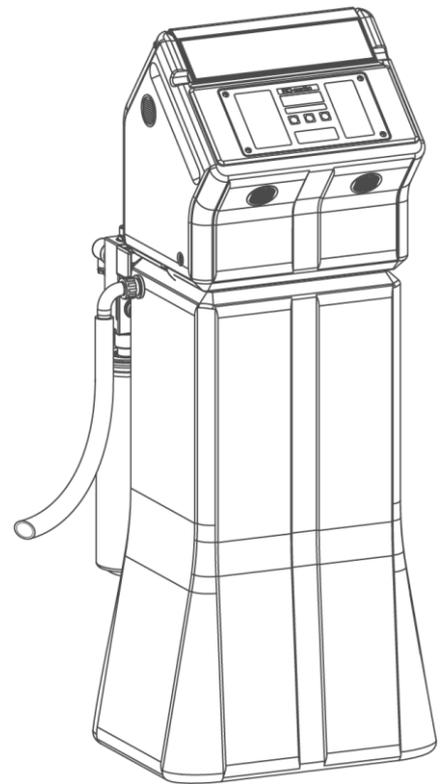


Operation manual Reverse osmosis system GENO-OSMO RO 125K



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Order no. 752 940-inter_325

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A company certified by TÜV SÜD
in accordance with DIN EN ISO 9001,
DIN EN ISO 14001 and SCC

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Publisher's information

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EU Declaration of Conformity

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

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

Manufacturer:	Grünbeck Wasseraufbereitung GmbH Josef-Grünbeck-Str. 1 89420 Hoechstädt Germany
Responsible for documentation:	Markus Pöpperl
System designation:	Reverse osmosis system GENO-OSMO RO 125K
System type:	TL; TS
Serial no.:	Refer to type plate
Applicable directives:	Machinery Directive (2006/42/EC) EMC (2014/30/EU)
Applied harmonised standards, in particular:	DIN EN ISO 12100:2011-03 DIN EN 61000-6-2:2006-03 DIN EN 61000-6-3:2011-09
Applied national standards and technical specifications, in particular:	
Place, date and signature:	<u>Hoechstädt, 30.04.2018</u> i. V.  M. Pöpperl Dipl. Ing. (FH)
Function of signatory:	Head of Technical Product Design

A General

1 | Preface

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

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

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

Customer satisfaction is our primary aim, and providing customers with qualified advice is crucial at Grünbeck. If you have any questions concerning the present product, possible extensions or general water and waste water treatment, our field staff, as well as the experts at our headquarters in Hoechststedt, are available to help you.

Advice and assistance For advice and assistance please contact your local representative (refer to www.gruenbeck.com). or get in touch with our service centre which can be reached during office hours:

Phone: +49 9074 41-333

Fax: +49 9074/41-120

Email: service@gruenbeck.com

We can connect you with the appropriate expert more quickly if you are able to provide the required system data. In order to have the required data handy at all times, please copy it from the type plate to the overview in chapter C-10.

2 | Notes on using the operation manual

This operation manual is intended for operators of our systems. It is divided into several chapters (a letter is assigned to each of them) that are listed in the "Table of contents" on page 2 in alphabetical order. Locate the corresponding chapter on page 2 in order to find the specific information you are looking for.

The headers and page numbers with chapter information make it easier to find your way around in the operating instructions.

3 | General safety information

3.1 Symbols and notes Important information in this operation manual is emphasised by symbols. Please pay particular attention to this information to ensure the hazard-free, safe and efficient handling of the system.



Danger! Failure to adhere to this information will cause serious or life-threatening injuries, major damage to property or inadmissible impurities in the drinking water.



Warning! Failure to adhere to this information may cause injuries, damage to property or contamination of the drinking water.



Caution! Failure to adhere to this information can result in damage to the system or other objects.



Note: This symbol characterises information and tips that make your work easier.



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



Tasks with this symbol may only be performed by trained and qualified electrical experts according to the VDE guidelines or according to the guidelines of a similar local institution.



Tasks with this symbol may only be performed by water suppliers or approved installation companies. In Germany, the installation company must be registered in the installation directory of a water supplier as per Section 12(2) AVBWasserV (German Ordinance on General Conditions for the Supply of Water).

3.2 Operating personnel

Only allow persons who have read and understood this operation manual to work with the system. Strictly observe the safety information.

3.3 Intended use

The system may only be used for the purpose outlined in the product description (chapter C). The instructions in this operation manual as well as the applicable local guidelines concerning drinking water protection, accident prevention and occupational safety must be adhered to.

In addition, intended use also implies that the system may only be operated when it is in proper working order. Any errors must be eliminated at once.

3.4 Protection from water damage



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

- a) a sufficiently dimensioned floor drain system must be available or
- b) a safety device (refer to chapter C Optional accessories) must be installed.



Warning! Floor drains that discharge to a lifting system do not work in case of a power failure.

3.5 Indication of specific dangers

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

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

Hazardous to health due to contaminated drinking water!

→ The system should be installed by a specialist company only.

Strictly adhere to the operation manual! Ensure that there is sufficient flow. Adhere to the pertinent guidelines when starting up the system after extended periods of standstill. Perform inspections and maintenance at the intervals specified!



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

4 | Shipping and storage



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

Protect from frost during transportation and storage!

Do not install or store the system next to objects which radiate a lot of heat.

5 | Disposal

Comply with the applicable national regulations.

5.1. Packaging

Dispose of the packaging in an environmentally sound manner.

5.2. Product



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



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



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

B Basic information (reverse osmosis system)

1 | Laws, regulations, standards

In the interest of good health, rules cannot be ignored when it comes to the processing of drinking water. This operation manual takes into consideration the current regulations and stipulates information that you will need for the safe operation of your water treatment system.

Among other things, the regulations stipulate that

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

2 | Water

There is no chemically pure water in nature. Even in the atmosphere, rain water absorbs various substances that change the properties of the water to a greater or lesser degree. This process continues as the water passes through the ground layers, with the result that the water is enriched with increasingly large quantities of materials. Carbon dioxide (CO₂) is particularly important here, since this substance increases the dissolving capability of the water even more. Consequently, drinking water contains quantities of dissolved sodium, potassium, calcium, magnesium, iron, manganese, copper, zinc, chlorides, fluorides, sulphates and also nitrates, nitrites, phosphates and silicates that vary greatly from location to location.

Due to dynamic substance and water cycles, harmful elements, which are only partly and only slowly biodegradable are increasingly released into nature. These are only partially and slowly broken down by natural effects. Consequently, these elements accumulate in the groundwater and surface water over the course of time. Removing them from natural water deposits represents a particular challenge. Grünbeck faces this challenge with the aim of producing unpolluted drinking and industrial water.

The water works provide us with pure drinking water that is suitable for consumption. However, if the water is to be used for technical purposes, further treatment is frequently required.

3 | Functional principle of reverse osmosis

Principle:

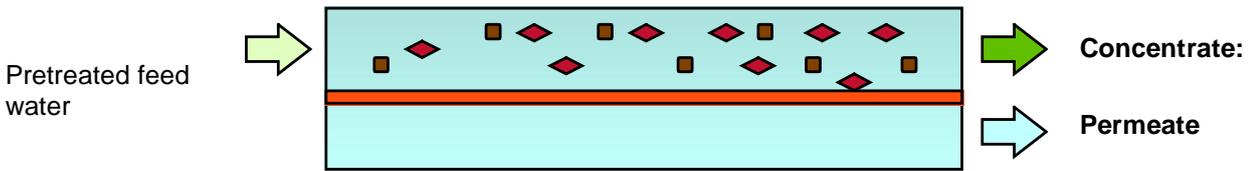


Fig. B-1: Functional principle

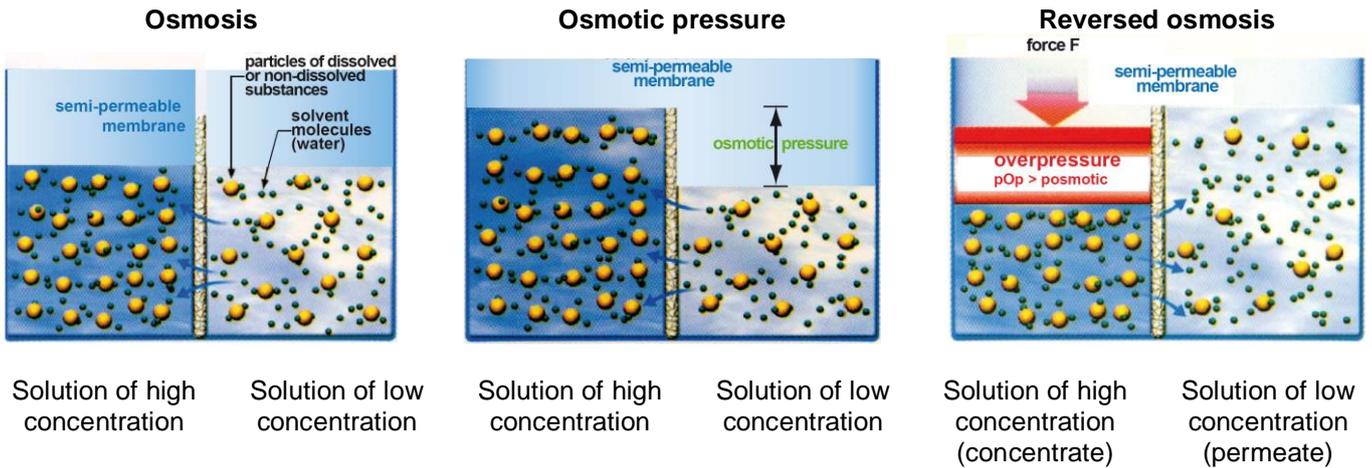


Fig. B-2: Reverse osmosis principle

In the osmosis process, watery solutions of different concentrations are separated by a semi-permeable membrane. In keeping with the law of nature, the concentrations will tend to equalise. What is referred to as "osmotic pressure" is generated on the side of the higher original concentration. In case of reverse osmosis, this osmotic pressure is countered by a higher pressure. The consequence: The process runs in the opposite direction. A particular advantage of the reverse osmosis technology compared to other water treatment processes is the fact that apart from the removal of dissolved salts, bacteria, germs, particles, and dissolved organic substances are also reduced.

