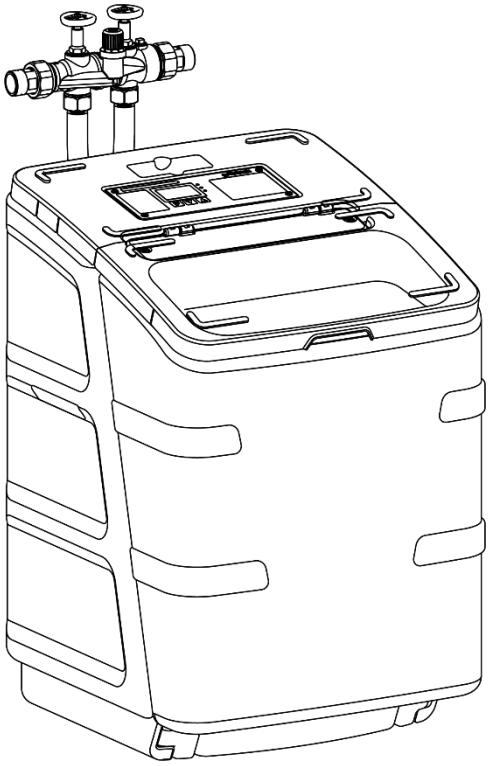
grünbeck

Operation Manual
Water Softener
Weichwassermeister
GSX 10, GSX 10-I



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CE

EU Declaration of Conformity

This is to certify that the system designated below meets the safety and health requirements of the applicable European guidelines in terms of its design, construction and execution.

If the system is modified in a way not approved by us, this certificate is void.

Manufacturer:	Grünbeck Wasseraufbereitung GmbH Josef-Grünbeck-Str. 1 89420 Hoechstaedt/Germany
Responsible for documentation:	Markus Pöpperl
System designation:	Weichwassermeister
System type:	GSX 10, GSX 10-I
Serial number:	Refer to type designation plate
Applicable EC guidelines:	Low Voltage (2014/35/EU) EMC (2014/30/EU) RoHS (2011/65/EU)
Applied harmonized standards, in particular:	DIN EN 61000-6-2:2006-03 DIN EN 61000-6-3:2011-09
Applied national standards and technical specifications, in particular:	DIN 19636-100:2008-02 DIN EN 14743:2007-09
Place, date and signature:	Hoechstaedt, 04.05.2020 i. V. Markus Pöpperl Dipl. Ing. (FH)
Function of signatory:	Head of Technical Product Design

A General

1 | Preface

Thank you for opting for a Grünbeck product. Backed by decades of experience in the area of water treatment, we provide solutions for all processes.

Drinking water is classified as food and requires particular care. Therefore, always ensure the required hygiene in operating and maintaining systems for drinking water treatment. This also applies to the treatment of water for industrial use if repercussions for the drinking water cannot completely be excluded.

All Grünbeck systems and devices are made of high-quality materials. This ensures reliable operation over many years, provided you treat the systems with the required care. This operation manual assists you with important information. Please read the operation manual thoroughly before installing, operating or maintaining the system.

Customer satisfaction is our prime objective and providing customers with qualified advice is crucial. If you have any questions concerning this system, possible extensions or general water and waste water treatment, our customer service staff as well as the experts at our headquarters in Hoechstaedt, are available to help you.

Advice and assistance

For advice and assistance please contact your local representative (refer to www.gruenbeck.com) In case of emergency, please get in touch with our service hotline at +49 9074 41333. We can connect you with the appropriate expert more quickly if you provide the required system data. In order to have this information handy at all times, please keep the precise equipment data to hand (refer to type plate in chapter C-1).

2 | How to use the operation manual

This operation manual is designed for the operators of our systems. It is divided into several chapters which are listed in alphabetic order in the table of contents on page 2. In order to find the information you are looking for please refer to page 2 for the corresponding chapter.

The header and the page numbers also indicate the corresponding chapter and therefore will help you to find your way within the operation manual.

3 | General safety information

3.1 Symbols and notes

Important notes in this operation manual are characterised by symbols. Please pay particular attention to these notes in order to ensure a danger-free, safe and productive system operation..

Danger! Failure to adhere to these notes will cause serious or life-threatening injury, extreme damage to property or inadmissible contamination of drinking water.

Warning! Failure to adhere to these notes may cause injury, damage to property or contamination of the drinking water.

Attention! Failure to adhere to these notes may result in damage to the system or other objects.

Note: This symbol characterises notes and tips to make your work easier.

Tasks with this symbol may only be performed by Grünbeck's technical service/authorised service or by persons expressly authorised by Grünbeck.

Tasks with this symbol may only be performed by personnel instructed in electrical engineering according to the VDE guidelines or according to the guidelines of a similar local institution.

Tasks with this symbol may only be performed by the local water works or an approved installation company.

3.2 Operating personnel

Only persons who have read and understood this operation manual are permitted to work with the system. The safety guidelines must be strictly adhered to.

3.3 Designated application

The system may only be used for the purpose outlined in the product description (chapter C). The present operation manual as well as the guidelines stipulated therein and the applicable local guidelines concerning the drinking water protection, accident prevention and occupational safety must be adhered to. In addition, appropriate application implies that the system may only be operated when it is in proper working order. Any malfunctions must be repaired at once.

3.4 Protection from water damage

Warning! In order to properly protect the installation site from water damage:

a) a sufficient floor drain system must be available or

b) a safety device (refer to chapter C – Accessories) must be installed.

Warning! Floor drains leading towards a lifting system do not work in case of a power failure.

3.5 Indication of specific hazards

Danger due to electricity! → Do not touch electrical parts with wet hands! Disconnect the system from mains before starting work on electrical parts of the system. Have qualified experts replace damaged cables immediately.

Danger due to mechanical energy! System parts may be subject to overpressure. Danger of injury due to escaping water and unexpected movement of system parts. → Check pressure pipes regularly. Depressurise the system before starting repair or maintenance work on the system.

Hazardous to health due to contaminated drinking water! → The system may only be installed by a qualified company. The operation manual must be strictly adhered to! Ensure that there is sufficient flow. The pertinent guidelines must be followed for starting-up after long periods of standstill. Inspections and maintenance must be performed at the intervals specified!

Note: By concluding a maintenance contract, you ensure that all of the required tasks are performed on time. You may perform the interim inspections yourself.

4 | Shipping and storage

Attention! The system may be damaged by frost or high temperatures. In order to avoid damage of this kind:

Protect from frost during shipping and storage! Do not install or store system next to objects which radiate a lot of heat.

5 | Disposal

Strictly observe the applicable national laws and regulations.

5.1 Packaging

Dispose of the packaging in an environmentally friendly manner.

5.2 Product

If this symbol (crossed out waste bin) is on the product, this product is subject to the European Directive 2012/19/EU. This means that this product or the electrical and electronic components must not be disposed with household waste.
Dispose of electrical and electronic products or components in an environmentally friendly manner.

For information on collection points for your product, contact your municipality, the public waste management authority, an authorised body for the disposal of electrical and electronic products or your waste disposal service.

B Basic information

1 | Laws, directives, standards

In the interest of good health, rules cannot be ignored when it comes to the processing of drinking water (raw water). This operation manual takes the applicable German guidelines into account and provides all the information you need to safely operate your water treatment system.

Among other things, the regulations stipulate that

- only approved companies are permitted to make major modifications to water treatment facilities,
- and that at regular intervals tests, inspections and maintenance are to be performed on the devices installed.

2 | Water, scaling, softening

The waterworks provide us with pure drinking water (raw water) which is suitable for human consumption. However, in case of the more frequent use of the water in washing machines, heating systems, water heaters, industrial systems, etc., problems might occur if “hard” water is present.

Hard water is generated if water containing carbon dioxide* flows through layers of calcium. It dissolves the calcium until the so-called calcium/carbon dioxide equilibrium has been reached.

If this equilibrium is destroyed (e.g. by heating $\rightarrow CO_2$ escapes) more calcium ($CaCO_3$) is precipitated (scale).

The total hardness of the water is the sum of the concentrations of calcium ions and magnesium ions.

Note: In nature, calcium and magnesium ions exist side by side, e. g. in the mineral dolomite.

Hardness ranges according to German Detergent and Cleaning Agents Act (WMRG):

Hardness range	**°dH**	**°f**	**mmol/l = mol/m³**
1 (soft)	< 8.4	< 15.0	< 1.50
2 (medium)	8.4 – 14.0	15.0 – 25.0	1.50 – 2.50
3 (hard)	>14.0	> 25.0	>2.50

Starting from hardness range “medium”, it is advisable to soften the water for usage. Additional measures may be necessary depending on the original quality of the water and its intended use.

* CO_2 from the air dissolves in water, causing a low concentration of carbon dioxide.

3 | Ion exchange

Fig. B-1: Initial state

The exchange of calcium and magnesium ions for sodium ions causes the water to become soft.

Principle

The hard raw water flows through an exchanger tank. This tank is filled with a resin to which sodium ions are bonded at certain positions (refer to fig. B-1).

Since these bonding positions at the resin prefer calcium and magnesium ions to sodium ions, such ions are retained while the resin discharges sodium ions into the water (exchange reaction). This way, all substances causing hardness remain in the exchanger tank. Soft water, loaded with sodium ions, leaves the exchanger tank (fig. B-2). This process continues until the sodium ions are used up.

Fig. B-2: Operation

The exchange reaction can be reversed if a large amount of sodium ions (salt solution = brine) is added (fig. B-3). By their sheer number, they replace the calcium and magnesium ions at the docking positions of the resin.

This process restores the initial state. The ion exchanger is regenerated and is again ready for softening.

Drinking water (raw water)

For reasons of corrosion protection, a water hardness of at least 3 °dH (5.3 °f, 0.53 mmol/l) is recommendable. According to the German Drinking Water Ordinance, the limit value for sodium ions (200 mg/l) must not be exceeded. This is achieved by adding untreated drinking water (raw water), a process which is also called “blending”.

Note: Many popular mineral waters contain significantly more sodium ions. Check for yourself by looking at the analysis results on the labels.

★ sodium ions ● calcium ions ▲ magnesium ions

Fig. B-3: Regeneration

C Product description

1 | Type designation plate

We can process your inquiries and orders more quickly if you specify the data shown on the type designation plate (Fig. C-2, item 15) of your system when contacting Grünbeck. Therefore, please fill in the table below, in order to have the required data handy at all times.

