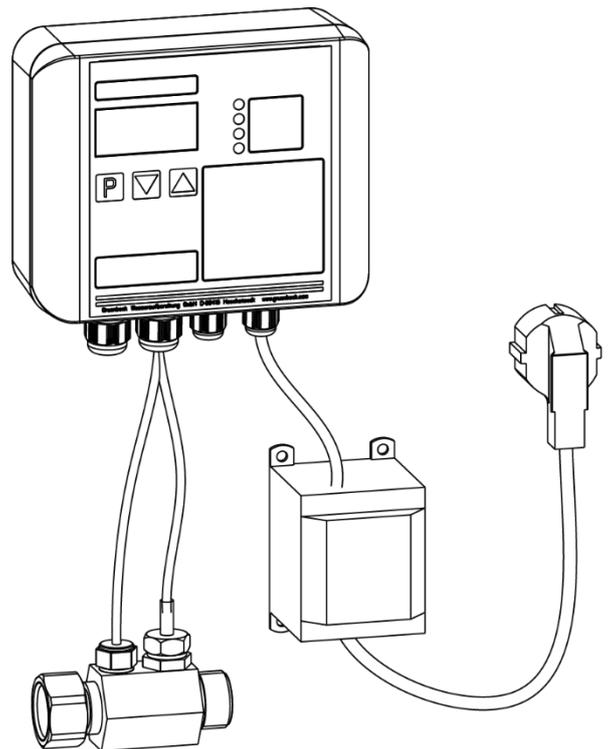


Operation manual

Conductivity measuring device

GENO-Multi-LF



Edition March 2021
Order no. 702 959-en_085

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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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EU Declaration of Conformity

This is to certify that the system designated below complies with the safety and health requirements of the applicable European Directives 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: Conductivity measuring device

System type: GENO-Multi-LF

Serial no.: Refer to type plate

Applicable directives: RoHS 2011/65/EU
Low Voltage (2014/35/EU)
EMC (2014/30/EU)

Applied harmonised standards,
in particular: DIN EN 61000-6-2:2006-03
DIN EN 61000-6-3:2011-09

Applied national standards
and technical
specifications,
in particular: DIN EN 61010-1:2011-07

Location, date and signature Hoechstädt, 11.11.2019

i. V. 
Markus 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 custom-made solutions for all kind 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. Therefore, please read the complete manual before installing, operating or maintaining your 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 Hoechstädt, are available to help you.

Advice and assistance For advice and assistance please contact your local representative (refer to www.gruenbeck.com). In case of emergency, please get in touch with our service hotline at +49 (0)9074 41-333. We can connect you with the appropriate expert more quickly if you provide the required system data. In order to have this information handy at all times, please copy the data indicated on the type designation plate to the table in chapter C-1, paragraph 1.

2 | Notes on using the operation manual

This operation manual is intended for operators of our measuring equipment. 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 are only allowed to 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 according to Section 12(2) AVBWasserV (German Ordinance on General Conditions for the Supply of Water).

3.2 Operating personnel Only persons who have read and understood this operation manual are permitted to work with the measuring device. The safety instructions in particular are to be strictly adhered to.

3.3 Intended use The measuring device may only be used for the purpose outlined in the product description (chapter C). The guidelines in this operating manual as well as the applicable local guidelines concerning the drinking water protection, accident prevention and occupational safety must be adhered to.
In addition, appropriate application also implies that the measuring device is only allowed to 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 water stop device (see chapter C, optional features) must be installed.

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 lines 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 measuring device 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 measuring device next to objects which radiate a lot of heat.

5 | Disposal

Comply with the applicable national regulations.

4.1 Packaging

Dispose of the packaging in an environmentally sound manner.

4.2 Product



If this symbol (crossed out waste bin) is on the product, European Directive 2012/19/EU applies to this product. This means that this product or the electric and electronic components are not allowed to be disposed of in the household waste.

