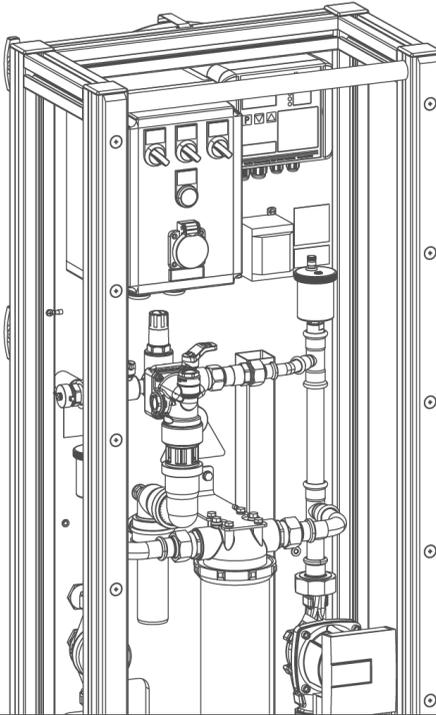


We understand water.



Heating water treatment system |
GENO-VARIO mini

Operation manual

grünbeck

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Original operation manual

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Table of contents

1	About this manual	5	5.1	Requirements for the installation site..	22
1.1	Other applicable documents	5	5.2	Checking the scope of supply	23
1.2	Target group	5	5.3	Connecting the cartridges	24
1.3	Storage of documents.....	5	5.4	Installing the product	28
1.4	Symbols used	5			
1.5	Typographical conventions	6	6	Start-up	32
1.6	Validity of the manual	7	6.1	Preliminary activities	32
1.7	Type plate	7	6.2	Venting	32
			6.3	Checking for leaks	33
2	Safety	9	6.4	Starting up the product	34
2.1	Safety measures	10	7	Operation	35
2.2	Technical safety instructions.....	11	7.1	Sampling	36
2.3	Regulations	12	7.2	Operating modes	36
2.4	Responsibilities of the qualified specialist	12	7.3	Operating the water meter	41
3	Product description	14	8	Shutting down the system	44
3.1	Intended use	14	9	Cleaning, inspection, maintenance ..	46
3.2	Product components	15	9.1	Cleaning	46
3.3	Connections and shut-off devices.....	16	9.2	Inspection	47
3.4	Functional description	17	9.3	Maintenance	48
3.5	Accessories	18	9.4	Consumables	50
4	Control unit	19	9.5	Spare parts	50
4.1	Overview	19	9.6	Wearing parts	51
4.2	Function of operating units	20	10	Malfunctions	52
5	Installation	22	11	Disposal	54
			11.1	Packaging	54

11.2	Product.....	54	Notes.....	63
12	Technical specifications.....	55	Notes.....	64
13	Other information	57	Notes.....	65
13.1	Explanation of terminology.....	57	Index	66
14	Operation log	58		
	EU Declaration of Conformity	62		

1 About this manual

1.1 Other applicable documents

The following documents shall be deemed as applicable documents for the GENO-VARIO mini:

- Electric circuit diagram (order no. TDe-GS000de)
- In addition, the manuals of all accessories used do apply.

1.2 Target group

This manual is intended for qualified specialists.

1.3 Storage of documents

Keep this manual and all other applicable documents, so that they are available when needed.

Enter inspections and maintenance work performed in the operation log in chapter 14.

1.4 Symbols used



This symbol identifies instructions that you must comply with for your own personal safety as well as to avoid damage to property.



This symbol identifies information and instructions that you must comply with in order to avoid damage to property.



This symbol identifies important information about the product or its handling.



This symbol identifies work that may only be carried out by electronically trained personnel according to the VDE guidelines or according to the guidelines of similar local institutions.

1.5 Typographical conventions

The following typographical conventions are used in this manual:

Description	Depiction
Handling instruction One-step or chronological sequence of steps does not matter	▶ Action
Handling instruction multi-step and chronological sequence of action steps important	<ol style="list-style-type: none">1. First action<ol style="list-style-type: none">a first stepb second step2. Second action
Result after a handling instruction	» Result
Lists	<ul style="list-style-type: none">• List item• List sub-item

Description	Depiction
Menu paths	Status level>Menu level >Submenu
Display texts	Display text
Operating elements	Button/key

1.6 Validity of the manual

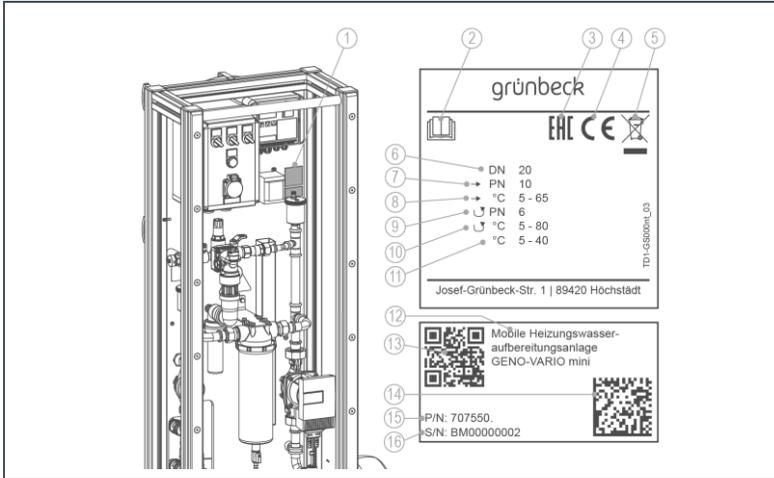
This manual applies to the following products:

- Heating water treatment system GENO-VARIO mini

1.7 Type plate

The type plate is located on the right next to the control unit. Please specify the data shown on the type plate in order to speed up the processing of your enquiries or orders.

Therefore, enter the necessary information in the table below to have it readily available whenever necessary.



Item	Designation	Item	Designation
1	Type plate	2	Observe operation manual
3	CE mark	4	EAC mark
5	Disposal information	6	Nominal connection diameter
7	Nominal pressure (inlet)	8	Water temperature (inlet)
9	Nominal pressure (circuit)	10	Water temperature (circuit)
11	Ambient temperature	12	Product designation
13	QR code	14	Data matrix code
15	Order no.	16	Serial no.:

- Product designation: Heating water treatment system
GENO-VARIO mini
- Order no.: _____
- Serial no.: _____

2 Safety



WARNING: Danger due to hot surfaces because of high water temperatures of the heating circuit.

- Risk of burns at heating circuit temperatures of more than 55 °C.
- ▶ Note the warning label “hot surfaces” in the pipe area.
- ▶ Do not touch the pipes without appropriate, protective gloves.



WARNING: Danger due to escaping hot circulation water.

- Risk of scalding.
- ▶ Let the GENO-VARIO mini cool down to room temperature or flush it with cold water prior to working on it.



WARNING: Risk of touching live components.