Water softener Weichwassermeister

GSX: n n n **Serial number:** n n n n n n

Order number: n n n n n n

Fig. C-1: Type designation plate of Weichwassermeister GSX

2 | System components

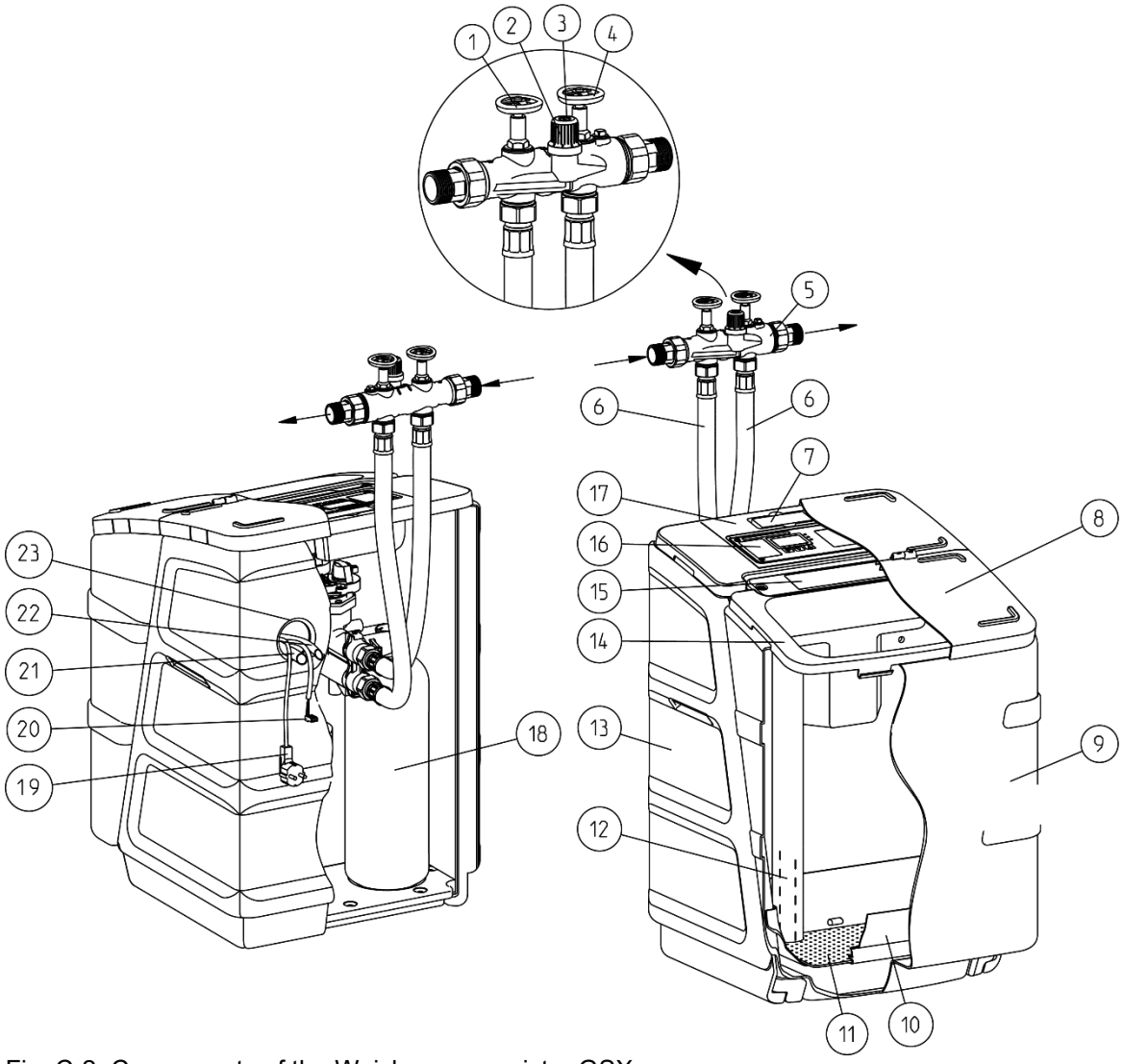


Fig. C-2: Components of the Weichwassermeister GSX

①	Shut-off valve for raw water	⑨	Brine tank	⑰	Electronics housing
②	Blending valve	⑩	Funnel of brine tank	⑱	Exchanger
③	Locking screw of blending valve	⑪	Sieve bottom	⑲	Power cable
④	Shut-off valve for soft water	⑫	Protective pipe with interior brine valve	⑳	EXAcount cable (only required for accessory „dosing computer“)
⑤	Connection block	⑬	Housing of exchanger bottles	㉑	Overflow hose of brine tank (d = 16 mm)
⑥	Connection hose	⑭	Chute cover	㉒	Rinsing water hose (d = 12 mm)
⑦	Water test kit „total hardness“ and operating card	⑮	Type designation plate	㉓	Housing orifice
⑧	Transparent cover	⑯	Control unit		

3 | Technical specifications

The water softener Weichwassermeister GSX is a twin system for a continuous soft water supply. It is equipped with a central control valve for both exchangers and features volume control. The regeneration is released when the pre-set water volume in an exchanger tank has been softened. If the pre-set amount of water between two regenerations is not consumed within 4 days after the last regeneration, the system starts a forced regeneration (as per DIN 19636-100). Raw water is used to regenerate the system.

All system data is shown in table C-1. The information applies to the standard version of the system. Different data for special versions will be provided separately, if applicable.

Warning! Extended periods of standstill may cause bacterial growth in the drinking water. The automatic regeneration counteracts this effect. Therefore, do not disconnect the system from water and power supply when you are absent for longer periods of time.

Attention! Electrically operated valves. In case of power failure during regeneration, water may flow into the drain or brine tank. Check the system and shut off the water supply (if necessary) in case of power failures.

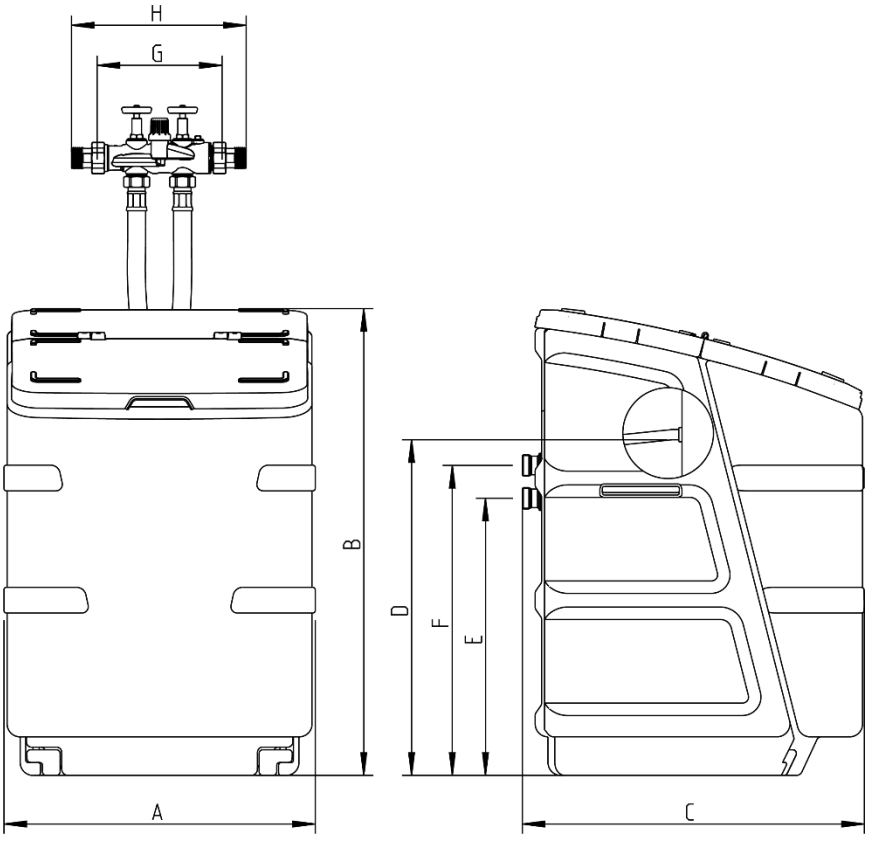


Fig. C-3: Dimensional drawing of Weichwassermeister GSX

Table-C-1 Technical specifications			**Weichwassermeister GSX**	
			10	**10-I**
Connection data				
Nominal connection diameter			DN 25 (1“ male thread)	
Min. drain connection			DN 50	
Power supply		[V]/[Hz]	85-265/50-60	
Connected load	Operation = max. Standby	[VA] [W]	17 0.95	
Protection/Protection class			IP 54/⏚	
Performance data				
Nominal pressure			PN 10	
Operating pressure min/max. (recommended)		[bar]	2.0/8.0 (4.0)	
Nominal flow* (0 °dH, 0 °f, 0 mmol/l)		[m³/h]	1.4	0.75
Nominal flow of soft water with blending (raw water hardness 20°dH (35.6 °f, 3.56 mmol/l), soft water hardness 8°dH (14.2 °f, 1.42 mmol/l))		[m³/h]	2.3	-
Pressure loss		[bar]	0.8	0.2
Nominal flow acc. to DIN EN 14743 resp. K_V value (at a pressure loss of 1.0 bar, theoretical value for comparison purposes only)		[m³/h]	1.7	-
Nominal capacity		[mol]	1.8	
Capacity per kg of regeneration salt		[mol/kg]	5.1	2.6
Dimensions and weights[1)]				
A Width of water softener		[mm]	485	
B Height of water softener		[mm]	730	
C Depth of water softener		[mm]	535	
D Height of safety overflow of brine tank		[mm]	530	
E Connection height of control valve (soft water)		[mm]	440	
F Connection height of control valve (raw water)		[mm]	490	
G Installation length without screw connections		[mm]	190	
H Installation length with screw connections		[mm]	272	
Operating weight, approx.		[kg]	102	108
Shipping weight, approx.		[kg]	42	48
Filling volumes and consumption data				
Resin volume (per exchanger tank)		[l]	6	
Salt consumption per regeneration, approx.		[kg]	0.350	0.700
Max. regeneration salt supply		[kg]	65	
Salt consumption		[kg / m³ x °dH]	0.035 (0.020[4)] / 0.20[5)])	0.07 (0.039[4)] / 0.39[5)])
Max. rinsing water volume		[m³/h]	0.44	
Total waste water volume per reg., approx.		[l]	25	30
Waste water volume		[l/m³ x °dH]	2.5 (1.40[6)] / 14.0[7)])	3.0 (1.69[6)] / 16.9[7)])
General				
Field of application: home for … families (up to … persons)[2)]			3-5 (12)	-
Max. water/ambient temperature[3)]		[°C]	30/40	
DVGW registration number			NW-9151CM0060	-
Order no.			**187 520**	**187 530**

***** The max. continuous flow decreases in case of high raw water hardness, refer to fig. 4 “Continuous flow”.
1) All data is approximate.
2) Installation recommendations for Switzerland: GSX 10 for 2 – 3 family homes
3) Refer to installation prerequisites!
4) [kg/m³ x °f]
5) [kg/mol]
6) [l/m³ x °f]
7) [l/mol]

4 | Designated application

Water softeners of the series Weichwassermeister GSX are designed for the softening and partial softening of cold drinking and industrial water. As twin systems, they are suitable for a continuous soft water supply.

The water to be softened must be free of iron and manganese (less than 0.2 mg iron and 0.05 mg manganese per litre). Based on the VDI 6023: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 exclusively industrial applications, the ambient temperature must not exceed 40 °C. For the softening of drinking water, the stipulations of the German Drinking Water Ordinance are compulsory (max. sodium concentration 200 mg/l (Refer to chapter E, paragraph 3).

The water softener is adapted to the soft water requirements to be expected at the installation site. It is not suitable for considerably differing performances. The nominal flow must not be exceeded.

In case of critical applications (e. g. boiler feed water), we recommend installing and automatic water analysis system (e. g. GENO-softwatch Komfort, order no. 172 500).

The system may only be operated if all components are properly installed. Safety devices must NEVER be removed, bridged or tampered with.

Appropriate application of the system also implies that the information contained in this operation manual and all safety guidelines applying at the installation site be observed. Finally, the system must be maintained and inspected at the specified intervals.

5 | Application limits

Acc. to DIN 1988-200, the following application limits do apply:

Field of application	Maximum nominal capacity acc. to DIN 1988-200	Water softener
Three to five family homes (up to 12 persons)	2.4 mol (13.4 °dH x m³, 23.9 °f x m³)	GSX 10
Six to eight family homes (up to 20 persons)	3.6 mol (20.2 °dH x m³, 40.0 °f x m³)	GSX 10

