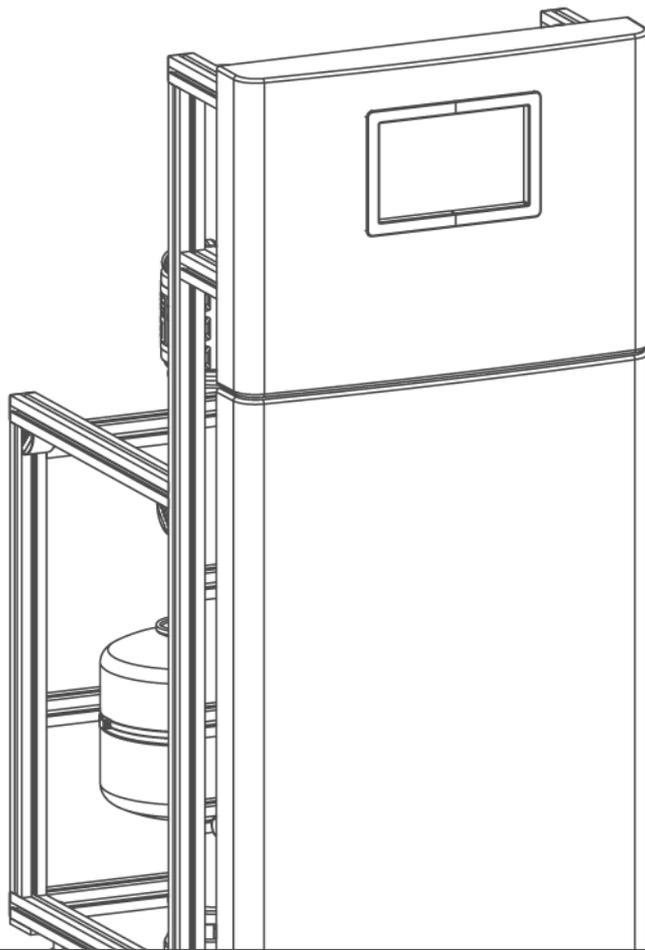


We understand water.



Ultrafiltration | ultraliQ:SB

Operation manual

grünbeck

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Original operation manual
Edition: February 2022
Order no.: 100243460000_en_024

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1 Introduction

This manual is intended for owners/operators/operating companies, users as well as qualified specialists and ensures the safe and efficient handling of the product. The manual is an integral part of the product.

- ▶ Carefully read this manual and the included manuals on the components before you operate your product.
- ▶ Obey all safety and handling instructions.
- ▶ Keep this manual and all other applicable documents, so that they are available when needed.

Illustrations in this manual are for basic understanding and can differ from the actual design.

1.1 Validity of the manual

This manual applies to the products below:

- Ultrafiltration ultraliQ:SB500
- Ultrafiltration ultraliQ:SB1000
- Ultrafiltration ultraliQ:SB1500
- Ultrafiltration ultraliQ:SB2000
- Special designs that essentially correspond to the standard products given above. For information on changes, please refer to the respective information sheet that is enclosed, if applicable.

1.2 Other applicable documents

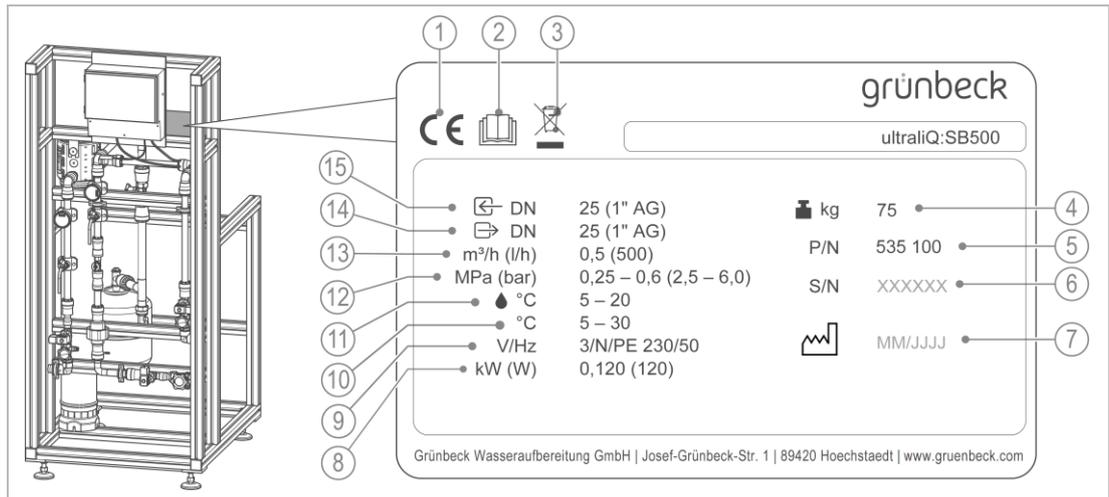
- Manuals for components from other manufacturers
- Safety data sheets for chemicals
- Electric circuit diagram, order no.: 561 015

1.3 Product identification

You can identify your product based on the product designation and the order number shown on the type plate.

- ▶ Check whether the products indicated in chapter 1.1 correspond to your product.

The type plate is mounted on the rack.



Designation	
1	CE mark
2	Obey the operation manual
3	Disposal information
4	Empty weight
5	Order no.
6	Serial no.
7	Date of manufacture
8	Connected load

Designation	
9	Power supply
10	Ambient temperature
11	Water temperature
12	Operating pressure
13	Nominal filtrate capacity
14	Nominal connection diameter of filtrate outlet
15	Nominal connection diameter of raw water inlet

1.4 Symbols used

Symbol	Meaning
	Danger and risk
	Important information or requirement
	Useful information or tip
	Written documentation required
	Reference to further documents
	Work that must be carried out by qualified specialists only
	Work that must be carried out by qualified electricians only
	Work that must be carried out by technical service personnel only

1.5 Depiction of warnings

This manual contains information and instructions that you must obey for your personal safety. The information and instructions are highlighted by a warning symbol and are structured as shown below:



SIGNAL WORD Type and source of hazard

- Possible consequences
- ▶ Preventive measures

The signal words below are defined subject to the degree of danger and might be used in the present document:

Warning symbol and signal word	Consequences if the information/instructions are ignored	
DANGER		Death or serious injuries
WARNING	Personal injury	Possible death or serious injuries
CAUTION		Possible moderate or minor injuries
NOTE	Damage to property	Possible damage to components, the product and/or its function or damage to an object in its vicinity

1.6 Demands on personnel

During the individual life cycle phases of the product, different people carry out work on the product. The respective tasks require different skills.

1.6.1 Qualification of personnel

Personnel	Requirements
User	<ul style="list-style-type: none"> No special expertise required Knowledge of the tasks assigned Knowledge of possible dangers in case of incorrect behaviour Knowledge of the required protective equipment and protective measures Knowledge of residual risks
Owner/operator/ operating company	<ul style="list-style-type: none"> Product-specific expertise Knowledge of statutory regulations on work safety and accident prevention
Qualified specialist <ul style="list-style-type: none"> Electrical engineering Sanitary engineering (HVAC and plumbing) Transport 	<ul style="list-style-type: none"> Professional training Knowledge of relevant standards and regulations Knowledge of detection and prevention of potential hazards Knowledge of statutory regulations on accident prevention
Technical service (Grünbeck's technical service/ authorised service company)	<ul style="list-style-type: none"> Extended product-specific expertise Trained by Grünbeck

1.6.2 Authorisations of personnel

The table below describes which tasks may be carried out by whom.

	User	Owner/operator/ operating company	Qualified specialist	Technical service
Transport and storage			X	X
Installation and mounting			X	X
Start-up/commissioning			X	X
Operation and handling	X	X	X	X
Cleaning		X	X	X
Inspection	X	X	X	X
Maintenance annually				X
Troubleshooting			X	X
Repair			X	X
Decommissioning and restart/recommissioning			X	X
Dismantling and disposal			X	X

1.6.3 Personal protective equipment

- ▶ As an owner/operator/operating company, make sure that the required personal protective equipment is available.

The components below fall under the heading of personal protective equipment (PPE):



Protective gloves



Protective footwear



Protective overall



Safety goggles



Mask



Protective apron

2 Safety

2.1 Safety measures

- Only operate your product if all components are installed properly.
- Obey the local regulations on drinking water protection, accident prevention and occupational safety.
- Do not make any changes, alterations, extensions or program changes on your product.
- Only use genuine spare parts for maintenance or repair.
- Keep the premises locked against unauthorised access to protect imperilled or untrained persons from residual risks.
- Comply with the maintenance intervals (refer to chapter 8.2). Failure to comply can result in the microbiological contamination of your drinking water system.

2.1.1 Mechanical hazards

- You must never remove, bridge, or otherwise tamper with safety equipment.
- For all work on the system that cannot be carried out from the ground, use stable, safe and self-standing access aids (e.g. stepladders).
- Make sure that the system is set up in a way that it cannot tip over and that the stability of the system is guaranteed at all times.

2.1.2 Pressure-related hazards

- Components may be under pressure. Risk of injuries and damage to property due to escaping water and unexpected movement of components. Check the system's pressure lines for leaks at regular intervals.
- Make sure that all system components concerned are depressurised before starting any repair and maintenance work.

2.1.3 Electrical hazards

In case of contact with live components, there is an immediate risk of death due to electric shock. Damage to insulation or individual components can be life-threatening.

- Only have qualified electricians carry out electrical work on the system.
- If live components are damaged, immediately switch off the power supply and arrange for repair.
- Switch off the supply voltage before working on electrical system parts. Discharge residual voltage.
- Never bridge electrical fuses. Do not disable fuses. Use the correct current ratings when replacing fuses.
- Keep moisture away from live parts. Moisture can cause short-circuits.

2.1.4 Danger due to chemicals

- Chemicals can be hazardous to health and environment. They can cause chemical skin and eye burns as well as irritation of the respiratory tract, or allergic reactions.
- Avoid any skin/eye contact with chemicals.
- Use personal protective equipment.
- Read the safety data sheet before handling chemicals and always obey the instructions for the different actions/situations.
- Current safety data sheets for chemicals are available for download at **www.gruenbeck.de/en/info-centre/safety-data-sheets**.
- Obey internal instructions when handling chemicals and make sure that any protective and emergency equipment such as emergency showers and eye showers is present and functional.

Mixing and residual amounts of chemicals

- Never mix different chemicals. Unforeseeable chemical reactions posing a lethal danger can occur.
- Dispose of residual amounts of chemicals in accordance with local regulations and/or internal instructions.
- Residual amounts from used containers should not be transferred into containers with fresh chemicals in order not to impair the effectiveness of the chemicals.

Labelling/Minimum shelf life/Storage of chemicals

- Check the labelling of the chemicals - labels must not be removed or rendered illegible.
- Do not use any unknown chemicals (no labelling or labelling illegible).
- Obey the use-by date (minimum shelf life) stated on the label to ensure the functionality of the system and the quality of the generated filtrate.
- If stored incorrectly, chemicals could change their state of matter, crystallise, outgas, or lose their effectiveness. Store and use the chemicals at the indicated temperatures only.

Cleaning/Disposal

- Immediately absorb leaked chemicals with suitable binding agents.
- Collect and dispose of chemicals in such a way that they cannot pose a risk to people, animals, or the environment.

2.1.5 Groups of persons requiring protection

- This product is not designed to be used by persons (including children) with reduced capabilities, lack of experience or lack of knowledge. Unless they are supervised, have been instructed on the safe use of the product and understand the resulting hazards.

2.2 Product-specific safety instructions

Diaphragm expansion tanks operate with a nitrogen or compressed air cushion and are subject to the Pressure Equipment Directive 97/23/EC.

- In the event of leaks, there is a risk of nitrogen escaping.
 - ▶ Check the diaphragm expansion tank(s) regularly for leaks (refer to chapter 8.4.2).

2.2.1 Signals and warning devices

Warnings/pictograms



Danger of electric shock (attached to the switch box)

- ▶ Disconnect the system from the power supply before working on electrical system parts



The affixed information and pictograms must be clearly legible. They must not be removed, soiled or painted over.

- ▶ Obey all warnings and safety instructions.
- ▶ Immediately replace illegible or damaged symbols and pictograms.

2.3 Conduct in emergencies

2.3.1 In case of water leaks

1. De-energise the system – unplug the power plug.
2. Locate the leak.
3. Eliminate the cause of the water leak.

3 Product description

3.1 Intended use

The ultrafiltration system ultraliQ is designed for the fully automatic reduction of solid particles, turbidities and micro-organisms in the raw water.

The ultrafiltration system is suitable for use in private water supply systems.



If the ultrafiltration system ultraliQ is used for drinking water supply, the provisions of DIN 2001-1, DIN 1988 as well as DIN EN 1717 must be complied with.

3.1.1 Application limits

Parameters		SB500	SB1000	SB1500	SB2000
Turbidity (on average)	NTU		< 15.0		
Turbidity (short-term)	NTU		< 30.0		
TOC	mg/l		< 5.0		
Oils/greases/hydrocarbons		not detectable			

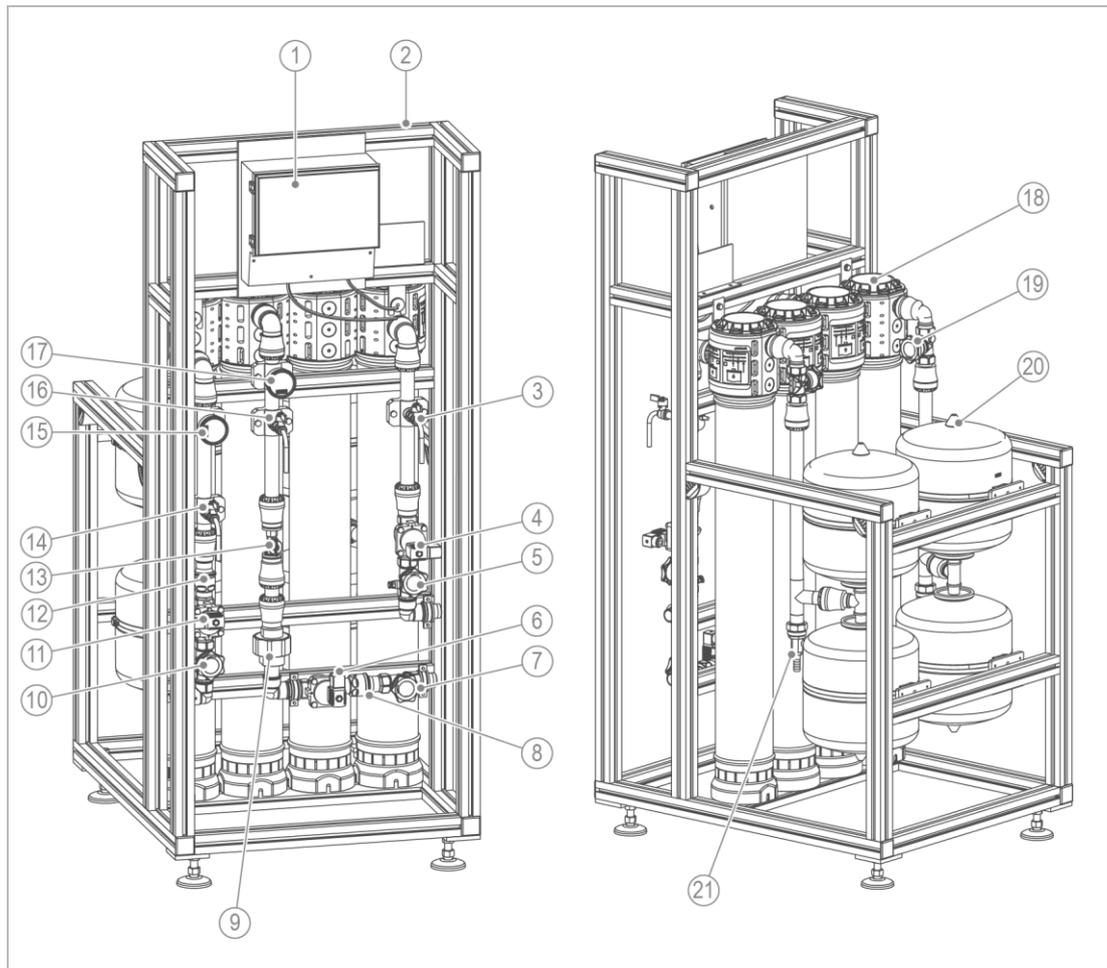


For all other water constituents contained in the raw water, with the exception of the microbiological parameters, the limit values of the German Drinking Water Ordinance (TrinkwV 2001) do apply.