- Risk of electric shock if the mains cables are damaged.
 - ▶ Do not use any products which have a damaged mains cable.
 - ▶ Have damaged mains cables replaced without delay.
-



NOTE: Inhibitors present in the heating circuit

- If inhibitors were added to the heating water, these will be removed by the resin of the softening or mixed bed cartridge.
 - ▶ Only carry out the filter operation (refer to chapter 7.2.1).
 - ▶ Check the dosing of the inhibitor during the softening or full demineralisation operation (refer to chapter 7.2.2 or chapter 7.2.3).
 - ▶ Re-establish the required inhibitor concentration, if necessary.
-

2.1 Safety measures

- Install the product in a frost-free room. Otherwise, the product may suffer irreparable damage.
- Only transport and store the product in a frost-free environment. Freezing residual water remaining in the system can irreparably damage the product.
- Only use genuine spare and wearing parts for maintenance or repair. If unsuitable spare and wearing parts are used, the warranty for your product will be void.
- Switch off the voltage supply prior to working on system components.
- Have electrical work done by skilled, qualified specialists only.

2.1.1 Warning and prohibition signs



WARNING: Sources of danger marked with warning and prohibition signs.

- Possible sources of danger are not recognised.
- ▶ Never remove warning and prohibition signs.
- ▶ Replace damaged warning and prohibition signs.

Warning sign

Label	Meaning
	This warning sign identifies hot surfaces that must not be touched without the corresponding precautionary measures. There is a risk of burns!

Prohibition sign

Label	Meaning
	This prohibition sign identifies the GENO-VARIO mini as sensitive to frost. In order to prevent any damage, it must be stored in a frost-proof place.

2.2 Technical safety instructions

This manual contains instructions that you must comply with for your own personal safety as well as to avoid damage to property. The instructions are highlighted by a warning triangle and have the following structure:



CAUTION: Type and source of danger.

- Possible consequences
 - ▶ Preventive measures
-

The following signal words were defined subject to the degree of danger and may be used in the present document:

- **Danger** means that serious or fatal injuries will occur.
- **Warning** means that serious or fatal injuries may occur.
- **Caution** means that minor injuries may occur.
- **Note** (without a warning triangle) means that damage to property may occur.

2.3 Regulations

When installing and starting up the product, amongst others, comply with the following regulations and guidelines:

- Statutory regulations on environmental protection
- Provisions of the employers' liability insurance companies
- DIN EN 806 Specifications for installations inside buildings conveying water for human consumption

2.4 Responsibilities of the qualified specialist

Comply with the following instructions to ensure the proper and safe functioning of the product:

- Only perform activities described in this manual.

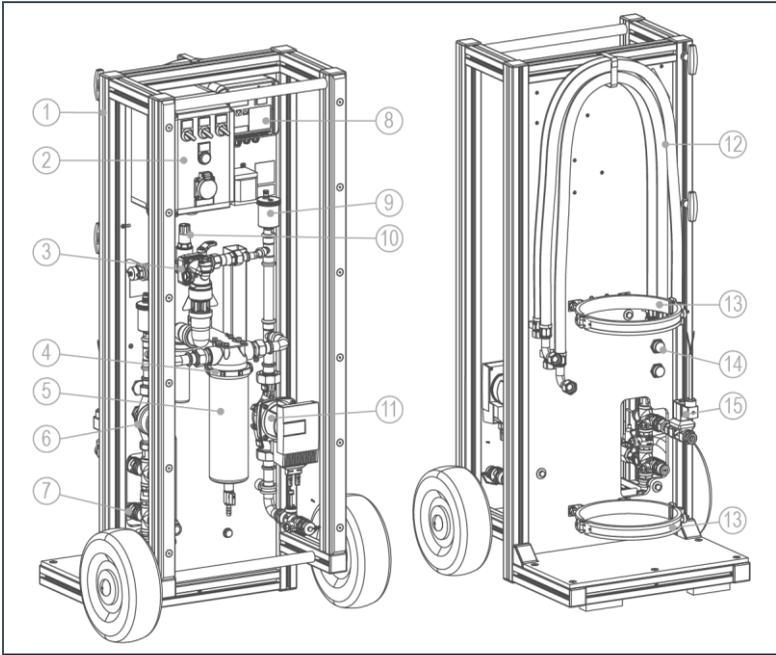
- Perform all activities in accordance with all applicable standards and regulations.
- Only use this product as intended.
- Make sure that the required inspection and maintenance work is carried out.
- Keep this manual.

3 Product description

3.1 Intended use

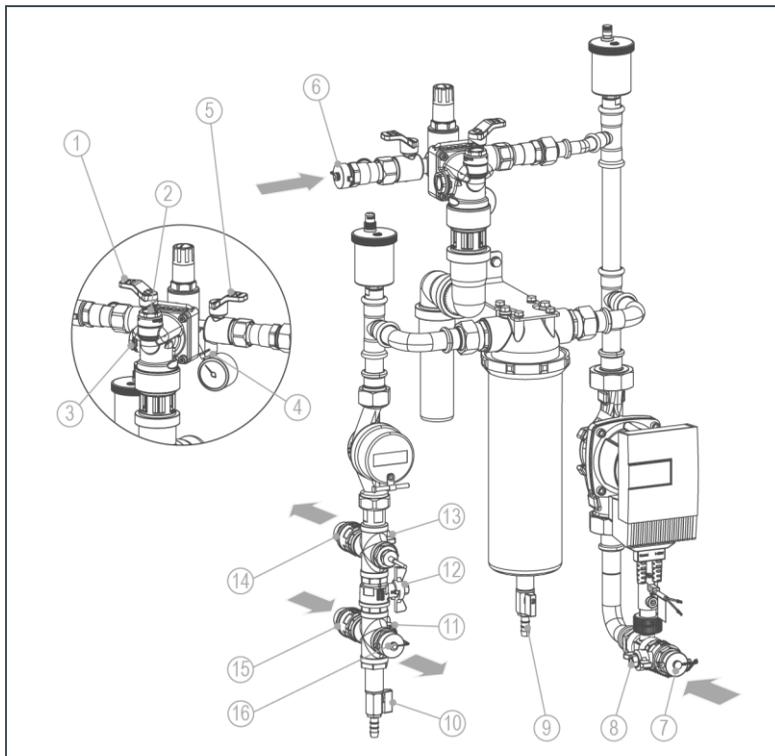
- The GENO-VARIO mini is intended for qualified specialists for the treatment of circulation water. In Germany, the requirements as per VDI 2035 do apply.
- The GENO-VARIO mini may only and exclusively be used for the treatment of water in closed heating or cooling circuits.
- For the duration of the treatment, the GENO-VARIO mini is integrated into the circuit in the form of a bypass.
- The GENO-VARIO mini can be used in new or existing systems.
- The GENO-VARIO mini is designed exclusively for use in industrial and commercial applications.

3.2 Product components



Item	Designation	Item	Designation
1	System rack	9	Air vent
2	Control unit	10	Pressure reducer
3	System separator	11	Circulation pump
4	Union nut	12	Flexible connection hoses
5	Filter	13	Retaining clamps for cartridges
6	Water meter	14	Placeholder for solenoid valve and conductivity measuring cell
7	Conductivity measuring cell	15	Solenoid valve
8	Conductivity meter GENO-Multi-LF		

3.3 Connections and shut-off devices



Item	Designation	Item	Designation
1	Shut-off valve for drinking water	9	Draining valve of filter
2	Test connection of upstream pressure zone	10	Draining valve of GENO-VARIO mini
3	Test connection of intermediate pressure zone	11	Shut-off valve from cartridge
4	Test connection (pluggable pressure gauge) of downstream pressure zone	12	Shut-off valve for bypass cartridge
5	Shut-off valve for pressure reducer	13	Shut-off valve to cartridge
6	Drinking water connection	14	Connection to cartridge
7	Connection of heating/cooling circuit	15	Connection from cartridge with sieve
8	Shut-off valve for heating/cooling circuit	16	Connection to heating/cooling circuit

3.4 Functional description

The function of the GENO-VARIO mini is based on the well-proven processes of filtration and softening or demineralisation.