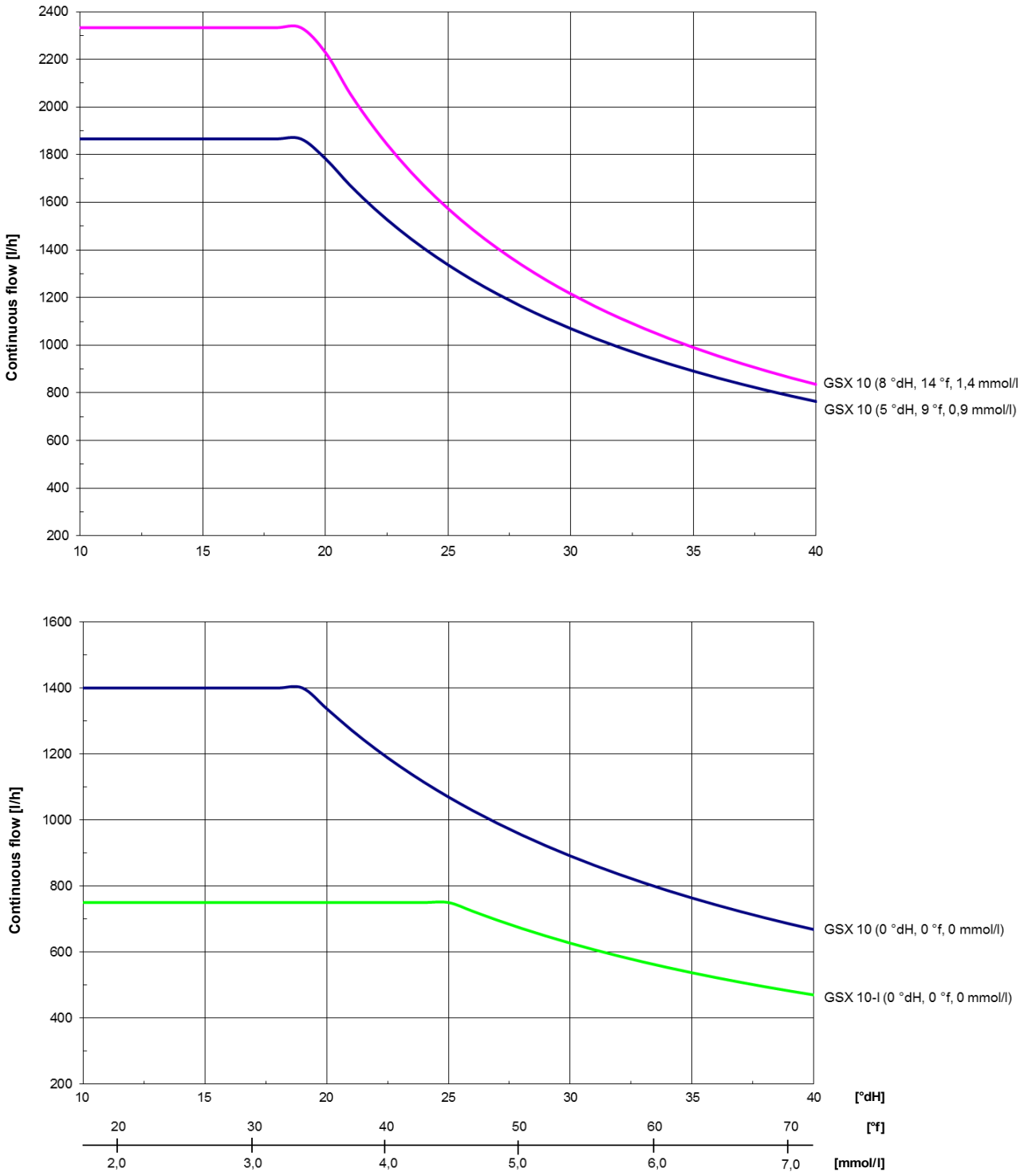


Fig. C-4: Continuous flow of Weichwassermeister GSX

Note: For the production of fully demineralised water (e. g. pre-treatment for reverse osmosis systems), the Weichwassermeister GSX 10-I has to be used. A nominal flow which is defined at 750 l/h in combination with a higher salt requirement for the regeneration guarantee a hardness of < 0.1 °dH (0.2 °f, 0.02 mmol/l) throughout the entire filter process.

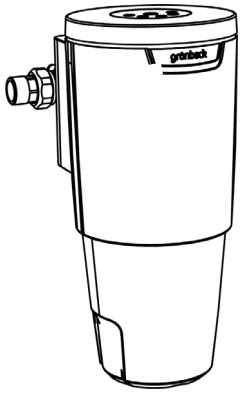
6 | Scope of supply

6.1 Standard equipment

- Water softener, completely mounted and ready for connection for DN 25 (1“).
- Operation manual.
- Short operation manual.
- Water test kit for total hardness.

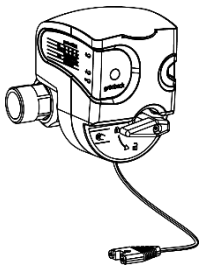
6.2 Optional accessories

Note: It is possible to retrofit existing water softeners with optional components. Please contact your local Grünbeck representative or Grünbeck’s headquarters for details.



Dosing system exaliQ:KC6 **117 400**
Dosieranlage exaliQ:SC6 **117 405**

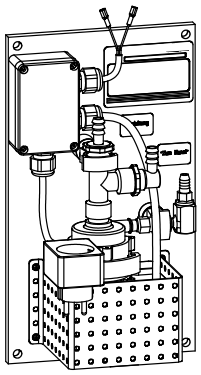
Electronically controlled dosing technology incl. contact water meter for corrosion protection or to stabilise the total hardness.



Safety device protectliQ:A25 126 405

Product for protection against water damage in one and two-family homes.

- For additional versions, please inquire -



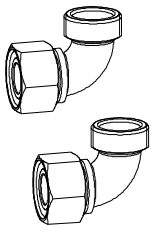
Regeneration water delivery pump VGX/GSX **188 800**
Salt water resistant delivery pump to discharge the regeneration waste water in case of drain heights starting from 1.8 m (from the ground). Electrical activation by means of the control unit.

Drain connection DN 50 188 875
For professional installation according to DIN EN 1717.

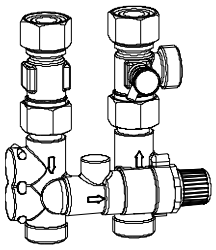
M bus measuring transducer D-DAM, complete 115 850
To transfer the flow and counter reading as well as statistical values of a turbine water meter by means of M bus (IEC870).
Furthermore, flow-controlled pulse output, analogue output and relay contact to Grünbeck control unit.
Dimensions: 160 x 240 x 160 mm.

Extension kit for connection hose 187 860

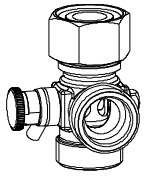
Extension kit for connection hose to extend the length of the hose to 1.6 m, consisting of:
2 coupling pieces
2 flexible connection hoses



Connection angle 90°- 1“ (1 pair) 187 865
In case of cramped installation situations, the connection hoses can be laid much closer alongside water softener.



Supplementary blending valve 187 870
To generate second soft water hardness, can directly be connected to the connection block.



Supplementary soft water outlet 187 875
Installation in soft water outlet between water softener and connection block, incl. sampling valve and non-return valve.

6.3 Consumables

In order to ensure the reliable operation of the system, only use genuine consumables.

- Regeneration salt (25 kg) as per EN 973 type A. 127 001
- Water test kit „total hardness“ °dH and °f 1 pc 170 187
  10 pcs 170 100

6.4 Spare parts

You may order spare parts and consumables from your local Grünbeck representative (refer to www.gruenbeck.com).

6.5 Spare parts

Seals and control disks are subject to a certain wear and tear. Wearing parts are indicated below.

Note: Although these parts are considered to be wearing parts, we grant a limited warranty period of 6 months.

a) Seals, injector, actuators

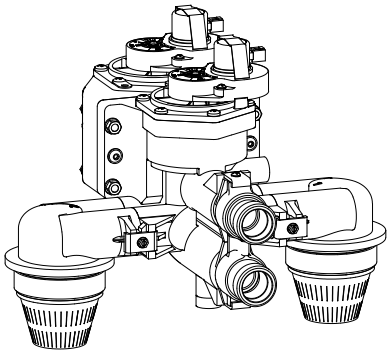


Fig. C-5: Control valve

b) Carbon electrode of disinfection unit

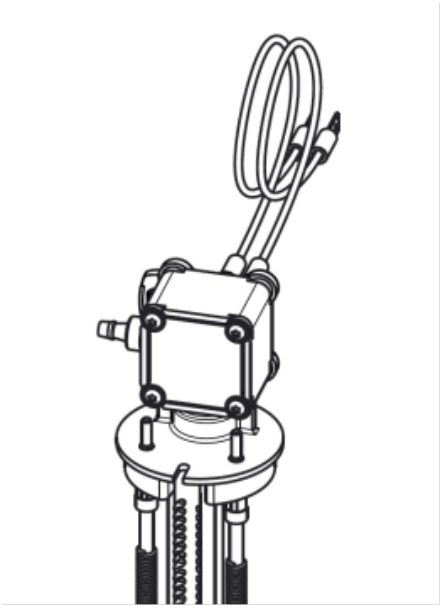
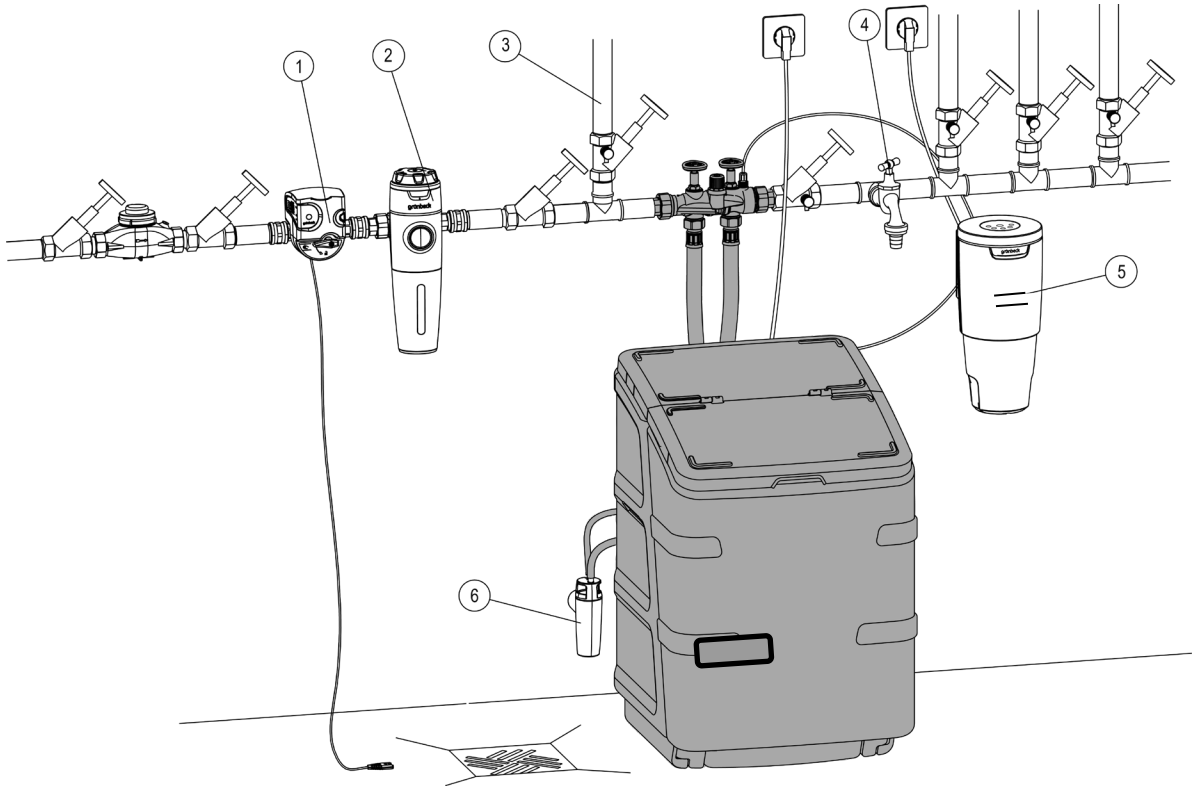


Fig. C-6: Brine valve

D Installation

1 | General installation instructions

The installation site must provide adequate space. A foundation of a sufficient size and load-carrying capacity must be provided. The required connections must be provided prior to the installation of the system. Please refer to table C-1 for dimensions and connection data.



①	Safety device protectliQ	④	Water withdrawal point
②	Drinking Water filter (e.g. pureliQ incl. pressure reducer)	⑤	Dosing system exaliQ
③	Garden water pipe	⑥	Drain connection DN 50 according to DIN EN 1717

Fig. D-1: Installation example for Weichwassermeister GSX

Note: When installing water softeners with optional accessories (refer to chapter C, 6.2), the operation manuals enclosed with these accessories must be observed as well.

1.1 Water installation

Certain binding rules must definitely be observed when installing the water softener Weichwassermeister GSX. Additional recommendations facilitate the work with the water softener. The installation instructions described herein are summarised in Fig. D-1.

Binding rules

The installation of a water softener represents a major interference with the drinking water system. Only authorised experts may install such systems.

- Observe the local installation guidelines and the general guidelines.
- Downstream of the Weichwassermeister GSX, a water tap has to be provided close by others on site for the purpose of checking the soft water quality.
- The water softener must be preceded by a drinking water filter (e. g. pureliQ KD incl. pressure reducer) and if necessary, by a pressure reducer. Recommended pressure: 4 bar.
- If the process (e. g. reverse osmosis system) established downstream requires such, a system separator has to be installed.
- Use corrosion-resistant material for the soft water pipe (e. g. stainless steel, plastic, PE-X). In case of galvanised steel or copper, we recommend dosing a corrosion inhibitor (refer to optional accessories: EXADOS dosing computer)

Note: If required, the drain connection can be made at up to 1 m above the water softener. However, in case of a high drain connection, the connection of the overflow hose of the brine tank cannot be made (but this safety feature is not necessarily required as a float valve is installed in the brine tank as an initial safety measure). However, the installation room must feature a floor drain.