Any required preliminary treatment stages (such as the oxidation filter system fermaliQ:MA for the reduction of iron, manganese and ammonium) are available from Grünbeck upon request.

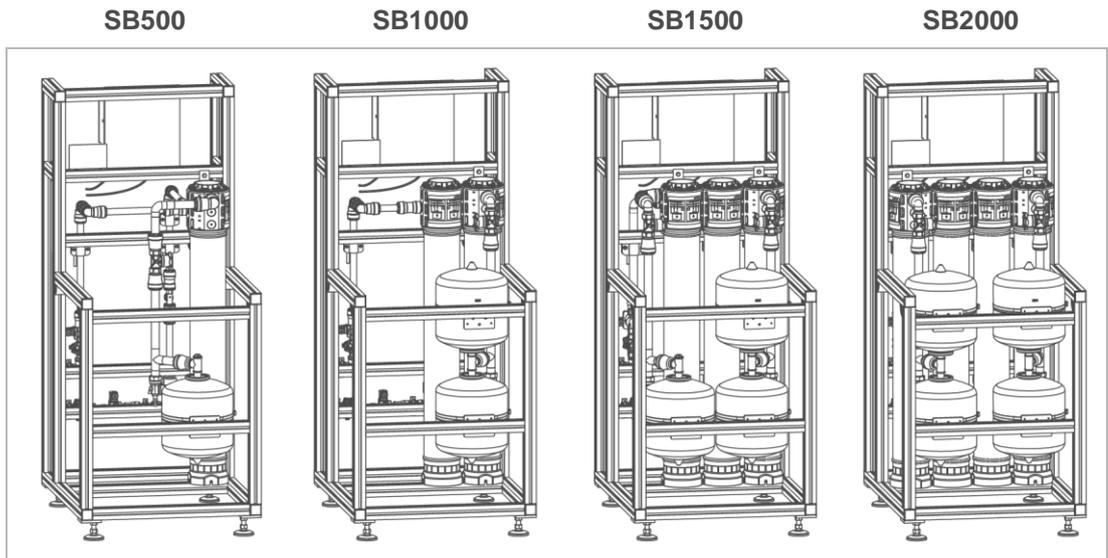
3.2 Product components



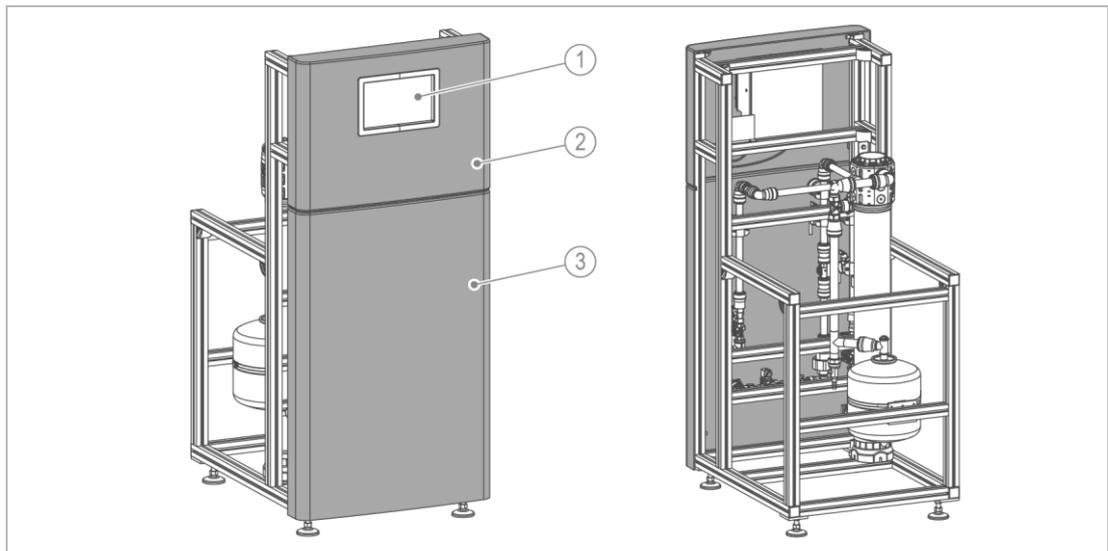
Designation	Function	Coding
1 Switch box	GENO-matic control unit	1UF1AE01
2 System rack	Made of anodised aluminium with adjustable feet	–
3 Sampling valve Flushing waste water	Flame-sterilisable sampling valve for taking water samples and flushing out the preserving agent	1UF1AH53
4 Solenoid valve Flushing waste water	Automatic valve to discharge the flushing waste water	1UF1AV02
5 Shut-off valve Flushing waste water	Piston valve to separate the system from the on-site pipe network	1UF1AH07
6 Solenoid valve Filtrate	Automatic valve to discharge the filtrate	1UF1AV03
7 Shut-off valve Filtrate	Piston valve to separate the system from the on-site pipe network	1UF1AH06
8 Non--return valve Filtrate	To prevent the backflow of filtrate from the on-site buffer tank during backwash and forward flush	1UF1AS03
9 Flow stabiliser	To set the filtrate volume flow	1UF1AS02
10 Shut-off valve Raw water	Piston valve to separate the system from the on-site pipe network	1UF1AH01
11 Solenoid valve Raw water	Automatic valve to supply the raw water	1UF1AV01
12 Non-return valve Raw water	To prevent the backflow of filtrate from the diaphragm expansion tank during backwash	1UF1AS01
13 Flow meter Filtrate	Flow measurement of the filtrate flow during filtration operation	1UF1ACF01

Designation	Function	Coding
14 Sampling valve Raw water	Flame-sterilisable sampling valve for taking water samples	1UF1AH51
15 Pressure indicator Raw water	Pressure gauge for visual indication of the raw water pressure applied	1UF1ACP01
16 Sampling valve Filtrate	Flame-sterilisable sampling valve for taking water samples and flushing out the preserving agent	1UF1AH52
17 Pressure indicator Filtrate	Pressure gauge for visual indication of the filtrate pressure applied	1UF1ACP02
18 Ultrafiltration module(s)	Pressure pipe with membrane	1UF1AB01 (1UF1AB02, 1UF1AB03, 1UF1AB04)
19 Shut-off valve(s) Backwash	Piston valve to separate the system from the diaphragm expansion tank	1UF1AH03 (1UF1AH04)
20 Diaphragm expansion tank(s)	Tank to backwash the UF module	1UF1AB05 (1UF1AB06, 1UF1AB07, 1UF1AB08)
21 Shut-off valve Draining	Mini ball valve to drain the diaphragm expansion tank	1UF1AH02 (1UF1AH05)

3.3 Versions



3.3.1 With front cover (optional)

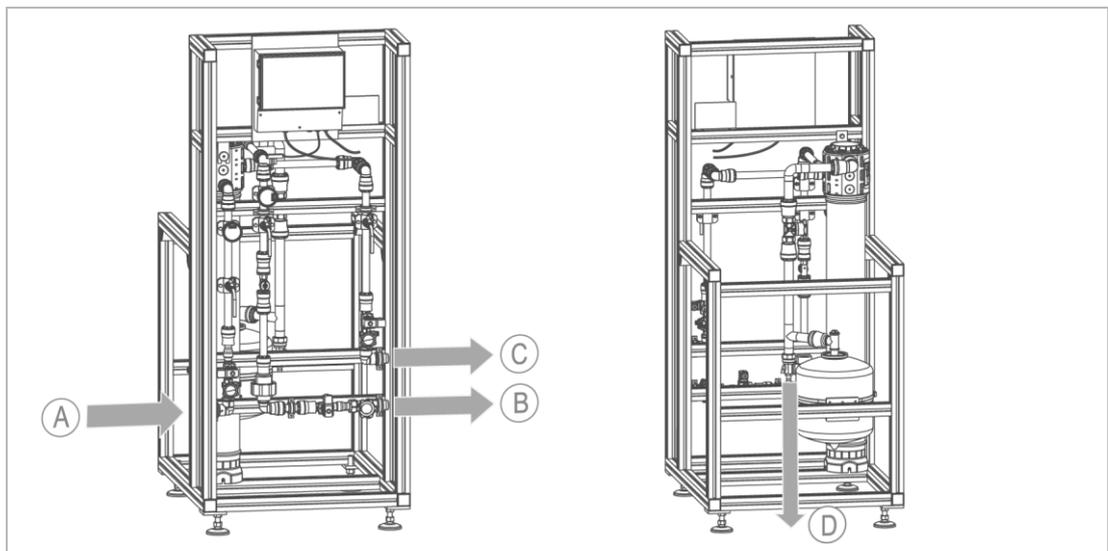


Designation	
1	Control panel of GENO-matic control unit
2	Upper cover

Designation	
3	Lower cover

- In case of the optional front cover, the control unit is moved to the front.
- The front cover consists of 2 covers.

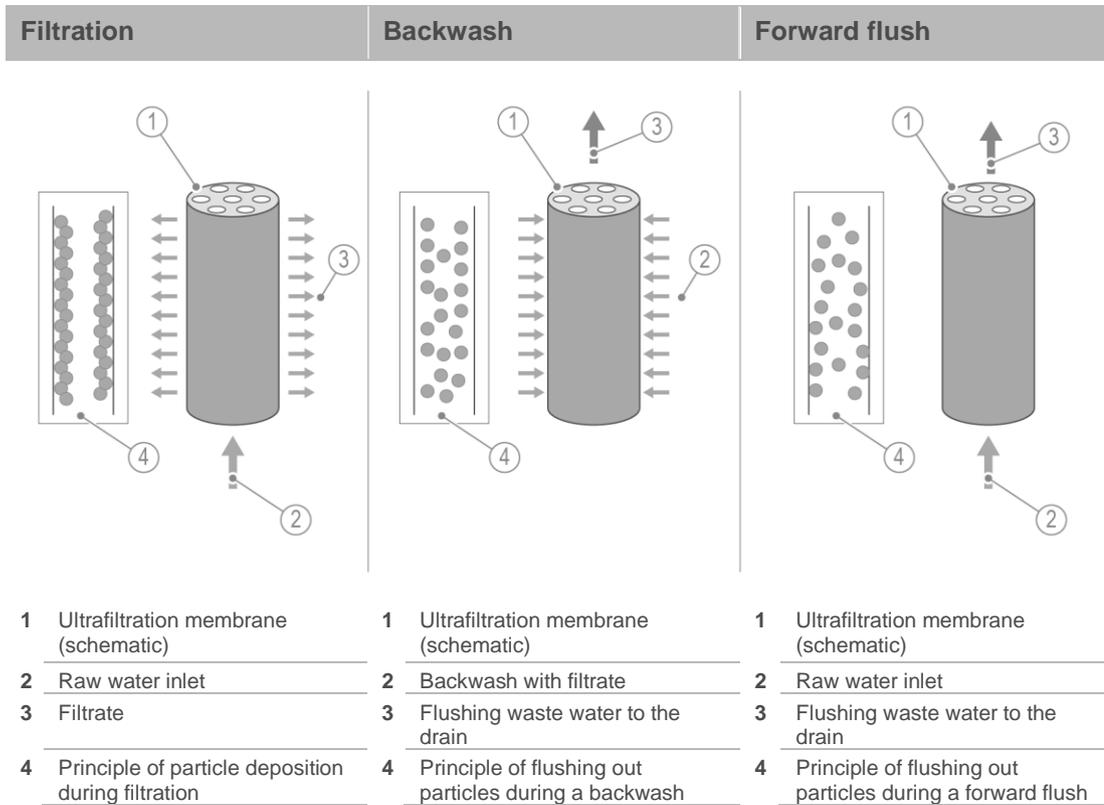
3.4 System connections



Designation	
A	Raw water inlet
B	Filtrate outlet

Designation	
C	Flushing waste water outlet
D	Draining outlet

3.5 Functional description



Filtration

Raw water is delivered into the ultrafiltration system and then pressed through the capillary membranes of the ultrafiltration elements installed in the pressure pipes. The pores of the semi-permeable membrane have a cut-off of 0.02 µm. Almost all undissolved substances contained in the water such as particles, bacteria or viruses are reliably retained on the raw water side of the membranes and a particle and germ-reduced filtrate is generated.

During the filtration process, the filtered particles are deposited on the membrane surface and increase the differential pressure (transmembrane pressure) between the raw water side and the filtrate side. This layer grows as the filtration time progresses and must be flushed from the membrane surface after each filtration interval.

Flushing the system

After each filtration interval, the ultrafiltration system is automatically flushed in 2 phases:

- Backwash with filtrate from a diaphragm expansion tank installed in the ulltraliQ:SB: The backwash process removes retained dirt particles and micro-organisms from the UF membrane.
- Forward flush with raw water: During the forward flush with raw water, the removed dirt particles and micro-organisms are flushed to the drain.

- The forced flushing processes programmed in the control unit prevent the stagnation of raw water in the UF module.

Formation of a surface layer

During operation, a surface layer is formed by the substances contained in the water (particles, turbidity, micro-organisms) retained on the UF membrane.

The formation of the surface layer (fouling) is divided into 3 categories:

- Inorganic fouling (= scaling)
 - Deposits of minerals (exceeding the solubility limit)
- Organic fouling
 - Deposits of organic components (suspended particles, macromolecules, colloidal turbidity, proteins)
- Biofouling: Fouling due to biofilms

As the filtration time progresses, the surface layer grows and leads to the effects below:

- The permeability of the membrane decreases
- The membrane resistance increases
- The transmembrane pressure (TMP) increases

Cleaning process

To remove deposits that cannot be removed by the combination of backwash and forward flush, chemical cleaning (CIP = **C**leaning **I**n **P**lace) must be carried out.

During CIP cleaning, the surface layers on the UF membrane are removed by a combination of chemicals, heat, mechanical forces and exposure time.

CIP cleaning has the effects below:

- The surface layer is removed
- The transmembrane pressure (TMP) drops
- The membrane resistance decreases
- The permeability of the membrane increases

CIP cleaning is required under the circumstances below:

- TMP has reached 0.7 bar and can no longer be reduced by the automatic flushing steps (backwash, forward flush)

3.6 Accessories



You can retrofit your product with accessories. Please contact your local Grünbeck representative or Grünbeck's headquarters in Hoechststadt/Germany for details.

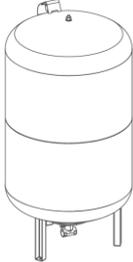
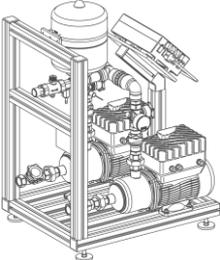
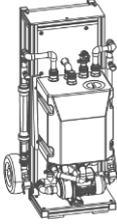
Illustration	Product	Order no.
	Diaphragm expansion tank DD 33, G^{3/4} To prevent water hammer in the inlet if a pressurised water tank provided by the client on site is used to store the filtrate.	33 l each 890 60 304
	Diaphragm expansion tank As an addition to an existing diaphragm expansion tank – or for new installations – for water supply during the flushing process of the ultrafiltration system	25 l 535 105 60 l 535 115 80 l 535 125 100 l 535 135 300 l 535 155 500 l 535 165
	Pressurised water tank, 6 bar As an addition to an existing pressurised water tank – or for new installations – for water supply during the flushing process of the ultrafiltration system	150 l 530 505 300 l 530 515 500 l 530 525 750 l 530 535 1000 l 530 545
	Basic pure water tank GT 1000 For the unpressurised storage of filtrate	without sterile air filter 712000010000 with sterile air filter 712000020000
	Pressure booster systems Automatically controlled via pressure and flow controller Speed-controlled by means of a pressure sensor as well as frequency converter	GENO-HR-X 2/40-1 N 730 460 GENO-FU-X 2/40-1 N 730 640

Illustration	Product	Order no.
	<p>Mobile cleaning system CIP:UF60 For the chemical cleaning of ultrafiltration systems</p>	778 100

3.7 Optional accessories



You can retrofit your product with optional equipment. Please contact your local Grünbeck representative or Grünbeck's headquarters in Hoechstädt/Germany for details.