2.1 System components

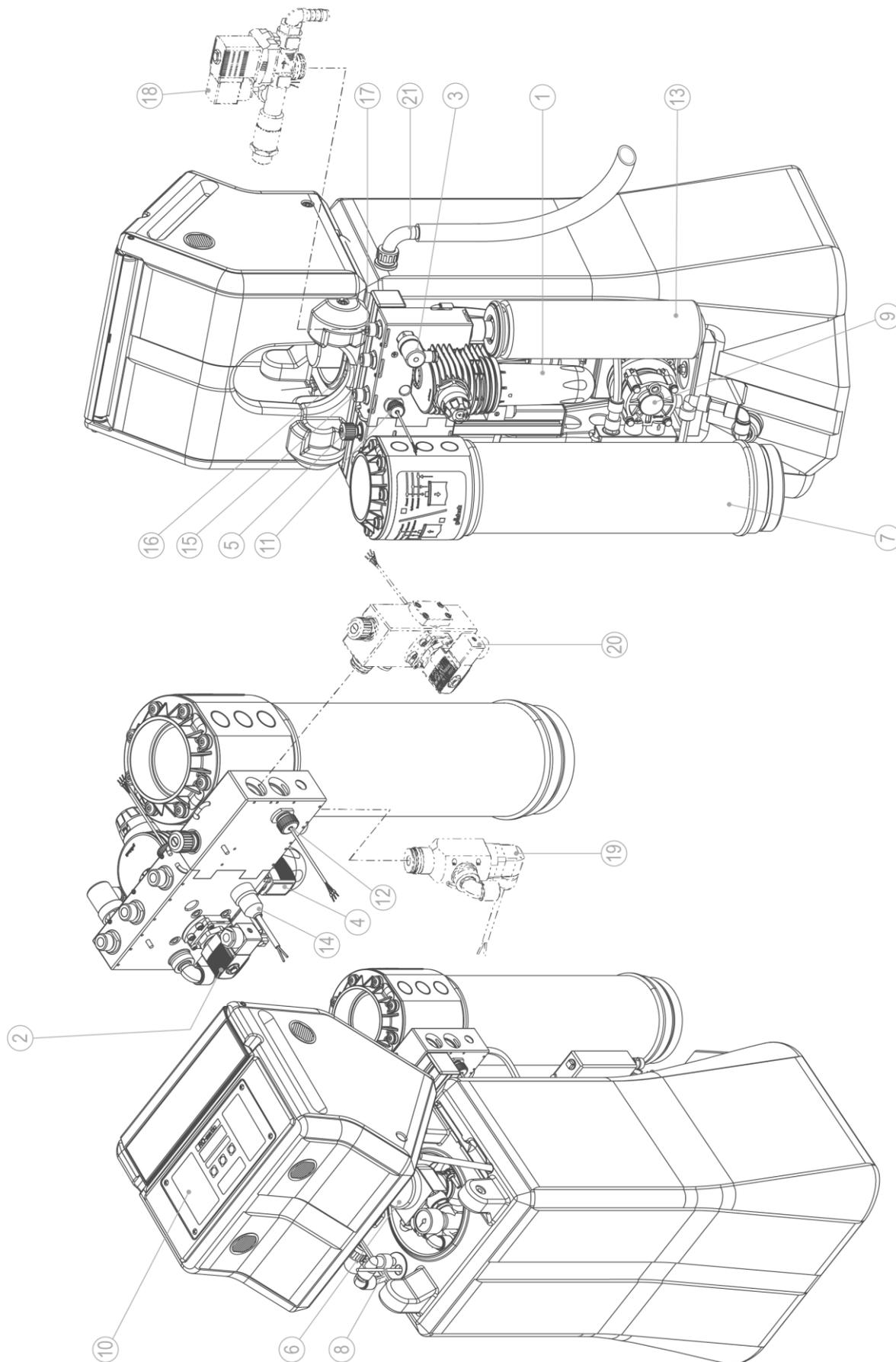


Fig. C-2: Exploded drawing of reverse osmosis system GENO-OSMO 125K-TS

①	Fine filter incl. pressure reducer	Pressure reducer preset to 2.5 bar, incl. pressure gauge.
②	Inlet solenoid valve	During the permeate production, this valve is always open. Following the system stop (tank full), the valve remains open for the programmed flushing time of the membrane. Optical display in control electronics ⑩.
③	Pressure switch Pressure booster pump	Switches the pressure booster on when water is required, and off again after water withdrawal ends (factory setting 3,0 bar cut-out pressure).
④	Flushing solenoid valve	opens after the level control ⑧ in the tank reports "FULL" to the control electronics for a set time. The solenoid valve also opens in the event of system malfunctions and always in conjunction with the inlet solenoid valve ②.
⑤	Needle valve, concentrate	To set the feed water-dependent "concentrate" volume flow to the drain. During permeate output, this portion of the water flows constantly to the drain.
⑥	High-pressure pump	Pump unit that generates the operating pressure required for the membrane. Pump runs according to permeate requirement from the level control ⑧ (LB switches) located in the permeate tank. A control valve for adjusting the operating pressure is integrated in the pump head. Optical display in control electronics ⑩.
⑦	Membrane	Reverse osmosis membrane to generate the permeate.
⑧	Level control	Float level control for controlling the water level in the permeate tank (TS version only).
⑨	Pressure booster pump	Pressure booster pump. Feeds permeate into the consumer network (only TS version).
⑩	Control electronics	Microprocessor controller that in conjunction with the respective units, regulates the permeate production and the supply of consumers downstream.
⑪	Flow sensor, concentrate	registers the concentrate volume and sends pulses to the control electronics. Optical display of the concentrate volume in the control electronics ⑩.
⑫	Flow sensor Permeate	registers the permeate quantity and sends pulses to the control electronics. Optical display of the permeate quantity in the control electronics ⑩.
⑬	Diaphragm expansion tank	Permeate buffer to reduce the switching operations of the DE pump.
⑭	Pressure switch High-pressure pump	to prevent the high-pressure pump from running dry. Switches time-delayed after the solenoid valve has opened ②. Optical display in control electronics ⑩.
⑮	Connection ½" (DN 15) male thread	Concentrate to drain
⑯	Connection ½" (DN 15) male thread	Feed water
⑰	Connection ½" (DN 15) male thread	Permeate/consumer
⑱	Option:	Solenoid valve forced withdrawal
⑲	Option:	Conductivity measurement
⑳	Option:	Blending unit
㉑	Tank overflow	For connection to the drain on site

2.2 Flow diagram reverse osmosis system GENO-OSMO RO 125K

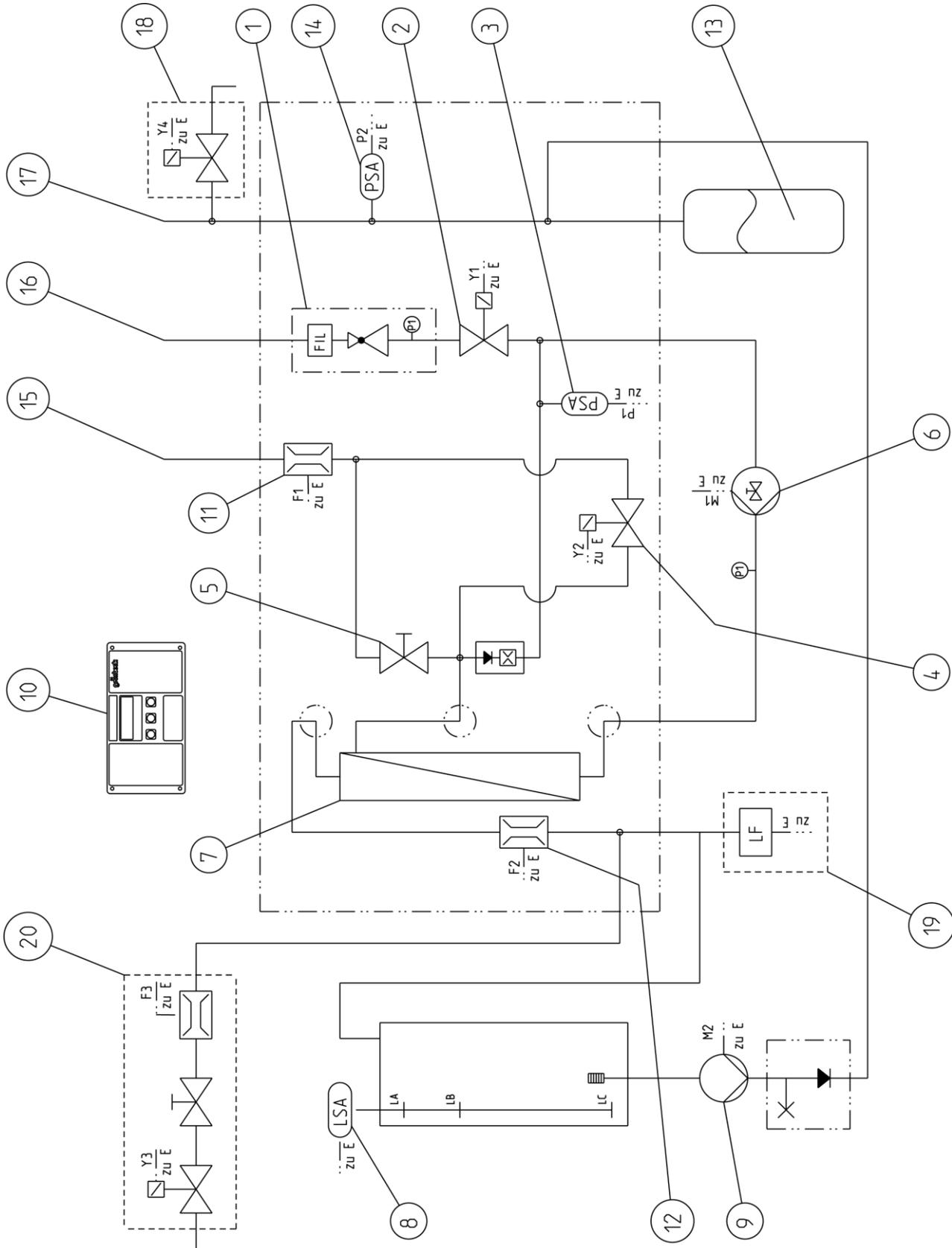


Fig. C-2.1: Flow chart reverse osmosis system GENO-OSMO RO 125K-TS (for legend see front page)

Table C-1: Technical data		Reverse osmosis system GENO-OSMO RO	
		125K-TS	125K-TL
Connection data			
Nominal connection diameter of feed water pipe		½" (DN 15) male thread	
Nominal connection diameter of permeate outlet		½" (DN 15) male thread	
Nominal connection diameter of concentrate outlet		½" (DN 15) male thread	
Min. drain connection required		DN 50	
Connected load, approx.	kW	0.85	0.50
Power supply	V/Hz	230/50	
Protection/protection class		IP 54/⊕	
Performance data			
Permeate output at a feed water temperature of 10 °C/15 °C	l/h	105/125	
Electrical capacity of pump at operating pressure	kW	0.37	
Permeate output per day (max. 24 h) approx. min./max.	m³/d	2.5/3.0	
Inlet flow pressure of feed water, min.	bar	2.5	
Permeate supply approx.	l	38	-
Pump characteristic curve pressure booster	l/h/bar	300/3.5 – 1200/1.0	-
Nominal pressure		PN 16	
Salt rejection		95 – 99 %	
Total salt concentration of the feed water as NaCl, max.	ppm	1000	
Concentrate volume flow, min./max. (at 15 °C)	l/h	40/125	
Feed water volume flow (fresh water 15 °C) at a recovery of 75 %, max.	l/h	160	
Recovery min./max.	%	50 – 75 (adjustable)	
Dimensions and weights			
Dimensions (w x d x h)	mm	450 x 600 x 1130	
Empty weight, approx.	kg	37	30
Operating weight, approx.	kg	75	30
Ambient data			
Feed water temperature min./max.	°C	10/30 ¹⁾	
Ambient temperature, min./max.	°C	5/35	
Order no.		752 100	752 110

¹⁾ For feed water temperatures > 20 °C, a separate design of the system is required.

3 | Intended use

The reverse osmosis system GENO-OSMO RO 125K is used for the demineralisation of feed waters. The water is primarily used for industrial applications.

The system can be used only after a prior water analysis and corresponding pretreatment.

The permeate capacity of the system depends on the temperature and is defined at 15 °C. The permeate outputs can fall (falling temperature) or rise (rising temperature) by up to 3 % for each °C rise or fall in the feed water temperature.

The system is adjusted to the permeate requirements to be expected at the installation site, it is not suitable for major deviations.

Only operate the system if all components are properly installed. Safety devices and equipment must NEVER be removed, bridged or tampered with.