Note: In general the corrosion behaviour of copper pipes, galvanised steel pipes and stainless steel pipes is not influenced by the softening process. However, when switching to softened water in galvanised steel pipes, the water may turn brownish, or in copper pipes it may become greenish. A dosing unit can counteract this effect.”

- Provide a drain connection (at least DN 50) to discharge the regeneration water.
- The installation site must have a floor drain. If this is not the case, an appropriate safety device must be installed (refer to chapter C, paragraph 6.2).

Warning! . Floor drains leading towards a lifting system do not work in case of a power failure.

Note: If the regeneration water is directed into a lifting device, this device must be salt water resistant.

Attention! A non-return valve is installed on the inlet side of the connection block (fig. C-2, item 5). Pressure relief safety valves therefore must be installed downstream of the connection block.

1.2 Electrical installation

An earthed socket is required for the electrical connection. It must correspond to the specifications in table C-1 and must be no further from the water softener than 1.20 m.

Attention! The socket must carry constant voltage (do not couple with light switch or emergency switch of heating system).

2 | Preliminary work

1. Unpack all components of the water softener.
2. Check for completeness and soundness.
3. Place the system at the designated location.

3 | How to connect the system

3.1 Water connection

Install connection block into the piping (pay attention to sieve insert)

Mount connection hoses (observe flow direction).

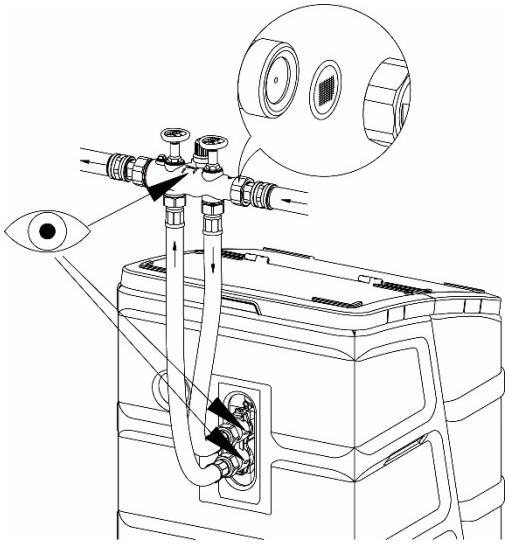


Fig. D-2: Water connection of Weichwassermeister GSX

Warning! Risk of bacterial growth due to stagnation! Acc. to VDI 6023 it is not admissible to fill in drinking water prior to the start of the designated operation.

Therefore, the water softener may only be connected to the drinking water supply immediately prior to start-up.

Make the waste water connection according to DIN EN 1717. In order to do so, shorten the rinsing water hose to the required length and direct it to the drain.

Make sure there is a free outlet (min. 20 mm) to the drain. Fasten the hose with appropriate means in order to prevent the hose from wagging (emerging regeneration water is under pressure).

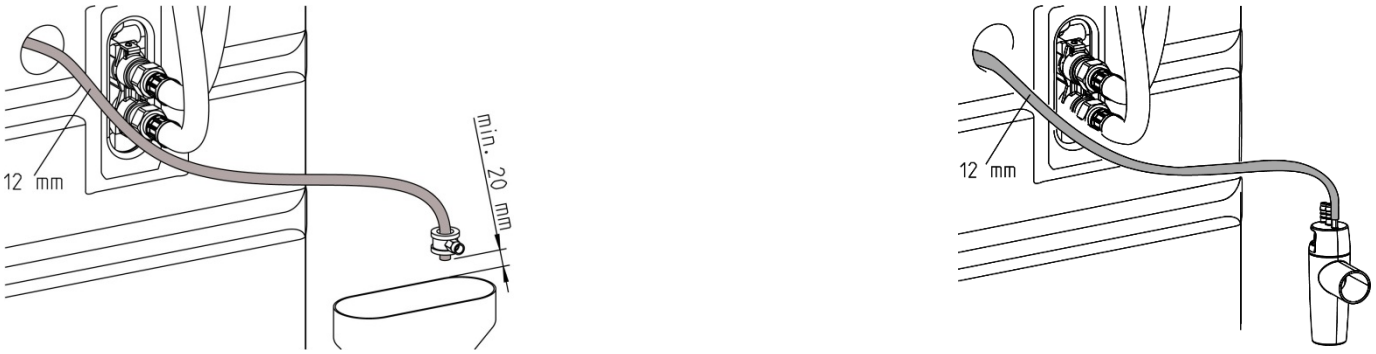


Fig. D-3: Drain connection of rinsing water hose with and without accessory drain connection DN 50 according to DIN EN 1717 (order no. 188 875)

Attention! Risk of damage and malfunctions due to back pressure of waste water. Do not bend the hose.

Shorten the overflow hose of the brine tank to the required length, route it descending to the drain and fasten it according to DIN EN 1717.

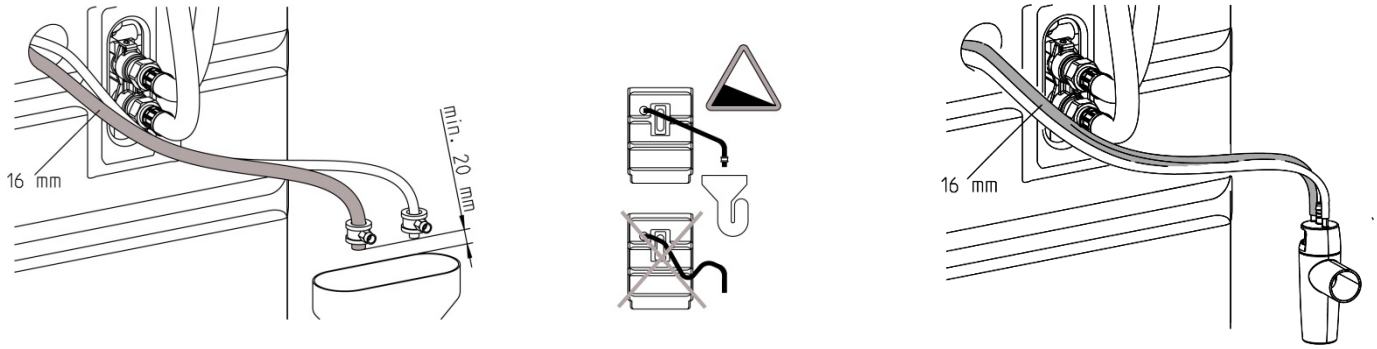


Fig. D-4: Drain connection of overflow hose of brine tank with and without accessory drain connection DN 50 according to DIN EN 1717 (order no. 188 875)

4 | Terminal diagram

Attention! Prior to opening the control unit, pull the mains plug.

The work described below may only be performed by trained experts. We recommend having Grünbeck's technical service/authorised service company start up the system.

For the optimum adjustment of the operating mode, a programmable output is available at the control unit (voltage-free contact/switching capacity 230 V~ 1 A, Fig. D-5, item 1) as well as a programmable input (for connection to a voltage-free contact, Fig. D-5, item 2). For a detailed description of the available functions, refer to chapter F, paragraph 3.2.

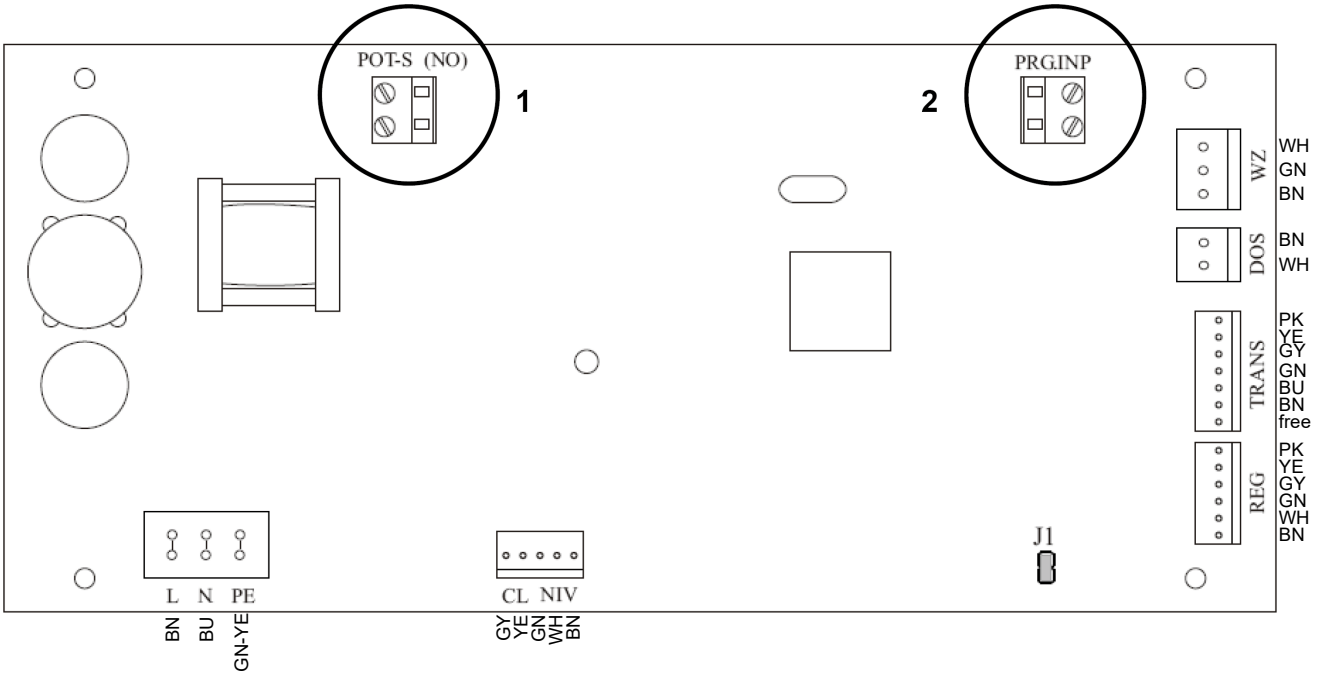


Fig. D-5: Terminal diagram for Weichwassermeister GSX

Table D-1: Description of board connections

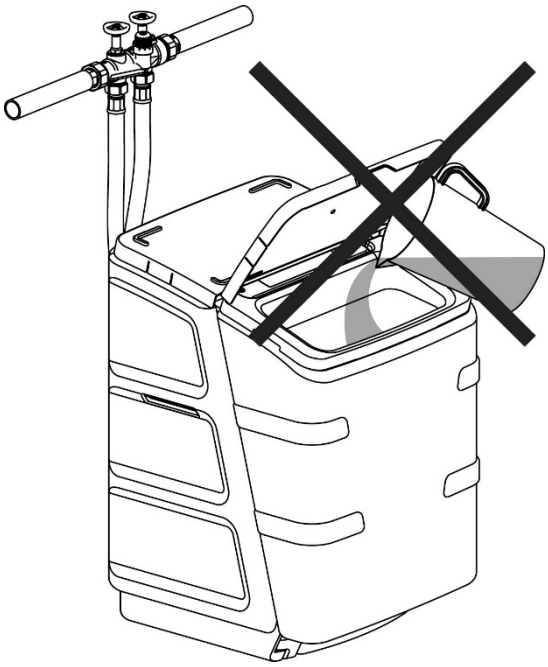
Connection	Description		Connection	Description
L / N / PE	Mains connection cable		DOS	EXAcount cable (opt. dosing system)
CL / NIV	Disinfection unit, brine valve		POT-S (NO)	1 programmable output relay contact for use by others
REG	Motor	Regeneration valve		
TRANS		Transfer valve	PRGINP	2 programmable input to connect a voltage-free contact by others
WZ	Water meter			

E Start-up

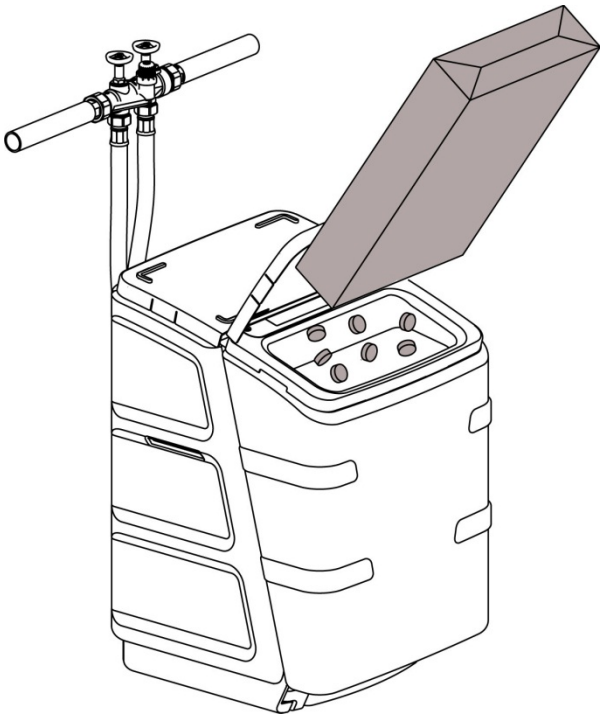
The work described below may only be performed by trained experts. We recommend having Grünbeck's technical service/authorised service company start up the system.