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



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

B Basic information

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 set of rules 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 | Intended use

The conductivity measuring device GENO-Multi-LF is used to measure the conductivity of fully demineralised water. A digital display enables direct reading of the fully demineralised water quality. If the set upper limit value is exceeded, warning devices (e.g. audible signal) and switch-off devices (optional accessory solenoid valve, order no. 707 055) can be controlled.

C Product description

1 | Type plate

The type plate is located to the right on the outside of the conductivity measuring device. To speed up the processing of your enquiries or orders, please specify the data shown on the type plate of your device when contacting Grünbeck.

Order no.		702 842
Voltage supply [V~]		230/24V~
Frequency		50/60 Hz
Power input max. [VA]		25 VA
Cell constant k [1/cm]	Measuring range [μ S/cm]	
0.1/0.6		0...99.9
1.0		0...999

Fig. C-1: Type plate GENO-Multi-LF

2 | GENO-Multi-LF components

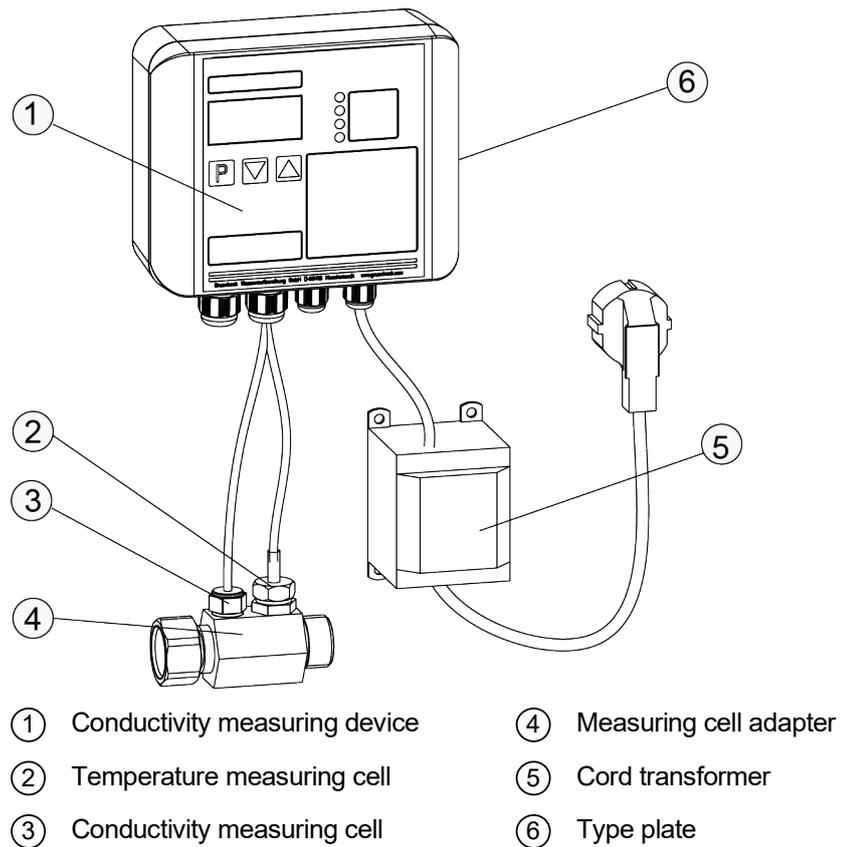


Fig. C-2: Components of the GENO-Multi-LF

3 | Functional description

3.1 Conductivity measurement The electrical conductivity is a measure of the ion concentration of a measured solution as a total parameter. The more salts or ions are dissolved in the water, the greater its conductivity. The conductivity therefore provides a statement on the salt load or the purity level of water. In industrial production processes, the conductivity measurement is used for process control purposes.

The conductivity is normally measured in the $\mu\text{S}/\text{cm}$ scale. The scale for aqueous solutions normally begins at a conductivity level of $0.05 \mu\text{S}/\text{cm}$ ($25 \text{ }^\circ\text{C}$) for the purest water. The conductivity of natural water such as drinking water or surface water is in the range from 100 - 1000 $\mu\text{S}/\text{cm}$.