Intended use of the device also implies that the information contained in this operation manual and all safety guidelines applying at the installation site be observed. Furthermore, the maintenance and inspection intervals must be respected.

The reverse osmosis system GENO-OSMO RO 125K is intended exclusively for use in the industrial and commercial sector.

3.1 | System shut-down

If the system is shut down for more than 14 days, the reverse osmosis system must be preserved by Grünbeck's technical customer service/authorised service company. The maximum time, the system can remain in the preserved condition is 6 months.

In case the down time is longer, the system must be preserved again in regular intervals by Grünbeck's technical customer service/authorised service company. Prior to resuming operation, the preserving agent must be flushed from the system.

4 | Application limits

For the application of the reverse osmosis system GENO-OSMO RO 125K, the limit values stipulated in the German Drinking Water Ordinance represent the upper limits for the admissible substances contained in the water.

- Total hardness < 0.1°dH (0.178°f, 0.0178 mmol/l)
- Free chlorine not detectable
- Iron < 0.1 mg/l
- Manganese < 0.05 mg/l
- Silicate < 15 mg/l
- Chlorine dioxide not detectable
- Turbidity < 1 FTU
- Colloid index SDI < 3
- pH range 3 - 9



Note: The permeate originating from the reverse osmosis system is not potable but requires additional treatment (blending, hardening) if it is to be used as drinking water.

5 | Scope of supply

5.1 Standard equipment

- Stand-alone housing made of opaque PE to accommodate all aggregates and control elements. Stand-alone housing also serves as supply tank incl. overflow (only GENO-OSMO RO 125K-TS)
 - Microprocessor controller with LC display, voltage-free collective fault signal and voltage-free signal contact (maintenance interval, various pre-warnings), installed in a stand-alone housing.
 - Sliding-vane rotary pump made of corrosion-resistant brass with motor as high-pressure pump to supply the membrane, incl. control valve for operating pressure and pressure gauge
 - ¹⁾ External pressure booster with pressure switch and membrane connection vessel for supplying permeate to downstream consumers
 - Hydro module for the water supply within the membrane system. Integrated valves and measuring instruments for easier system calibration.
 - Fine filter with integrated pressure reducer preset to 2.5 bar.
 - Ultra-low pressure reverse osmosis membrane, installed in pressure pipe made of high-strength PE
 - Flow sensor to measure the volume of the system flows permeate and concentrate
 - Operation manual
- ¹⁾ Only GENO-OSMO RO 125K-TS

5.2 Optional features



Note: It is possible to retrofit existing systems with optional components. Please contact your local Grünbeck representative or Grünbeck's headquarters in Hoechstädt for more information.

- **Connection block for GENO-OSMO RO 125K**
Connection block (installation length 190 mm).
Permeate-resistant incl. two shut-off valves – suitable for connection set

752 840
- **Connection set for GENO-OSMO 125K**
2 flexible connection hoses DN 15
(L = 600 mm) for feed water and permeate
1 drain hose for concentrate

752 830
- **Conductivity measurement for GENO-OSMO RO 125K**
As plug-in board to the control electronics.
Display with limit value and delay, incl.
connecting line and conductivity measuring
cell installed in the combi-cap pressure pipe.

752 820
- **Forced withdrawal solenoid valve for RO 125K-TS**
Solenoid valve can be adapted to the
permeate outlet hydro module for forced
withdrawal with GENO-OSMO RO 125K-TS
from the tank during longer idle times.
Electrically controlled from control electronics
of the GENO-OSMO RO 125K.

752 810
- **Blending device for GENO-MSR system 200**
Adaptable control unit to hydraulic unit
GENO-OSMO RO 125K consisting of:
Connection G $\frac{3}{4}$ for feed water, solenoid
valve, needle valve, flow sensor to display
the total blended water in the control unit
GENO-OSMO RO 125K, connection option
for blended water in GENO-OSMO RO 125K
or on-site tank

752 800

Note: Retrofitting on site is not possible.



- **Fine filter pureliQ:KD**
For prefiltration.

101 275



- **Euro system separator GENO-DK 2 Mini**
For protecting systems hazardous to drinking water in accordance with DIN 1988 (DIN EN 1717) GENO-DK 2 Mini.

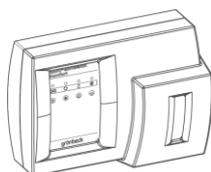
133 100



- **Water softener softliQ:MD12i in industrial version**
As alternating water softener(s) including connection block and flexible connection hoses.

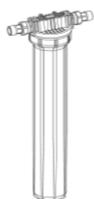
187 140

Note: Diaphragm expansion tank must be provided.



- **Hardness monitoring device softwatch**
for automatic monitoring of the residual/total hardness (water hardness).

172600000000



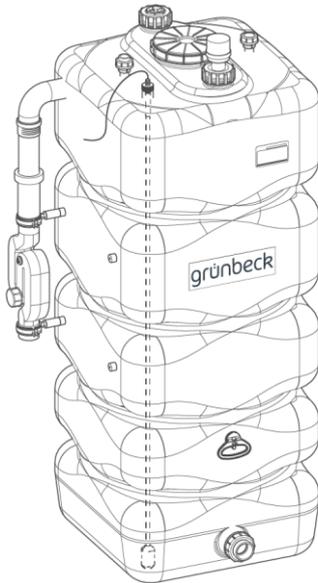
- **GENO activated carbon filter AKF 300**
For reducing the chlorine content in water.

109 150



- **Safety device protectliQ:A20**
Product for the protection from water damage in one and two-family homes.
For other sizes, please inquire.

126 400



- **Pure water tank for intermediate storage of permeate flowing unpressurised from GENO-reverse osmosis systems**

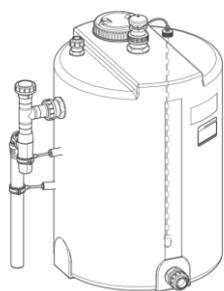
Tank design:

All tanks are pre-assembled, with PVC overflow pipe as well as connections for the permeate inlet and the suction line of the pressure booster system. Black PE. Hand hole with removable screwed lid and level control device GENO-Multi Niveau (switching level).

- **Pure water basic tank GT-X 1000 with sterile air filter and level probe** 712000040000
Tank height including fitting
net volume approx. 840 l (L= 960 x W= 860 x overall height =2200 mm)
For larger tanks, please inquire
- **Additional tank GT 1000 with sterile air filter** 712000060000
as add-on tank of the same size as the basic pure water tank GT-X 1000 with sterile air filter and level probe, aeration and ventilation with 0.2 µm microfilter
- **Basic pure water tank GT-X 1000 with level probe** 712000030000
Without sterile overflow designed as siphon.
Overflow designed as down-pipe
Tank height including connecting pieces.
Useful capacity approx. 840 l (w = 960 x d = 860 x total h = 2200 mm)
For larger tanks, please inquire.
- **Additional tank GT 1000 without sterile air filter** 712000050000
As add-on tank of the same size as the basic pure water tank GT-X 1000 with level probe, aeration and ventilation as fitting with cover



Note: A maximum of four supply tanks can be combined.

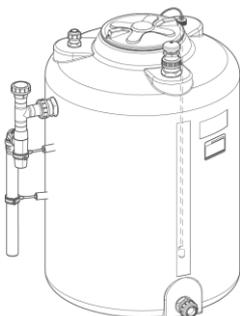


- **Pure water tank RB-X 300 with level probe, without sterile air filter**
Volume 300 l (w= 880 x d= 860 x overall height =2200 mm)

711000030000

- **Pure water tank RB-X 300 with level probe and sterile air filter**
Volume 300 l (w= 880 x d=750 x overall height =1120 mm)

711000040000

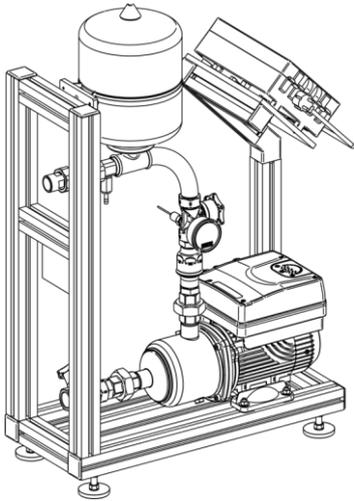


- **Pure water tank RB-X 500 with level probe, without sterile air filter**
Volume 500 l (w= 1040 x d= 920 x overall height =1265 mm)

711000070000

- **Pure water tank RB-X 500 with level probe and sterile air filter**
Volume 500 l (w= 1040 x d= 920 x overall height =1310 mm)

711000080000



Druckerhöhungsanlage GENO-FU-X 2/40-1 N

730 640

Kompaktes, druckabhängig gesteuertes Pumpenaggregat bestehend aus einer Kreiselpumpe kpl. Edelstahl, sowie integriertem Druck- und Kontaktwasserzähler. Steuerelektronik mit Leistungsschaltung, hintergrundbeleuchtetes Graphikdisplay. Betriebsschalter, Betriebsprotokoll über SD-Karte, potentialfreier Melde-/ Störmeldekontakt, Rückschlagventil, Absperrventil für jede Pumpe (saug- und druckseitig), zwangsdurchströmtes Membran-Druckausdehnungsgefäß.

Förderstrom: max. 1,2 - 4,2 m³/h

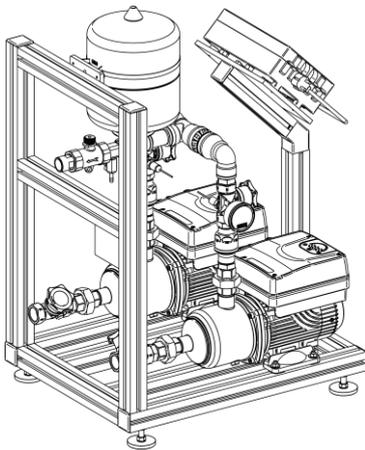
Förderhöhe: max. 18,2 – 45,6 m

Netzanschluss: 230 V / 50 Hz

Leistungsaufnahme: 1 kW

Anschlüsse: DN 25 / DN 32

Schutzart: IP 55

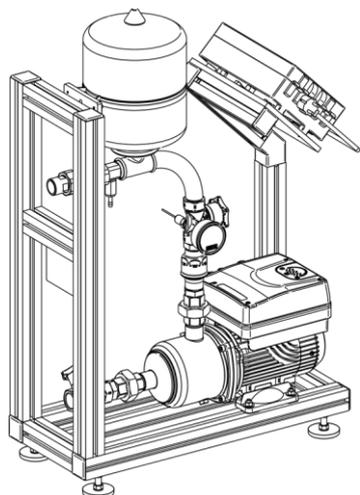


Druckerhöhungsanlage GENO-FU-X-2/40-2 N

730 641

Beschreibung wie Einzeldruckerhöhung jedoch Möglichkeit zur Zeit-/Lastwechselumschaltung.

-Weitere Druckerhöhungsanlagen auf Anfrage-

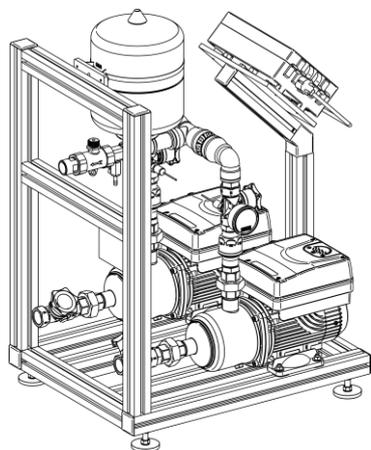


Pressure booster system
GENO-FU-X 2/40-1 N

730 640

Compact, pressure-dependant, controlled pump aggregate consisting of a centrifugal pump completely made of stainless steel as well as an integrated pressure and contact water. Control electronics with power switching, back-lit graphic display. Operating switch, operating log via SD card, voltage-free signal/fault signal contact, non-return valve, shut-off valve for each pump (on suction and pressure side), membrane expansion vessel with forced flow.