Note: The salt level in the brine tank must always be higher than the brine level. Please observe the minimum salt filling level (see marking line at brine tank funnel).

1 | How to prepare the brine tank



Do not fill in any water.

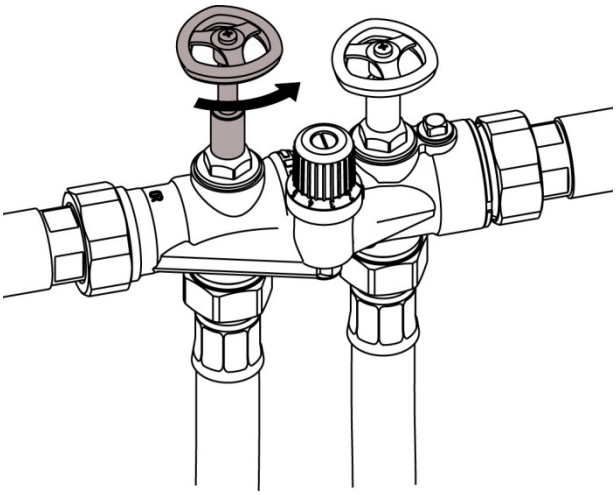


Fill one or two 25 kg bags of salt tablets into the brine tank.

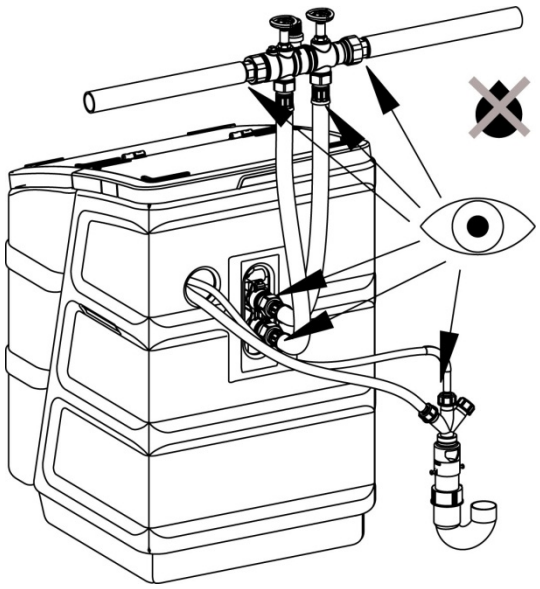
Attention! Impurities in the salt may cause malfunctions at the brine valve and the injector of the control valve.

Only use salt tablets as per EN 973, type A.

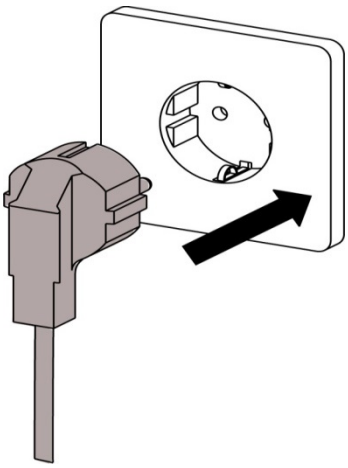
2 | How to start up the water softener



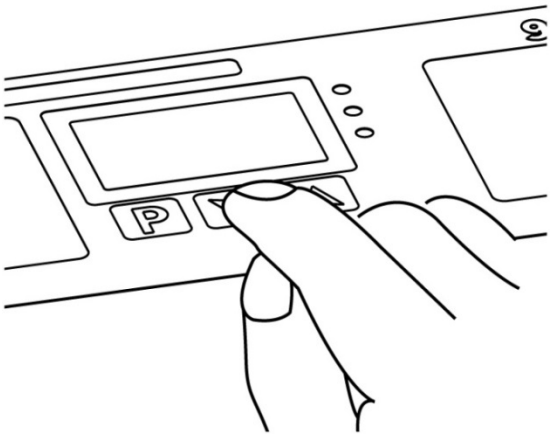
1. Open the shut-off valve for raw water at the connection block.



2. Visually check for tightness (check at the connection block as well).

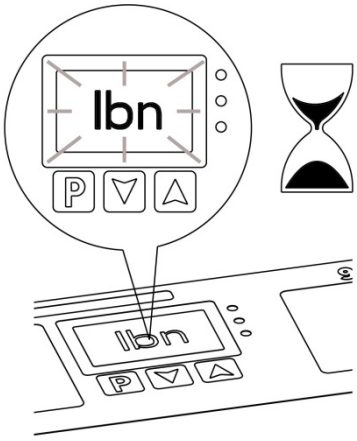


3. Plug in mains plug.

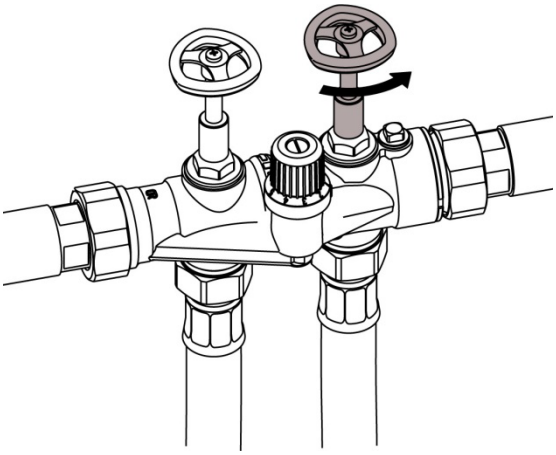


Note: For detailed information on the handling of the control unit, please refer to the operator card and chapter F, paragraph 2.2.

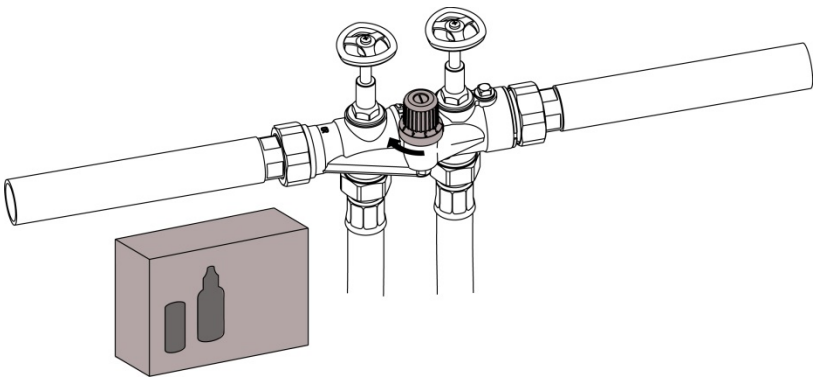
4. Set the control unit:
   - Set the time.
   - Set the raw water hardness.
   - Start start-up program: Change parameter from “Ibn0“ to “Ibn1“ and save. The display now indicates the text “Ibn” instead of the time.

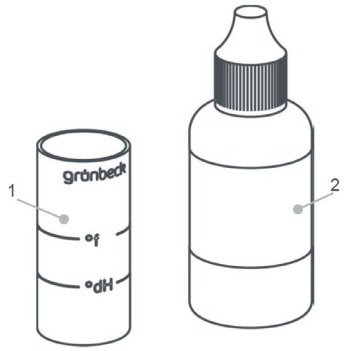


5. During system deaeration, "Ibn" is indicated in the display and after approx. 6 minutes into the subsequent twin regeneration, the time is displayed.



6. Open the shut-off valve for soft water at the connection block.





7. Perform 0 °dH (0 °f, 0 mmol/l)test:
   - Unscrew the locking screw at the blending valve and close the blending valve at the connection block completely (turn to the right).
   - Withdraw a water sample downstream of the water softener and determine the soft water hardness by means of the water test kit „total hardness“.
   - The water softer is working properly if the measurement is < 1 °dH (1.8 °f, 0.18 mmol/l).

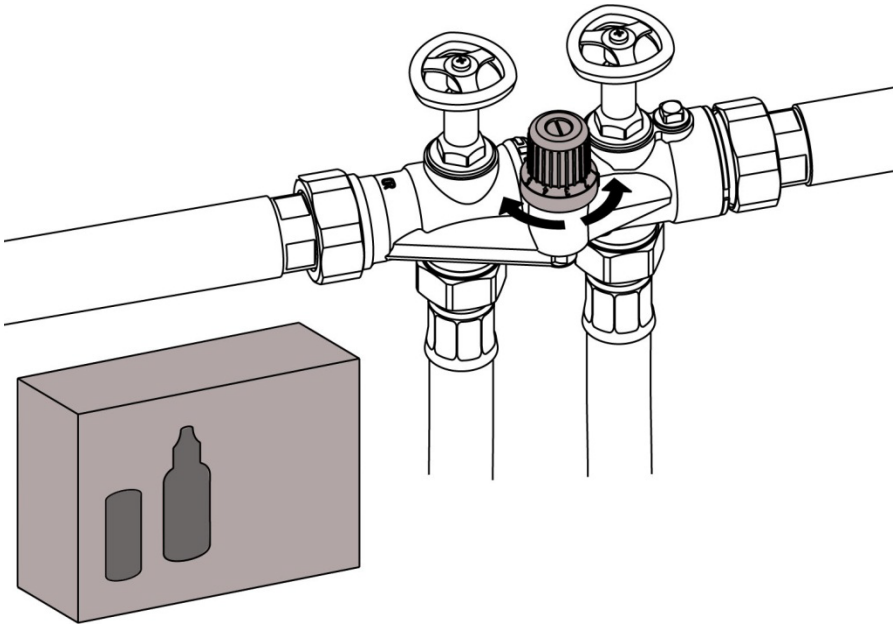
The automatic start-up program takes about 45 minutes. During this time, the system is deaerated, the brine tank automatically filled with water and both exchangers are regenerated one after the other. During the deaeration respectively during the regeneration, water flows through the rinsing water hose to the drain.

1 Test tube

2 Titration solution

3 | How to set the soft water hardness (only GSX 10)

Note: When setting the soft water hardness, a tap should be completely open (e. g. open tap at the sink).



- Set the blending valve to a medium value at the scale. The figures at the blending valve are only markers and do not indicate the soft water hardness.
- Withdraw a water sample at the closest tap and determine the soft water hardness.
- Soft water hardness too low:
  Turn the blending valve a little further to the left (open).
- Soft water hardness too high:
  Turn the blending valve a little further to the right (close).
- Repeat this process until the desired soft water hardness is achieved.
- Hold the blending valve and slightly tighten the locking screw.

Note: We recommend storing the operation manual close to the system by inserting it in the transparent envelope and fastening it at the pipes with two cable clips after the start-up process is completed.

Table E-1: Conversion factors regarding water hardness

Water hardness			**°dH**	**°f**	**mmol/l = mol/m³**
German degrees	1 °dH	≙	1	1.78	0.178
French degrees	1 °f	≙	0.56	1	0,1
Alkaline earth ions	1mmol/l = mol /m³	≙	5.6	10	1

Note: When softening drinking water, the stipulations of the German Drinking Water Ordinance are compulsory! Max. sodium concentration: 200 mg/l.

Sodium concentration

Your local waterworks will inform you about the sodium concentration of the raw water. When softening the water by 1 °dH (1.8 °f, 0.18 mmol/l), the sodium concentration increases by approx. 8.2 mg/l. If the stipulations of the German Drinking Water Ordinance must be observed, the water cannot be softened indefinitely. The permissible blending hardness results from the limit value for the sodium concentration and the raw water hardness.