4 | Technical specifications

Table C-1: Technical data		GENO-Multi-LF conductivity measuring device
Connection data		
Connection diameter		$\frac{3}{4}$ "
Voltage supply	[V]	230/24 ~ (*)
Frequency	[Hz]	50
Power input	[VA]	25
Protection/protection class		IP 54/ \square or \diamond
Dimensions and weights		
Dimensions (L x W x D) (housing)	[mm]	160 x 154 x 61
Operating weight (incl. transformer, adapter)	[kg]	1.6
System data		
Accuracy of indicated value	[%]	5
Measuring range standard measuring cell (k = 0.6 $\frac{1}{\text{cm}}$)	$[\mu\text{S}/\text{cm}]$	0.0 up to 99.9
Automatic temperature compensation		can be switched off
Connection of a solenoid valve		24 V~ / 13 VA
Output voltage-free limit value contact		230 V~ / 1 A
Ambient data		
Max. ambient temperature	$[\text{ }^\circ\text{C}]$	40
Order no.		702 842

(*) operation with protective low voltage

5 | Intended use

The conductivity measuring device GENO-Multi-LF is used in combination with mixed bed cartridges desaliQ:BA to monitor the conductivity of fully demineralised water at the pure water outlet.

The conductivity measuring device is only permitted to be operated when all components have been properly installed. Safety devices must never be removed or otherwise tampered with.

The designated application also includes the information contained in this operation manual and all safety regulations that apply at the installation site being complied with, as well as the maintenance and inspection intervals being observed.

6 | Application limits

The maximum display range of the conductivity from 0.0 to 99.9 $\mu\text{S}/\text{cm}$ limits the water quality being tested (see also table E-1).



Note: Fully demineralised water (FD water) is not drinking water.

7 | Scope of supply

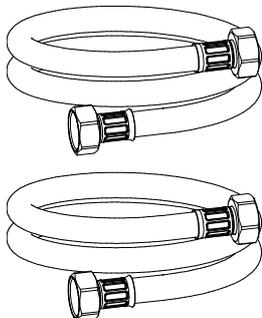
7.1 Standard equipment

- Conductivity measuring device.
- Cord transformer.
- Fastening materials for wall mounting.
- Measuring cell adapter with conductivity measuring cell and temperature measuring cell.
- Operation manual.

7.2 Optional accessories



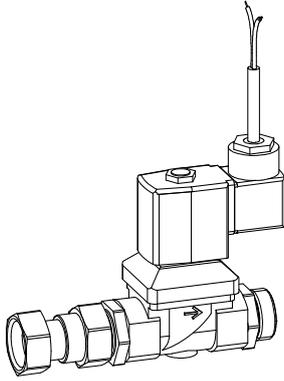
Note: It is possible to retrofit the conductivity measuring device with accessory components. Please contact your local Grünbeck representative or Grünbeck's headquarters in Hoechststadt for more information.



desaliQ hose set

707 850

Consisting of: two drinking water hoses of 1.5 m in length (DVGW W270 and KTW-A certified). The raw and pure water hose each have a hose fitting with 3/4" union nuts (nickel-plated brass).

**Solenoid valve**

The solenoid valve is only provided as an option for GENO-Multi-LF. The solenoid valve (closed in de-energised state) interrupts the pure water line when the set conductivity limit value has been exceeded.

707 055

D Installation



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

1 | General installation information

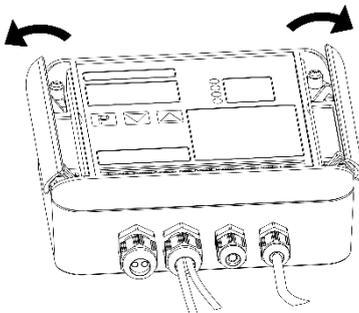


Caution! Do not install the conductivity measuring cell in the vicinity of powerful magnetic fields or cables carrying power current (measuring inaccuracy).