Delivery rate: max. 1.2 – 4.2 m³/h
Delivery head: max. 18.2 – 45.6 m
Power supply: 230 V / 50 Hz
Power input: 1 kW
Connections: DN 25 / DN 32
Protection type: IP 55



Pressure booster system
GENO-FU-X-2/40-2 N

730 641

Description as for single pressure booster system, however, with the possibility for time-load switch-over.

**- For additional pressure booster systems,
please inquire -**

5.3 Consumables

Only use genuine consumables in order to ensure the reliable operation of the system.

- | | | |
|--|-----------|---------|
| • GENO-replacement filter element with protective cylinder
Packing unit: 2 pc | | 103 061 |
| • Reverse osmosis membrane with gasket
Packaging unit: 1 pc | | 720 290 |
| • Water test kit for total hardness °dH and °f | 1 piece | 170 187 |
| | 10 pieces | 170 100 |

5.4 Wearing parts

Gaskets and valves are subject to a certain wear and tear. Wearing parts are listed below:



Note: Although these are wearing parts, we offer a limited warranty period of 6 months.

- a) Solenoid valves, control valve, gaskets, water meter
- b) High-pressure pump

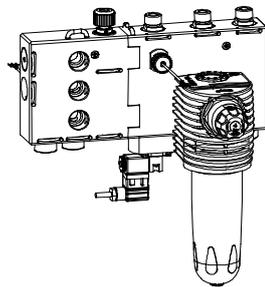


Fig. C-3: Valves

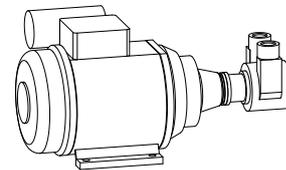


Fig. C-4: High-pressure pump

D Installation

1 | General installation information

The installation site must offer adequate space. A foundation of a sufficient size and adequate load carrying capacity has to be provided. The required connections must be provided prior to the installation. Dimensions and connection data are summarised in table C-1.



Note: Also observe the operation manuals that have been supplied with the optional accessories (see chapter C, 5.2) for your system (if applicable).

1.1 Sanitary installation

Certain binding rules must always be observed when installing the reverse osmosis system GENO-OSMO RO 125K. Additional recommendations are given in order to facilitate the handling of the system. The installation instructions described below are also illustrated in fig. D-4.

Mandatory regulations



The installation of a reverse osmosis system GENO-OSMO RO 125K represents a major interference with the drinking water system. Therefore, only authorised experts may install such systems.

- Observe local installation guidelines and general regulations.
- Install a drinking water filter upstream (e.g. BOXER KD) (option).
- Install a system separator upstream (option).
- Install a water softener upstream (option).
- Install an activated carbon filter upstream, if required (option).
- Provide a drain connection (minimum DN 50) to discharge the concentrate.



Note: If the concentrate is directed to a lifting system, the delivery rate of the lifting system should at least be 500 l/h.



Warning! The installation site must have a floor drain. If no floor drain is available, an adequate safety device needs to be installed (refer to option C-6).



Warning! Floor drains that discharge to a lifting system do not work in case of a power failure.

Recommendations

Install a sampling valve immediately before and after the reverse osmosis system GENO-OSMO RO 125K. This simplifies the sampling for the regular quality control (functional check).

1.2 Electrical installation

Internal wiring control GENO-OSMO RO 125K

The system is completely pre-wired (possibly including options) and delivered ready to plug in. During start-up, parameter ECL:1 must be reprogrammed to ECL:0 at code level 113 (NC contact >>NO contact). This is a protective measure to prevent the system from being inadvertently switched on after the power cable has been plugged in, without the system having been vented first.

Jumpers must be plugged in like this

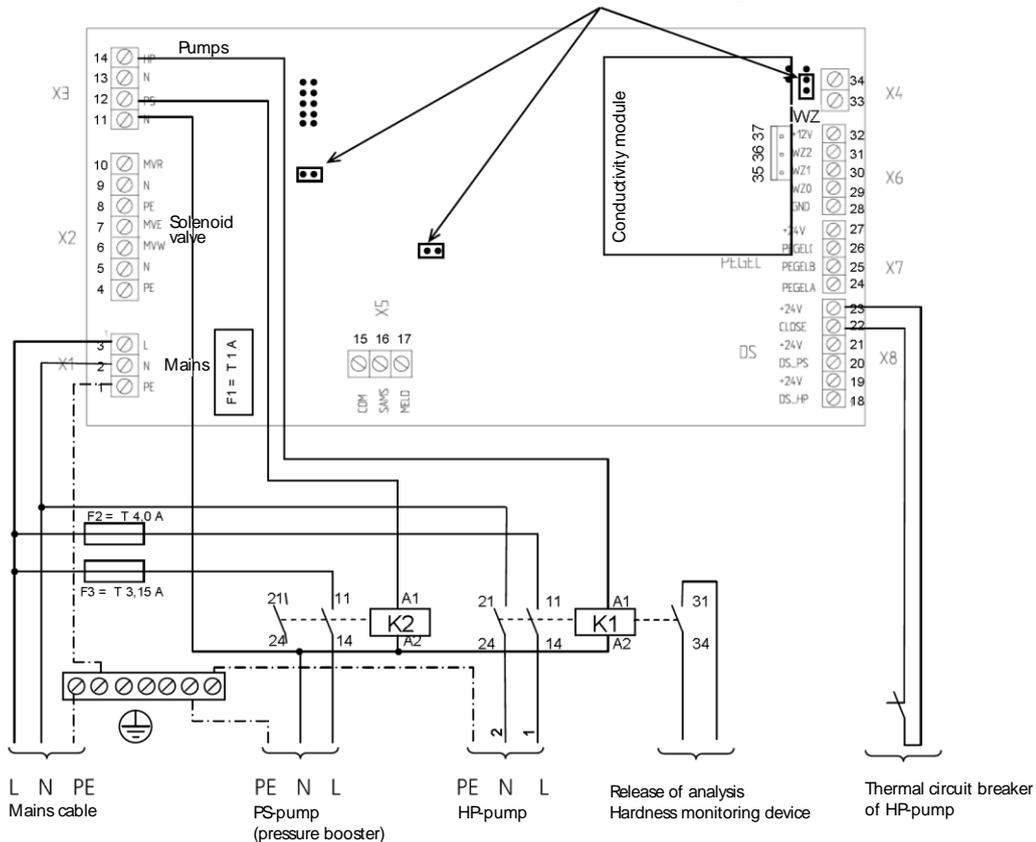


Fig. D-1: Printed circuit board assignment GENO-OSMO RO 125K

Terminal no.	Terminal	Function (core colour)	Note
All protective grounding conductors are connected to the 7-pin protective grounding conductor terminal on the left-hand mounting rail			
X1	3	L	230 V / 50 Hz phase
	2	N	Neutral conductor
	1	PE	Earth wire
X2	6	MVW	230 V / 50 Hz phase
	5	N	Neutral conductor
	7	MVE	230 V / 50 Hz phase
	10	MVR	230 V / 50 Hz phase
	9	N	Neutral conductor
X3	12	PS	230 V / 50 Hz phase
	13	N	Neutral conductor
	14	HP	230 V / 50 Hz phase
	13	N	Neutral conductor
	14	HP	230 V / 50 Hz phase
	2	N	Neutral conductor
	33	+	Electrode cable AVRO
X4	34	GND	
	Only used with AVRO 125 TS/TL		
X5	15	COM	Common root
	16	SAMS	Fault signal contact
	17	MELD	Signal contact
X6	28	GND	Common ground (brown)
	29	WZ0	Pulse input permeate
	30	WZ1	Pulse input concentrate
	31	WZ2	Option: Impulse input blending unit
	32	+12V	Common transmitter voltage 12 VDC (white)
X7	24	Level "a"	Switch-off level high-pressure pump
	25	Level "b"	Switch-on level high-pressure pump
	26	Level "c"	Dry-run protection pressure booster pump
	27	+24V	Common transmitter voltage 24 VDC

Mains cable, on-site fuse protection min. 6 A

Rinse solenoid valve
Inlet solenoid valve

Common neutral conductor terminal

Option:
Solenoid valve forced withdrawal

GENO-OSMO RO 125K-TS
Actuation only of integrated booster pump via relay K2, fuse protection by fuse F3 (T 3,15 A)

GENO-OSMO RO 125K-TL

- Actuation of pressure booster pump voltage-free contact: Relay K2, terminals 21-24
- Control voltage for external power unit 230 V~: Relay K2, terminals 14-A2

Option:
Solenoid valve blending unit

Actuation of high-pressure pump via relay K1, fuse protection by fuse F2 (T 4.0 A)

Only used with AVRO 125 TS/TL

Voltage-free contacts NC 250 V~ / 3 A with common control COM

Hall impulse cable of the turbine water meters

Level control permeate tank

Terminal no.		Terminal	Function (core colour)	Note	
X8	18	DS_HP +24V	Pressure switch high-pressure pump	Feed water negative pressure, dry-run protection high-pressure pump	
	19		Transmitter voltage 24 VDC		
	20	DS_PS +24V	Pressure switch pressure booster pump	Pressure switch for controlling the pressure booster pump (GENO-OSMO RO 125K-TS or AVRO 125 TS integrated in the system). For the RO/AVRO 125-TL version, a jumper must be inserted at terminals X8 20/21.	
	21		Transmitter voltage 24 VDC		
	22	CLOSE	Release input close	<ul style="list-style-type: none"> • Shutdown of the system when the thermal protection contact in the HP pump is activated. • Block system from outside, e.g. pretreatment, residual hardness For this purpose, an on-site NC contact must be connected in series to the thermal circuit breaker. 	
23	+24V	Transmitter voltage 24 VDC			
X9	35	Shielding	Conductive 2-electrode measuring cell, not temperature-compensated, cell constant 0.1 or 1.0	Option: Conductivity measurement	
	36	LF E			White
	37	LF V			Brown
Relay K1	31 34		Release signal/start of analysis Hardness control monitoring device	Contact is closed when system is producing permeate. GENO-Softwatch Komfort: connect to terminals 16/17.	

Arrangement of the components on the mounting rails, accessible after removal of the control unit:



Protective grounding conductor, mounted underneath the two fuses F2 and F3.

Fig. D-2: Position of protective grounding conductor terminal

2 | Preliminary work

1. Unpack all system components.
2. Check for completeness and undamaged condition.
3. Install the reverse osmosis system GENO-OSMO RO 125K at the intended location.

3 | How to connect the system to the water supply

- Connect the feed water to the system (refer to fig. D-4)
- Connect permeate line to the system. With GENO-OSMO RO 125K-TL to the on-site tank
- Connect the tank overflow (for GENO-OSMO RO 125K-TS only) to the drain according to DIN EN 1717.



Caution! If withdrawal/supply points (e.g. on-site tank) of permeate from the RO 125K are below the connection level of the system, a pressure maintaining valve must be installed in the permeate line to protect the permeate tank against siphoning.