200 mg/l (limit value acc. to Ger. Drinking Water Regulations)
– > x mg/l (sodium concentration in raw water)

y mg/l (permissible dosing of sodium during softening)

$\frac{y}{8.2}$ = Z °dH (max. possible softening)

The raw water may be softened by up to a maximum of Z x °dH (Z x 1.8 °f, Z x 0.18 mmol/l). Depending on the sodium concentration of the raw water, a blending hardness must be chosen which is lower than the maximum value of 200 mg/l.

Example for the softening of drinking water

Raw water (28 °dH, 50 °f, 5.0 mmol/l) contains sodium (10.5 mg/l).

Permissible dosing of sodium during softening:

200 mg/l – 10.5 mg/l = 189.5 mg/l

This means that the maximum permissible softening is:

$\frac{189.5}{8{,}2} \approx 23\ °\mathrm{dH}\ (41\ °\mathrm{f}, 4.1\ \mathrm{mmol/l})$

This means:
Blending at least to 28 – 23 = 5 °dH (9 °f, 0.9 mmol/l)!

3.1 Recommended soft water hardness

3°dH: 5.3 °f: 0.53 mmol/l — Minimum value according to DIN 12502 Corrosion Protection.

4-6°dH: 7.1-107 °f 0.71-1.07 mmol/l — Ideal soft water (highest comfort).

F Operation

1 | Introduction

The water softeners Weichwassermeister GSX are volume and/or timer controlled. They are operated and monitored by means of the control unit.

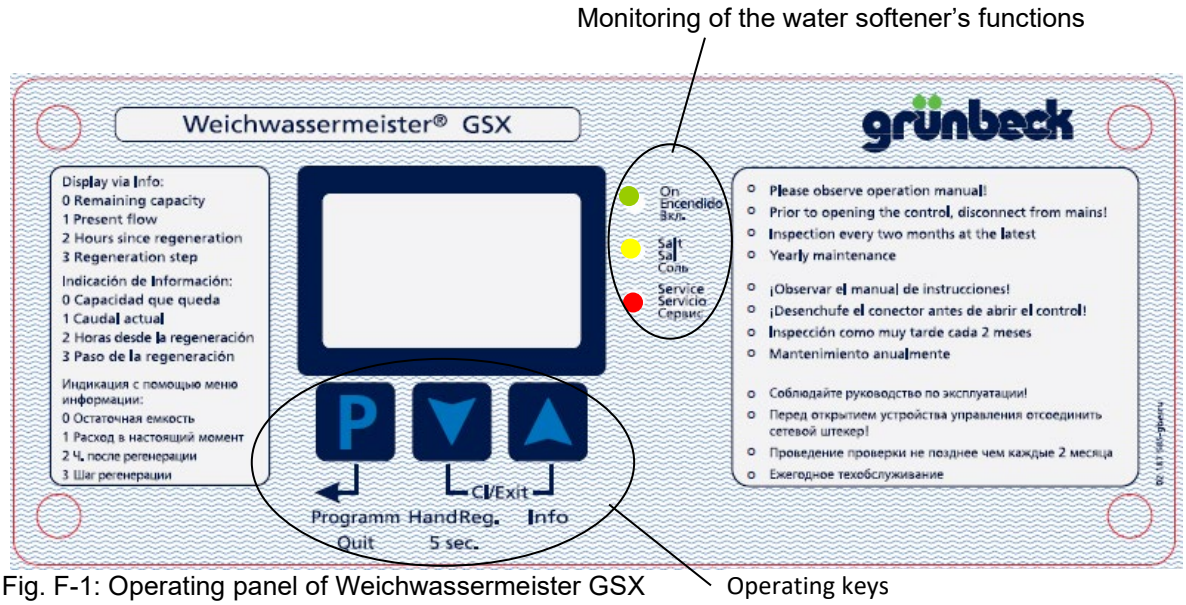


Fig. F-1: Operating panel of Weichwassermeister GSX

●	green LED	Water softener is working properly.
●	yellow LED	Lack of regeneration salt, other messages (if activated).
●	red LED	Service, maintenance by Grünbeck's technical service/authorised service company required, illuminated display is blinking.

Table-F-1: Monitoring of the water softener's functions

2 | How to operate the control unit

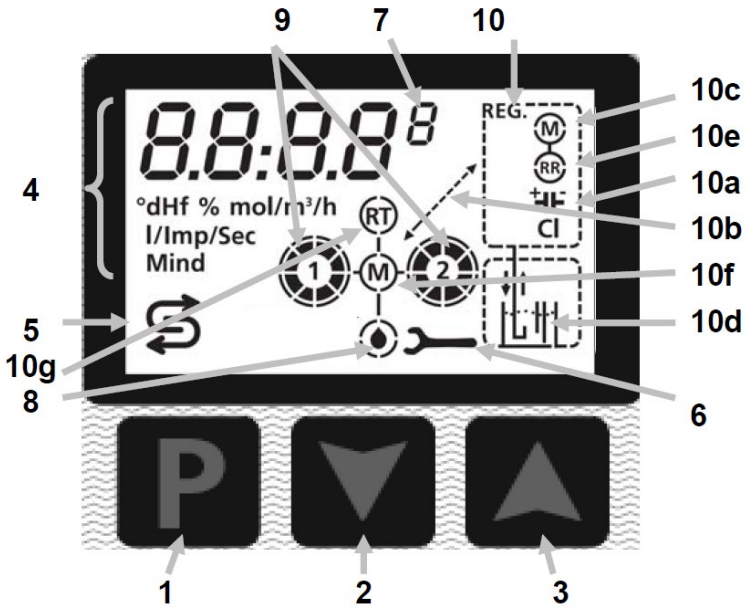


Fig. F-2: Control unit, operating elements and display

Pos.	Key	Displayed parameter
1	P	**In standard operation:** • to switch to User Programming level (press > 2 sec.). • to acknowledge malfunctions. **On the User Programming level:** • to access parameter for modification (numerical display is blinking). • to save and close parameter (numerical display stops blinking).
2	▼	**In standard operation:** • to release a manual regeneration (press for > 5 sec.). **On the User Programming level:** • to return to the previous parameter. • to decrease numerical values while the numerical display is blinking.
3	▲	**In standard operation:** • to call the Info level and switch to the next Info value. **On the User Programming level:** • to switch to the next parameter. • to increase numerical values while the numerical display is blinking.
	▼ + ▲	• to close open parameters without saving them (numerical display stops blinking), the value set before remains stored. • to quit the User Programming level resp. the Code level.

Pos.	Key	Displayed parameter
4	8.8:8.8 °dHf % mol/m³/h l/Imp/Sec Min d	**In standard operation:** • indicates the time. **On the Info level respectively the User Programming level:** • indicates the operating parameters as well as the corresponding unit, if applicable. **In case of malfunctions/warnings:** • indicates malfunction currently pending or warning Er x.
5		Symbol appears if salt needs to be refilled. (refer to chapter H, paragraph 2).
6		Symbol appears if maintenance interval has expired (only if activated).
7	8	**On the Info level respectively the User Programming level:** • As a guide, the index shows the consecutive number of the current value in the numerical display.
8		The symbolic drop is blinking when water is withdrawn (share 0 °dH, 0 °f, 0 mmol/l).
9		**In standard operation:** • The exchanger and its residual capacity is indicated. The respective segments of the circle each represent 12.5 % of the residual capacity.  residual capacity between 100 % and 87.5 %.  residual capacity between 75 % and 62.5 %.  residual capacity between 50 % and 37.5 %.  residual capacity between 25 % and 12.5 %.  exchanger is exhausted. • Only the figure for the exchanger which is currently in operation will be displayed. **Within the Info level:** • Residual capacity and flow indicated in the numerical display of pos. 4 refers to the exchanger which is currently in operation.
10	**REG.**	**REG**. is displayed during the entire regeneration process. The supplementary symbols 10 a … 10 e are indicated on the Info level at parameter index 3 (refer to chapter F, paragraph 2.3) or may be activated in Code 290 (parameter 6).

Pos.	Key	Displayed parameter
10 a	+ Cl −	Regeneration step „salting“: Symbol appears if the electrolysis current for the chlorine generation (disinfection of exchanger) is ok.
10 b	**Flow arrow between regeneration and transfer valve**	Depending on the respective regeneration step, the arrow points in one direction or the other. • First filtrate (5) • Salting (1), displacing (2), backwash (3) • Fill brine tank (4): no pointing arrow available
10 c	**Regeneration valve**	Regeneration motor (M) switches to the next regeneration step.
10 d	**Brine tank**	• Is indicated during the entire regeneration process (if activated). • Depending on the regeneration step, the corresponding arrow will appear: ↑ Brine is sucked from the brine tank. ↓ Water is filled into the brine tank.
10 e	**Reference run regeneration valve**	Only appears during the reference run of the regeneration valve.
10 f	**Transfer valve**	Transfer motor (M) switches to the other exchanger tank.
10 g	**Reference run transfer valve**	Only appears during the reference run of the transfer valve.
	Background illumination of display	• Is switched on for 10 minutes after the last operation of a key. • With every press of a key, initially, the background illumination is activated. • Is blinking during malfunctions / warnings.

Table F-2: Operating elements and display

Note: If the system operates without malfunctions, only the most important information will be displayed. Fig. F-2, however, illustrates the maximum number of features that may be displayed.

2.2 How to set the operating parameters

Basic setting (User Programming level)

In its basic setting, the display indicates the time (colon is blinking). First, access the User Programming level.

1. Keep **P** key pressed for more than 2 seconds.

The display indicates the hours.

2. Press **P** key. The displayed hours start blinking.
3. Set current time (hours). In order to do so:
   Decrease the hours by means of ▼ key.
   Increase hours by means of ▲ key.
4. Save setting by pressing **P** key. The displayed hours stop blinking.
5. Press ▲ key to access the next menu item.

The display indicates the minutes.

6. Press **P** key. The displayed minutes start blinking.
7. Set current time (minutes). In order to do so:
   Decrease the minutes by means of ▼ key.
   Increase the minutes by means of ▲ key.
8. Save setting by pressing **P** key. The displayed minutes stop blinking.
9. Press ▲ key to switch to the next menu item.

The display indicates the stored raw water hardness.

10. Here, the actual raw water hardness at the operating site must be entered. The raw water hardness can be determined by means of the water test kit “total hardness” or requested from the local water supplier (factory-setting: 25 °dH, 45 °f, 4,5 mmol/l).
11. Enter the appropriate value. To do so, repeat steps 6. - 8. accordingly.

Note: In case of fluctuating raw water hardness, the highest value that might occur has to be entered!

Note: The next parameter will start the start-up program: deaeration of the water softener, filling of brine tank with water, regeneration of the two exchanger tanks.

The display indicates „Inbetriebnahme-Programm/start-up program“.

12. Change the parameter from „Ibn0“ to „Ibn1“.To do so, repeat steps 6. – 8 accordingly.
13. Press keys ▲ and ▼ simultaneously to return to the basic display.

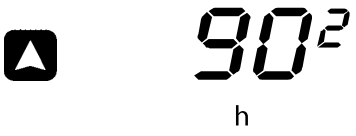
The display indicates „Ibn“. After approx. 10 minutes the current time will be displayed and both exchanger tanks will be regenerated.

2.3 Info level

The display indicates the time (≙ basic setting).

The display indicates the soft water volume[1)] (m³) remaining until the next regeneration.

The display indicates the system flow[1)] (m³/h). This value is adapted every 5 s.



The display indicates the time (hours) since the last regeneration.

The display indicates the regeneration step currently in progress and the remaining time.

Time (days) until the next maintenance is due (only if activated).

1): The soft water volume resp. the system flow refers to the 0 °dH (0 °f, 0 mmol/l) portion.

2.4 How to release a manual regeneration

Start the regeneration in the basic display „time“:

Press the ▼ key for at least 5 seconds. The water softener starts the regeneration and „**REG.“** is indicated in the display.

A manual regeneration must be released if

- the water softener is operated in operating mode b 1 (regeneration exclusively via daily interval and time) and the maximum soft water volume is reached prior to the set regeneration interval has expired.
- the water softener is restarted after a longer period of standstill (as an alternative: C.290, Index 9, menu item, twin regeneration).
- maintenance or repair work has been done.
- the raw water hardness has increased, in particular, if the water softener does not produce the desired soft water quality during the entire filter operation.

