modbus is blocked.

If there is a regeneration block via Profibus, the manual regeneration via Profibus is blocked.

Sequence of a manual regeneration:

- Step 1 = Salting
- Step 2 = Slow rinse
- Step 3 = Backwash
- Step 4 = fill brine tank
- Step 5 = First filtrate



Item	Designation	Item	Designation
1	Number of exchangers to be regenerated	2	rEG = Regeneration

You have the option of starting manual regeneration for 1, 2 or 3 exchangers:

Number of exchangers	Button press	Display shows
1 Regenerate exchanger (AT*)	3 seconds	1rEG
Regenerate 2 exchangers in succession (AT* and AT**)	6 seconds	2rEG
Regenerate 3 exchangers in succession (AT*, AT** and AT***)	9 seconds	3rEG

► Press ▼ in the basic display until the desired number of exchangers for manual regeneration appears in the display.

» The manual regeneration starts.

If you want to increase the number of exchangers for manual regeneration after the start of manual regeneration, this is until step 5 (first filtrate) of the 1st exchanger has been reached.

► Press ▼ until the desired number of exchangers for manual regeneration appears in the display.

7.5 Set time

1. Press P for longer than 1 second in the basic display.
2. Press P.
3. Set the desired value using ▼ and ▲.
4. Press P to save the value.
5. Use ▲ to switch the minute display.
6. Press P.
7. Set the desired value using ▼ and ▲.
8. Press P to save the value.

» The time is set.

8 Cleaning, inspection, maintenance

WARNING: Risk of contaminated drinking water if the work is not carried out properly.

- Risk of infectious diseases.
- ► Pay attention to hygiene when working on the product.

Inspection and maintenance of a water softener is stipulated in DIN standard EN 806-5. Regular maintenance ensures trouble-free, hygienic operation. At least once a year, the water softener must be serviced by Grünbeck's technical service/authorised service company or by a qualified specialist trained by Grünbeck.

A maintenance contract ensures that all the required maintenance work will be performed in due time.

► Only use genuine spare and wearing parts from Grünbeck.

8.1 Cleaning

NOTE: Do not clean the product with alcohol or cleaning agents containing solvents.

- These substances will damage plastic components.
- ► Use a mild/pH-neutral soap solution.

► Only clean the outside of the product.

► Do not use any strong or abrasive cleaning agents.

► Wipe the housing with a damp cloth.

8.2 Intervals

Complying with the inspection and maintenance intervals is important for trouble-free and hygienic operation.

Task	Interval	Execution
Inspection	2 months	Visual inspection for function and tightness, check raw and soft water hardness, check salt supply, check tightness of the control valve
Maintenance	6 months	Visual/functional check of the system, determine raw and soft water hardness, leak test, check salt quantity and salt condition, read of water meter reading, assess consumption, check control valve for leaks, check control unit settings
	annually	Check operating values: Water meter reading, rest and flow pressure, raw and soft water hardness, meter for regeneration and soft water volume; read out error memory, check settings of blending valve (not with Delta-p I), check control unit, check regeneration triggering, check brine control, check chlorine cell, check disinfection unit, check/clean injector/injector sieve, check control valve for leaks, clean brine tank and float valve, check all cables and hose connections for firm seating, damage and tightness, check safety fitting
Maintenance	2 years	Recommended: Changing chlorine cell(s)
	3 years or 20,000 m^3	Recommended: Changing push-in turbines

8.3 Inspection

Regular inspection increases the operational reliability of your product.

► Conduct an inspection at least every 2 months.

1. Check the raw water hardness.
2. Check the soft water hardness.
3. Check there are sufficient salt tablets in the brine tank.
4. Check the system for leaks.
5. Check the tightness of the control valve to the drain in the operating state – without regeneration procedure.

8.4 Maintenance

DIN EN 806-5 recommends a semi-annual and an annual maintenance.

8.4.1 Semi-annual maintenance

The following work must be carried out as part of the semi-annual maintenance:

1. Read the water meter.
2. Check the raw water hardness.
3. Check the soft water hardness with blending (not with Delta-p I).
4. Check the setting of the control unit:
   - Time
   - Raw water hardness set
   - Soft water hardness with blending
5. Check there are sufficient salt tablets in the brine tank.
6. Check the salt condition (salt must not be lumpy).
   Remove incrustations with a tool (do not use pointed objects).
7. Evaluate the salt consumption subject to the water volume consumed.

Minor deviations in salt consumption are normal and cannot be avoided technically. If the deviations are considerable, contact Grünbeck's technical service/authorised service company.

8. Check the installation for leaks – check all hose connections and fittings for water leakage.
9. Check the tightness of the control valve to the drain in the operating state – without regeneration procedure.
10. Enter all data and work in the operation log (refer to chapter 14).

8.4.2 Annual maintenance

Carrying out annual maintenance work requires specialist knowledge. This maintenance work may only be performed by Grünbeck's technical service/authorised service company or by qualified specialists trained by Grünbeck.

The following work must be carried out as part of annual maintenance:

Operating values

1. Read off the resting and flow pressure.
2. Read the water meter.
3. Check the raw water hardness.
4. Match the measured raw water hardness to the setting in the control unit.
5. Check the soft water hardness with blending (not with Delta-p I).
6. Check the water hardness directly after the exchangers (0 °dH test), if necessary. (Only the two bottles in operation can be tested.)

» The water hardness should be 0 °dH.

7. Readjust the electronically controlled blending valve if necessary (not with Delta-p I).
8. Check the soft water hardness with blending again (not with Delta-p I).

A system data printout of the data is possible via the serial interface of the control unit.

9. Read off the regeneration counter.
10. Read off the soft water volume meter.
11. Read out the error memory.

We recommend replacing the push-in turbines after a total water volume of 20,000 m³ has been reached; however, at the latest after 3 years.

Maintenance work

12. Check the setting of the control unit.
13. Check the brine control:
    - Salting
    - Filling the brine tank
14. Check the function of the disinfection unit in the control unit.

We recommend replacing the chlorine cell(s) after 2 years at the latest.

15. Check the injector and injector sieve for dirt and clean them if necessary.

16. Check the control valve in the operating position for leaks (flushing water, filling and suction hose).
17. Clean the brine tank, if necessary.
18. Clean the float valve for filling device – descale it if necessary.
19. Check the function of the safety fitting against backflow.
20. Check all cables and connections for damage and a firm seat.
21. Reset the maintenance interval.

8.5 Consumables

Product		Quantity	Order no.
Regeneration salt tablets according to DIN EN 973 type A	[kg]	25	127 001
Water test kit total hardness	pc.	1	170 187
		10	170 100

8.6 Spare parts

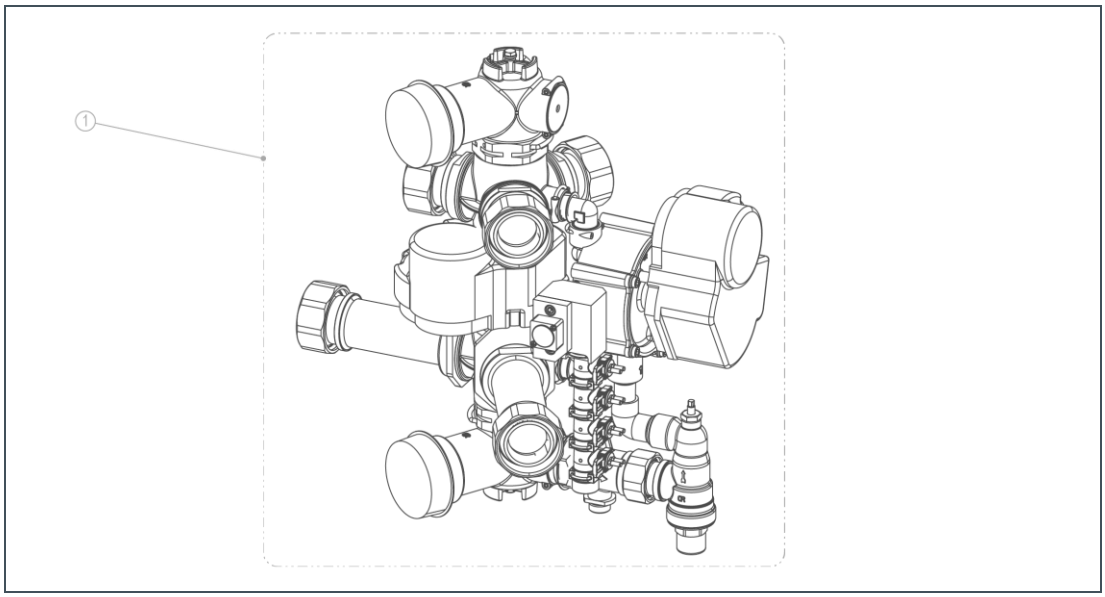
For spare parts and consumables please contact your local representative. You can find these on the Internet at www.gruenbeck.com.

8.7 Wearing parts

Wearing parts are only allowed to be changed out by a qualified specialist.

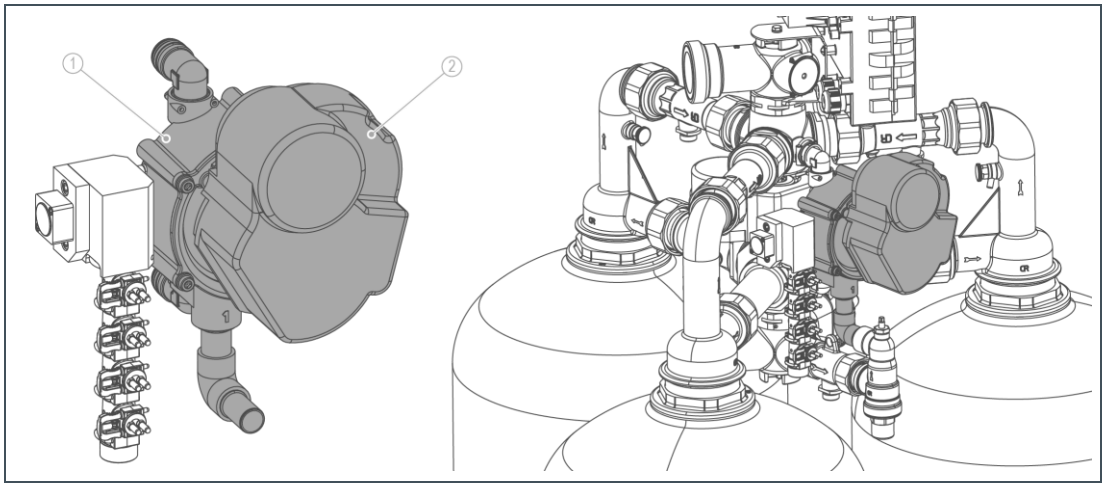
Wearing parts are listed below:

- Gaskets

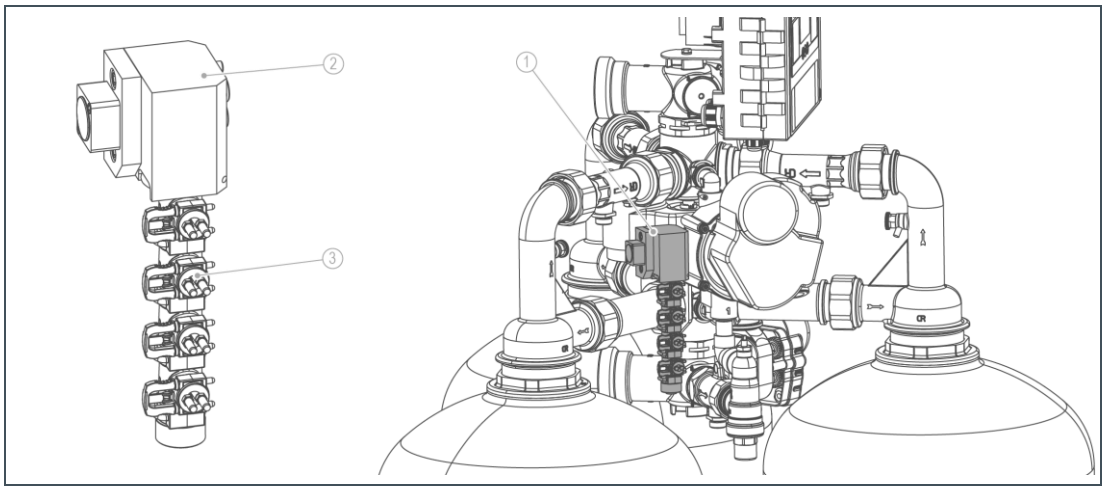


Item	Designation
1	Control valve consisting of: Regeneration valve Disinfection unit Pressure reducer with water meter Transfer valve (raw water) Transfer valve (soft water) Transfer valve actuator

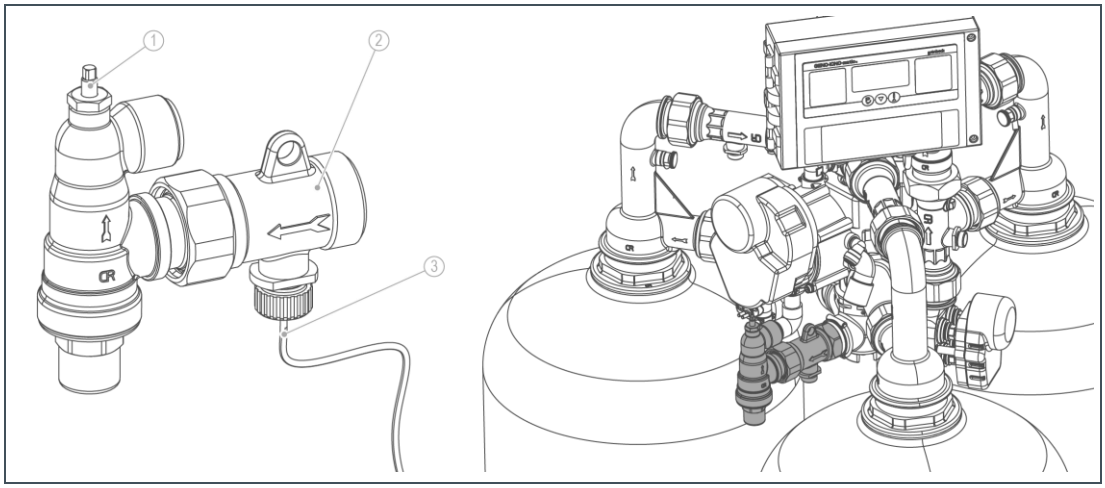
Individual assemblies of the control valve



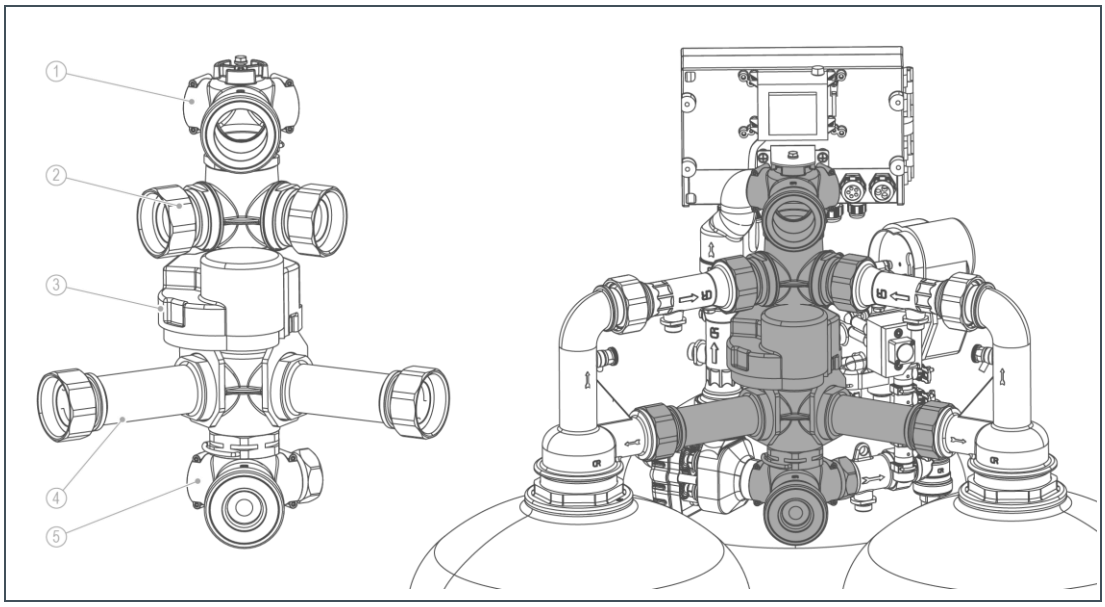
Item	Designation	Item	Designation
1	Regeneration valve with adapter cable	2	actuator



Item	Designation	Item	Designation
1	Disinfection unit		
2	Injector	3	Chlorine cells: 1" – 1 piece 1¼" – 2 pieces 1½" – 3 pieces 2" – 4 pieces

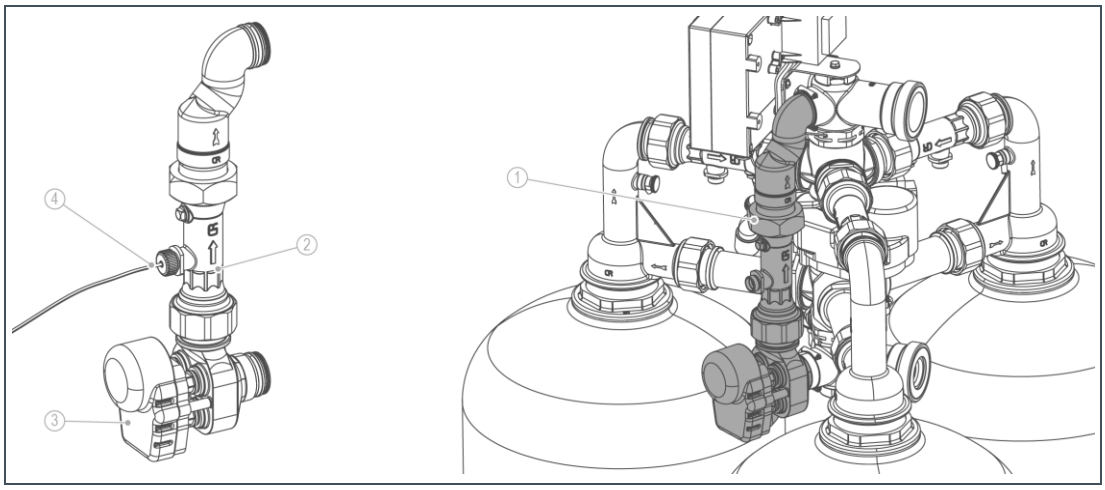


Item	Designation	Item	Designation
1	Pressure reducer	2	Water meter with flow straightener and sieve insert
3	Pulse cable with Hall element		

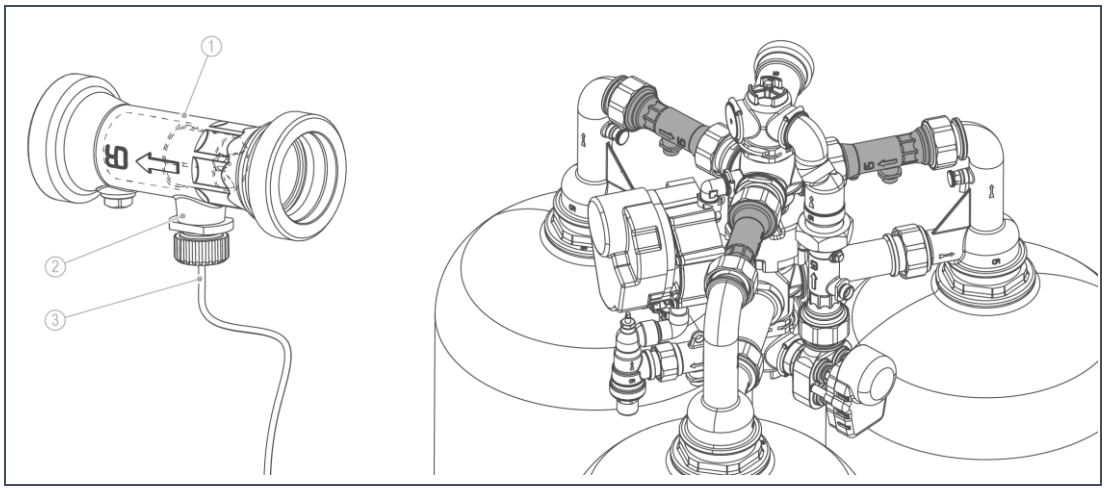


Item	Designation	Item	Designation
1	Transfer valve soft water	2	Ring distributor soft water (3-way valve)
3	actuator	4	Ring distributor raw water (3-way valve)
5	Transfer valve raw water		

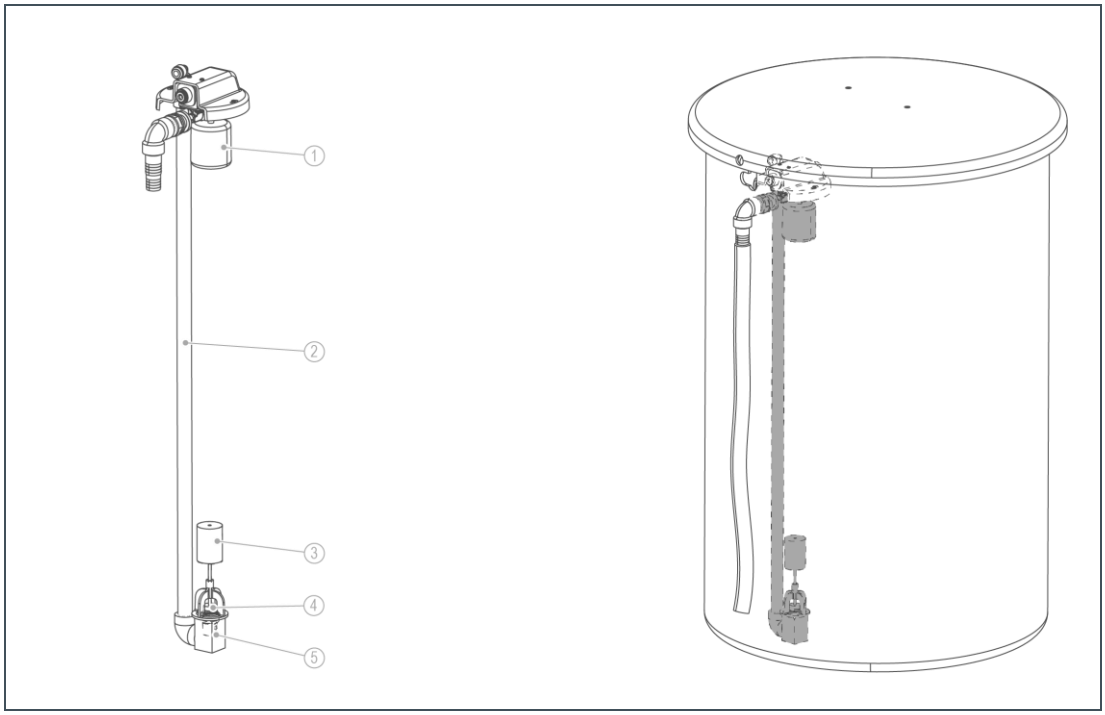
Further assemblies



Item	Designation	Item	Designation
1	Blending unit	2	Water meter without flow straightener
3	Control unit for blending with motor	4	Pulse cable with Hall element



Item	Designation	Item	Designation
1	Water meter with push-in turbine	2	Hall seating
3	Pulse cable with Hall element		



Item	Designation	Item	Designation
1	Float valve for filling device	2	Suction unit
3	Closing valve with valve disk	4	Valve seat brine float valve
5	Non-return valve		

9 Malfunction

WARNING: Danger of contaminated drinking water due to stagnation.

- Risk of infectious diseases.
- ► Have malfunctions remedied immediately.

The voltage-free signal contact (terminals 37-39) opens when the maintenance interval has expired and Er A. For all other faults Er X opens the fault signal contact (terminals 39-41). Both signals, signal contact and fault signal contact, are active.

The water softener indicates malfunctions on the display. The display of the fault remains active until the condition is rectified.

► If malfunctions cannot be remedied by the instructions given below, contact Grünbeck's technical service/authorised service company.

► Have the type plate data handy (refer to chapter 1.7).

9.1 Display messages

1. Press P to acknowledge the fault.
2. Watch the display.
3. If the fault occurs again, compare the display message with the following table.

Malfunction	Explanation	Remedy
	Maintenance interval has expired.	Notify Grünbeck's technical service/authorised service company.
Er 0	Power failure > 5 minutes has occurred. The signal of a power failure is not activated in the factory settings of the GENO-IONO-matic3.	Carry out manual regeneration if the exchangers in operation have been used further during the power failure (refer to chapter 7.4).
		Notify Grünbeck's technical service/authorised service company.
		A different parameter setting could be required.

Malfunction	Explanation	Remedy
Er 1	Run-time monitoring motor regeneration valve has responded. • Connection cable from the regeneration valve to the control unit is incorrectly connected or defective. • Microswitch S3 ... S5 defective. • Motor of the regeneration valve defective. • Control unit defective.	Notify Grünbeck's technical service-/authorised service company.
	Fuse F2 has tripped.	Replace the fuse by one of the same type
	Pressure reducer on regeneration valve set incorrectly (completely open).	Notify Grünbeck's technical service/authorised service company.
Er 2	Run-time monitoring motor-Transfer valve has been activated. • Transfer valve-control unit connection cable incorrectly connected or defective. • Microswitch S1 ... S2 defective. • Motor transfer valve defective. • Control unit defective.	Notify Grünbeck's technical service/authorised service company.
	Fuse F2 has tripped.	Replace the fuse by one of the same type
Er 3	The regeneration of exchangers ** is due, but the regeneration of exchanger * is not yet completed. Only mixed or raw water is available.	Reduce the water withdrawal. The fault is acknowledged automatically when 2 exchangers with a corresponding capacity are in operation again.
	The hard water message Er 3 is not activated in the factory settings of the GENO-IONO-matic$_3$.	Notify Grünbeck's technical service/authorised service company.
		A different parameter setting could be required.

Malfunction	Explanation	Remedy
Er_4	Chlorine generation for disinfection of the exchanger during regeneration has not been carried out properly.	Check the connecting cable between the control unit and the disinfection unit.
	The electrolysis-current is too low due to insufficient brine concentration.	Check the minimum amount of salt in the brine tank and refill salt tablets. Wait five minutes and then acknowledge the fault.
		Notify Grünbeck's technical service/authorised service company.
	Electrodes consumed.	Notify Grünbeck's technical service/authorised service company.
Er‾‾4	Short circuit on electrodes.	Notify Grünbeck's technical service/authorised service company.
		Check the connecting cable between the control unit and the disinfection unit.
Er 6 (Code 290, index A = F)	Water volume for refilling the brine tank was not reached within the required time. For the next regeneration, it may not be possible to produce enough brine.	Check and establish the raw water supply.
		Eliminate the kinks.
	Turbine water meter 4 - pulse cable defective.	Notify Grünbeck's technical service/authorised service company.
	Turbine water meter 4 faulty.	
	Control unit defective.	
Er 7 (Code 290, index A = b)	Water volume for salting was not reached within the required time. It is not possible to generate the full capacity.	Check and establish the raw water supply. Eliminate the kinks.
	Turbine water meter 4 - pulse cable defective.	Notify Grünbeck's technical service/authorised service company.
	Turbine water meter 4 faulty.	
	Control unit defective.	

Malfunction	Explanation	Remedy
Er 8	One of the exchangers' water meters does not work.	Check that all cables are connected to the turbine water meter of the correct exchanger or regeneration/transfer valve.
		Notify Grünbeck's technical service/authorised service company.
Er 9	The control unit detects an invalid microswitch-position on the regeneration or transfer valve.	Check the connecting cables. Check the cabling.
	Connection cable regeneration valve-control unit or transfer valve-control unit incorrectly connected or defective.	
	Microswitch S1 ... S5 defective.	Notify Grünbeck's technical service/authorised service company.
	Control unit defective.	
Er A with symbol	Display only if pre-alarm salt supply accessory is installed and code 113, parameter 3 = L are programmed.	Check the minimum amount of salt in the brine tank and refill salt tablets.
		Notify Grünbeck's technical service/authorised service company if the display appears despite the quantity of salt being at or above the minimum.
Er C	Nominal flow of water softener exceeded. Risk of damage to system components.	Reduce the flow through the water softener.

Malfunction	Explanation	Remedy
Er D	Run-time monitoring motor blending valve has responded.	
	Soft water hardness is programmed although no blending valve is installed.	Set the parameter for soft water hardness with blending to 0 °dH (0 °f, 0 mol/m³).
	Parameters for soft water hardness selected too high in relation to raw water hardness.	Program the parameter for soft water hardness to a lower value. 50% of the raw water hardness can be achieved at most.
	Cabling of turbine water meter/motor blending valve faulty.	Check the cabling.
	Turbine water meter 5 – pulse cable defective.	Notify Grünbeck's technical service-/authorised service company.
	Turbine water meter 5 faulty.	
	Control unit defective.	
	Blending valve defective.	
Er F	Data connection to accessories communication module DE200-Profibus is faulty.	Re-establish the data connection. Re-establish the power supply to the communication module.

9.2 Other observations

Observation	Meaning	Remedy
Hardness increase in the soft water	- Water softener overrun -	
	Water softener does not have a permanent power connection.	Check the electrical connection. Change the current connection if necessary.
	No impulses from the turbine water meter at the control unit.	Check the turbine water meters and pulse cables. Replace defective parts.
	Incorrect setting of the control unit.	Check the parameter settings and correct them if necessary.
	Water softener does not draw in enough brine. Not enough water in brine tank.	Clean the injector. Check the regeneration step Fill brine tank.

Observation	Meaning	Remedy
	- Other explanation -	
	External blending valve incorrectly set, if fitted.	Check the raw water hardness or soft water hardness.
		Check the setting of the blending valve and correct it if necessary.
	Water supply interrupted.	Check whether the shut-off valves for raw water are open.
	Nominal flow rate exceeded.	Reduce the flow rate (refer to chapter 12).
	Not enough salt in brine tank.	Check the salt level and refill salt tablets.
Exchanger resin in discharge line	Defective jet system.	Notify Grünbeck's technical service-/authorised service company.
Water pressure at the withdrawal point too low. (pressure loss too high)	Exchanger resin contaminated by undissolved substances.	Notify Grünbeck's technical service-/authorised service company.
Water softener does not suck brine. Brine tank is full	Water pressure too low.	Increase the flow pressure to min. 2.0 bar.
	Injector clogged.	Clean the injector.
	Injector sieve clogged.	Clean the injector sieve.
	Brine valve clogged.	Disassemble and clean the brine valve.
	Incorrectly mounted transfer valve.	Check the assembly "point-by-point".
Display shows nothing	Fuse F3 or transformer fuse has tripped.	Replace the fuse with one of the same type.
Soft water is very salty	Insufficient washing out during regeneration.	Notify Grünbeck's technical service-/authorised service company.
	Pressure reducer cartridge is corroded.	

10 Shut-down and restart

10.1 Shut-down

In accordance with DIN EN 19636--100, your water softeners are regenerated after 4 days, even if the softening capacity has not yet been exhausted by that time. The stagnation of water is prevented.

► Leave your product connected to electricity and water.

Should you wish to temporarily shut down your water supply due to a longer period of absence, proceed as follows:

1. Close the soft water shut-off valve.
2. Leave the raw water shut-off valve open.
3. Keep the water softener connected to power.
4. If a dosing system is connected – pull the mains plug of the dosing system.

» The product remains in an operating state which is considered to be safe with regard to hygiene and which is admissible according to DIN EN 19636-100.

10.2 Restart

The following measures must be carried out when the system is put back into operation:

Period of inactivity		What to do
≥ 4	[d]	Regeneration of each exchanger
> 4	[d]	Disinfection of the water softener by Grünbeck's customer service (refer to www.gruenbeck.com)

► Put the system into operation (refer to chapter 6).

11 Dismantling and disposal

11.1 Dismantling

The work described herein represents an intervention into your drinking water system.
Have this work performed by qualified specialists only.

1. Close the raw water shut-off valve.
2. Open a water withdrawal point.
3. Wait for a few seconds.

» The pressure in the product and the pipe network is being relieved.

4. Close the water withdrawal point.
5. Disconnect the product from mains.
6. Remove the individual components.

11.2 Disposal

► Comply with the applicable national regulations.

11.2.1 Packaging

► Dispose of the packaging in an environmentally sound manner.

11.2.2 Product

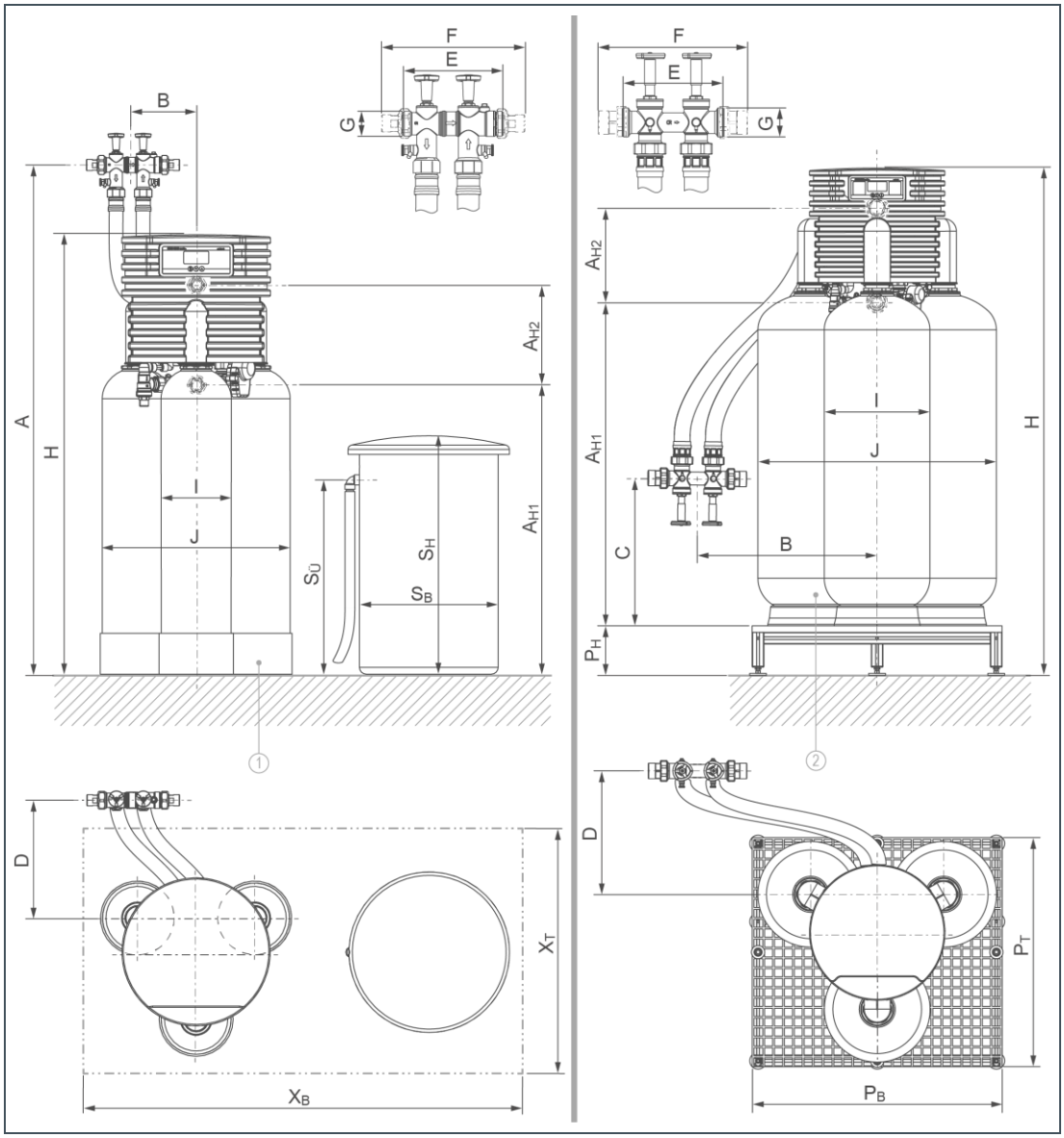
If this symbol (crossed out waste bin) is on the product, this product or the electric and electronic components must not be disposed of in the household waste.

► Dispose of electrical and electronic products or components in an environmentally sound manner.

► If your product contains batteries or rechargeable batteries, dispose of them separately from your product.

For more information on take-back and disposal, go to www.gruenbeck.com.

12 Technical specifications



Item	Designation	Item	Designation
1	Delta-p/Delta-p-I without pedestal	2	Delta-p/Delta-p-I with pedestal

Dimensions and weights		Delta-p 1"	Delta-p 1¼"	Delta-p 1½"	Delta-p 2"
A Connection height (high line)	[mm]	1000 – 2000		1550 – 2250	1700 – 2400
B Lateral offset	[mm]	350±20		600±20	
C Connection height (low line)	[mm]	0 – 1000		350 – 550	500 – 700
D Distance to wall	[mm]	200±20		550±20	
E Installation length without screw connections	[mm]	190		260	
F Installation length with screw connection	[mm]	276		378	
G External thread		1½"		2½"	
H System height (without/with pedestal)	[mm]	1300/1500		1640/1840	1760/1960
I Ø exchanger	[mm]	210	257	369	406
J System width	[mm]	580	630	900	960
AH1 Connection height of control valve (raw water)	[mm]	860		1125	1245
AH2 Distance height control valve (soft water)	[mm]	290		360	
SH Brine tank height (standard/accessories)	[mm]	670/860 (210 l)		860/1250 (750 l)	
SB Ø brine tank (standard/accessories)	[mm]	410/570 (210 l)		570/900 (750 l)	
SÜ Safety overflow height (standard/accessories)	[mm]	575/785 (210 l)		785/1100 (750 l)	
PW x PD x PH pedestal dimensions	[mm]	770 x 770 x 200		960 x 880 x 200	
XW x XD Foundation dimensions min. (recommended)	[mm]	1240 x 920	1400 x 1020	1770 x 1400	1850 x 1450
Operating weight, approx.	[kg]	255 (80 l) 403 (210 l)	322 (80 l) 471 (210 l)	745 (210 l) 1400 (750 l)	862 (210 l) 1520 (750 l)

Connection data			Delta-p 1"	Delta-p 1¼"	Delta-p 1½"	Delta-p 2"
Nominal connection diameter			DN 25 (1" male thread)	DN 32 (1¼" male thread)	DN 40 (1½" male thread)	DN 50 (2" male thread)
Min. drain connection			DN 50			
Rated voltage range		[V]	230			
Rated frequency		[Hz]	50 – 60			
Power supply for Taiwan (see type plate)	Version 1		110 V/60 Hz			
	Version 2		230 V/60 Hz			
Max. rated load in operation		[W]	26		32	
Power input in standby		[W]	19			
Protection/protection class			IP 54/ ⏚			

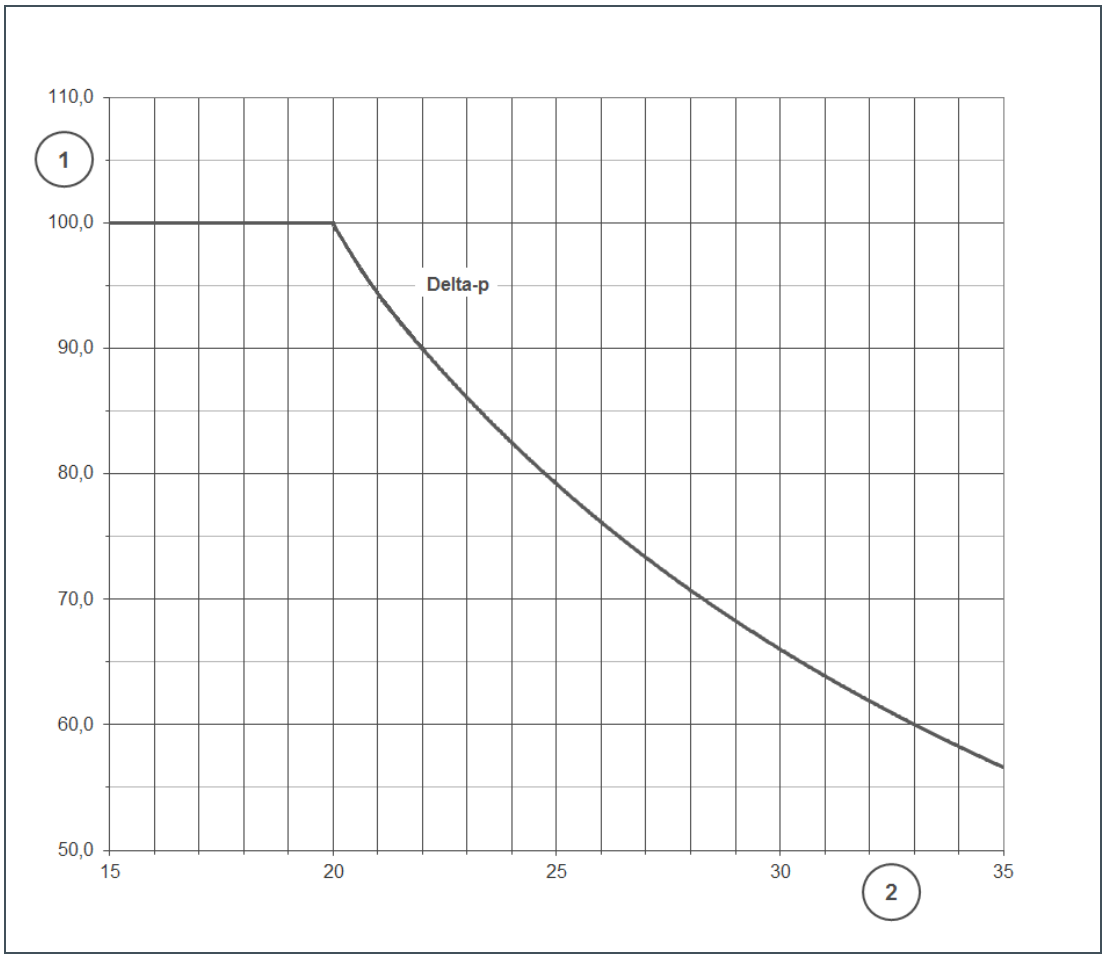
Performance data		Delta-p 1"	Delta-p 1¼"	Delta-p 1½"	Delta-p 2"
Nominal pressure		PN 10			
Min./max. operating pressure	[bar]	2/10			
Nominal flow (0 °dH, 0 °f, 0 mol/m³) acc. to DIN EN 14743 at a pressure loss of 1.0 bar (theoretical value)	[m³/h]	4.2	5.6	11.3	13.4
Nominal flow (raw water hardness 20 °dH (35.6 °f, 3.56 mol/m³), soft water hardness 8 °dH (14.2 °f, 1.42 mol/m³)) **not with Delta-p-I**	[m³/h]	5	8.3	13.3	20
Pressure loss at nominal flow	[bar]	0.5	0.8	0.5	0.8
Nominal flow (restricted by hard raw water from 20 °dH / 35.6 °f / 3.56 mol/m³)	[m³/h]	3	5	8	12
Continuous flow (Maximum value reduced by hard raw water from 20 °dH / 35.6 °f / 3.56 mol/m³)		Dependence on raw water hardness refer to continuous flow curve chapter 12.1			
Minimum volume of water removed for system control (raw water hardness 0 °dH (0 °f, 0 mol/m³)) Systems with a blending valve increase the minimum volume according to the proportion of which is blended.	[l/h]	70		180	

Performance data		Delta-p 1"	Delta-p 1¼"	Delta-p 1½"	Delta-p 2"
Nominal capacity	[m³ x °dH]	48	79	165	229
	[m³ x °f]	85.4	140.6	293.7	407.6
	[mol]	8.2	13.2	27.8	38.6
Capacity per kg of regeneration salt	[mol/kg]	5.7			

Filling volumes and consumption data		Delta-p 1"	Delta-p 1¼"	Delta-p 1½"	Delta-p 2"
Resin volume (tank)	[l]	21	33	75	100
Freeboard (exchanger resin in form of sodium) approx.	[mm]	135	160	195	265
Salt consumption per regeneration, approx.	[kg]	1.5	2.5	5.2	7.2
Regeneration salt supply max. standard brine tank/accessories for brine tank	[kg]	65 (80 l) / 180 (210 l)		180 (210 l) / 630 (750 l)	
Salt consumption					
per m³ and °dH	[kg/(m³ x °dH)]	0.03			
per m³ and °f	[kg/(m³ x °f)]	0.018			
per m³ and mol	[kg/mol]	0.18			
Max. rinsing water volume	[m³/h]	0.6	0.9	1.9	2.0
Total waste water volume per regeneration, approx.	[l]	68	110	235	315
Waste water volume					
per m³ and °dH	[l/(m³ x °dH)]	1.42			
per m³ and °f	[l/(m³ x °f)]	0.79			
per m³ and mol	[l/mol]	7.8			
Operating water volume	[l]	4.2	6.9	14.4	20

General data		Delta-p 1"	Delta-p 1¼"	Delta-p 1½"	Delta-p 2"
Water temperature	[°C]	5 – 30			
Ambient temperature (drinking water)	[°C]	5 – 25			
Ambient temperature (technical application)	[°C]	5 – 40			
Max. humidity of air (non-condensing)	[%]	90			
Iron content in the raw water max.	[mg/l]	0.2			
Manganese content in the raw water max.	[mg/l]	0.05			
DVGW-registration number (not Delta-p-I)		NW-9151BU0049			
SVGW-certificate-number (not Delta-p-I)		1305-6162			
ÜA registration number The Office of the Vienna Provincial Government – City of Vienna		R-15.2.3-21-17496			
Data record in the control unit		CA31	CA32	CA35	CA36
Order no. Delta-p		**185 100**	**185 110**	**185 120**	**185 130**
Order no. Delta-p ready for connection on pedestal		**185 105**	**185 115**	**185 125**	**185 135**
Order no. Delta-p-I		**185 200**	**185 210**	**185 220**	**185 230**
Order no. Delta-p-I ready for connection on pedestal		**185 205**	**185 215**	**185 225**	**185 235**

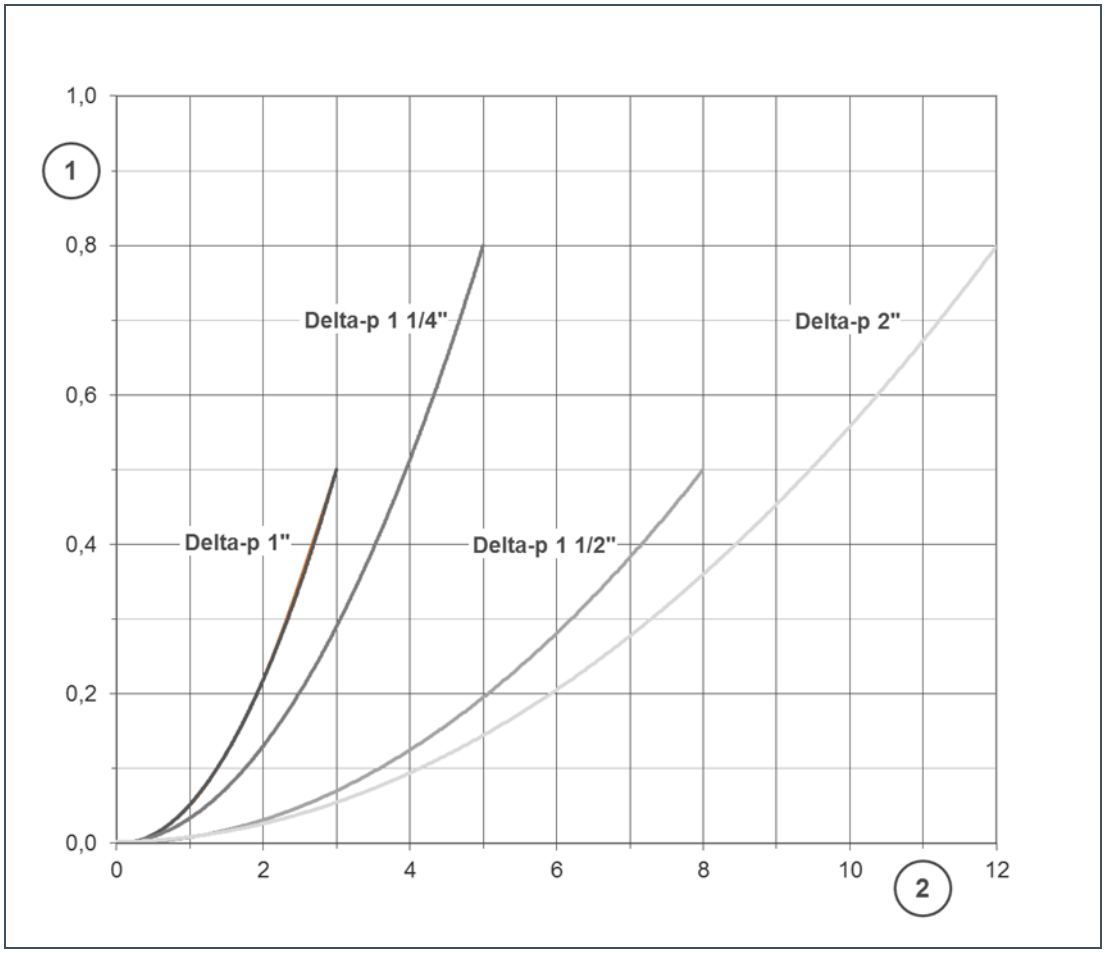
12.1 Continuous flow curve



Item	Designation	Item	Designation
1	max. continuous flow in % of nominal flow rate at 0 °dH, 0 °f, 0 mol/m³	2	Raw water hardness in °dH

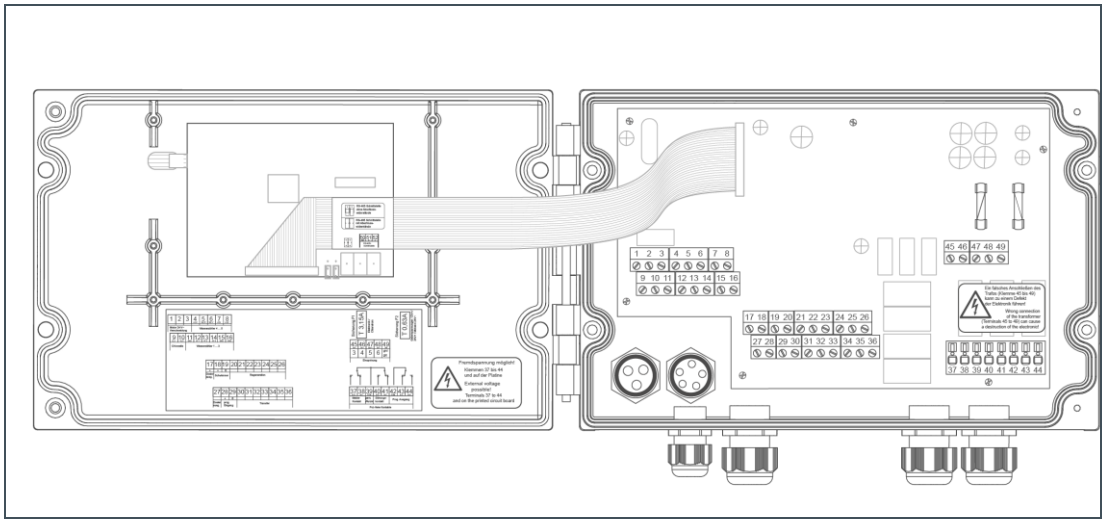
Conversion table											
°dH	14	16	18	20	22	24	26	28	30	32	34
°f	24.9	28.5	32.0	35.6	39.2	42.7	46.3	49.8	53.4	57.0	60.5
mol/m³	2.49	2.85	3.20	3.56	3.92	4.27	4.63	4.98	5.34	5.70	6.05

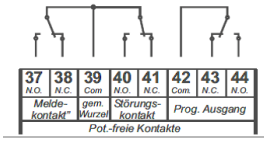
12.2 Pressure loss curves



Item	Designation	Item	Designation
1	Pressure loss in bar at 0 °dH, 0 °f, 0 mol/m³	2	Flow rate in m³/h

12.1 Electrical connection



Terminal	Function	Wire colour/wire number	Comments
Supply	Power supply from transformer on rear of housing.		Transformer fuse primary 0.25 A slow-blow.
45/46	9 V~	3/4	Power supply control logic/chlorine cell fuse F1 (3.15 A slow blow)
47/48	24 V~	5/6	Encoder voltages 12 V= / 24 V= / 24 V~ fuse F2 (0.63 A slow-blow)
49	PE	green-yellow	Earth wire
	Voltage-free contacts		Contact rating max. 230 V~ / 1 A.
37/38/39	Signal contact: Normally open contact opens when a signal occurs.		Maintenance interval, pre-alarm lack of salt- (Er A), connection error to the optional Profibus-module (Er F).
39/40/41	Fault signal contact: Normally open contact opens when a fault occurs.		
42/43/44	Relay function programmable via installer level 113 (refer to chapter 4.10.1)		
Regeneration	Regeneration valve (R)		
20	Micro-switch	Green	+24 V= encoder voltage
21		Brown	Switch S3 (inside)
22		White	Switch S4 (centre)
23		Yellow	Switch S5 (outside)
24	Motor 24 V~	Grey	Motor wires black
25		Blue	Motor wires blue
26		Pink	Motor wires red
Transfer	Transfer valve (T)		Terminal 30 is not assigned.
31	Micro-switch	Green	+24 V= encoder voltage
32		White	Switch S1 (top)
33		Yellow	Switch S2 (bottom)
34	Motor 24 V~	Blue	Motor wires blue
35		Grey	Motor wires black
36		Pink	Motor wires red
Chlorine cell	Disinfection unit		For systems in sizes 1½" and 2", 2 chlorine cells are connected in parallel.

Terminal	Function	Wire colour/wire number	Comments
9		Blue	
10		Brown	
Water meter 1 … 3 **Water meter 4 … 5**	Turbine water meter		Water meter 5 is not provided in industrial systems Delta-p-I.
4/7/8	Encoder voltage 12 V=	White	
11/15/16	Earth	Brown	
12	Water meter (1)	Green	Exchanger tank 1
13	Water meter (2)	Green	Exchanger tank 2
14	Water meter (3)	Green	Exchanger tank 3
5	Water meter (4)	Green	Regeneration valve
6	Water meter (5)	Green	Blending valve
Motor 24 V~ blending	Motor 24 V~ blending valve (V)		Blending valve is not provided in industrial systems Delta-p-I.
1		Grey	Motor wires blue
2		Black	Motor wires black
3		Brown	Motor wires red
Float switch	Pre-alarm lack of salt accessories (order no. 185 335)		Infra-red light sensor detects the filling level of salt in the brine tank.
18	Encoder voltage +24 V=	Brown	If the orange LED on the light sensor lights up: Object present and terminal 19 has +24 V. Settings code 113, parameter 3 = L (refer to chapter 4.10.1)
19	Input	Black	
16	Earth	Blue	
Programmable input	Input function programmable via installer level code 113 (refer to chapter 4.10.1).		
28	Encoder voltage +24 V=		
29	Input		
Dosing output	Pulse output for optional dosing system GENODOS DME Delta-p		Index L (devider 31 preset as of software ≥ V3.05)
17	Pulse signal	White	With a 2-wire connection cable to the dosing device.
		Green	With a 4-wire connection cable to the EXADOS device. The white and the yellow wire remain unused.
27	Earth	Brown	

13 Other information

13.1 Sodium content in the water

When softening water by 1 °dH (0.18 mmol/l), the sodium content increases by about 8.2 mg/l.

The German Drinking Water Ordinance specifies that the sodium content of drinking water must not exceed 200 mg/l.

Select a soft water hardness with a sodium content less than 200 mg/l.

The local water suppliers will inform you about the sodium content of your raw water.

Sample calculation:

Raw water hardness: 28 °dH (50 °f)
Sodium content in the raw water: 10.5 mg/l

Admissible increase of the sodium content by softening:

- 200 mg/l – 10.5 mg/l = 189.5 mg/l
- 189.5 : 8.2 = 23 °dH (41 °f)

The raw water hardness can be reduced from 28 °dH (50 °f) to 5 °dH (9 °f).

13.2 Hardness ranges

The hardness ranges were classified according to the German Act on Detergents and Cleaning Agents.

Hardness range	°dH	°f
Soft	< 8.4	< 15
Medium	8.4 - 14	15 – 25
Hard	> 14	> 25

Recommendation soft water hardness

Soft water hardness	Remark
3 °dH 5.3 °f 0.53 °mmol/l	Minimum value as per DIN 12502 Corrosion Protection.
4 – 6 °dH 7.1 – 10.7 °f 0.71 – 1.07 mmol/l	Ideal soft water – highest comfort.

14 Operation log

Water softener Delta-p _____

Serial no.: _____

Start-up log

Customer					
Name:					
Address:					
Installation/accessories					
Drinking water filter (make/type):					
Drain connection acc. to DIN EN 1717	☐ yes	☐ no			
Floor drain available	☐ yes	☐ no			
Material of the line downstream of the system					
Safety device	☐ yes	☐ no			
Regeneration water lifting system	☐ yes	☐ no			
Make:					
Dosing	☐ yes	☐ no			
Active agent:					
Operating values					
Water pressure	[bar]				
Residential water meter reading	[m³]				
Hardness unit	☐ °dH	☐ °f	☐ mol/m³	☐ °e	☐ °ppm
Raw water hardness (measured)					
Raw water hardness (set)					
Soft water hardness (set)					
Commissioning activities					OK
Hose connections checked for leaks and damage					☐
Soft water meter checked for pulse output					☐
Regeneration water meter checked for pulse output					☐
Start-up					
Service technician:					
Company:					
Work time certificate (no.):					
Date/signature:					

1st maintenance

Operating values	
Raw water hardness measured/set	/
Soft water hardness measured/set	/
Soft water hardness 0 °dH – inspection	☐ OK
Operating pressure	[bar]
Residential water meter reading	[m³]
Soft water volume meter	[m³]
Regeneration counter	

Read out error memory			
	Error	**Date**	**Time**
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			

Maintenance work	OK
Hose connections checked for leaks and damage	☐
Soft water meter checked for pulse output	☐
Regeneration water meter checked for pulse output	☐
Cables checked for damage and firm seating	☐
Controller settings checked	☐
Regeneration triggering checked	☐
Injector and injector sieve cleaned/checked	☐
Control valve checked for tightness	☐
Motor of the transfer/regeneration valve checked for function	☐
Functional check chlorine cell (read off mA from code after 5 minutes salting)	☐
Brine tank and brine valve cleaned	☐
Operation and setting of brine valve checked	☐
Filling and suction hose to the brine valve checked for leaks during operation	☐
Flushing water hose checked for leaks in operation	☐
Safety fitting tested against backflow	☐
System data printout made	☐

Remarks

Performed by
Company:
Customer service technician:

2nd maintenance

Operating values	
Raw water hardness measured/set	/
Soft water hardness measured/set	/
Soft water hardness 0 °dH – inspection	☐ OK
Operating pressure	[bar]
Residential water meter reading	[m³]
Soft water volume meter	[m³]
Regeneration counter	

Read out error memory			
	Error	**Date**	**Time**
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			

Maintenance work	OK
Hose connections checked for leaks and damage	☐
Soft water meter checked for pulse output	☐
Regeneration water meter checked for pulse output	☐
Cables checked for damage and firm seating	☐
Controller settings checked	☐
Regeneration triggering checked	☐
Injector and injector sieve cleaned/checked	☐
Control valve checked for tightness	☐
Motor of the transfer/regeneration valve checked for function	☐
Functional check chlorine cell (read off mA from code after 5 minutes salting)	☐
Brine tank and brine valve cleaned	☐
Operation and setting of brine valve checked	☐
Filling and suction hose to the brine valve checked for leaks during operation	☐
Flushing water hose checked for leaks in operation	☐
Safety fitting tested against backflow	☐
System data printout made	☐

Remarks

Performed by
Company:
Customer service technician:

3rd maintenance

Operating values	
Raw water hardness measured/set	/
Soft water hardness measured/set	/
Soft water hardness 0 °dH – inspection	☐ OK
Operating pressure	[bar]
Residential water meter reading	[m³]
Soft water volume meter	[m³]
Regeneration counter	

Read out error memory			
	Error	**Date**	**Time**
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			

Maintenance work	OK
Hose connections checked for leaks and damage	☐
Soft water meter checked for pulse output	☐
Regeneration water meter checked for pulse output	☐
Cables checked for damage and firm seating	☐
Controller settings checked	☐
Regeneration triggering checked	☐
Injector and injector sieve cleaned/checked	☐
Control valve checked for tightness	☐
Motor of the transfer/regeneration valve checked for function	☐
Functional check chlorine cell (read off mA from code after 5 minutes salting)	☐
Brine tank and brine valve cleaned	☐
Operation and setting of brine valve checked	☐
Filling and suction hose to the brine valve checked for leaks during operation	☐
Flushing water hose checked for leaks in operation	☐
Safety fitting tested against backflow	☐
System data printout made	☐

Remarks

Performed by
Company:
Customer service technician:

4th maintenance

Operating values	
Raw water hardness measured/set	/
Soft water hardness measured/set	/
Soft water hardness 0 °dH – inspection	☐ OK
Operating pressure	[bar]
Residential water meter reading	[m³]
Soft water volume meter	[m³]
Regeneration counter	

Read out error memory			
	Error	**Date**	**Time**
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			

Maintenance work	OK
Hose connections checked for leaks and damage	☐
Soft water meter checked for pulse output	☐
Regeneration water meter checked for pulse output	☐
Cables checked for damage and firm seating	☐
Controller settings checked	☐
Regeneration triggering checked	☐
Injector and injector sieve cleaned/checked	☐
Control valve checked for tightness	☐
Motor of the transfer/regeneration valve checked for function	☐
Functional check chlorine cell (read off mA from code after 5 minutes salting)	☐
Brine tank and brine valve cleaned	☐
Operation and setting of brine valve checked	☐
Filling and suction hose to the brine valve checked for leaks during operation	☐
Flushing water hose checked for leaks in operation	☐
Safety fitting tested against backflow	☐
System data printout made	☐

Remarks

Performed by
Company:
Customer service technician:

5th maintenance

Operating values	
Raw water hardness measured/set	/
Soft water hardness measured/set	/
Soft water hardness 0 °dH – inspection	☐ OK
Operating pressure	[bar]
Residential water meter reading	[m³]
Soft water volume meter	[m³]
Regeneration counter	

Read out error memory			
	Error	**Date**	**Time**
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			

Maintenance work	OK
Hose connections checked for leaks and damage	☐
Soft water meter checked for pulse output	☐
Regeneration water meter checked for pulse output	☐
Cables checked for damage and firm seating	☐
Controller settings checked	☐
Regeneration triggering checked	☐
Injector and injector sieve cleaned/checked	☐
Control valve checked for tightness	☐
Motor of the transfer/regeneration valve checked for function	☐
Functional check chlorine cell (read off mA from code after 5 minutes salting)	☐
Brine tank and brine valve cleaned	☐
Operation and setting of brine valve checked	☐
Filling and suction hose to the brine valve checked for leaks during operation	☐
Flushing water hose checked for leaks in operation	☐
Safety fitting tested against backflow	☐
System data printout made	☐

Remarks

Performed by
Company:
Customer service technician:

EU Declaration of Conformity

In accordance with the EU Low Voltage Directive 2014/35/EU, Appendix IV

CE

We hereby declare that the system designated below meets the safety and health requirements of the applicable European guidelines in terms of its design, construction and manufacture.

This certificate will become invalid if the system is modified in a way not approved by us.

Water softener Delta-p/Delta-p-I

Serial-no.: refer to type plate

The aforementioned system also complies with the following directives and provisions:

- EMC (2014/30/EU)
- Directive on the Restriction of Hazardous Substances RoHS (2011/65/EC)

The following harmonised standards have been applied:

- DIN EN 61000-6-2:2006-03
- DIN EN 61000-6-3:2011-09

The following national standards and regulations have been applied:

- DIN 19636-100:2008-02
- DIN EN 14743:2007-09

Responsible for documentation: Dipl.-Ing. (FH) Markus Pöpperl

Manufacturer

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Hoechstaedt; Germany, 13.11.2019

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