- Please observe the local installation guidelines and the general guidelines.
- The installation type must be accessible for maintenance work, flood and frost-proof and ensure the system's protection from chemicals, dyes, solvents and vapours.

2 | Preliminary work

2.1 Wall mounting



1. Unpack the conductivity measuring device.
2. Check for completeness and undamaged condition.
3. Mount the conductivity measuring device to the wall.

The drilling template (see appendix) is used to establish the positions of the four fixing holes for the conductivity measuring device at the required location. Use a masonry drill (6 mm) to drill the four holes approximately 40 mm deep into the wall. Insert dowels and open the two side housing covers (see Fig. D-1) on the GENO-Multi-LF. The four enclosed fastening screws can be used to screw the conductivity measuring device to the wall.

The separate power supply unit can then be attached in the immediate vicinity using suitable screws (not included in the scope of supply).

Fig. D-1: Housing lid



Note: When wall mounting the conductivity measuring device, the required location of the mixed bed cartridge desaliQ:BA should be taken into account. The maximum permitted distance between the conductivity measuring device and mixed bed cartridge desaliQ:BA is 1.6 m due to the cable length. For the voltage supply of the conductivity measuring equipment, a shock-proof socket (230 V / 50 Hz) must be fitted at an approximate distance of 1.6 m.

4. Remove both caps from the measuring cell adapter.



Note: Please do not dispose the two yellow plastic caps, and instead use as a safety device in the event of standstill times or transport.

3 | How to connect the measuring cell adapter

1. Mount the solenoid valve on the clean water connection.
2. Mount the measuring cell adapter on the clean water connection.
3. Mount/set up water treatment products (e.g. mixed-bed cartridge desaliQ:BA).
4. Connect hoses.



Note: Together with the solenoid valve accessory (order no. 707 055), the following convenient configuration can be attached to a filling section thermaliQ:FB13i (see Fig. D-2).