Note: In this case, the increased raw water hardness must be readjusted in the control unit (refer to chapter F, paragraph 2.2).

3 | How to make deviating settings

The control unit of the Weichwassermeister GSX controls the operating and regeneration processes subject to the selected operating mode, water consumption, daily interval and time. The various parameters of the water softener are stored in programming levels and can be set via the code-protected menu navigation. The control unit features a programmable input as well as a programmable output.

The parameters described in the following may only be modified by authorised experts as incorrectly set values may result in the overrunning of the exchangers or in malfunctions.

3.1 Installer level 290

Prerequisite: The control unit indicates the standard display „time“.

1. Press **P** and ▼ key simultaneously until display changes.

The Installer Programming level is active. Initially, the required menu has to be chosen. The figures (000) are blinking. They have to be modified so that they indicate the Code for the menu to be processed. The code for the level required in this context is 290.

2. Count upwards by means of ▲ key until C.290 is displayed.

   Count downwards by means of ▼ key until C.290 is displayed.

   When keeping keys ▼ and ▲ pressed, the figures run through more quickly, the fine tuning can be made by pressing the keys again.

3. Press **P** key, to accept Code 290.

Note: Within the Installer level, you may switch between the individual parameters by means of keys ▲ and ▼ .

Index	Parameter unit	Factory-setting	Setting range	Remarks
0	Hardness unit	L1	1 = °dH, 2 = °f, 3 = mol/m³	Applies to the raw water and soft water hardness as well as to the capacity number
1	System data record CA	Depending on system type		CA82: Weichwassermeister GSX 10 CA83: Weichwassermeister GSX 10-I All other data records are reserved. **Warning:** Modifications may only be made by Grünbeck's technical service/authorised service company!
2	Capacity number [m³x°dH]	Depending on system type	Display only	CA82: 10.0 CA83: 10.0
3	Turbine water meter constant [l/pulse]	Depending on system type	Display only	CA82: 0300 is displayed CA83: 0300
4	Home in on reference position of transfer valve	0	0 … 1	Started by reprogramming to the value 1. An ongoing regeneration is aborted by this. **Attention:** Modifications may only be made by Grünbeck's technical service/authorised service company!
5	Home in on reference position of regeneration valve	0	0 … 1	
6	Displayed segments regeneration unit / brine tank	0	0 … 1	Are activated by reprogramming to the value 1.
7	Green LED „OK / ON“	1	0 … 1	Is switched off for good by reprogramming to the value 0.
8	Disinfection program	0	0 ... 1	Is started by reprogramming to the value 1. **Attention**: Also observe the instructions for the disinfectant! The disinfection may only be performed by Grünbeck's technical service/ authorised service company
9	Start twin regeneration (both exchangers, one after the other)	0	0 .. 9	1 = immediate start 2 = start after a delay period of 2 hours 9 = start after a delay period of 9 hours.

Table F-3: Parameters on Installer level 290

3.2 Extended Installer level 113

Prerequisite: The control unit indicates the standard display “time”.

1. Press **P** and ▼ key simultaneously until display changes.

The Installer Programming level is active. Initially, the required menu has to be chosen. The figures (000) are blinking. They have to be modified so that they indicate the Code for the menu to be processed. The Code for the level required in this context is 113.

2. Count upwards by means of ▲ key until C.II3 is displayed.

   Count downwards by means of ▼ key until C.II3 is displayed.

   When keeping the keys ▼ and ▲ pressed, the figures run through more quickly and the fine tuning can be made by pressing the keys again.

3. Press **P** key, to accept Code 113.

Index	Parameter unit	Factory-setting	Setting range	Remarks
0	Function of programmable output (voltage-free relay contact) SA	SA 1	SA 0 ... SA 4	0 = collective fault alarm active (contact is open in case of power failure or when a malfunction occurs). 1 = contact is only closed in case of malfunction. 2 = activation of a delivery pump for regeneration water (order no. 188 800). 3 = closed during the entire regeneration process 4 = contact closed in case of a flow rate of 0 m³/h or in case of transfer.
1	Delay time for SA = 4 [min.]	1,0	0,1 … 9,9	Contact only reopens time-delayed when the transfer has been completed.
2	Dosing interface EXAcount IA	IA 2	IA 0 … IA 3	0 = pulse output 1:1 1 = pulse output 1:10 2 = pulse output 1:1 3 = pulse output 1:10 When 2 or 3 is set, no EXADOS dosing will take place as long as an error, Er1/2/4/6/7, is pending at the Weichwassermeister GSX and therefore, no soft water is available.
3	Function of programmable input (to connect to voltage-free contact provided by others)	0	0 ... 3	0 = no function 1 = external release of regeneration 2 = external lock of regeneration 3 = reserved function

Table F-4: Parameters of Installer level 113

G Troubleshooting

1 | Introduction

Even carefully designed and manufactured water softeners that are properly operated, may experience malfunctions. Table G-1 provides an overview of possible problems that may occur during the operation of the water softener Weichwassermeister GSX and indicates the causes and their elimination.

The GSX water softeners are equipped with an error detection and signal system.
If an error message is displayed:

1. Press **P** key (= acknowledgement of malfunction);
   does not apply to symbol respectively Er4 (refer to table G-1).
2. Watch the display.
   If the message reappears (after approx. 30 minutes),
   compare to table G-1.
3. If necessary, notify Grünbeck's technical service/authorised service company.

Note: Grünbeck's technical customer service/authorised service company definitely must be notified in case of malfunctions that cannot be remedied with the information given in table G-1! When contacting the technical customer service, please indicate the system designation, serial number and the error message displayed.

2 | Error messages

Table G-1: Troubleshooting		
This is what you see	**This is the cause**	**This is what to do**
Error messages displayed		
Er 0 [1)]	Power failure	• Appears after power has returned (in case of power failures longer than 5 minutes). Water softener performs regeneration for each exchanger tank. • In general, the regeneration in progress is only stopped in case of power failure and afterwards continues running. • In case of longer periods of power failure, the internal clock of the control unit continues running for at least 3 hours. • If the available soft water volume has not been consumed, the time interval of 4 days for the forced regeneration is prolonged by the duration of the power failure (only applies, if the error signal Er0 is deactivated as per factory setting).
Er 1	Step monitoring at regeneration motor	Acknowledge malfunction (home in on the reference position refer to table F-3, item 5). Notify Grünbeck's technical service/authorised service company
Er 2	Step monitoring at transfer motor	Acknowledge malfunction (home in on the reference position, refer to table F-3, item 4). Notify Grünbeck's technical service/authorised service company
Er 3 [1)]	Hardness stop.	Both exchangers are exhausted – error message is acknowledging itself after completed regeneration.
Er_4[1)]	Low-on-salt alarm	Check salt level in brine tank and refill salt tablets, if necessary. Acknowledge malfunction after 5 minutes (both exchangers will be regenerated).
	Salt clumps together	Loosen up clumped salt with suitable tool, so that loose salt is available again in brine tank. Release manual regeneration (twin regeneration).
	Worn carbon electrodes	Acknowledge malfunction. Notify Grünbeck's technical service/authorised service company
Er¯4[1)]	Short circuit between carbon electrodes	Acknowledge malfunction. Notify Grünbeck's technical service/authorised service company.

Continuation table G-1: Troubleshooting		
This is what you see	**This is the cause**	**This is what to do**
Error messages displayed		
Er 6	Maximum contact at step “filling of brine tank” has not been achieved.	Acknowledge malfunction. Notify Grünbeck’s technical service/authorised service company
Er 7	Minimum contact at step “salting” has not been achieved. Too much water/brine in brine tank	Acknowledge malfunction. Notify Grünbeck’s technical service/authorised service company
Er c [1)]	Nominal flow at water softener exceeded	Acknowledge malfunction.
Er E	Malfunction of a component which is connected to the control unit	Notify Grünbeck’s technical service/authorised service company
Er F	Incorrect System-data record	Refer to chapter F-3.1: Readjust the correct data record CA71 … CA73 (parameter index 1)
	[1)] Factory-setting: deactivated (can be activated by Grünbeck’s technical service/authorised service company, if required).	

3 | Symbols

Table G-2: Symbols		
This is what you see	**This is the cause**	**This is what to do**
Symbol displayed		
 1)	Maintenance interval has expired. For information only. No malfunction	Will be reset by Grünbeck’s technical service/authorised service company when maintenance has been performed.
	Salt needs to be refilled into the brine tank	Check the salt level in the brine tank and if necessary, refill salt tablets as per EN 973 type A. Acknowledge the error after 5 minutes.
	Salt clumps together	Loosen up clumped salt with suitable tool, so that loose salt is available again in brine tank. Release manual regeneration (twin regeneration).
	Carbon electrode worn out	Acknowledge error. Notify Grünbeck’s technical service/authorised service company.
	[1)] Factory-setting: deactivated (can be activated by Grünbeck’s technical service/authorised service company, if required).	

4 | Other malfunctions

Table G-3: Other malfunctions		
This is what you see	**This is the cause**	**This is what to do**
Other malfunctions		
Increased hardness in soft water	Water softener overrun	
	Water softener does not carry continuous current (coupled with light switch).	Check power supply.
	No turbine water meter pulses at control unit.	Check turbine water meter (💧 must be blinking), check control line.
	Incorrect setting at control unit	Check parameter (raw water hardness) and readjust, if necessary.
	Water softener does not suck brine	Increase flow pressure to at least 2.0 bar. Clean injector. Clean injector sieve. Dismantle brine valve and thoroughly clean it.
	No salt in brine tank	Refill salt.
	Salt clumps together	Loosen up clumped salt with suitable tool, so that loose salt is available again in brine tank. Release manual regeneration (twin regeneration).
	Not enough salt in brine tank	Respect minimum salt filling level (refer to marking line at brine tank funnel).
	„Salting“ is too fast.	Reduce flow pressure to 4.0 bar (if possible).
Other causes	Setting at blending valve	Check raw water and soft water hardness,. Check setting of blending valve and adjust, if necessary.
	Water supply interrupted	Shut-off valves closed.
	Water withdrawal too high (exceeding peak flow indicated on type designation plate)	Reduce water withdrawal.
Resin in outlet line	Jet system defective.	Notify Grünbeck’s technical service/authorised service company.
Pressure loss too high	Resin impure due to undissolved substances.	Notify Grünbeck’s technical service/authorised service company.

H Maintenance and care

1 | Basic information

In order to guarantee the reliable function of the water softeners over a long period of time, some maintenance has to be performed at regular intervals. In particular when it comes to softening within the range of the drinking water supply, the required measures to be taken are stipulated in standards and guidelines. Furthermore, all regulations and guidelines which apply at the installation site must be observed.

DIN EN 806-5 stipulates:

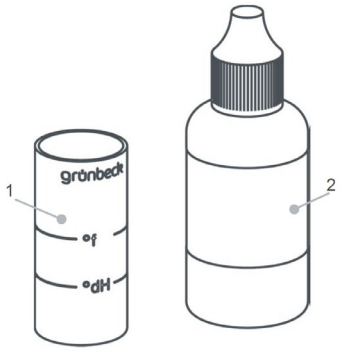
- Inspection every second months.
- Maintenance every six months.

For documentation of the maintenance work, an operation log (refer to chapter H, paragraph 5) must be kept.

Note: By concluding a maintenance contract, you ensure that all required maintenance work will be performed in due time.

2 | Inspection (functional check)

You may perform the regular inspections yourself.



1 Test tube
2 Titration solution

Fig. H-1: Determine the hardness

- Check the salt level in the brine tank, respect the minimum salt filling level (refer to marking line at brine tank funnel). If necessary, refill salt tablets.