Product	Order no.
Front cover ultraliQ:SB	535 138
Control unit S7-1200 for ultraliQ	535 060

4 Transport, set-up and storage

4.1 Shipping/Delivery/Packaging

The system is fixed on a pallet at the factory and secured against tipping.

- ▶ Load and unload the system with a forklift or lift truck with suitable pallet forks. Be aware of the system's top-heavy centre of gravity.



NOTE

Risk of damage when lifting the system with a crane and lifting strap.

- The system does not feature any lifting points for lifting by a crane and lifting strap.
- ▶ The system must not be loaded/unloaded by crane and lifting strap.
- ▶ Dispose of the packaging material in an environmentally sound and appropriate manner only after installation of the system (refer to chapter 6.5.1).

4.2 Transport/Set-up



WARNING

Risk of tipping in case of improper transport.

- The system's centre of gravity is top-heavy. The system can tip and crush persons/limbs.
- ▶ Transport the system by means of a forklift or lift truck with appropriate forks only – obey the marked pick-up direction
- ▶ Do not transport the system over inclines or stairs.
- ▶ Transport the system to the installation site (longer distances) in its original packaging and secured on a pallet only.
- ▶ Transport the unpacked system (without pallet) in close vicinity of the final installation site only – do not lift it at the system rack.
- ▶ Remove the transport lock, if present.

4.3 Storage

- ▶ Protect the product from the impacts below when storing it:
 - Moisture, wetness
 - Environmental impacts such as wind, rain, snow, etc.
 - Frost, direct sunlight, severe heat exposure
 - Chemicals, dyes, solvents and their vapours

5 Installation



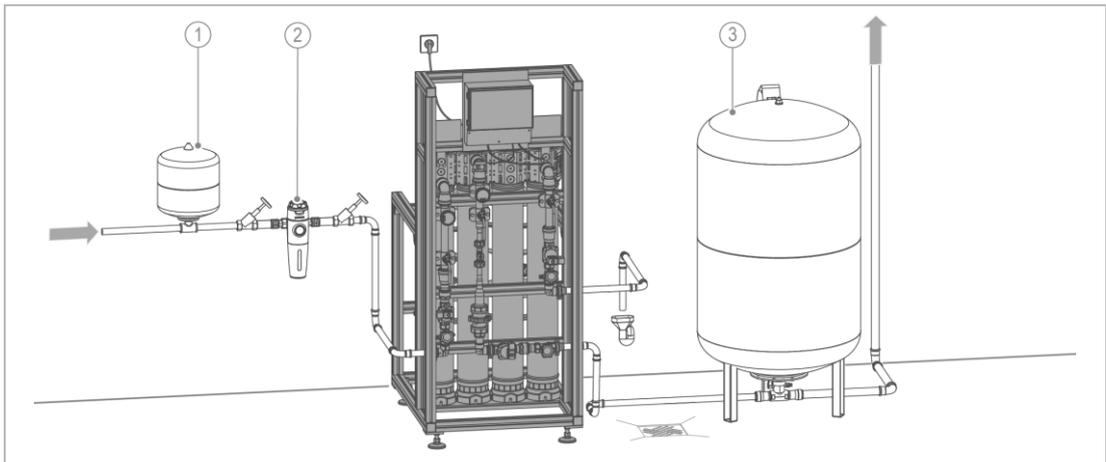
The installation of the system represents a major intervention into the water system and must be carried out by a qualified specialist only.



On-site interfaces (incl. fittings, tanks) must be in perfect condition (no dirt, no rust, no suspected microbial contamination)

► Clean and disinfect the water system before installation, if necessary

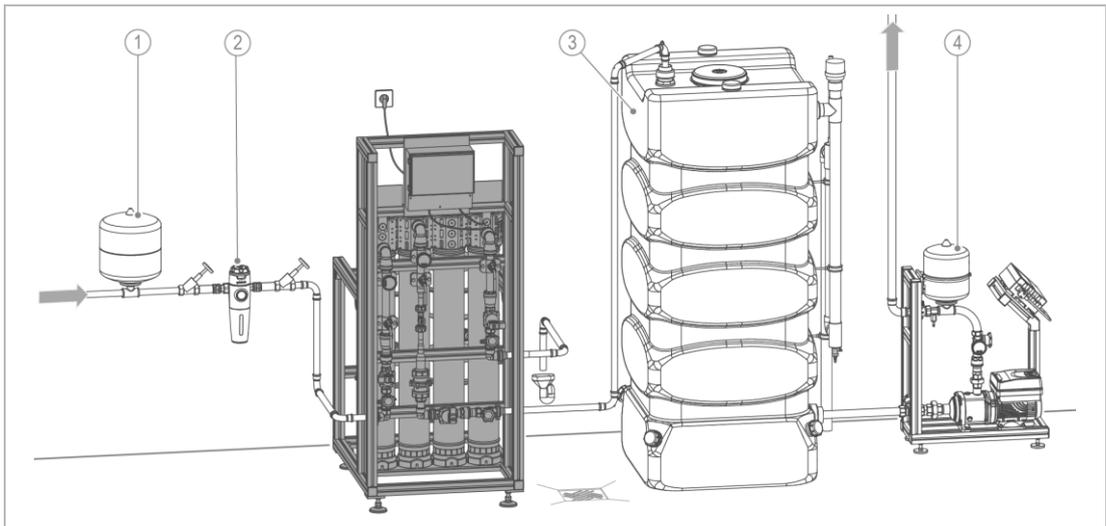
Installation example: ultraliQ:SB2000 with diaphragm expansion tank/pressurised water tank



Designation	
1	Diaphragm expansion tank
2	Fine filter with pressure reducer

Designation	
3	Diaphragm expansion tank/pressurised water tank (buffer tank)

Installation example: ultraliQ:SB2000 with unpressurised tank and pressure booster system



Designation	
1	Diaphragm expansion tank
2	Fine filter with pressure reducer

Designation	
3	Unpressurised tank
4	Pressure booster system

5.1 Requirements for the installation site

Obey the local installation directives, general guidelines and technical specifications.

- The installation site must be frost-proof and protect the system from chemicals, dyes, solvents and their vapours.
- Avoid strong heat radiation and direct sunlight.
- The installation site must be adequately illuminated and ventilated.
- A sufficiently dimensioned drain connection must be available (refer to chapter 12).
- A floor drain suitable for the respective system size must be available at the installation site. If no floor drain is available, the client must install a flushing waste water tank including waste water lifting system on site.
- Lifting systems must be secured against power failure.

5.1.1 Placing of the system/Required space

- The sufficiently dimensioned installation surface of the system (foundation) must be level and have sufficient strength and load-bearing capacity to support the operating weight of the system.
- The system must be accessible for maintenance and repair work. All necessary operating aisles and heights must be kept free in addition to the depth/width/height of the system
 - Front: 800 mm, left: 500 mm, right: 500 mm, height: 200 mm
- The room/installation height should at least be 2000 mm.

5.1.2 Products installed upstream and downstream

The components below must be installed upstream and downstream of the system by the client on site:

Upstream of the ultrafiltration system (on raw water side)

- Well pump with pressure switch control (only for use with well/spring water)



If the well pump is a centrifugal pump, it can be integrated via an enable signal.

- Diaphragm expansion tank to prevent water hammer (refer to chapter 3.6)
- Fine filter (pore size $\leq 200 \mu\text{m}$) with pressure reducer

Downstream of the ultrafiltration system (on filtrate side)

- Diaphragm expansion tank or pressurised water tank
- Alternatively: Pure water tank with pressure booster system to maintain the water supply during the flushing process

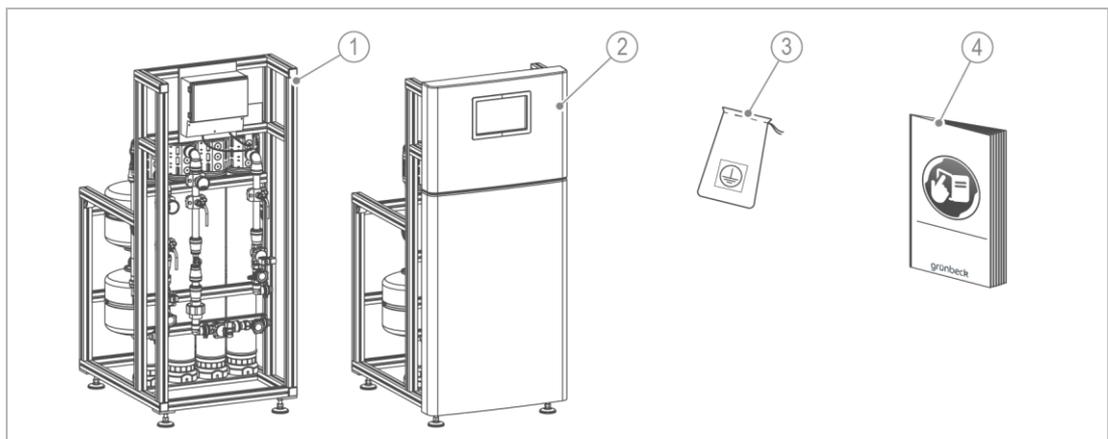
5.1.3 Requirements for electrical installation

- For electrical connection, a Schuko socket is required within a distance of approx. 1.2 m.
- The socket outlet requires permanent power supply and must not be coupled with light switches, emergency heating switches or the like.

5.2 Checking the scope of supply



The systems are pre-assembled on an aluminium rack and ready for connection.



Designation	
1	ultraliQ:SB
2	Optional: ultraliQ:SB with front cover

Designation	
3	Bag with connection material for "Potential equalisation of aluminium rack"
4	Operation manual

- ▶ Check the scope of supply for completeness and damage.

5.3 Water installation

Here, an ultraIQ:SB without any optional equipment is described as representative for all system designs. The illustrations are only exemplary representations.

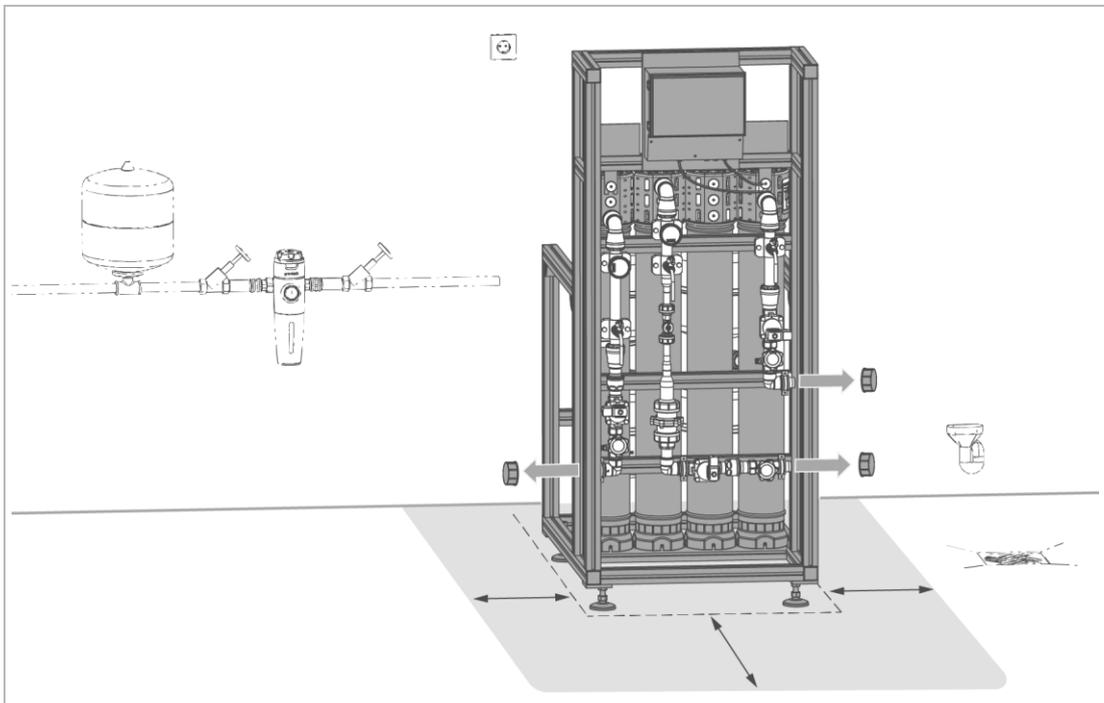
- ▶ Do all work for all versions in an analogous way.



Obey the safety instructions regarding local transport (refer to chapter 4.2).

5.3.1 Preliminary work

1. Release the system rack from the transport lock.
2. Remove the pallet.

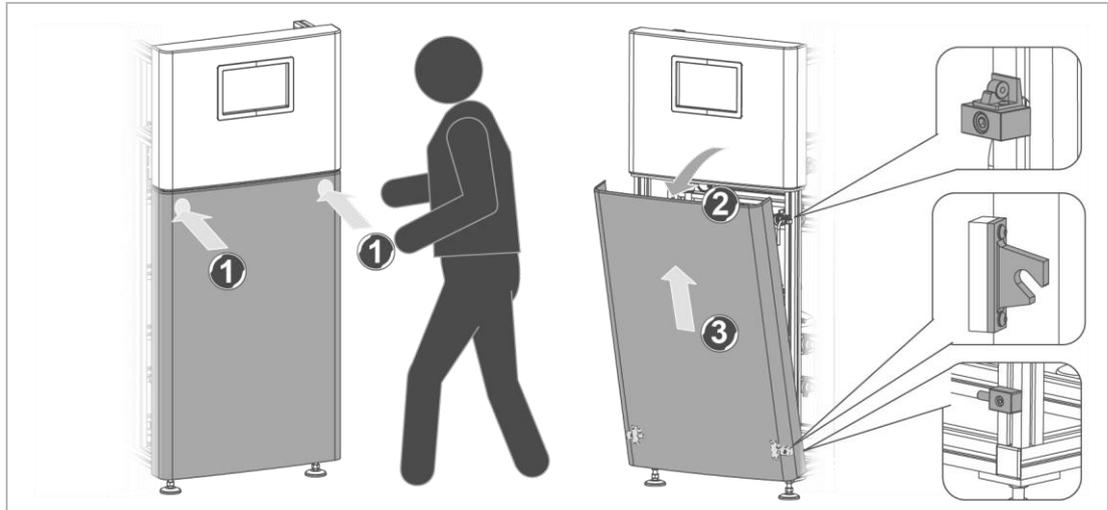


3. Securely place the system at the designated location – take note of the minimum space required.
4. Level out possible unevenness with the levelling feet.
5. Remove the protective caps from the connections.

5.3.2 Removing the front cover (optional)

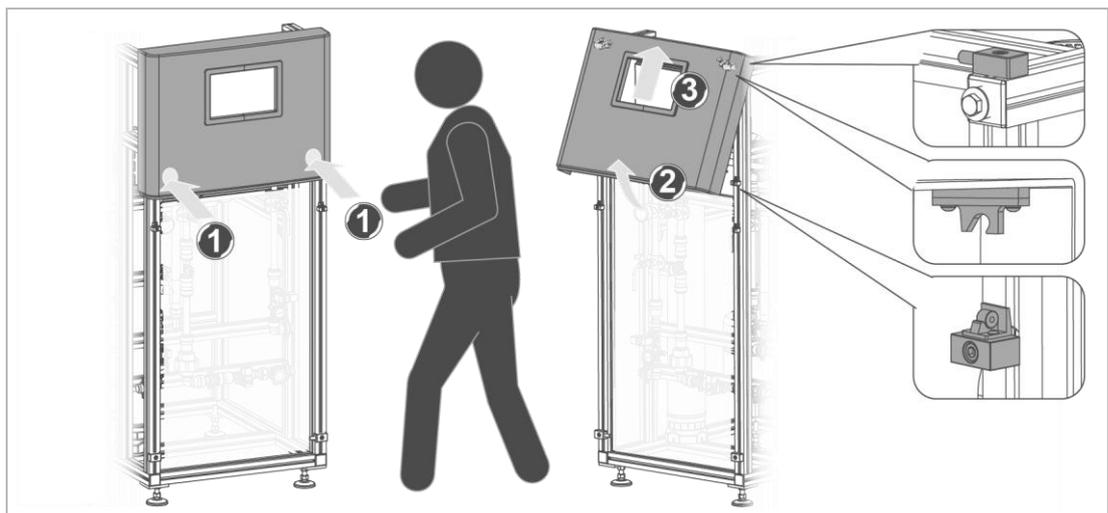
The optional front cover must be removed to be able to carry out preliminary work (installation, inspection and maintenance) on the technical equipment.

Removing the lower cover



1. Push the cover against the system rack at the upper corners.
 - » The snap-fit connections release the cover.
2. Tilt the top of the cover forwards.
3. Lift off the cover from the lower mounting bracket.
4. Put the cover down and secure it against toppling.

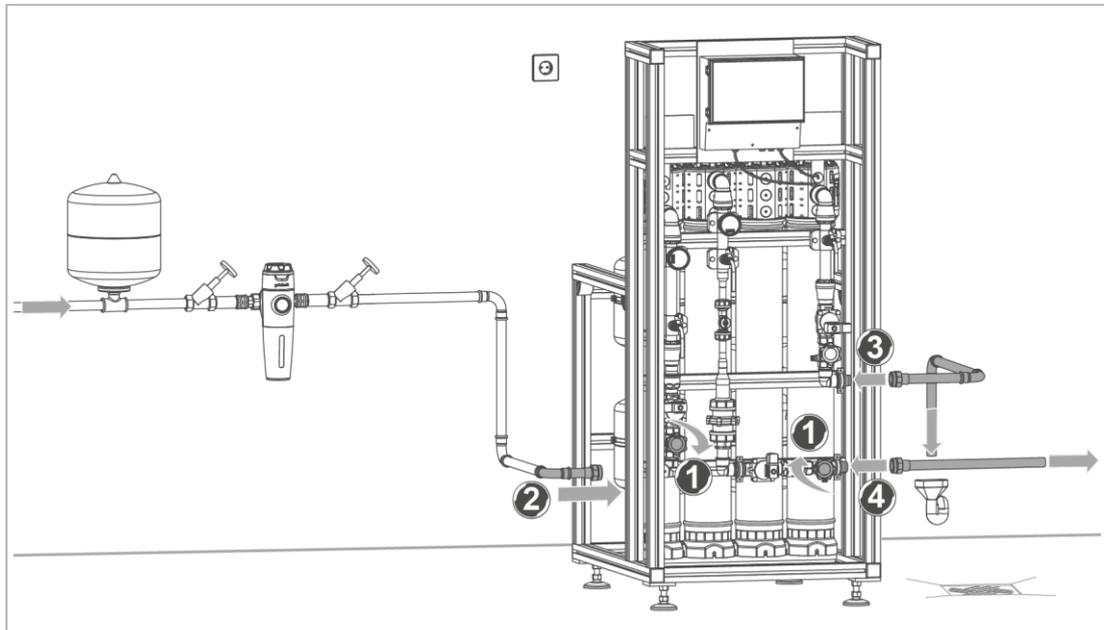
Removing the upper cover



1. Push the cover against the system rack at the bottom corners.
 - » The snap-fit connections release the cover.
2. Lift off the cover from the upper mounting bracket.
3. Tilt the cover forwards on the underside.

4. Put the cover down and secure it against toppling.
 - » The front cover is removed.

5.3.3 Connecting the system



1. Close the shut-off valves for raw water inlet and filtrate outlet.
2. Connect the raw water inlet to the on-site raw water connection. Obey the allowable operating pressure (refer to Technical specifications, chapter 12).
3. Connect the flushing waste water outlet to the drain connection (with free outlet according to DIN 1988-100 and DIN EN 1717).
4. Connect the filtrate outlet to the filtrate supply tank (e.g. diaphragm expansion tank, pressurised water tank or unpressurised tank).

5.4 Electrical installation



The electrical installation must be carried out by a qualified electrician only.



DANGER Dangerous voltage of 230 V

- Severe burns, cardiovascular failure, fatal electric shock
- ▶ Only have qualified electricians carry out electrical work on the system.



The system is electrically pre-installed in the factory and must not be modified.

- ▶ Conduct an inspection of the installation in accordance with DIN EN 60204 at the installation site.

Cable connections within the control unit

Einspeisung power supply			Magnetventil 1UF1AV01 solenoid valve			Magnetventil 1UF1AV02 solenoid valve			Magnetventil 1UF1AV03 solenoid valve			Sammelstörung collective fault			Freigabe Zu- laufpumpe release for inlet pump		Uni. Stop- eingang universal stop input		Pegel Filtrattank level filtrate tank			Wasserzähler water meter		
230V/50Hz			230V/50Hz			230V/50Hz			230V/50Hz			pot. frei pot. free			pot. frei pot. free		24V DC		24V DC			12V DC		
PE	N	L	N	PE	L	N	PE	L	N	PE	L	n. c.	Com.	n. o.	n. o.	Com.	n. c.	Com.	A	B	Com.	GND	IMP	12V
3	2	1	8	4	7	11	6	14	12	4	15	18	19	20	37	38	24	21	25	26	22	28	29	30

TDB-0016206_00

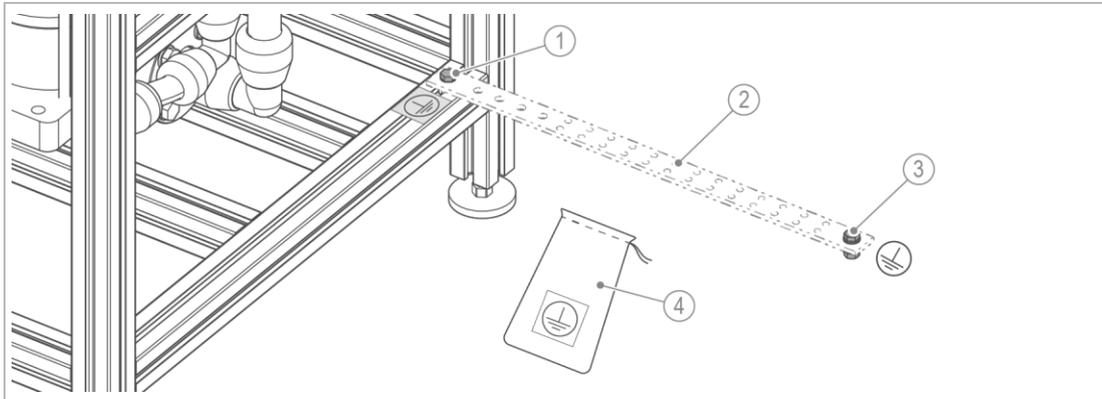
Ter m.	Signal	Colour	Function	Line	Comments
3	PE	GN/YE	Feed-in	230 V/50 Hz	Voltage supply Fuse max. 4 A
2	N	BU			
1	L	BN			
8	N	2	Solenoid valve 1UF1AV01	230 V/50 Hz	Oilflex 3G0.75 mm ² Activation 8 W
4	PE	GN/YE			
7	L	1			
11	N	2	Solenoid valve 1UF1AV02	230 V/50 Hz	Oilflex 3G0.75 mm ² Activation 8 W
6	PE	GN/YE			
14	L	1			
12	N	2	Solenoid valve 1UF1AV03	230 V/50 Hz	Oilflex 3G0.75 mm ² Activation
4	PE	GN/YE			
15	L	1			
18	Normally closed contact		Collective fault	voltage-free	max. 250 V AC 8 A
19	Common				
20	Normally open contact				
37	Normally open contact		Release for inlet pump	voltage-free	Oilflex 3G0.75 mm ² max. 250 V AC 8 A
38	Common				
24	Normally closed contact		Universal stop input	24 V DC	Oilflex 2x0.75 mm ²
21	Common				
25	Level A		Level Filtrate tank	24 V DC	Oilflex 3x0.75 mm ²
26	Level B				
22	Common Level A, B				
28	GND	BK	Water meter (via pulse divider) 1UFACF01	12 V DC	Oilflex 3x0.25mm ²
29	Pulse	BU			
30	12 V DC	BN			

5.4.1 Establishing potential equalisation

► Proceed as follows to establish the connection to the on-site potential equalisation:



The protective conductor must have a minimum cross-section of 6 mm² Cu or 10 mm² Al.

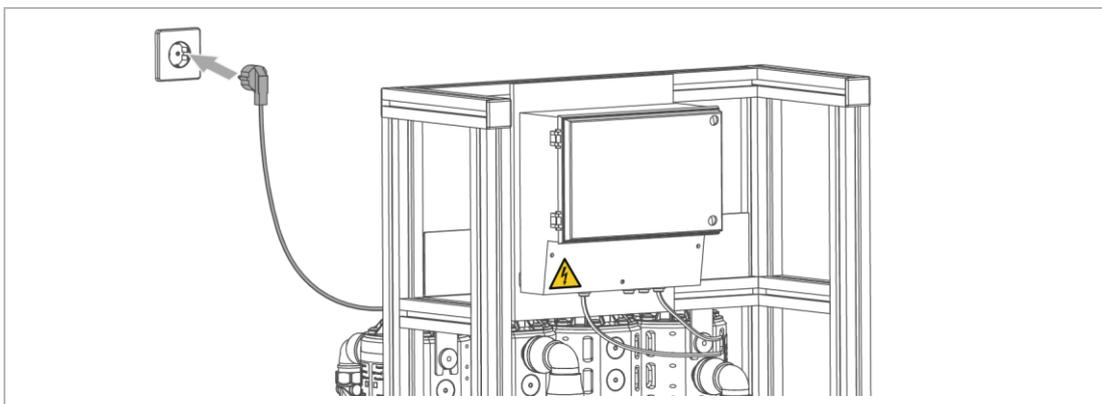


Designation

- | | |
|---|---------------------------------------------------------------------------|
| 1 | Grounding point on the aluminium rack |
| 2 | Grounding tape |
| 3 | Grounding point for potential equalisation provided by the client on site |
| 4 | Bag with connection material (included in the scope of supply) |

1. Connect the grounding point to the aluminium rack – use the connection material: Hammer nut, hexagon head screw M8x30 and serrated washer.
2. Attach the “Grounding” label.
3. Connect the protective conductor to the potential equalisation provided by the client on site – use the connection material: Hexagon head screw M8x20, washer and spring washer.

5.4.2 Establishing power supply



► Plug the power plug into the 230 V socket.

6 Start-up/commissioning



The initial start-up/commissioning of the product must be carried out by technical service personnel only.

6.1 Flushing out the preserving agent

Systems that were preserved in the factory are marked accordingly.

For the duration of storage and transport, the membrane(s) is (are) protected by means of a preserving agent.



Prerequisite:

To flush out the preserving agent, the system must be connected on the raw water side and sufficient water pressure (max. 6.0 bar) must be available.



WARNING Contact with preserving agent

- Risk of chemical burns to the eyes/skin
- ▶ Use personal protective equipment (PPE).
- ▶ Obey the safety data sheet of the chemical.

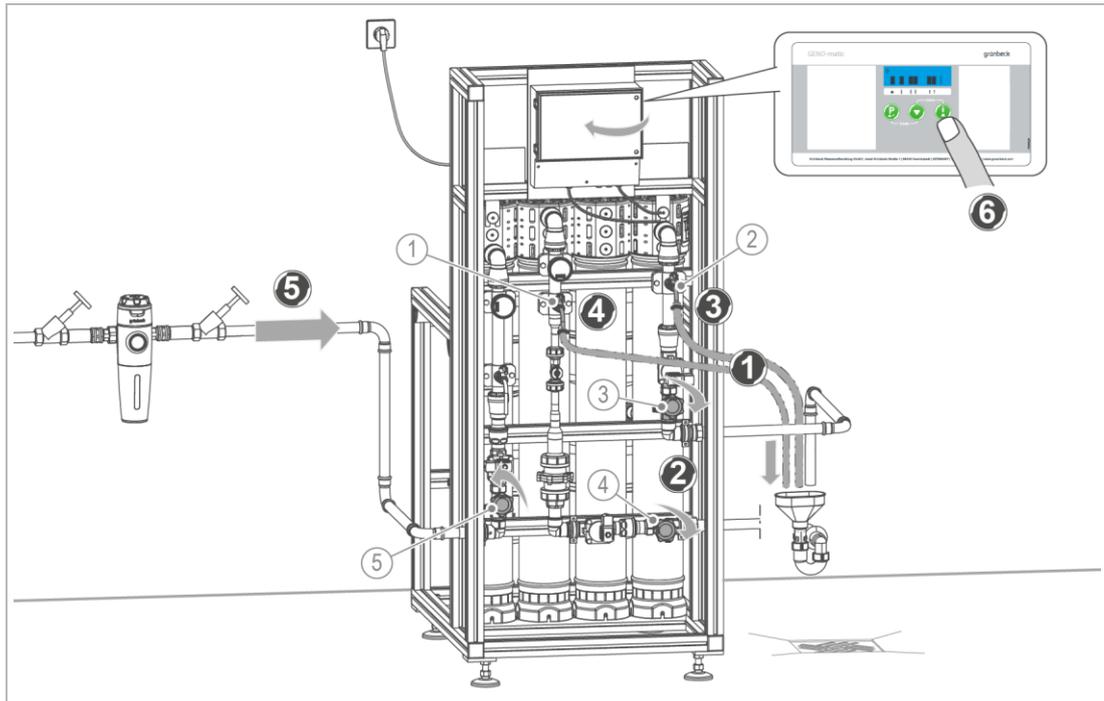


WARNING Danger from contaminated water/medium when flushing

- Contamination of the medium by preserving agents
- Illness/infection when consuming contaminated water
- ▶ Make sure that flushing water does not get into the water installation leading to the consumer.
- ▶ Direct the flushing water to the drain.

Proceed as follows to flush out the preserving agent:

Preparations



	Designation	Function	Coding
1	Sampling valve Filtrate	Here: For flushing out the preserving agent	1UF1AH52
2	Sampling valve Flushing waste water	Here: For flushing out the preserving agent	1UF1AH53
3	Shut-off valve Flushing waste water	Piston valve to separate the system from the on-site pipe network	1UF1AH07
4	Shut-off valve Filtrate	Piston valve to separate the system from the on-site pipe network	1UF1AH06
5	Shut-off valve Raw water	Piston valve to separate the system from the on-site pipe network	1UF1AH01

1. Connect hoses with hose clamps to the sampling valves for flushing waste water and filtrate.

a Route the hoses to the drain.



Alternatively, the flushing process can be carried out using a suitable container (e.g. a bucket). In this case, the container must be filled and emptied by opening and closing the corresponding sampling valves until the preserving agent has been flushed out completely.

2. Close shut-off valves for flushing waste water and filtrate.

3. Open the sampling valve for flushing waste water.

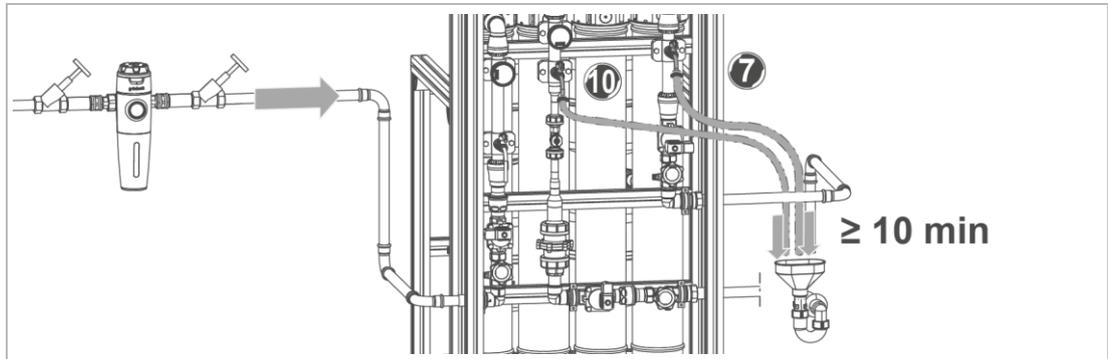
4. Close the sampling valve for filtrate.

5. Apply water to the system - Open the raw water shut-off valve.

6. Open the switch box and switch on the system using the  button on the control unit.

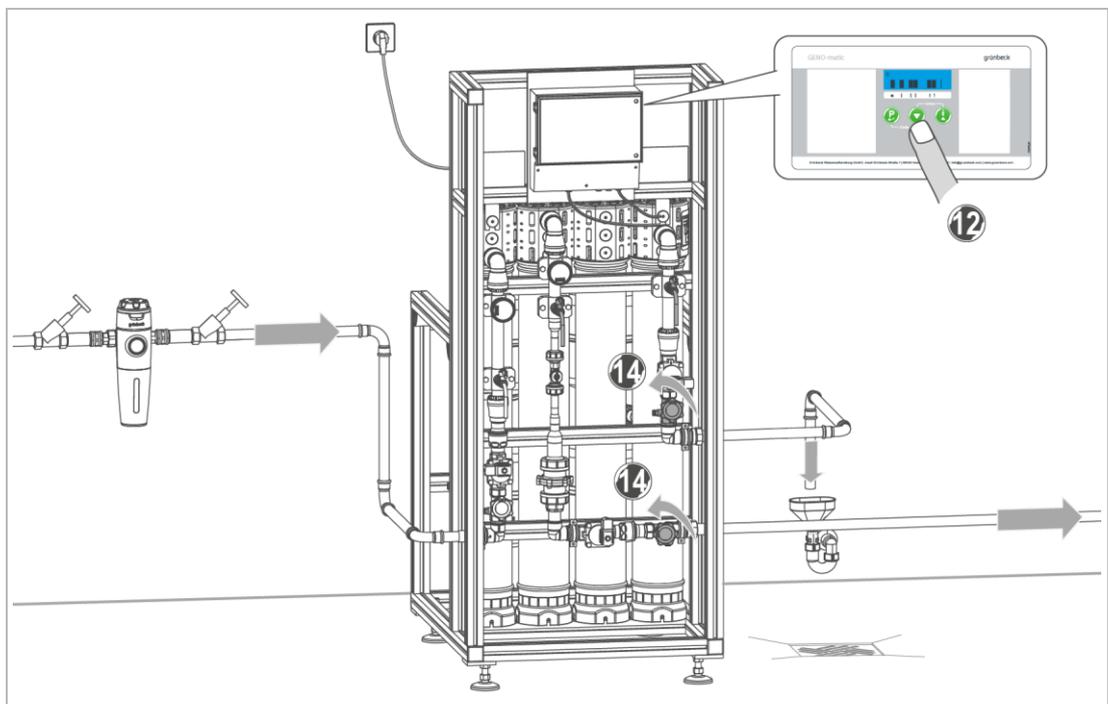
Flushing out

- ▶ Check and set the filtration interval to ≥ 30 minutes (factory setting 30 min) in the programming level (Code C 303).



7. Flush for a period of 10 minutes (this corresponds to a forward flush).
 - » The preserving agent is flushed out via the flushing waste water side.
8. Close the sampling valve for flushing waste water.
9. Open the sampling valve for filtrate.
10. Flush for a period of 10 minutes (this corresponds to filtration to the drain)
 - » The preserving agent is flushed out via the filtrate side.
11. Close the sampling valve for filtrate.

Follow-up work



12. Dismantle the hoses.
13. Open the shut-off valves for flushing waste water and filtrate.

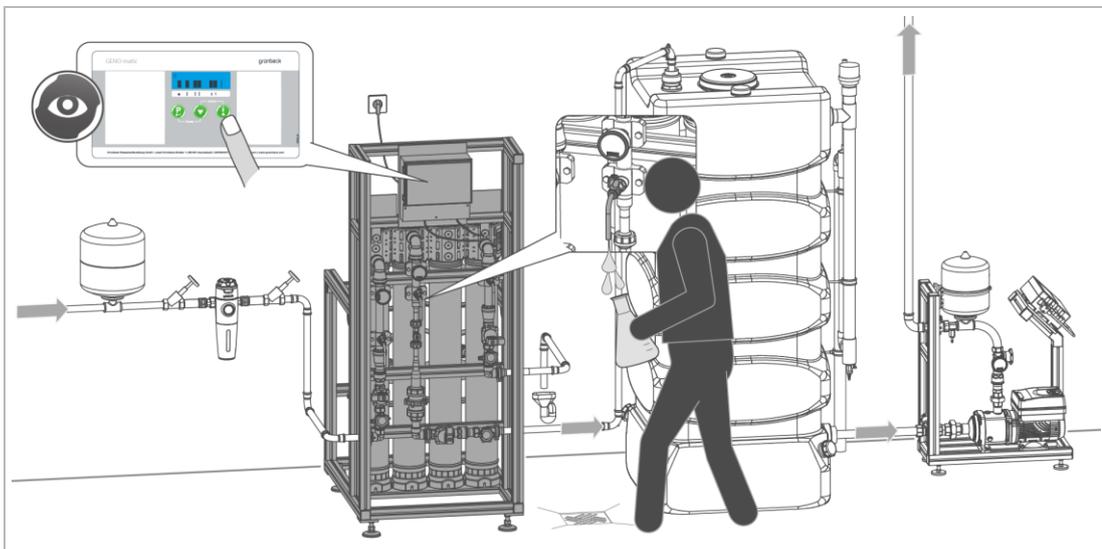
14. Reset the filtration interval to factory settings (Code C 303).
 - » The preserving agent has been flushed out of the membranes.
15. If necessary, switch off the system using the  button (press for > 5 s).

6.2 Checking the system



CAUTION Risk of slipping at the sampling points

- You might slip/fall and injure yourself.
- ▶ Use personal protective equipment – wear sturdy shoes.
- ▶ Immediately mop up escaped liquids.



1. Switch on the system at the operating panel of the control unit.
 - a Press and hold the  key for > 5 s
2. Check the system settings in the control unit (refer to chapter 7.1.3).
3. Check the system for leaks.
4. Do a test run, if necessary.
5. Take water samples of raw water and filtrate.
6. Determine the pH value and the temperature of the raw water and the filtrate and note the measured values in the start-up log (refer to chapter 13.1 “Remarks”).
7. Fill in the start-up/commissioning log (refer to chapter 13.1).

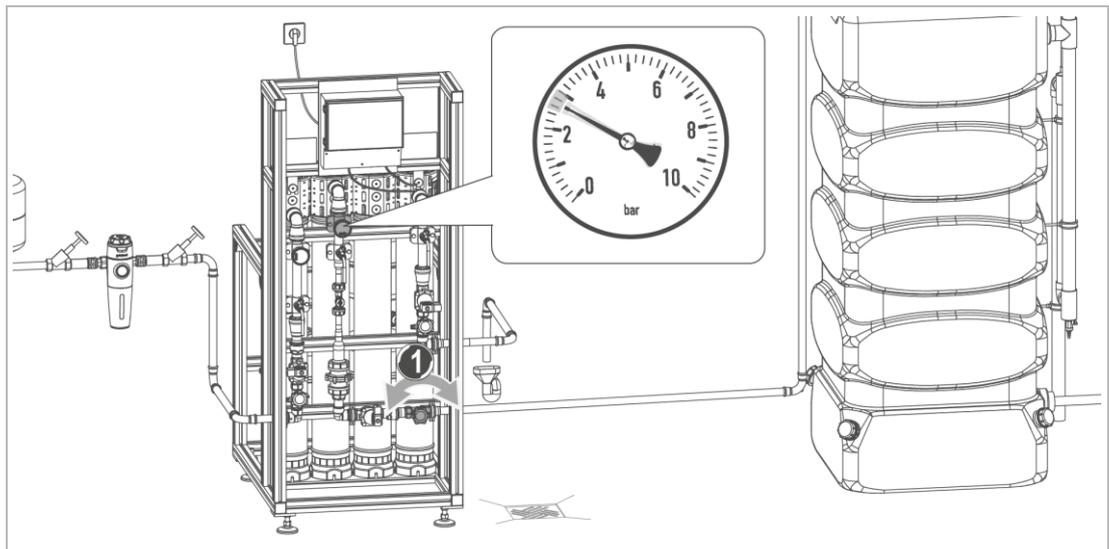
6.3 Settings in case of an unpressurised filtrate tank

Operation with unpressurised tank



If the ultraiQ is operated with an unpressurised tank installed downstream, changes must be made to the control unit. The necessary changes are described in the technical service manual (chapter 2.1) and must be carried out by a qualified specialist only.

If the filtrate produced is stored in an unpressurised (open) filtrate tank, make sure that there is sufficient pressure in the diaphragm expansion tanks. Otherwise, proper backwashing cannot be guaranteed.



1. Throttle the filtrate shut-off valve during filtration operation in a way that a pressure of 2.5 – 3.0 bar is established at the filtrate pressure indicator.
2. Check whether the backwash is carried out properly.

To check for proper functioning, the filtration interval can be temporarily shortened for this purpose via programming level “C 303” (refer to chapter 7.4).

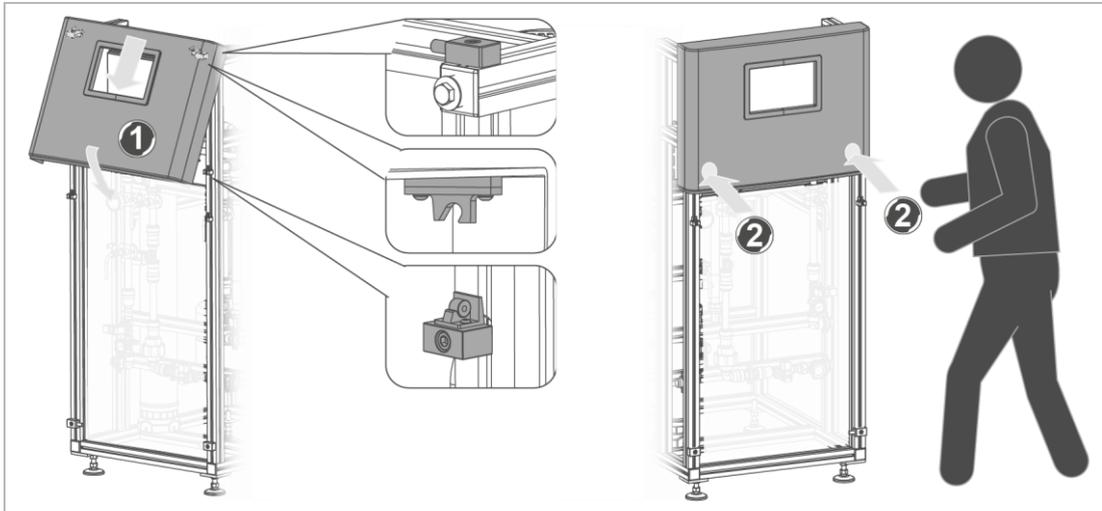


- The filtration interval must be at least 5 minutes to make sure that the diaphragm expansion tank/s is/are sufficiently filled.
- ▶ After checking and confirming a properly running backwash, restore the original settings.

6.4 Mounting the front cover (optional)

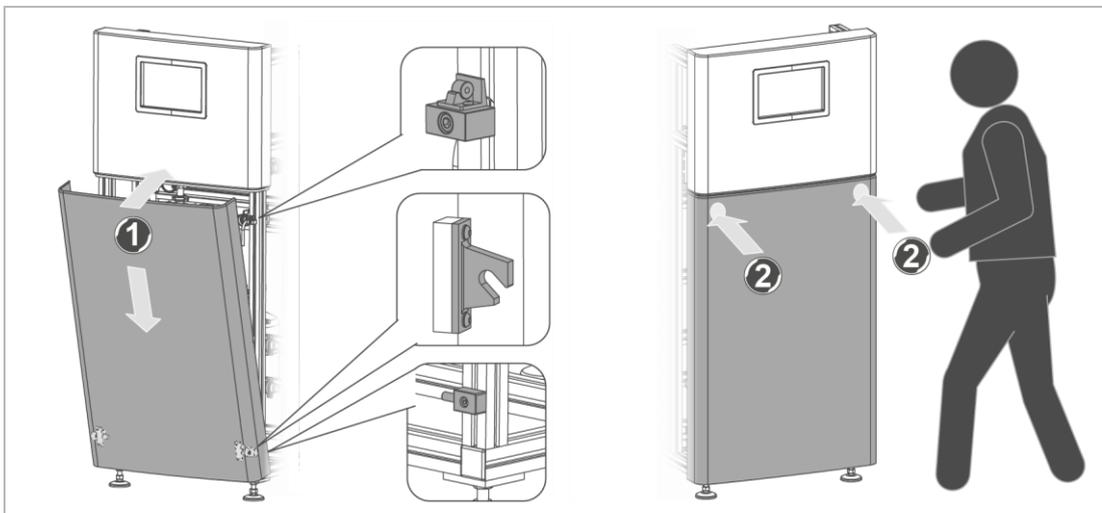
After the work has been carried out, the optional front cover must be fitted.

Mounting the upper cover



1. Insert the upper cover into the mounting bracket.
2. Push the upper cover against the system rack at the bottom corners.
 - » The snap-fit connections engage.
 - » The front cover is installed.

Mounting the lower cover



3. Insert the lower cover into the mounting bracket.
4. Push the lower cover against the system rack at the upper corners.
 - » The snap-fit connections engage.

6.5 Handing over the product to the owner/operator/operating company

- ▶ Explain to the owner/operator/operating company how the system works.
- ▶ Use the manual to brief the owner/operator/operating company and answer any questions.
- ▶ Inform the owner/operator/operating company about the need for inspections and maintenance.
- ▶ Hand over all documents to the owner/operator/operating company for keeping.

6.5.1 Disposal of packaging

- ▶ Dispose of the packaging material as soon as it is no longer needed.

NOTE

Danger to the environment due to incorrect disposal

- Packaging materials are valuable raw materials that can be reused in many cases.
- Incorrect disposal can cause hazards to the environment.
- ▶ Dispose of packaging materials in an environmentally sound manner.
- ▶ Obey the local disposal regulations.
- ▶ If necessary, commission a specialist company with the disposal.

6.5.2 Storage of accessories

- ▶ Keep the accessories supplied with the system in a safe place near the system.

7 Operation

Normally, no intervention by the owner/operating company/operator or the user is required during operation.



The system is automatically flushed twice a day, regardless of whether the system has produced filtrate since the last flushing process or not. The times are freely adjustable (refer to 7.4, Index 4/5)

- ▶ Make sure that there is a permanent power supply.

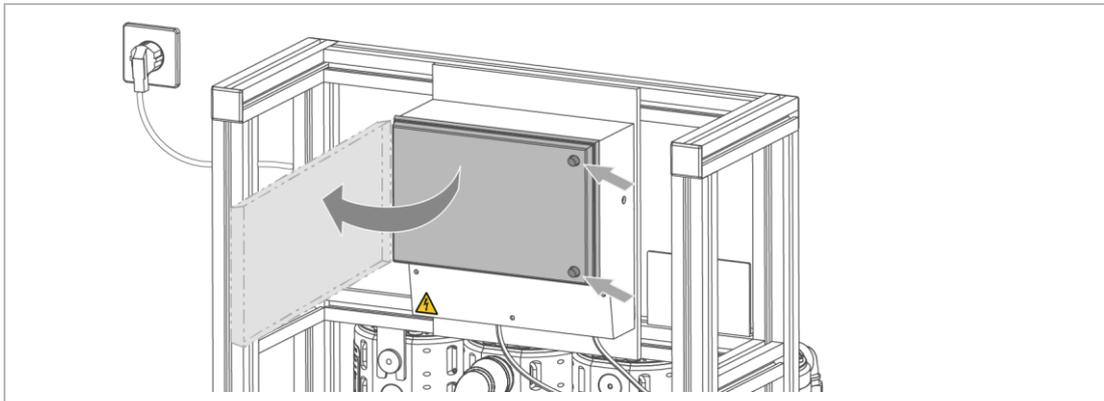
7.1 Operation of the control unit

The GENO-matic control unit controls the operation of the system and the optional components.

The system is operated via the control panel of the GENO-matic control unit.

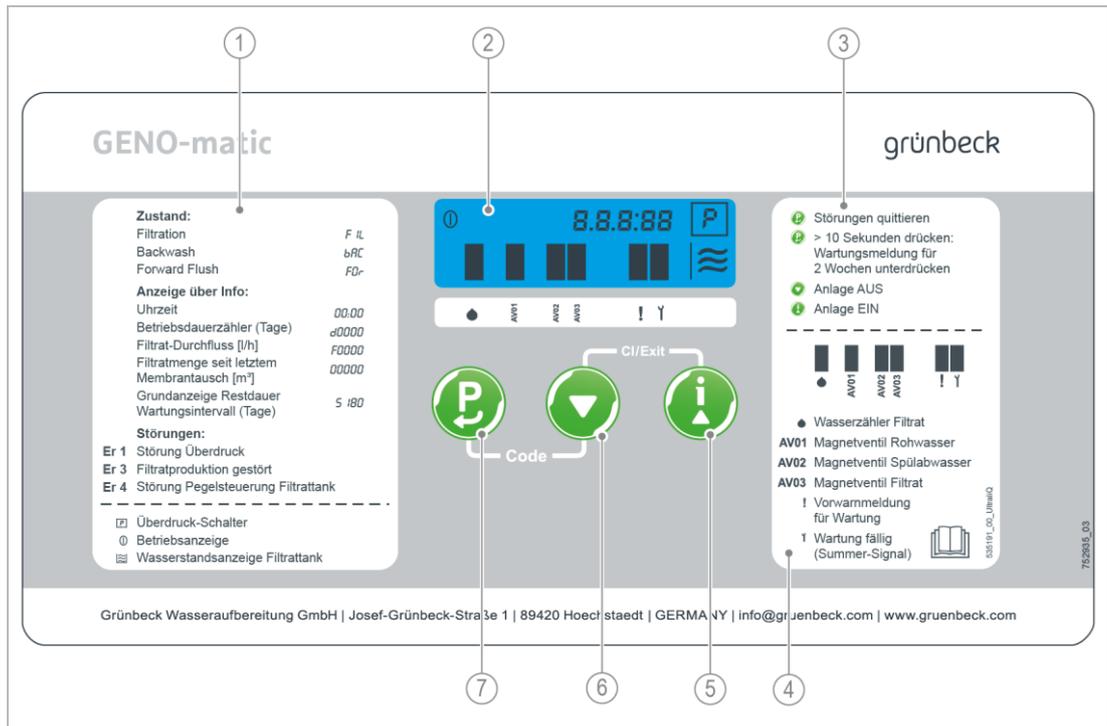
If no key is pressed for a period of 3 minutes, the basic display “System status” appears automatically (refer to chapter 7.1.3).

Switching on the system



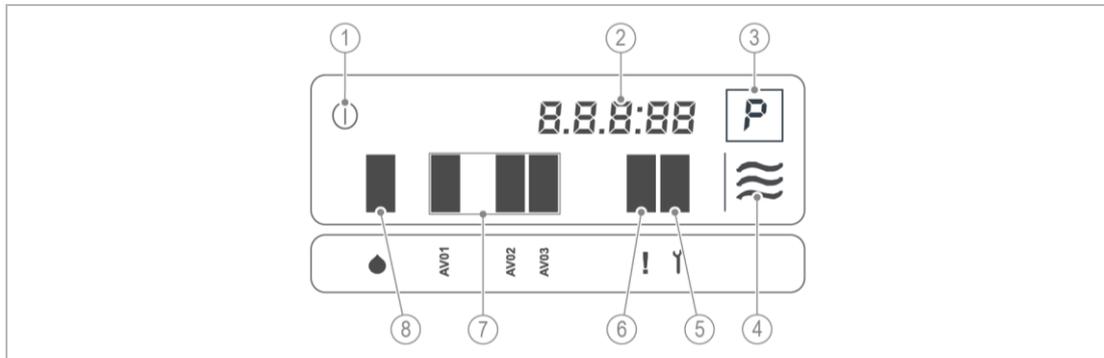
- ▶ Unlock the switch box - unscrew 2 screws.
- ▶ Open the switch box.
- ▶ Switch on the system at the operating panel of the control unit.
 - a Press and hold the key for > 5 s

7.1.1 Control panel



Designation	Meaning/Function
1 Overview	Display parameters info level, symbols and faults
2 Display	Refer to chapter 7.1.2
3 Brief description	Function of keys
4 Brief description	Display
5 Operating key 	<ul style="list-style-type: none"> In the basic display: Switching on the system (press and hold > 5 s) In the info level: Displaying the parameters In the programming level: Switching to the next parameter Increasing the numerical value of a parameter (display value is flashing)
6 Operating key 	<ul style="list-style-type: none"> In the basic display: Switching off the system (press and hold > 5 s) In the programming level: Returning to the previous parameter Decreasing the numerical value of a parameter (display value is flashing)
7 Operating key 	<ul style="list-style-type: none"> In the basic display: Opening the time programming Acknowledging malfunctions Suppressing maintenance message for 2 weeks In the programming level: Opening a parameter for editing (display value is flashing) Saving a parameter (display value stops flashing)
Key combination  + 	<ul style="list-style-type: none"> Access to the programming level (Code request c 000)
Key combination  + 	<ul style="list-style-type: none"> In the programming level: Closing an open parameter without saving (previous display value is retained) Returning to the basic display

7.1.2 Symbols displayed:



Designation	Meaning/Function
1 	Operation indicator <ul style="list-style-type: none"> • System is switched on
2  Numeric display	<ul style="list-style-type: none"> • In the basic display: <ul style="list-style-type: none"> • System state • Error messages • Display in the info level: <ul style="list-style-type: none"> • Operating data • Time • Display in the programming level: <ul style="list-style-type: none"> • Parameters
3  Overpressure switch	Function is suppressed, no effect
4  Water level indicator Filtrate tank <i>(only if an unpressurised tank is installed downstream)</i>	Number of waves displayed indicates the filling level of the tank (3 = full, ..., 0 = empty)
5 Error message	Er is displayed in the event of malfunctions: Er 1, Er 2, Er 3, Er 4
6  Signal contact	Maintenance due (buzzer signal)
7  Signal contact	Pre-alarm for maintenance
8 AV01 AV02 AV03	<ul style="list-style-type: none"> • Solenoid valve Raw water open • Solenoid valve Flushing waste water open • Solenoid valve Filtrate open
9  Water meter Filtrate	Flashes with filtrate flow

7.1.3 Operating concept/menu structure

The control unit of the ultrafiltration system ultraliQ:SB has the menu structure below:

- **Basic display**
- **Info level**
- **Programming level**

Basic display

- The system's operating status is displayed.

Info level

- Various operating data are displayed.
- ▶ Read the operating data (refer to chapter 7.2).
- The time is displayed.
- ▶ Set the time (refer to chapter 7.3).

Programming level

- The program sequence can be read or set (refer to chapter 7.5).

Menu structure

Level	Parameters (examples)		Meaning		
Basic display System status	FIL		Filtration (production of filtrate)		
	bAC		Backwash		
	FOr		Forward flush		
	OFF		System OFF		
Info level	00:00	hh:mm	Time		
	d0441	d	Operating time: System electrically connected to mains voltage		
	F0440	l/h	Filtrate flow		
	00329	m ³	Filtrate volume produced up to this point by the current membrane(s)		
	S 180	d	Basic display "Remaining time Maintenance interval"		
Programming level	C303	030	min	1 Filtration	Max. withdrawal time until flushing
		15	s	2 Backwash	Flushing duration of backwash
		15	s	3 Forward flush	Flushing duration of forward flush
		06:00	hh:mm	Forced flushing 1	Time of forced flushing
		00:00	hh:mm	Forced flushing 2	

7.2 Reading the operating data

- ▶ Switch between the parameters by tapping the  key.
 - Time
 - Operating time
 - Flow
 - Filtrate volume
 - Remaining time of maintenance interval
- If no key is operated for a period of 3 minutes, the basic display reappears automatically.

7.3 Setting the time

Display	Unit	Parameter/meaning
00:00	hh:mm	Time

1. Press  repeatedly, until the time is displayed.
2. Press and hold the  key for > 2.5 s
 - » The hour value **00:** starts flashing.
3. Change the value using  and .
4. Save the value using .
 - » The hour value stops flashing.
5. The minute value **:00** starts flashing.
6. Set the minutes (items 3 – 4).
7. Change back to the basic display.
 - a Simultaneously press  and .

7.4 Program sequence

The program sequence is permanently predefined by the GENO-matic control unit and is preset at the factory:

Operating mode	Step	Duration	Time (factory setting)	Solenoid valve			Release of inlet pump
				1UF1AV01 Raw water	1UF1AV01 Flushing waste water	1UF1AV01 Filtrate	
Operation with downstream DET/PWT *	Filtration	min	30	OPN	CLS	OPN	Released (on-site shutdown)
Operation with unpressurised tank installed downstream	Filtration operation ("Full" level not reached)	min	30	OPN	CLS	OPN	Released
	Filtration standby ("Full" level reached)	min	30	CLS	CLS	CLS	Not released
Operation with DET/PWT * or with unpressurised tank	Backwash	s	15	CLS	OPN	CLS	Not released
	Forward flush	s	15	OPN	OPN	CLS	Released

* DET = diaphragm expansion tank, PWT = pressurised water tank

Filtration

In the "Filtration" step, only the time in which filtrate is produced is totalled (refer to the display: Bar above the water drop symbol flashes). Afterwards, flushing then takes place (backwash, forward flush).

Level Filtrate tank (in systems with unpressurised tank installed downstream):

During the "Filtration" step, the solenoid valves are also controlled via the level control of the filtrate tank:

- At the "Empty" level (= level "B"), the solenoid valves on the raw water and filtrate side are open until the "Full" level is reached.
- At "Full" level (= level "A"), the solenoid valves on the raw water and filtrate side are closed.

The level control has no effect on the flushing steps (backwash, forward flush). These remain active and are carried out completely.

Release of inlet pump (for centrifugal pumps):

The raw water pump is released when the solenoid valve on the raw water side is open. Likewise, the raw water pump switches off when the solenoid valve on the raw water side is closed.



The client on site must make sure that the switching cycles of the centrifugal pump can be maintained in a technically correct way via a diaphragm expansion tank.

The operation of a piston pump with downstream diaphragm expansion tank must be carried out exclusively via a pressure switch control.

Suppression of flushing in systems without filtrate tank:

In the case of UF systems directly installed in the water supply (e.g. with downstream diaphragm expansion tank or pressurised water tank), a shortage of UF filtrate can occur at the consumer points during peak load operation (buffer volume of the diaphragm expansion tank/pressurised water tank is used up) and subsequent backwash.

Therefore, a factory setting suppresses the flushing of the UF system until no filtrate is withdrawn by the consumer for at least one minute.

Forced flushing

To prevent hygienic impairment of the UF system due to stagnating water, forced flushing takes place twice a day at fixed programmed times (factory setting: 06:00 and 00:00 hrs). This makes sure that the UF system continues to function properly, even if the consumer does not withdraw water for a longer period of time (e.g. during holidays). If regular flushing takes place at the time of the forced flushing, the forced flushing is omitted.

The step "Forced flushing" can only be carried out if the UF system is not disconnected from the electrical power supply and the raw water supply.

7.5 Programming level (C 303)

In the programming level, the duration of the individual program steps can be changed.



The program times for filtration and flushing are preset at the factory. In the tables below, the factory settings are highlighted in **bold**.

After consultation with the technical service, the setting parameters can be adapted to the conditions on site as follows:

1. Simultaneously press and hold keys  and  > 1 s
» The display changes to Code request **C 000**.
2. Set Code C 303 using  or .
3. Confirm with .
4. Select the desired parameter.
5. Set the desired value.
6. Save the value using .

7. By simultaneously pressing  and , you close the setting without saving.
8. Change back to the basic display.
 - a Simultaneously press  and .

Setting parameters

Index	Parameter/Unit		Remarks	Setting range
1	Step 1 Filtration	min	Maximum withdrawal time until flushing (3)	1 – 240 (030)
2	Step 2 Backwash	s	Duration of backwash	15 – 60
3	Step 3 Forward flush	s	Duration of Forward flush	15 – 60
4	Forced flushing 1	hh:mm	Fixed time	00:00 – 23:59 (06:00)
5	Forced flushing 2	hh:mm	Fixed time	00:00 – 23:59

8 Maintenance and repair

Maintenance and repair includes cleaning, inspection and maintenance of the product.



Inspection and maintenance is subject to local and national requirements. The owner/operator/operating company is responsible for compliance with the prescribed maintenance and repair work.



By concluding a maintenance contract, you make sure that all maintenance work will be carried out on time.

- ▶ Only use genuine spare and wearing parts from Grünbeck.

8.1 Cleaning



Have cleaning work only carried out by persons who have been instructed in the risks and hazards that can arise from the system.



WARNING

Cleaning of live components with a damp cloth.

- Risk of electric shock.
- Sparking possible due to short circuit.
- Switch off the voltage supply as well as any external voltage before starting the cleaning work.
- ▶ Wait for at least 15 minutes and make sure that no voltage is present at the components.
- ▶ Do not open any switch cabinets.
- ▶ Do not use any high-pressure equipment for cleaning and do not blast electric/electronic devices with water.



CAUTION

Climbing onto system components

- Risk of falling when climbing onto system components.
- ▶ Do not climb onto system components such as pipes, racks, etc.
- ▶ Use stable, safe and self-standing access aids such as stepladders, platforms, etc. when cleaning components that are located at high levels.

NOTE

Do not clean the system with cleaning agents containing alcohol or solvents.

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

- ▶ Use personal protective equipment.
- ▶ Only clean the outside of the system.
- ▶ Do not use any strong or abrasive cleaning agents.
- ▶ Wipe the surfaces with a damp cloth.
- ▶ Dry the surfaces with a cloth.

8.2 Intervals

The interval table below shows the minimum intervals for the activities to be carried out.

Activity	Interval	Work
Inspection	weekly	<ul style="list-style-type: none"> • Visual inspection for damage and leaks • Check transmembrane pressure • Check actual flow rate (filtration volume flow)
Maintenance	annually	<ul style="list-style-type: none"> • Check the diaphragm expansion tank • Perform CIP cleaning • Perform an integrity test

8.3 Inspection

You as owner/operator/operating company can carry out the regular inspections yourself.

- ▶ Carry out the inspection work below **on a weekly basis**:
 1. Visually check the system for damage, leaks and tears.
 2. Determine the transmembrane pressure (TMP) as follows:
 - a Read the pressure on the raw water pressure gauge and the filtrate pressure gauge.
 - b Calculate the TMP (difference = raw water pressure p_1 – filtrate pressure p_2).
 - c Inform the technical service if the pressure difference is ≥ 0.7 bar and can no longer be reduced after backwash and forward flush.
 - d Have CIP cleaning carried out by technical service personnel.
 3. Check the filtration volume flow.
 - a Inform the technical service if the filtration volume flow is 20 % above or below the setpoint.
 - b Have the orifices of the flow stabiliser replaced by technical service personnel.
 4. Monitor the remaining time of the maintenance interval – contact technical service at a remaining time of < 30 days.



If you notice a rapid increase in the transmembrane pressure (TMP), this indicates that the membranes are clogged.

- ▶ Have the membranes checked by technical service personnel and replaced, if necessary.

8.4 Maintenance

In order to ensure the proper functioning of the product in the long term, certain tasks have to be performed at regular intervals.



For each maintenance, create a written maintenance log on the condition and functioning of the system and the maintenance work performed.

8.4.1 Annual maintenance



Carrying out annual maintenance work requires specialist knowledge. This kind of maintenance work must be carried out by technical service personnel only.

1. Check the fine filter upstream of the system – replace the filter element, if necessary.
2. Clean the solenoid valves.
3. Check the solenoid valves for function.
4. Check the flow volumes.
5. Check all electrical lines for damage on the outside.
6. Check the installation for leaks – visually check all pipe/hose connections and all connections for escaping water.
7. Check the mechanical and electrical functioning and performance of all units (pumps, valves).
8. Check the setting of the control unit.
9. Perform CIP cleaning.



Carry out CIP cleaning (refer to the technical service manual of ultraliQ:SB or the operation manual of the CIP system).

10. Perform an integrity test.

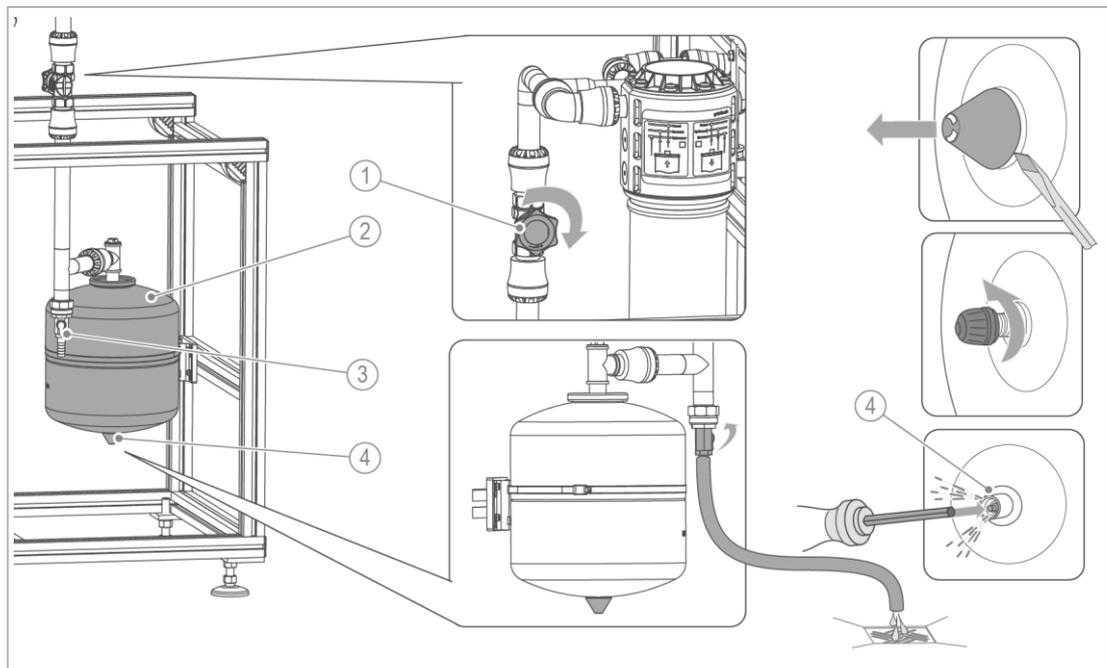


Performance of an integrity test (refer to the technical service manual of ultraliQ:SB).

11. Reset the “Remaining time Maintenance interval”.

8.4.2 Checking the diaphragm expansion tank

- Carry out the activities below for each diaphragm expansion tank individually.



Designation	Designation
1 Shut-off valve Backwash	3 Shut-off valve Draining
2 Diaphragm expansion tank	4 Gas filling valve

- Check the diaphragm expansion tank for damage and corrosion.

1. Tap the diaphragm expansion tank on all sides.
 - » A hollow echo must be heard.
 - » If the diaphragm expansion tank sounds muffled at each place you tap it, it is probably completely submerged in water.
2. Remove the cap from the gas filling valve – use a tool to pull it off.
3. Briefly operate the gas filling valve – push it in using a tool.
 - » If air escapes with a soft hiss, the diaphragm expansion tank can be refilled with nitrogen or compressed air.
 - » If water sprays out, the diaphragm expansion tank is defective.
4. Replace the diaphragm expansion tank.

Refilling nitrogen/compressed air

5. Close the shut-off valve Backwash.
6. Drain the diaphragm expansion tank via shut-off valve Draining – pressure is relieved at the same time.
7. Check the preload pressure (set pressure: 1.5 bar) of the diaphragm expansion tank.

8. Refill nitrogen/compressed air (gas cylinder, oil-free air compressor) using a refill can.
Use nitrogen for gas filling – the water side must be unpressurised.
9. Check the setting pressure of the diaphragm expansion tank – correct the preload pressure, if necessary.

8.5 Spare parts

For spare parts and consumables please contact your local Grünbeck representative who you can find on the internet at www.gruenbeck.com.

Special installation requirements apply to the spare parts below:

Product	Order no.
Pulse divider for water meter (ET-BG) Pulse divider for water meter complete, incl. operation manual	119 604

8.6 Wearing parts



Wearing parts must be replaced by qualified specialists only.

The wearing parts are listed below:

- Seals
- Solenoid valves
- Flow sensors
- Ultrafiltration elements

9 Troubleshooting

The ultrafiltration systems ultraliQ:SB are equipped with an error detection and reporting system.

If an error message appears in the display, proceed as follows:

1. Press  to acknowledge the fault.
2. Watch the display.
3. If the error message appears again, rectify the fault (refer to chapter 9.1).
 - ▶ If you cannot eliminate malfunctions with the instructions given below, contact technical service.
 - ▶ Have the data given on the type plate handy (refer to chapter 1.3).

9.1 Display messages

Error	Explanation	Remedy
Er 1	Overpressure switch (optional) tripped	▶ Check primary pressure
Er 2	Maintenance message suppressed for 2 weeks	▶ Carry out maintenance. ▶ Contact technical service • The error message is reset
Er 3	Filtrate production disrupted: In systems with level control, no filtrate flow was registered within 10 seconds after the start of filtration	▶ Check raw water supply ▶ If there is a raw water supply, inform technical service. ▶ Check the components below and have them replaced, if necessary: <ul style="list-style-type: none"> • UF elements • Water meter and pulse cable • Raw water solenoid valve 1UF1AV01 • Filtrate solenoid valve 1UF1AV03 • GENO-matic control unit
Er 4	Error Level control Filtrate tank Level "a" (top) is detected by the GENO-matic, level "b" (bottom) is not	▶ Check wiring and function of the levels and repair, if necessary

9.2 Other observations

Observation	Explanation	Remedy
Backwash is not performed correctly	Diaphragm expansion tank defective	▶ Service diaphragm expansion tank
Flow indication not correct	Flow stabiliser worn	▶ Service flow stabiliser
	Flow meter Filtrate defective	▶ Check flow meter Filtrate (gauging the filtration volume flow)

10 Decommissioning



Decommissioning and restarting/recommissioning requires expert knowledge. This work must be carried out by technical service personnel only.

10.1 Temporary standstill

The system features programmable forced flushing.

- If a longer downtime (> 48 hrs) of the system is planned, the system must be decommissioned.

10.2 Decommissioning

► Carry out the tasks below:

- Mechanically disconnect the raw water inlet line
- Mechanically disconnect the filtrate outlet line
- Mechanically disconnect the flushing waste water line
- Switch off control unit (unplug the power plug, if necessary)
- Chemically clean and preserve UF modules in the pressure pipes



CIP cleaning and preservation must be carried out by technical service personnel only.



Obey the instructions for attaching the CIP lines (refer to the technical service manual of ultraI:SB).

Obey the instructions for carrying out CIP cleaning (refer to technical service manual of ultraI:SB or the operation manual of the CIP system).

- Mark the system with a note and a warning stating that preservation was done.

10.3 Restart/recommissioning

► Carry out the tasks below:

- Flush out the preserving agent
- 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 carried out by qualified specialists only.
1. Flush the system with raw water.
 2. Disconnect the system from mains – discharge residual voltage.
 3. Close the raw water shut-off valve.
 4. Vent and drain the system.
 5. Disconnect the system from the water installation (raw water inlet pipe, filtrate outlet pipe, flushing waste water line to drain).
 6. Disconnect the electrical connections to components installed downstream.
 7. Disconnect the potential equalisation (grounding) provided by client on site.
 8. Remove individual components such as accessories, if necessary.
 9. Transport the system secured on a pallet.

11.2 Disposal

- ▶ Obey the applicable national regulations.

Packaging

- ▶ Dispose of the packaging in an environmentally sound manner.

Ultrafiltration elements

- ▶ Dispose of the used ultrafiltration elements with your household waste.

Product



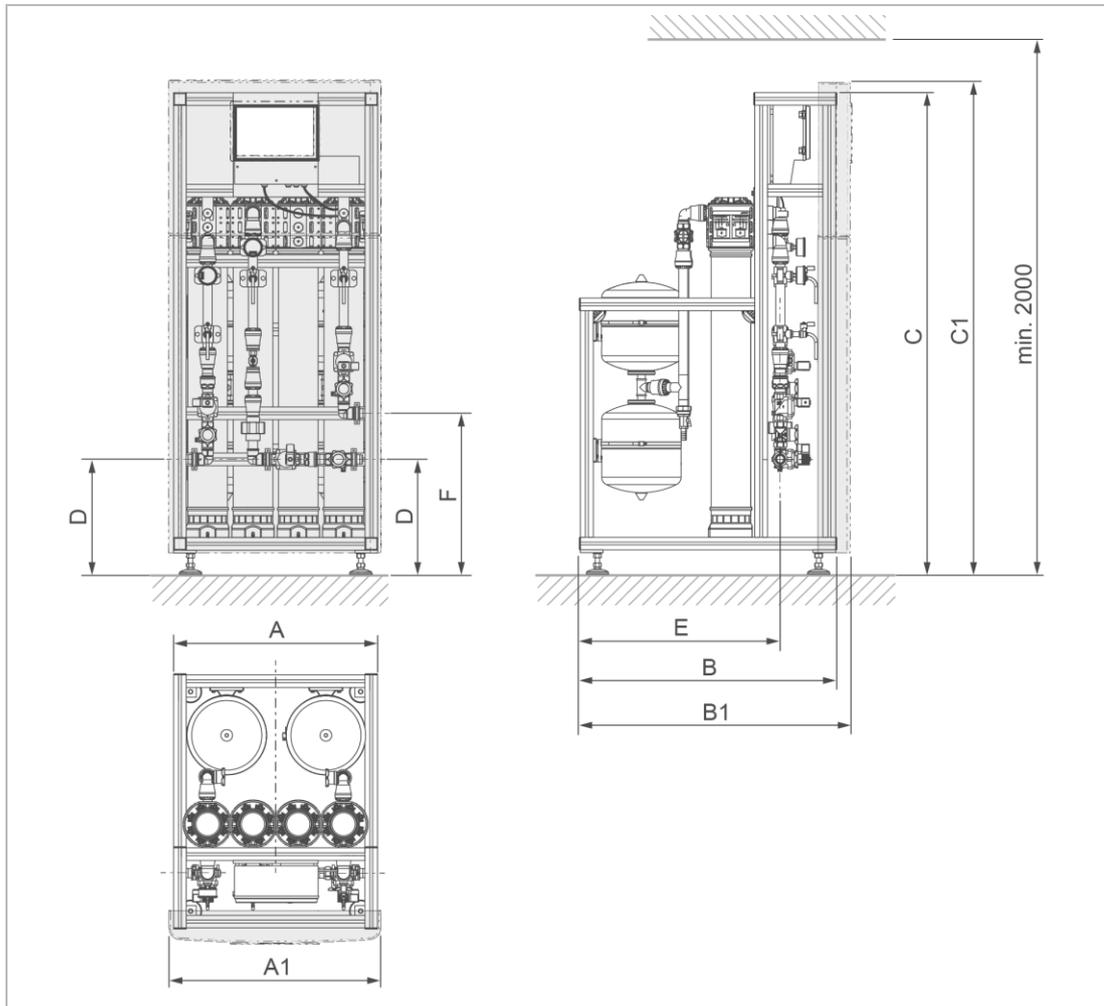
If this symbol (crossed-out wheellie bin) is on the product, this product or its electrical and electronic components must not be disposed of as household waste.

- ▶ Find out about the local regulations on the separate collection of electrical and electronic products.
- ▶ Make use of the collection points available to you for the disposal of your product.
- ▶ 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.de.

12 Technical specifications

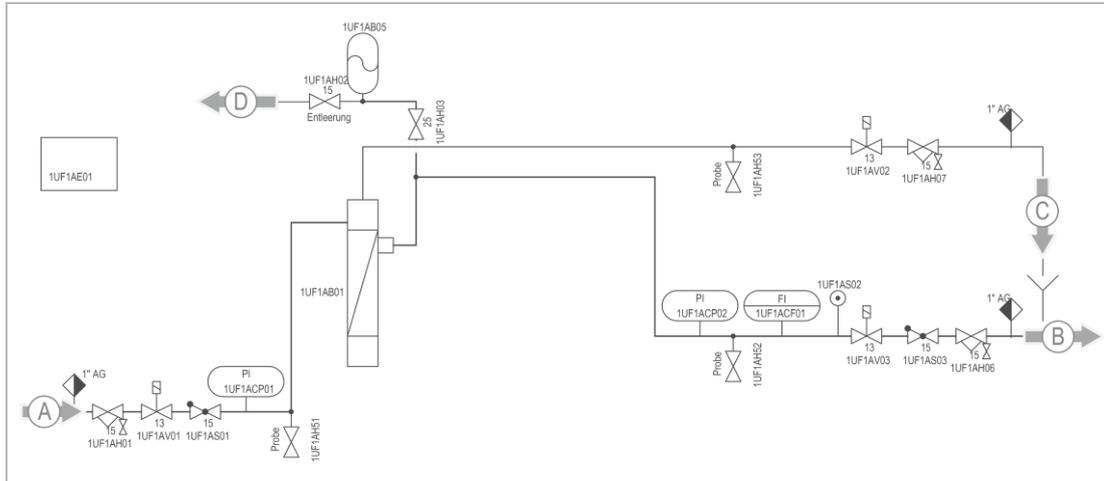


Dimensions and weights		SB500	SB1000	SB1500	SB2000	
A	System width	mm		720		
A1	System width including front cover	mm		750		
B	System depth	mm		900		
B1	System depth including front cover	mm		960		
C	System height	mm		1710		
C1	System height including front cover	mm		1750		
D	Connection height of raw water/filtrate outlet	mm		410		
E	Connection depth of raw water/filtrate outlet/flushing waste water	mm		705		
F	Connection height of flushing waste water	mm		572		
	Operating weight, approx.	kg	105	155	205	255
	Empty weight, approx.	kg	75	95	115	135

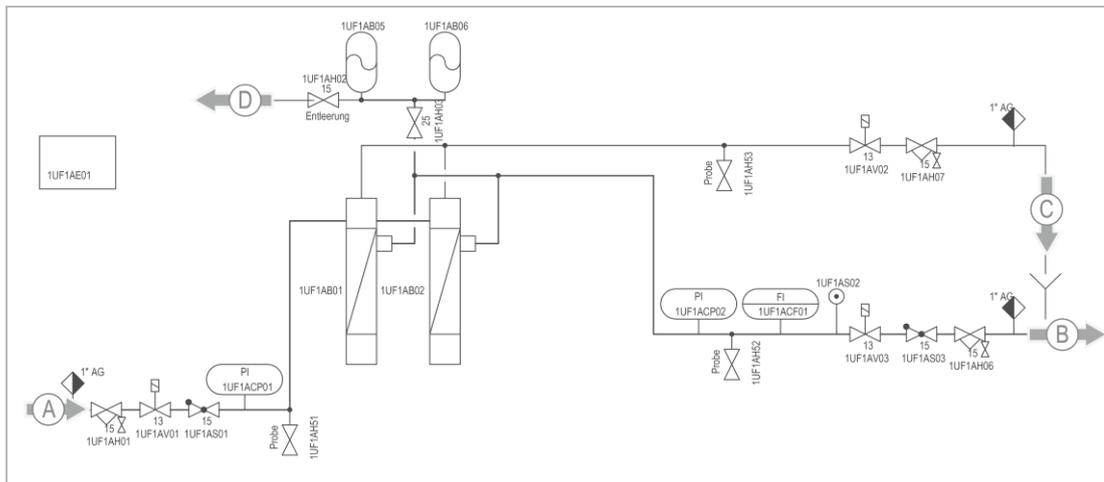
Connection data		SB500	SB1000	SB1500	SB2000
Nominal connection diameter of raw water inlet	DN	25 (1" male thread)			
Nominal connection diameter of filtrate outlet	DN	25 (1" male thread)			
Nominal connection diameter of flushing waste water to drain	DN	25 (1" male thread)			
Drain connection	DN	≥ 50	≥ 80	≥ 100	≥ 125
Connected load, approx.	W	120			
Power supply	V/Hz	230/50			
Protection/protection class		IP54/⚡			
Performance data		SB500	SB1000	SB1500	SB2000
Nominal filtrate capacity	m ³ /h	0.5	1.0	1.5	2.0
Operating pressure					
For use with city water	bar	2.5 – 6.0			
For use with non-pressurised tank installed downstream	bar	3.5 – 6.0			
For use with diaphragm expansion tank/pressurised water tank installed downstream	bar	4.5 – 6.0			
Number of ultrafiltration modules	pc(s)	1	2	3	4
Total active membrane surface	m ²	6.0	12.0	18.0	24.0
Nominal pore size of the membrane (cut-off)	µm	0.02			
Recovery (standard setting), approx.	%	93			
Filtration interval (standard setting)	min	30			
General data		SB500	SB1000	SB1500	SB2000
Water temperature (drinking water)	°C	5 – 20			
Ambient temperature (drinking water)	°C	5 – 25			
Water temperature (technical applications)	°C	5 – 35			
Ambient temperature (technical applications)	°C	5 – 35			
Humidity (non-condensing)	%	≤ 70.0			
Order no.		535 100	535 110	535 120	535 130

12.2 P&ID (flow chart)

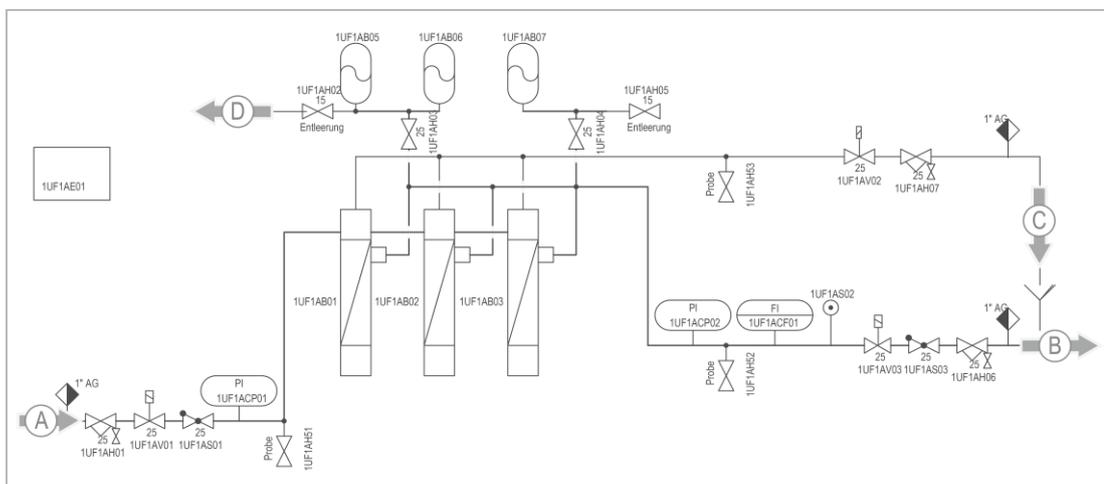
ultraliQ:SB500



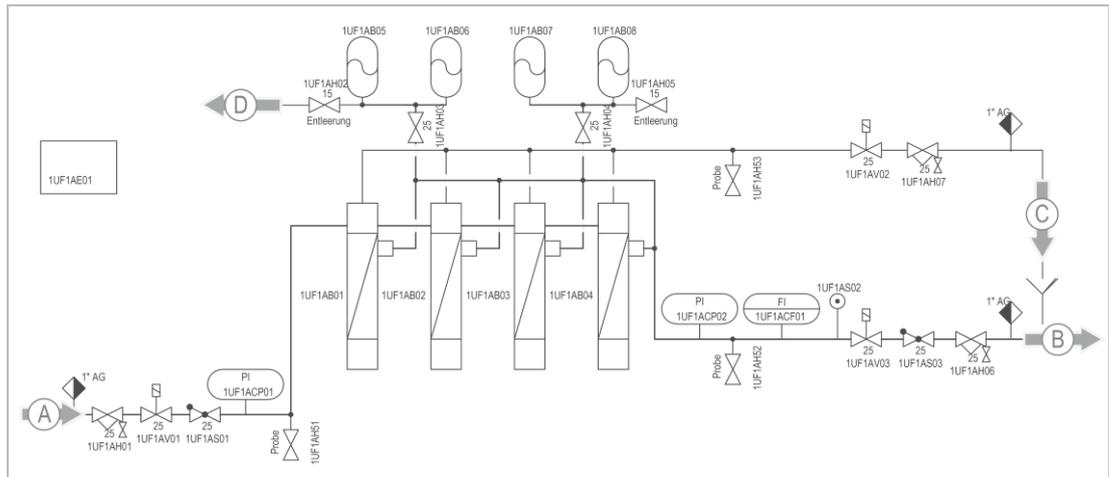
ultraliQ:SB1000



ultraliQ:SB1500



ultraliQ:SB2000



Connections

Designation	
A	Raw water inlet
B	Filtrate outlet

Designation	
C	Outlet Flushing waste water
D	Outlet Draining of diaphragm expansion tank

Components

Coding	Designation
1UF1AB01	Ultrafiltration module 1
1UF1AB02	Ultrafiltration module 2
1UF1AB03	Ultrafiltration module 3
1UF1AB04	Ultrafiltration module 4
1UF1AB05	Diaphragm expansion tank 1
1UF1AB06	Diaphragm expansion tank 2
1UF1AB07	Diaphragm expansion tank 3
1UF1AB08	Diaphragm expansion tank 4
1UF1ACF01	Flow meter Filtrate
1UF1ACP01	Pressure indicator Raw water
1UF1ACP02	Pressure indicator Filtrate
1UF1AE01	Switch box
1UF1AH01	Shut-off valve Raw Water
1UF1AH02	Shut-off valve Draining 1

Coding	Designation
1UF1AH03	Shut-off valve Backwash 1
1UF1AH04	Shut-off valve Backwash 2
1UF1AH05	Shut-off valve Draining 2
1UF1AH06	Shut-off valve Filtrate
1UF1AH07	Shut-off valve Flushing waste water
1UF1AH51	Sampling valve Raw water
1UF1AH52	Sampling valve Filtrate
1UF1AH53	Sampling valve Flushing waste water
1UF1AS01	Non-return valve Raw water
1UF1AS02	Flow stabiliser
1UF1AS03	Non-return valve Filtrate
1UF1AV01	Solenoid valve Raw water
1UF1AV02	Solenoid valve Flushing waste water
1UF1AV03	Solenoid valve Filtrate

13 Operation log



- ▶ Document the initial start-up/commissioning and all maintenance activities.
- ▶ Copy the maintenance report.

Ultrafiltration system **ultraliQ:SB** | Type: _____

Serial No./Project No.: _____

13.1 Start-up/commissioning log

Customer		
Name: _____		
Address: _____		
Installation/Accessories		
Fine filter (make, type):		
System separator (make, type):		
Drain connection acc. to DIN EN 1717	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Floor drain available	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Safety device (if no floor drain is available)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Preserving agent flushed out	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Operating values		
Transmembrane pressure (TMP 1) at the end (t_e) of a filtration interval		
Raw water pressure, p_1	bar	_____
Filtrate pressure, p_2	bar	_____
TMP 1 (t_e) = $p_1 - p_2$	bar	_____
Transmembrane pressure (TMP 2) at the start (t_a) of a filtration interval		
Raw water pressure, p_1	bar	_____
Filtrate pressure, p_2	bar	_____
TMP 2 (t_a) = $p_1 - p_2$	bar	_____
Total flow rate	m ³	_____
Remarks		

Start-up/commissioning		
Company:		
Service technician:		
Work time certificate (no.):		
Date/signature:		

Maintenance no.: _____



- ▶ Enter the measured values and operating data.
- ▶ Confirm the tests with **OK** or record any repairs done.

Maintenance carried out	UF element no.	Restart/recommissioning
<input type="checkbox"/> With flushing of UF element		<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Without replacement of UF element		Date:
<input type="checkbox"/> With replacement of UF element		

Inspections	OK
Fine filter upstream of the system checked	<input type="checkbox"/>
Filter element replaced	<input type="checkbox"/>
Settings of control unit checked	<input type="checkbox"/>
Electronics visually checked for damage	<input type="checkbox"/>
All electric cables checked for external damage	<input type="checkbox"/>
Pipes and connections checked for damage and a tight fit	<input type="checkbox"/>
Solenoid valve(s) cleaned and checked for leaks	<input type="checkbox"/>
Installation/system checked for leaks	<input type="checkbox"/>
Basic display "Remaining time Maintenance interval" reset	<input type="checkbox"/>

Operating values	
Operating time	d
Total flow rate	m ³
Flow rate during filtration operation	m ³ /h

Transmembrane pressure (TMP 1) at the end (t _e) of a filtration interval	
Raw water pressure, p ₁	bar
Filtrate pressure, p ₂	bar
TMP 1 (t _e) = p ₁ – p ₂	bar

Transmembrane pressure (TMP 2) at the start (t _a) of a filtration interval	
Raw water pressure, p ₁	bar
Filtrate pressure, p ₂	bar
TMP 2 (t _a) = p ₁ – p ₂	bar

Remarks

Carried out by

Company: _____

Service technician: _____

Date _____ Signature _____

Maintenance no.: _____



- ▶ Enter the measured values and operating data.
- ▶ Confirm the tests with **OK** or record any repairs done.

Maintenance carried out	UF element no.	Restart/recommissioning
<input type="checkbox"/> With flushing of UF element		<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Without replacement of UF element		Date:
<input type="checkbox"/> With replacement of UF element		

Inspections	OK
Fine filter upstream of the system checked	<input type="checkbox"/>
Filter element replaced	<input type="checkbox"/>
Settings of control unit checked	<input type="checkbox"/>
Electronics visually checked for damage	<input type="checkbox"/>
All electric cables checked for external damage	<input type="checkbox"/>
Pipes and connections checked for damage and a tight fit	<input type="checkbox"/>
Solenoid valve(s) cleaned and checked for leaks	<input type="checkbox"/>
Installation/system checked for leaks	<input type="checkbox"/>
Basic display "Remaining time Maintenance interval" reset	<input type="checkbox"/>

Operating values	
Operating time	d
Total flow rate	m ³
Flow rate during filtration operation	m ³ /h

Transmembrane pressure (TMP 1) at the end (t _e) of a filtration interval	
Raw water pressure, p ₁	bar
Filtrate pressure, p ₂	bar
TMP 1 (t _e) = p ₁ - p ₂	bar

Transmembrane pressure (TMP 2) at the start (t _a) of a filtration interval	
Raw water pressure, p ₁	bar
Filtrate pressure, p ₂	bar
TMP 2 (t _a) = p ₁ - p ₂	bar

Remarks

Carried out by

Company: _____

Service technician: _____ Date _____ Signature _____

Maintenance no.: _____



- ▶ Enter the measured values and operating data.
- ▶ Confirm the tests with **OK** or record any repairs done.

Maintenance carried out	UF Element no.	Restart/recommissioning
<input type="checkbox"/> With flushing of UF element		<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Without replacement of UF element		Date:
<input type="checkbox"/> With replacement of UF element		

Inspections	OK
Fine filter upstream of the system checked	<input type="checkbox"/>
Filter element replaced	<input type="checkbox"/>
Settings of control unit checked	<input type="checkbox"/>
Electronics visually checked for damage	<input type="checkbox"/>
All electric cables checked for external damage	<input type="checkbox"/>
Pipes and connections checked for damage and a tight fit	<input type="checkbox"/>
Solenoid valve(s) cleaned and checked for leaks	<input type="checkbox"/>
Installation/system checked for leaks	<input type="checkbox"/>
Basic display "Remaining time Maintenance interval" reset	<input type="checkbox"/>

Operating values	
Operating time	d
Total flow rate	m ³
Flow rate during filtration operation	m ³ /h

Transmembrane pressure (TMP 1) at the end (t _e) of a filtration interval	
Raw water pressure, p ₁	bar
Filtrate pressure, p ₂	bar
TMP 1 (t _e) = p ₁ – p ₂	bar

Transmembrane pressure (TMP 2) at the start (t _a) of a filtration interval	
Raw water pressure, p ₁	bar
Filtrate pressure, p ₂	bar
TMP 2 (t _a) = p ₁ – p ₂	bar

Remarks

Carried out by

Company: _____

Service technician: _____ Date _____ Signature _____

Maintenance no.: _____



- ▶ Enter the measured values and operating data.
- ▶ Confirm the tests with **OK** or record any repairs done.

Maintenance carried out	UF element no.	Restart/recommissioning
<input type="checkbox"/> With flushing of UF element		<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Without replacement of UF element		Date:
<input type="checkbox"/> With replacement of UF element		

Inspections	OK
Fine filter upstream of the system checked	<input type="checkbox"/>
Filter element replaced	<input type="checkbox"/>
Settings of control unit checked	<input type="checkbox"/>
Electronics visually checked for damage	<input type="checkbox"/>
All electric cables checked for external damage	<input type="checkbox"/>
Pipes and connections checked for damage and a tight fit	<input type="checkbox"/>
Solenoid valve(s) cleaned and checked for leaks	<input type="checkbox"/>
Installation/system checked for leaks	<input type="checkbox"/>
Basic display "Remaining time Maintenance interval" reset	<input type="checkbox"/>

Operating values	
Operating time	d
Total flow rate	m ³
Flow rate during filtration operation	m ³ /h

Transmembrane pressure (TMP 1) at the end (t _e) of a filtration interval	
Raw water pressure, p ₁	bar
Filtrate pressure, p ₂	bar
TMP 1 (t _e) = p ₁ - p ₂	bar

Transmembrane pressure (TMP 2) at the start (t _a) of a filtration interval	
Raw water pressure, p ₁	bar
Filtrate pressure, p ₂	bar
TMP 2 (t _a) = p ₁ - p ₂	bar

Remarks

Carried out by

Company: _____

Service technician: _____ Date _____ Signature _____

EU Declaration of Conformity

In accordance with the EC Machinery Directive 2006/42/EC



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

This certificate becomes void if the system is modified in any way not approved by us.

Ultrafiltration system ultraliQ:SB

Serial no.: Refer to type plate

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

- Directive on the Restriction of Hazardous Substances RoHS (2011/65/EU)

Furthermore, we confirm compliance with the essential requirements of the EMC Directive 2014/30/EU.

The following harmonised standards have been applied:

- DIN EN ISO 12100:2011-03
- DIN EN 60204-1:2019-06

Responsible for documentation:

Mirjam Müller

Manufacturer:

Grünbeck Wasseraufbereitung GmbH
Josef-Grünbeck-Str. 1
89420 Hoechstädt/Germany

Hoechstädt, 09.11.2021

A handwritten signature in black ink, appearing to read 'P. Höß', with a stylized flourish at the end.

i. V.

Peter Höß

Head of Technical Systems & Equipment

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