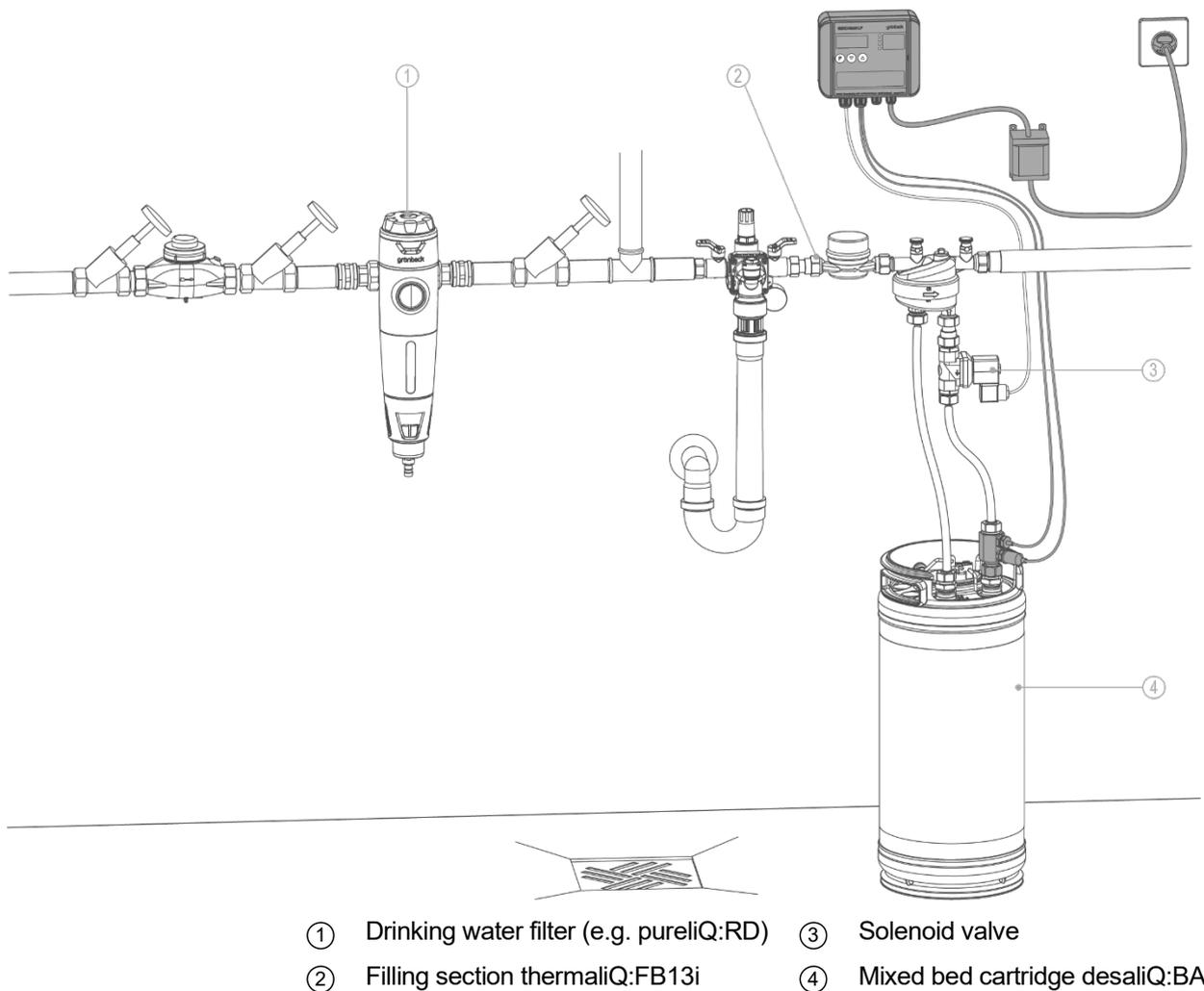


Fig. D-2: Installation example conductivity measuring device GENO-Multi-LF

4 | Electrical connection



Caution! Before opening the housing, unplug the cord transformer!

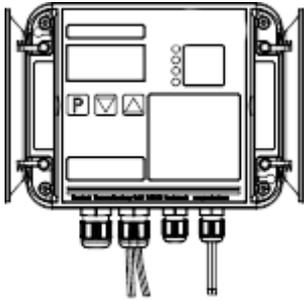


Fig. D-3: Covers

After opening the left and right covers (Fig. D-1), the four lid fixing screws can be opened and the housing lid (Fig. D-4) folded downwards.

The conductivity measuring cell and the temperature sensor are pre-connected at the factory and for that reason are not permitted to be changed.



Caution! The socket for the transformer mains cable must be easily accessible, so that unplugging is not made more difficult!

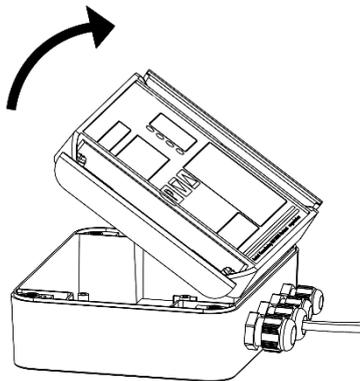


Fig. D-4: Housing lid

To connect the alarm contact or the solenoid valve (option order no. 702 840), actuate the corresponding terminal opening using a flat-head screwdriver with a max. 3 mm blade.

4.1 Wiring diagram

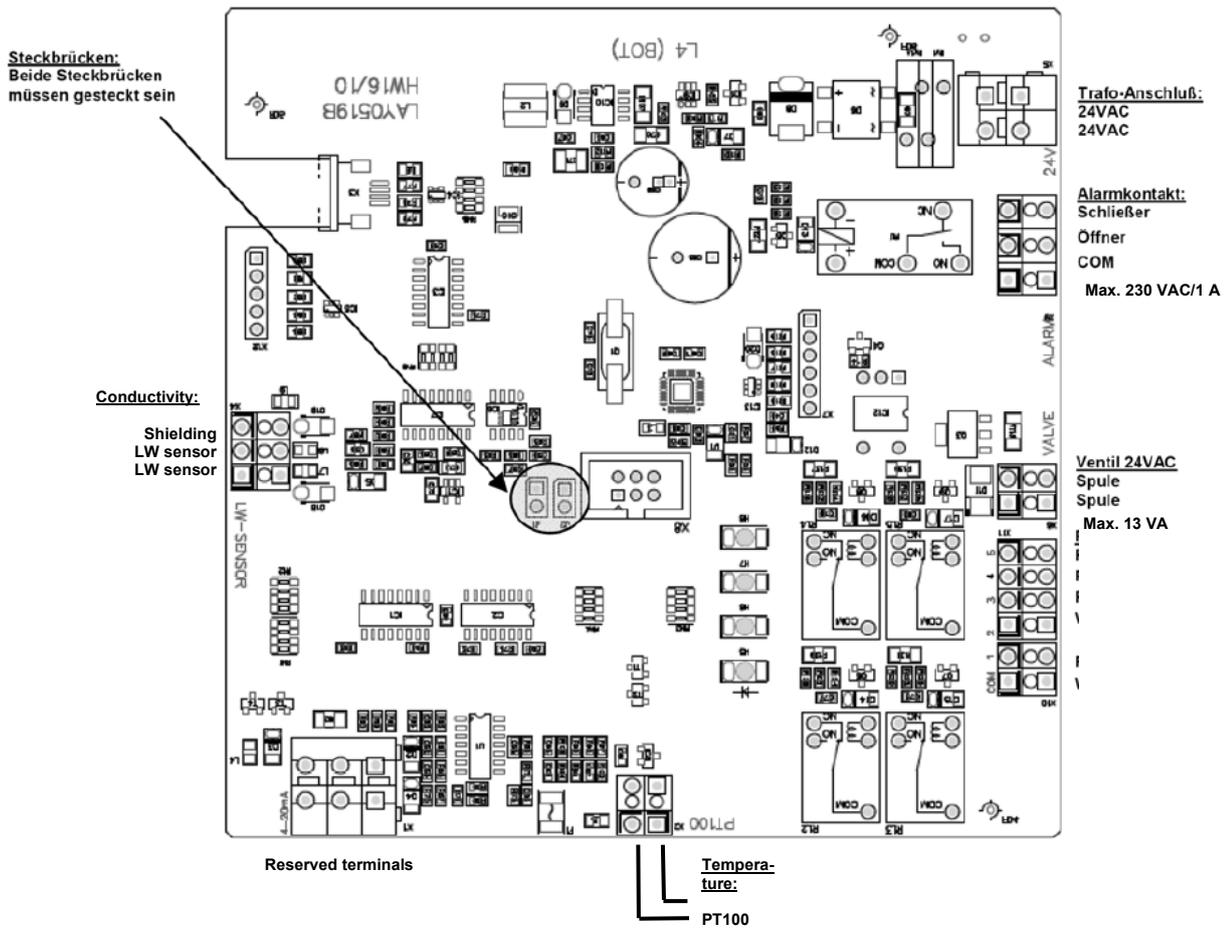


Fig. D-5: Position of the connecting terminals on the circuit board

E Operation

1 | Introduction



Warning! Incorrect operation and settings may lead to hazardous operating states which cause injury, illness or damage to property.

Only make the settings described in this chapter.



All other work at the control unit, in particular modifications to the records, may only be performed by Grünbeck's customer service/authorised service company.