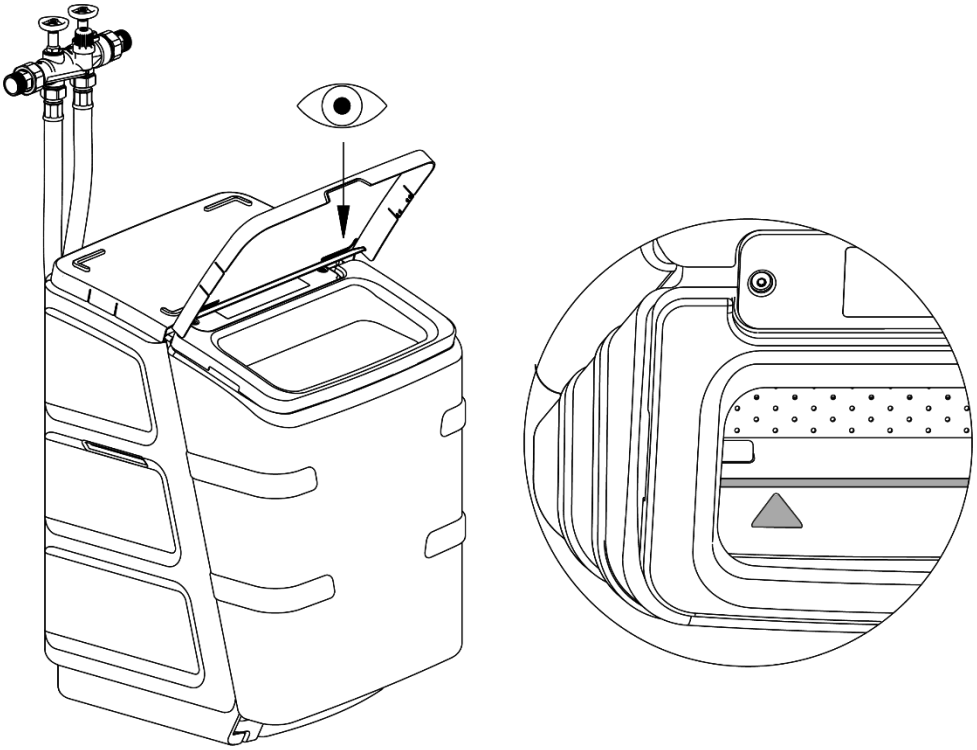


Fig. H-2: Marking line at brine tank funnel

- Check tightness of control valve towards the drain (in operating mode without ongoing regeneration).

3 | Half-yearly maintenance

You may perform the half-yearly maintenance work yourself.

- Determine the soft water hardness
  (water test kit „Total hardness“)
- Check the salt level in the brine tank, refill salt tablets, if necessary.
- Check the salt quality – the salt must not be clumped. If necessary, break up clumping by means of a suitable tool.
- Assess the salt consumption subject to the water volume consumed.

Note: Minor fluctuations are normal and cannot be prevented technically. In case of considerable deviations, however, notify Grünbeck’s technical service.

- Check system for tightness.
- Check tightness of the control valve at the flushing water hose
  (in operating mode without ongoing regeneration).

4 | Yearly maintenance

Warning! Impurities introduced to the brine tank may adversely affect the water quality.

Therefore, be very careful with regard to hygiene when refilling salt.

According to DIN EN 806-5, the yearly maintenance work on water softeners may only be performed by the manufacturer's technical customer service/ authorised technical service or by a specialised company.

Work to be performed in addition to the half-yearly maintenance work

- Read water pressure, flow pressure and residential water meter reading.
- Measure the raw water hardness.
- Measure the soft water hardness.
- If necessary, readjust blending valve and check soft water hardness again.
- Adjust the electronics settings subject to the measured raw water-hardness.
- Check the hose connections and seals and replace, if necessary.
- Check whether the turbine water meter emits pulses.
- Check cable for damage.
- Clean injector and injector sieve.
- Clean brine valve.
- Clean carbon electrodes, replace, if necessary.
- Clean brine tank.
- Complete system.
- Check tightness of control valve (no regeneration in progress) (flushing water and brine hose).
- Release a manual regeneration
- Monitor chlorine bubbles in brine hose (during the step "salting").
- Read the regeneration counter and total soft water volume.
- Reset service interval, if activated.
- Record all data and activities, including repair work in the operation log.
- Hand over the water softener and the filled out operation log to the operator.

5 | Operation log Weichwassermeister GSX 10, GSX 10-I

GSX 10 ☐ **GSX 10-I** ☐

Serial number:.....

Customer:

Name: .....

Address:.....

.....

Start-up:

Installed by:.....

Customer service technician:.....

Company: .....

Work time certificate (no.): .....

Signature: .....

Filter: Make/type	…… /……		
Drain connection DIN EN 1717	☐ yes	☐ no	
Floor drain available	☐ yes	☐ no	
Water stop	☐ yes	☐ no	
Pumping system	☐ yes	☐ no	Make:.....
Dosing	☐ yes	☐ no	Agent: .....
Operating values:	Water meter reading at residential water installation	…….. [m³]	
	Raw water hardness measured	☐ [°dH] ☐ [°f] ☐ [mmol/l] ..	
	Set raw water hardness	☐ [°dH] ☐ [°f] ☐ [mmol/l] ..	
	Set soft water hardness	☐ [°dH] ☐ [°f] ☐ [mmol/l] ..	
	Primary pressure	..... [bar]	

Remarks:

.....

.....

.....

.....

.....

Operating values	
Water pressure [bar]	
Water meter reading at residential water installation [m³]	
Raw water hardness (measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Set raw water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Soft water hardness (measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Readjusted soft water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	

Operating values	
Water pressure [bar]	
Water meter reading at residential water installation [m³]	
Raw water hardness(measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Set raw water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Soft water hardness (measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Readjusted soft water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	

Functional check / Maintenance work	
Hose connections checked	
Cable checked for damage	
Water meter checked for pulse output	
Injector cleaned	
Injector sieve cleaned	
Carbon electrode of chlorine cell cleaned	
Carbon electrode of chlorine cell replaced	
Brine tank cleaned	
Flushing water hose checked for tightness during operation	
Brine hose checked for tightness during operation	
Manual regeneration released	
Function of the disinfection unit checked (Bubbles in brine line during salting)	
Regeneration counter reading retrieved	
Total soft water volume reading retrieved	

Functional check / Maintenance work	
Hose connections checked	
Cable checked for damage	
Water meter checked for pulse output	
Injector cleaned	
Injector sieve cleaned	
Carbon electrode of chlorine cell cleaned	
Carbon electrode of chlorine cell replaced	
Brine tank cleaned	
Flushing water hose checked for tightness during operation	
Brine hose checked for tightness during operation	
Manual regeneration released	
Function of the disinfection unit checked (Bubbles in brine line during salting)	
Regeneration counter reading retrieved	
Total soft water volume reading retrieved	

Remarks

Remarks

Date:
Company:
CS-Technician:
Work time certificate (no.):
Signature:

Date:
Company:
CS-Technician:
Work time certificate (no.):
Signature:

Operating values	
Water pressure [bar]	
Water meter reading at residential water installation [m³]	
Raw water hardness (measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Set raw water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Soft water hardness (measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Readjusted soft water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	

Functional check / Maintenance work	
Hose connections checked	
Cable checked for damage	
Water meter checked for pulse output	
Injector cleaned	
Injector sieve cleaned	
Carbon electrode of chlorine cell cleaned	
Carbon electrode of chlorine cell replaced	
Brine tank cleaned	
Flushing water hose checked for tightness during operation	
Brine hose checked for tightness during operation	
Manual regeneration released	
Function of the disinfection unit checked (Bubbles in brine line during salting)	
Regeneration counter reading retrieved	
Total soft water volume reading retrieved	

Remarks

Date:
Company:
CS-Technician:
Work time certificate (no.):
Signature:

Operating values	
Water pressure [bar]	
Water meter reading at residential water installation [m³]	
Raw water hardness(measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Set raw water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Soft water hardness (measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Readjusted soft water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	

Functional check / Maintenance work	
Hose connections checked	
Cable checked for damage	
Water meter checked for pulse output	
Injector cleaned	
Injector sieve cleaned	
Carbon electrode of chlorine cell cleaned	
Carbon electrode of chlorine cell replaced	
Brine tank cleaned	
Flushing water hose checked for tightness during operation	
Brine hose checked for tightness during operation	
Manual regeneration released	
Function of the disinfection unit checked (Bubbles in brine line during salting)	
Regeneration counter reading retrieved	
Total soft water volume reading retrieved	

Remarks

Date:
Company:
CS-Technician:
Work time certificate (no.):
Signature:

Operating values	
Water pressure [bar]	
Water meter reading at residential water installation [m³]	
Raw water hardness (measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Set raw water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Soft water hardness (measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Readjusted soft water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	

Functional check / Maintenance work	
Hose connections checked	
Cable checked for damage	
Water meter checked for pulse output	
Injector cleaned	
Injector sieve cleaned	
Carbon electrode of chlorine cell cleaned	
Carbon electrode of chlorine cell replaced	
Brine tank cleaned	
Flushing water hose checked for tightness during operation	
Brine hose checked for tightness during operation	
Manual regeneration released	
Function of the disinfection unit checked (Bubbles in brine line during salting)	
Regeneration counter reading retrieved	
Total soft water volume reading retrieved	

Remarks

Date:
Company:
CS-Technician:
Work time certificate (no.):
Signature:

Operating values	
Water pressure [bar]	
Water meter reading at residential water installation [m³]	
Raw water hardness(measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Set raw water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Soft water hardness (measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Readjusted soft water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	

Functional check / Maintenance work	
Hose connections checked	
Cable checked for damage	
Water meter checked for pulse output	
Injector cleaned	
Injector sieve cleaned	
Carbon electrode of chlorine cell cleaned	
Carbon electrode of chlorine cell replaced	
Brine tank cleaned	
Flushing water hose checked for tightness during operation	
Brine hose checked for tightness during operation	
Manual regeneration released	
Function of the disinfection unit checked (Bubbles in brine line during salting)	
Regeneration counter reading retrieved	
Total soft water volume reading retrieved	

Remarks

Date:
Company:
CS-Technician:
Work time certificate (no.):
Signature:

Operating values	
Water pressure [bar]	
Water meter reading at residential water installation [m³]	
Raw water hardness (measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Set raw water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Soft water hardness (measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Readjusted soft water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	

Functional check / Maintenance work	
Hose connections checked	
Cable checked for damage	
Water meter checked for pulse output	
Injector cleaned	
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Carbon electrode of chlorine cell replaced	
Brine tank cleaned	
Flushing water hose checked for tightness during operation	
Brine hose checked for tightness during operation	
Manual regeneration released	
Function of the disinfection unit checked (Bubbles in brine line during salting)	
Regeneration counter reading retrieved	
Total soft water volume reading retrieved	

Remarks

Date:
Company:
CS-Technician:
Work time certificate (no.):
Signature:

Operating values	
Water pressure [bar]	
Water meter reading at residential water installation [m³]	
Raw water hardness(measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Set raw water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Soft water hardness (measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Readjusted soft water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	

Functional check / Maintenance work	
Hose connections checked	
Cable checked for damage	
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Injector cleaned	
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Carbon electrode of chlorine cell replaced	
Brine tank cleaned	
Flushing water hose checked for tightness during operation	
Brine hose checked for tightness during operation	
Manual regeneration released	
Function of the disinfection unit checked (Bubbles in brine line during salting)	
Regeneration counter reading retrieved	
Total soft water volume reading retrieved	

Remarks

Date:
Company:
CS-Technician:
Work time certificate (no.):
Signature:

Operating values	
Water pressure [bar]	
Water meter reading at residential water installation [m³]	
Raw water hardness (measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Set raw water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Soft water hardness (measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Readjusted soft water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	

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Hose connections checked	
Cable checked for damage	
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Injector sieve cleaned	
Carbon electrode of chlorine cell cleaned	
Carbon electrode of chlorine cell replaced	
Brine tank cleaned	
Flushing water hose checked for tightness during operation	
Brine hose checked for tightness during operation	
Manual regeneration released	
Function of the disinfection unit checked (Bubbles in brine line during salting)	
Regeneration counter reading retrieved	
Total soft water volume reading retrieved	

Remarks

Date:
Company:
CS-Technician:
Work time certificate (no.):
Signature:

Operating values	
Water pressure [bar]	
Water meter reading at residential water installation [m³]	
Raw water hardness(measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Set raw water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Soft water hardness (measured) ☐ [°dH] ☐ [°f] ☐ [mmol/l]	
Readjusted soft water hardness ☐ [°dH] ☐ [°f] ☐ [mmol/l]	

Functional check / Maintenance work	
Hose connections checked	
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Carbon electrode of chlorine cell replaced	
Brine tank cleaned	
Flushing water hose checked for tightness during operation	
Brine hose checked for tightness during operation	
Manual regeneration released	
Function of the disinfection unit checked (Bubbles in brine line during salting)	
Regeneration counter reading retrieved	
Total soft water volume reading retrieved	

Remarks

Date:
Company:
CS-Technician:
Work time certificate (no.):
Signature: