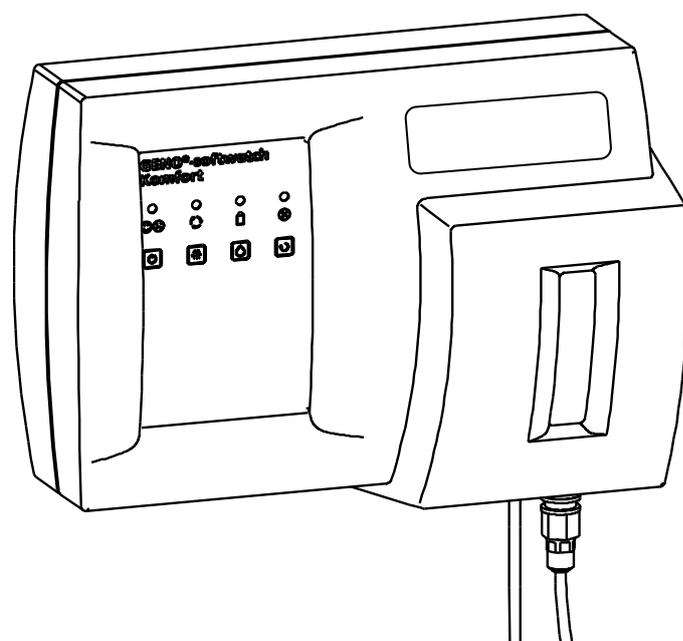


Operation manual

Automatic water analysis system

GENO-softwatch Komfort

starting from serial no. 40342



Edition January 2022
Order no. 172 955-inter_175

Grünbeck Wasseraufbereitung GmbH

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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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EC 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 invalid 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: Automatic water analysis system

System type: GENO-softwatch Komfort

Serial no.: Refer to type designation plate

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

Applied harmonised standards,
in particular: DIN EN 60335-1:2012-10

Applied national standards
and technical specifications,
in particular: DIN-EN 60335-2-89:2018-12

Place, date and signature: Hoechstädt, 09.12.2019

i. V. 
Markus Pöpperl
Dipl. Ing. (FH)

Function of signatory: Head of Technical Product Design

A General information

1 | Preface

Thank you for opting for a Grünbeck product. Backed by decades of experience in the area of water treatment, we provide solutions for all 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 supply. 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 trouble-free operation over many years, provided you treat your water treatment system with the required care. These operating instructions assist you with important information. Therefore, please read the entire operation manual before installing, operating or maintaining the system.

Customer satisfaction is our prime objective, and providing customers with qualified advice is crucial. If you have any questions concerning this system, possible extensions or general water and waste water treatment, our field service 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.de). You can also get in touch with our service centre, which can be reached during business hours:

Phone: +49 9074 41-333

Fax: +49 9074 41-120

Email: service@gruenbeck.de

We can connect you with the appropriate expert more quickly if you provide the required system data. In order to have the required data handy at all times, please copy it from the type designation plate to the overview in Chapter C-1.

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. Check for the corresponding chapter on page 1 in order to find the specific information you need.

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 characterised 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, extreme damage to property or inadmissible contamination of 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 may result in damage to the system or other objects.



Note: This symbol emphasises 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 an installation directory of a water supplier as per §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 guidelines in this operation manual as well as the applicable local guidelines concerning drinking water protection, accident prevention and occupational safety must be observed.

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 against water damage:

- a) A sufficiently dimensioned floor drain system must be available or
- b) A water stop device must be installed.



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

3.5 Indication of specific dangers

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

Danger due to mechanical energy! System components may be subject to overpressure. Danger of injury and damage to property due to escaping water and the 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 shall be installed only by a specialist company. Strictly observe the operation manual! Ensure that there is sufficient flow; the relevant guidelines must be followed for commissioning after extended periods of standstill. Inspections and maintenance must be performed at the intervals specified!



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

4 | Shipping and storage



Caution! The system may 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.

The system may only be transported and stored in its original packing. Ensure that it is handled with care and placed the right side up (as indicated on the packaging).

5 | Disposal

Strictly observe the applicable national laws and regulations.

5. Packaging

Dispose of the packaging in an environmentally friendly manner.

5.1 Product



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



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



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

B Basic information

1 | Laws, 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 guidelines 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 specialist companies are permitted to make major modifications to water supply systems
- and that tests, inspections and maintenance on installed devices are to be performed at regular intervals.

2 | Field of application

The GENO-softwatch Komfort is designed for the automatic monitoring of the total resp. residual hardness in the water.

The parameters to be measured as well as the corresponding limit value are determined by the choice of the indicator and the respective programming by the user.

The automatic water analysis system GENO-softwatch Komfort is intended for industrial and commercial use only.

3 | Available indicators for GENO-softwatch Komfort

The different measuring parameters and limit values are determined by the choice of indicators. The following table (Table B-1) will give you an overview on the various possibilities.

Pressure reducer at operating pressure > 5 bar – to protect the measuring equipment from damage. Pressure reducer with suitable connections for installation in the sampling water supply line (order no. 172 860).

Table B-1: Limit value indicator (shelf life 2 years!)

Limit value/unit		Indicator SWK – 0.1	Indicator SWK – 0.3	Indicator SWK – 0.5	Indicator SWK – 10	1x 500 ml
	°dH	0.1	0.3	0.5	10	
	°f	0.178	0.534	0.89	17.8	
	ppm CaCO ₃	1.78	5.35	8.9	178	
	mol/l	0.0178	0.053	0.089	1.783	
Order no.	172 201	172 202	172 203	172 204		

3.1 Application limits

The proper functioning of the GENO-softwatch Komfort may only be ensured if genuine indicators are used!

If the system is used to monitor the residual resp. total hardness, high amounts of heavy metal ions in the softened water may affect the colour reaction.

pH	4 – 10.5
Iron	< 3 mg/l
Copper	< 0.2 mg/l
Aluminium	< 0.1 mg/l
Manganese	< 0.2 mg/l
Acid capacity K _{S4,3}	< 5 mmol/l

In case of a concentration of more than approx. 100 mg/l CO₂ (carbon dioxide) in the water, the free carbon dioxide should be removed.



Caution! Chlorine in the measuring water leads to reactions with the indicator – which results in incorrect measurements.

C Product description

1 | Type designation plate

The type designation plate is located to the right on the outside of the automatic water analysis system. In order to speed up the processing of your inquiries or orders, please specify the data shown on the type designation plate of your system when contacting Grünbeck. Please copy the indicated information to the table below in order to have it handy whenever necessary.

Automatic water analysis system GENO-softwatch Komfort

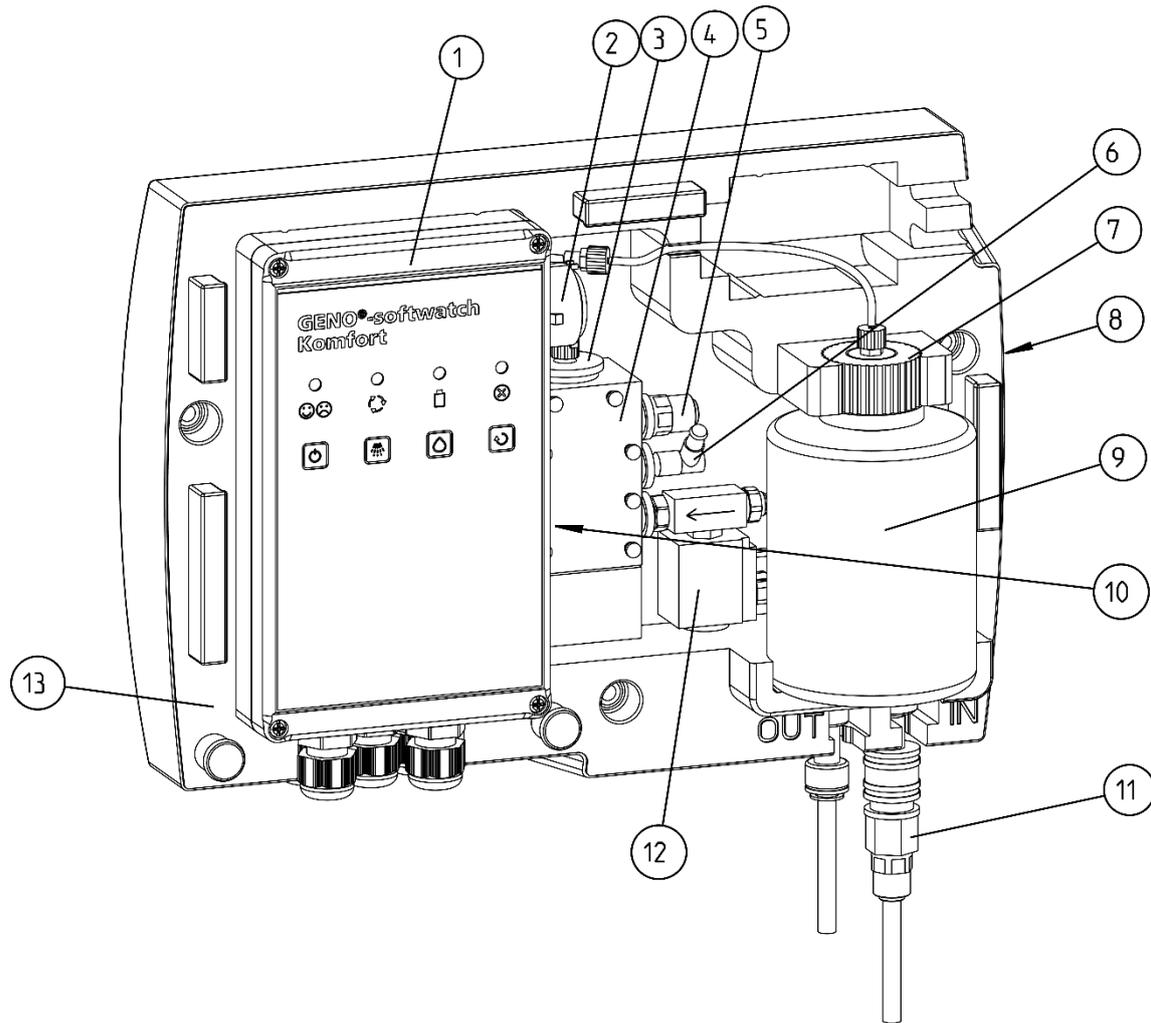
Serial no.: /

Order no.:

GENO-softwatch Komfort		grünbeck	
Nom. connection diameter inlet/outlet	6/8 mm	Ambient temperature	5-45 °C
Operating pressure	0.5/5.0 bar	Water temperature	5-40 °C
Power supply	85-264 V AC/47-63 Hz	Serial no.	
Order no.	172500.		
Observe the operation manual!		  	
Grünbeck Wasseraufbereitung GmbH Josef-Grünbeck-Str. 1 89420 Hoechstädt www.gruenbeck.com			

Fig. C-1: Type designation plate GENO-softwatch Komfort

2 | Components



- | | |
|--|---|
| ① Control electronics | ⑧ Type designation plate |
| ② Hose pump | ⑨ Suction hose for indicator |
| ③ Dosing plug | ⑩ Mains switch |
| ④ Measuring chamber with steering device | ⑪ Connection coupling with non-return valve |
| ⑤ Outlet plug | ⑫ Inlet solenoid valve |
| ⑥ Light source | ⑬ EPP system housing |
| ⑦ Screw cap for indicator bottle | |

Fig. C-2: Components

3 | Technical specifications

Table C-1: Technical specifications		Automatic water analysis system GENO-softwatch Komfort
Connection data		
Nominal connection diameter inlet/outlet	[mm]	6/8
Operating pressure	[bar]	0.5-5 (1-2 recommended)
Required drain connection	[DN]	50
Power supply	[V]/[Hz]	85 – 264 V AC / 47 – 63 Hz all-phase power switched off
Max. power input	[VA]	25
Protection/protection class		IP 54/⊕
Dimensions and weights		
Dimensions approx. (w x h x d)	[mm]	350 x 250 x 140
Approx. weight	[kg]	2
Consumption data		
Indicator consumption	[ml]	< 0.10/analysis
Range indicator bottle 500 ml		> 4000 analyses
Water consumption, approx.	[ml]	1000
Ambient data		
Humidity		20 – 90 % (RH non-condensing)
Ambient temperature	[°C]	5 – 45
Water temperature, min./max.	[°C]	5/40
Order no.		172 500

4 | Functional Description

The GENO-softwatch Komfort is installed in a branch line of the soft water pipe.

The main components of the automatic water analysis system are the photometric measuring chamber with receptacle and non-wearing stirring device, the dosing unit for the indicator and the control electronics.

Following the flushing of the feed line and the measuring chamber, the fully automatic titration takes place. The indicator is added by means of a dosing pump. After a settling period, the photometric evaluation of the water sample is carried out. Depending on the colour change, the water sample is either above or below the limit value (green = good measurement; red = bad measurement) and depending on the colour, a visual alarm signal will be released. A voltage-free output to connect an acoustic alarm on site is provided.

4.1 Function of GENO-softwatch Komfort

Triggering conditions for an analysis start



T1

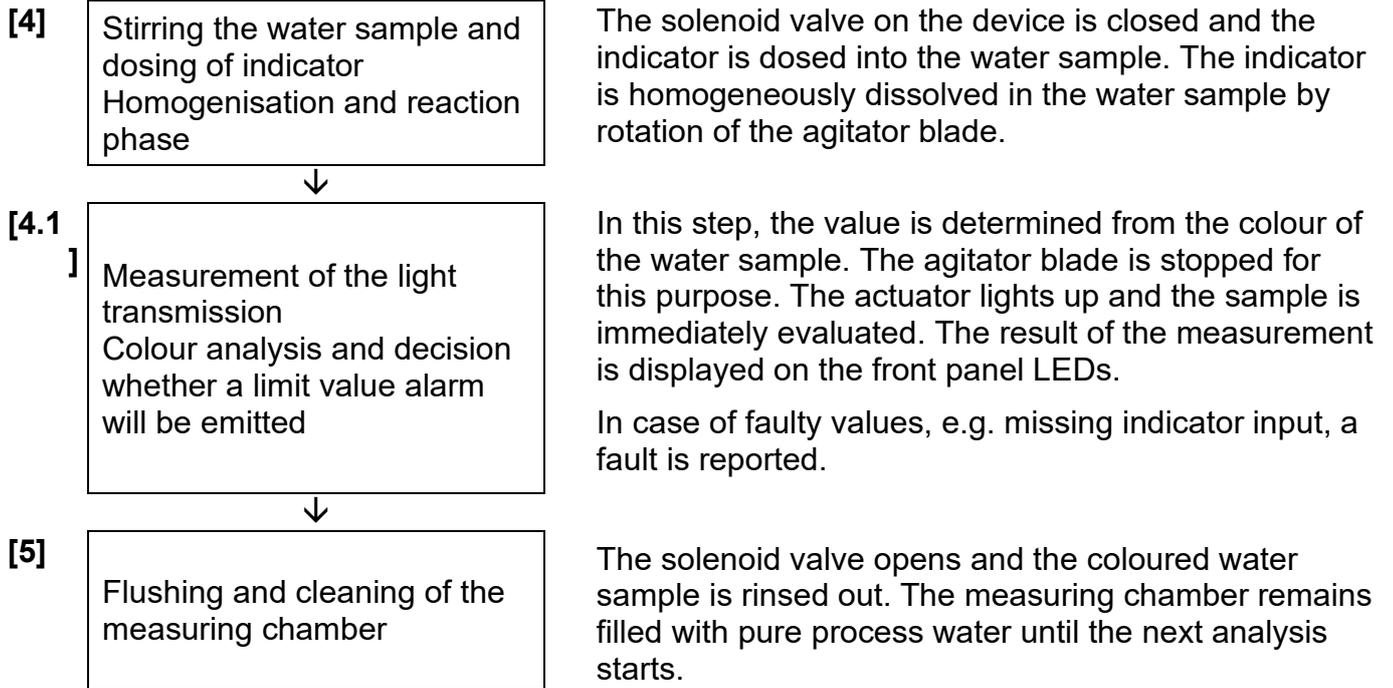
- Automatically via the set time interval
- Manual analysis by pressing key T1
- 3 minutes after turning on the device
- 4 minutes after a limit value is exceeded with the first value suppression activated
- Switching on a connected flow controller after system standstill
- By means of a connected external control unit



Note: An analysis takes 3 minutes plus the set flushing time.

One measuring cycle comprises 5 steps

- | | | |
|-----|--|---|
| [1] | Delay time for the analysis to start, if delay time is > 0, adjustable delay time:
1 – 30 minutes.
Start of the interval period of 5/10/20 or 30 minutes | When monitoring hot water, the sample must be cooled to below 40 °C (< 104 °F). A cooling water valve can be opened via relay REL 3. Only after the sample has reliably been cooled down after an analysis delay time to be set, the inlet solenoid valve will open and the analysis will start. |
| | ↓ | |
| [2] | Flushing and cleaning of the measuring chamber with sample water
Adjustable flushing time:
5 seconds – 30 minutes | The inlet solenoid valve opens. The measuring chamber and the feed line will be flushed until it can safely be assumed that there is water from the process to be monitored in the measuring chamber. The flushing time can be adapted to the length of the supply line. |
| | ↓ | |
| [3] | Filling the measuring chamber with sample water for zero calibration:
Measuring without adding any indicator | Prior to the proper measurement, a zero sample has to be taken at all times. The zero sample is used to determine influencing disturbance variables such as sample turbidity, contamination of the lens or extraneous light influences and to take them into account for the evaluation of the water sample. The actuator LED lights up. The solenoid valve is open during the zero sample. |
| | ↓ | |



4.2 Functions

The GENO-software Komfort has the following characteristics:

1. Automatic detection of hardness breaking through, depending on the indicator used.
The analysis process is fully automatic, more effective than manual methods and more sustainable than other measuring procedures which only work indirectly.
2. There is no need for system calibration.
3. The interval period between two measurements can be adjusted in 4 steps: 5/10/20/30 minutes. The analysis may also be started by means of an external switch.
4. Reliable detection of hardness breaking through by means of limit value indicators.
5. High precision monitoring of the limit value:
After a BAD measurement, a reference measurement can be carried out after 4 minutes to evaluate the result.
6. The LED indicating the status is independent of the country-specific languages.
7. Alarm functions:
If the limit value is exceeded, an alarm is released as the voltage-free relay REL 1 switches. This alarm output can be wired to a switch room for signalling purposes or used to operate a horn, to close a valve or to trigger a program for the regeneration of a water softener.

8. Low maintenance
The measuring chamber must be cleaned subject to the set measuring interval resp. the frequency of the measurements. The hoses for the indicator and the sealing rings should be replaced once or twice a year depending on the usage of the system (refer to chapter H-2).
9. Low indicator consumption
The indicator bottle can easily be replaced. A 500 ml bottle typically must be replaced every three to four months.



Note: Depending on the analysis intervals, a more frequent replacement might become necessary.

10. Compact design, easy installation and start-up
The system simply has to be hung on a wall or a support structure. Installation and start-up are easy to do.
11. Digital input IN
At this input, the voltage-free switch of a flow controller, a timer or any other state switch can be connected. If the contact is open, no analyses are performed in the programmed interval.

As an alternative, this input may also be used as a start input for analyses.

There are three voltage-free relay outputs REL 1/REL 2/REL 3.

The voltage-free relay outputs can be used to transmit a limit value alarm (REL 1), a system malfunction (REL 2) or an analysis in progress (REL 3) as a status to a switch room (refer to chapter D-2.2). Alternatively, signalling devices or solenoid valves may be switched.

BOB operation

The abbreviation BOB stands for "operation without constant supervision" such as indicated in the special rules and standards of the TÜV for steam boiler houses. The standards request that the measuring device must at least have a sufficient indicator supply to last the next 72 hours and thus be ready for operation.

The relay output REL 2 may be used to transmit an alarm, for example to a superordinate switch room, if the indicator supply is not sufficient to cover the minimum interval.

The analysis devices of the GENO-softwatch Komfort are specifically designed for BOB operation (operation without supervision). Steam boilers require a qualitative monitoring of the water quality, in particular of the concentration of the water hardness in the boiler feed water, as per the technical guidelines for steam boiler systems TRD 604 ("Technical Regulations for Steam Boilers", published by the TÜV).

The analysis devices of the GENO-softwatch Komfort register the indicator consumption in order to make sure that during the times of unsupervised operation, a sufficient amount of indicator is available for reliable analysis operations.

Whether the indicator supply is sufficient for the next 72 hours of operation is calculated subject to the set analysis interval.

If the next 72 hours of operation without constant supervision can no longer reliably be guaranteed, the alarm "lack of indicator" will be released at the relay output REL 2.



Warning! The indicator supply can only be calculated correctly if - after the replacement of a new 500 ml indicator bottle - the internal counter is reset by means of the key combination for RESET.



+



→new indicator bottle



Note: The system does not recognize the content of the bottle. By means of a RESET, an internal counter in the hose dosing pump is reset and then starts counting backwards from 500 ml again. The counter may only be reset to ZERO. If the key combination is pressed during operation without prior replacement of a new, full bottle, the indicator supply cannot be calculated correctly and the alarm will not be emitted or be emitted at the wrong time. The same also applies if the RESET was omitted.

5 | Scope of supply

Fully automatic water analysis system GENO-softwatch Komfort with shapely, functional housing, consisting of:

- Housing
- Control electronics with LED display and operating keys
- Integrated automatic flushing
- Photometric measuring chamber with non-wearing stirring device
- Dosing unit for indicator
- Connection technology
- Operation manual

6 | Consumables

In order to ensure the reliable operation of the GENO-softwatch Komfort, only genuine consumables may be used.

Table C-2: Limit value indicator (shelf life 2 years!)

Limit value/unit		Indicator SWK – 0.1	Indicator SWK – 0.3	Indicator SWK – 0.5	Indicator SWK – 10	1x 500 ml
	°dH	0.1	0.3	0.5	10	
	°f	0.178	0.534	0.89	17.8	
	ppm CaCO ₃	1.78	5.35	8.9	178	
	mol/l	0.0178	0.053	0.089	1.783	
Order no.	172 201	172 202	172 203	172 204		

7 | Spare parts

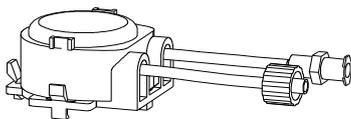
You may order spare parts and consumables from your local Grünbeck representative (refer to www.gruenbeck.de).

8 | Wearing parts

Seals and pumps are subject to a certain wear and tear. Wearing parts are listed below.



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



Hose pump without motor for GENO-softwatch.
Order no. 172 575e

D Installation

1 | General safety information

Please observe the respective country-specific regulations and directives (e.g. DIN, VDE, UVV) when installing and operating the system.

1.1 Preliminary work

1. Unpack all system components.
2. Check for completeness and soundness.



The installation and start-up of the system may only be performed by Grünbeck's technical service/authorised service company or by persons expressly authorised by Grünbeck.

2 | Installation/mounting

- Please make sure that sufficient space to open the system is available. This will also make the electrical installation easier and facilitate future system maintenance and care.

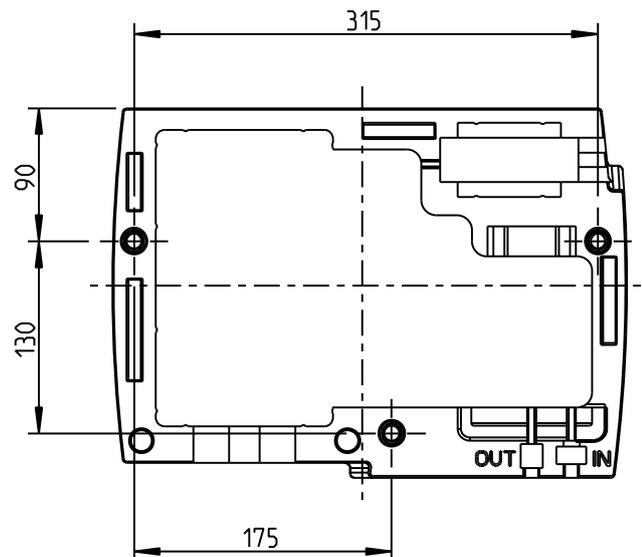


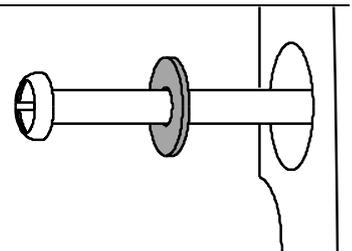
Fig. D-1: Bore diagram



Note: A drilling template is attached to facilitate the installation.



Note: To avoid damage to the housing, the washer must be installed!



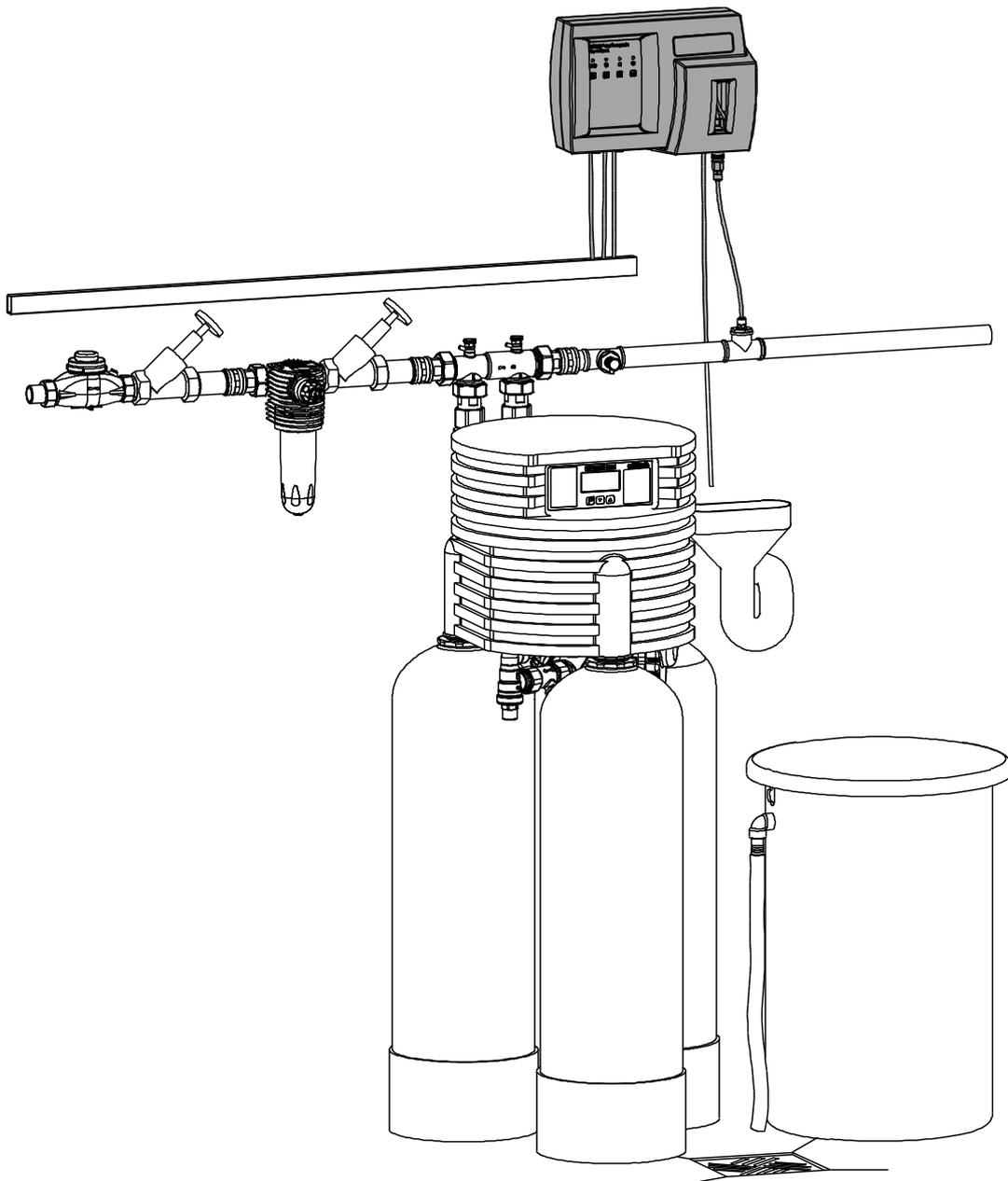


Fig. D-2: Installation drawing of GENO-softwatch Komfort

2.1 Electrical connection

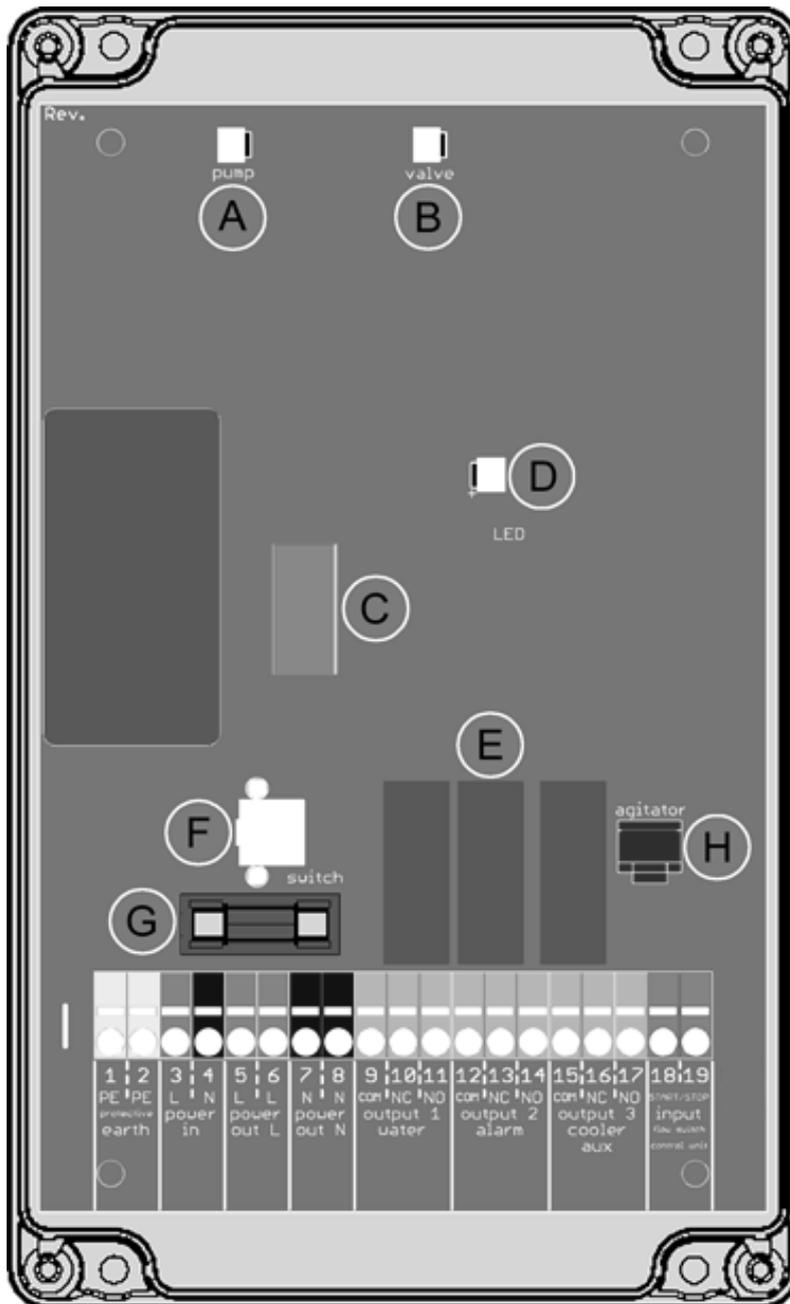


Caution! Disconnect the power plug prior to opening the control unit.



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

2.2 Terminal diagram and internal connections

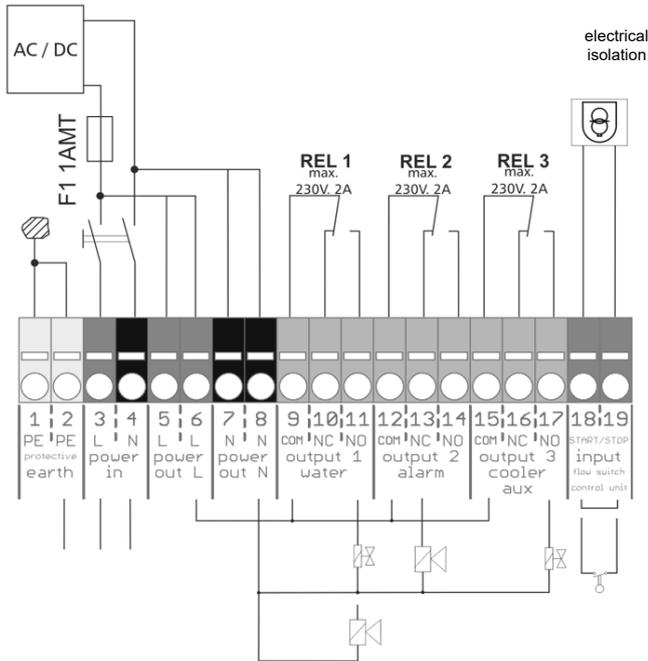


Pos.	Connections
A	Connection of dosing pump
B	Connection of solenoid valve
C	Connection of display
D	Connection of actuator LED
E	3 x relays (230 V, 2 A)
F	Connection of mains switch
G	Fuse (1 A slow blow)
H	Connection of agitator blade drive

Terminal	Assignment
1	PE protective grounding conductor
2	PE protective grounding conductor
3	Mains input L
4	Mains input N
5	Mains output L
6	Mains output L
7	Mains output N
8	Mains output N
9	Relay REL 1 – COM
10	Relay REL 1 – NC
11	Relay REL 1 – NO
12	Relay REL 2 – COM
13	Relay REL 2 – NC
14	Relay REL 2 – NO
15	Relay REL 3 – COM
16	Relay REL 3 – NC
17	Relay REL 3 – NO
18	Input contact (input)
19	Input contact (input)

Fig. D-3: Terminal diagram of GENO-softwatch Komfort

2.3 Wiring diagram



Drawn position for REL 1, REL 2 and REL 3:

Device de-energized – dropped out

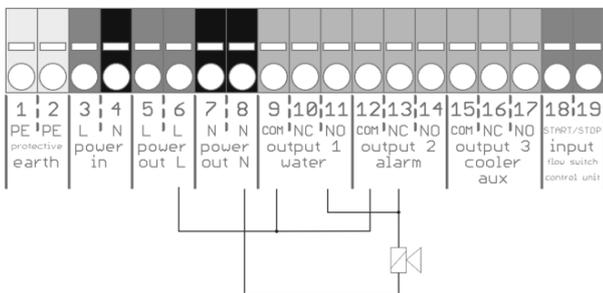
Attention

- REL 1 is picked up when limit value is exceeded
- REL 2 is dropped out in case of device fault
- REL 3 is picked up during analysis

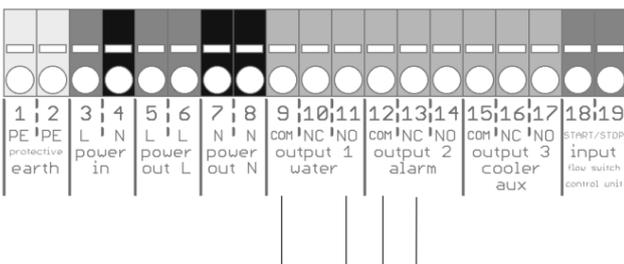
Analysis start with closed input contact (input) and program switch S10 = ON

With closed input contact and program switch S10 = OFF

- Analyses in set interval time



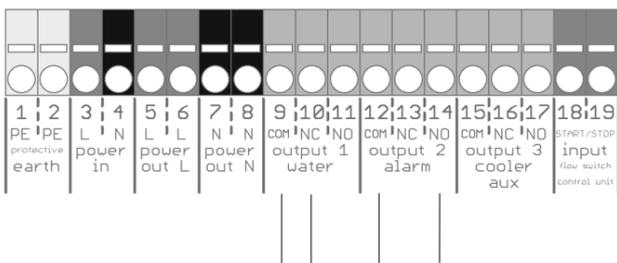
- Parallel connection REL 1 and REL 2
- Connection of a horn



Connection of voltage-free contacts for control room or programming system

Contacts close on:

- Limit value overshoot
- System malfunction



Connection of voltage-free contacts for control room or programming system

Contacts open on:

- Limit value overshoot
- System malfunction

Fig. D-4: Wiring diagram of GENO-software Komfort

2.4 Water connection

The connection must be established directly downstream of the water treatment system. Keep the feed line to the GENO-softwatch Komfort as short as possible and do not exceed a maximum length of 5 metres, if possible. It is essential that the line is directed straight up to the water pipe in order to make sure that no dirt particles from the water pipe are carried along to the system.

Hydraulic connection

1. Install T-piece provided by others on site (vertical installation position below the inlet of the GENO-softwatch Komfort).
2. Mount the on-site adapter to reduce the thread to 1/4" (female thread) at the T-piece.
3. Screw a straight screw-in connector 1/4" - 6 mm into the T-piece.



Note: The max. screw-in torque for plastic fittings is 1.5 Nm.

4. Plug on the quick coupling with non-return valve at the nipple "IN" of the device inlet.
5. Plug in the 6 mm feed hose, cut it to length and insert it in the second threaded connector.

Waste water connection

6. Insert the 8 mm waste water hose at the system connection "OUT" and cut to length.



Caution! The drain connection must be made according to EN 1717.

E Start-up



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

1 | Start-up



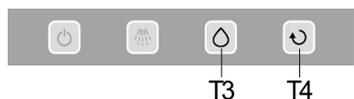
Note: Make sure that the analysis system has been installed in accordance with chapter D and that the programme switches have been programmed according to the respective requirements, refer to chapter F-4.



Step 1:

Switch on the system

- Switch on mains switch
- The green LED (L-1) is flashing



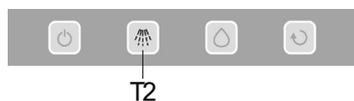
Step 2:

Reset the filling volume of the indicator

- Simultaneously press keys (T3 and T4)



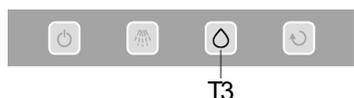
Note: Reset filling volume only, if a full bottle was inserted (refer to chapter F-2).



Step 3:

Filling the measuring chamber with water

- Press key (T2) until the measuring chamber is filled up and the sample is free of air bubbles



Step 4:

Deaerate the dosing pump

- Press key (T3) until indicator continuously flows into the measuring chamber



Note: During this time the agitator blade is turning in the measuring chamber



Step 5:

Start the analysis

- Press key (T1) to start the first analysis



Note: An analysis starts with the flushing of the measuring chamber

F Operation

1 | Safety information

In case of system malfunctions, immediately switch off the device. Shut off the water supply and notify the service personnel.

Do not try to repair the system yourself (loss of warranty) but notify the authorised service personnel. This is the only way to ensure the reliable and safe operation of the system.

Upon the activation of a safety device remedy the cause of the failure first (e.g. replace a defective valve), prior to reactivating the device (safety fuse). Frequent activation of a safety device usually is caused by a defect which may also damage the system.



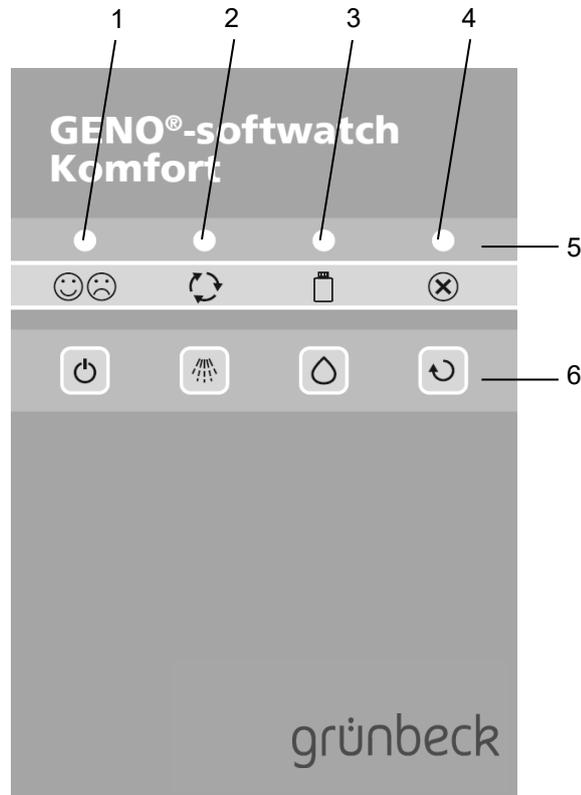
Caution! Please observe the safety instructions regarding the handling of reagents, chemicals and cleaning agents!



Caution! Non-observance of above information may damage the system and cause the loss of warranty.

2 | Operation of the device

LED display and operating buttons



The LED display shows the operating state: from left to right, the LEDs with the respective colour show the following information:

Pos.	LED	Colour	Information
1	1	Green	Below limit value
	1	Red	Limit exceeded
2	2	Yellow	Analysis in progress
	2	Flashing yellow	Input contact open, e.g. by flow controller
3	3	Blue	Provide indicator
	3	Flashing blue	BOB signal
4	4	Red	System malfunction
5			LED display
6			Operating keys

Fig. F-1: Display and operating foil

2.1 Analysis start – key T1



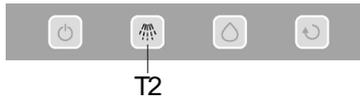
Manually start an analysis.

When an analysis sequence has been started, you may switch to the next program step by pressing the start key.



Note: If an analysis is started manually, the possibly activated relays REL 1 and REL 2 are deleted as well.

2.2 Flushing and filling of the measuring chamber – key T2



Outside of an analysis sequence, the measuring chamber and the feed line to the measuring chamber can be flushed.

2.3 Deaerating dosing pump – key T3



Outside of an analysis sequence, the indicator pump can be switched on to deaerate the hose line during start-up, for example.



Note: The stirring device is running together with the indicator pump.

2.4 RESET – key T4



Reset of output relay REL 1 in case the limit value is exceeded (refer to analysis result, chapter F-3).

Reset of output relay REL 2 in case of a device malfunction or the signal "lack of indicator" (refer to alarm signals, limit value exceeded chapter F-3.4).



Note: By means of these keys, an analysis in progress can be aborted → and previous alarms can be deleted.

2.5 Resetting the filling volume for the indicator – keys T3 and T4



By simultaneously pressing the keys, the measurement of the indicator volume is reset. The reset has been carried out if the LEDs lack of indicator (blue) and alarm signal (red) light up at the same time.



Note: The reset is only allowed to take place if a full 500 ml indicator bottle has been inserted.

3 | Description of the display elements

3.1 Result of analysis

This display has two different colours and indicates the analysis result.



Flashing green:

There is no analysis result as the system has been switched on.

Green:

The water quality is below the set limit value.



Red:

The limit value has been exceeded – however, relay REL 1 has not yet been activated (suppression of first value).

Flashing red:

The set limit value has been exceeded and relay REL 1 activated.

3.2 Analysis active



Yellow:

The display is illuminated permanently and thus signals that the analysis is in progress.

Flashing yellow:

The display is flashing and thus signals that the analysis interval has expired but the start of the analysis has been locked via input IN (flow controller).



Flashing yellow:

The display is flashing and thus signals that no analyses are started automatically. The system is programmed to stop the analysis if the limit value has been exceeded. At the same time, the red display for the analysis result (refer to programme switches S4 and S5 in chapter F-4.2.3) is flashing or is illuminated.

Quickly flashing yellow:

The display is flashing with a high flashing frequency and thus signals that the start of the analysis has been delayed, for example in order to cool down the sample water prior to the sampling (refer to the setting of the rotary switch for the delay time in chapter F-4.1.2).

3.3 Lack of indicator



Blue:

The display is illuminated permanently and thus indicates that the remaining indicator is less than 30 %. The remaining quantity indicator allows operation for a further 72 hours in the set analysis interval.

3.4 Alarm messages, limit value exceeded



Flashing red + flashing red

Analysis result (flashing red) + alarm signal (flashing red): The display is flashing and in combination with the flashing red display for the analysis result indicates that the set limit value has been exceeded.

→ The relay REL 1 for "limit value exceeded" is active.

Flashing red + red

Analysis result (flashing red) + alarm signal (red): The display is illuminated permanently and in combination with the flashing red display for the analysis result indicates that the set limit value has been exceeded.

→ The relay REL 1 „limit value exceeded“ has dropped out in the following cases:

- Button T4 (RESET) has been pressed
- A pulse contact has arrived at the input contact (terminal 18/19).



Red flashing + yellow flashing + red flashing

The yellow LED is flashing and thus signals that no analyses are started automatically. The system is programmed to stop the analysis if the limit value has been exceeded. At the same time, the red "Analysis result" display lights up (refer to program switches S4 and S5). → The relay REL 1 for "limit value exceeded" is active.



Red + yellow flashing

The limit value has been exceeded - however, relay REL 1 has not yet picked up (suppression of first value) takes place in 4 minutes.



Flashing blue + flashing red

Lack of indicator (blue flashing) + alarm signal (red flashing): the display flashes and signals an indicator level that might no longer be sufficient for unattended operation in the set analysis interval for 72 hours.

→ The relay REL 2 fault is active (dropped out).



Note: Confirm the BOB alarm by pressing the Reset key.



Flashing blue + red

Lack of indicator (flashing blue) + alarm signal (red): The display is flashing and in combination with the flashing blue display for lack of indicator indicates a lack of indicator < 10 %.

→ The relay REL 2 faults has been reset (dropped out).

→ The BOB signal has already been acknowledged.

3.5 Device fault



Flashing red

Alarm signal (flashing red):
The display signals a system malfunction
→ an improper zero sample or an improper measurement.
→ All other displays are switched off.
→ The relay REL 2 fault is active (picked up).



Note: Device faults are acknowledged with the RESET key.



Red

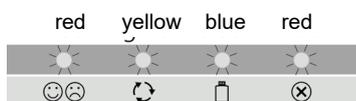
→ Alarm signal (red):
The display indicates a device fault
→ Faulty zero sample or measurement
→ All other displays are switched off.
→ The relay REL 2 fault has been reset (dropped out).

3.6 Display of the calculated filling level

After the GENO-software automatic water analysis system is switched on, the calculated filling level is displayed for 1 second:

Operation and handling

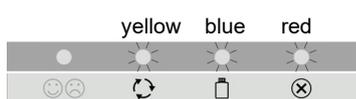
Immediately after resetting the indicator counter: More than 5000 analyses are possible.



Filling level 100 % to 75 %:
More than 3750 analyses are possible.



Filling level 75 % to 50 %:
More than 2500 analyses are possible.



Filling level 50 % to 25 %:
More than 1250 analyses are possible.



Filling level 25 % to 0 %:
Less than 1250 analyses are possible until the indicator bottle is changed.



4 | Adjusting GENO-softwatch Komfort



Work on electrical connections is only allowed be performed by trained and qualified electrical experts according to the VDE guidelines or according to the guidelines of a similar local institution.



Caution! Supply voltage 85 ... 264 V AC/47 ... 63 Hz.

By means of the little sliding switches S1 – S12, the GENO-softwatch Komfort is programmed and adjusted to specific operating requirements.

The DIP switches (dual in-line package) are located on an operating board which is screwed onto the main board. This operating board must not be removed.

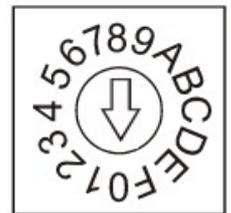
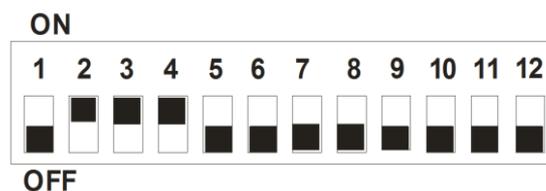


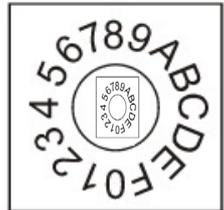
Fig. F-1: DIP switch

In addition, the two 16-step rotary switches for the setting of the flushing time and the delay time for the start of the analysis are located.



Note: In order to operate the rotary switches and to adjust the sliding switches you will need a small screwdriver. Please only use high-quality and tested tools in order to avoid damaging these easily damaged components.

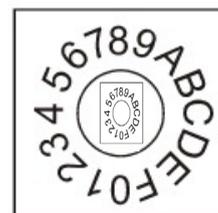
4.1 Factory setting of the rotary switch

Refer to chapter	Setting	Factory-setting	Pos.	
F-4.1.1	Flushing time	4 minutes	6	
F-4.1.2	Delay time	Off/0 minutes	0	

4.1.1 How to set the flushing time

The flushing time before the start of an analysis can be set to between 5 seconds and 30 minutes by means of the rotary switch "flush time" on the left.

Pos.	Time [sec]	Pos.	Time [min]	Pos.	Time [min]	Pos.	Time [min]
0	5	4	1.5	8	10	C	18
1	10	5	2	9	12	D	20
2	20	6	4	A	14	E	25
3	50	7	8	B	16	F	30



Subjecting the flushing time to the length of the feed line to the GENO-softwatch Komfort ensures that water from the softer is being analysed.



Note: The 2 m hose line 6 x 4 with an interior diameter of 4 mm has a volume of approx. 30 ml and - depending on the pressure conditions - can be flushed within approx. 4 seconds.

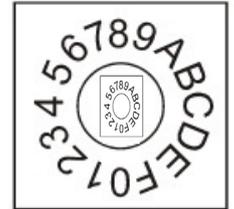


Note: We recommend a flushing time of at least 20 seconds.

4.1.2 Setting the delay time

The delay time before sampling (e.g. in case of hot water) can be set to between 0 seconds and 30 minutes by means of the rotary switch "delay time" on the right.

Item	Time [min]	Item	Time [min]	Item	Time [min]	Item	Time
0	0	4	4	8	8	C	18
1	1	5	5	9	9	D	20
2	2	6	6	A	10	E	25
3	3	7	7	B	12	F	30



The delay time must be selected in a way that definitely no hot water will be flowing into the measuring chamber at the start of an analysis.



Caution! If condensate shall be monitored, it is essential that the sample be cooled down to a temperature of less than 40 °C. However, in case of longer sampling intervals, it does not make sense to permanently cool down the condensate. In order to save cooling water, a cooling water valve must be opened as soon as a sample is requested. The inlet valve of the analysis device may only be opened - with delay - if the sample in the cooler has reached a temperature of less than 40 °C. → The value of the delay time must be determined on site. It depends on the temperatures of the condensate and the cooling water as well as on the flow conditions within the system. In order to determine the proper delay time, you always start out with a long delay time at the beginning.

4.2 Factory setting of the DIP switches

Table F-1: Settings DIP switch (factory setting)

Refer to chapter	Flushing time		DIP switch		
	F-4.2.1	Analysis interval	10 minutes	S1 OFF	S2 ON
F-4.2.2	First value suppression	Yes – ON	S3 ON		
F-4.2.3	Functions Relay 1	Permanent contact No stop of analysis	S4 ON	S5 OFF	
F-4.2.4	Measuring parameters	Total hardness	S6 OFF	S7 OFF	S8 OFF
F-4.2.5	Limit value monitoring	Indication that limit value has been exceeded	S9 OFF		
F-4.2.6	Input function	Flow controller function	S10 OFF		
	Operating mode	Analysis operations	S11 OFF	S12 OFF	

4.2.1 Analysis interval

There are 4 fixed interval periods that can be set by means of the programme switches S1 and S2. The interval period determines the frequency with which the analyses are carried out. It is the time between 2 subsequent starts of an analysis.



Note: If the IN input (terminal 18/19) is open, no analyses are started. Upon delivery, this input is bridged.



Note: The input contact (terminal 18/19) can be switched to a start function (S10 = ON) via the program switch S10.

If program switch S10 is programmed to ON and the jumper is not removed at input contact terminal 18/19, analyses are carried out permanently.

Analysis interval		
S1	S2	Time [min]
OFF	OFF	5
OFF	ON	10
ON	OFF	20
ON	ON	30

ON											
1	2	3	4	5	6	7	8	9	10	11	12
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>									
OFF											

ON											
1	2	3	4	5	6	7	8	9	10	11	12
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>									
OFF											

ON											
1	2	3	4	5	6	7	8	9	10	11	12
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>								
OFF											

ON											
1	2	3	4	5	6	7	8	9	10	11	12
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>									
OFF											

4.2.2 First value suppression

If the water hardness (limit value) is exceeded, it is possible to define whether a 2nd analysis is to be carried out (first value suppression). Relay REL 1 is only activated if two consecutive analyses indicate that the limit value has been exceeded.

The 2nd analysis will take place approx. 4 minutes later - no matter the set analysis interval. If a flow controller is connected to input IN, the analysis will take place even if no water flow is indicated.

Suppression of first value REL 1	
S3	Function
OFF	Without suppression of first value
ON	With first value suppression

ON

1	2	3	4	5	6	7	8	9	10	11	12
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>								

OFF

ON

1	2	3	4	5	6	7	8	9	10	11	12
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>								

OFF

4.2.3 Function relay REL 1

Relay REL 1 (terminal 9/10/11) signals that the limit value has been exceeded. You choose between a pulse contact of 3 and 60 seconds for the activation of a controller or a permanent contact.

Regarding a permanent contact, two alternatives are available:

- Analyses are performed continuously at the set time interval. If the value falls below the limit value, the relay REL 1 has dropped out.
- No further analyses will be performed after the limit value has been exceeded. Relay REL 1 must be reset by pressing the RESET key. Only afterwards analyses will be carried out again.

Function of relay REL 1		
S4	S5	Function
OFF	OFF	Pulse contact 3 seconds
OFF	ON	Pulse contact 60 seconds
ON	OFF	Permanent contact No analysis stop (refer to a)
ON	ON	Permanent contact Analysis stop (refer to b)

The diagrams show the ON and OFF states for each function:

- Function 1 (OFF/OFF):** ON state shows pins 4 and 5 filled; OFF state shows all pins empty.
- Function 2 (OFF/ON):** ON state shows pins 4 and 5 filled; OFF state shows all pins empty.
- Function 3 (ON/OFF):** ON state shows pins 4 and 5 filled; OFF state shows all pins empty.
- Function 4 (ON/ON):** ON state shows pins 4 and 5 filled; OFF state shows all pins empty.

4.2.4 Measurement parameters

In case of limit value monitoring, the GENO-softwatch Komfort must be parameterised for total hardness.



Note: The respective limit value is determined by the indicator used. For available indicators, please refer to chapter B-3.

S6	S7	S8	Parameter
OFF	OFF	OFF	Total hardness

ON

1	2	3	4	5	6	7	8	9	10	11	12
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

OFF

4.2.5 Limit value monitoring

In general, an alarm will be emitted if the limit value is exceeded. This way, for instance an ion exchanger for instance is monitored for hardness breaking through.

- If the programme switch S9 is in the OFF position, the exceedance of a limit value is monitored.
- If the programme switch S9 is in position ON, it is monitored whether a limit value is undershot. This option may be applied in case a blending unit has to be monitored where a minimum hardness is required.
- However, all functions with regard to signals and reactions of the system described in the present operation manual refer to the limit value being undershot.

Limit value monitoring	
S9	Function
OFF	Indication that limit value has been exceeded
ON	Signal if value is undershot

ON

1	2	3	4	5	6	7	8	9	10	11	12
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							

OFF

ON

1	2	3	4	5	6	7	8	9	10	11	12
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							

OFF

4.2.6 Input function

Input function	
S10	Function
OFF	No analysis
ON	External analysis start

ON

1	2	3	4	5	6	7	8	9	10	11	12
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								

OFF

ON

1	2	3	4	5	6	7	8	9	10	11	12
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								

OFF

Flow controller function

Program switch S10 is set to OFF (delivery state).

This function is used if an analysis shall only be carried out when water is withdrawn. This is particularly useful for discontinuous water withdrawal.

The function is also used when no analyses are required, e.g. during the regeneration of a single water softener.



Note: In the as-delivered state, input IN (terminal 18/19) is bridged and thus the flow controller function is active.

The external contact for the IN input (terminal 18/19) must always be a potential-free switch.

The set time interval (S1 and S2) continues to expire when the contact at the input is opened briefly.

Start function

Program switch S10 is set to ON.

As soon as the voltage-free contact at input IN is closed, an analysis is carried out every 5 minutes (independent of the switch positions S1 and S2). The first analysis starts immediately after the contact is closed.



Note: Instead of a flow controller, any other voltage-free contact of a timer or a relay (osmose control unit, softener control unit) can be used.

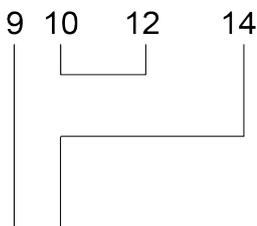
4.2.7 Connection examples for input IN

GENO softwatch ← Analysis start/stop				
	GENO-softwatch	HLX	OSMO-X	RO/AVRO 125
Terminals	18/19	K1 13/14	14/15	K1 31/34
	GSX 10i	IONO-matic3	WE-X	Control cabinet for controlling 2 systems (order no. 755 820)
Terminals	X3 (POT-S)	42/43	30/31	4A1 X11 Q3 2/1

4.2.8 Connection examples alarm signal

GENO-softwatch → alarm signal				
	GENO-softwatch	HLX	OSMO-X	RO/AVRO 125
Terminals	9/14	X1-21/29	66/67	X8 22/23
	GSX 10i	IONO-matic3	WE-X/WE-OSMO-X	Control cabinet for controlling 2 systems (order no. 755 820)
Terminals	X8 (PRGINP)	28/29	15/16	L+7 4A2 I3

Connection example alarm signal



4.2.9 Programming peripherals

Programming		
HLX	-	-
OSMO-X	Code 339	Registering softwatch
RO/AVRO 125	-	-
GSX 10i	Code 113 par SA	4
Ionomatic3	Code 113 par. 0 prog input Code 113 par. 1 prog. output	1 3
WE-X	Code 113 prog output Code 113 prog. input	2 1

G Troubleshooting

Table G-1: Other errors		
This is what you observe	This is the cause	This is what to do
No LEDs on the device light up after switch-on	<ul style="list-style-type: none"> The power supply is not connected properly or not switched on. 	<ul style="list-style-type: none"> Switch on the system. Check the power supply.
	<ul style="list-style-type: none"> The ribbon cable between operator panel and main board has not been plugged in. 	<ul style="list-style-type: none"> Check whether the ribbon cable is plugged in.
	<ul style="list-style-type: none"> The fuse of the main board or the power unit is defective. 	<ul style="list-style-type: none"> Check the fuse.
The device is leaking	<ul style="list-style-type: none"> An O-ring at one of the connection plugs of the measuring chamber is missing. 	<ul style="list-style-type: none"> Check O-rings at the measuring chamber.
	<ul style="list-style-type: none"> The water pressure is out of spec. 	<ul style="list-style-type: none"> Check water pressure and install pressure reducer, if necessary.
	<ul style="list-style-type: none"> One of the connection plugs is not mounted properly. 	<ul style="list-style-type: none"> Check that the connection plug is firmly seated.
	<ul style="list-style-type: none"> The connection plug is defective. 	<ul style="list-style-type: none"> Check whether the seal seats of the O-rings show mechanical damage.
The analysis does not start	<ul style="list-style-type: none"> The indicator has been used up or the indicator counter has not been reset after the replacement of the bottle. 	<ul style="list-style-type: none"> Check the filling level of the indicator bottle.
	<ul style="list-style-type: none"> The input contact prevents analysis in flow controller mode. 	<ul style="list-style-type: none"> Check whether the system is locked via an external input.

Continuation Table G-1: Other errors		
This is what you observe	This is the cause	This is what to do
Zero sample error	<ul style="list-style-type: none"> The set flushing time is too short. 	<ul style="list-style-type: none"> Prolong the flushing time.
	<ul style="list-style-type: none"> There is no water in the measuring chamber. 	<ul style="list-style-type: none"> Water pressure too low. Water inlet is shut off.
	<ul style="list-style-type: none"> The outlet is clogged. 	<ul style="list-style-type: none"> Check whether the hose is unobstructed.
	<ul style="list-style-type: none"> The plug at the light source has not been screwed on properly. 	<ul style="list-style-type: none"> Check the plug connections.
	<ul style="list-style-type: none"> The water pressure is too low. 	<ul style="list-style-type: none"> Check the water pressure.
	<ul style="list-style-type: none"> There is gas in the sample (formation of bubbles). 	<ul style="list-style-type: none"> Remedy the introduction of air into the water.
	<ul style="list-style-type: none"> The measuring chamber is dirty. 	<ul style="list-style-type: none"> Clean the measuring chamber.
Measuring error	<ul style="list-style-type: none"> The indicator has been used up or the indicator counter has not been reset after the replacement of the bottle. 	<ul style="list-style-type: none"> Replace indicator bottle and reset counter.
	<ul style="list-style-type: none"> The stir bar does not turn or is missing. 	<ul style="list-style-type: none"> Check whether the stir bar is turning. Check whether the stir bar is in the measuring chamber.
	<ul style="list-style-type: none"> There is no water in the measuring chamber. 	<ul style="list-style-type: none"> Check the water supply to the system.
	<ul style="list-style-type: none"> The outlet is clogged. 	<ul style="list-style-type: none"> Check whether the hose is unobstructed.
	<ul style="list-style-type: none"> There is foreign matter in the inlet of the solenoid valve, so that it does not close completely. 	<ul style="list-style-type: none"> Remove the foreign matter.
	<ul style="list-style-type: none"> Defective hose pump. 	<ul style="list-style-type: none"> Replace hose pump.

Continuation Table G-1: Other errors

This is what you observe	This is the cause	This is what to do
Incorrect measuring value	<ul style="list-style-type: none"> • There is foreign matter in the inlet of the solenoid valve, so that it does not close completely. 	<ul style="list-style-type: none"> • Remove the foreign matter.
	<ul style="list-style-type: none"> • Defective hose pump. 	<ul style="list-style-type: none"> • Replace hose pump.
	<ul style="list-style-type: none"> • The stir bar does not turn or is missing. 	<ul style="list-style-type: none"> • Check whether the stir bar is turning. • Check whether the stir bar is in the measuring chamber.
	<ul style="list-style-type: none"> • A wrong type of indicator or an indicator whose shelf life has expired has been used. 	<ul style="list-style-type: none"> • Check the shelf life of the indicator. • Check indicator type.
	<ul style="list-style-type: none"> • After the replacement of the bottle, not enough indicator has been delivered. There is still air in the indicator hose. 	<ul style="list-style-type: none"> • Deaerate hose pump.
	<ul style="list-style-type: none"> • O-ring on dosing plug is missing. 	<ul style="list-style-type: none"> • Check O-ring.
	<ul style="list-style-type: none"> • The sample water contains high iron concentrations and other chemicals which affect the indicator. 	<ul style="list-style-type: none"> • Check the inlet water for application limits.

H Inspection, maintenance



The work described here may only be performed by Grünbeck's technical service/authorised service company or by persons expressly authorised by Grünbeck.



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.



Warning! Make sure that your eyes, your skin and your clothing do not come into contact with the indicator.

Respect the instructions stipulated in the safety data sheets.

Appropriate protective clothing is required for the maintenance work: Work clothes/lab gloves/eye protection/protective goggles.

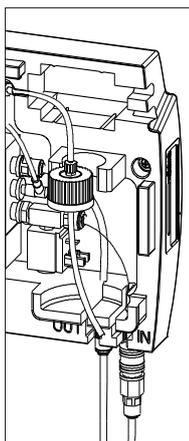
1 | Inspection

Careful handling of the system increases operating safety and service life!

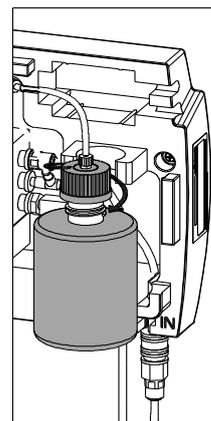
Therefore, please conduct a visual inspection in regular intervals and check the following:

- Are the hose connections of the dosing pump tight?
- Is there air in the dosing hoses?
- Are all water connections tight?
- Is the system overly dirty?

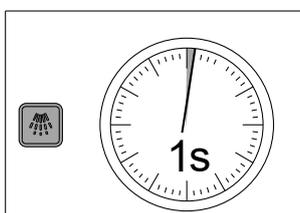
1.1 Changing the indicator



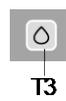
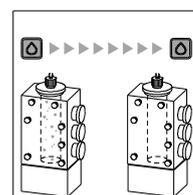
- Remove the empty bottle from the system housing.
- Unscrew the screw cap and remove the suction line from the indicator bottle.
- Remove indicator drips with a paper towel
- Dispose of empty, used up bottles.



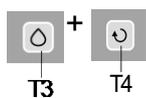
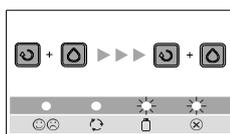
- Open the full indicator bottle, unscrew the screw cap.
- Put the screw cap with the suction hose into the indicator bottle and tighten the screw cap.



- Keep the key pressed until the measuring chamber is filled with water.



- Keep the key pressed until the hose dosing pump delivers to the measuring chamber without bubbles.

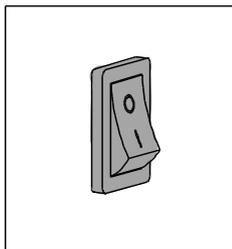


- Press the keys simultaneously and reset internal counter.

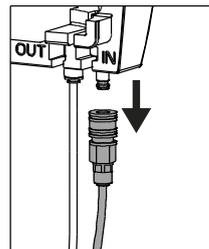
2 | Maintenance

In order to ensure the long-term operation of the GENO-softwatch Komfort, it is necessary to clean the measuring chamber and to replace the wearing parts. This should be done in regular intervals and subject to the frequency with which analyses are carried out. Maintenance work should be carried out at intervals of about 6 months, depending on the load on the device.

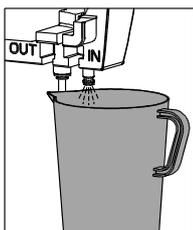
2.2 Cleaning the measuring chamber



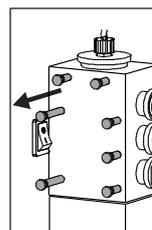
- Switch off the system to "0".



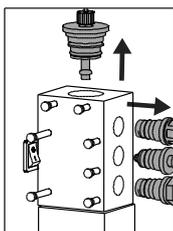
- Disconnect the connection coupling at the device inlet "IN".



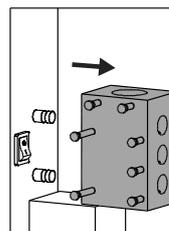
- Collect running water in a container



- Pull the stainless steel safety pins at the measuring chamber as far as they will go.



- Pull the dosing plug, the inlet plug, the light source and the outlet plug from the measuring chamber.



- Remove the measuring chamber from the control box.
- Put the measuring chamber into the cleaning liquid for at least 10 minutes.
- Clean the measuring chamber mechanically under running water by means of cleaning brushes.
- Reinstall the measuring chamber in reverse order in the system and re-establish water connection.
- Switch on the system again.



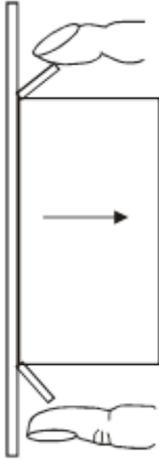
T2

Press key: Fill the measuring chamber with water. Perform sample analysis.

2.3 Changing the cartridge and hose pump



Note: To ensure the measuring accuracy of the GENO-softwatch Komfort, the hose pump cartridge should be replaced after 6 months.



1. Press the locking straps together with your thumb and index finger and pull the cartridge to the right off the motor shaft.
2. Loosen the bayonet locks of the LUER connections.
3. Pull up the fastening pins of the indicator plug and remove the plugs.
4. Replace the blue O-ring of the indicator plug.
5. Insert the indicator plug into the measuring chamber and secure it with the fastening pins.
6. If indicator fluid leaks, remove it with a paper towel.
7. Insert a new cartridge in reverse order.
8. Deaerate pump: Switch on the device and press the INDICATOR key until the hose pump pumps indicator into the measuring chamber without bubbles.