The GENO-VARIO mini is integrated into the filled up heating or cooling circuit as a bypass. Part of the circulation water permanently flows through the GENO-VARIO mini. Prior draining or flushing is not required.

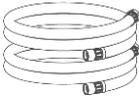
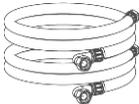
First, the filter removes undissolved impurities such as rust or dirt particles. Afterwards, the circulation water either flows through the softening cartridge decaliQ:BA or the mixed bed cartridge desaliQ:BA – depending on the accessories used.

When filling new systems, the circuit may be filled with drinking water. The treatment of the circulation water by means of the GENO-VARIO mini only takes place shortly before the start-up of the heating/cooling circuit. Thus, optimum water quality is achieved. In Germany, the requirements as per VDI 2035 do apply.

The filling or make-up water feed of the circuit as per DIN EN 1717 can be realised by means of the integrated filling group.

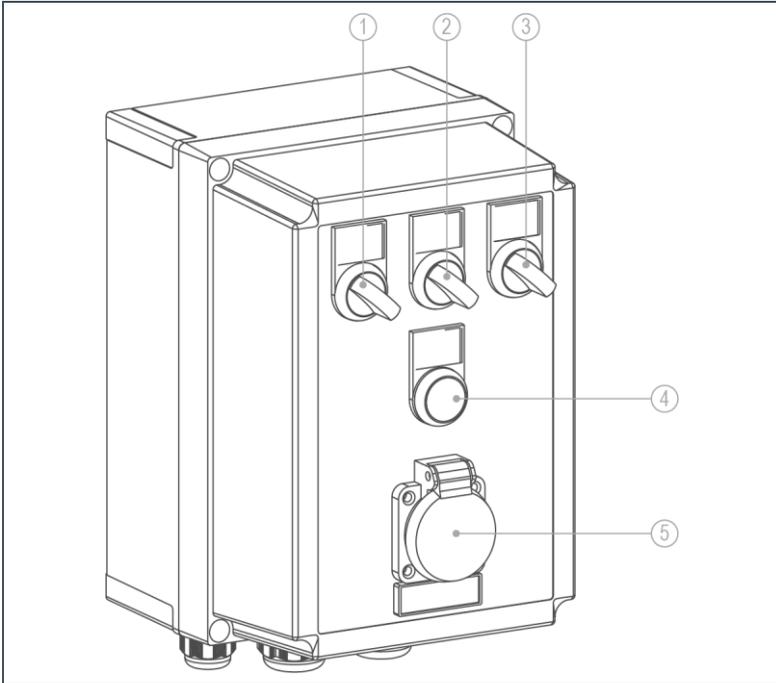
The GENO-VARIO mini is available with or without conductivity meter GENO-Multi-LF. The GENO-Multi-LF is only applied for demineralisation.

3.5 Accessories

Illustration	Product	Order no.
	Softening cartridge decaliQ:BA12 VARIO mini	707 765
	Softening cartridge decaliQ:BA16 VARIO mini For water softening	707 785
	Mixed bed cartridge desaliQ:BA12 VARIO mini	707 465
	Mixed bed cartridge desaliQ:BA16 VARIO mini For water demineralisation	707 485
	Hose kit DN 20, union nut 3/4" straight/straight, 1.5 m	707 840
	For hose extension, consisting of 2 hoses with straight connections, 2 double nipples, including seals	
	Hose kit DN 20, union nut 3/4" straight/90°, 1.5 m	707 845
	For hose extension, consisting of 2 hoses with straight connection on one side and connection with 90° angle on the other side, 2 double nipples, including seals	
Without illustration	Strap wrench To simplify the removal of the filter cylinder for the replacement of the filter elements	105 805
Without illustration	Service kit Service kit for the maintenance of system separators	132 095

4 Control unit

4.1 Overview



Item	Designation	Item	Designation
1	ON/OFF switch GENO-VARIO mini	4	Illuminated button Flow display/start
2	Selector switch for pump switch-off 60 °C or 80 °C	5	Socket External circulation pump
3	ON/OFF switch GENO-Multi-LF		

4.2 Function of operating units

Button	Function
(1) ON/OFF switch GENO-VARIO mini	Switching on the GENO-VARIO mini Rotary switch set to 1 . Switching off the GENO-VARIO mini Rotary switch set to 0 . Rotary switch is illuminated: mains voltage is present
(2) Selector switch for pump switch- off 60 °C or 80 °C	Switch-off of circulation pump at 60 °C. Rotary switch set to 60° C . Switch-off of circulation pump at 80 °C. Rotary switch set to 80° C . Rotary switch is illuminated: circulation pump is running.
(3) ON/OFF switch GENO- Multi-LF	GENO-Multi-LF activated: Rotary switch set to 1 . GENO-Multi-LF not activated: Rotary switch set to 0 . Rotary switch is illuminated: GENO-Multi-LF is active.
(4) Illuminated button Flow display/start	In case the flow is < 200 l/h for longer than a period of 30 sec, the circulation pump switches off. Illuminated button ON: Flow > 200 l/h Illuminated button OFF: Flow < 200 l/h Pressing the illuminated button resets the delay time.

Button	Function
(5) Socket External circulation pump	Connection of external circulation pump. Switched in parallel to internal circulation pump.

5 Installation

5.1 Requirements for the installation site

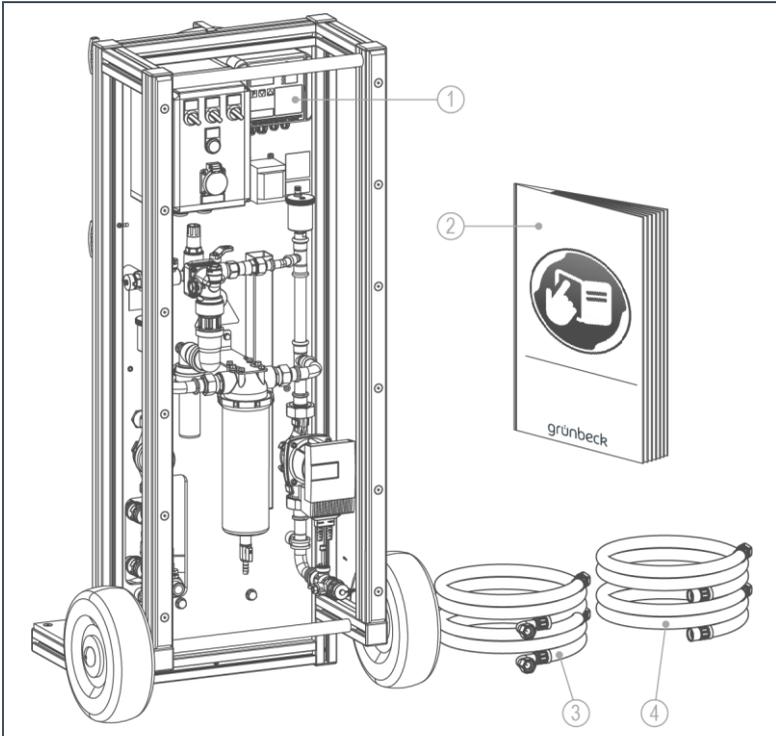
- Observe local installation directives, general guidelines and technical specifications.
- The installation site must be frost-proof and ensure the system's protection from chemicals, dyes, solvents and vapours.
- In case of make-up water feed and filling, a drinking water filter must be installed upstream of the system.
- A floor drain or a corresponding safety device (such as a protectliQ) must be available in the installation room.
- A shock-proof socket is required for electrical installation.



NOTE: No system function without continuous power supply.

- If the system is operated without power, the content of the heating/cooling circuit is neither filtered nor softened or demineralised.
- ▶ Do not interconnect the socket with a light switch, heating emergency switch or the like.
-

5.2 Checking the scope of supply



Item	Designation	Item	Designation
1	GENO-VARIO mini, fully mounted	3	2 Connection hoses DN 20, each 1.5 m in length, with union nuts 3/4" on both sides, one connection with 90° elbow
2	Operation manual	4	2 Connection hoses DN 20, each 1.5 m in length, with union nuts 3/4" on both sides

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

5.3 Connecting the cartridges



NOTE: In case of the variant with GENO-Multi-LF, this must be deactivated for softening operation.

- No flow due to permanently closed solenoid valve.
 - ▶ Install the solenoid valve and the conductivity measuring cell on the placeholders.
-



NOTE: Incorrect installation of connection hoses at the cartridge possible.

- If connected incorrectly, no water will flow through the cartridge (integrated non-return valve).
 - ▶ Make sure to properly connect the cartridge according to the attached operation manual.
-



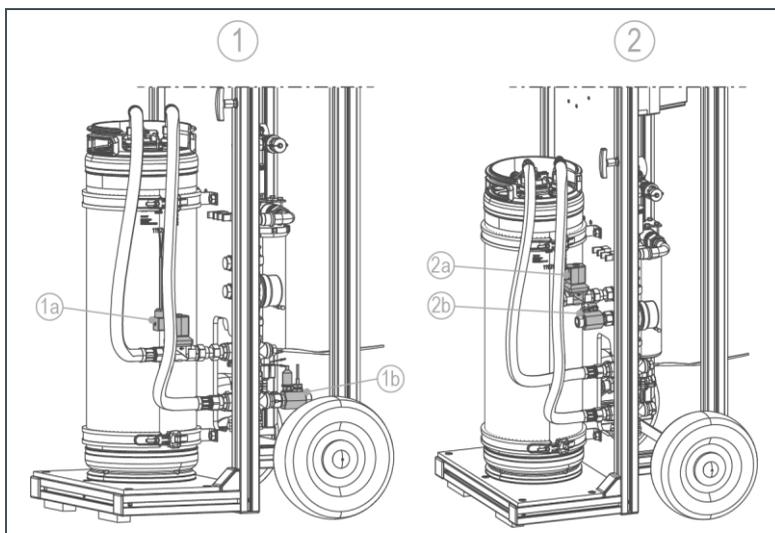
NOTE: Incorrect installation of solenoid valve and conductivity measuring cell possible.

- If connected incorrectly, no water will flow through the cartridge (solenoid valve closes).
 - ▶ Check that the solenoid valve is installed on the connection to and the conductivity measuring cell on the connection from the cartridge.
 - ▶ Install the solenoid valve (upper connection) and the conductivity measuring cell (lower connection) on the connections to and from the cartridge (refer to chapter 3.3).
-



NOTE: Removal of inhibitors present in the heating circuit.

- If inhibitors were added to the heating water, these will be removed by the resin of the softening or mixed bed cartridge.
- ▶ To maintain the inhibitors present in the heating water circuit, only carry out the filter operation (refer to chapter 7.2.1).
- ▶ If inhibitors are present in the heating water circuit, check the inhibitor dosing after softening or full demineralisation. Re-establish the required concentration.



Item	Designation	Item	Designation
1	GENO-VARIO mini with GENO-Multi-LF in demineralisation mode	2	GENO-VARIO mini with GENO-Multi-LF in softening mode
1a	Solenoid valve	2a	Solenoid valve
1b	Conductivity measuring cell	2b	Conductivity measuring cell

5.3.1 Connecting the softening cartridge

1. Select temperature switch-off 60 °C or 80 °C at the selector switch on the control unit.
2. Mount a newly filled softening cartridge on the GENO-VARIO mini using the retaining clamps.



CAUTION: The temperature range is subject to the maximum admissible operating temperature of the cartridge.

- The cartridge may be damaged.
 - ▶ Observe the maximum admissible operating temperature indicated on the type plate and in the operation manual of the cartridge.
-

3. Check whether the solenoid valve and the conductivity measuring cell are installed.
4. If no solenoid valve and no conductivity measuring cell are installed, connect the connection hoses to the connections to the cartridge.



All other steps are only required for the product variant with GENO-Multi-LF and if solenoid valve and conductivity measuring cell are installed.

5. Use the GENO-Multi-LF ON/OFF switch on the control unit to switch off the GENO-Multi-LF.
6. Disconnect the connection hoses from the solenoid valve and from the conductivity measuring cell.
7. Remove the solenoid valve and the conductivity measuring cell.
8. Install the solenoid valve and the conductivity measuring cell on the placeholders.

9. Connect the connection hoses to the connections to the cartridge.

5.3.2 Connecting the mixed bed cartridge (demineralisation cartridge)



All other steps are only required for the product variant GENO-VARIO mini with GENO-Multi-LF.

10. Select temperature switch-off 60 °C or 80 °C at the selector switch on the control unit.
11. Mount a newly filled mixed bed cartridge (demineralisation cartridge) on the GENO-VARIO mini using the retaining clamps.



CAUTION: The temperature range is subject to the maximum admissible operating temperature of the cartridge.

- The cartridge may be damaged.
 - ▶ Observe the maximum admissible operating temperature indicated on the type plate and in the operation manual of the cartridge.
-

12. Use the GENO-Multi-LF ON/OFF switch on the control unit to switch off the GENO-Multi-LF.
13. Check whether the solenoid valve and the conductivity measuring cell are installed.
14. If yes, connect the hoses of the mixed bed cartridge (demineralisation cartridge) to the solenoid valve and to the conductivity measuring cell.



All other steps are only required if the solenoid valve and the conductivity measuring cell are not installed.

15. Disconnect the connection hoses of the mixed bed cartridge (demineralisation cartridge) from the connections to the cartridge.
16. Remove the solenoid valve and the conductivity measuring cell from the placeholder.
17. Install the solenoid valve (upper connection) and the conductivity measuring cell (lower connection) on the connections to and from the cartridge (refer to chapter 3.3).



NOTE: Incorrect installation of solenoid valve and conductivity measuring cell possible.

- System malfunctions.
 - ▶ Install the solenoid valve on the upper and the conductivity measuring cell on the lower connection.
-

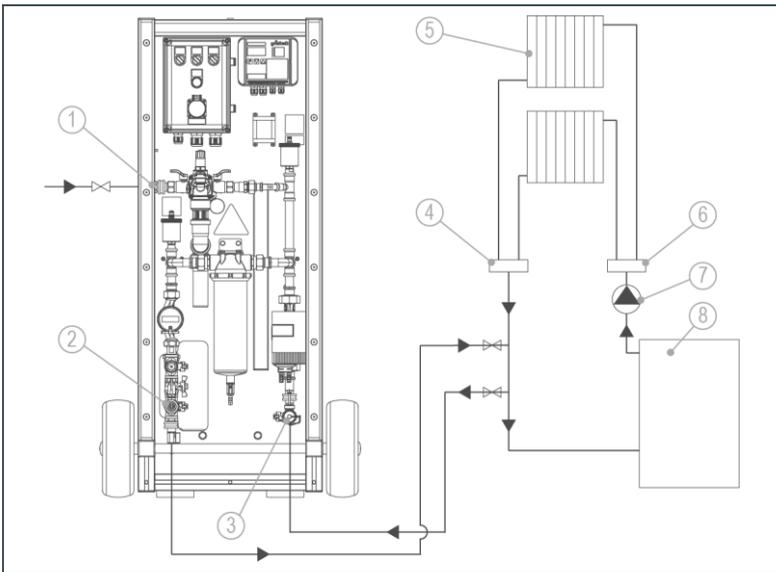
18. Connect the hoses of the mixed cartridge (demineralisation cartridge) to the solenoid valve (upper connection) and to the connection to the conductivity measuring cell (lower connection) (refer to chapter 3.3).

5.4 Installing the product

The GENO-VARIO mini is integrated in the return of the cooling/heating circuits. In order to ensure the proper operation of the GENO-VARIO mini, observe the following points:

- In order to be able to treat the entire content of the circuit, it must be completely circulated.
To this end, the following points must be fulfilled:

- All the circulation pumps in the heating/cooling circuit must be in operation.
- All shut-off valves must be open.
- Make sure that the pumps in the heating/cooling circuit hydraulically are affected as little as possible by the GENO-VARIO mini.
- Do not connect the supply and return of the heating/cooling circuit with each other by way of the GENO-VARIO mini.
- Do not bypass any valves of the heating/cooling circuit with the GENO-VARIO mini.
- Note the following installation example.



Item	Designation	Item	Designation
1	Drinking water connection	5	Consumer
2	Connection to heating/cooling circuit	6	Supply heating/cooling circuit
3	Connection from heating/cooling circuit	7	Circulation pump
4	Return heating/cooling circuit	8	Boiler



The activities described here are illustrated in chapters 3.2, 3.3 and 4.1.



CAUTION: Risk of damage to the your customer's heating system due to introduction of foreign particles or chemicals from previous customers (e.g. particles, precipitation, inhibitors, ...)

- Your customer's heating/cooling circuit or consumers connected to it may be damaged.
 - ▶ Replace the filter element before every new assignment.
 - ▶ Drain and clean the accessories used (e.g. softening cartridge) before every new assignment.
 - ▶ Fill the accessories used (e.g. softening cartridge) with new resin before every new assignment.
-

1. Close all shut-off and draining valves.
2. Loosen the union nut of the filter cylinder.
3. Pull the filter cylinder off downwards.
4. Equip the filter with a new depth filter element of the desired filter fineness.



On delivery, the GENO-VARIO mini features a 100 µm depth filter element. Depending on the application, a different filter fineness may be useful (refer to Accessories in chapter 9.4)

5. Install the filter cylinder.
6. Tighten the union nut of the filter cylinder.
7. Connect the on-site drinking water hose to the drinking water connection of the GENO-VARIO mini.



Connect the drinking water hose even if you do not want to fill the heating/cooling circuit. Otherwise the content of the GENO-VARIO is taken from the heating/cooling circuit.

8. Connect the connecting hoses of the heating/cooling circuit to the connections to and from the heating/cooling circuit of the GENO-VARIO mini.



Note the connection diagram in chapter 5.3.

6 Start-up

6.1 Preliminary activities

1. Check whether the steps described in the previous chapters have been carried out properly.
2. Set the filling pressure of the circuit at the pressure reducer.
3. Open the on-site shut-off valve for the drinking water inlet.
4. Open the shut-off valves for drinking water and pressure reducer on the GENO-VARIO.

6.2 Venting



WARNING: Danger due to escaping hot circulation water in case of heating systems that are already in operation.

- Risk of scalding.
- ▶ Under no circumstances, vent the GENO-VARIO mini by opening a screw connection or the circulation pump.

-
1. Withdraw water at both draining valves until air no longer escapes.



The two quick air vents provide additional automatic venting.

2. Open the shut-off valves from and to the heating/cooling circuit on the GENO-VARIO.



NOTE: Keep the on-site shut-off valves from and to the heating/cooling circuit closed still.

- Increased introduction of air into the heating circuit.
 - ▶ Only open the on-site shut-off valves from and to the heating/cooling circuit after venting the GENO-VARIO mini.
-

3. Open the shut-off valves from and to the cartridge on the GENO-VARIO.
4. Vent the cartridge as described in the operation manual of the cartridge.



Only a system that has been fully vented works without major noise emission.

6.3 Checking for leaks

1. Open the on-site shut-off valve from the heating/cooling circuit.
1. Open the on-site shut-off valve to the heating/cooling circuit.
2. Check the system for leaks.
3. Close the shut-off valve for drinking water.

6.4 Starting up the product

1. Plug the mains plug into a socket.
2. Switch on the system at the ON/OFF switch.
 - » The pump starts running and you can monitor the flow at the water meter.



If the system makes unusual flow noises, you need to vent it again.



WARNING: Danger due to escaping hot circulation water in case of heating systems that are already in operation.



- Risk of scalding.
 - ▶ Under no circumstances, vent the GENO-VARIO mini by opening a screw connection or the circulation pump.
-

7 Operation

- ▶ Make sure that the activities described in chapter 5.4 have been carried out properly.



WARNING: Danger due to hot surfaces because of high water temperatures of the heating circuit.

- Risk of burns at heating circuit temperatures of more than 55 °C.



- ▶ Note the warning label “hot surfaces” in the pipe area.
- ▶ Do not touch the pipes without appropriate, protective gloves.



Warning: Danger due to escaping hot circulation water in case of heating systems.

- Risk of scalding.



- ▶ Let the GENO-VARIO mini cool down to room temperature or flush it with cold water prior to working on it.
-

7.1 Sampling

As the GENO-VARIO mini is connected in the partial flow, sampling must take place at regular intervals in order to check the progress of the treatment. Note the following information:

- During the sampling, the entire system volume must be in motion.
- Directly take the water sample from the circuit during circulation – not from the supply line or the filling device.
- Discard the contents of the sampling point (e.g. the sampling valve and the feed line to the sampling valve).
- Fill the sampling container slowly to prevent the introduction of oxygen into the water sample.
- Measure the pH value and the hardness or the pH value and the conductivity.
- Compare the measured values with the requirements of the VDI 2035 and of the manufacturers of the circuit components.

7.2 Operating modes

7.2.1 Filter operation

In case of systems whose water parameters are good but which have a high amount of impurities, filter operation only can make sense.

1. Close the shut-off valves from and to the cartridge.
2. Open the shut-off valve for bypass cartridge.



NOTE: The duration of the filter operation depends on the degree of impurities, the volume and the hydraulic conditions in the heating/cooling circuit.