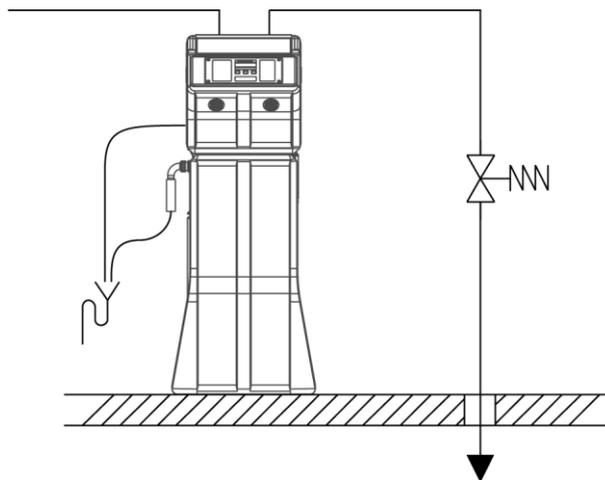
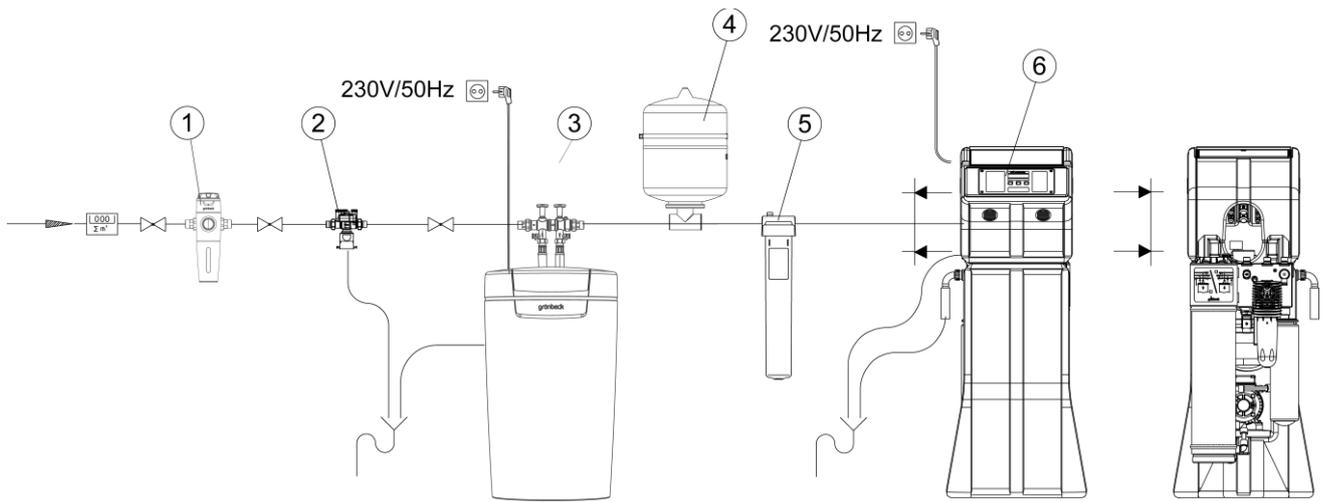
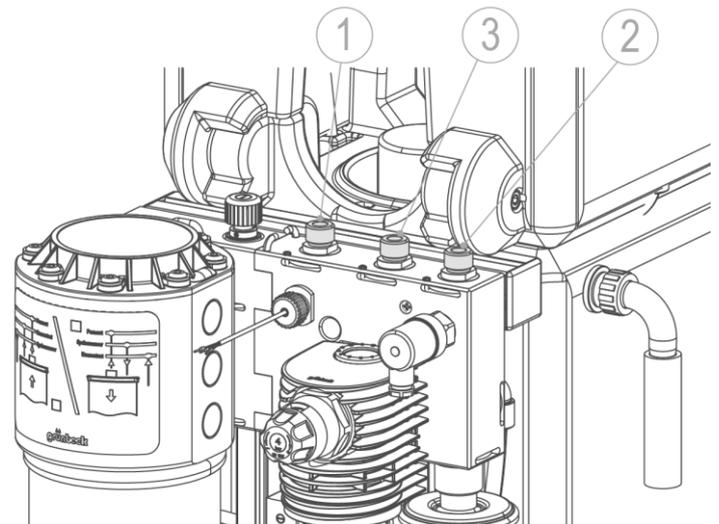


Fig. D-3: Withdrawal point below system level



- ① Drinking water filter pureliQ:KD
- ② Euro system separator DK 2-Mini
- ③ Water softener softliQ:MD12i
- ④ Diaphragm expansion tank
- ⑤ Activated carbon filter ACF
- ⑥ Reverse osmosis system GENO-OSMO RO 125K

Fig. D-4 Installation drawing reverse osmosis system GENO-OSMO RO 125K



- ① Concentrate connection
- ② Permeate connection
- ③ Feed water connection

Fig. D-4(a) Installation drawing reverse osmosis system GENO-OSMO RO 125K

E Start-up



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

1 | How to flush the system

1.1 Mounting the flushing line

Disassemble the permeate line from the collection tank (refer to figs. E-1, E-2 no. 1) and route it to the drain in a separate hose.

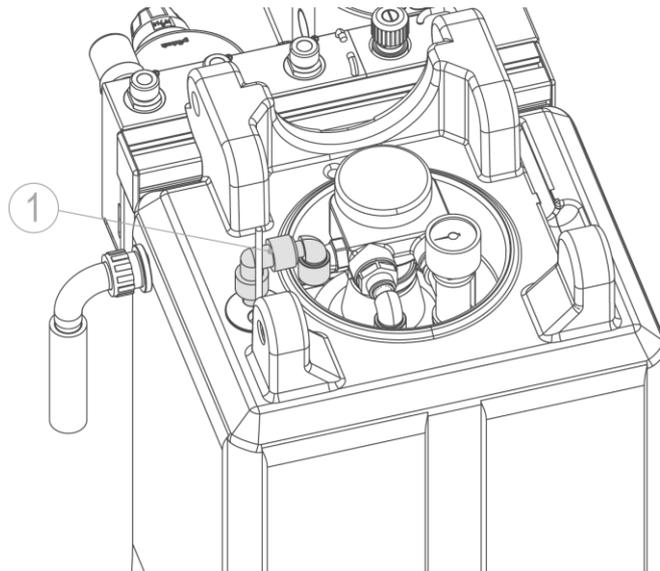


Fig. E-1: Permeate line RO 125K-TS

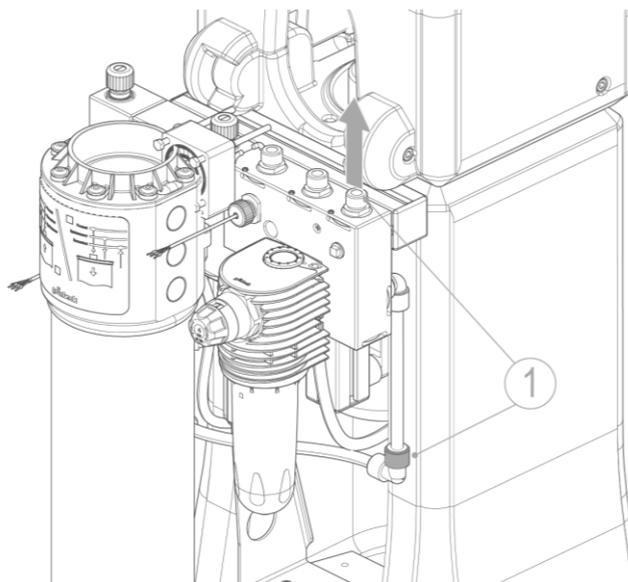


Fig. E-2: Permeate line RO 125K-TL

① Permeate pipe RO 125K-TS

1.2 Rinsing out preserving agent

For the duration of storage and transport, the membrane is protected by means of a preserving agent. First of all, this preserving agent must be flushed out. In order to prevent the system being switched on beforehand, it is locked electronically.



Note: For more detailed information on the handling of the control unit, refer to chapter F.

- Via code 113, (refer to Table E-1: Extract from...), parameter ECL release the system: To do this, open parameters with the P key, use the ▼ key to set ECL: 1 and confirm with the P button
- Via code 113, (refer to Table E-1: Extract from...), parameter EnL: 1, open both solenoid valves ("DEAERATE") and rinse preserving agent out system for 30 minute by opening parameters with the P button, use the ▲ button to set EnL: 1 and confirm with the P button
- Complete program step "DEARATE": Open parameter with P button, set EnL: 0 with ▼ button and confirm with P button
- Exit the "EnL" program by simultaneously pressing the ▼ and ▲ buttons

Table E-1: Extract from point F-3.1 input logic code 113

Display factory setting	Parameters	Setting range	Comments
E-A: 1	Contact type level "a"	0 ... 1	0 = NO contact 1 = NC contact
E-b: 0	Contact type level "b"	0 ... 1	0 = NO contact 1 = NC contact
E-c: 0	Contact type level "c"	0 ... 1	0 = NO contact 1 = NC contact
EHP: 2	Type of contact pressure switch negative pressure HP (high-pressure pump)	0 ... 3	0 = NO contact 1 = NC contact 2 = NO contact with auto restart ¹⁾ 3 = NC contact with auto restart ¹⁾
EPS: 0	Contact type pressure switch PS (pressure boost pump)	0 ... 1	0 = NO contact 1 = NC contact
ECL: 1	Contact type close input.	0 ... 1	0 = NO contact 1 = NC contact
EnL: 0	Rinse system (inlet and rinsing solenoid valves).	0 ... 1	1 = Open solenoid valves (only possible if the system is switched off using ▼ button). 0 = Close solenoid valves again
A.PF:0	Function signal contact terminals 15/17.	0 ... 1	0 = Contact opens when HP pressure switch is deenergised, conductivity pre-warning, level has fallen below "c", maintenance interval expired. 1 = Contact closed when HP pump running.

For flushing do not modify preservation!

1.3 Venting permeate output/pressure booster pump

- Reinstall permeate line on collection tank (refer to fig. E-1).
- Switch on the reverse osmosis system RO 125K by pressing the ▲ button. The system produces permeate in the tank.



Note: Below only for reverse osmosis system RO 125K-TS.

- Let the system produce permeate for 15 minutes (approx. 30 litres of permeate).
- The pressure booster pump is vented when permeate flows out of the venting/sample valve (refer to fig. E-3, no. 1). Close the vent valve.
- Plug the pressure switch plug (refer to fig. E-4, no. 1) into the pressure switch – the pressure booster pump starts pumping. In order to vent the connecting line of the reverse osmosis (piping by client on site) slightly loosen the union nut, if necessary, until the air has escaped.



Note: In order for the booster pump to reach its cut-out pressure, the downstream line must also be vented. Therefore, it is imperative to establish permeate consumption.

- Cut-in pressure approx. 1.8 bar; cut-out pressure approx. 3.0 bar.

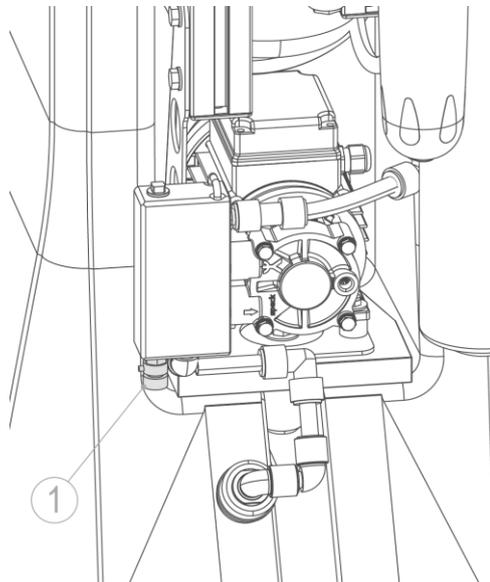


Fig. E-3: Venting pressure booster

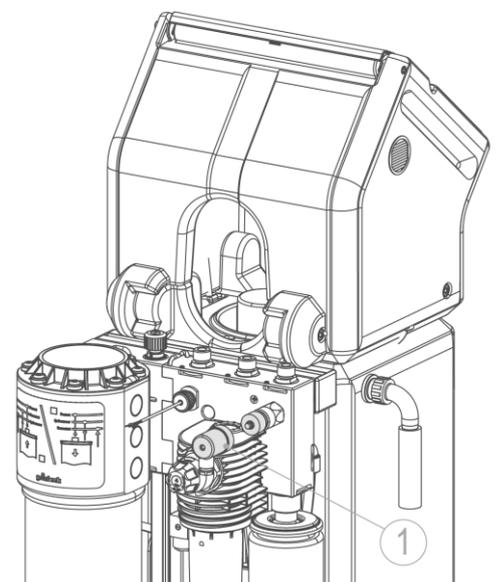


Fig. E-4: Pressure switch pressure booster

F Operation

1 | Preface



Note: Instructions in bold are absolutely essential to ensure that work can continue. All other instructions can be ignored if the value shown on the display remains unchanged.



Settings in the technical service programming level may only be performed by Grünbeck's technical customer service/authorised service company or by persons expressly authorised by Grünbeck.



Warning! Incorrect settings may lead to hazardous operating conditions which cause injury, illness or damage to property. The operation manual must be strictly adhered to! Only make the settings described there!

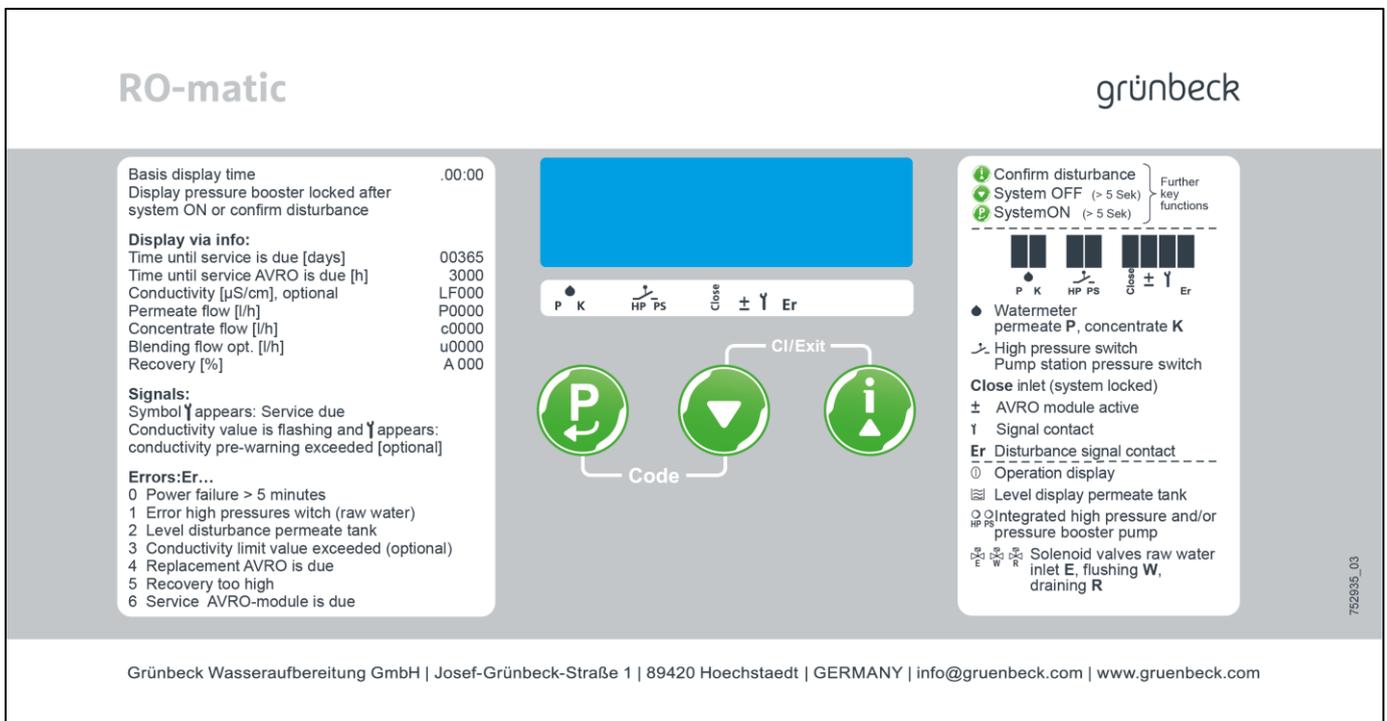
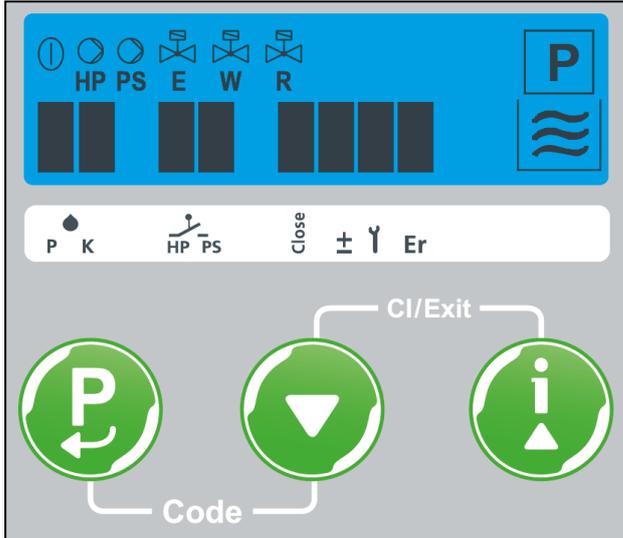


Fig. F-1: Control unit

2 | How to operate the control unit

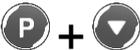
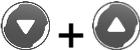
Display symbols:	
	Operating display Appears when the system is switched on using the ▲ button (> 5 s from basic time display).
	High-pressure pump Appears when the high-pressure pump is producing permeate (flashes with fault Er1).
	Pressure booster pump Appears when the pressure booster pump is pumping permeate or when the power unit K2 is active.
	Solenoid valve input Appears when permeate is being produced, or when the system is rinsing.
	Rinse solenoid valve Appears when the system is rinsing.
	Solenoid valve forced withdrawal Appears when the permeate tank is emptied to the drain.
	Level indicator permeate tank Upper wave: Cut-off level for high-pressure pump. Middle wave: Switch-on level for high-pressure pump. Lower wave: Dry-running protection for pressure booster pump.
	Bars for water meter pulses Flash with every 5th pulse of the water meter permeate or concentrate.
	Bars for operational readiness of high-pressure pump (HP) and pressure booster pump (PS) Shows the status of the feed water inlet pressure switch (bar appears when pressure is active) and PS pump operation enable (bar appears when enabled).
	Bar for close input <ul style="list-style-type: none"> Appears when the system is blocked because the on-site operational release is missing. Appears when HP pump is overheated.



The control panel features a blue top section with icons for HP, PS, E, W, R, and a 'P' icon. Below this is a white section with a 'P K' indicator, an HP PS indicator, a 'Close' button, and an 'Er' error indicator. The bottom section has three large green circular buttons labeled 'Code', 'CI/Exit', and an information icon.

Fig. F-2: Control panel control GENO-OSMO RO 125K

	Numerical display 8.8.8.8.8 <ul style="list-style-type: none"> In the information level, indicates the time and operating parameters. Displays the parameters of the code levels. Displays symbols in addition to the error message.
	Dot appears for as long as the pressure booster pump is blocked (after ON using ▲ button, after exceeding the lower wave permeate tank, acknowledge after malfunction).
	Flashes when the pressure switch for high-pressure pump drops out during permeate production (lack of feed water pressure).
	Bars for signal and fault signal contact Y appears when the maintenance interval has expired, high-pressure pump pressure switch failed, conductivity pre-alarm, permeate tank empty. Er appears in the event of malfunctions Er 0 ... Er 6.
	Symbol not relevant for GENO-OSMO RO 125K-TL/TS.

Key functions:	
Basic function:	Expanded function in programming levels:
 <ul style="list-style-type: none"> Acknowledgement of malfunctions. Access to time programming (press and hold button > 2.5 s). 	<ul style="list-style-type: none"> Open parameter for editing (value is flashing). Save and close parameter.
 <p>Switch off system (> 5 s in basic time display)</p>	<ul style="list-style-type: none"> Decrease numerical value. Return to previous menu item.
 <p>Switch on system (> 5 s in basic time display), display operating values of the information level</p>	<ul style="list-style-type: none"> Increase numerical value. Go to the next menu item.
 <p>Access to the code-protected programming levels (code request C 000)</p>	<ul style="list-style-type: none">
	<ul style="list-style-type: none"> Close the opened parameters without saving (previous value is maintained). Return to basic display time.

2.1 How to read the operating state

Various operating parameters can be displayed in the information level. The information level is accessed by pressing the ▲ button (> 5 s). The other parameters are accessed by touching. The information level remains locked for as long as the system has not been enabled using the close input signal.

Key	Display	Parameters
	00:00	Basic time display
	The system might still be switched on with the first press (> 5 s)!	
	365	Remaining duration of the service interval [days]
	0000	Display value not relevant for RO 125K-TL/TS
	LF022	Permeate conductivity [μ S/cm] (optional – display value flashes if the advance warning value is exceeded)
	P0200	Permeate flow rate [l/h]
	c0200	Concentrate flow [l/h]
	u0320	Flow rate blending [l/h] (option 752 800)
	A 050	System recovery [%]

2.2 How to set the time**Requirement:**

Basic time display is currently being displayed

1. Press P key > 2.5 seconds, only the hours are still displayed 00:
2. Press P button to change the hours (value is flashing, now set the desired value with the ▼ or ▲ button and save with the P button)
or
press ▲ button to advance to the minutes :00
3. Press P button to change the minutes (value is flashing, now set the desired value with buttons ▼ or ▲ and save with the P button)
4. Return to the basic display time by simultaneously pressing buttons ▼ and ▲.

2.3 Access to the programming levels – change parameters

1. Simultaneously pressing the buttons P and ▼ (> 1 sec) causes the code request C 000 to appear.
2. Set the required code with the ▼ or ▲ buttons and confirm with P button.
3. Within the programming level, select the desired parameter with the ▼ or ▲ button and open it for editing with the P button (value starts flashing).
4. Use the ▼ or ▲ button to change the parameter to the required value.
5. Save the new parameter setting with the P button (value stops flashing) or reject the change by simultaneously pressing the ▼ and ▲ buttons, and close the parameter again (value stops flashing, previous setting remains saved).
6. Return to the basic display time by simultaneously pressing buttons ▼ and ▲.
7. If no button is pressed within a parameter level for more than 5 minutes, the system automatically returns to the basic display time. Any opened parameters (flashing value) and closed and the old set value is maintained.

2.4 Software version

Display	Parameters
P1.00	Software version of the RO-matic control unit

3 | Programming levels

3.1 Input logic code 113

Display factory setting	Parameters	Setting range	Comments
E-A: 1	Contact type level "a"	0 ... 1	0 = NO contact 1 = NC contact
E-b: 0	Contact type level "b"	0 ... 1	0 = NO contact 1 = NC contact
E-c: 0	Contact type level "c"	0 ... 1	0 = NO contact 1 = NC contact
EHP: 2	Type of contact pressure switch negative pressure HP (high-pressure pump).	0 ... 3	0 = NO contact 1 = NC contact 2 = NO contact with auto restart ¹⁾ 3 = NC contact with auto restart ¹⁾
EPS: 0	Contact type pressure switch PS (pressure booster pump).	0 ... 2	RO/AVRO 125-TS: 0 = Normally open contact RO/AVRO 125-TL: 0 = Normally open contact + wire bridge Terminals 20/21 or 1 = Normally closed contact 2 = reserved function
ECL: 0	Contact type close input.	0 ... 1	0 = NO contact 1 = NC contact
EnL: 0	Rinse system (inlet and rinsing solenoid valves).	0 ... 1	1 = Open solenoid valves (only possible if the system is switched off using the ▼ button). 0 = Close solenoid valves again
A.PF:0	Function signal contact terminals 15/17.	0 ... 1	0 = Contact opens when HP pressure switch is deenergised, conductivity pre-warning, level has fallen below "c", maintenance interval expired. 1 = Contact closed when HP pump running.

<p>1) If fault Er 1 occurs when permeate production is in progress (high-pressure pump negative pressure switch), the system causes a new start in at the following time intervals: 5 ... 10 ... 20 ... 40 ... 80 ... 160 minutes.</p> <p>If there is sufficient pressure available, permeate is produced until level "a" is reached, and the error is self-acknowledging.</p> <p>The symbol P flashes on the display in the waiting time between the start attempts</p>
<p>2) Pressure switch: Cut-in pressure 1.8 bar Cut-out pressure 3.0 bar</p> <p>The hysteresis of the pressure switch can be adjusted in parallel with the central screw of the switch.</p>

3.2 System parameters code 290

Display / factory setting	Parameters	Setting range	Comments
1. 0	Cell constant conductivity measurement (optional).	0.0 / 0.1 / 1.0	0.0 = Conductivity measurement deactivated, i.e. parameter 2 ... 4 inactive. 0.1 = Measurement range 0 ... 99 µS/cm 1.0 = Measurement range 0 ... 999 µS/cm
2. 080	Conductivity limit value for fault Er 3 [µS/cm].	1 ... 999	 Note: Set value must be selected appropriate for the cell constant (i.e. measuring range)!
3. 070	Conductivity advance warning [µS/cm] (display in the information level starts to flash and signal contact switches).	1 ... 999	
4. 05	Switch-off delay with Er 3 [minutes].	0 ... 99	Also delay time for outputting the signal message when the conductivity advance warning is exceeded.

Display / factory setting	Parameters	Setting range	Comments
5. 0	Mains return reaction for fault Er 0 (mains failure > 5 minutes).	0 ... 2	0 = Irrespective of whether the system was switched off or on before the mains failure, it remains switched off after the mains returns and fault Er 0 is output. 1 = Fault Er 0 is deactivated. 2 = After the mains power returns, the system is switched off or on as it was before the mains failure, and fault Er 0 is output.
6. 1	Daily interval for forced operation/forced withdrawal [days].	1 ... 3	If the day interval since the last permeate output has been reached at the programmed time, forced operation or forced withdrawal takes place – depending on what is activated.
7.18:00	Time forced operation/forced withdrawal.	00:00 ... 23:59	
8. 0	Duration forced operation [hours].	0 ... 9	
9. 3.0	Opening time solenoid valve forced withdrawal [minutes].	0.0 ... 99.9	
A. 0	Recovery monitoring (Er 5).	0 ... 1	With AVRO 125 TS/TL the recovery monitoring must be activated!
b. 80	Upper recovery limit value [%].	1 ... 99	 Caution! With AVRO 125 TS/TL, the recovery must be set to 65 %!
c. 060	Delay time for recovery deactivation [min.]	0 ... 240	

4 | Operation of reverse osmosis

4.1 How to set the system recovery

A certain part of the feed water must be rejected in order to prevent the membrane from clogging due to scaling. The ratio of the produced permeate volume to the feed water volume flowing into the drain is called yield.

4.1.1 How to set the permeate volume

- Switch on the system using the ▲ button (see chapter F-2) on the control electronics.
- Use the adjustment valve operating pressure (refer to fig. F-3, no. 1) to throttle the pump in such a way that the specific permeate flow rate 125 l/h is achieved.



Note: The current permeate flow can be displayed via the control unit (refer to chapter F, point 2.1 Reading the operating status).

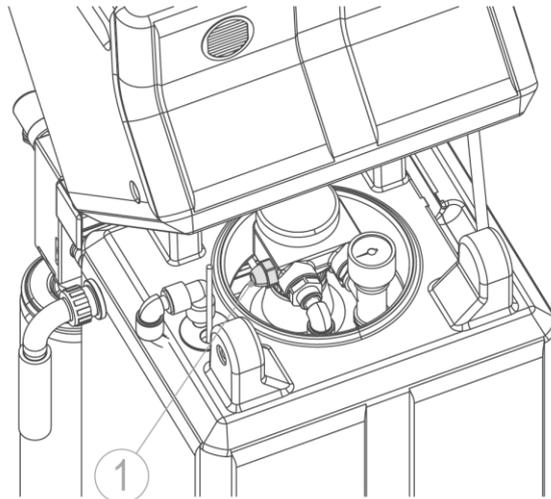


Fig. F-3: Pump

4.1.2 How to set the concentrate volume

- Set the concentrate flow at the concentrate needle valve (refer to fig. F-4, no. 1)
- The concentrate flow in a standard system has to be set in a way, that a recovery of 75 % is attained (125 l/h of permeate flow, 42 l/h of concentrate flow)



Note: The current concentrate flow and the recovery can be displayed via the control unit (refer to chapter F, point 2.1 Reading the operating status).



Caution! If the set recovery is not met, scaling (precipitation of dissolved salts) occurs on the reverse osmosis system.

- Measure water values of feed water, permeate, concentrate after 10 minutes and enter them in the operating log.
- Switch off the system ▼ (refer to chapter F-2).

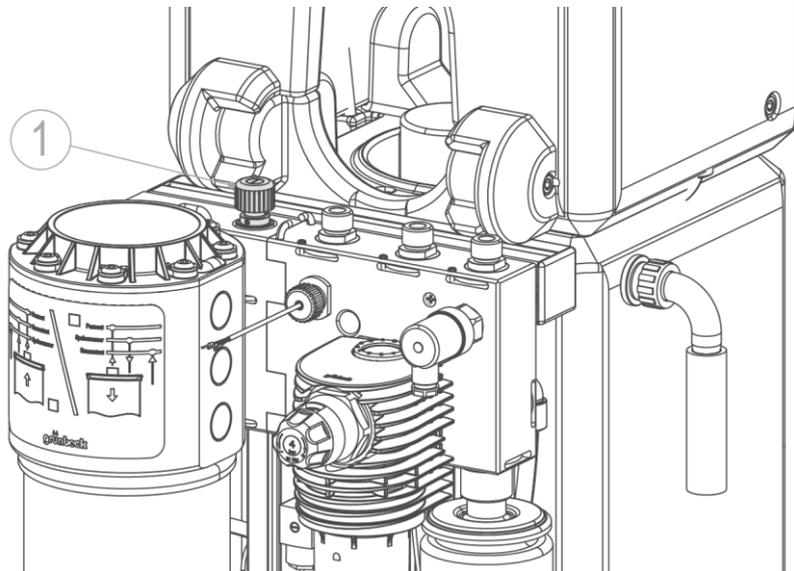


Fig. F-4: Hydro module

Example for the calculation of the recovery

$$\text{Recovery}[\%] = \frac{\text{Permeate flow [l/h]} \times 100\%}{\text{Permeate flow [l/h]} + \text{Concentrate flow [l/h]}}$$

$$\text{Concentrate flow [l/h]} = \frac{\text{Permeate flow [l/h]} \times 100}{\text{Conenctrate recovery}[\%]} - \text{Permeate flow [l/h]}$$

G Troubleshooting

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

The systems are equipped with an error detection and reporting system.

If an error message is displayed:

1. Press button (= acknowledge malfunction).
2. Watch the display.
If the message reappears, compare it with table G-1.
3. If necessary, notify Grünbeck's technical customer service.



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

Table G-1: Troubleshooting		
This is what you observe	This is the cause	This is what to do
Water quality deteriorated by 50 %.	Membrane clogged.	Replace or flush the membrane ¹⁾ .
	Feed water values deteriorated.	Check feed water values.
Solenoid valve does not open .	Coil defective or fuse on the circuit board blown.	Replace coil or fuse.
Solenoid valve does not close .	Valve contaminated.	Clean valve.
Bar appears in the display above Symbol Close.	<ul style="list-style-type: none"> • HP pump: Thermostat contact has responded, pump has overheated. • Upstream hardness monitoring or water treatment blocks the system. 	<ul style="list-style-type: none"> • Wait until the pump has cooled down again, the system will then automatically continue to produce. • Inspect system installed upstream.
Bar appears in the display above screw wrench symbol (without further indications of a malfunction).	Service interval has elapsed.	Have maintenance performed.
Conductivity measured value in information level is shown flashing and bar appears in the display over spanner symbol.	Optional conductivity measurement: Conductivity pre-warning part F / chapter 3.2 / parameter 4 has been exceeded.	Check feed water values and rinse diaphragm, if necessary.

Continuation Table G-1: Troubleshooting		
This is what you observe	This is the cause	This is what to do
Er 0	Power failure > 5 minutes Refer to part F / chapter 3.2 / parameter A: Depending on the setting, the system either continues to run or remains switched off.	Check mains supply for failures.
Er 1	Pressure loss at pressure switch HP: Refer to part F / chapter 3.1 / parameter EHP: Depending on the setting, the system had 6 previous unsuccessful start attempts.	Re-establish feed water primary pressure.
Er 2	Invalid level setting in the permeate tank.	Check wiring or setting in code 113, parameters E-A, E-b and E-c and correct if necessary (NC/NO contact assignment).
Er 3	Optional conductivity measurement: Conductivity limit value Part F / chapter 3.2 / parameter 3 has been exceeded.	Check feed water values, rinse diaphragm and renew if necessary.
Symbol  flashes (from software V1.22) or symbol  flashes (up to software V1.19)	See Er 1: Waiting time runs between 2 start attempts	Re-establish feed water primary pressure
Er 5	System recovery too high.	Gauge and reset the system.

¹⁾ Separate flushing instructions for membranes are available for authorised service personnel under order no. 700 950.

H Maintenance and care

1 | Basic information

In order to guarantee the reliable function of the systems over a long period of time, some maintenance work has to be performed at regular intervals. All regulations and guidelines which apply at the installation site must be strictly adhered to.

- Check the quality and the system volume flows every day.
- Maintenance has to be performed by Grünbeck's technical customer service/authorised service company or by a specialised company. Maintenance is subject to the load, but at the latest has to be performed once a year.
- An operation log and the corresponding test log must be kept in order to document the maintenance work performed.



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

The maintenance work performed must be documented in the checklist, refer to appendix "Operation log"

2 | Inspection (functional check)

You may perform the daily inspections yourself.

Please refer to the following summary for the tasks to be performed within the framework of an inspection.

Overview: Inspection work

- Determine the feed water hardness (inlet).
(Water test kit "Total hardness")
- Determine the permeate quality. Either at the display if a conductivity monitoring device is installed or by means of a manual conductivity meter.
- Read the recovery.
- Take the remaining time of the service interval into consideration Chapter F point 2.2 Read operating state.
In case the remaining time of the maintenance interval is < 30 days, inform Grünbeck's technical customer service about the impending service.



Note: Minor deviations are normal and cannot be prevented technically. In case of considerable deviations from the standard, notify Grünbeck's technical customer service.

- Make sure that there are no leakages from the system to the drain (all 3 waves can be seen on the display when the system is switched off, refer to fig. F-2, point 5). Solenoid valves are not tightened, visible in the display (refer to fig. F-2, no. 9 and 10). In this state, no water must creep to the drain



Note: There can be increased water consumption by the system if the solenoid valves are leaking. The recovery is impaired.

3 | Maintenance



According to DIN EN 806-5, maintenance work at the systems may only be performed by Grünbeck's technical service/authorised service company or an approved specialist company.

For this kind of systems, an operation log - a checklist has to be kept. In this operation log, the service technician records all maintenance and repair work performed. In case of malfunctions, this log helps to identify possible sources of error. In addition, the log documents the proper system maintenance.



Note: Make sure that all maintenance work is recorded in the operation log as well as in the corresponding test report.

Overview: Maintenance work

- Replacing the filter element.
- If necessary, replace the filter element of the activated carbon filter.
- Check the permeate quality; flush or replace the membrane, if necessary. So-called flushing instructions (order no. 700 950) are available for authorised service personnel.
- Clean the solenoid valves - check their function.
- Check the flow volumes and recalibrate the water meter.
- Check the state of the entire system and check for tightness.

- Mechanical resp. electrical functional and performance check of all aggregates (pumps, valves).
- Prepare a written maintenance log on the state and function of the system and the maintenance work performed, incl. evaluation and assessment of the operating values and water analysis results.



Note: The maintenance work performed must be documented in the checklist, refer to appendix "Operation log"

3.1 Operation log

The operation log is located in chapter H, point 4 of this operation manual. When starting up the system, make sure to record all data on the cover sheet of the operation log and fill in the first column of the checklist.

The service technician will fill in a column of the check list whenever maintenance is performed. This document provides evidence of proper maintenance.

4 | Operation log

Customer

Name:

Address:.....

.....

.....

Reverse osmosis system GENO-OSMO RO 125K

TL

(Please check appropriate box)

TS

Serial number

Installed by

Drinking water filter: Make/Type /

System separator: Make/Type /

Water softener: Make/Type /

Activated carbon filter: Make/Type. /

Fine filter: Make/type /

Connection data:

Drain connection yes no
DIN EN 1717

(Please check appropriate box)

Floor drain available yes no

Line before Galvanised

GENO-OSMO RO 125K Copper

Plastic

Height of drain cm from bottom edge of the system

**Maintenance work on reverse osmosis system GENO-OSMO RO 125K
Checklist**

Please enter measured values. Confirm checks with OK or enter repair work performed.

<input type="checkbox"/> Maintenance performed without replacement of module Module no.....	<input type="checkbox"/> Maintenance performed with replacement of module Module no.....	Start-up	Date
---	--	----------	------

Measured values

Water volumes and water qualities **before** the replacement of the module / **after** the replacement of the module or in case of maintenance

	Pump pressure [bar]	Conductivity [μ S/cm]	Total hardness [$^{\circ}$ dH] ¹⁾	Temperature [$^{\circ}$ C]	Volume flow [l/h]	Recovery [%]
	before/after	before/after	before/after	before/after	before/after	before/after
Inlet water	/	/	/	/	/% / ... %
Permeate	/	/	/	/	/	
Concentrate/drain	/	/	/	/	/	

	Acknowledgement	Remarks
Water meter reading upstream of the system	m ³	
Inlet water pressure (2.5-4 bar) checked		
Filter elements changed		
Settings of electronics checked		
Water meter configured (code 302, par. 2 and 3)	l/h	
Operating hours (chapter F, 3.4)		
Run time of high-pressure pump (code 245, par. c)	h	
Run time of pressure booster pump (code 245, par. d)	h	
Permeate volume produced (code 245, par. E)	m ³	
Generated concentrate volume (code 245, par. F)	m ³	
Blended water quantity (optional) (code 245, par. G)	m ³	
Duration of flushing (code 302, par. 6)	min.	
Check all electrical lines for external damage		
All hoses and connections checked for external damage		
Inlet water and flushing water solenoid valve cleaned and checked for tightness		
Function of low pressure monitor checked		
Conductivity sensor checked/cleaned		

¹⁾ 1 $^{\circ}$ dH = 1.78 $^{\circ}$ f = 0.178 mmol/l

	Acknowledgement	Remarks
Visual check of electronics board		
System checked for tightness		
Load units reset		

Miscellaneous
<p>Remarks:</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>Start-up expertt/CS technician:</p> <p>Company:</p> <p>.....</p> <p>.....</p> <p>Work time certificate (no.):</p> <p>Date/signature</p>

**Maintenance work on reverse osmosis system GENO-OSMO RO 125K
Checklist**

Please enter measured values. Confirm checks with OK or enter repair work performed.

<input type="checkbox"/> Maintenance performed without replacement of module Module no.	<input type="checkbox"/> Maintenance performed with replacement of module Module no.	Start-up	Date
--	---	----------	------

Measured values

Water volumes and water qualities **before** the replacement of the module / **after** the replacement of the module or in case of maintenance

	Pump pressure [bar]	Conductivity [μ S/cm]	Total hardness [$^{\circ}$ dH] ¹⁾	Temperature [$^{\circ}$ C]	Volume flow [l/h]	Recovery [%]
	before/after	before/after	before/after	before/after	before/after	before/after
Inlet water	/	/	/	/	/% /%
Permeate	/	/	/	/	/	
Concentrate/drain	/	/	/	/	/	

	Acknowledgement	Remarks
Water meter reading upstream of the system	m ³	
Inlet water pressure (2.5-4 bar) checked		
Filter elements changed		
Settings of electronics checked		
Water meter configured (code 302, par. 2 and 3)	l/h	
Operating hours (chapter F, 3.4)		
Run time of high-pressure pump (code 245, par. c)	h	
Run time of pressure booster pump (code 245, par. d)	h	
Permeate volume produced (code 245, par. E)	m ³	
Generated concentrate volume (code 245, par. F)	m ³	
Blended water quantity (optional) (code 245, par. G)	m ³	
Duration of flushing (code 302, par. 6)	min.	
Check all electrical lines for external damage		
All hoses and connections checked for external damage		
Inlet water and flushing water solenoid valve cleaned and checked for tightness		
Function of low pressure monitor checked		
Conductivity sensor checked/cleaned		

¹⁾ 1 $^{\circ}$ dH = 1.78 $^{\circ}$ f = 0.178 mmol/l

	Acknowledgement	Remarks
Visual check of electronics board		
System checked for tightness		
Load units reset		

Miscellaneous
<p>Remarks:</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>Start-up specialist/CS technician:</p> <p>Company:</p> <p>.....</p> <p>.....</p> <p>Work time certificate (no.):</p> <p>Date/signature</p>

**Maintenance work on reverse osmosis system GENO-OSMO RO 125K
Checklist**

Please enter measured values. Confirm checks with OK or enter repair work performed.

<input type="checkbox"/> Maintenance performed without replacement of module Module no.....	<input type="checkbox"/> Maintenance performed with replacement of module Module no.....	Start-up	Date
---	--	----------	------

Measured values

Water volumes and water qualities **before** the replacement of the module / **after** the replacement of the module or in case of maintenance

	Pump pressure [bar]	Conductivity [μ S/cm]	Total hardness [$^{\circ}$ dH] ¹⁾	Temperature [$^{\circ}$ C]	Volume flow [l/h]	Recovery [%]
	before/after	before/after	before/after	before/after	before/after	before/after
Inlet water	/	/	/	/	/% /%
Permeate	/	/	/	/	/	
Concentrate/drain	/	/	/	/	/	

	Acknowledgement	Remarks
Water meter reading upstream of the system	m ³	
Inlet water pressure (2.5-4 bar) checked		
Filter elements changed		
Settings of electronics checked		
Water meter configured (code 302, par. 2 and 3)	l/h	
Operating hours (chapter F, 3.4)		
Run time of high-pressure pump (code 245, par. c)	h	
Run time of pressure booster pump (code 245, par. d)	h	
Permeate volume produced (code 245, par. E)	m ³	
Generated concentrate volume (code 245, par. F)	m ³	
Blended water quantity (optional) (code 245, par. G)	m ³	
Duration of flushing (code 302, par. 6)	min.	
Check all electrical lines for external damage		
All hoses and connections checked for external damage		
Inlet water and flushing water solenoid valve cleaned and checked for tightness		
Function of low pressure monitor checked		
Conductivity sensor checked/cleaned		

¹⁾ 1 $^{\circ}$ dH = 1.78 $^{\circ}$ f = 0.178 mmol/l

	Acknowledgement	Remarks
Visual check of electronics board		
System checked for tightness		
Load units reset		

Miscellaneous
<p>Remarks:</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>Start-up specialist/CS technician:</p> <p>Company:</p> <p>.....</p> <p>.....</p> <p>Work time certificate (no.):</p> <p>Date/signature</p>

**Maintenance work on reverse osmosis system GENO-OSMO RO 125K
Checklist**

Please enter measured values. Confirm checks with OK or enter repair work performed.

<input type="checkbox"/> Maintenance performed without replacement of module Module no.	<input type="checkbox"/> Maintenance performed with replacement of module Module no.	Start-up	Date
--	---	----------	------

Measured values

Water volumes and water qualities **before** the replacement of the module / **after** the replacement of the module or in case of maintenance

	Pump pressure [bar]	Conductivity [μ S/cm]	Total hardness [$^{\circ}$ dH] ¹⁾	Temperature [$^{\circ}$ C]	Volume flow [l/h]	Recovery [%]
	before/after	before/after	before/after	before/after	before/after	before/after
Inlet water	/	/	/	/	/% /%
Permeate	/	/	/	/	/	
Concentrate/drain	/	/	/	/	/	

	Acknowledgement	Remarks
Water meter reading upstream of the system	m ³	
Inlet water pressure (2.5-4 bar) checked		
Filter elements changed		
Settings of electronics checked		
Water meter configured (code 302, par. 2 and 3)	l/h	
Operating hours (chapter F, 3.4)		
Run time of high-pressure pump (code 245, par. c)	h	
Run time of pressure booster pump (code 245, par. d)	h	
Permeate volume produced (code 245, par. E)	m ³	
Generated concentrate volume (code 245, par. F)	m ³	
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Duration of flushing (code 302, par. 6)	min.	
Check all electrical lines for external damage		
All hoses and connections checked for external damage		
Inlet water and flushing water solenoid valve cleaned and checked for tightness		
Function of low pressure monitor checked		
Conductivity sensor checked/cleaned		

¹⁾ 1 $^{\circ}$ dH = 1.78 $^{\circ}$ f = 0.178 mmol/l

	Acknowledgement	Remarks
Visual check of electronics board		
System checked for tightness		
Load units reset		

Miscellaneous
<p>Remarks:</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>Start-up specialist/CS technician:</p> <p>Company:</p> <p>.....</p> <p>.....</p> <p>Work time certificate (no.):</p> <p>Date/signature</p>