2 | Key functions



Fig. E-1: Front foil

Key	Display of parameters
	<p>In standard mode:</p> <ul style="list-style-type: none"> • Switches to the limit value programming level (press for > 2 sec.). • Acknowledges malfunctions. <p>On the limit value programming level:</p> <ul style="list-style-type: none"> • Opens a limit value to change it (numeric display flashing). <p>Saves and closes the limit value (numeric display stops flashing).</p>
	<p>On code levels 290 and 245:</p> <ul style="list-style-type: none"> • Returns to the previous parameter. • Reduces the numerical values while the numerical display is flashing.
	<p>In standard mode:</p> <p>Calls up the Info level and switches to the next Info value.</p> <p>On code levels 290 and 245:</p> <ul style="list-style-type: none"> • Switches to the next parameter. • Increases the numerical values while the numerical display is flashing.
	<ul style="list-style-type: none"> • Closes open parameters without saving them (numerical display stops flashing) and the previously set value is maintained. • Exits the limit value programming level or the code level.

Key	Calls up info level from the basic display Actual conductivity value, LED "µS/cm" is lit
	Press once: Limit value is displayed, "Max. µS/cm" LED is lit.
	Press twice: Water temperature is displayed, "°C" LED is lit.
	Press three times: Basic display actual conductivity value "µS/cm" LED is lit.

Key	Confirm a disturbance, "ALARM" LED is lit
	Only acknowledge the error once the cause has been removed.

3 | Operating performance

After plugging in the cord transformer, all digits and LEDs are switched on temporarily. The device then switches to standard mode: The potential-free limit value contact closes and the optional solenoid valve (order no. 707 055) opens. On the basic display, the measured actual conductivity value is displayed in $\mu\text{S}/\text{cm}$.

If the set limit value is exceeded, the GENO-Multi-LF issues a visual warning via an alarm LED. The solenoid valve is deenergised and therefore closes the water feed. The integrated potential-free limit value contact opens.

After acknowledging the limit value exceedance, the solenoid valve opens again, the ALARM LED goes out and the potential-free limit value contact closes again.

Table E-1: Limit value setting, measuring range

		0.6 (standard)	0.1	1.0
Conductivity measuring cell constant k	[1/cm]			
Limit value setting range	[$\mu\text{S}/\text{cm}$]	1 ... 99.9		1 ... 999
Limit value factory setting	[$\mu\text{S}/\text{cm}$]	10.0		
Measuring range	[$\mu\text{S}/\text{cm}$]	0 ... 99.9		0 ... 999

If the actual conductivity exceeds the measuring range of the GENO-Multi-LF, the display E.EE appears on the display – the alarm LED is lit, the solenoid valve is deenergised and the potential-free contact opens.

4 | Deviating configuration, recalibration: (Code 290)

For configurations deviating from the standard (cell constant, temperature sensor), as well as a recalibration of the conductivity measurement, please contact Grünbeck's technical service/authorised service company (www.gruenbeck.com).



The parameters described below are only permitted to be modified by authorised experts as incorrect values can result in property damage or malfunctions.

Index	Parameters	Unit	Factory setting	Setting range	Remark
1	Conductivity reference data (recalibration)	µS/cm	1	0.1 ... 99.9	The measured value of a reference measuring device is programmed. The measuring cell must be located in the medium!
2	Cell constant	1/cm	0.6	0.1/0.6/1.0	The standard measuring cell for the mixed bed cartridges desaliQ:BA has a cell constant 0.6 1/cm and is not permitted to be changed!
3	Temperature compensation of the conductivity measurement (depending on the measuring cell)		1	0 ... 1	0 = conductivity without temperature compensation. 1 = conductivity with temperature compensation.
4	Reference temperature (only with activated temperature compensation)	°C	25	10 ... 30	The current conductivity is converted to the set reference temperature. Only possible if a temperature sensor is present.
5	Alarm delay time	[min.]	5	1 ... 99	Delay time for closing the solenoid valve and opening the alarm contact. The response only occurs when the set limit value is continuously exceeded for longer than the programmed time.

5 | Measured value graph: Code 245 (display only)

For control purposes, the max and min values for conductivity and temperature from the last 7 days are stored in this memory.

Index	Parameters	Unit	Remark
1	1. ---	μS/cm	Min. conductivity yesterday
	1. ---	μS/cm	Max. conductivity yesterday
	1. ---	°C	Min. temperature yesterday
	1. ---	°C	Max. temperature yesterday
2	2. ---	μS/cm	Min. conductivity day before yesterday
	2. ---	μS/cm	Max. conductivity day before yesterday
	2. ---	°C	Min. temperature day before yesterday
	2. ---	°C	Max. temperature day before yesterday
3	...		
4	...		
5	...		
6	...		
7	...		
8	8. ---	μS/cm	Min. conductivities 7 days ago
	8. ---	μS/cm	Max. conductivity 7 days ago
	8. ---	°C	Min. temperature 7 days ago
	8. ---	°C	Max. temperature 7 days ago

F Troubleshooting

Even carefully designed and manufactured technical systems that are operated properly may experience malfunctions. Table F-1 provides an overview of the possible errors when operating the device, their causes and fault rectification.



Note: Grünbeck's technical customer service/authorised service company must always be notified in the event of malfunctions that cannot be eliminated with the information given in table F-1!

Table F-1: Troubleshooting

This is what you observe	This is the cause	This is what to do
No flow.	Maximum conductivity limit value exceeded, solenoid valve blocked.	Regeneration of the mixed bed cartridge desaliQ:BA or set a higher limit value.
	Solenoid valve incorrectly connected or not electrically connected.	Check electrical solenoid valve connection.
	Cable break between conductivity measuring device and solenoid valve.	Replace cable between conductivity measuring device and solenoid valve.
Very low flow.	Hoseline kinked.	Reinstall hoseline.
	Hoseline blocked.	Disconnect the hoses from the conductivity measuring equipment and rinse thoroughly.
	High iron content in the inlet water.	Notify Grünbeck's technical customer service/authorised service company.
Display not functioning.	Power supply unit not plugged in.	Plug in power supply unit
	Circuit board in housing defective.	Notify Grünbeck's technical customer service/authorised service company.
Operating keys not functioning.	Circuit board in housing defective.	Notify Grünbeck's technical customer service/authorised service company.
Display E.EE, $\mu\text{S}/\text{cm}$ or E.EE °C.	Conductivity or temperature has exceeded the measuring range.	Disconnect the power supply unit and replace mixed bed cartridge desaliQ:BA
Display EE.E	Conductivity measuring cell is defective	Conductivity measuring cell must be replaced

G Maintenance and care

1 | Basic information

To guarantee the reliable function of the conductivity measuring equipment over the long term, some maintenance work must be performed at regular intervals. All regulations and guidelines which apply at the installation site must be strictly adhered to.

DIN EN 806-5A1 stipulates:

- An inspection must be performed at least every 2 months.
- Maintenance must be carried out twice a year.
- Maintenance must be performed by the Grünbeck's technical service/authorised service company or by an approved company. The regeneration of mixed-bed resin is subject to the load.

2 | Inspection (functional check)

You can perform the inspection in-house.

Please refer to the following overview for the tasks to be performed as part of an inspection.

3 | Maintenance



According to DIN EN 806-5A1, maintenance work on the conductivity measuring device is only permitted to be performed by Grünbeck's technical service/authorised service company or an approved company.

Overview: Maintenance work

- Check all installed components for tightness.
- Check the function of the GENO-Multi-LF via reference measurement, e.g. combined measuring device for pH and conductivity (order no. 170000010000).
- In the event of conductivity deviation between the reference measurement and GENO-Multi-LF, have the conductivity measuring cell calibrated by Grünbeck's technical service/authorised service company.

4 | Cleaning the GENO-Multi-LF

The housing of the GENO-Multi-LF is only permitted to be carefully cleaned with a damp cloth.



Note: Do not use any abrasive cleaning agents as these could damage the control foil.

Drilling template

