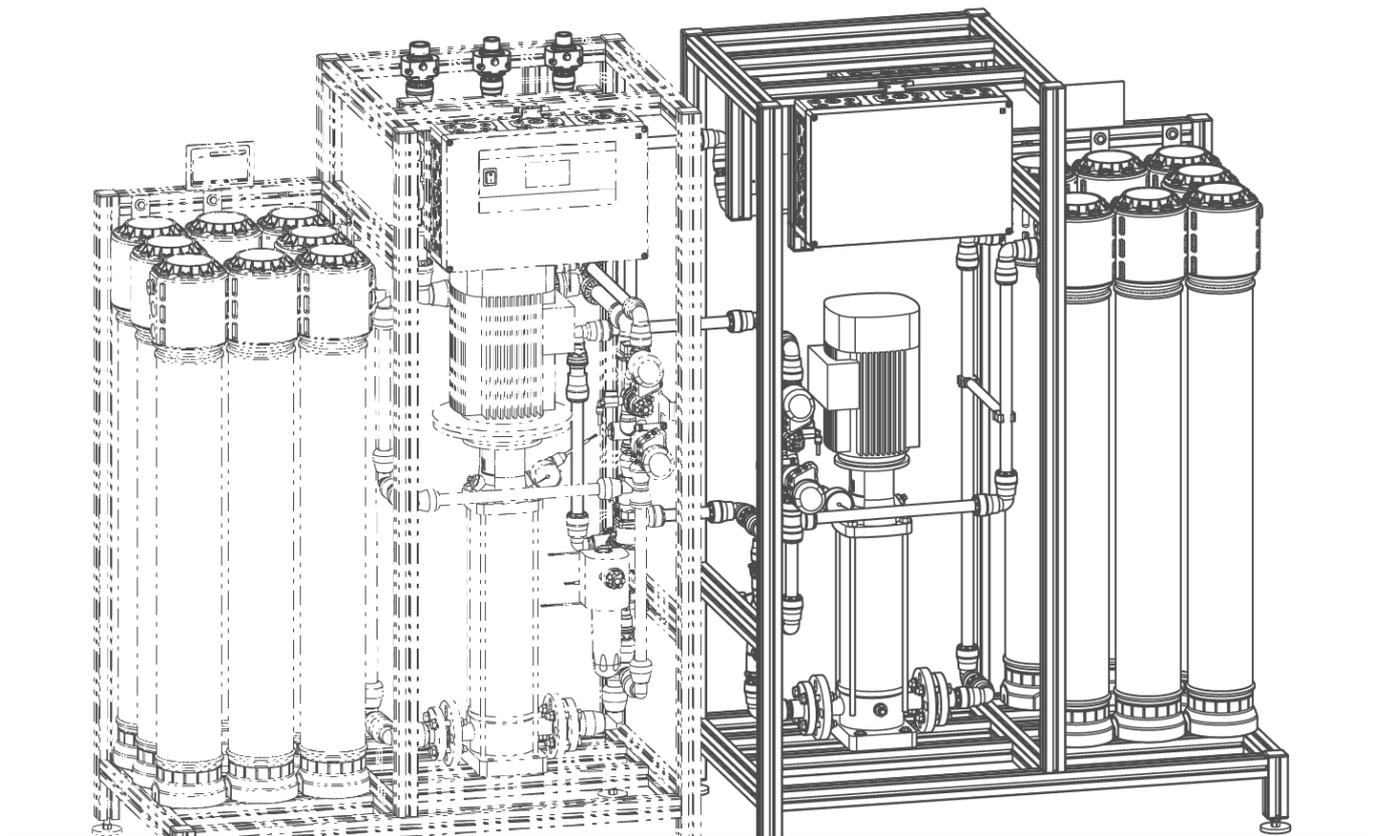


We understand water.



Reverse osmosis system | GENO-OSMO-X permeate stage

Operation manual

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1 Introduction

This manual is intended for owners/operating companies, operators/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 system.
- ▶ 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



The present operation manual is a supplementary documentation to the operation manual of reverse osmosis system GENO-OSMO-X (order no. 750 927).

This manual applies to the products below:

- Reverse osmosis system GENO-OSMO-X permeate stage 180
- Reverse osmosis system GENO-OSMO-X permeate stage 360
- Reverse osmosis system GENO-OSMO-X permeate stage 720
- Reverse osmosis system GENO-OSMO-X permeate stage 1100
- Reverse osmosis system GENO-OSMO-X permeate stage 1450
- Reverse osmosis system GENO-OSMO-X permeate stage 2000
- Reverse osmosis system GENO-OSMO-X permeate stage 2700
- Reverse osmosis system GENO-OSMO-X
in optional versions: with membrane degassing
- 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

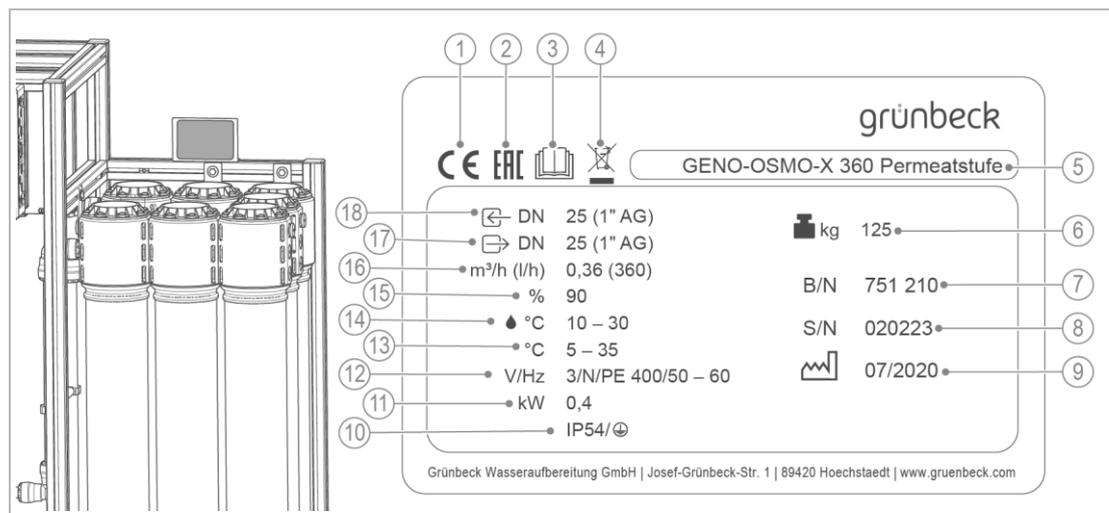
- Operation manual Reverse osmosis system GENO-OSMO-X (order no.: 750 927)
- Manuals of all accessories used
- Manuals of components from other manufacturers
- Safety data sheets for chemicals
- Electric circuit diagram, order no.: 750 292 and 751 292

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 given in chapter 1.1 correspond to your product.

The type plate is located on the system rack.



Designation	
1	CE mark
2	EAC mark
3	Obey the operation manual
4	Disposal information
5	Product designation
6	Operating weight
7	Order no.
8	Serial no.
9	Date of manufacture
10	Protection/protection class

Designation	
11	Power input
12	Power supply
13	Ambient temperature
14	Feed water temperature
15	Recovery
16	Permeate capacity at a feed water temperature of 15 °C
17	Nominal connection diameter Permeate/concentrate discharge pipe
18	Nominal connection diameter Feed water supply pipe

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 following signal words 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	Personal injury	Death or serious injuries
	WARNING		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 phases in the service life of the system, different persons carry out work on the systems. The respective tasks require different skills.

1.6.1 Qualification of personnel

Personnel	Requirements
Operator/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 necessary protective equipment and protective measures Knowledge of residual risks
Owner/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.

	Operator/ user	Owner/ 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				X
Troubleshooting	X	X	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/operating company, make sure that the required personal protective equipment is available.

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

PPE			
	Protective gloves		Protective footwear
	Protective overall		Protective goggles
	Hard hat		Mask
	Face shield		Protective apron

2 Safety

2.1 Safety measures

- Only operate the system 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. If unsuitable spare parts are used, the warranty for the system will be void.
- Always keep the premises locked against unauthorised access to protect imperilled/non-trained 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 safety

- You must never remove, bridge, or otherwise tamper with safety equipment
- For all work on the system that cannot be done 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 can be under pressure. There is a risk of injuries and damage to property due to escaping water and unexpected movement of components. Check the system's pressure lines at regular intervals.
- Before starting repair and maintenance work, make sure that all affected components are depressurised.

2.1.3 Electrical hazards

There is an immediate danger of fatal injury from electric shock when touching live parts. Damage to the insulation or individual components can be life-threatening.

- Only have qualified electricians carry out electrical work on the system.
- In case of damage to live components, switch off the voltage supply immediately 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 harmful to the environment and/or to health. They can cause 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 prior to handling chemicals and always follow the instructions for the different activities/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 permeate.
- 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 spilled 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 can be used by persons with limited abilities or lack of experience if they are supervised or instructed in the safe use of the system and understand the resulting hazards.
- Operation, cleaning and maintenance must not be carried out by children.

2.2 Product-specific safety instructions



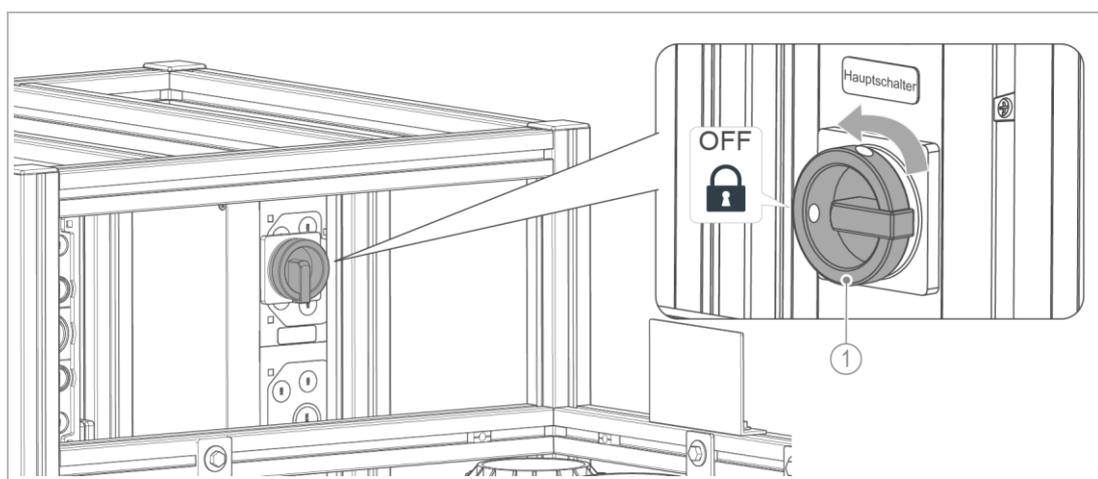
WARNING Contamination of drinking water due to improper handling.

- Risk of infectious diseases
- ▶ Have installation, start-up/commissioning and annual maintenance carried out by a qualified specialist.



The system features a main switch. Via the main switch, the system and the components installed downstream are de-energised.

- ▶ Completely switch off the system in an emergency situation.



Designation

- | | |
|---|-----------------------|
| 1 | Lockable main switch. |
|---|-----------------------|

- ▶ In case of maintenance and repair work, de-energise the system by switching off the main switch – secure against unintentional restart.

2.2.1 Signals and warning signs

Warnings/pictograms	
	<p>Risk of electric shock (attached to the distributor cover and in the power distribution/electrical switch cabinet)</p> <ul style="list-style-type: none"> ▶ Disconnect the system from the power supply before working on electrical system parts
	<p>Risk of electric shock due to residual voltage High voltage can be present even if the LED warning indicator is not illuminated. (attached to the frequency converter and HP pump)</p> <ul style="list-style-type: none"> ▶ Wait for 15 minutes after switching off the main switch.
	<p>Hazardous material (attached to the packaging) Environmental damage due to lithium batteries</p>



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.

3 Product description

The reverse osmosis system GENO-OSMO-X permeate stage (2nd stage) is mounted on an aluminium system rack and ready for connection.

The reverse osmosis system GENO-OSMO-X permeate stage (2nd stage) features connecting pipes to the 1st stage. A transfer unit with transfer station for feed water, concentrate and permeate is installed in the 1st stage.

The control unit of the 2nd stage (without touch screen) is operated from the 1st stage (with touch screen).

3.1 Intended use

- A reverse osmosis system GENO-OSMO-X (1st stage) must necessarily be installed upstream of the GENO-OSMO-X permeate stage. The 2nd stage further improves the permeate quality.
- The respective pretreatment and the limit values of the GENO-OSMO-X (1st stage) must be complied with.
- The reverse osmosis system GENO-OSMO-X permeate stage is designed exclusively for use in industrial and commercial applications.
- For a defined, temperature-dependent continuous permeate capacity (at 15 °C). The continuous permeate capacity decreases by up to 3 % per degree centigrade of the feed water temperature.

3.1.1 GENO-OSMO-X permeate stage with membrane degassing

- Carbon dioxide gas (CO₂) dissolved in the inlet water is not retained by either of the two reverse osmosis stages and enters the permeate of the 2nd stage as conductivity.
- The gases affect the permeate conductivity of the entire system. If quality requirements are placed on the permeate, these must be taken into account and additional treatment steps (e.g. membrane degassing) might be necessary.

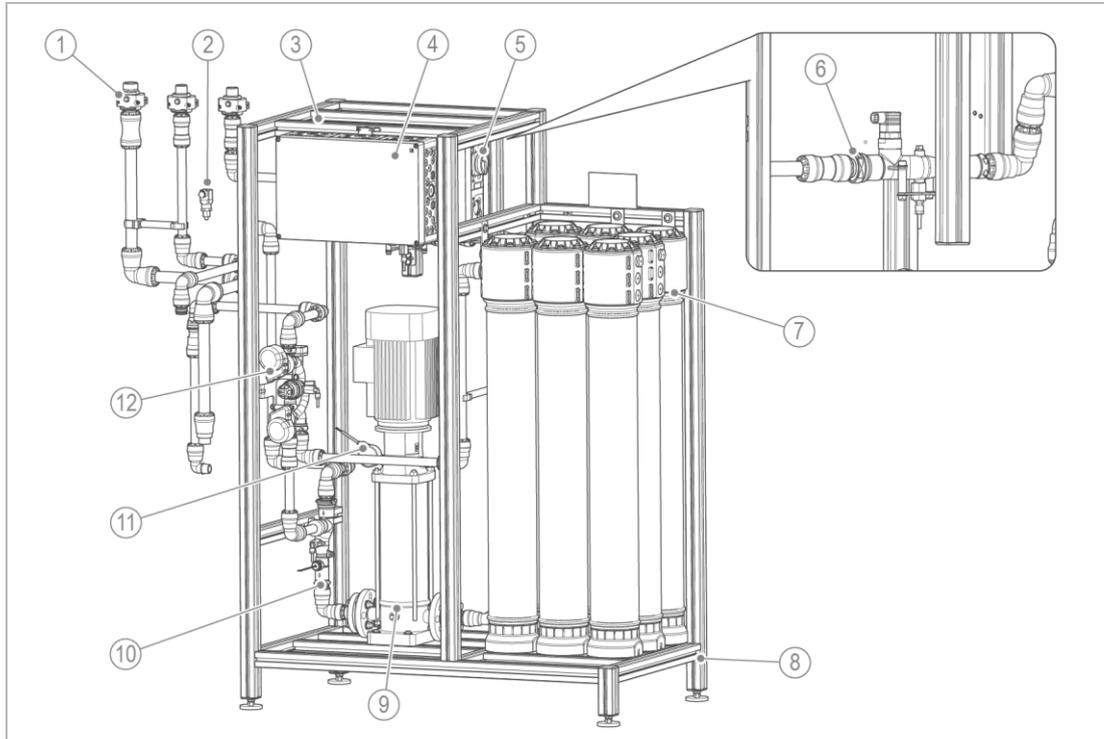
3.2 Foreseeable misuse

The reverse osmosis system GENO-OSMO-X permeate stage is not suitable for the applications indicated below:

- Demineralisation of salt water (sea water)
- Strongly deviating and/or fluctuating flow rates of the feed water

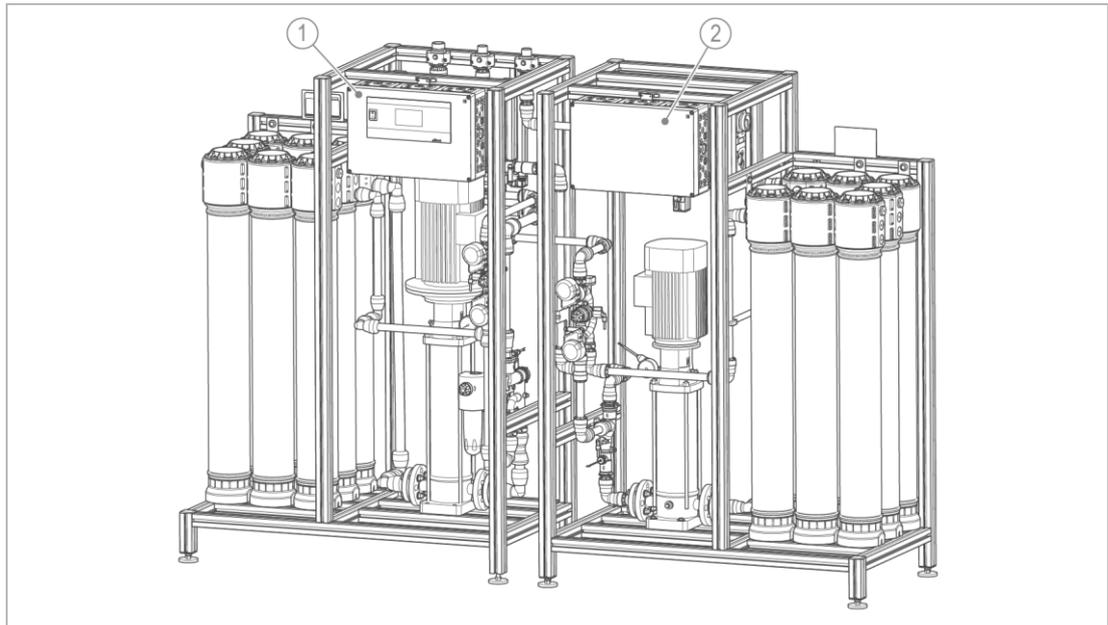
3.3 Product components

3.3.1 GENO-OSMO-X permeate stage



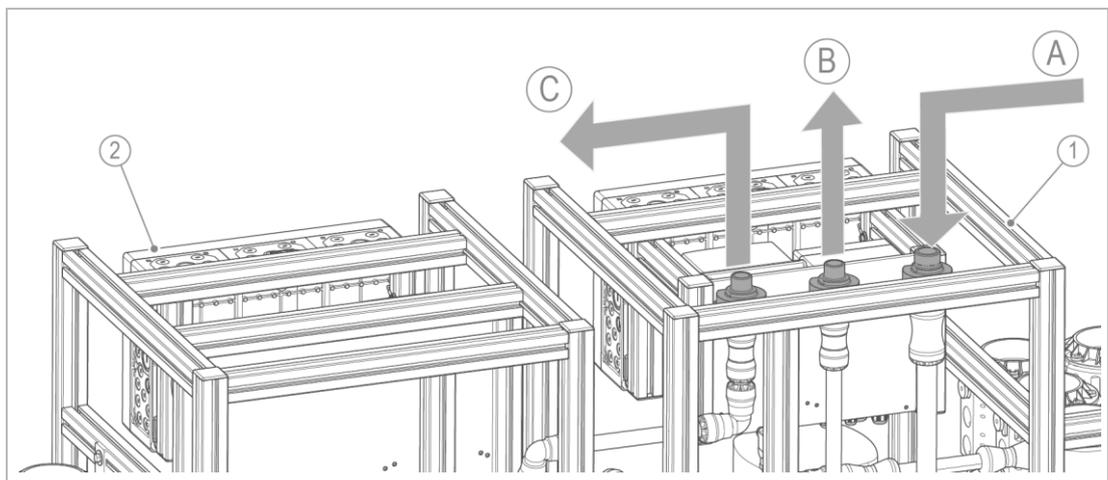
Designation	Function	Coding
1 Transfer unit	Piping with connections: Feed water inlet, concentrate-to-drain and permeate outlet are installed on the system rack	
2 Pressure transducer	Installed in the hydro block Permeate of the 1st stage. For constant pressure control of the 1st stage	RO1CP2
3 Frequency converter	By means of the frequency converter, the pump's revolution speed is adapted in a way that the permeate output is achieved	
4 Control unit	Without graphic touch screen, mounted tiltable. Is operated from the 1st stage.	RO1E3
5 Power distribution	With automatic circuit breakers and main switch to switch the entire system on and off .	RO1E4
6 Hydro block	Permeate	
7 Membrane	Reverse osmosis membranes in pressure pipes to generate the permeate	RO1B9
8 System rack	Made of anodised aluminium with adjustable feet	
9 High-pressure pump (HP pump)	Centrifugal pump (frequency-controlled) which generates the operating pressure required for the membrane(s)	RO1P4
10 Hydro block	Permeate inlet from the 1st stage	
11 Pressure switch for maximum pressure	Prevents the system's operating pressure from exceeding 16 bar	RO1CP3
12 Hydro block	Concentrate (to drain)	

3.3.2 GENO-OSMO-X with GENO-OSMO-X permeate stage



Designation	Designation
1 GENO-OSMO-X (1st stage)	2 GENO-OSMO-X permeate stage (2nd stage)

3.4 System connections



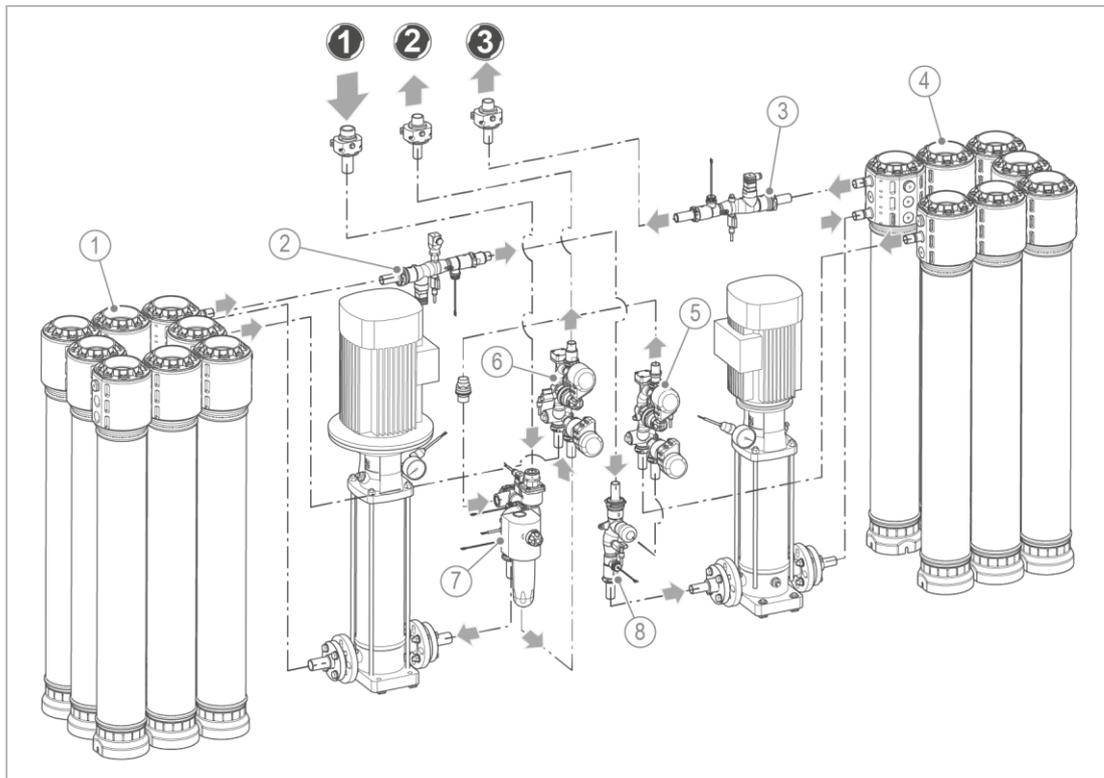
Designation	Designation
1 GENO-OSMO-X (1st stage)	A Feed water inlet BL1 (1" m. thr. or 1¼" m. thr.)
2 GENO-OSMO-X permeate stage (2nd stage)	B Concentrate outlet to drain BL2 (1" m. thr.)
	C Permeate outlet to permeate tank BL3 (1" m. thr.)



Connections to water meter screw connections 1" or 1¼" (male thread) to be provided by client.

3.5 Functional description

The reverse osmosis system consists of the functional units below:



1	2	3
Feed water	Concentrate-to-drain	Permeate

Designation	Designation
1 Pressure pipe with membrane module (1st stage) (number subject to system size)	5 Hydro block Concentrate-to-drain (2nd stage)
2 Hydro block Permeate (1st stage)	6 Hydro block Concentrate-to-drain (1st stage)
3 Hydro block Permeate (2nd stage)	7 Hydro block Feed water (1st stage)
4 Pressure pipe with membrane module (2nd stage)	8 Hydro block Permeate inlet from the 1st stage into the 2nd stage

The reverse osmosis system GENO-OSMO-X (1st stage) is completely piped and wired with the GENO-OSMO-X permeate stage (2nd stage).

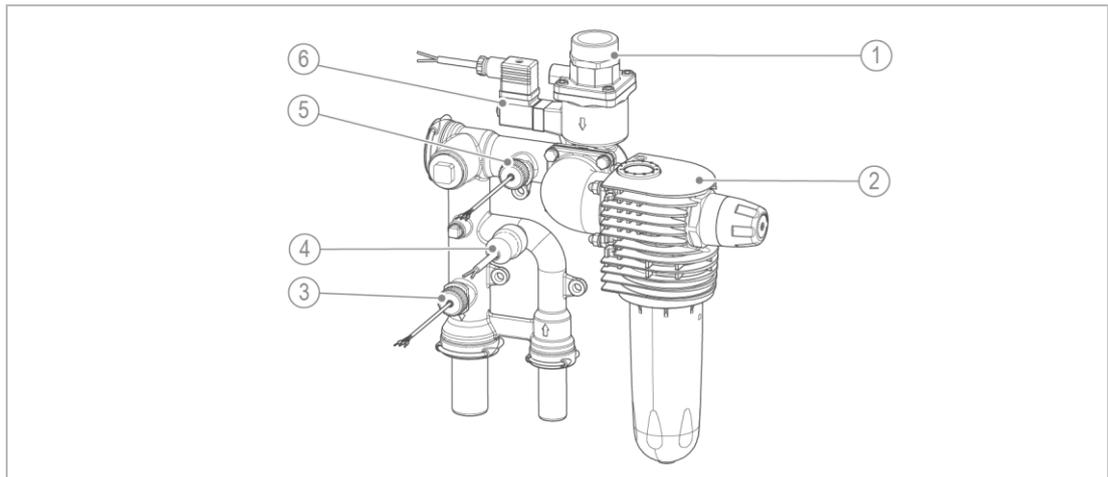
By means of a constant, adjustable pressure, the permeate of the 1st stage is directed to the 2nd stage (treatment stage).

The permeate of the 1st stage is further demineralised in the 2nd stage using identical process steps.

In the 2nd stage, however, the concentrate is not discharged to the drain via the control valve (motor-driven) but is once again directed to the feed water inlet of the 1st stage of the reverse osmosis.

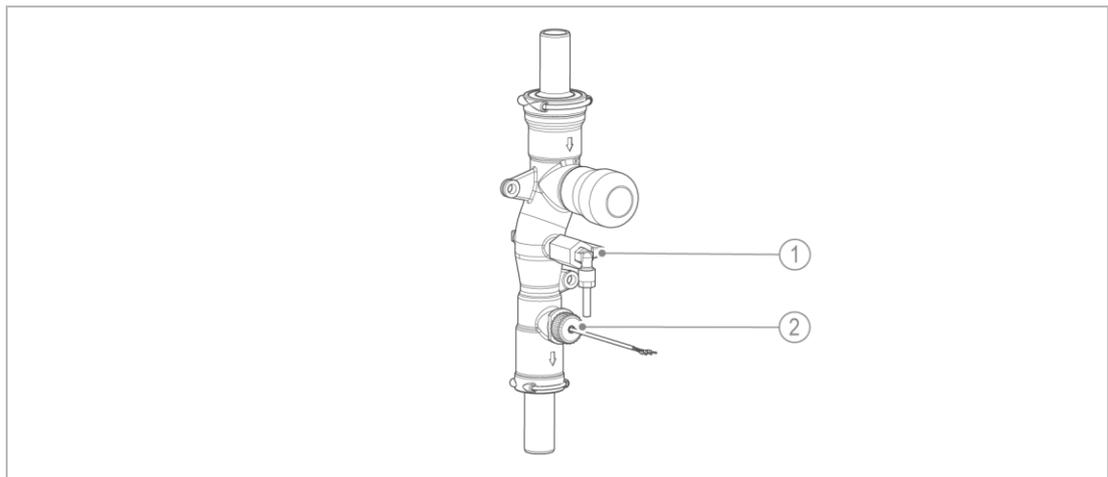
In the 2nd stage, a recovery of 90 % can be achieved.

Hydro block Feed water 1st stage



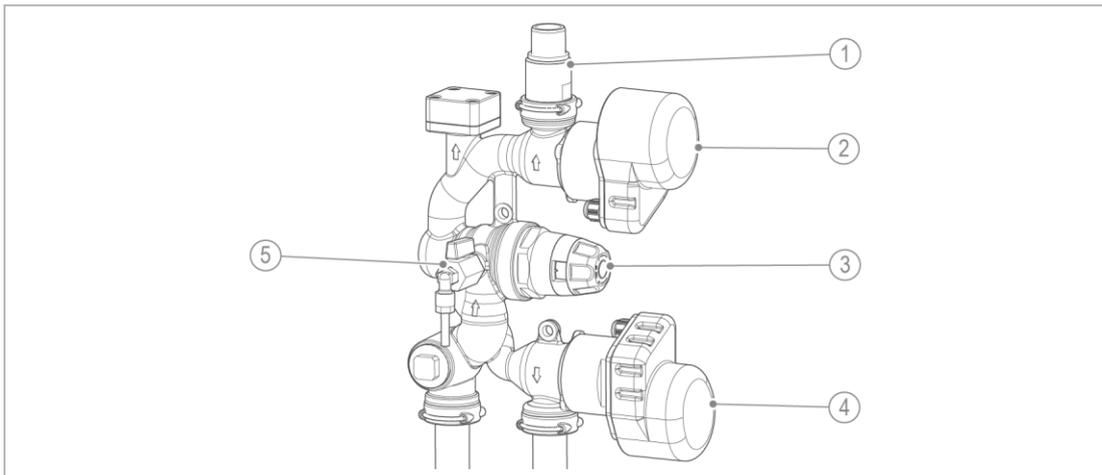
	Designation	Function	Coding
1	Connection Feed water inlet	Water meter screw connection 1" or 1¼" (male thread) with flat sealing	BL1
2	Fine filter	Prefiltration of the feed water incl. pressure reducer (preset) 4.0 bar and integrated pressure gauge. Osmosis version with black filter cylinder and filter element.	RO1F1
3	Flow sensor FEED	Via pulse signal to the control unit. FEED = Concentrate recirculation + Permeate + Concentrate-to-drain	RO1CF2
4	Low pressure switch	To prevent the high-pressure pump from running dry. Switches time-delayed after the feed water solenoid valve has opened.	RO1CP1
5	Flow sensor Feed water	Via pulse signal to the control unit. Feed water = Permeate + Concentrate-to-drain.	RO1CF1
6	Feed water solenoid valve	During the permeate production, this valve is always open. After a system stop, the valve remains open for the programmed flushing volume of the membrane(s).	RO1V1

Hydro block Permeate inlet 2nd stage



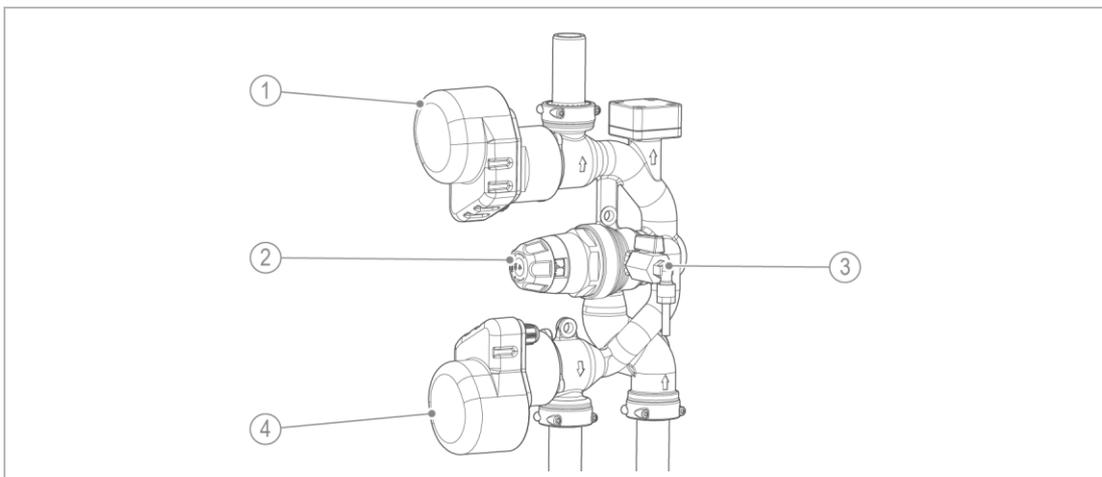
	Designation	Function	Coding
1	Sampling valve Permeate inlet	Allows for manual quality determination via sampling valve	RO1H12
2	Flow sensor Permeate	Via pulse signal to the control unit. FEED Permeate stage = Recirculated permeate + Permeate + Concentrated permeate back to 1st stage	RO1CF6

Hydro block Concentrate 1st stage



	Designation	Function	Coding
1	Connection Concentrate-to-drain	Water meter screw connection 1" (male thread) with flat sealing	BL2
2	Adjusting valve Concentrate-to-drain with drive	To automatically adjust the volume flow Concentrate-to-drain (recovery). During the production of permeate, this portion of the water permanently flows to the drain. In case of a system stop and in case of a system failure, the valve opens the entire cross section always in combination with the feed water solenoid valve	RO1V3
3	Pressure reducer Concentrate	To improve the control accuracy of the adjusting valves (set to 6 bar)	RO1H4
4	Adjusting valve Concentrate recirculation with drive	For automatic adjustment of the volume flow Concentrate recirculation The volume flow depends on the system size	RO1V2
5	Sampling valve Concentrate	Allows for manual quality determination via the sampling valve	RO1H1

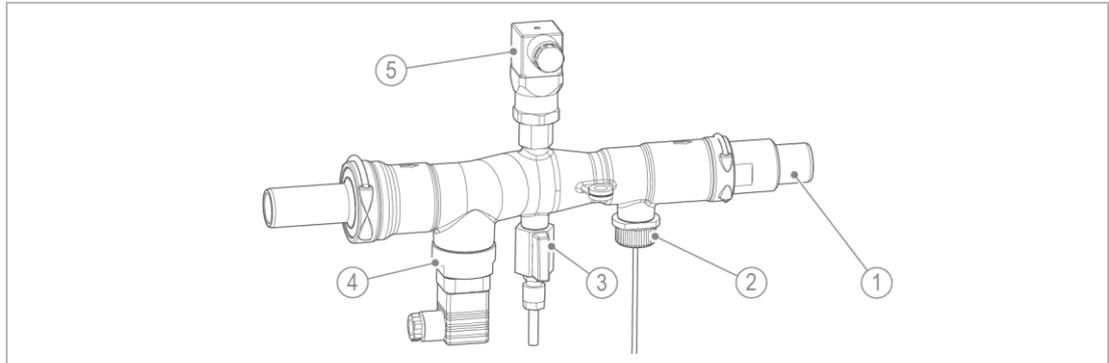
Hydro block Concentrate 2nd stage



	Designation	Function	Coding
1	Adjusting valve Concentrate of permeate stage	To automatically adjust the volume flow Concentrate back into the 1st stage	RO1V10
2	Pressure reducer Concentrate of permeate stage	To improve the regulation accuracy of the adjusting valves (set to 6 bar)	RO1H13

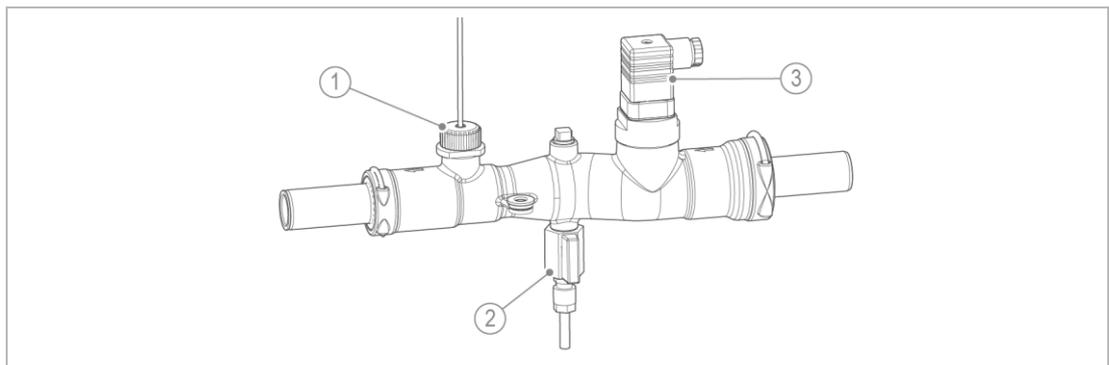
Designation	Function	Coding
3 Sampling valve Concentrate of permeate stage	Allows for manual quality determination via the sampling valve	RO1H11
4 Adjusting valve Concentrate recirculation with drive	For automatic adjustment of the volume flow Concentrate recirculation. The volume flow depends on the system size	RO1V9

Hydro block Permeate 1st stage



Designation	Function	Coding
1 Connection Permeate	Water meter screw connection 1" (male thread) with flat sealing	BL3
2 Flow sensor Permeate	Via pulse signal to the control unit	RO1CF3
3 Sampling valve Permeate	Allows for manual quality determination via the sampling valve	RO1H5
4 Conductivity meter	Conductivity sensor according to the 2-electrode principle (temperature-compensated (RO1CT1)) for the continuous measurement of the permeate conductivity The measuring results are shown in the control unit	RO1CQ1
5 Pressure transducer	For constant pressure control of the 1st stage	RO1CP2

Hydro block Permeate 2nd stage



Designation	Function	Coding
1 Flow sensor Permeate of permeate stage	Via pulse signal to the control unit	RO1CF7
2 Sampling valve Permeate of permeate stage	Allows for manual quality determination via the sampling valve	RO1H14
3 Conductivity meter Permeate stage	Conductivity sensor acc. to the 2-electrode principle (temperature-compensated (RO1CT1)) for the continuous measurement of the permeate stage conductivity. The measuring result is shown in the control unit of GENO-OSMO-X 1st stage	RO1CQ2

3.6 Accessories

Your product can be retrofitted with accessories. Please contact your local Grünbeck representative or Grünbeck's headquarters in Hoechststaedt/Germany for details.

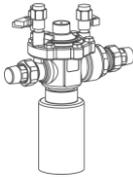
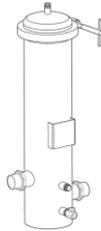
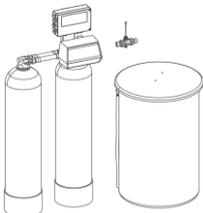
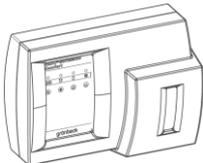
Illustration	Product	Order no.
	Drinking water filter BOXER KX 1"	101 835
	80 µm filter element for prefiltration	
	Drinking water filter BOXER KDX 1"	101 820
	with additional pressure reducer	
	EURO system separator GENO-DK 2 DN 15 (1/2")	132 510
	Euro system separator GENO-DK 2 DN 20 (3/4")	132 520
To secure systems and devices that might endanger the drinking water as per DIN EN 1717-part 4.		
	GENO-activated carbon filter AKF 1600	109 460
	To reduce the chlorine concentration in the water. For larger activated carbon filters, please inquire.	
	Water softener GENO-mat duo WE-X	186 100
	Fully automatic twin water softener working according to the ion exchange principle. Generation of fully softened water with volume-controlled regeneration. For larger systems, please inquire.	
	Water softener Delta-p-I	185 200
	Fully automatic triple water softener working according to the ion exchange principle. Generation of fully/partially softened water with volume-controlled regeneration. For larger systems, please inquire.	
	Hardness control measuring device softwatch	17260000000
	Automatic limit value monitoring of residual/total hardness via limit value indicator	

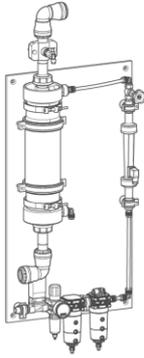
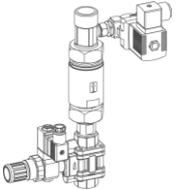
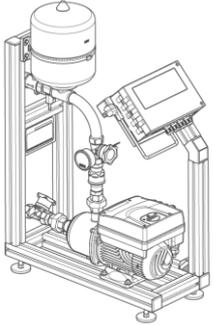
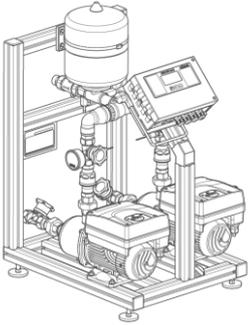
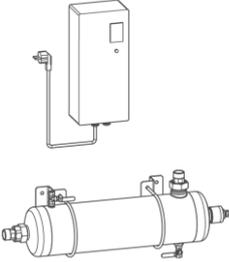
Illustration	Product	Order no.
	<p>GENO-membrane degassing system MEC 500-1</p> <p>For a permeate capacity < 500 l/h, chemical-free removal of CO₂ disturbing the process using a porous membrane. On-site stripping gas supply as oil-free and aerosol-free compressed air 3 - 10 bar required.</p> <p>Optional: Integrated in the rack-mounted modular system of the GENO-OSMO-X permeate stage.</p>	<p>770 200</p>
	<p>Emergency bypass for reverse osmosis systems</p> <p>An emergency bypass of the reverse osmosis systems might become necessary if the permeate supply in the pure water tank is not sufficient due to peak withdrawals.</p> <p>By means of a level signal in the pure water tank, the solenoid valve with butterfly valve emergency bypass is opened and the water supply ensured.</p>	<p>750 75x</p>
	<p>Pure water tank</p> <p>For intermediate storage of permeate flowing unpressurised from GENO reverse osmosis systems</p> <p>Design of all tanks:</p> <ul style="list-style-type: none"> • Pre-assembled with PVC overflow line • Connections for permeate inlet and suction line of pressure booster system • Grey PE • Hand hole with removable screw cap • A maximum of 4 tanks can be combined to a supply battery 	<p>Basic pure water tank GT-X 1000 with sterile air filter and level probe</p> <p>712000040000</p> <p>Tank height including connecting pieces. Useful capacity approx. 840 l (w = 780 x d = 1000 x total h = 2000 mm) For larger tanks, please inquire.</p> <p>Additional tank GT 1000 with sterile air filter</p> <p>712000060000</p> <p>Add-on tank of the same size as basic pure water tank GT-X 1000 with sterile air filter and level probe, ventilation and deaeration with 0.2 µm ultra-fine filter</p>
	<p>Basic pure water tank GT-X 1000 with level probe</p> <p>712000030000</p> <p>Without sterile overflow designed as siphon. Overflow designed as down-pipe Tank height including connecting pieces. Useful capacity approx. 840 l (w = 780 x d = 1000 x total h = 2000 mm) For larger tanks, please inquire.</p> <p>Additional tank GT without sterile air filter</p> <p>712000050000</p> <p>Add-on tank of the same size as basic pure water tank GT-X 1000 with level probe, ventilation and deaeration as connecting piece with cover</p>	

Illustration	Product	Order no.						
	<p>Combined unit CO₂ trap SL3K with sterile air filter (optional)</p> <p>For sterile aeration and ventilation (ventilation line up to 5.0 m³/h) of permeate tanks to retain germs and particles and to remove CO₂ from the ambient air. For wall mounting, connected to the top of the permeate tank with fixed piping.</p>	<p>712 820</p>						
	<p>Pressure booster system GENO-FU-X 2/40-1 NE</p> <p>Compact, pressure-controlled pump aggregate consisting of:</p> <ul style="list-style-type: none"> • Centrifugal pump made of stainless steel • Integrated pressure and contact water meter • Control electronics with power switching • Backlit display • Operating switch • Operation log via SD-card • Voltage-free signal/fault signal contact • Non-return valve • Shut-off valve for each pump (on suction and pressure side) • Diaphragm expansion tank with forced flow <p>Max. delivery rate: 1.2 – 4.2 m³/h Max. delivery head: 18.2 – 45.6 m Power supply: 230 V / 50 Hz Power input: 1 kW Connections: DN 25 / DN 32 Protection: IP 55</p>	<p>730 790</p>						
	<p>Pressure booster system GENO-FU-X 2/40-2 NE</p> <p>Same as 730 790, however, with the option for time/load switch-over. For additional pressure booster systems, please inquire.</p>	<p>730 791</p>						
	<p>UV disinfection system violiQ:UV33i/80i/120i</p> <table border="1" data-bbox="608 1451 1214 1547"> <tbody> <tr> <td data-bbox="608 1451 911 1480">UV33i</td> <td data-bbox="916 1451 1214 1480">523210000000</td> </tr> <tr> <td data-bbox="608 1487 911 1516">UV80i</td> <td data-bbox="916 1487 1214 1516">523220000000</td> </tr> <tr> <td data-bbox="608 1523 911 1552">UV120i</td> <td data-bbox="916 1523 1214 1552">523230000000</td> </tr> </tbody> </table> <p>For disinfection of permeate which to a large extent is free of turbidities and only slightly loaded.</p>	UV33i	523210000000	UV80i	523220000000	UV120i	523230000000	
UV33i	523210000000							
UV80i	523220000000							
UV120i	523230000000							

4 Transport, placing 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/lift truck with suitable pallet forks. Take note 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 11.2).

4.2 Transport/Placing



CAUTION 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.
- ▶ 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; located at the HP pump for GENO-OSMO-X permeate stage 2000 and GENO-OSMO-X permeate stage 2700.

4.3 Storage

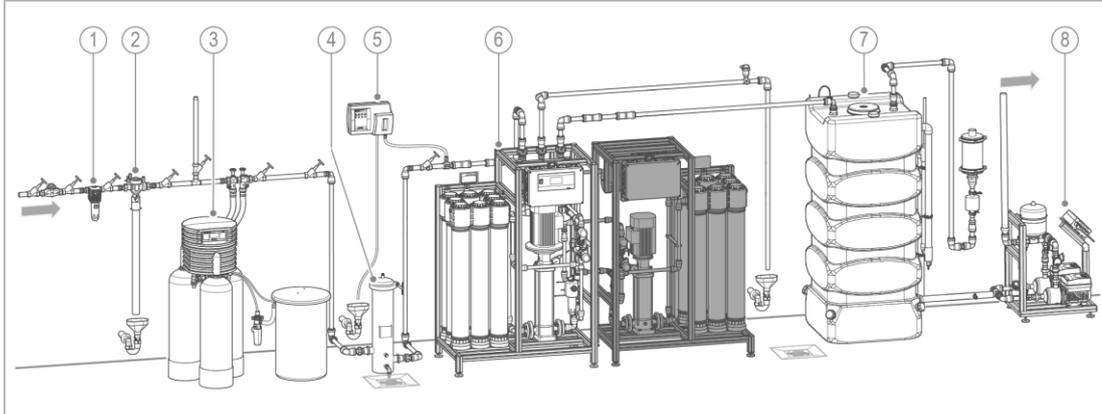
- ▶ Protect the product from the impacts below when storing it:
 - Dampness, moisture
 - Environmental impacts such as wind, rain, snow, etc.
 - Frost, direct sunlight, severe heat exposure
 - Chemicals, dyes, solvents and their vapours

5 Installation



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

Installation example GENO-OSMO-X permeate stage



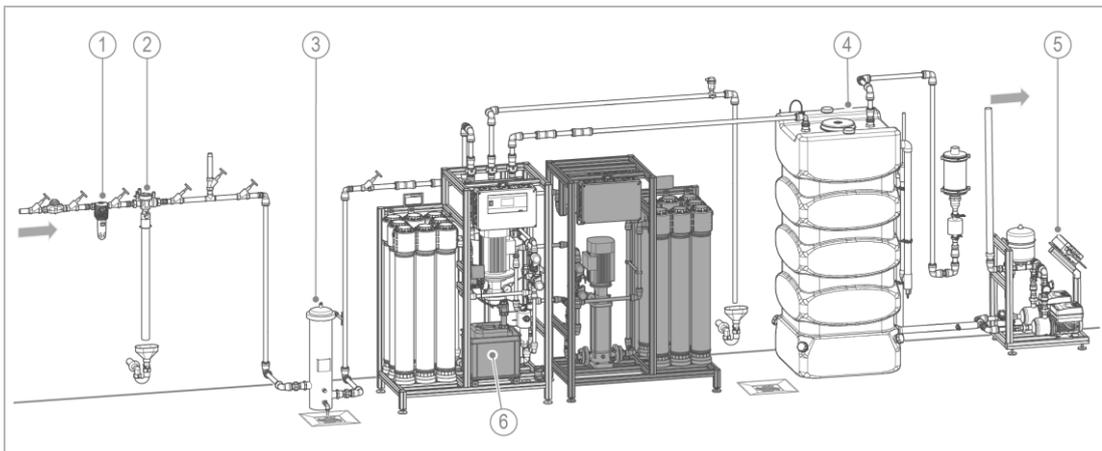
Designation

- 1 Drinking water filter (e.g. BOXER KDX)
- 2 System separator GENO-DK 2
- 3 Water softener Delta-p-I
- 4 Activated carbon filter AKF
- 5 Automatic water analysis system GENO-softwatch Komfort

Designation

- 6 Reverse osmosis system GENO-OSMO-X
- 7 Pure water tank GT-X with level probe
Accessories: CO₂ trap with sterile air filter
- 8 Pressure booster system GENO-FU-X 2/40-2 N

Installation example GENO-OSMO-X permeate stage "Antiscalant"



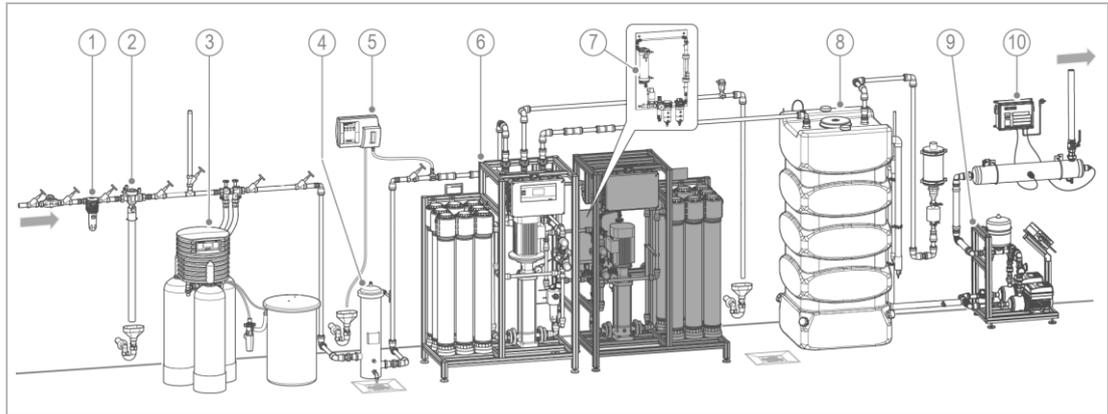
Designation

- 1 Drinking water filter (e.g. BOXER KDX)
- 2 System separator GENO-DK 2
- 3 Activated carbon filter AKF

Designation

- 4 Pure water tank RT-X with level probe
Accessories: CO₂ trap with sterile air filter
- 5 Pressure booster system GENO-FU-X 2/40-2 N
- 6 Reverse osmosis system GENO-OSMO-X 1st stage with Antiscalant dosing

Installation example GENO-OSMO-X permeate stage „Membrane degassing and UV system”



Designation	
1	Drinking water filter (e.g. BOXER KDX)
2	System separator GENO-DK 2
3	Water softener Delta-p-I
4	Activated carbon filter AKF
5	Automatic water analysis system GENO-softwatch Komfort
6	Reverse osmosis system GENO-OSMO-X 1st stage

Designation	
7	GENO-membrane degassing system MEC 500-1, integrated in system rack of the 2nd stage
8	Pure water tank RT-X with level probe Accessories: CO ₂ trap with sterile air filter
9	Pressure booster system GENO-FU-X 2/40-2 N
10	GENO-UV system „industrial version“

5.2 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 drain connection (at least DN 50) to discharge the concentrate must be available (refer to chapter 12).
- A floor drain suitable for the respective system size must be available at the installation site.
- The permeate and concentrate pipes provided by the client on site must be made of corrosion-proof material.

5.2.1 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.
- For installation and maintenance work, a sufficient distance of at least 500 mm must be maintained in front/behind and to the right of the system.
- For operating purposes, there must be a distance of at least 800 mm in front of the system.
- The room/installation height should at least be 1800 mm.
- On the left side (membrane pressure pipes), the system can be placed flush to the wall.

5.2.2 Products installed upstream

- In general, the following must be installed upstream of the systems:
 - Drinking water filter
 - Pressure reducer, if necessary (in case of a feed water pressure > 5 bar)
 - Euro system separator
 - Activated carbon filter, if necessary (note the water analysis).
 - Water softener or antiscalant dosing
- The feed water inlet pipe and the permeate outlet pipe provided by the client on site must feature a provision to separate the pipes (e.g. a screw connection). This is required to flush out the preserving agent, or to carry out chemical cleaning and/or disinfection, if necessary.
- In case of system configurations with water softeners, we recommend monitoring the residual hardness by installing an automatic water analysis system in the soft water outlet in order to increase operational safety.

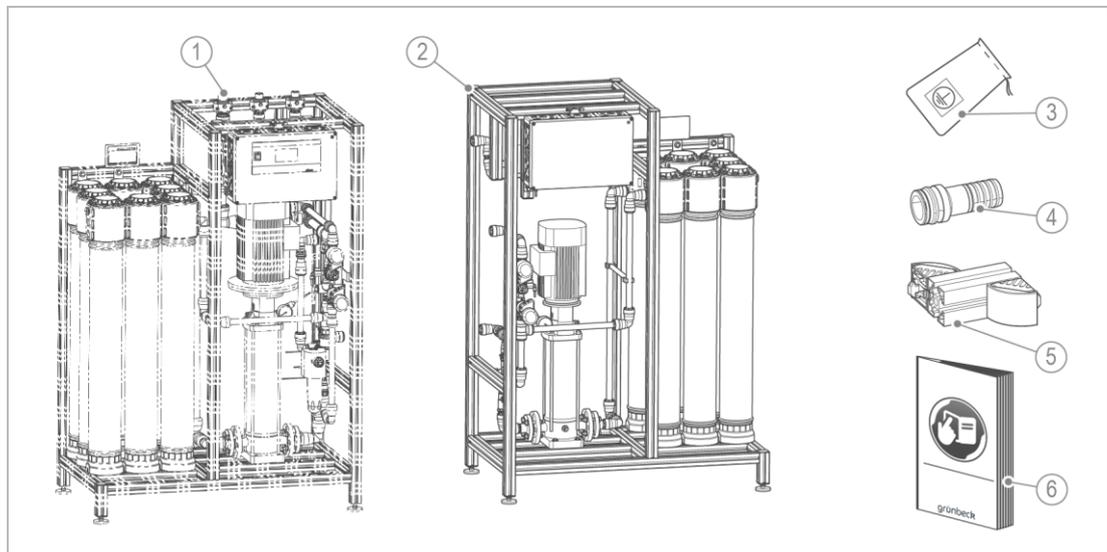
5.2.3 Requirements for electrical wiring

- For the power supply of the system, a power outlet of 3 x 400 V/50 Hz/L/N/PE (with a fuse protection of 32 A) must be provided by the client on site (refer to chapter 5.5).
- The feed line to the system provided by the client on site must be appropriately dimensioned and routed according to the respective system type (refer to the electric circuit diagram of GENO-OSMO-X, order no. 750 292 and GENO-OSMO-X permeate stage, order no. 751 292).

5.3 Checking the scope of supply



The reverse osmosis systems GENO-OSMO-X (1st stage) and GENO-OSMO-X permeate stage (2nd stage) are each pre-assembled on an aluminium rack and ready for connection.



Designation

- | | |
|---|--|
| 1 | GENO-OSMO-X (1st stage) with transfer unit |
| 2 | GENO-OSMO-X permeate stage (2nd stage), connecting lines disconnected |
| 3 | Bag with connection material for "Potential equalisation of aluminium rack" (placed in the power distribution) |

Designation

- | | |
|---|---|
| 4 | Connection nozzle (to flush out the preserving agent) |
| 5 | 4x spacer (1st stage to 2nd stage) |
| 6 | Operation manual |

► Check the scope of supply for completeness and damage.

5.4 Water installation

Only the GENO-OSMO-X permeate stage without any additional features is described here as an example for all system versions. The illustrations are only exemplary representations.

► Install the reverse osmosis systems GENO-OSMO-X (1st stage) and the GENO-OSMO-X permeate stage (2nd stage) in coherent working steps (refer to operation manual no. 750 927).



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

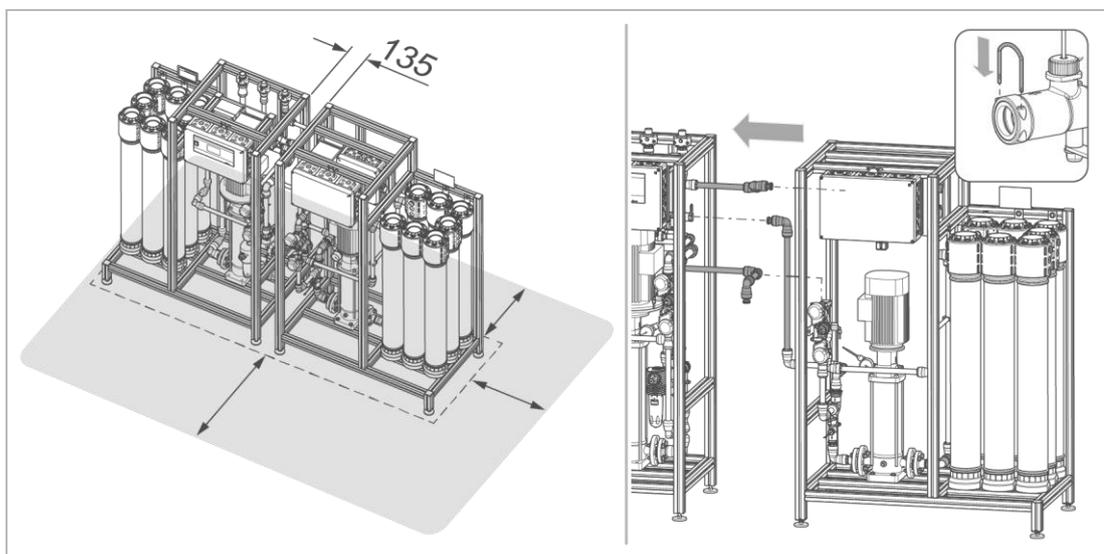
5.4.1 Preliminary work

NOTE

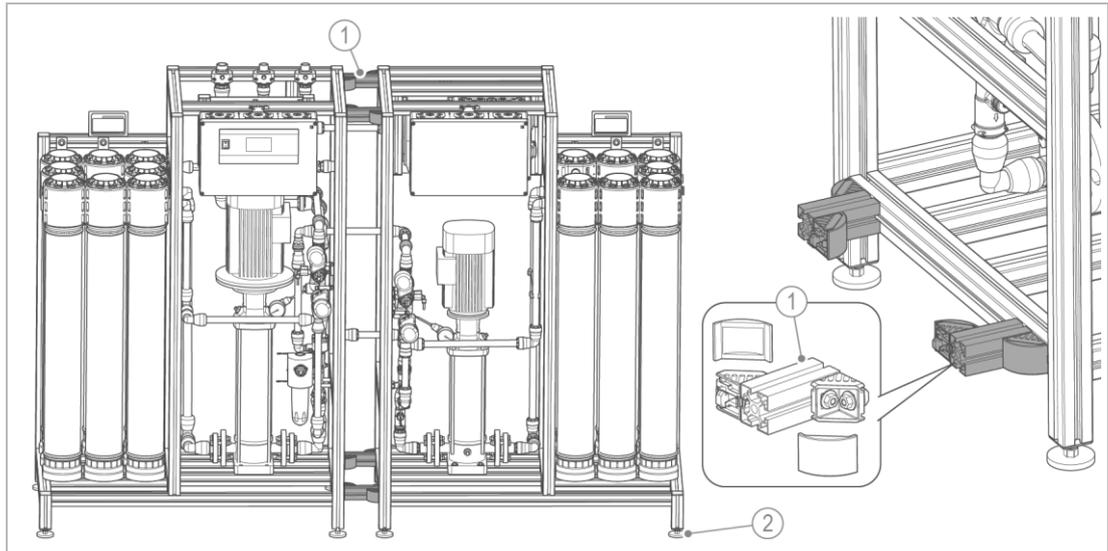
High difference in temperature at the installation site during the installation of the system.

- Possible malfunction of the control unit during initial start-up/commissioning due to moisture condensation on electronic components inside the control unit.
- ▶ Unpack the system and let it rest unused at the installation site for 1 hour prior to installing it.
- » Possible moisture on electronic components inside the control unit can dry off.

1. Release the system rack of the two systems from the transport lock.
2. Remove the pallets.



3. Securely place the 1st stage system at the designated location – take the minimum space required into consideration (refer to chapter 5.2.1).
4. Release the transport lock of the connecting lines.
5. Remove the protective caps from the connections.
6. Line up the 2nd stage system flush with the 1st stage system, so that a gap of approx. 135 mm remains between the two stages.
7. Turn the connecting lines towards the hydro blocks to be connected.
8. Plug the connecting lines onto the hydro blocks – secure with clamps:
 - a Permeate inlet from the 1st stage to the 2nd stage
 - b Concentrate outlet to the 1st stage
 - c Permeate outlet to the 2nd stage



Designation	Designation
1 Spacer	2 Adjustable feet

- 9. Level out any uneven floors with the adjustable feet.
- 10. Position the spacers at the top and the bottom of the system racks.
- 11. Fix the system racks with the angles of the spacers.
 - » The two system racks are placed and secured against each other.

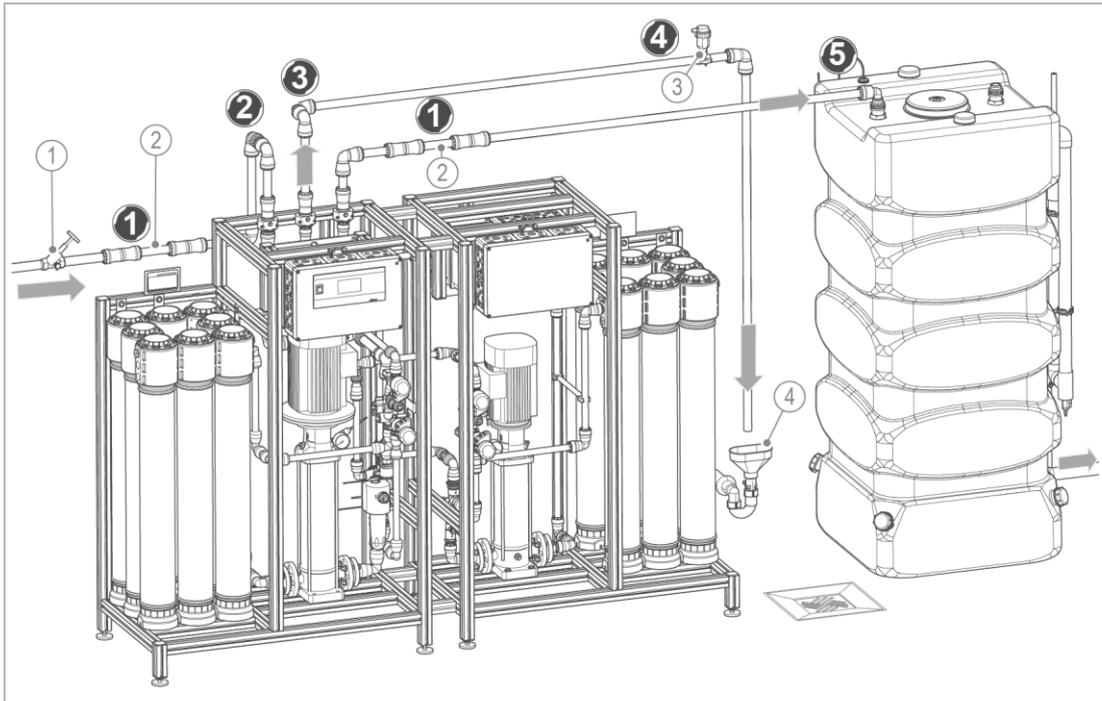
5.4.2 Connecting the system

The pipes made of corrosion-resistant material provided by the client on site for feed water and permeate must be separable, for instance by means of a screw connection (flushing section).



The flushing section – which can be removed, if necessary – is a pipe section with detachable connecting elements at both pipe ends.

During chemical cleaning (CIP) and disinfection operations, the system must be disconnected from the feed water and permeate pipe.



Designation

- 1 Shut-off valve (to be provided by client on site)
- 2 Flushing section (to be provided by client on site)

Designation

- 3 Aeration/ventilation valve
- 4 Drain connection acc. to DIN EN 1717

1. Install a flushing section each in the inlet pipe “feed water” and the outlet pipe “permeate”.
2. Connect the inlet pipe to the “feed water” connection.
3. Connect the discharge pipe to the “concentrate-to-drain” connection according to DIN EN 1717 (with free outlet).
4. Install an aeration/ventilation valve above system level at the discharge pipe “concentrate”.
5. Connect the permeate pipe to the permeate supply tank.

5.5 Electrical installation



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



DANGER Life-threatening voltage of 400 V

- Risk of severe burns, cardiovascular failure, fatal electric shock
- ▶ Check the system for proper condition before start-up/commissioning.
- ▶ Switch off the supply voltage before working on electrical system parts.
- ▶ Secure the system against restart.
- ▶ Discharge residual voltage.
- ▶ Only use suitable, undamaged tools.
- ▶ Use personal protective equipment – do not work with wet hands.

NOTE

The frequency converter of the high-pressure pump can cause malfunctions of the residual current circuit breaker installed in the mains supply line.

- ▶ Use an AC/DC sensitive RCCB with a response threshold of 300 mA.
- ▶ For the on-site power supply of the system, use a power outlet of 3x 400 V/50 Hz/L/N/PE with 32 A fuse protection.

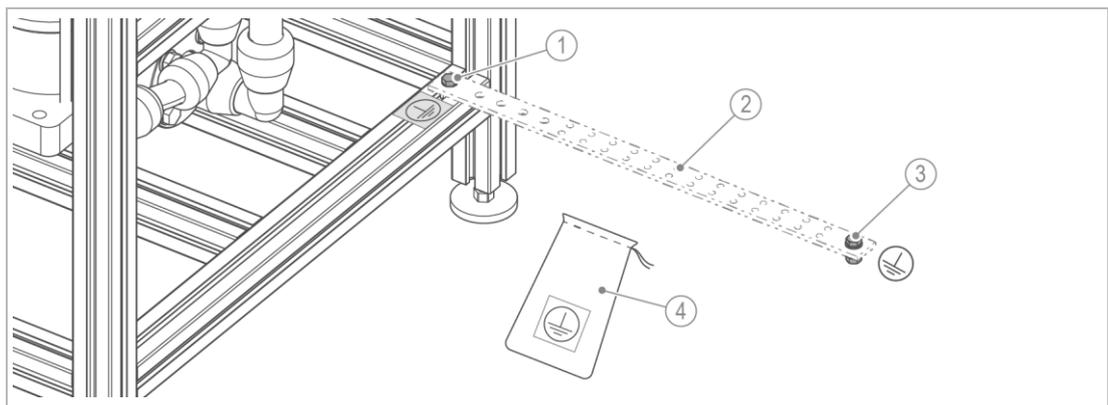
5.5.1 Establishing potential equalisation



In proper operation, the speed-controlled high-pressure pump can have a ground leakage current of > 10 mA.

- Connection to the potential equalisation provided by the client is required.

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



Designation	Designation
1 Grounding point on the aluminium system rack	3 Grounding point for potential equalisation provided by the client on site
2 Grounding tape	4 Bag with connection material

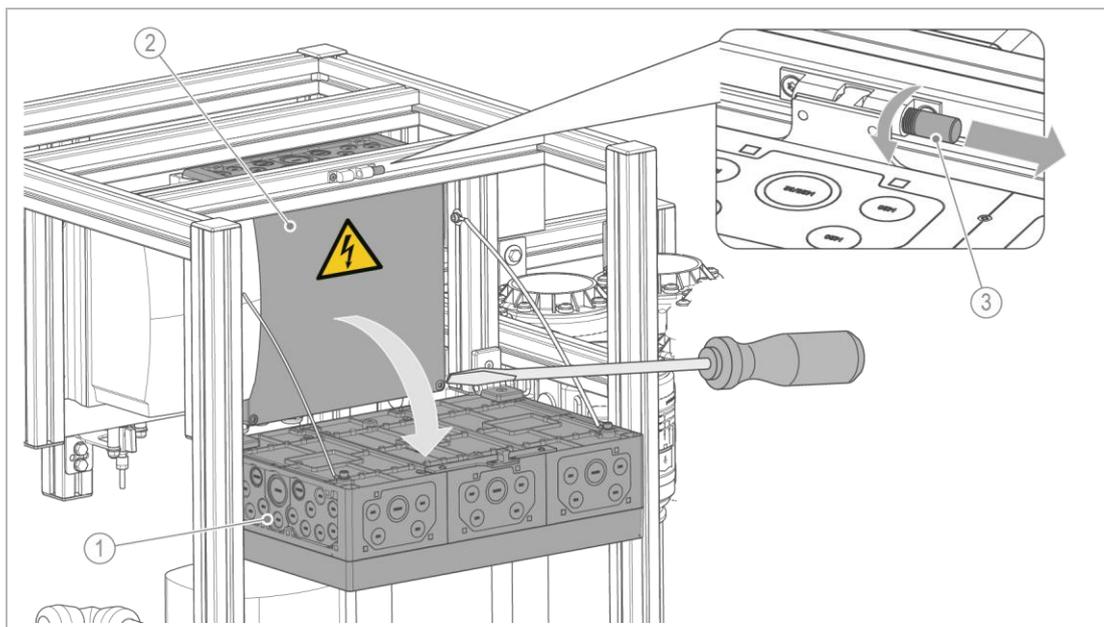
1. Remove the bag with the connection material from the power distribution box.
2. Connect the grounding point to the aluminium rack – use the connection material: hammer nut, hexagon head screw M8x25 and serrated washer.
3. Attach the “Grounding” label.
4. Connect the protective conductor to the potential equalisation provided by the client on site – use the connection material: hexagon head screw M8x20, washer and spring washer.

5.5.2 Establishing the electrical connection



The connecting cable for the 2nd stage is fixed at the system rack of the 1st stage.

- ▶ Disengage the connecting cable (release the cable tie) and route the connecting cable to the 2nd stage.



Designation	Designation
1 Control unit	3 Lock
2 Power distribution	

1. Release the lock – unscrew slightly.
 2. Carefully fold down the control unit.
 3. Loosen the screws of the cover of the power distribution.
 4. Make the electrical connection
(refer to electrical wiring diagram, order no. 751 292).
- ▶ Fix the connecting cable at the back of the power distribution using a cable tie.

- ▶ Close the power distribution.
- ▶ Fold up the control unit and secure it with the lock.
- ▶ Prior to starting up the system, make sure that the control unit/power distribution is closed – the main switch must be in the OFF position.

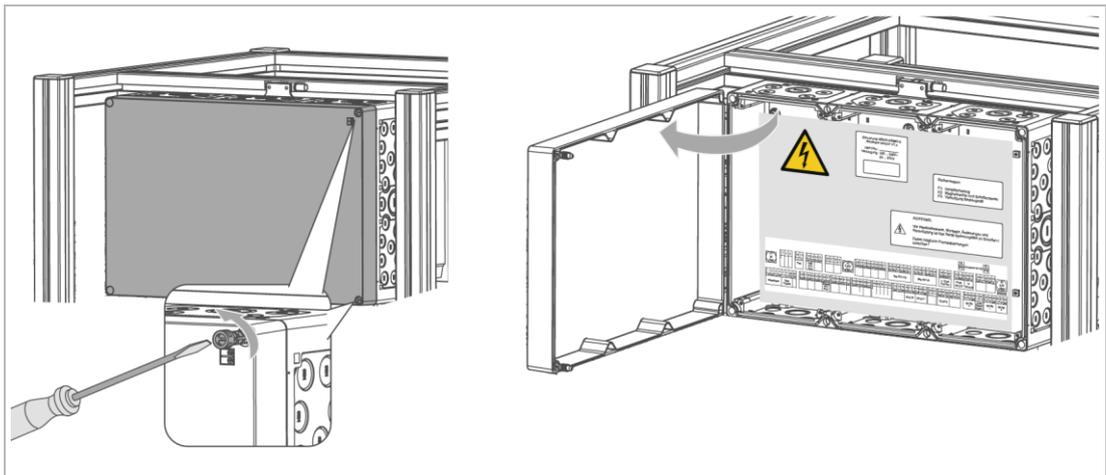
5.5.3 Line connections (control unit GENO-OSMO-X 2nd stage)



WARNING External voltage possible at voltage-free contacts and on the circuit board.

- Risk of electric shock when connected to 230 V.
- ▶ Do not open any switch boxes or other parts of the electrical equipment if you are not a qualified electrician.
- ▶ Switch the system's main switch to OFF before working on the electrical system.
- ▶ Wait for approx. 15 minutes for the residual voltage to be discharged.
- ▶ Obey the warning labels in the control unit.

Opening the control unit

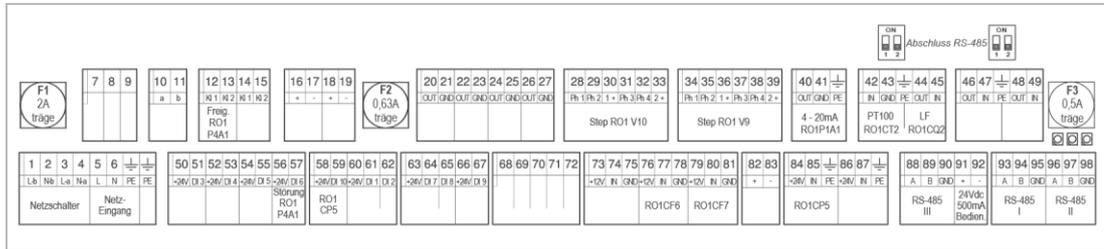


1. Make sure that the system is de-energised.
2. Loosen both screws.
3. Swing open the cover.
 - » The terminal strip is accessible.

5.5.3.1 Terminal strip of motherboard



The line connections below are pre-installed in the system at the factory and must not be modified:



Power supply of operating board

Terminal from motherboard	Function	Terminal to operating board
91	24 VDC / 500 mA	8
92	Ground	7

RS-485 (III) serial interface

Terminal from motherboard	Function	Terminal to operating board
88	RS 485 A	11
89	RS 485 B	10
90	RS 485 GND	9

Fuses of motherboard

Fuse	Function	Comment
F1	2 A slow-blow	Main fuse of mains input
F2	0.63 A slow-blow	24 VDC solenoid valves, step motors
F3	0.5 A slow-blow	Operating board 24 VDC

Connections of the motherboard

Term.	Signal	Colour	Function	Line	Comment	
1	L-b		Mains switch on housing cover	H05VV-F 5G1.5 mm ²	From mains switch	
2	N-b				To mains switch	
3	L-a					
4	N-a					
PE					Protective conductor	
5	L		230 V~ power supply from power distribution	38	H05VV-F 3G0.75 mm ²	Mains input
6	N			39		
PE				RO1E2		40
12	+ 24 V=	WH	Frequency converter (FC) of high-pressure pump RO1P4A1	1	LiYcY 7x0.25 mm ²	Enable FC
13	IN	BN		2		
56	+ 24 V=	GY		10		Fault signal FC
57	DI 6	PK		11		
40	4-20 mA	YE		6		Setpoint FC
41	GND	GN				
PE		YE-GN			Protective conductor	
28	Ph1	GN	Adjusting valve Concentrate-to-drain KK RO1V10	LiYY 7x0.25 mm ² (blue strand is not being used)	Step motor	
29	Ph1	WH				
30	Com1	BN				
31	Ph2	PK				
32	Ph2	YE				
33	Com2	GY				
34	Ph1	GN	Adjusting valve Concentrate recirculation KR RO1V9	LiYY 7x0.25 mm ² (white strand is not being used)	Step motor	
35	Ph1	BU				
36	Com1	BN				
37	Ph2	PK				
38	Ph2	YE				
39	Com2	GY				
42	Pt 100	BN	Temp. measurement	LiYcY 4x0.25 mm ²		
43		GN				RO1CT2
PE			Conductivity measuring cell		Shield	
44	K= 0.1	WH	RO1CQ2 cell constant 0.1			
45	1/cm	YE				
58	+ 24 V=	WH	Pressure switch for maximum pressure	LiYY 2x0.5 mm ²		
59	DI 10	BN				RO1CP5
76	+12 V=	WH	Flow sensor FEED	LiYY 3x0.25 mm ²		
77	Pulse	GN				
78	GND	BN				RO1CF6
79	+12 V=	WH	Flow sensor Permeate			
80	Pulse	GN				
81	GND	BN				RO1CF7

5.5.4 Line connections to other subsystems



Obey the operation manuals of the subsystems.

5.5.4.1 Interface RS-485 Data line to interconnected subsystems Water softener and/or Pressure booster

Connecting terminating resistors



If more than two subsystems are interconnected or if the length of the line between the two is > approx. 20 m, the so-called terminating resistors have to be connected to the two "endpoints" by means of DIP switches.

RS485 interconnection between	Terminating resistors to be connected in case of	
GENO-OSMO-X 1st stage + 2nd stage		
Delta-p + GENO-OSMO-X	Delta-p and GENO-OSMO-X (*)	
GENO-OSMO-X 2nd stage + pressure booster	GENO-OSMO-X + pressure booster (*)	
GENO-OSMO-X 1st stage or Delta-p + GENO-OSMO-X 2nd stage + pressure booster GENO-FU (HR)-X	GENO-OSMO-X 2nd stage	Pressure booster

(*) For length of line RS-485 > approx. 20 m

For GENO-OSMO-X permeate stage:

The terminating resistors are aligned below the sheet cover of the motherboard.

- Near terminal 50 (connection to water softener Delta-p)
- Near terminal 47 (connection to pressure booster)

5.5.4.2 Pretreatment Water softener

Term.	Signal	Function	Line	Comment
93	RS -485 A	Control unit	36	LiYcY 3x0.25 mm ² (*)
94	RS -485 B	IONO-matic WE	37	
95	GND		GND2	
93	RS -485 A	Control unit	52	LiYcY 3x0.25 mm ² (*)
94	RS -485 B	Delta-p	51	
95	GND		50 GND	

(*) For length of line RS-485 > approx. 20 m

5.5.4.3 Pressure booster installed downstream

Term.	Signal	Function	Line	Comment
96	RS -485 A	Control unit of pressure	38	LiYcY 3x0.25 mm ² (*)
97	RS -485 B	booster system	39	
98	GND	GENO-FU (HR)-X	GND2	

(*) A shielded line is required in case the length of the line is > 20 m.
The shield must be connected to a vacant PE terminal on one side.

6 Start-up/Commissioning



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



CAUTION

Climbing onto system components when operating components that are located at high levels.

- Risk of falling when climbing onto system components
- Risk of tripping in case of loose cables/pipes lying around.
- ▶ Do not climb onto system components such as pipes, racks, etc.
- ▶ Use stable, safe and self-standing access aids such as step ladders, pedestals, etc. when operating components that are located at high levels.

6.1 Flushing out the preserving agent



In case of 2-stage systems, the preserving agent must be flushed out from each stage separately.



WARNING

Contact with preserving agent

- Risk of chemical eye/skin burns.
- ▶ Use personal protective equipment (PPE).
- ▶ Completely route the concentrate line to the drain so that no preserving agent can escape.
- ▶ Obey the safety data sheet of the dosing agent.

NOTE

Danger in case of skipping or prematurely terminating the flushing process.

- By flushing out the preserving agent, the system is vented at the same time.
- When the flushing process is cancelled, the high-pressure pump runs dry.
- The preserving agent gets into the permeate tank or a permeate pipe provided by the client on site – these can only be cleaned/flushed with difficulty.
- ▶ Always flush out the preserving agent.
- ▶ Flushing out the system can be restarted manually.

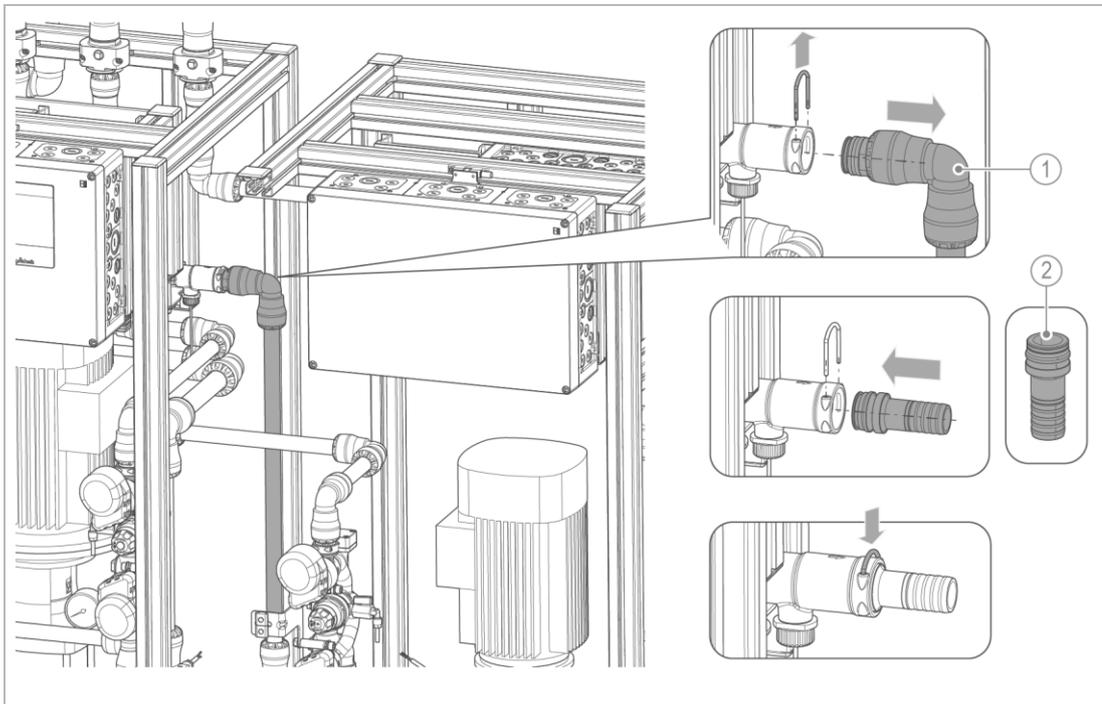
NOTE

Damage to the system when operated with hard water.

- Operating the system with hard water results in damage to the membranes.
- The preserving agent must be flushed out with softened (0° dH) or hardness-stabilised water.
- ▶ Put the water softener into operation before flushing out the preserving agent.

6.1.1 Flushing the 1st stage

► Prepare the 1st stage as follows:



Designation

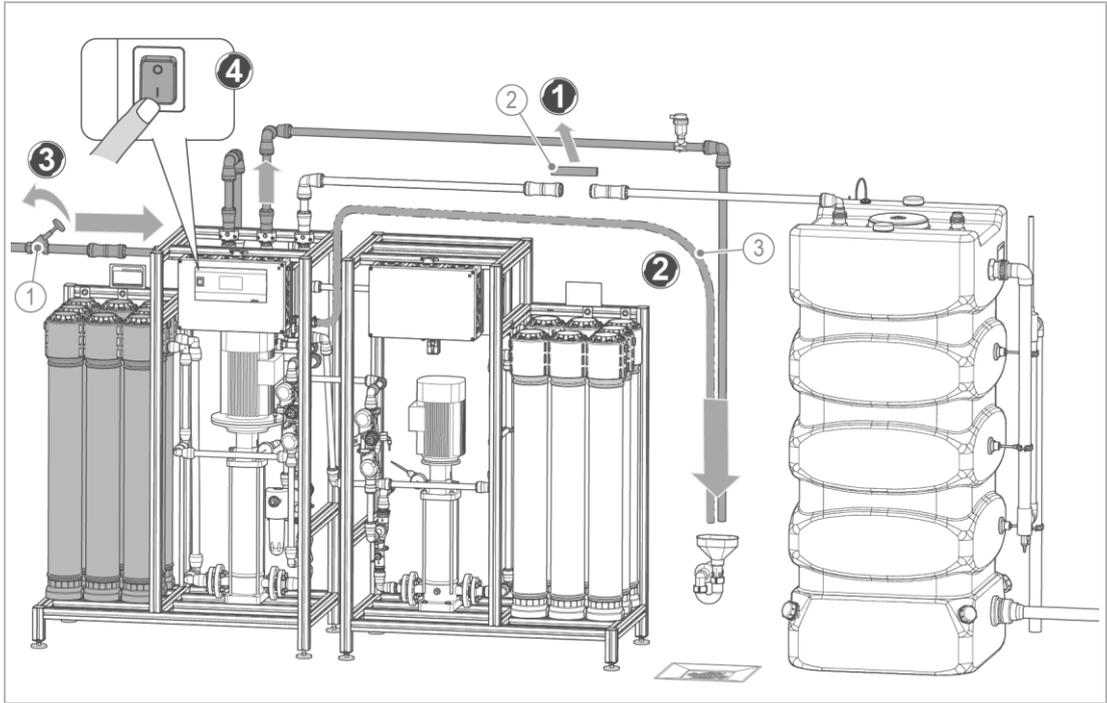
1 Permeate pipe to 2nd stage

Designation

2 Connection nozzle

1. Disconnect the connection of the permeate pipe to the 2nd stage from the hydro block Permeate 1st stage.
2. Insert the connection nozzle for flushing out the preserving agent into the hydro block.
 - » The permeate pipe to the 2nd stage is disconnected hydraulically.

► Flush out the 1st stage as follows:



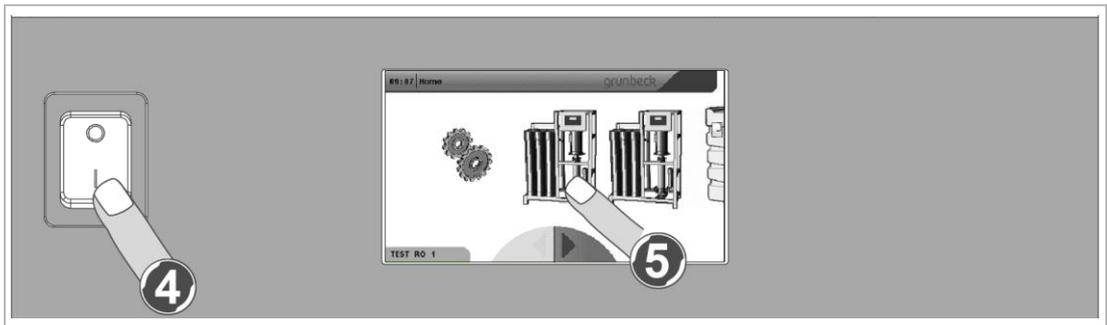
Designation

- 1 Shut-off valve Feed water inlet
- 2 Flushing section of permeate pipe

Designation

- 3 Flushing line provided by the client on site

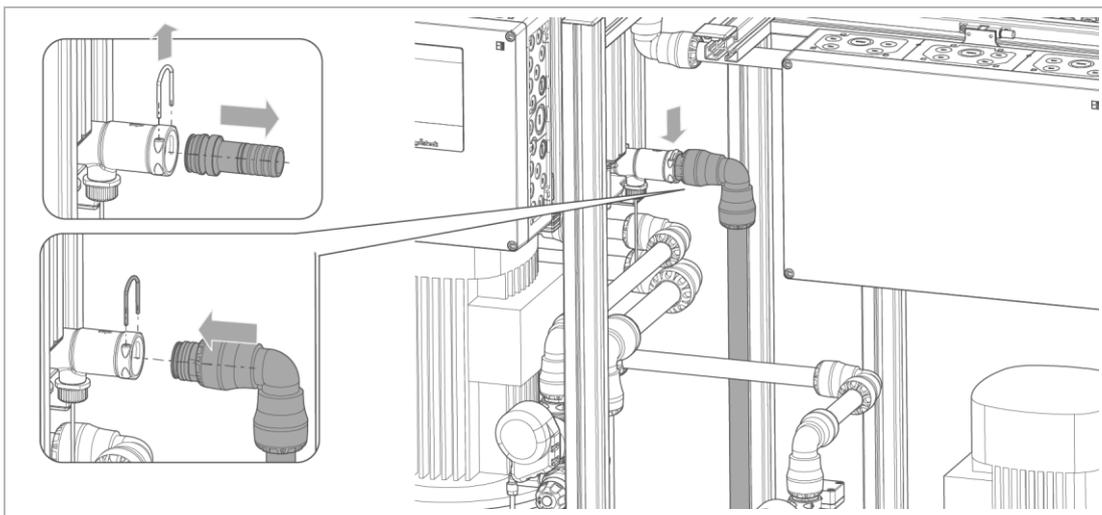
1. Remove the flushing section from the permeate pipe.
2. Route the flushing line provided by the client on site from the permeate outlet of the 1st stage to the drain.
3. Open the shut-off valve of the “feed water” inlet.
4. Switch on the control unit of the 1st stage.



5. Tap on the system GENO-OSMO-X 1st stage in the display.



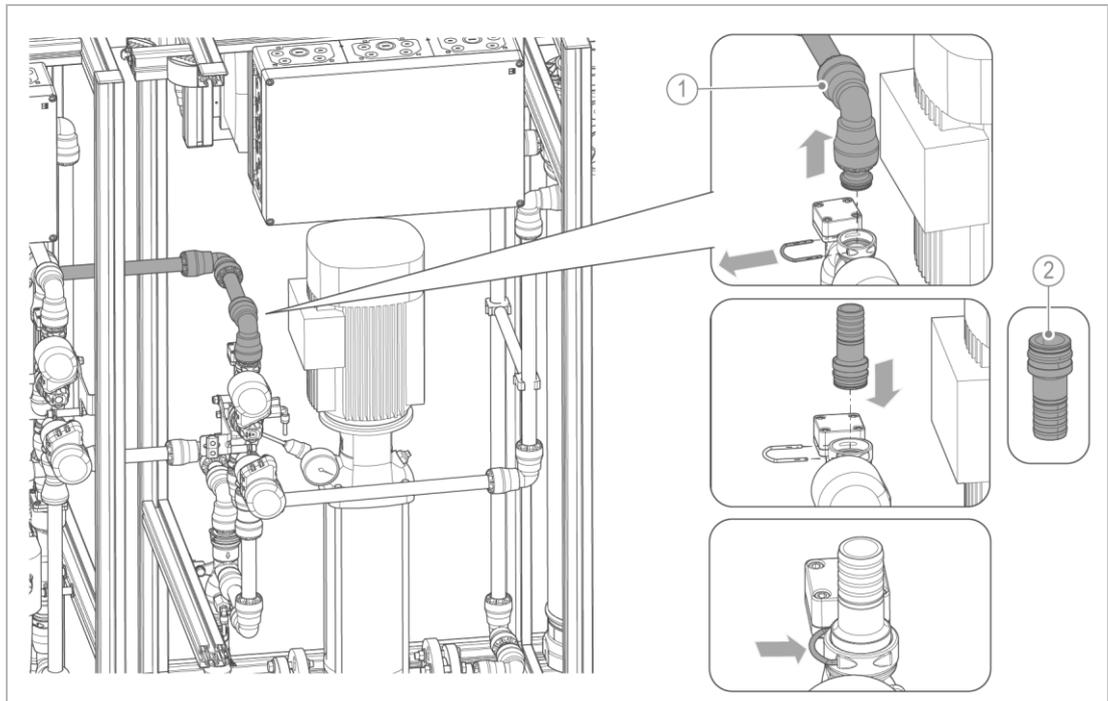
6. Tap on **START**.
 - » The feed water solenoid valve, the concentrate-to-drain control valve and at times the control valve for concentrate recirculation are opened.
 - » The system automatically stops flushing when three times the flushing volume has been flushed to the drain (duration subject to system size and programmed flushing volume).
7. After completion of the flushing process, close the shut-off valve “feed water” inlet.
8. Remove the connection nozzle including the flushing line provided by the client on site.



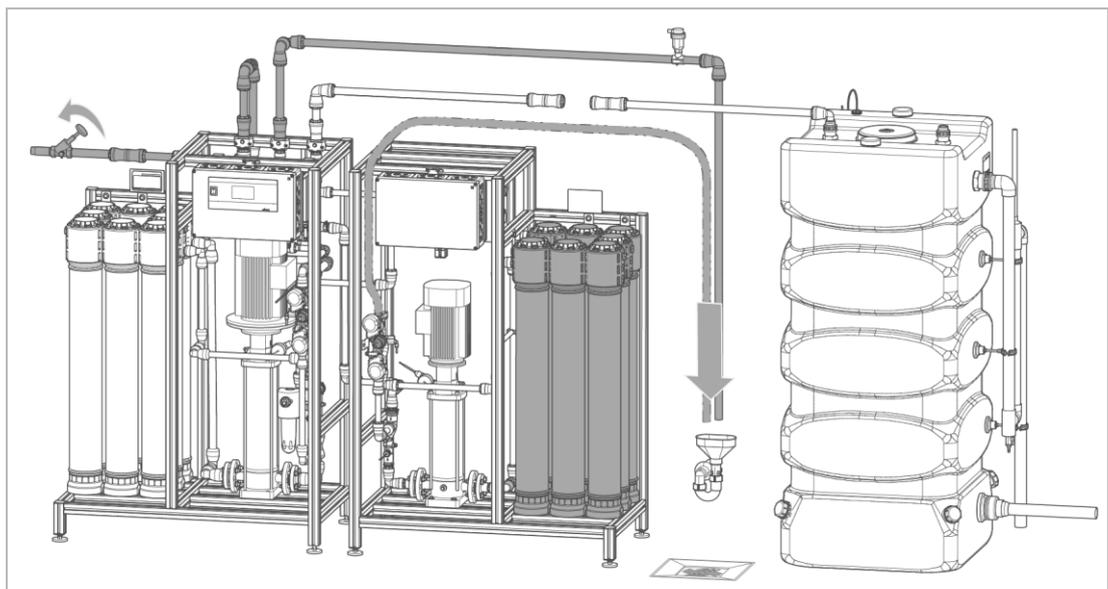
9. Connect the permeate pipe of the 2nd stage to the hydro block Permeate of the 1st stage.
 - » After completion of the flushing process of the 1st stage, the 2nd stage must be flushed out manually.

6.1.2 Flushing the 2nd stage

► Prepare the 2nd stage as follows:



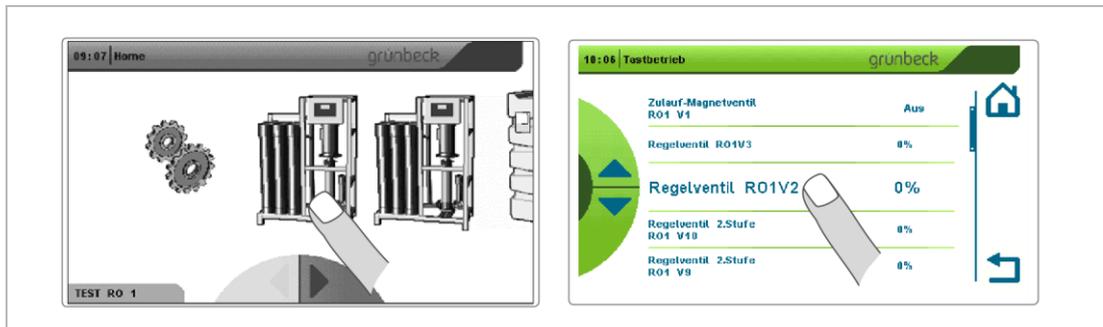
1. Disconnect the connection of the concentrate pipe to the 2nd stage from the hydro block Concentrate (adjusting valve RO1V10).
2. Insert the connection nozzle for flushing out the preserving agent into the hydro block Concentrate.
 - » The concentrate pipe of the 2nd stage is disconnected hydraulically.



3. Route the flushing line provided by the client on site from the concentrate outlet of the 2nd stage to the drain.

4. Open the shut-off valve of the “feed water” inlet.

► Flush out the 2nd stage as follows:



1. Tap on the system GENO-OSMO-X 1st stage in the display.

2. In the user programming level of the 1st stage, go to **Jog mode** (Code 653).



When quitting the jog mode, all settings in this level are automatically reset.

3. Set the values below one after the other:

Component	Setting	Note
Control valve RO1V3	---- %	Start position (refer to technical service manual, chapter 4.12)
Control valve RO1V2	---- %	
Inlet valve RO1V1	On	
Control valve 2nd stage RO1V10	50 %	
Control valve 2nd stage RO1V9	50 %	
Setpoint FC HP pump RO1P1A1	40 %	

» All other parameters do not need to be changed.

4. Flush out the 2nd stage for approx. 5 minutes.

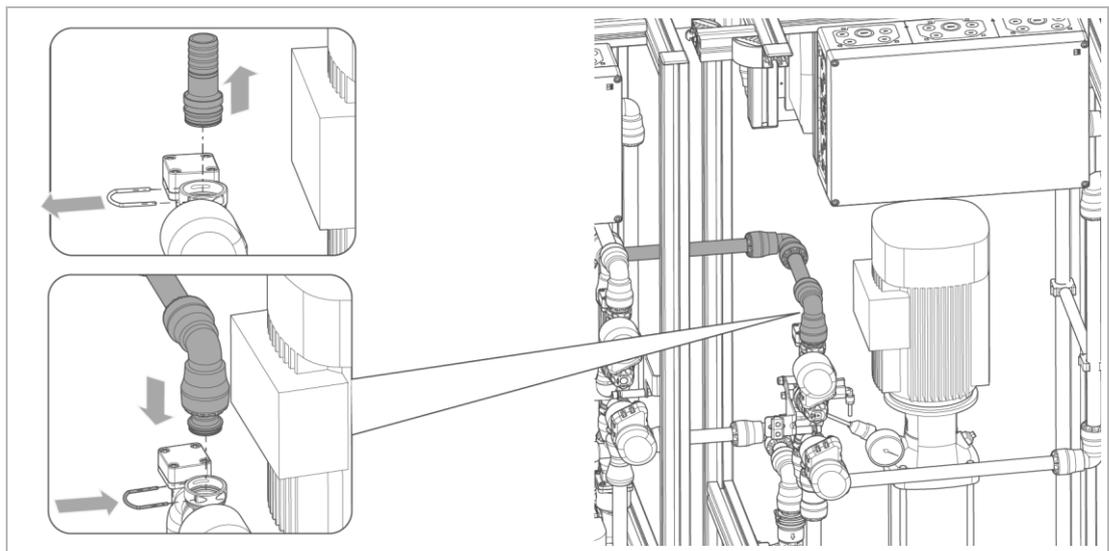
5. Change the values below:

Component	Setting	Note
Control valve 2nd stage RO1V10	100 %	
Control valve 2nd stage RO1V9	0 %	
Setpoint FC HP pump RO1P1A1	---- %	Change in a way that a pump pressure of approx. 5 bar is achieved

» All other parameters do not need to be changed.

» The preserving agent of the 2nd stage is flushed to the drain with permeate from the 1st stage.

6. After 30 minutes of flushing, check the conductivity as follows:
 - a Take samples at the sampling valves RO1H11 (2nd stage) and RO1H1 (1st stage).
 - b Compare the conductivity.
 - » The conductivity should be about the same.
7. Continue with the flushing process if the conductivity shows too great a difference. Compare the conductivity once again after approx. 15 minutes.
8. End the flushing process by quitting the jog mode.
 - » The flushing process of the 2nd stage is terminated automatically.



9. After completion of the flushing process, close the shut-off valve “feed water” inlet.
10. Remove the connection nozzle including the flushing line provided by the client on site.
11. Keep the connection nozzle.
12. Connect the concentrate pipe of the 2nd stage to the hydro block Concentrate of the 2nd stage.
13. Insert the flushing section into the permeate pipe.
14. Open the shut-off valve of the “feed water” inlet.

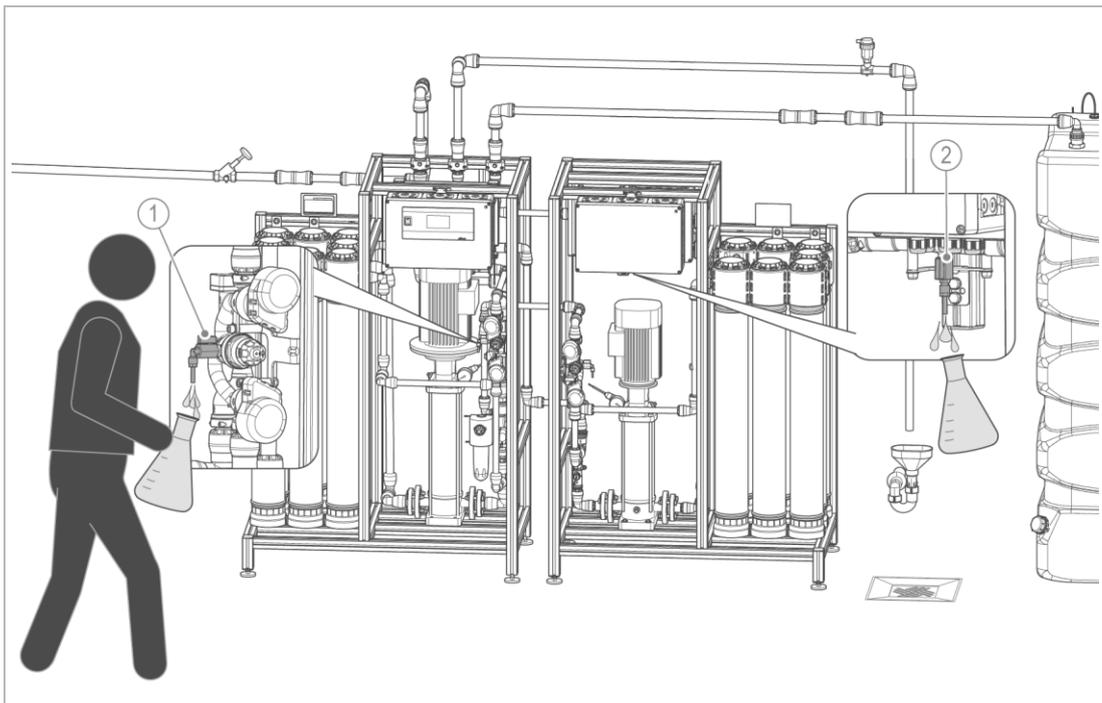
6.2 Checking the 2-stage system



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 liquid.

1. Let the 2-stage system run in for at least 20 minutes.
2. Check the system for leaks.



Designation

1 Concentrate-to-drain sampling valve

Designation

2 Permeate sampling valve

3. Do the total hardness test.
 - a Take water samples of the permeate and, if necessary, of the concentrate.
4. Determine the quality of the permeate and/or the concentrate.
5. Document the values in the start-up/commissioning log (refer to chapter 13.1).

6.3 Setting the control unit

1. Make the basic settings (refer to chapter 7.1.1).
2. Check the operating mode of the subsystem GENO-OSMO-X 1st stage and of the GENO-OSMO-X 2nd stage in the info level (refer to chapter 7.2.1).
3. Start the 2-stage system with the I/O button.
 - » The operating mode of the 2-stage system is **AUTOMATIC** and the I/O button is green.
4. Do a test run, if necessary.
5. Fill in the start-up/commissioning log (refer to chapter 13.1).

6.4 Handing over the product to the owner/operating company

- ▶ Explain to the owner/operating company how the 2-stage system works.
- ▶ Use the manual to brief the owner/operating company and answer any questions.
- ▶ Inform the owner/operating company about the need for inspections and maintenance.
- ▶ Hand over all documents to the owner/operating company for keeping.

6.4.1 Disposal of packaging

- ▶ Dispose of the packaging 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.

6.4.2 Storage of accessories

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

7 Operation/handling

The 2-stage system is operated via the operating unit of the GENO-tronic control unit with 4.3" touch screen on the GENO-OSMO-X of the 1st stage



Settings in the technical service programming level must only be made by Grünbeck's technical service or a qualified specialist trained by Grünbeck (refer to Technical service manual, order no. 750 929).

7.1.1 Menu structure

The table below shows the different menu levels with their respective parameters and settings.

Menu level 1	Menu level 2	Code	Settings/parameters *
Subsystem section			
 <p>Info level: Reverse osmosis system 2nd stage</p>			Operating mode
			Permeate flow, l/h
			Permeate recovery, %
			Indication Permeate conductivity 2nd stage, µS/cm
			Service in, d
			Recirculation RO1V9, l/h
			Recirculation to stage 1 RO1V10, l/h
			Output level Adjusting valve RO1V10, %
			Output level Adjusting valve RO1V9, %
			Inlet flow, l/h
		FEED flow, l/h	
Setting levels:	User programming level		Conductivity monitoring RO1CQ2
			Conductivity limit value RO1CQ2
			Delay conductivity fault/signal RO1CQ2
	Installer level	113	Output logic
			Enable FC pump RO1P4
			Function Pulse outputs of control valves
			Input logic Fault signal FC RO1P4
			Input logic Overpressure switch RO1CP5
	Technical service level		<i>Contains parameters that might have to be adapted to the conditions on site during start-up/commissioning.</i>
	Extended technical service level I		<i>Contains parameters that in general only need to be programmed in Grünbeck's production but rarely on site.</i>
	Extended technical service level II		
	Counter readings, error memory	245	Run time HP pump stage 2 RO1P4
			Water meter sums
			Recovery-Limit value-Hours

* Information in italics is for explanation purposes only and does not appear like this in the control unit. These items can each contain several parameters.

 Code-protected level

7.2 Reverse osmosis system GENO-OSMO-X 2nd stage

7.2.1 Info level



- ▶ In the basic display, tap on the subsystem 2nd stage

The information below is stored in the Info level of the GENO-OSMO-X 2nd stage.

Parameters		Description
Operating mode	–	Locked/Flushing/Manual operation/Automatic
Permeate flow rate	l/h	
Permeate recovery	%	
Indication Permeate conductivity 2nd stage	µS/cm	
Service in	d	Maintenance work due
Recirculation ((RO1V9)	l/h	
Recirculation to stage 1 (RO1V10)	l/h	
Output level Adjusting valve (RO1V10)	%	
Output level Adjusting valve (RO1V9)	%	
Inlet flow rate	l/h	
FEED flow rate	l/h	XX.X

7.2.2 Setting level



- ▶ Tap on the subsystem 2nd stage in the Info level
- ▶ Select the required sublevel.
- The setting level of the subsystems includes:
 - User programming level
 - Installer level (Code 113)
 - Technical service level (🔒)
 - Extended technical service level I (🔒)
 - Extended technical service level II (🔒)
 - Counter readings, error memory (Code 245)
 - Resetting counter readings (🔒)



In the tables below, the factory settings are **greyed out**.

7.2.2.1 User programming level

Parameters	Setting range	Remarks
Conductivity monitoring RO1CQ2	Signal	Monitoring of permeate conductivity: The system continues running although the limit value has been exceeded.
	Malfunction	The system switches off.
Conductivity limit value RO1CQ2	0...30...99 µS/cm	If the programmed conductivity limit value is exceeded for the delay time, optional programming is possible.
Delay Conductivity fault/signal RO1CQ2	0...30...999 min	

7.2.2.2 Installer level (Code 113)



The installer level contains parameters that might have to be adapted to the conditions on site during start-up/commissioning.

The settings described here must be made by a qualified specialist only.



The parameters marked with (*) must not be modified for the GENO-OSMO-X.

Parameters	Setting range	Remarks
Output logic Enable FU pump RO1P4A1 (*)	Normally open contact NOC Normally closed contact NCC	The voltage-free contact terminals 12/13 of the control unit must be connected to terminals 1/2 of the frequency converter – pump is on when contact is closed.
Function Pulse outputs of control valves (*)	Step Relay	Only Step is admissible as output signal to activate the control valves Concentrate-to-drain and Concentrate recirculation. Relay = Reserved for future applications.
Input logic Fault signal RO1P4A1 (*)	Normally open contact NOC Normally closed contact NCC	The voltage-free contact terminals 10/11 of the frequency converter must be connected to terminals 56/57 of the control unit. The contact is closed if there is no fault in the frequency converter
Input logic Overpressure switch RO1CP5	Normally open contact NOC Normally closed contact NCC	Contact type Terminals 58/59: Contact closes if system pressure is too high Contact opens if system pressure is too high

7.2.2.3 Counter readings, error memory (Code 245)



Here, the system's history is documented. Access to this level is protected by Code 245.

The settings described here must be made by a qualified specialist only.

Parameters	Display	Remarks
Run time HP pump Stage 2 RO1P4		h Time during which permeate was produced
Water meter sums		
Recovery-Limit value-Hours		h Time during which the recovery was > than the limit value (e. g. while the system was started)

8 Maintenance and repair

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



The responsibility for inspection and maintenance is subject to local and national requirements. The owner/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 is done on time.

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

8.1 Cleaning



Have cleaning work only be done by persons that have been briefed on the risks and dangers the system and the possibly used chemicals might pose.



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 prior to 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 electrical/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



By way of regular inspections and maintenance, malfunctions can be detected in time and system failures might be avoided.

- ▶ (As owner/operating company) Determine which components have to be inspected and maintained at which intervals (load-dependent). This is subject to the actual conditions such as: water condition, degree of impurities, environmental influences, consumption, etc.

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

Task	Interval	Execution
Inspection	daily	<ul style="list-style-type: none"> • Check system volume flows and pressures • Determine the feed water values and permeate quality • Read off the recovery • Take note of the remaining time of the maintenance interval [d] • Visually check for leaks
Maintenance	annually	<ul style="list-style-type: none"> • Check the condition of the system and check for leaks • Clean the solenoid valves • Check the flow volumes • Calibrate the flow sensors • Check the function and performance of all aggregates (pumps, valves)
	load-dependent	<ul style="list-style-type: none"> • See “annually”
Repair	5 years	<ul style="list-style-type: none"> • Recommendation: Replace wearing parts

8.3 Inspection

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



- ▶ Record the operating values in the daily log.

Please note that there can be slight fluctuations in the values, especially during the run-in phase of the system. Minor deviations from the standard values are normal and cannot be prevented technically. In case of considerable deviations, however, contact the technical service of Grünbeck Wasseraufbereitung GmbH.

- ▶ Carry out the inspection work below **on a daily basis**:

1. Determine the total hardness (inlet) using the water test kit "Total hardness" (order no. 170 187).
2. Read off the permeate quality "Indication Permeate conductivity 2nd stage".
3. Read off the recovery.
4. Observe the remaining time of the service interval – contact technical service at a remaining time of < 30 days.

8.4 Maintenance

Some regular work is necessary to ensure the proper functioning of the system in the long term. DIN EN 806-5 recommends regular maintenance to ensure trouble-free and hygienic operation of the product.



Maintenance is subject to the load but must be carried out once a year at the latest.

The maintenance work done must be documented in the operation log as well as in the corresponding test log (refer to chapter 13).

8.4.1 Annual maintenance



Carrying out annual maintenance work requires specialist knowledge. This kind of maintenance work must be done by Grünbeck's technical service or by qualified specialists trained by Grünbeck only.

The work below must be carried out as part of the annual maintenance in conjunction with the GENO-OSMO-X 1st stage:

Operating values

1. Read off the water meter reading.
2. Read off the static and flow pressure (inlet pressure 1 – 4 bar).
3. Determine the total hardness (inlet).
4. Determine the quality of the permeate.
 - a Flush the membrane modules, if necessary or replace them.



The membrane modules must be flushed and replaced by authorised service personnel only.

Obey the Technical service manual (order no. 750 929) and the Flushing instructions (order no. 700 950).

5. Check the settings in the control unit, in particular the ones below:
 - Pretreatment
 - Recovery
 - System outlet
6. Read off the operating hours:
 - Run time of high-pressure pump 2nd stage
 - Water meter sums
 - Recovery, limit value, hours

Maintenance work

7. Determine the measuring values below for feed water, permeate and concentrate-to-drain:
 - Conductivity
 - Total hardness
 - Temperature
 - Volume flow
 - Recovery
 - a Determine these measuring values again in case the membrane modules were flushed or replaced.
 - b Recalibrate the conductivity meter, if necessary.
8. Clean the solenoid valves for feed water and flushing water.
 - a Check the solenoid valves for function and leaks after the cleaning.
9. Check all cables and connections for damage and a tight fit.
10. Check all aggregates such as valves, HP pump, etc. for proper mechanical and electrical function.
 - a Check the minimum pressure at the pressure switch.
 - b Check and clean the conductivity probe.
11. Visually check the electronics board for damage.
12. Check the installation for leaks – visually check all pipes, hoses and all connections for escaping water.
13. Check the condition and presence of warning labels – replace them if they are worn/illegible.
14. Reset the maintenance interval and, if necessary, the counter readings.
15. Enter all data and work into the operation log (refer to chapter 13).

8.5 Consumables

Product	Quantity	Order no.
 RO membrane module (4" x 40") with seal for GENO-OSMO-X 400 ... 3000	1	750 261
 RO membrane module (4" x 21") with seal for GENO-OSMO-X 200	1	750 293

8.6 Spare parts

For an overview on the spare parts, go to our spare parts catalogue at www.gruenbeck.com. You can obtain the spare parts from your local Grünbeck representative.

8.7 Wearing parts



Wearing parts must be replaced by a qualified specialist only (refer to Technical service manual, order no. 750 929-inter).

Wearing parts are listed below:

- Seals
- Solenoid valves
- Control valves
- Flow sensors
- Mechanical seal (high-pressure pump)

9 Troubleshooting

Warning and fault signals for GENO-OSMO-X (2nd stage) are shown on the display of the control unit of GENO-OSMO-X (1st stage).



WARNING

Risk of contaminated drinking water due to stagnation

- Risk of infectious diseases
- ▶ Have malfunctions eliminated immediately.



- ▶ For all warning and fault signals on the 2nd stage, refer to the fault tables of the 1st stage (refer to chapter “Troubleshooting” in the operation manual of GENO-OSMO-X, order no. 750 927).

10 Decommissioning



Decommissioning and restarting requires expert knowledge. This kind of work must only be carried out by Grünbeck's technical service or by qualified specialists trained by Grünbeck.

10.1 Temporary shutdown

The system features an automatic forced operation mode to minimise bacterial growth.



If no permeate is generated within a set time (technical service level: pre-set to 2880 minutes = 48 h), a forced operation or forced flushing is released automatically.

The forced operation can be set to 48 h max.

- ▶ If a longer standstill of the system is planned, the system must be shut down.

10.2 Decommissioning

- ▶ The tasks below must be carried out:

- Mechanically separate the feed water inlet pipe.
- Mechanically separate the pipe to the permeate outlet.
- Preserve the system.
- Set the control unit to operating mode **locked**.
- Set the main switch to OFF and secure it against restart.
- Mark the system with a notice and a warning about preservation having been done.

10.3 Restart

- ▶ The tasks below must be performed:

- 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 feed water.
2. Disconnect the system from mains – discharge residual voltage.
3. Close the feed water shut-off valve.
4. Vent and drain the system.
5. Disconnect the system from the water system (feed water inlet pipe, permeate outlet pipe and concentrate-to-drain pipe).
6. Disconnect the electrical connections to subsystems installed downstream.
7. Disconnect the potential equalisation (grounding) provided by client on site.
8. Remove the spacers between the 1st stage and the 2nd stage.
9. Remove individual components such as accessories, if necessary.
10. Transport the individual systems (1st stage and 2nd stage) separately; each secured on a pallet (refer to chapter 4).

11.2 Disposal

- ▶ Obey the applicable national regulations.

Packaging

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

Membrane module

- ▶ Dispose of used membrane modules with your household waste.

Batteries

- ▶ Take used batteries to the local recycling facility – do not dispose of them with your household waste.

11.2.1 Product



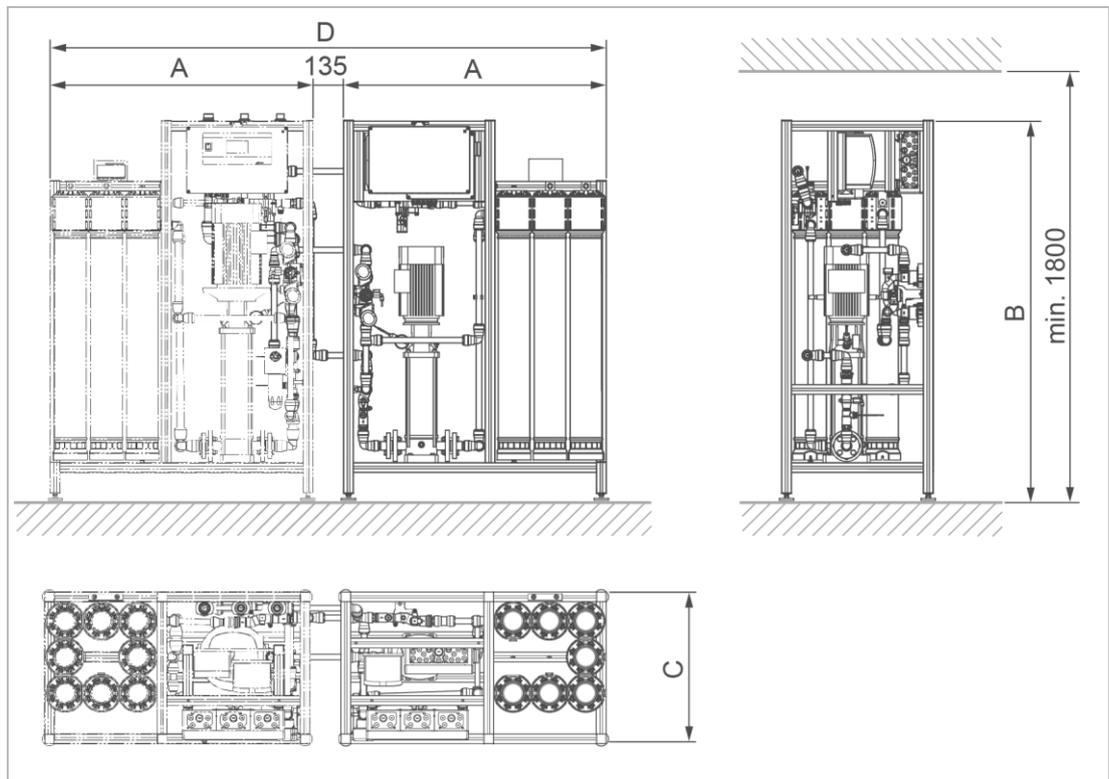
If this symbol (crossed-out wheelee bin) is on the product, it means that this product or its electrical and electronic components must not be disposed of as household waste.

- ▶ 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.



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.

12 Technical specifications



GENO-OSMO-X permeate stage										
Dimensions and weights			180	360	720	1100	1450	2000	2700	
A	System width	mm	900	900	1035	1035	1170	1170	1170	
B	System height	mm	1700	1700	1700	1700	1700	1700	1700	
C	System depth	mm	675	675	675	675	675	675	675	
D	System width (1st + 2nd stage)	mm	1935	1935	2205	2205	2475	2475	2475	
	Min. room/installation height	mm	1800	1800	1800	1800	1800	1800	1800	
	Operating weight, approx. (1st + 2nd stage)	kg	200	230	290	340	390	480	580	
Connection data			180	360	720	1100	1450	2000	2700	
	Nominal connection diam. Feed water inlet (installed in 1. stage)	DN	25 (1" male thread)	25 (1" male thread)	25 (1" male thread)	25 (1" male thread)	25 (1" male thread)	32 (1¼" m. thread)	32 (1¼" m. thread)	
	Nominal connection diam. Permeate outlet (installed in 1st stage)	DN	25 (1" male thread)							
	Nominal connection diam. Concentrate outlet (installed in 1st stage)	DN	25 (1" male thread)							
	Min. drain connection	DN	50							
	Power supply	V/Hz	230/400 / 50 – 60							
	Phases		3/N/PE							
	Max. power supply (1st and 2nd stage)		9.5 kW / C 32 A / 4 mm ² (depending on the expansion stage)							
	Protection/protection class		IP 54/⊕							
	Power input 90 % recovery	kW	0.45	0.4	0.4	0.5	0.6	0.8	0.9	

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Performance data		180	360	720	1100	1450	2000	2700
Permeate capacity at a								
feed water temperature of 10 °C	l/h	155	310	620	945	1245	1720	2320
feed water temperature of 15 °C	l/h	180	360	720	1100	1450	2000	2700
feed water temperature of 15 °C	m³/d	4.3	8.6	17.2	26.4	34.8	48.0	64.8
Min. outlet pressure of permeate	bar	0.5						
Nominal pressure	PN	16						
Salt rejection	%	95 – 99						
Max. recovery (adjustable)	%	90						
Concentrate volume flow is recirculated to 1. stage again								
Concentrate volume flow, at a recovery of 90 % (15 °C)	l/h	20	40	80	120	160	220	300
General data		180	360	720	1100	1450	2000	2700
Feed water temperature	°C	10 – 30 ¹⁾						
Ambient temperature	°C	5 – 35						
Max. humidity (non-condensing)	%	70						
Order no.		751 200	751 210	751 220	751 230	751 240	751 250	751 260

¹⁾ In case of a feed water temperature of > 20 °C, a separate design of the system is required.

13 Operation log



- ▶ Document the initial start-up/commissioning and all maintenance activities.
- ▶ Copy the maintenance sheets, if necessary.

Reverse osmosis system | GENO-OSMO-X permeate stage | Type:

Serial no.: _____

13.1 Start-up/Commissioning log

Customer					
Name: _____					
Address: _____					
Installation/Accessories					
Drinking water filter (80 µm) upstream of water softener		<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Make/type:					
Euro system separator		<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Make/type:					
Water softener		<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Make/type:					
Activated carbon filter		<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Make/type:					
Fine filter upstream of RO system		<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Make/type:					
Additional tank		<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Drain connection (concentrate) acc. to DIN EN 1717		<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Height of drain, measured from bottom line of RO system				cm	
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		
Feed water pipe upstream of RO system	<input type="checkbox"/> Galvanised steel	<input type="checkbox"/> Copper	<input type="checkbox"/> Plastic	<input type="checkbox"/> Stainless steel	
Operating values					
Water pressure, flow pressure	bar			bar	
Water meter reading	m³				
Permeate supply tank	m³				
Pressure booster	bar				
Highest withdrawal point, approx.	m				
Room temperature	°C				
Hardness unit	°dH	°f	mol/m³	°e	°ppm
Total raw water hardness (measured)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Parameters		
Feed water	Date/time	yyyy/mm/hh:mm
	Inlet pressure of fine filter	bar
	Temperature	°C
	Volume flow	l/h
	Total hardness	°dH mol/m³
	Dosing (Option: Antiscalant)	ml/h
	Conductivity	µS/cm
	pH value	pH
	Free chlorine downstream of activated carbon filter (Cl ₂)	mg/l
	Silt density index < 3	
High-pressure pump	Pump pressure	bar
	Pump frequency	Hz
	Run time of pump	h
Permeate	Volume flow	l/h
	Pressure	bar
	Conductivity	µS/cm
Concentrate	Volume flow	l/h
	Conductivity	µS/cm
	Concentrate recirculation	l/h
	System recovery (WCF - water conversion factor)	%

Remarks	

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

1. Maintenance



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

Maintenance done	Membrane module no.	Restart	
<input type="checkbox"/> with flushing of membrane module		<input type="checkbox"/> Yes	<input type="checkbox"/> No
<input type="checkbox"/> without replacement of membrane module		Date:	
<input type="checkbox"/> with replacement of membrane module			

Measured values: Before or during restart or / after replacement of membrane module(s)

	Conductivity µS/cm <i>before / after</i>	Total hardness °dH, mol/m ³ <i>before / after</i>	Temperature °C <i>before / after</i>	Volume flow l/h <i>before / after</i>	Recovery % <i>before / after</i>
Feed water	/	/	/	/	-
Permeate	/	/	/	/	-
Concentrate-to-drain	/	/	/	/	/

Inlet pressure (inlet)	bar	Water meter reading	m ³
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Operating hours

Concentrate volume generated	m ³	Feed water volume	m ³
Permeate volume produced	m ³	Run time HP pump 2nd stage	h

Error memory read out	Counter reading reset	System printout created
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

Maintenance work **OK**

Settings of control unit checked (pretreatment, recovery, system outlet)	<input type="checkbox"/>
Solenoid valves for feed and flushing water cleaned and checked for leaks	<input type="checkbox"/>
All cables and connections (hydraulic, electrical) checked for damage and tight seat	<input type="checkbox"/>
Mechanical and electrical function of all aggregates (HP pump, valves) checked	<input type="checkbox"/>
Conductivity probe cleaned and checked	<input type="checkbox"/>
Pressure sensor for operating pressure checked for function	<input type="checkbox"/>
Electronics board visually checked for damage	<input type="checkbox"/>
Installation/system checked for leaks	<input type="checkbox"/>
Condition and presence of warning labels checked	<input type="checkbox"/>

Remarks

Carried out by

Company:	
Service technician:	
Date	Signature

2. Maintenance



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

Maintenance done	Membrane module no.	Restart	
<input type="checkbox"/> with flushing of membrane module		<input type="checkbox"/> Yes	<input type="checkbox"/> No
<input type="checkbox"/> without replacement of membrane module		Date:	
<input type="checkbox"/> with replacement of membrane module			

Measured values: Before or during restart or / after replacement of membrane module(s)

	Conductivity μS/cm <i>before / after</i>	Total hardness °dH, mol/m ³ <i>before / after</i>	Temperature °C <i>before / after</i>	Volume flow l/h <i>before / after</i>	Recovery % <i>before / after</i>
Feed water	/	/	/	/	-
Permeate	/	/	/	/	-
Concentrate-to-drain	/	/	/	/	/

Inlet pressure (inlet)	bar	Water meter reading	m ³
------------------------	-----	---------------------	----------------

Operating hours

Concentrate volume generated	m ³	Feed water volume	m ³
Permeate volume produced	m ³	Run time HP pump 2nd stage	h

Error memory read out	Counter reading reset	System printout created
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

Maintenance work	OK
Settings of control unit checked (pretreatment, recovery, system outlet)	<input type="checkbox"/>
Solenoid valves for feed and flushing water cleaned and checked for leaks	<input type="checkbox"/>
All cables and connections (hydraulic, electrical) checked for damage and tight seat	<input type="checkbox"/>
Mechanical and electrical function of all aggregates (HP pump, valves) checked	<input type="checkbox"/>
Conductivity probe cleaned and checked	<input type="checkbox"/>
Pressure sensor for operating pressure checked for function	<input type="checkbox"/>
Electronics board visually checked for damage	<input type="checkbox"/>
Installation/system checked for leaks	<input type="checkbox"/>
Condition and presence of warning labels checked	<input type="checkbox"/>

Remarks

Carried out by

Company:	
Service technician:	
Date	Signature

3. Maintenance



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

Maintenance done	Membrane module no.	Restart	
<input type="checkbox"/> with flushing of membrane module		<input type="checkbox"/> Yes	<input type="checkbox"/> No
<input type="checkbox"/> without replacement of membrane module		Date:	
<input type="checkbox"/> with replacement of membrane module			

Measured values: Before or during restart or / after replacement of membrane module(s)

	Conductivity μS/cm <i>before / after</i>	Total hardness °dH, mol/m ³ <i>before / after</i>	Temperature °C <i>before / after</i>	Volume flow l/h <i>before / after</i>	Recovery % <i>before / after</i>
Feed water	/	/	/	/	-
Permeate	/	/	/	/	-
Concentrate-to-drain	/	/	/	/	/

Inlet pressure (inlet)	bar	Water meter reading	m ³
------------------------	-----	---------------------	----------------

Operating hours

Concentrate volume generated	m ³	Feed water volume	m ³
Permeate volume produced	m ³	Run time HP pump 2nd stage	h

Error memory read out	Counter reading reset	System printout created
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

Maintenance work **OK**

Settings of control unit checked (pretreatment, recovery, system outlet)	<input type="checkbox"/>
Solenoid valves for feed and flushing water cleaned and checked for leaks	<input type="checkbox"/>
All cables and connections (hydraulic, electrical) checked for damage and tight seat	<input type="checkbox"/>
Mechanical and electrical function of all aggregates (HP pump, valves) checked	<input type="checkbox"/>
Conductivity probe cleaned and checked	<input type="checkbox"/>
Pressure sensor for operating pressure checked for function	<input type="checkbox"/>
Electronics board visually checked for damage	<input type="checkbox"/>
Installation/system checked for leaks	<input type="checkbox"/>
Condition and presence of warning labels checked	<input type="checkbox"/>

Remarks

Carried out by

Company:	
Service technician:	
Date	Signature

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EC Declaration of Conformity

In accordance with 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.

Reverse osmosis system GENO-OSMO-X permeate stage

Serial no.: Refer to type plate

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:

Manufacturer

Dipl.-Ing. (FH) Markus Pöpperl

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

Hoechstädt/Germany, May 2, 2020

A handwritten signature in blue ink, appearing to be 'M. Pöpperl', written over a horizontal line.

By power of attorney Dipl. Ing. (FH) Markus Pöpperl
Head of Technical Product Design

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