- It is not possible to accurately indicate the duration of the filter operation.
- ▶ Take samples from the heating/cooling circuit at regular intervals in order to check whether the filter operation can be terminated.

7.2.2 Softening operation



Any inhibitors possibly present in the heating circuit might be removed by the resin of the softening and mixed bed cartridge.

- ▶ Refer to the safety instructions in chapter 2.

1. Check whether the steps described in chapter 5.3.1 have been carried out properly.
2. Open the shut-off valves from and to the cartridge.
3. Close the shut-off valve for bypass cartridge.



NOTE: The duration of the softening operation depends on the hardness present, the target hardness, the volume and the hydraulic conditions in the heating/cooling circuit and in general takes a few hours up to several days.

- It is not possible to accurately indicate the duration.
- ▶ Take the first sample after 1 – 2 hours to roughly estimate the duration of the softening operation.

4. Measure the water parameters and document them in the system log of the heating system.

7.2.3 Demineralisation mode



Any inhibitors possibly present in the heating circuit might be removed by the resin of the softening and mixed bed cartridge.

► Refer to the safety instructions in chapter 2.

1. Check whether the steps described in chapter 5.3.2 have been carried out properly.
 2. Open the shut-off valves from and to the cartridge.
 3. Close the shut-off valve for bypass cartridge.
 4. Set the desired conductivity limit value on the GENO-Multi-LF.
-



NOTE: The conductivity measuring cell measures the conductivity delivered by the mixed bed cartridge.

- The water in the heating/cooling circuit may have a different conductivity.
- Check the water in the circuit separately. In order to check the conductivity of the circulation water with the conductivity measuring cell, the shut-off valves must be set as in filter operation, refer to chapter 7.2.1.
-



Observe the operation manual of the GENO-Multi-LF when setting the conductivity limit value.



NOTE: The duration of the demineralisation operation depends on the conductivity present, the target conductivity, the volume and the hydraulic conditions in the heating/cooling circuit and in general takes a few hours up to several days.

- It is not possible to accurately indicate the duration.
- ▶ Take the first sample after 1 – 2 hours to roughly estimate the duration of the demineralisation operation.

-
5. Measure the water parameters and document them in the system log.

7.2.4 Filling or refilling the heating/cooling circuit

The typical application of the GENO-VARIO mini is the treatment of systems that are already filled. Nevertheless, it is basically possible to also fill or refill systems with the GENO-VARIO mini. The precondition being that the GENO-VARIO mini is vented and is in softening or demineralisation mode.



NOTE: Before carrying out the work, you need to decide whether you want to fill in softened or demineralised water.

- Prior to performing the work, the proper cartridge must be installed and the GENO-VARIO mini must be prepared.
- ▶ Observe chapter 5.3.

-
1. Close the shut-off valve from the heating/cooling circuit on the GENO-VARIO mini.
 2. Reset the water meter as described in chapter 7.3.
 3. Open the shut-off valves for drinking water and pressure reducer.
 - » The heating/cooling circuit is being filled.



In case of demineralisation, a conductivity measurement can be started by means of the ON/OFF switch of the GENO-Multi-LF.



Make sure that the heating/cooling circuit is vented at a suitable point.



CAUTION: The heating/cooling circuit is filled with the water pressure of the drinking water system.

- Damage to the heating/cooling circuit due to the pressure being too high.
 - ▶ Check the admissible pressure of the heating/cooling circuit to be filled.
 - ▶ Set the admissible pressure on the GENO-VARIO mini (refer to chapter 6).
-

4. Close the shut-off valves for drinking water and pressure reducer if the flow has come to a stop.

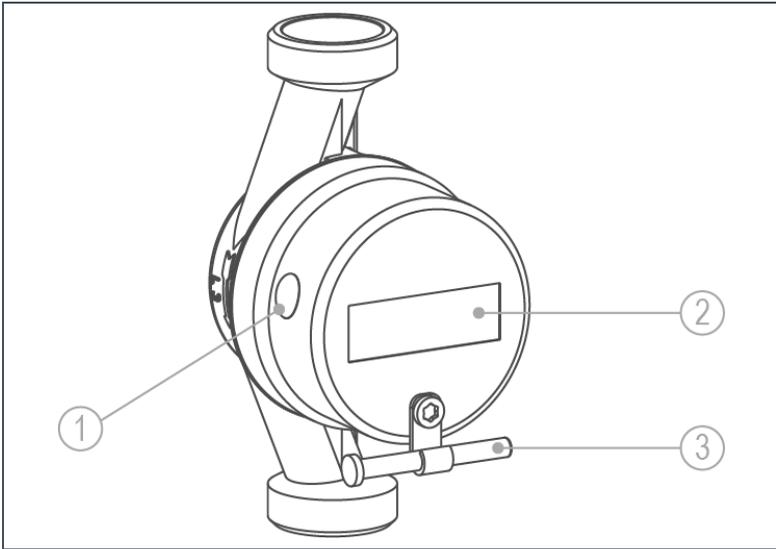


On the water meter you can see whether water is flowing through the system.

5. Document the water volume you have refilled or have required for filling in the system log of the heating system.
6. Measure the water parameters and document them in the system log of the heating system.

7.3 Operating the water meter

7.3.1 Overview



Item	Designation	Item	Designation
1	Sensor field	3	Programming stylus
2	Display		

The display of the water meter has 4 levels:

- Basic display of current flow (in l/h)
- Totals display since last deletion (in m³)
- Number of the deletion processes performed so far
- Readiness to delete the totals display

Using the programming stylus, tap on the marked sensor field on the housing. To do so, proceed as follows:

1. Touch the sensor field with the arrow head for approx. 0.5 sec. .
2. Keep the arrow head at a distance of at least 1 cm from the sensor field for at least 1 sec.

7.3.2 Resetting water meter and totals display



If no tap is made with the programming stylus for 5 seconds, the display returns to the basic display.

You are in the basic display.

1. Using the programming stylus, tap on the marked sensor field on the housing.
 - » The display changes to the totals display.
2. Using the programming stylus, tap on the sensor field a second time.
 - » The display changes to show of the number of deletion processes performed **CL XXXX**.
3. Tap the programming stylus on the sensor field for a third time and stay on it with the stylus.
 - » **CLEAR** is displayed.
After approx. 5 sec, **5** appears in the centre of the display.

4. Stay on the sensor field with the stylus until the display has counted down to 0.
 - » The water meter is reset and ready for a new measurement.



If you started the deletion process by mistake and want to cancel it, remove the stylus from the sensor field prematurely.

8 Shutting down the system



WARNING: When operated in heating circuits, temperatures of more than 55 °C are possible on the system.

- Burns and scalding may occur.
- ▶ Let the GENO-VARIO mini cool down to room temperature or flush it with cold water prior to working on it.

-
1. Close the on-site shut-off valves from and to the heating/cooling circuit.
 2. Open the draining valves of the filter and of the GENO-VARIO mini.
 3. Open the shut-off valves for drinking water and pressure reducer and flush the system until it has reached room temperature.
 4. Close the on-site shut-off valve for drinking water.
 5. Open the shut-off valve for bypass cartridge.
 6. Switch off the GENO-VARIO mini.
 7. Wait until the GENO-VARIO mini is drained completely.
 8. Remove the connection hoses from the shut-off valves to and from the heating/cooling circuit on the GENO-VARIO mini.
 9. Remove the on-site connection hose from the drinking water connection of the GENO-VARIO mini.
 10. Close all shut-off and draining valves.
 11. Loosen the union nut of the filter cylinder.
 12. Pull the filter cylinder off downwards.

13. Remove and dispose of the depth filter element.
14. Install the filter cylinder.
15. Tighten the union nut of the filter cylinder.
16. Drain the cartridge used.



Please observe the manual of the cartridge when draining the cartridge.

17. Close the connections by means of the closing caps.

9 Cleaning, inspection, maintenance

Inspection and maintenance is prescribed in DIN EN 806-5 standard. Proper operation and maintenance of the system are essential for trouble-free and hygienic operation.

An operation log for the documentation of inspections and maintenance work carried out is available in chapter 14.

9.1 Cleaning



Note: Do not clean the product with cleaners that contain alcohol or solvents or use strong, abrasive cleaning agents.

- Non-suitable cleaning agents damage the components.
 - ▶ Use a mild soap solution for external cleaning and thoroughly rinse the parts.
 - ▶ Wipe the surfaces of the system with a damp cloth.
-

9.2 Inspection



Regular inspection increases the operational reliability of your product. DIN EN 806 Part 5 recommends that an inspection be carried out at least every 6 months.

To conduct an inspection, proceed as follows:

1. Check all water-carrying parts for leaks.
2. Check all components for possible damage and corrosion.
3. Check that valves and connections are easy to operate.
4. Check that the drainage system can absorb the discharge water and that a free outlet via the vertical drain funnel is ensured.



The prerequisite for the following steps for the leak test of the system separator is that the drinking water connection provided by the client on site is connected.

5. Open the on-site shut-off valve for drinking water.
6. Open the shut-off valves for drinking water and pressure reducer on the GENO-VARIO mini.
7. Open a withdrawal point downstream (e.g. the draining valve of the filter).
 - » No water may escape from the system separator to the drain funnel.
8. Close the shut-off valve for the pressure reducer.
9. Close the on-site shut-off valve for drinking water.
 - » No water may escape from the system separator to the drain funnel.

10. Open the shut-off valve for the pressure reducer.

11. Close the shut-off valve for drinking water on the GENO-VARIO mini.

9.3 Maintenance



Regular inspection increases the operational reliability of your product. DIN EN 806 Part 5 recommends that maintenance be carried out at least every 12 months.



May only be carried out by a qualified specialist.

- ▶ Service the GENO-VARIO mini with the service kit for the maintenance of system separators (order no. 132 095).

In addition to the inspection work described in chapter 9.2, proceed as follows in order to perform maintenance:

Cleaning the dirt trap

1. Close both shut-off valves.
2. Depressurise the filling combination by unscrewing the screw plug at the test connection of the upstream pressure zone.
3. Remove the safety clip at the test connection of the upstream pressure zone and remove the brass insert.
4. Remove the internal dirt trap and clean it.
5. Reassemble all components.
6. Mount the safety clip.
7. Tighten the screw plug.

Cleaning the drain funnel

- ▶ Clean the drain funnel (free outlet) and the ventilation openings.

Functional check of the system separator



The prerequisite for the following steps for the functional and leak test of the system separator is that the drinking water connection provided by the client on site is connected.

1. Open the on-site shut-off valve for drinking water.
2. Open the shut-off valve on the filling group of the GENO-VARIO mini until water pressure is applied and then close it again.
3. Slowly unscrew the screw plug at the test connection of the upstream pressure zone of the system separator by approx. ½ turn.
 - » The relief valve must open, the intermediate pressure zone must drain completely and water must escape to the drain funnel.
4. Close the screw plug at the test connection of the upstream pressure zone of the system separator.
5. Open the shut-off valve for drinking water on the filling group (inlet).
 - » The filling group goes into operating position – no water is escaping any longer.
6. Close the on-site shut-off valve for drinking water.
7. Open a withdrawal point downstream (e.g. the draining valve of the filter).

Testing of rest, flow and differential pressure of the system separator

The service kit (refer to chapter 3.5) can be used to perform a test. For the necessary test steps, refer to the operation manual of the service kit, order no. 132 945 or to DIN 12729.

- ▶ Enter all work in the operation log.

9.4 Consumables



NOTE: Damage to the system due to unsuitable consumables.

- Risk of functional impairment, malfunctions and loss of warranty.
- ▶ Only use genuine consumables.

Product (2 pcs each in cardboard box)	Order number
Depth filter element 25 µm	707 570
Depth filter element 50 µm	707 575
Depth filter element 100 µm	707 580
Depth filter element 150 µm	707 585

9.5 Spare parts

You may order spare parts and consumables from your local Grünbeck representative (refer to the internet at www.gruenbeck.com).



NOTE: Damage to the system due to unsuitable spare parts.

- Risk of functional impairment, malfunctions and loss of warranty.
 - ▶ Only use genuine spare parts.
-

9.6 Wearing parts



NOTE: Damage to the system due to unsuitable wearing parts.

- Risk of functional impairment, malfunctions and loss of warranty.
 - ▶ Only use genuine wearing parts.
-

Wearing parts are listed below:

- Circulation pump
- Water meter
- Air vent
- Pressure reducer and pressure gauge
- Components of system separator
- Inlet and outlet valve
- Flow controller
- Temperature sensor
- Draining valves

10 Malfunctions

Observation	Meaning	Remedy
GENO-VARIO mini in general		
No or insufficient flow Detectable at the display of the water meter and by the extinguished LED on the illuminated button for flow display/start.	Inlet and return line to the cartridge mixed up.	Swap inlet and return on the tank lid.
	Hose line kinked.	Check hose lines.
	One or several shut-off valves closed.	Check shut-off valves.
	Air in circuit.	Vent as described in chapter 6. Check air vent for function.
	Depth filter element dirty.	Replace depth filter element.
Sieve on the connection of cartridge dirty.	Clean sieve and find the cause of the impurities.	
No flow or insufficient flow Detectable by the extinguished LED on the illuminated button for flow display/start and the extinguished LED on the selector switch for pump switch-off 60 °C or 80 °C.	Pump switch-off 60 °C or 80 °C has triggered.	Let the circuit cool down. Flush the GENO-VARIO mini with cold water via the draining valves.
Circulation pump		
Circulation pump is not running.	Mains overvoltage or undervoltage occurred; protective function of circulation pump motor	Switch the GENO-VARIO mini off for 30 sec and on again. If the pump starts running again, the error has been eliminated.
	Motor clogged, e.g. due to deposits. The control unit of the pump makes 5 restart attempts at intervals of 30 sec.	Switch the GENO-VARIO mini off for 30 sec and on again. If the pump does not run again after 5 restart attempts, it must be replaced.
	Defective motor or module. The pump makes 5 restart attempts at intervals of 30 sec.	
	Poor synchronisation of the pump. The pump makes 25 restart attempts at intervals of 5 sec.	Switch the GENO-VARIO mini off for 30 sec and on again. If the pump does not run again after 25 restart attempts, it must be replaced.

Observation	Meaning	Remedy
Soft water meter		
No display on water meter.	Battery on water meter dead.	Replace the water meter or send it to Grünbeck for reworking.
Softening cartridge		
Insufficient exchanger capacity of cartridge.	Insufficient venting.	Repeat venting.
	Exhausted cartridge installed.	Replace cartridge or resin.
Target hardness not achieved.	Resin exhausted.	Replace cartridge or resin.
Mixed bed cartridge		
Insufficient exchanger capacity of cartridge.	Water softener installed upstream.	Cartridge directly connected to untreated drinking water.
	Phosphate system installed upstream.	
	Insufficient venting.	Repeat venting.
	Exhausted cartridge installed.	Replace cartridge or resin.
Volatile increase of conductivity value after longer use.	Reionisation.	Let the water run off unused until the conductivity value drops.
Conductivity limit value exceeded.	Resin exhausted.	Replace cartridge or resin.
System separator		
Water escaping for a short time or repeatedly at the outlet funnel.	This is a normal control behaviour in case of fluctuating pressure at the inlet.	No malfunction.
Water escaping permanently at the outlet funnel when relief valve is closed (the system separator is in flow position).	Non-return valve on the inlet side, control unit or relief valve leaking or defective due to impurities or damage.	Check non-return valve on the inlet side, control unit and relief valve for damage, clean them and/or replace parts.
Water escaping permanently at the outlet funnel when relief valve is open (the system separator is in separation mode).	Non-return valve on the outlet side leaking or defective due to impurities or damage.	Check non-return valve on the outlet side for damage, clean it and/or replace parts.
Pressure reducer		
High pressure when filling or refilling the heating system.	Defective pressure gauge.	Check with a different pressure gauge; replace, if faulty..
Increase in system pressure above the pressure set on the pressure reducer.	Impurities on the seal seat of the pressure reducer.	Close shut-off valves to heating/cooling circuit and monitor the pressure on the outlet side. If the pressure increases, check the pressure reducer for impurities.

11 Disposal

- ▶ Observe the applicable national regulations.

11.1 Packaging

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

11.2 Product



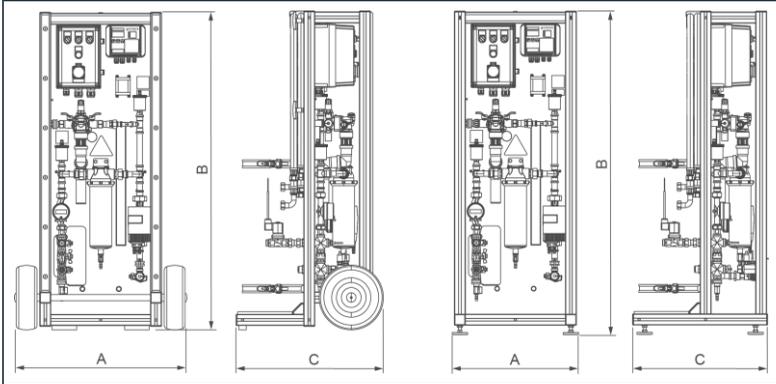
If this symbol (crossed out waste bin) is on the product, this product is subject to the European Directive 2012/19/EU. This means that this product or the electrical and electronic components must not be disposed of as household waste.

- ▶ 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 management authority, an authorised body for the disposal of electrical and electronic products or your waste disposal service.

12 Technical specifications



Dimensions and weights			Mobile variant	Stationary variant
A	System width	mm	697	514
B	System height	mm	1280	1301
C	System depth	mm	595	548
Operating weight (subject to accessories)		kg	85 – 109	85 – 109
Empty weight		kg	47	47

Connection data		
Nominal connection diameter	DN (thr)	20 (3/4" male thread)
Power supply	V/Hz	230/50

Performance data		
Nominal pressure (drinking water inlet)	PN	10
Nominal pressure (circuit)	PN	6
Min./max. operating pressure (circuit)	bar	1.5/4
Circulation capacity ^{a)}	l/h	500 – 1000
Circulation capacity of filtration ^{a)}	l/h	200 – 1400

^{a)} Depending on the pollution of the filter and the accessories used.

• Technical specifications

General data		
Setting range of pressure reducer	bar	0.2 – 4
Water temperature (inlet)	°C	5 – 65
Water temperature (circuit)	°C	5 – 80
Ambient temperature	°C	5 – 40
<hr/>		
Order no. (mobile variant)		707 550
Order no. (mobile variant incl. GENO-Multi-LF)		707 550.01
Order no. (stationary variant)		707 560
Order no. (stationary variant incl. GENO-Multi-LF)		707 560.1

13 Other information

13.1 Explanation of terminology

Drinking water	Drinking water is any water that is intended to be used in the domestic environment for drinking and all other food preparation purposes, for personal hygiene and cleaning as well as for cleaning objects that do not only temporarily come into contact with foodstuffs or the human body.
Fully softened water	Water without any residual hardness.
Fully demineralised water	Water without mineral substances.
Particles	Solid matter in the drinking water, contrary to dissolved solids in the drinking water
Precipitation	Designates dissolved solids that, due to changes, spontaneously form solid matter in drinking water. Applies, for instance, to dissolved scale.
Inhibitors	Inhibitors are substances that prevent, inhibit or delay a reaction. In heating systems, inhibitors are used for corrosion protection.

14 Operation log

Heating water treatment system GENO-Vario mini

Serial no.: _____

Work performed

Inspection Maintenance Repair

Description

Execution confirmed

Company: _____

Name: _____

Date: _____

Signature: _____

Work performed

Inspection Maintenance Repair

Description

Execution confirmed

Company:

Name:

Date:

Signature:

Work performed

Inspection Maintenance Repair

Description

Execution confirmed

Company:

Name:

Date:

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Work performed

Inspection Maintenance Repair

Description

Execution confirmed

Company:

Name:

Date:

Signature:

Work performed

Inspection Maintenance Repair

Description

Execution confirmed

Company:

Name:

Date:

Signature:

EU Declaration of Conformity

In accordance with the Low Voltage Directive 2014/35/EU, Appendix IV



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.

If the system is modified in a way not approved by us, this certificate is void.

**Heating water treatment system
GENO-Vario mini**

Serial no.: Refer to type plate

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

- EMC (2014/30/EU)

The following harmonised standards have been applied:

- DIN EN 61000-6-2:2006-03
- DIN EN 61000-6-3:2011-09
- DIN EN ISO 12100:2011-03

The following national standards and regulations have been applied:

- DIN EN 1717:2011-08

Responsible for documentation:

Dipl. Ing. (FH) Markus Pöpperl

Manufacturer

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

Hoechstaedt, January 2019

A handwritten signature in black ink, appearing to read 'M. Pöpperl'.

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

Notes

Notes

Notes

Index

C

Circulation pump 29
Conductivity measuring cell ..26, 27,
28
Connecting hoses..... 31

D

Depth filter element 30

F

Filter cylinder.....30, 44, 45

I

Illuminated button..... 20
Inspection.....46, 47
Installation site: 22

M

Maintenance.....46, 48
Mixed bed cartridge ..17, 18, 27, 28,
53

O

ON/OFF switch.....20, 26, 27, 34

P

Prohibition sign..... 11
Pump switch-off..... 20

S

Scope of supply..... 23
Sensor field42, 43
Serial number..... 8
Shut-off and draining valves 30
Shut-off valve 32, 33, 36, 37, 38, 39
Softening cartridge 26
Solenoid valve26, 27, 28
Spare parts..... 50

T

Type plate 8

W

Warning sign 11
Water meter34, 43, 51

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