oventrop

Regumaq X-45

Operating instructions EN

Regumaq X-45
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1. General information

The original operating instructions are written in German.

The operating instructions in other languages have been translated from German.

1.1 Validity of the instructions

These instructions are valid for the Regumaq X-45 fresh water station.

1.2 Type plate

The type plate is attached to the bottom left of the upper shell from the outside.

1.3 Scope of delivery

Check your delivery for transport damage and completeness.

The scope of delivery includes:

- Regumaq X-45 fresh water station
- Fixing material
- Wall bracket
- 4x sealing ring
- Operating instructions

1.4 Contact

Contact address
OVENTROP GmbH & Co. KG
Paul-Oventrop-Straße 1
59939 Olsberg
GERMANY

Technical customer service
Phone: +49 (0) 29 62 82-234

1.5 Declaration of conformity

Oventrop GmbH & Co. KG hereby declares that this product has been manufactured in compliance with the essential requirements and the relevant provisions of the relevant EU directives.

The declaration of conformity is attached.

1.6 Symbols used

	Highlights important information and further additions.
▶	Action required
•	List
1 2	Fixed order. Steps 1 to X.
▷	Result of action

2. Safety-related information

2.1 Intended use

Operational safety is only guaranteed if the product is used as intended.

The station is an electronically controlled product assembly with heat exchanger for use in domestic areas (e.g. rental units in residential, business or commercial areas). The product assembly supplies heated potable water (hot water).

Use the product:

- In technically perfect condition.
- At locations directly connected to the public low-voltage grid.

The passage of media other than heating water in the storage cylinder circuit and potable water in the potable water circuit is not as intended. Direct connection of the fresh water station to the local and/or district heating networks can lead to malfunctions. Parallel operation with other heating system components, such as heating circuit stations etc. is not permitted.

Any further and/or different use is considered unintended use.

Claims of any kind against the manufacturer and/or his authorised representatives for damage resulting from unintended use cannot be recognised.

Intended use also includes correct compliance with these instructions.

2.2 Modifications to the product

Modifications to the product are not permitted. In case of modifications to the product, the warranty will become void. The manufacturer will not accept liability for damage and breakdowns caused by modifications to the product.

2.3 Warnings

Each warning contains the following elements:

Warning symbol **SIGNAL WORD**

Type and source of danger!
Possible consequences if the danger occurs or the warning is ignored.

! Ways to avoid the danger.

Signal words define the severity of the danger posed by a situation.

DANGER

Indicates an imminent danger with high risk. If the situation is not avoided, death or most serious bodily injuries will result.

WARNING

Indicates a possible danger with moderate risk. If the situation is not avoided, death or serious bodily injuries may result.

CAUTION

Indicates a possible danger with lower risk. If the situation is not avoided, minor and reversible bodily injuries will result.

NOTICE

Indicates a situation that can potentially result in damage to property if not avoided.

2.4 Safety instructions

We have developed this product in accordance with current safety requirements.

Observe the following instructions for safe use.

2.4.1 Danger to life due to legionella formation

Ensure the following:

- The temperature of the potable water in the cold water pipeline must not exceed 25 °C.
- The water in the potable water circuit must be completely replaced after 72 hours at the latest.
- When using a circulation pipe, the hot water temperature must be at least 60 °C. The temperature difference between the hot water outlet of the heat exchanger and the return of the circulation pipe at the station must not exceed 5 °C.

2.4.2 Danger to life due to electric current

- ▶ Make sure that the product can be disconnected from the power supply at any time.
- ▶ Do not operate the product if there is visible damage.

The controller only needs to be opened when using accessory components. Work on the power supply is therefore only necessary when using accessory components.

Work on the power supply may only be carried out by a qualified electrician.

- ▶ Disconnect the product from the power supply at all poles and secure the station against being switched on again.
- ▶ Check that no voltage is present.
- ▶ Only mount the product in dry indoor areas

2.4.3 Danger due to insufficient personnel qualification

Work on this product may only be carried out by suitably qualified specialist tradespeople.

Due to their professional training and experience as well as knowledge of the relevant legal regulations, qualified specialist tradespeople are able to carry out work on the described product in a professional manner.

Operator

The operator must be instructed in the operation by specialist tradespeople.

2.4.4 Risk of scalding due to hot water

Due to setting or defect of the controller, the hot water temperature at the draw-off points can rise up to the heating water temperature in the buffer storage cylinder.

If there is a risk of scalding in accordance with DIN EN 806 and DIN 1988 due to a high heating water temperature in the buffer storage cylinder, you must install scald protections at all draw-off points.

If the heating water temperature in the buffer storage cylinder is low, resulting in a low hot water temperature without risk of scalding at the draw-off points, you must instruct the system operator to ensure the low heating water temperature in the buffer storage cylinder all year round.

2.4.5 Risk of injury from pressurised components

- ▶ Only carry out work on the storage cylinder circuit or the potable water circuit when the system is depressurised.
- ▶ Adhere to the permissible operating pressures during operation.
- ▶ Install a non-shut off safety valve in the potable water heating system (DIN EN 806-2).

2.4.6 Risk of burns due to unintentionally escaping hot media

- ▶ Only carry out work on the storage cylinder circuit or the potable water circuit when the system is depressurised.
- ▶ Allow the product to cool down before working on it.
- ▶ Check that the product is not leaking after work is complete.
- ▶ Wear safety goggles.

2.4.7 Risk of burns on hot components and surfaces

- ▶ Allow the product to cool down before working on it.
- ▶ Wear suitable protective clothing to avoid unprotected contact with hot fittings and system components.

2.4.8 Risk of injury due to the weight of the product

- ▶ Always wear safety shoes during installation.

2.4.9 Risk of injury from improper work

Stored energy, angular components, points and corners on and in the product can cause injuries.

- ▶ Ensure there is sufficient space before starting work.
- ▶ Handle open or sharp-edged components with care.
- ▶ Keep the working area tidy and clean to avoid sources of accidents.

2.4.10 Damage to property due to unsuitable location

- Do not install the product in rooms prone to frost.
- Do not install the product in wet or damp environments.
- Do not install the product in rooms with corrosion-enhancing ambient air. Observe the notes on corrosion protection in the appendix.
- Ensure that the product is not exposed to strong sources of electromagnetic radiation.

2.4.11 Risk of damage to property due to incorrect operation

- Do not close the secondary ball valves during operation.

2.4.12 Availability of the operating instructions

Every person who works with this product must have read and apply this manual and all applicable instructions (e.g. accessories instructions).

The instructions must be available at the place of use of the product.

- Pass on these instructions and all applicable instructions (e.g. accessories instructions) to the operator.

3. Technical description

3.1 Design

3.1.1 Station design

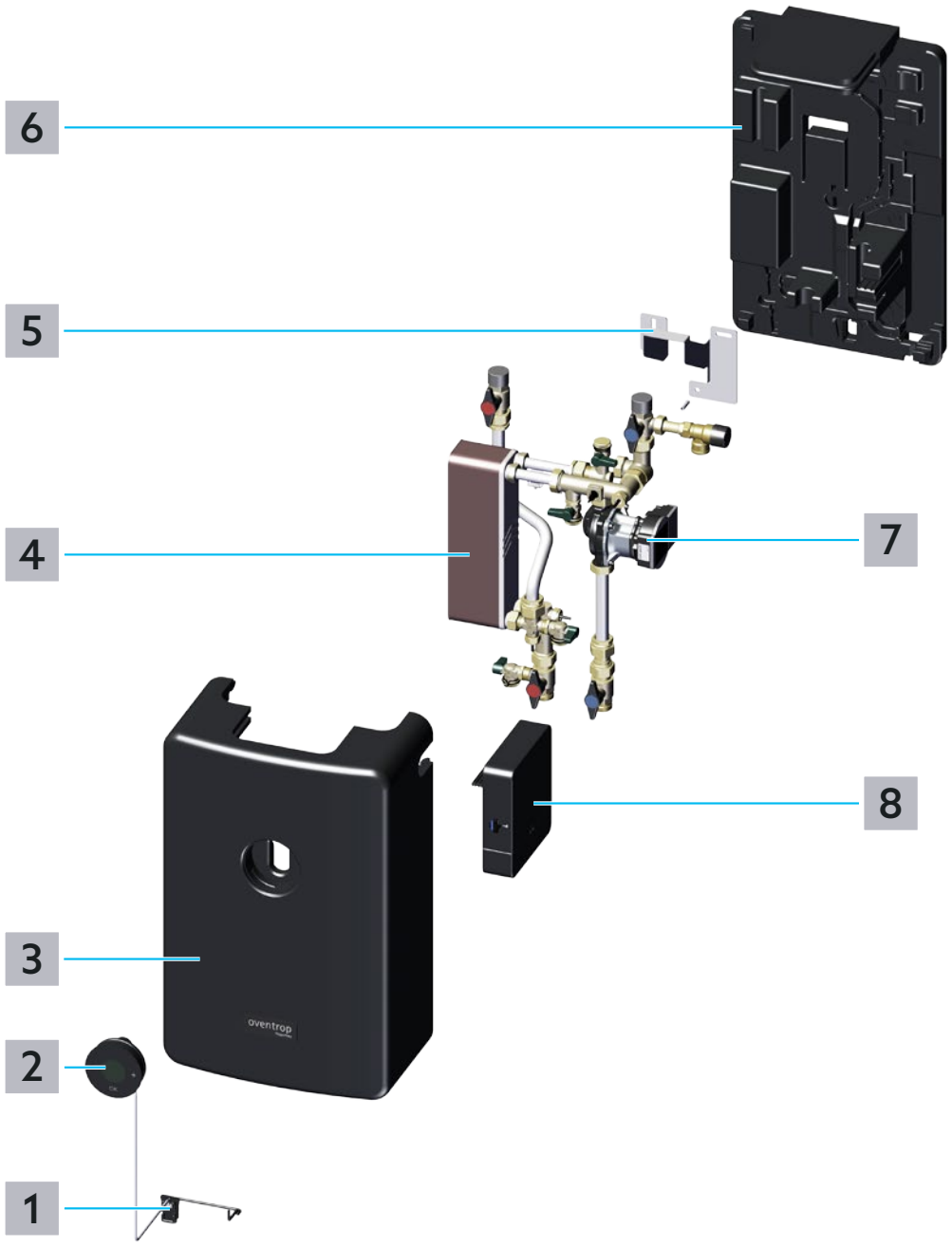

Fig. 1: Station design

1	Magnetic contact	**5**	Wall bracket
2	Touch control panel	**6**	Lower shell
3	Upper shell	**7**	Circulation pump for storage cylinder circuit
4	Heat exchanger	**8**	Controller

3.1.2 Product assembly design

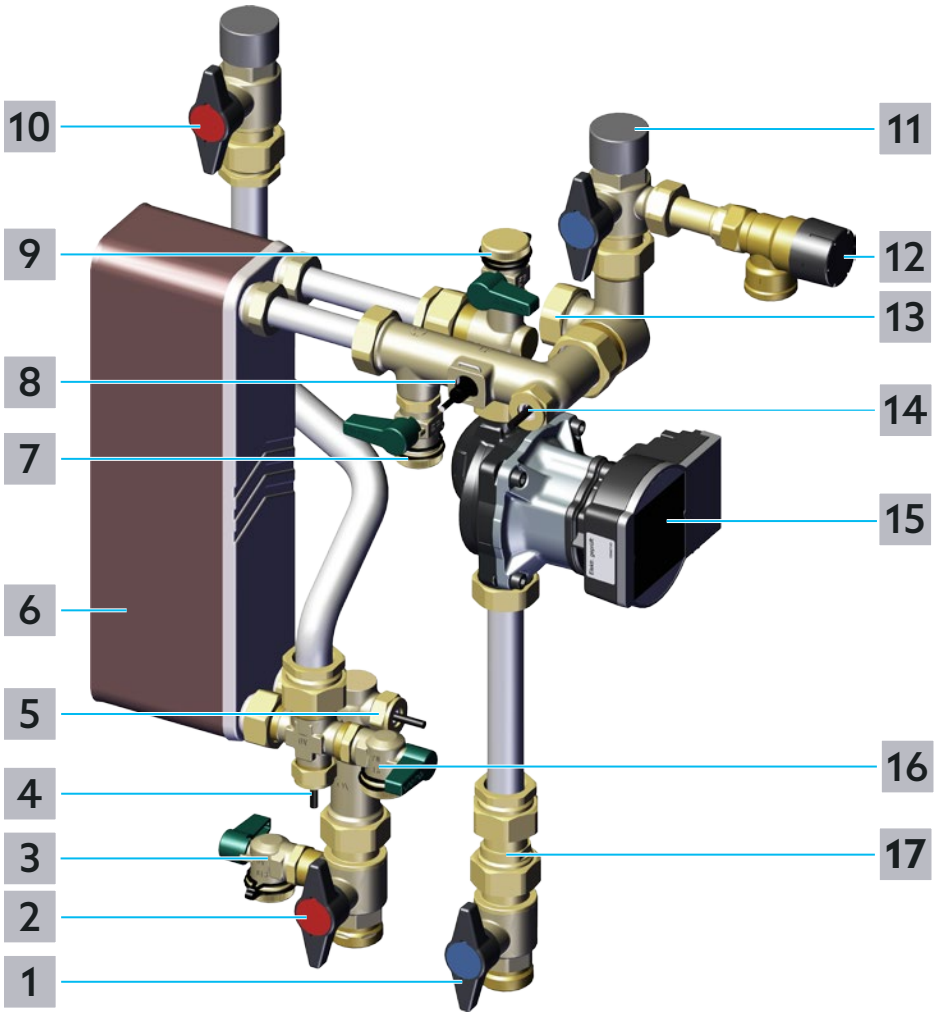

Fig. 2: Product assembly design

1	Shutoff ball valve for storage cylinder circuit return
2	Shutoff ball valve for storage cylinder circuit supply
3	Fill and drain ball valve for storage cylinder circuit supply
4	Temperature sensor for potable water (hot) S2
5	Temperature sensor for storage cylinder circuit S1
6	Heat exchanger
7	Fill and drain ball valve for potable water (cold)
8	Volume flow sensor for potable water circuit
9	Fill and drain ball valve for storage cylinder circuit return
10	Shutoff ball valve for potable water (hot)
11	Shutoff ball valve for potable water (cold)
12	Safety valve for potable water circuit (10 bar)
13	Connection for circulation pipe
14	Temperature sensor for potable water (cold)/ circulation S3
15	Circulation pump for storage cylinder circuit
16	Fill and drain ball valve for potable water (hot)
17	Backflow preventer in the storage cylinder circuit

3.2 Functional description

The Regumaq X-45 is an electronically controlled product assembly with heat exchanger for potable water heating according to the continuous flow principle. The potable water is only heated when it is needed. This station does not require hot potable water to be stored in a storage cylinder. The station enables heat to be provided according to demand, even with very low potable water consumption.

The integrated heat exchanger provides system separation between the potable water circuit and the storage cylinder circuit.

At a specified potable water temperature of 60 °C and a storage cylinder temperature of 75 °C, the discharge of hot potable water can be between 1 and 45 l/min. The provision of hot potable water is realised by the controller regulating the circulation pump to a (variable) speed in order to feed heating water from the connected buffer storage cylinder into the heat exchanger according to demand. Based on the actual values for the volume flow and the temperature (of the potable water) recorded by the sensors, the controller calculates the pump speed required to achieve the desired hot potable water temperature.

The controller is connected to the touch control panel via magnetic contacts. The contacts are closed or separated by mounting and removing the upper shell.

The controller is equipped with a total of 5 relays. Consumers (e.g. pumps, valves or similar) can be connected to the relays.

Example:
Simultaneous tapping at several draw-off points and the associated higher consumption of hot potable water immediately triggers a higher pump speed in order to feed more heating water into the heat exchanger. This transfers correspondingly more heat to the potable water circuit.

3.3 Installation schemes

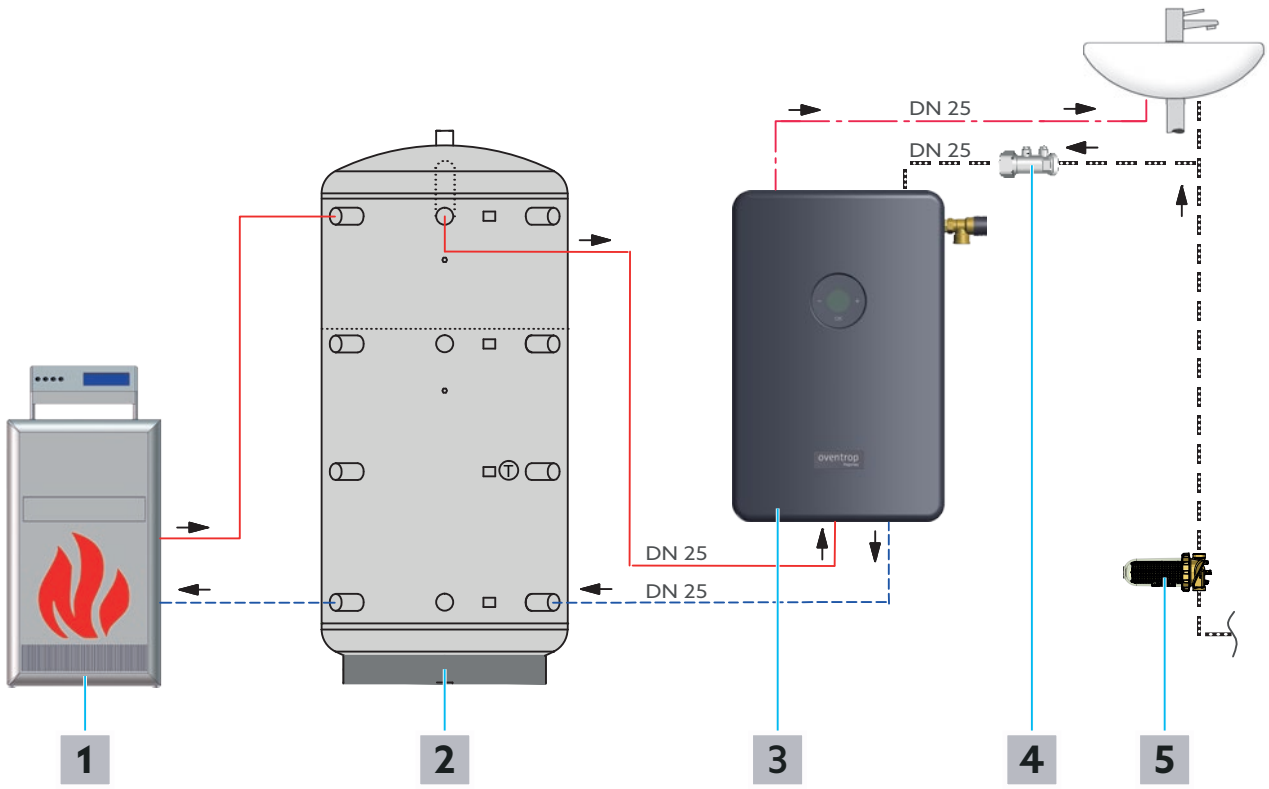

Fig. 3: Installation scheme with a Regumaq X-45 fresh water station

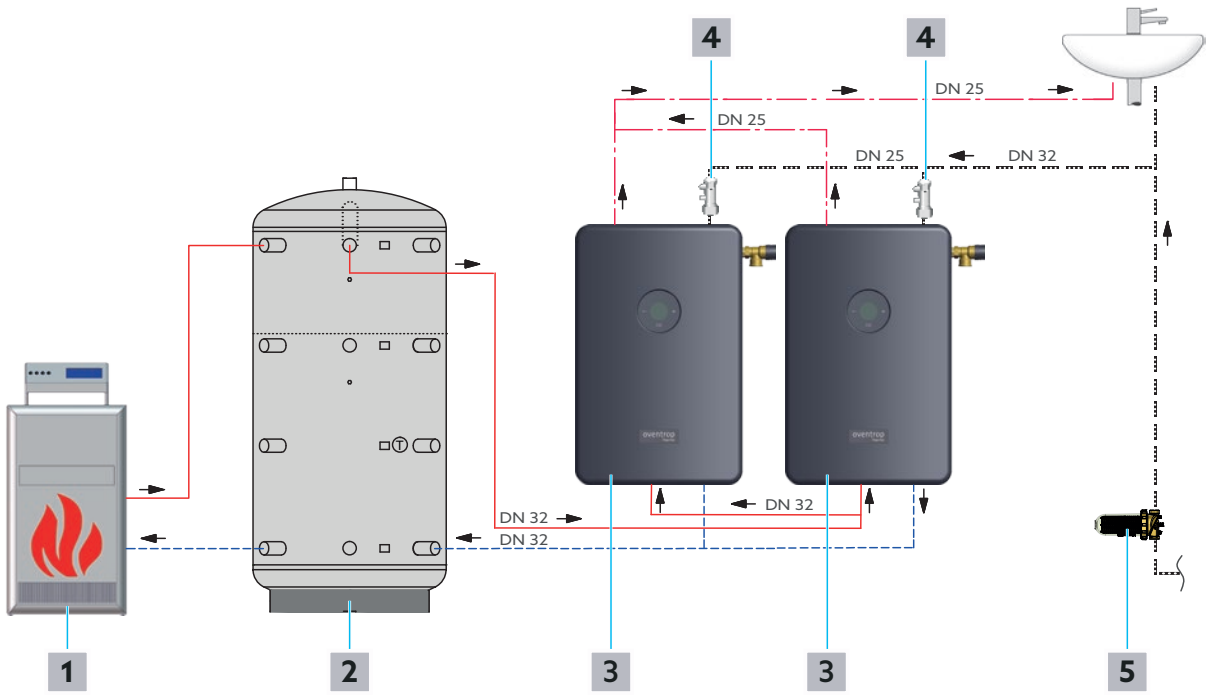

Fig. 4: ***Installation scheme with two Regumaq X-45 fresh water stations***

1	Heat generator
2	Buffer storage cylinder
3	Regumaq X-45
4	Backflow preventer
5	Water filter
	Storage cylinder circuit supply
	Storage cylinder circuit return
	Potable water (cold) (PWC)
	Potable water (hot) (PWH)
	Direction of flow

If you operate several Regumaq X-45 stations in parallel, pipe the stations according to the Tichelmann's pipe routing in order to realise an even flow through the stations with the lowest possible resistance.

3.4 Application example

Design temperatures: 60°C hot water; 75°C flow temperature storage cylinder circuit (design according to DIN 1988-300)

Number of X-45 stations	Residential building	Hospital room	Hotel room	Series shower installation	Buffer storage cylinder volume [l]	Required boiler output [kW]
	1 washbasin 1 kitchen sink 1 shower	**1 washbasin 1 shower**	**1 washbasin 1 shower**	**Number of showers at 6l/min 60 °C PWH (simultaneity factor 80%)**		
1	7	7	7	9	800	39
2	48	28	26	18	1500	82

3.5 Technical data

General information	
Max. operating pressure (p_S)	10 bar
Max. operating temperature (t_S)	95°C
Ambient temperature	2 - 35 °C
Empty weight	Approx. 15 kg

Connections	
Storage cylinder circuit, potable water circuit, circulation	G 1 flat sealing external thread
Fill and drain ball valves	G ¾ external thread, for hose fitting

Storage cylinder circuit	
Fluid	Heating water according to VDI 2035/Ö-Norm (Austrian standard) H5195-1, fluid category ≤ 3 according to DIN EN 1717, (see Oventrop information sheet on corrosion protection in the appendix)
k_V value	3.41 m³/h
High-efficiency pump	Wilo PARA 15-130/8-75/ LIN-9 Power consumption in operation 2 - 75 W

Potable water circuit	
Fluid	Potable water (see Oventrop information sheet on corrosion protection in the appendix) ***Notice*** **Damage to the measuring turbine due to chemical influences!** Water treatment additives in high concentrations can damage the measuring turbine. ! Ensure that the permissible limits for potable water are not exceeded.
Discharge capacity (at Δ T = 15K)	1-45 l/min
k_V value	2.55 m³/h
Safety valve	10 bar
- Control range: - Controller presetting:	20 - 75°C 35 - 60°C

Material	
Valves and fittings	Brass / dezincification resistant brass
Seals	Fibre material, EPDM

Thermal insulation	Expanded polypropylene
Pipes	Stainless steel 1.4404
Heat exchanger copper brazed	Plates: Stainless steel 1.4401 Connections: Stainless steel 1.4404 Brazing material: Copper
Heat exchanger copper brazed, Sealix® protective layer	Plates: Stainless steel 1.4401 Connections: Stainless steel 1.4404 Brazing material: copper Protective layer: SIO_2based

Dimensions

Width/Height/Depth	400/625/240 mm
Pipe distance (primary) connections	100 mm
Pipe distance (secondary) connections	250 mm
Centre distance - Wall (primary)	105 mm
Centre distance - Wall (secondary)	65 mm
Distance between sealing surfaces Primary to secondary side	565 mm

Torques

Union nuts G¾	45 Nm
Union nuts G 1	45 Nm
Temperature sensor	15 Nm

Controller

Inputs	8 sensors, 1 Sika volume flow sensor
Outputs	4 electromechanical relays, 1 potential-free relay and 4 PWM outputs
Switching capacity	1 (1) A 240 V~ (electromechanical relay) 4 (2) A 240 V~ (potential-free relay)
Total switching capacity	4 A 240 V~
Relay 1 to 4	Electromagnetic Conductor 1 to 4 Neutral conductor N Protective conductor ⏚
Relay 5	Potential-free relay R5-A = Normally open contact R5-M = Centre contact R5-R = Normally closed contact
Supply	100 – 240 V~ (50 – 60 Hz)
Connection type	X
Mode of operation	Type 1.C.Y
Rated surge voltage	2.5 kV
Fuse	T4AH250V
Data interface	S bus LIN bus, microSD card slot
Casing	Plastic, PC-ABS and PMMA
Display /	Touch/full graphic display
Operation	3 touch keys
Protection type	IP 21 / DIN EN 60529
Protection class	I
Contamination degree	2
Controller dimensions	183 x 203 x 54 mm
Touch control panel dimensions	Ø 100, depth 50 mm

3.5.1 Dimensions in mm

3.5.1.1 With upper shell

Fig. 5: Dimensions Regumaq X-45 with upper shell

3.5.1.2 Lower shell with product assembly

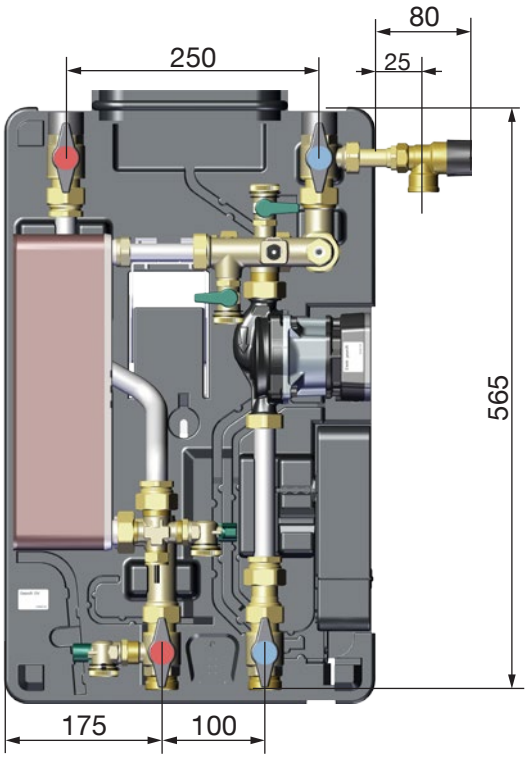

Fig. 6: Dimensions Regumaq X-45 with product assembly

3.5.1.3 Side view

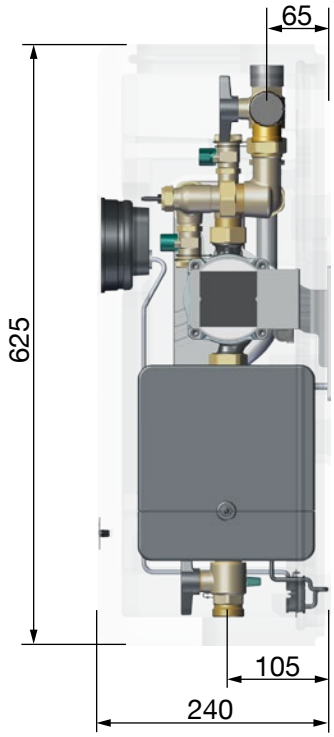

Fig. 7: Dimensions Regumaq X-45 side view

3.5.1.4 Wall bracket

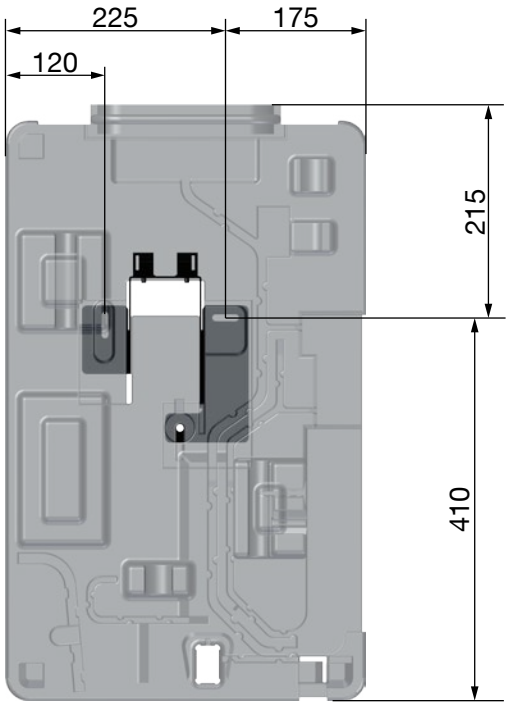

Fig. 8: Dimensions Regumaq X-45 wall bracket

3.6 Terminal assignment of the controller

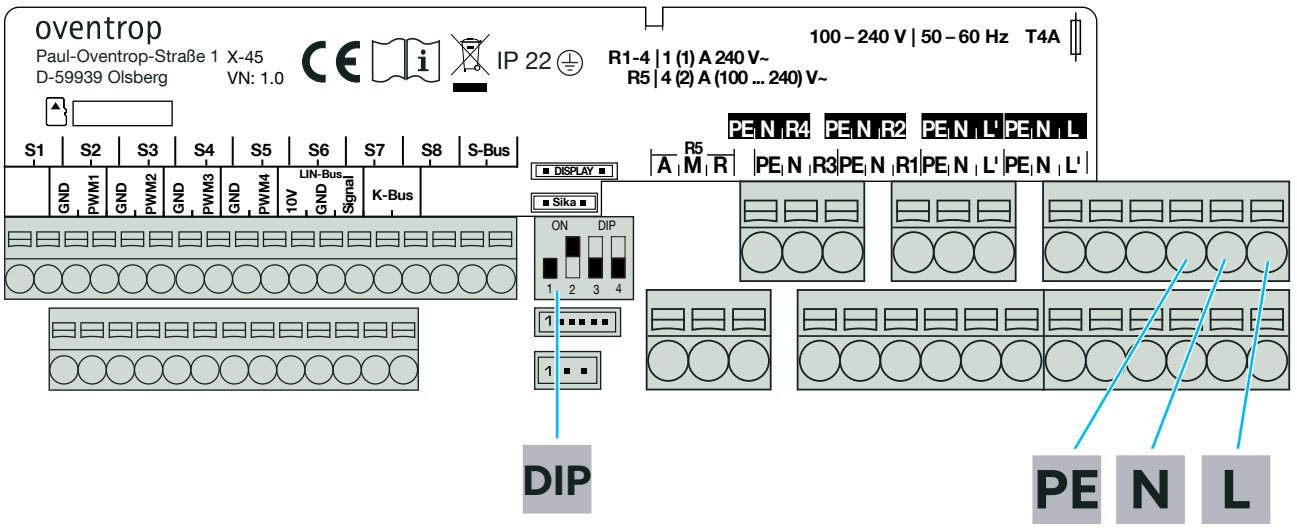

Fig. 9: Terminal assignment

Sensors

S1	Storage cylinder supply	Connections for temperature sensors **with any polarity** at terminals S1 to S8.
S2	Hot water	
S3	Cold water	
S4 - S8	Unassigned, freely assignable	

Control outputs for high-efficiency pumps

PWM 1-4	Control outputs for high-efficiency pumps.

Interface for LIN bus pump

10 V	
GND	Connection of the LIN bus pump to the terminals 10 V, GND and Signal, **observing the prescribed polarity**.
Signal	

Interface for the touch control panel

Display	Connection via plug contact

Volume flow sensor (Sika)

10 V		
V̇	Flow rate	Connection for the volume flow sensor via **plug contact.**
GND		

Power supply 100 – 240 V~ (50 – 60 Hz)

PE	Protective conductor
N	Neutral conductor
L	Phase power supply
R1 - R4	Electromagnetic relay
R5	Potential-free relay
L'	Phase (permanently live, fused contact)

4. Accessories and spare parts

CAUTION

Risk of injury due to incorrect accessories and spare parts!
Incorrect or faulty accessories and spare parts can cause damage, operational failure and malfunction, creating a risk of injury.

- ! Always use original spare parts from the manufacturer.
- ! If possible, use original accessories from the manufacturer or suitable accessories.

You will find the current accessories and spare part list on our website.

1 Go to the website **www.oventrop.com**.

2 Open the search by clicking on the magnifying glass symbol.

3 Enter the item no. of your product into the search field.

4 Confirm the entry with "Enter" or by clicking on the magnifying glass

5 Select your product.

▷ On the overview page that opens, you will find various information about your product.

5. Transport and storage

Temperature range	0 °C to +40 °C
Relative air humidity	Max. 95%
Particles	Store in a dry and dust-protected place
Mechanical influences	Protected from mechanical shock
Weather influences	Do not store outdoors
	Protected from UV rays and direct sunlight
Chemical influences	Do not store together with aggressive media

6. Mounting

DANGER

Danger to life due to electric current!
There is a danger to life if live components are touched.

- ! Disconnect the product from the power supply at all poles.
- ! Check that no voltage is present.
- ! Secure the product against being switched on again.
- ! Only mount the product in dry indoor areas.

WARNING

Risk of injury from pressurised components!
Media escaping under pressure can cause injuries.

- ! Only carry out installation work when the system is depressurised.

For retrofitting an existing system:

- ! Drain the system or shut off the supply pipes of the system section and depressurise the system section.

CAUTION

Risk of injury due to the heavy weight of the station!
The station is heavy. Falling down can cause injuries.

- ! Always wear safety shoes during installation.

6.1 Notes on mounting

The fresh water station should not be considered in isolation, but always in interaction with other components of the heating system.

- ▶ Match the design of the buffer storage cylinder and the heat generator to the performance characteristics of the fresh water station and the specific consumption behaviour in the property.
- ▶ When designing the heat generator, also consider the energy consumption for heating mode.

NOTICE

Damage to property due to overpressure in the system!
The safety valve only protects the potable water circuit within the fresh water station.

- ! Equip the potable water system with an additional (non-shut-off) safety valve in accordance with DIN EN 806-2.

NOTICE

Damage to property due to frost or overheating!
Frost or excessive ambient temperatures may damage components of the station.

- ! Mount the station in a dry, frost-free room in which the ambient temperature does not exceed 35 °C during operation.

- ▶ Before mounting the station, make sure that the pipes to the installation site have been laid, flushed and leak tested.
- ▶ Before mounting the station, make sure that power cables and earthing cables are routed to the installation site.
- ▶ Always mount the station upright, never inclined or lying down.
- ▶ The station must always be freely accessible even after mounting.
- ▶ The station should be installed as close as possible to the buffer storage cylinder. The pipe connection must have a nominal diameter of at least DN 20.

6.2 Wall mounting of the station

6.2.1 Required tools

Have the following tools ready for wall mounting:

- Pipe wrench
- Spirit level
- Drill (8 mm masonry drill bit)
- 10 mm open-end spanner / reversible ratchet with 10 mm socket
- 32 mm open-end spanner
- 38 mm open-end spanner
- 4 mm key for screws with hexagon socket
- Marking pen

6.2.2 Mounting

To ensure that the magnetic contact is closed correctly, the upper shell must be fitted accurately.

- Avoid tilting.
- When mounting on a stud frame, make sure that in addition to a cross brace at the height of the wall bracket, another one is installed at the height of the magnetic contact!

1 Pull the product out of the box.

2 Lift off the upper shell.

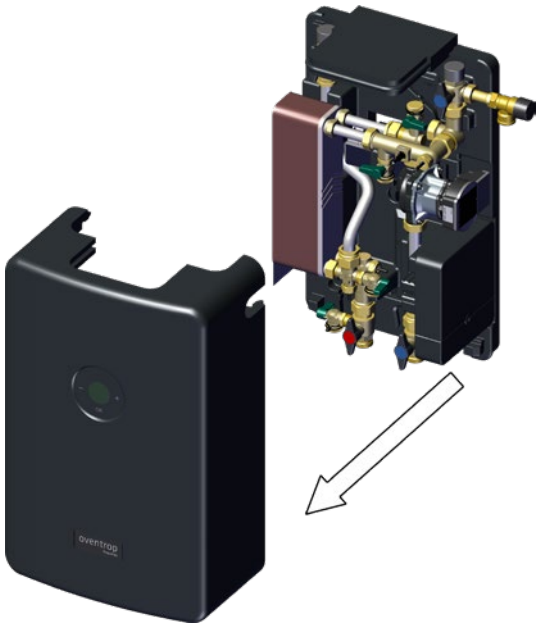

Fig. 10: Removal of the upper shell

3 Dismantle the wall bracket.

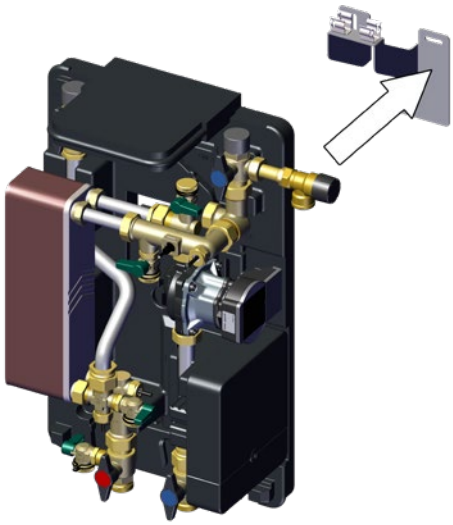

Fig. 11: Dismantling of the wall bracket

4 Hold the wall bracket horizontally against the wall to use it as a drilling template.

5 Mark two holes.

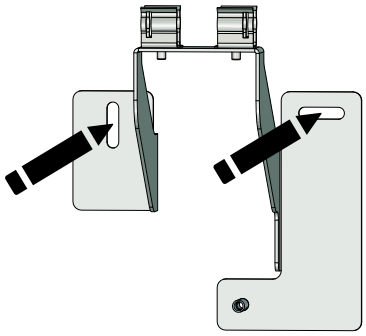

Fig. 12: Use of the wall bracket as drilling template

6 Drill the corresponding holes (ø 8mm) and insert the dowels.

7 Screw the wall bracket onto the wall with two 10x60 mm screws and washers (supplied).

8 Hang the lower shell with the product assembly onto the wall bracket.

Make sure that the bracket audibly clicks into place. Make sure that the station is firmly seated on the bracket.

9 Place the washer in the contour provided in the lower shell.

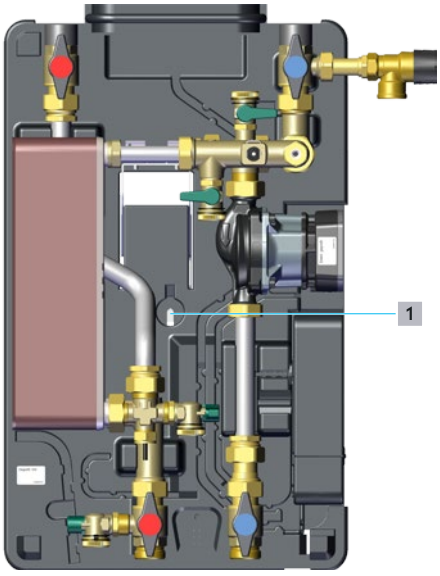

Fig. 13: Position of the washer

1	Position of the washer

10 Fix the lower shell with the cylinder screw with hexagon socket (M5 x 20). Tighten the screw to the metallic stop.

▷ Wall mounting of the fresh water station is completed. In the next step you can start with the piping.

6.3 Piping

All four supply and return connections are sized G 1 (flat sealing external thread).

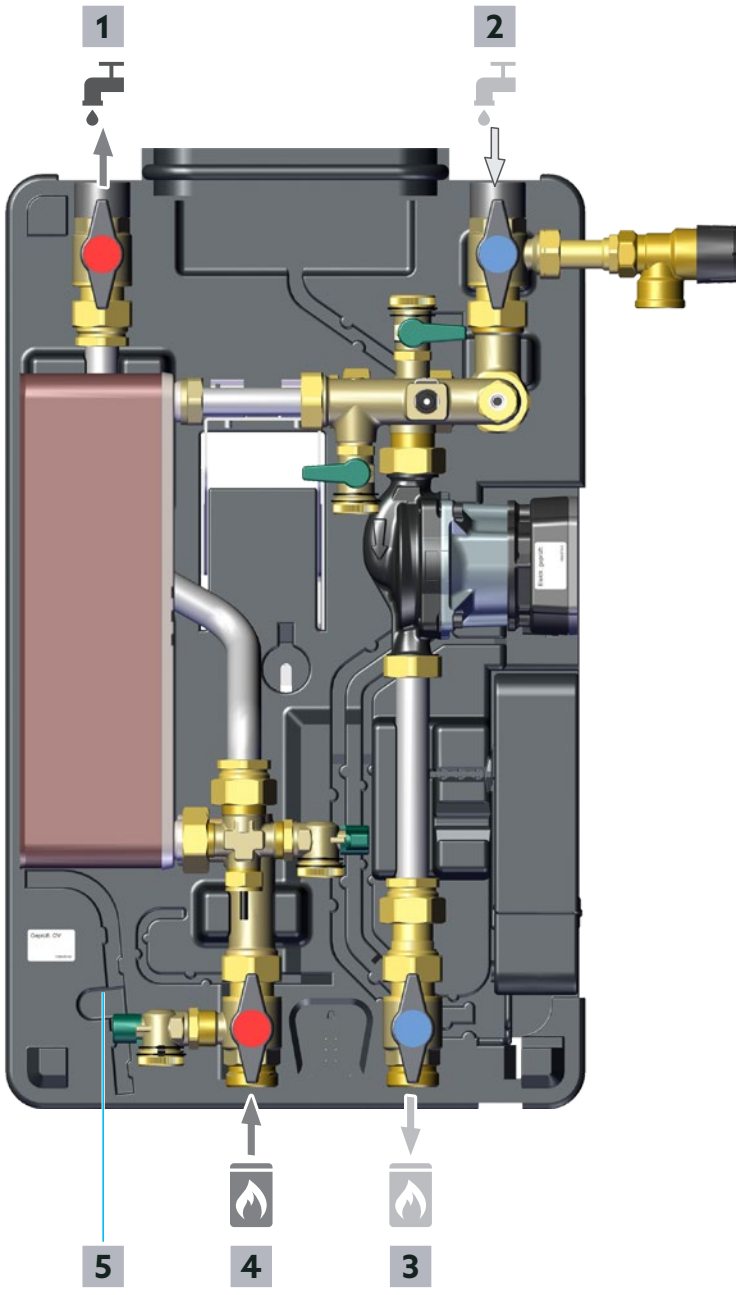

Fig. 14: Functional description

1	Hot potable water return
2	Cold potable water supply
3	Storage cylinder circuit return
4	Storage cylinder circuit supply
5	Recess for the discharge elbow of the water sampling valve

- The supply pipe "storage cylinder circuit supply" for the fresh water station may only be connected to one connection pipe of the buffer storage cylinder (principle of hydronic decoupling). A joint connection with other components of the heating system (e.g. by means of a T-piece) is not permitted.
- Note the nominal widths for the spanners to be used, which are embedded in the lower shell.
- We recommend the installation of a strainer in the storage cylinder circuit supply.
- If necessary, mount another potable water filter (TF) (Oventrop accessory) as close as possible to the cold water connection of the station.
- If a circulation pipe is used, install a strainer suitable for potable water in the inlet of the circulation set, if necessary, so that any particles and foreign bodies do not get into the measuring turbine.
- Install a backflow preventer(position 4 in Fig. 4 on page 14) in the cold potable water supply (position 2 in Fig. 14 on page 22) to separate the cold potable water from the already heated potable water within the station.
- When operating the fresh water station with Oventrop buffer storage cylinders of the "Hydrocor HP" series, connect the "storage cylinder circuit supply" to the connection pipe marked with an arrow in Fig. Fig. 15 and FigFig. 16.
- Install an air vent on the upper dished bottom of the storage cylinder.
- If you operate the station in circulation mode, the water in the circulation circuit expands when the temperature increases and the station's safety valve is triggered. Install a diaphragm expansion tank suitable for potable water to prevent overpressure in the circulation circuit.

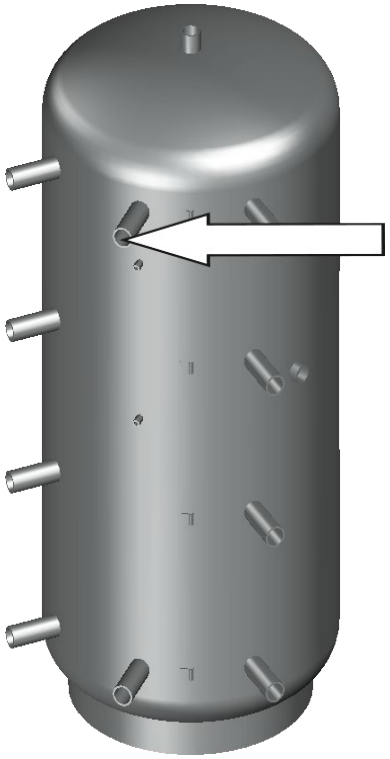

Fig. 15: Connection of the storage cylinder circuit supply to the buffer storage cylinder

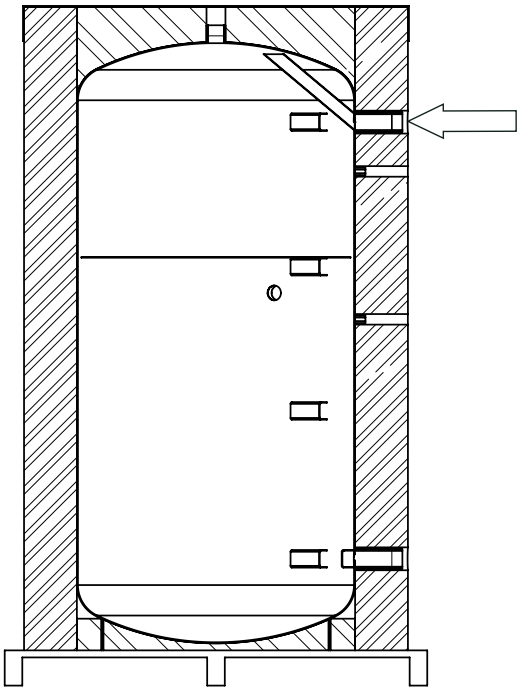

Fig. 16: Internal design of the buffer storage cylinder

6.4 Protective equipotential bonding/ earthing

Protective equipotential bonding establishes a connection with good electrical conductivity between conductive bodies of electrical equipment and the main equipotential bonding bar (main earthing bar) of the building. (According to DIN VDE 0100, bodies are touchable conductive parts which, in contrast to the "active parts" of the equipment, can only be live as a result of a fault).

This measure serves to protect against electric shock and is standardised in IEC 60364-4-41:2005 and DIN VDE 0100-410:2007-06.

The technical design for equipotential bonding is standardised in IEC 60364-5-54:2011 and DIN VDE 0100-540:2012-06.

- ▶ Comply with applicable standards and country-specific regulations.
- ▶ Use an equipotential bonding conductor made of copper with a cross-section of at least 6 mm² .

DANGER

Danger to life due to electric current!
There is a danger to life if live components are touched.

- ! Disconnect the product from the power supply at all poles.
- ! Check that no voltage is present.
- ! Secure the product against being switched on again.
- ! Only mount the product in dry indoor areas.

Since the circulation pump cannot be considered electrically conductive, it is necessary to connect the piping upstream and downstream of the pump to the equipotential bonding bar. This can be done outside and inside the station. Suitable mounting points for earthing clamps inside the station are shown in Fig. 17 on page 24.

- ▶ Fit appropriate earthing clamps to the station's piping. Earthing clamps are available as accessory.

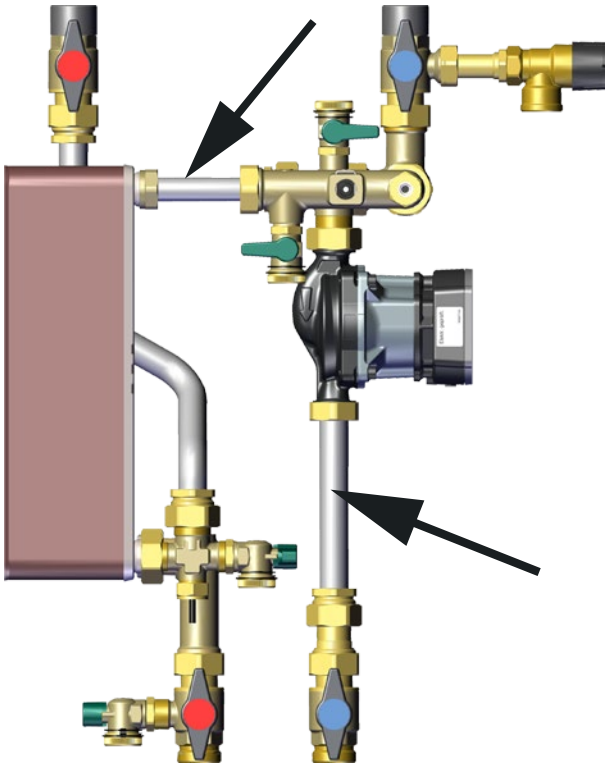

Fig. 17: Equipotential bonding

- ▶ Connect the earthing clamps to a suitable equipotential bonding bar in the building using an equipotential bonding conductor made of copper with a cross-section of at least 6 mm².

7. Commissioning

7.1 Filling and venting of the storage cylinder circuit

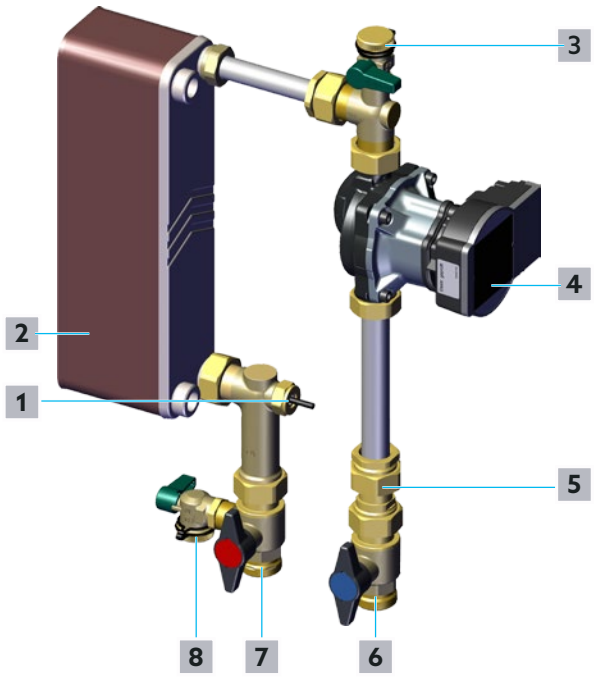

Fig. 18: Filling and venting of the storage cylinder circuit

1	Temperature sensor for storage cylinder circuit S1
2	Heat exchanger
3	Fill and drain ball valve for storage cylinder circuit return
4	Circulation pump for storage cylinder circuit
5	Backflow preventer in the storage cylinder circuit
6	Shutoff ball valve for storage cylinder circuit return
7	Shutoff ball valve for storage cylinder circuit supply
8	Fill and drain ball valve for storage cylinder circuit supply

⚠ CAUTION

Risk of scalding due to hot media!
If the station has been in operation, there is a risk of scalding due to unintentional escape of hot water or water steam.

- ! Allow the system to cool down.
- ! Wear safety goggles.

⚠ CAUTION

Risk of burns on hot components!
Touching hot components can cause burns.

- ! Wear safety gloves.

NOTICE

Risk of damage due to pressure surge!
The abrupt filling of the station can lead to damage, e.g. to the sensors or sealing points.

- ! Always open and close ball valves slowly.

1. Slowly open the shutoff ball valve for storage cylinder circuit supply (position 7 in Fig. 18 on page 25 and position 2 in Fig. 2 on page 12).
2. Unscrew the cap of the fill and drain ball valve for storage cylinder circuit return (position 3 in Fig. 18 on page 25 and position 9 in Fig. 2 on page 12).
3. Connect a flushing hose to the fill and drain ball valve for storage cylinder circuit return.
4. Open the fill and drain ball valve for storage cylinder return slightly until air escapes.
5. Close the fill and drain ball valve for storage cylinder circuit return as soon as only water escapes here.
6. Remove the flushing hose and refit the cap of the fill and drain ball valve for storage cylinder circuit return.
7. Slowly open the shutoff ball valve for storage cylinder circuit return (position 6 in Fig. 18 on page 25 and position 9 in Fig. 2 on page 12).

During the tapping process, air remaining in the storage cylinder circuit is transported into the storage cylinder by the volume flow.

▶ If noises due to trapped air continue to occur in the pipe, repeat the venting process.

7.2 Filling and venting of the potable water circuit

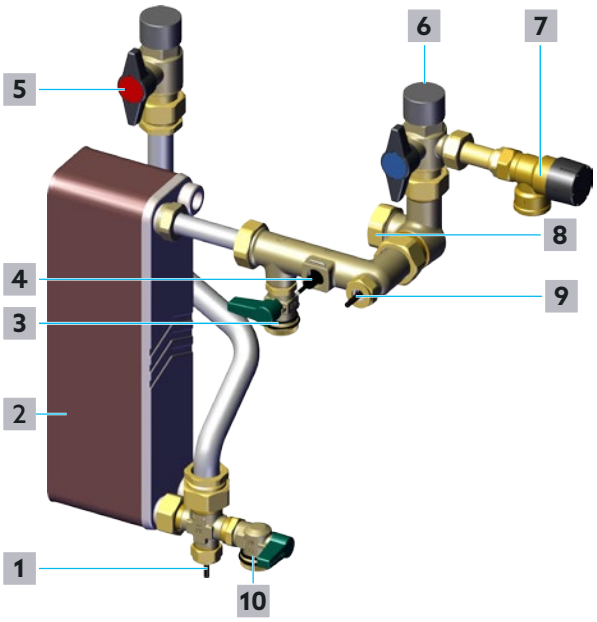

Fig. 19: Filling and venting of the potable water circuit

1	Temperature sensor for potable water (hot) S2
2	Heat exchanger
3	Fill and drain ball valve for potable water (cold)
4	Volume flow sensor for potable water circuit
5	Shutoff ball valve for potable water (hot)
6	Shutoff ball valve for potable water (cold)
7	Safety valve for potable water circuit (10 bar)
8	Connection for circulation pipe
9	Temperature sensor for potable water (cold)/ circulation S3
10	Fill and drain ball valve for potable water (hot)

⚠ CAUTION

Risk of scalding due to hot media!
If the station has been in operation, there is a risk of scalding due to unintentional escape of hot water or water steam.

- ! Allow the system to cool down.
- ! Wear safety goggles.

⚠ CAUTION

Risk of burns on hot components!
Touching hot components can cause burns.

- ! Wear safety gloves.

NOTICE

Risk of damage due to pressure surge!
The abrupt filling of the station can lead to damage, e.g. to the sensors or sealing points.

- ! Always open and close ball valves slowly.

1. Slowly open the shutoff ball valve for potable water (hot) (position 5 in Fig. 19 on page 26 and position 10 in Fig. 2 on page 12).
2. Slowly open the shutoff ball valve for potable water (cold) (position 6 in Fig. 19 on page 26 and position 11 in Fig. 2 on page 12).
3. Perform a tapping process.

During the tapping process, air remaining in the potable water circuit is discharged via the draw-off point.

- ▶ If noises due to trapped air continue to occur in the potable water circuit, slightly open the fill and drain ball valve for potable water (hot) (position 10 in Fig. 19 on page 26 and position 16 in Fig. 2 on page 12) until only water escapes .

7.3 Electrical connection

After the power supply has been established, the controller goes through an initialisation phase.

NOTICE

Malfunctions due to electromagnetic fields!
Strong electromagnetic fields can impair the function of the controller.

- ! Ensure that the product is not exposed to strong sources of electromagnetic radiation.

If you use a potable water circulation set, observe the operating instructions for the accessory.

It must be possible to disconnect the product from the mains at any time.

- ▶ Position the mains plug so that it is accessible at all times.
- ▶ If this is not possible, install a switch that is accessible at all times. In this case, it must be possible to disconnect the product from the mains at all poles via an additional device with an isolating distance of at least 3 mm or with a disconnecting device (fuse) in accordance with applicable installation regulations.

7.3.1 Power supply through the pre-assembled mains connection cable

A fused earthed socket must be available at the installation location.

- Close the thermal insulation of the station by fitting the upper shell.
- Insert the plug of the pre-assembled mains connection cable into an earthed socket.

7.3.2 Power supply without the pre-assembled mains connection cable

If the pre-assembled earthing contact plug cannot be used, the power supply may only be established by a qualified electrician.

DANGER

Danger to life due to electric current!
There is a danger to life if live components are touched.

- ! Disconnect the product from the power supply at all poles.
- ! Check that no voltage is present.
- ! Secure the product against being switched on again.
- ! Only mount the product in dry indoor areas..

NOTICE

Damage to electronic components due to electrostatic discharge!

- ! Before touching the inside of the casing, ensure that the potentials are equalised by taking suitable measures. Touch an earthed component. This can be a water tap or a radiator, for example.

Make sure that the product can be disconnected from the power supply at any time.

- Install a switch that is accessible at all times. It must be possible to disconnect the product from the mains at all poles via an additional device with an isolating distance of at least 3 mm or with a disconnecting device (fuse) in accordance with applicable installation regulations.

The controller receptacle in the lower shell is designed in such a way that you can easily fix the controller in a comfortable mounting position without tools.

1 Carefully pull the controller off the lower shell as shown in Fig. 20 on page 27.

NOTICE

Damage to the electrical lines and connections due to tensile forces!
Electrical lines or connections can break if excessive tensile forces are applied.

- ! Make sure that the cables connected to the controller are not subjected to strain.

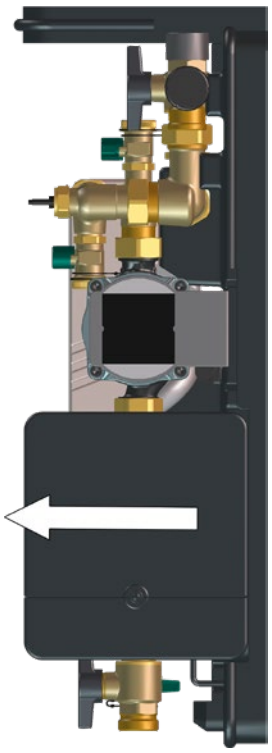

Fig. 20: Removal of the controller from the lower shell

2 Turn the controller and fix it in the mounting position as shown in Fig. 21 on page 28.

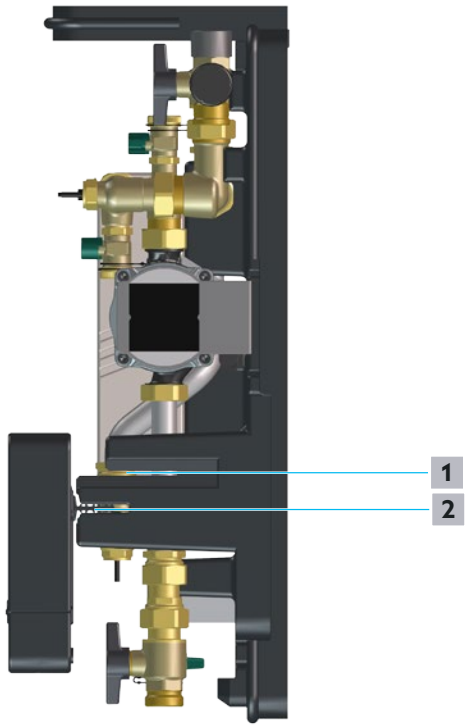

Fig. 21: Mounting position

1 Recess for operation position
2 Recess for mounting position

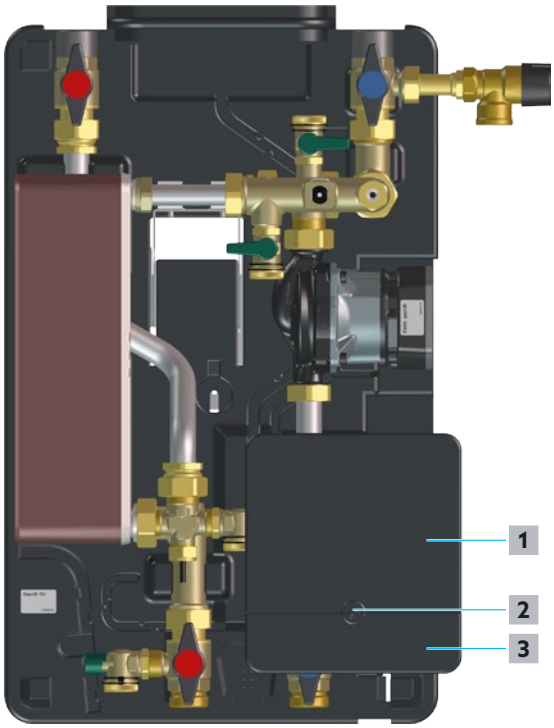

Fig. 22: Opening of the controller

1 Connection panel cover
2 Hexagon socket screw
3 Supply line cover

3 Loosen the screw (position 2 in Fig. 22 on page 28) and put it aside.
4 Slide the connection panel cover (position 1 in Fig. 22 on page 28) upwards until it audibly clicks into place.
5 Fold down the supply line cover (position 3 in Fig. 22 on page 28).
6 Guide the power line through the opening provided in the casing.
7 Carry out the electrical connections according to the terminal assignment (see Fig. 9 on page 18).
8 Fix the power line with a suitable cable tie for strain relief.
9 Close the supply line cover and the connection panel cover.
10 Tighten the screw.
11 Put the controller back from the mounting position to the operation position (see Fig. 20 on page 27).
12 Lay the electrical lines in the channels provided in the lower shell.

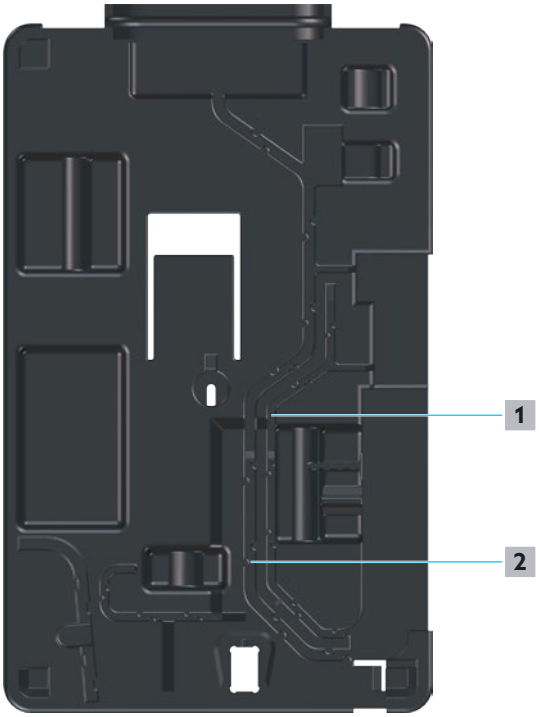

Fig. 23: Cable channels in the lower shell

1 Channel for sensor and control lines
2 Channel for 230 V line

13 Establish the power supply.
▷ The fresh water station is ready for operation.

7.4 Handover to the operator

- Once commissioning has been completed, fill in the handover report. You will find a corresponding form in the appendix. Sign the report and give a copy to the operator.
- Pass on these instructions and all applicable instructions (e.g. accessories instructions) to the operator. The instructions must be available at the place of use of the product.

8. Operation

You can operate the station via the touch control panel in the upper shell.

Fig. 24: Touch control panel

Touch key	"⊕"	Scrolling through the menu to the right / Increasing the set values
Touch key	"⊖"	Scrolling through the menu to the left / Decreasing the set values
Touch key	"OK"	Confirm

If no touch key is pressed for 5 minutes, the display switches to the start screen.

8.1 Start screen

In normal mode of the controller, the display is in the start screen. The start screen displays the set hot water temperature. If the operating function has not been locked, anyone can select the hot water temperature in the start menu.

You can switch to the start screen at any time by pressing and holding the touch keys "⊖" and "⊕" simultaneously.

After this change, you are in the operator menu. For extended operating options, you must log in with the corresponding pin.

If the system has detected an error, a corresponding message is displayed in place of the temperature setting.

8.2 Main menu

1 To go from the start screen to the main menu, press the touch key "OK".

▷ The "Status" menu appears.

Fig. 25: Main menu

The "Status" submenu is for information purposes. No settings can be made here.

The number of circles displayed in the lower area depends on the number of functions available or activated at the time.

The available functions can be activated with the appropriate user authorisations.

The filled circle of the navigation button indicates where you are in the menu.

In the menus where you can select a function, the icon for "Back" appears when you scroll all the way to the right with the touch key "⊕". Press "OK" to go to the higher menu level.

In menus where you can enter a numerical value, the minimum value is indicated at the boom left and the maximum value at the bottom right.

The large figure in the middle shows the current setting.

The available setting range can be configured with the corresponding user authorisations.

2 Use the touch keys "⊖" or "⊕" toselect the desired submenu.

3 Press the "OK" touch key to open the respective submenu.

4 Use the touch keys "⊖" or "⊕" to set the desired value.

5 Confirm your entry by pressing the "OK" touch key.

8.3 Operator authorisations

Settings can be made at three different authorisation levels.

When setting ranges are defined, the setting options adapt to the restricted setting ranges.

Example: If you limit the hot water setting range to 50 °C to 60 °C, the hot water temperature can only be selected from this range.

The "operator" (standard user) does not need a PIN.

1. Open the main menu (see section 8.2 on page 30).
2. If you want to log in as an "Installer" or as a "Special functions" user, scroll all the way to the right with the touch key "⊕" to the menu item "Operator code".
3. Select "OK".
4. Select the respective figure with the touch keys "⊕" and "⊖".
5. Confirm your entries in each case with "OK".

▷ If the PIN has been entered correctly, a green ring appears on the touch control panel instead of a blue ring.

8.3.1 Start menu

After the initial commissioning, the product first queries various basic settings.

Controller presettings are provided at the factory for use in different system combinations (see section 8.4 on page 37). To keep the effort for specific settings low, you have the option at this point to activate preloaded default settings.

This menu only appears after the initial commissioning and if you have reset the station to factory settings.

	Operator	Installer	Special functions		Parameters	
Start menu	✓	✓	✓	Language	EN, DE, FR, NL, IT, ES, RU, BG, RO	
	✓	✓	✓	Time	Hour, Min.	
	✓	✓	✓	Date	Day, Month, Year	
		✓	✓	Controller presetting	Here you have the option of activating preloaded default settings.	
					0	Activate no presetting
					1- 5	Activate presetting (see section 8.4 on page 37)
	✓	✓	✓	Save	Yes, No	

8.3.2 Status

Status	Operator	Installer	Special functions			
	✓	✓	✓	Hot water	Hot water heating	Auto
	✓	✓	✓			Hot water set temp.
	✓	✓	✓			Hot water temp.
	✓	✓	✓			Store flow temp.
	✓	✓	✓			Flow rate DHW (l/min)
	✓	✓	✓			Pump power (%)
	✓	✓	✓			Back
	✓	✓	✓	Circulation	The status of these functions is displayed when the corresponding functions have been activated.	
	✓	✓	✓	Storage cylinder loading		
	✓	✓	✓	Return stratification		
	✓	✓	✓	Error relay		
	✓	✓	✓	Parallel relay		
	✓	✓	✓	Function block 1		
	✓	✓	✓	Function block 2		
	✓	✓	✓	Error message	Everything is OK or error message	
	✓	✓	✓	Back		

8.3.3 Hot water

Hot water	Operator	Installer	Special functions		Parameters
	✓	✓	✓	Hot water set	35 - 60 °C The setting range depends on the values set in the menu items “Hot water set min.” and “Hot water set max.”.
		✓	✓	Hot water set min.	20 - Hot water set
		✓	✓	Hot water set max.	Hot water set - 75 °C
			✓	Holding temperature heat exchanger	Deactivated, Activated
		✓	✓	Emergency operation	Deactivated, Activated
	✓	✓	✓	Back	

8.3.4 Circulation

	Operator	Installer	Special functions			Parameters
Circulation		✓	✓	Off		
		✓	✓	Demand	Min. pulse duration	0 - Max. pulse duration
		✓	✓		Max. pulse duration	Min. pulse duration - 15 s
		✓	✓		Running time circulation pump (min)	1 - 15 min
		✓	✓		Waiting time (min)	1 - 15 min
		✓	✓		Sensor demand	-, S4, S5, S6, S7, S8, S11
		✓	✓		Back	
		✓	✓	Thermal	Circulation set temperature	25 to (hot water set minus 3K)
		✓	✓		Sensor circulation temp.	-, S1, S2, S3, S4, S5, S6, S7, S8
		✓	✓		Back	
		✓	✓	Continuous operation	Is activated when selected	
		✓	✓	Timer	Timer	
	✓	✓	✓		Timer (visible when activated)	Timer configuration see section 8.5 on page 37
		✓	✓		Back	

8.3.5 Additional functions

Additional functions	Operator	Installer	Special functions				Parameters
		✓	✓	Return stratification	Deactivated		
		✓	✓		Activated	Relay	-, R1,R2, R3, R4, R5, PWM2, PWM3, PWM4
		✓	✓			Store sensor	-, S4, S5, S6, S7, S8
		✓	✓			Sensor return temp.	-, S3, S4, S5, S6, S7, S8
		✓	✓			Relay inverted	No, Yes
		✓	✓			Delete function	No, Yes (deactivate)
		✓	✓			Back	
		✓	✓	Storage cylinder loading	Deactivated		
		✓	✓		Activated	Backup heating	Fixed value
		✓	✓				Zone loading
		✓	✓			Relay	-, R1, R2, R3, R4, R5, PWM2, PWM3, PWM4
		✓	✓			Store sensor	-, S4, S5, S6, S7, S8
		✓	✓			Switch-on temperature	25 - 89 °C
		✓	✓			Switch-off temperature	26 - 90 °C
		✓	✓			Delete function	No, Yes (deactivate)
		✓	✓			Back	
			✓	Error relay	Deactivated		
			✓		Activated	Relay	-, R1, R2, R3, R4, R5, PWM2, PWM3, PWM4
			✓		Back		
			✓	Parallel relay	Deactivated		
			✓		Activated	Relay	- R1, R2, R3, R4, R5, PWM2, PWM3, PWM4
			✓			Ref. relay 1	- R1, R2, R3, R4, R5, PWM1, PWM2, PWM3, PWM4, LIN
			✓			Ref. relay 2	- R1, R2, R3, R4, R5, PWM1, PWM2, PWM3, PWM4, LIN
			✓			Ref. relay 3	- R1, R2, R3, R4, R5, PWM1, PWM2, PWM3, PWM4, LIN
			✓			Mode	and, or
			✓			Inverted	No, Yes
			✓			Delete function	No, Yes (deactivate)
			✓			Back	
			✓	Function block 1	Deactivated		
			✓		Activated	Relay	-, R1, R2, R3, R4, R5, PWM2, PWM3, PWM4
			✓			Thermostat a	Deactivated, Activated

Operator	Installer	Special functions				Parameters	
		✓			Thermostat a (visible when activated)	Switch-on temperature	10 - 100 °C
		✓				Switch-off temperature	10 - 100 °C
		✓				Sensor	-, S1, S2, S3, S4, S5, S6, S7, S8
		✓				Back	
		✓			Thermostat b	Deactivated, Activated	
		✓			Thermostat b (visible when activated)	Switch-on temperature	10 - 100 °C
		✓				Switch-off temperature	10 - 100 °C
		✓				Sensor	-, S1, S2, S3, S4, S5, S6, S7, S8
		✓				Back	
		✓			Δ T - function	Deactivated, Activated	
		✓			Δ T - function (visible when activated)	Δ T On	1 - 50 K
		✓				Δ T Off	0.5 - 49.5 K
		✓				Sensor source	-, S1, S2, S3, S4, S5, S6, S7, S8
		✓				Sensor sink	-, S1, S2, S3, S4, S5, S6, S7, S8
		✓				Back	
		✓			Timer	Deactivated, Activated	
		✓			Timer (visible when activated)	Timer configuration see section 8.5 on page .	
		✓			Flow rate	Deactivated, Activated	
		✓			Flow rate (visible when activated)	Flow On (8.0 l/min....60.0 l/min) Vol. Off (1.0 l/min....7.5 l/min)	
		✓			Delete function	No, Yes (deactivate)	
		✓			Back		
		✓	Function block 2	Analogous to function block 1			
	✓	✓	Disinfection		Disinf. temperature	70 - 80 °C	
	✓	✓			Disinf. duration	5 - 180 min	
	✓	✓			Start	No, Yes	
	✓	✓			Back		

8.3.6 Basic settings

	Operator	Installer	Special functions		Parameters
Basic settings	✓	✓	✓	Language	EN, DE, FR, NL, IT, ES, RU, BG, RO
	✓	✓	✓	Date	Day, Month, Year
	✓	✓	✓	Time	Hour, Min.
	✓	✓	✓	Summer/Winter time	Yes, No
	✓	✓	✓	Display standby	30 - 300 s
	✓	✓	✓	Display mode	White on black, Black on white
		✓	✓	SD card	Message whether a card is inserted
		✓	✓	Factory reset	No, Yes
	✓	✓	✓	Back	

8.3.7 Manual mode

	Operator	Installer	Special functions		Parameters
Manual mode		✓	✓	Primary pump	Auto - 100%
		✓	✓	R1	Off, Auto, On
		✓	✓	R2	Off, Auto, On
		✓	✓	R3	Off, Auto, On
		✓	✓	R4	Off, Auto, On
		✓	✓	R5	Off, Auto, On
		✓	✓	PWM1	Auto - 100%
		✓	✓	PWM2	Auto - 100%
		✓	✓	PWM3	Auto - 100%
		✓	✓	PWM4	Auto - 100%
		✓	✓	Back	

8.4 Controller presettings

8.4.1 Circulation (presetting 1)

Mode	Continuous operation
Relay	R1
Connection pump	PWM1

8.4.2 Storage cylinder loading (presetting 2)

Mode	Fixed value
Relay	R3
Store sensor	S6

8.4.3 Circulation with return stratification (presetting 3)

Circulation

Mode	Continuous operation
Relay	R1
Connection pump	PWM1

Return stratification

Relay	R2
Store sensor	S4
Sensor return temp.	S5

8.4.4 Circulation with storage cylinder loading (presetting 4)

Circulation

Mode	Continuous operation
Relay	R1
Connection pump	PWM1

Storage cylinder loading

Mode	Fixed value
Relay	R3
Store sensor	S6

8.4.5 Circulation with return stratification and storage cylinder loading (presetting 5)

Circulation

Mode	Continuous operation
Relay	R1
Connection pump	PWM1

Return stratification

Relay	R2
Store sensor	S4
Sensor return temp.	S5

Storage cylinder loading

Mode	Fixed value
Relay	R3
Store sensor	S6

8.5 Setting of the timer

When programming the timer, first select the days of the week and then the regular time frame for activating or deactivating the respective function.

Access to the timer menu

Day selection	Selection of the days on which the timer is to be active
Mon-Sun	The timer should be active at the same time every day
Reset	Delete day selection
Back	Switch to the higher menu level

8.5.1 Day selection

At this point you can select the weekdays on which the timer is to be activated. You can select individual days or groups.

Groups are used to shorten the entry. In the next step, you can add more weekdays to the selection. You can then set up to 6 common time frames for the selected weekdays.

Mon-Sun	Group whole week
Mon-Fri	Group Mon-Fri
Sat, Sun	Group Sat, Sun
Mon	Individual day
Tue	
Wed	
Thu	
Fri	
Sat	
Sun	
Back	Switch to the higher menu level

1. In the first step, select a group or an individual day.
2. Select the desired additional weekdays in the next step.
3. Save the day selection with "Continue".

▷ You will be taken to the settings menu for the time frame.

4. To set a time frame for the previously saved weekdays, select "New time frame".
5. Confirm the set time frame with "Save".

6 If you want to create another time frame for the same day selection, select "New time frame" and proceed accordingly.

7 If you do not want to create any more time frames, select "Back".

▷ The programmed timer appears as a menu item next to the menu item "Day selection". If you call up the corresponding menu item, you can modify and add to the selected settings.

8.5.2 Reset

Deletion of individual programmed time frames

With the function "Reset" you can delete a programmed time frame.

▶ Select the desired combination of weekdays.

▶ Select "Reset".

▶ Confirm the security query with "Yes".

Deletion of the complete timer

▶ Select "Reset".

▶ Confirm the security query with "Yes".

8.5.3 Back

8.6 Hot water

The speed of the primary pump is controlled depending on the set hot water temperature.

NOTICE

High media temperatures (>60 °C) increase the risk of corrosion and energy costs!

! Do not set the water temperature higher than absolutely necessary.

8.6.1 Setting of the temperature

If the operating function has not been locked, anyone can select the hot water temperature in the start menu and in the "Hot water" menu. The temperature that can be set depends on the specified temperatures "Hot water set min." and "Hot water set max."

8.6.2 Emergency operation

Emergency operation means that the pump is permanently switched on.

If emergency operation has been activated, the ring on the touch control flashes red and the message "Emerg. op" appears in the display.

⚠ CAUTION

Risk of scalding due to excessively hot potable water at the draw-off points!

In emergency operation, the primary pump pumps a constant quantity of water from the storage cylinder through the heat exchanger. In extreme cases, this can lead to the water at the draw-off points almost reaching the temperature of the storage cylinder water.

! In emergency operation, reduce the temperature of the storage cylinder circuit so that the temperature in the storage cylinder does not exceed the desired potable water temperature.

! Only use the emergency operation temporarily to ensure the supply of hot potable water on a makeshift basis. Immediately replace the defective sensor and restore controlled operation of the pump.

8.6.2.1 Automatic activation

Automatic emergency operation is used to ensure hot water preparation even in the event of a sensor failure. The speed after automatic activation is configurable.

8.6.2.2 Manual activation (DIP switch)

If, in addition to a sensor, the touch control panel has also failed, emergency operation can be activated manually.

▶ Set DIP switch 1 (see Fig. 9 on page 18) to "ON".

▷ Emergency operation is permanently activated. The speed of the pump corresponds to 50% of the pump capacity.

8.7 Operator code

An operator code can be entered in the "Operator code" menu. Each digit of the four-digit code must be entered and confirmed individually. After confirming the last digit, there is an automatic jump to the next higher menu level.

When an "Installer" operator code is active, the ring around the touch control panel is green.

For the authorisation of the respective user groups see section 8.3 on page 31. The authorisations available to the respective user groups are symbolised by the ticks in front of the functions.

8.8 Circulation

If you use the circulation set, you can configure the function in the controller menu.

Observe the operating instructions supplied with the circulation set.

R1 and PWM1 are mandatorily provided for the circulation function. Connect the electrical connections for the circulation to the contacts R1 and PWM1 (see Fig. 9 on page 18). Assign the corresponding outputs to the circulation in the programming. If you have already assigned other functions to these outputs, the message "Not possible, R1 in use" appears when you try to activate them.

There are 5 operating modes available for the circulation function. When one of the modes is selected, the associated setting parameters appear.

8.8.1 Off

The circulation pump is permanently switched off.

8.8.2 On demand

You can activate the circulation automatically via the volume flow sensor (position 8 in Fig. 2 on page 12) or manually via a tactile contact.

The default setting is control via the volume flow sensor. When you request hot water at a draw-off point, a flow is measured at the volume flow sensor and the controller switches on the circulation pump. The pulse duration required for this can be set by the parameters "Min. pulse duration" and "Max. pulse duration".

If you want to activate the circulation manually, use a free sensor input and connect it to a push button.

The assigned sensor input is monitored.

If a demand is detected, the circulation pump is switched on.

You can set the running time. After the running time has expired, the circulation pump is switched off again.

You can set a waiting time. During the waiting time, the circulation pump remains switched off even if a demand is detected at the assigned sensor.

8.8.3 Thermal

The circulation pump is controlled depending on the temperature measured at the temperature sensor for potable water (cold)/circulation S3 (position 14 in Fig. 2 on page 12).

- The pump is switched on when the measured value is 6 Kelvin below the setpoint value.
- The pump is switched off when the measured value is 2 Kelvin below the setpoint value.

8.8.4 Continuous operation

Continuous operation means that the circulation pump runs 24 hours at a stretch without interruption or switch-off criterion.

8.8.5 Timer

The circulation pump is switched on within the set time frames (see section 8.5 on page 37), and switched off outside.

8.9 Additional functions

8.9.1 Return stratification

The return stratification serves to protect the temperature stratification in the storage cylinder from mixing while the circulation is active. If the temperature difference between the return sensor and the storage cylinder sensor (store sensor) exceeds the switch-on temperature difference (5 K), the relay for return stratification is switched on. The return flow is fed into the upper storage cylinder section.

If the temperature difference between the return sensor and the storage cylinder sensor (store sensor) falls below the switch-off temperature difference (3 K), the relay is switched off. The return flow is fed into the lower storage cylinder section.

The actuator for the return stratification ball valve must be configured in such a way that, when de-energised, the return water is directed into the lower storage cylinder section. To obtain stratification in the upper storage cylinder section, the storage cylinder sensor (store sensor) must be installed in the upper storage cylinder section.

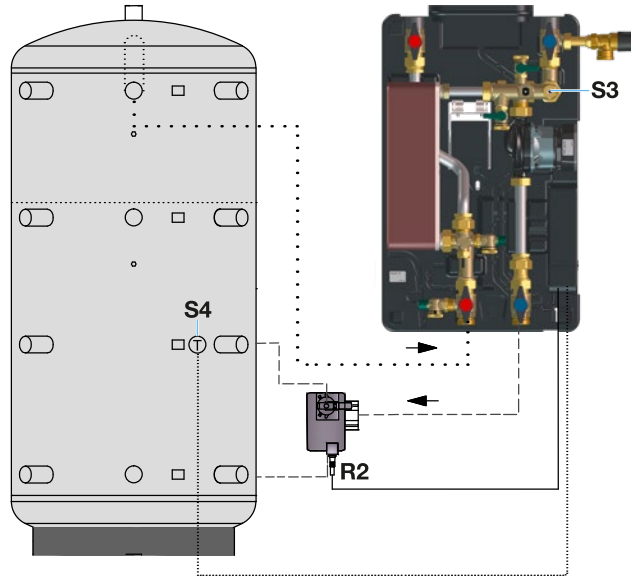

Fig. 26: Return stratification

8.9.2 Storage cylinder loading

2 modes are available for reheating (backup heating):

In fixed value mode, the flow setpoint temperature is compared with a storage cylinder reference sensor. If the measured temperature at the assigned sensor falls below the entered switch-on temperature, the output is switched on. The output is switched off again when the measured temperature has risen above the switch-off temperature. Ifthe sensor is defective, the fixed value loading is cancelled or suppressed.

In zone loading mode, a specific storage cylinder section between 2 sensors is continuously loaded. For this purpose, 2 sensors are used to monitor the switch-on and switch-off conditions. The switch-on and switch-off temperatures apply as reference parameters. If the temperature measured at the assigned upper storage cylinder sensor falls below the entered switch-on temperature, the output is switched on. The output is switched off again when the temperature at the assigned lower storage cylinder sensor has risen above the switch-off temperature. If one of the two sensors is defective, the zone loading is cancelled or suppressed.

8.9.3 Error relay

The "Error relay" function is used to switch an output in the event of an error. For example, a signal transmitter can be connected to report error cases.

If the function is activated, the assigned output switches if there is an error.

8.9.4 Parallel relay

The "Parallel relay" function is used to always switch a selected output together with one or more selected reference relays.

In AND mode, all selected reference relays must be active for the assigned output to switch. In OR mode, only one of the selected reference relays must be active for the assigned output to switch.

If the option "Inverted" is activated, the output reacts exactly the other way round.

8.9.5 Function block (1 or 2)

In addition to the predefined additional functions, function blocks are available that consist of thermostat, timer and difference functions. They can be used to realise further components or functions.

Sensors and free outputs can be assigned for the function blocks. Already used sensors can be used without influencing their control function.

8.9.5.1 Thermostat function

When the set switch-on temperature is reached, the switching condition for the thermostat function is considered fulfilled.

When the set switch-off temperature is reached, the switching condition for the thermostat function is no longer considered fulfilled.

8.9.5.2 Assignment of the reference sensor

Set maximum temperature limit with switch-off temperature > switch-on temperature,

set minimum temperature limit with switch-on temperature > switch-off temperature.

The temperatures cannot be equated.

8.9.5.3 △T function

When the set switch-on temperature difference (△T on) is reached, the switching condition for the △T function is considered fulfilled.

When the set switch-off temperature difference (△T off) is reached, the switching condition for the △T function is no longer considered fulfilled.

8.9.6 Thermal disinfection

This function is used to limit the formation of legionella in the hot water and circulation pipes on the secondary side of the heat exchanger. For disinfection, the temperature is monitored at the assigned sensor (S3).

While disinfection is active, the current temperature at the assigned sensor and the remaining time for disinfection appear in the display.

Disinfection is considered complete when the temperature measured at the sensor continuously exceeds the set disinfection temperature for the disinfection duration. The function is started with the "Start" parameter and can be cancelled manually with the "Cancel" parameter.

8.10 Basic settings

In the "Basic settings" menu, all basic parameters for the station can be set.

8.11 MicroSD card slot

The controller has a microSD card slot for commercially available microSD cards with a capacity of up to 8 GB.

The following functions can be performed with a microSD card:

- Recording of measured and balance values. After transfer to a computer, the saved values can be opened and visualised with a spreadsheet programme, for example.
- Updating the firmware on the controller.
- Loading and saving of controller settings.

8.11.1 Insertion of the microSD card

DANGER

Danger to life due to electric current!
There is a danger to life if live components are touched.

- ! Disconnect the product from the power supply at all poles.
- ! Check that no voltage is present.
- ! Secure the product against being switched on again.
- ! Only mount the product in dry indoor areas.

NOTICE

Damage to electronic components due to electrostatic discharge!

- ! Before touching the inside of the casing, ensure that the potentials are equalised by taking suitable measures. Touch an earthed component. This can be a tap or a radiator, for example.

The controller receptacle in the lower shell is designed in such a way that you can easily fix the controller in a comfortable mounting position without tools.

1 Lift off the upper shell.

2 Carefully pull the controller off the lower shell as shown in Fig. 27 on page 41.

NOTICE

Damage to the electrical lines and connections due to tensile forces!
Electrical lines or connections can break if excessive tensile forces are applied.

- ! Make sure that the cables connected to the controller are not subjected to strain.

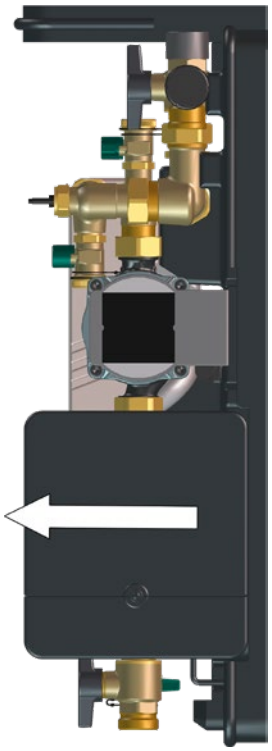

Fig. 27: Removal of the controller from the lower shell

3 Turn the controller and fix it in the mounting position as shown in Fig. 28 on page 42.

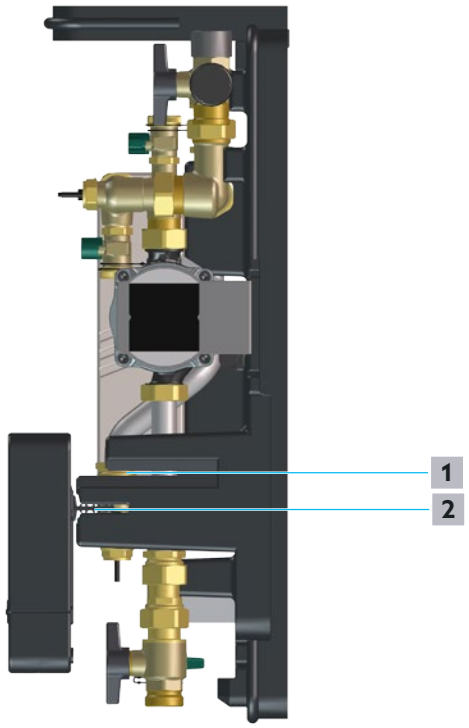

Fig. 28: Mounting position

1 Recess for operation position
2 Recess for mounting position

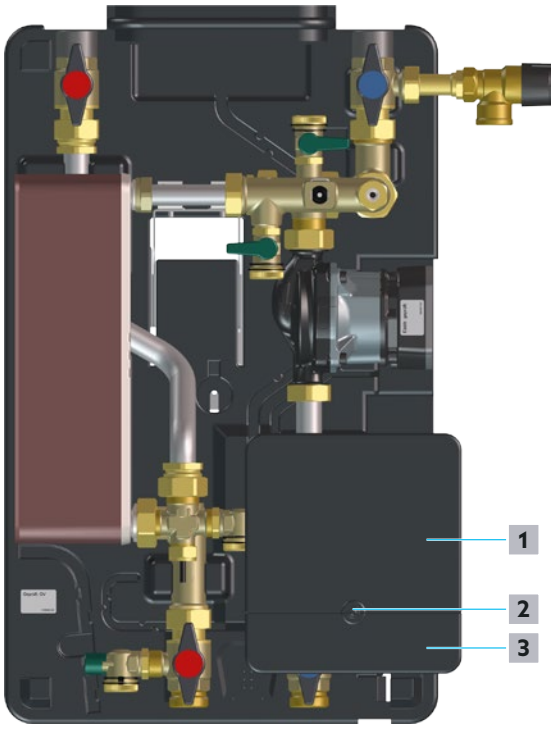

Fig. 29: Opening of the controller

1 Connection panel cover
2 Hexagon socket screw
3 Supply line cover

4 Loosen the screw (position 2 in Fig. 29 on page 42) and put it aside.

5 Slide the connection panel cover (position 1 in Fig. 29 on page 42) upwards beyond the catches.

6 Insert the microSD card into the card slot.

7 Slide the connection panel cover downwards.

8 Close the casing with the screw.

9 Fix the controller in the operation position.

Make sure that the lines are positioned correctly (see Fig. 23 on page 28).

10 Put on the upper shell.

11 Establish the power supply.

▷ The fresh water station is ready for operation.

8.11.2 Updating the firmware on the controller

1 Insert a microSD card containing the firmware update software into the microSD card slot as described in section 8.11.1 on page 41.

The controller only recognises firmware updates if they are saved in a folder "RQ" on the top level of the microSD card.

▶ Create a directory "RQ" on the microSD card in advance and extract the contents of the ZIP file into this directory.

2 To start the update, select the menu item "Update" in the "Basic settings" menu.

3 Confirm the safety query with "Yes".

▷ During the update process, "Firmware update in progress" is displayed. This process takes about 5 minutes. After the update, the controller restarts and the firmware version is displayed during the boot process.

8.11.3 Start of recording

▶ Insert the microSD card into the card slot as described in section 8.11.1 on page 41.

Recording starts immediately. The oldest data on the card is overwritten as soon as the capacity limit is reached.

The possible recording time depends on the capacity of the data carrier and the complexity of the data to be saved.

8.11.4 End of recording

Select the menu item "Remove card" and remove the card.

8.11.5 Saving of the controller settings

▶ To save the controller settings on an inserted microSD card, select the menu item "Save adjustments".

▷ When the saving process is complete, the message "Done" appears. The controller savings are saved in a .SET file on the microSD card.

8.11.6 Loading of the controller settings

▶ To load the controller settings from a microSD card, select the menu item "Load adjustments".

▶ Select the desired .SET file.

▷ When the loading process is complete, the message "Done" appears.

Before removing the microSD card, always select the menu item "Remove card" to avoid data loss.

8.12 Manual mode

In the "Manual mode" menu, you can set the operating mode of all outputs used.

You can check the function of all connected components, such as relays, pumps etc. by switching them on temporarily by hand here.

8.13 Blocking of the controller settings

The function "Block controller adjustments" can be used to prevent improper modification of the settings.

▶ To activate the function "Block controller adjustments", select "Yes".

▷ The controller jumps to the start screen. All settings and access to the menu are blocked.

When "OK" is pressed, the controller asks for a operator code. The main menu is available after entering a operator code.

8.14 Anti-blocking protection

The anti-lock protection is used to prevent the primary pump from seizing up after long periods of standstill.

The pump is switched on for 5 seconds 24 hours after the end of its last activation.

8.15 Replacement of the fuse

The controller is protected by a fuse (T4AH250V).

The fuse holder contains a spare fuse when delivered.

DANGER

Danger to life due to electric current!
There is a danger to life if live components are touched.

- ! Disconnect the product from the power supply at all poles.
- ! Check that no voltage is present.
- ! Secure the product against being switched on again.
- ! Only mount the product in dry indoor areas.

NOTICE

Damage to the electrical lines and connections due to tensile forces!
Electrical lines or connections can break if excessive tensile forces are applied.

- ! Make sure that the cables connected to the controller are not subjected to strain.

1. Disconnect the controller from the power supply at all poles.
2. Loosen the screw (position 2 in Fig. 22 on page 28) and put it aside.
3. Slide the connection panel cover (position 1 in Fig. 22 on page 28) upwards until it audibly clicks into place.
4. Pull the fuse holder out of the socket.
5. Replace the fuse. Only use fuses that comply with the technical data (see section 3.5 on page 15).
6. Close the connection panel cover.
7. Fix the bonnet by tightening the screw.
8. Restore the power supply.

9. Troubleshooting

9.1 Troubleshooting table

MALFUNCTION	CAUSE	REMEDY
The display is permanently off.	The controller is in standby mode.	Press a key to activate the display.
	The power supply to the controller is interrupted.	Establish the power supply.
	The controller fuse is defective.	Replace the fuse (see section 8.15 on page 43).
The target temperature is not reached. The circulation pump makes unusual noises.	The system has not been vented.	Vent the system (see section 7.1 on page 25 for the storage cylinder circuit and section 7.2 on page 26 for the potable water circuit).
The potable water is not heated. Only cold water is available at the draw-off points.	The volume flow sensor is contaminated or defective.	Clean the volume flow sensor or replace a defective volume flow sensor (see section 9.4 on page 49).
	The controller is not in operation (de-energised).	Check the power supply of the controller or establish the power supply. Replace the fuse if necessary (see section 8.15 on page 43).
	There is an air inclusion in the storage cylinder circuit.	Check the air vents in the storage cylinder circuit for correct positioning, function and open position.
	The circulation pump in the storage cylinder circuit is defective (pump does not run when hot water is tapped).	Replace the circulation pump in the storage cylinder circuit.
The hot water temperature drops at the draw-off point(s).	The heating water temperature in the buffer storage cylinder is too low.	Increase the buffer storage cylinder temperature. Check the output of the heat generator.
	The storage cylinder capacity is not sufficient.	Increase the storage cylinder capacity. Check the system design.
During circulation operation, the water at the draw-off point cools down abruptly.	Cold water flows directly into the circulation pipe instead of into the heat exchanger. The check valve in the circulation pipe (accessory) is contaminated or defective.	Clean or replace the check valve.
With larger draw-off quantities, the target temperature is no longer reached.	The storage cylinder temperature is not sufficient for the requested draw-off quantity.	Increase the heating water temperature in the buffer storage cylinder.
	The heat exchanger is contaminated.	Clean the storage cylinder circuit side of the heat exchanger.
	The heat exchanger is calcified.	Decalcify the potable water side of the heat exchanger.
The ring on the touch control panel flashes red. The error is displayed. (When the error has been corrected, the error message is automatically reset.)	The cause is determined by the error displayed in each case. The complete error history can be called up with the operator logins “Installer” and “Special functions” in the “Status” menu.	The remedy depends on the displayed error.

MALFUNCTION	CAUSE	REMEDY
Water leakage or leaks at the heat exchanger (external). Pressure increase in the storage cylinder circuit (potable water enters the storage cylinder circuit). The safety valve in the storage cylinder circuit may be triggered.	Leakage at the heat exchanger due to corrosion. This can be the result of a heat exchanger that is unsuitable for the potable water quality.	Replace the heat exchanger. Match the new heat exchanger to the potable water quality (see Oventrop information sheet on corrosion protection in the appendix).
The discharge capacity at the draw-off points is too low.	The heat exchanger is heavily calcified.	Decalcify the potable water side of the heat exchanger.
	The cold water pressure is too low (the pressure reducer is set incorrectly).	Check the setting of the pressure reducer. Increase the pressure if necessary.

9.2 Nominal resistances of the temperature sensors

°C	Ω PT 1000
-10	961
-5	980
0	1000
5	1019
10	1039
15	1058
20	1078
25	1097
30	1117
35	1136
40	1155
45	1175
50	1194
55	1213
60	1232
65	1252
70	1271
75	1290
80	1309
85	1328
90	1347
95	1366
100	1385
105	1404
110	1423
115	1442

9.3 Decalcification of the heat exchanger

If you notice during operation of the system that the potable water is no longer heated to to the required temperature, even though the controller does not indicate an error and you have not changed the temperature setting, limescale deposits may have formed in the heat exchanger.

Due to the high temperatures in fresh water stations, calcification of the installed heat exchangers cannot generally be avoided. This is especially true when using a circulation pipe.

NOTICE

Risk of environmental pollution!
Chemicals for decalcification can cause environmental damage if disposed of improperly.

- ! Follow the decalcification agent manufacturer's disposal instructions.

You can decalcify the heat exchanger both when it is removed and when it is installed.

9.3.1 Decalcification of the potable water circuit with the heat exchanger installed

⚠ CAUTION

Risk of scalding due to hot media!
If the station has been in operation, there is a risk of scalding due to unintentional escape of hot water or water steam.

- ! Allow the system to cool down.
- ! Wear safety goggles.

⚠ CAUTION

Risk of burns on hot components!
Touching hot components can cause burns.

- ! Wear safety gloves.

NOTICE

Risk of damage due to pressure surge!
The abrupt injection of water into the station can lead to damage, e.g. to the sensors or sealing points.

- ! Always open and close ball valves slowly.

1. Disconnect the controller from the power supply at all poles.
2. Close the shutoff ball valve for potable water (hot) (position 10 in Fig. 2 on page 12).
3. Close the shutoff ball valve for potable water (cold) (position 11 in Fig. 2 on page 12).
4. Close the shutoff ball valve for storage cylinder circuit return (position 1 in Fig. 2 on page 12).
5. Close the shutoff ball valve for storage cylinder circuit supply (position 2 in Fig. 2 on page 12).
6. Unscrew the caps of the fill and drain ball valves for potable water (cold and hot) (positions 7 and 16 in Fig. 2 on page 12).
7. Connect one flushing hose each to the fill and drain ball valves for potable water (cold and hot) (positions 7 and 16 in Fig. 2 on page 12).

Observe the flow direction of the decalcification agent. It must flow in the opposite direction to the intended direction of flow of the potable water in the potable water circuit.

Only use a decalcification agent approved by the DVGW, e.g. based on citric acid, to decalcify the heat exchanger. Observe DVGW work sheets W 291 and 319!

8. Slowly open the fill and drain ball valves for potable water (cold and hot) (positions 7 and 16 in Fig. 2 on page 12) to initiate flushing with the decalcification agent.
9. Finish the flushing process after the prescribed exposure time has elapsed.

The exposure times depend on the decalcifying agents used. Decalcifying agents may have to be heated. Follow the instructions of the decalcification agent manufacturer!

10. Drain the liquid with the flushed out limescale residues from the flushing circuit.

Flushing with a lye solution

11. Neutralise the potable water circuit by flushing with a lye solution.
12. Close the upper fill and drain ball valve.
13. Remove the flushing hoses.

▷ The decalcification flushing is completed.

Flushing of the potable water circuit with potable water

14. Connect the drain hose for potable water to the lower fill and drain ball valve.
15. Open the shutoff ball valve for potable water (cold) (position 11 in Fig. 2 on page 12) slightly.

▷ The heat exchanger is flushed with potable water.

16. Wait for at least one minute.
17. Close the fill and drain ball valve for potable water (hot) (position 16 in Fig. 2 on page 12).
18. Remove the drain hose.
19. Screw the caps back onto the fill and drain ball valves for potable water (cold and hot).

▷ The decalcification of the potable water circuit with the heat exchanger installed is completed.

9.3.2 Cleaning of the heat exchanger (storage cylinder circuit side)

A loss of performance may also be due to contamination

of the storage cylinder circuit. As a further measure, the storage cylinder circuit should always be flushed first before considering replacing the heat exchanger.

⚠ CAUTION

Risk of scalding due to hot media!
If the station was in operation, there is a risk of scalding due to unintentional escape of hot water or water vapour.

- ! Allow the system to cool down.
- ! Wear safety goggles.

⚠ CAUTION

Risk of burns on hot components!
Touching hot components can cause burns.

- ! Wear safety gloves.

1. Disconnect the controller from the power supply at all poles.
2. Close the shutoff ball valve for potable water (hot) (position 10 in Fig. 2 on page 12).
3. Close the shutoff ball valve for potable water (cold) (position 11 in Fig. 2 on page 12).
4. Close the shutoff ball valve for storage cylinder circuit return (position 1 in Fig. 2 on page 12).
5. Close the shutoff ball valve for storage cylinder circuit supply (position 2 in Fig. 2 on page 12).
6. Unscrew the caps of the fill and drain ball valves for storage cylinder circuit return and supply (positions 9 and 3 in Fig. 2 on page 12).
7. Connect one flushing hose each to the fill and drain ball valves for storage cylinder circuit return and supply (positions 9 and 3 in Fig. 2 on page 12).
8. Slowly open the fill and drain ball valves for storage cylinder circuit return and supply (positions 9 and 3 in Fig. 2 on page 12) to initiate flushing. Flush for at least 5 minutes.
9. Drain the liquid and the flushed residues from the flushing circuit.
10. Close the fill and drain ball valve for storage cylinder circuit return (position 9 in Fig. 2 on page 12).
11. Close the fill and drain ball valve for storage cylinder circuit supply (position 3 in Fig. 2 on page 12).
12. Remove the flushing hoses.
13. Screw the caps back onto the fill and drain ball valves.

NOTICE

Risk of damage due to pressure surge!
The abrupt injection of water into the station can lead to damage, e.g. to the sensors or sealing points.

- ! Always open and close ball valves slowly.

14. Open the shutoff ball valves (positions 10, 11, 1 and 2 in Fig. 2 on page 12).
15. Restore the power supply for the fresh water station.

▷ Cleaning is completed.

9.3.3 Decalcification of the removed heat exchanger

CAUTION

Risk of scalding due to hot media!
If the station has been in operation, there is a risk of scalding due to unintentional escape of hot water or water steam.

- ! Allow the system to cool down.
- ! Wear safety goggles.

CAUTION

Risk of burns on hot components!
Touching hot components can cause burns.

- ! Wear safety gloves.

NOTICE

Risk of damage due to pressure surge!
The abrupt injection of water into the station can lead to damage, e.g. to the sensors or sealing points.

- ! Always open and close ball valves slowly.

1 Disconnect the controller from the power supply at all poles.

2 Close the shutoff ball valve for potable water (hot) (Position 10 in Fig. 2 on page 12).

3 Close the shutoff ball valve for potable water (cold) (position 11 in Fig. 2 on page 12).

4 Close the shutoff ball valve for storage cylinder circuit return (position 1 in Fig. 2 on page 12).

5 Close the shutoff ball valve for storage cylinder circuit supply (position 2 in Fig. 2 on page 12).

6 Unscrew the caps of the fill and drain ball valves (positions 7, 9, 16 and 3 in Fig. 2 on page 12).

7 Connect one drain hose each to the fill and drain ball valve for potable water (hot) and storage cylinder circuit supply (positions 16 and 3 in Fig. 2 on page 12).

8 Open the fill and drain ball valves to drain the pipes and the heat exchanger.

9 Loosen all four union nuts of the heat exchanger using 32 and 38 mm spanners.

10 Carefully remove the heat exchanger and place it on a flat surface with the connections facing upwards.

Only use a decalcification agent approved by the DVGW, e.g. based on citric acid, to decalcify the heat exchanger. Observe DVGW work sheets W 291 and 319!

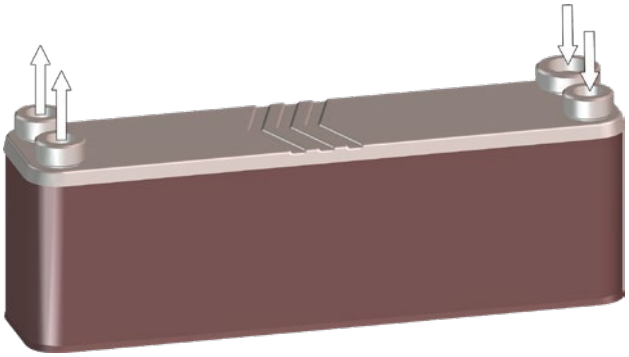

Fig. 30: Decalcification of the removed heat exchanger

11 Fill both circuits of the heat exchanger with decalcifying agent.

12 Finish the process after the prescribed exposure time has elapsed.

The exposure times depend on the decalcifying agents used. Decalcifying agents may have to be heated. Follow the instructions of the decalcification agent manufacturer!

13 Drain the decalcifying agent.

14 Neutralise both circuits of the heat exchanger by flushing with a lye solution.

15 Flush both circuits of the heat exchanger with potable water for at least one minute.

The removed flat seals are not reusable. Use new seals for reassembly (available as accessories).

16 Reinstall the heat exchanger in the station in the reverse order of removal.

17 Vent the potable water circuit (see section 7.2 on page 26) and the storage cylinder circuit (see section 7.1 on page 25).

9.4 Cleaning of the volume flow sensor

If not hot potable water can be added at the draw-off points, there is an operational fault. As listed in the troubleshooting table in section 9.1 on page 44, this can have several causes.

▶ If easy to determine causes such as a de-energised controller can be ruled out, check the volume flow sensor for contamination.

A contaminated sensor means that the volume flow of the cold water inlet or of the cold water inlet with circulation pipe is no longer detected. As a result, no more tapping is registered and the circulation pump of the storage cylinder circuit is no longer activated. In the heat exchanger, energy is no longer transferred to the potable water circuit.

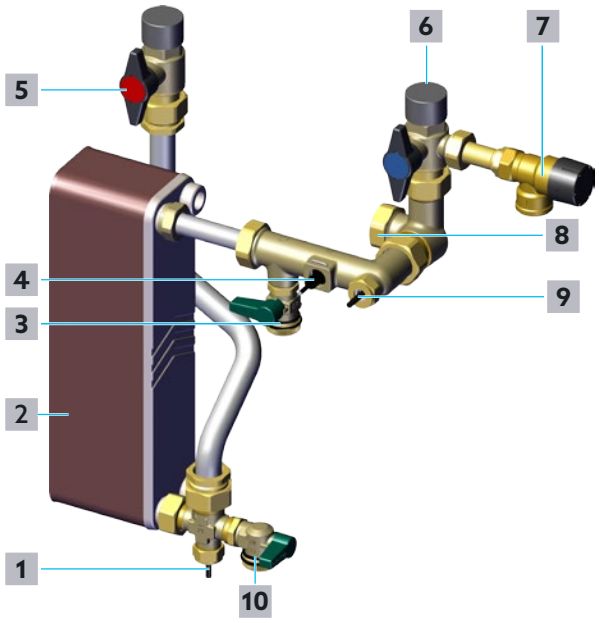

Fig. 31: Potable water circuit

1	Temperature sensor for potable water (hot) S2
2	Heat exchanger
3	Fill and drain ball valve for potable water (cold)
4	Volume flow sensor for potable water circuit
5	Shutoff ball valve for potable water (hot)
6	Shutoff ball valve for potable water (cold)
7	Safety valve for potable water circuit (10 bar)
8	Connection for circulation pipe
9	Temperature sensor for potable water (cold)/ circulation S3
10	Fill and drain ball valve for potable water (hot)

9.4.1 Required tools

- 12, 37 and 38 mm sapnner
- Fuse tongs J2 (e.g. EAN 4003773048534).
- Slotted screwdriver

9.4.2 Cleaning of the measuring turbine

⚠ CAUTION

Risk of scalding due to hot media!
If the station has been in operation, there is a risk of scalding due to unintentional escape of hot water or water steam.

! Allow the system to cool down.
! Wear safety goggles.

⚠ CAUTION

Risk of burns on hot components!
Touching hot components can cause burns.

! Wear safety gloves.

NOTICE

Risk of damage due to pressure surge!
The abrupt injection of water into the station can lead to damage, e.g. to the sensors or sealing points.

! Always open and close ball valves slowly.

1. Disconnect the controller from the power supply at all poles.
2. Slowly close the shutoff ball valve for potable water (hot) (position 5 in Fig. 31 on page 49 and position 10 in Fig. 2 on page 12).
3. Slowly close the shutoff ball valve for potable water (cold) (position 6 in Fig. 31 on page 49 and position 11 in Fig. 2 on page 12).
4. Unscrew the cap of the fill and drain ball valve for potable water (hot) (position 10 in Fig. 31 on page 49 and position 16 in Fig. 2 on page 12).
5. Connect the drain hose for potable water to the fill and drain ball valve for potable water (hot) (position 10 in Fig. 31 on page 49 and position 16 in Fig. 2 on page 12).
6. Open the fill and drain ball valve for potable water (hot) (position 10 in Fig. 31 on page 49 and position 16 in Fig. 2 on page 12).

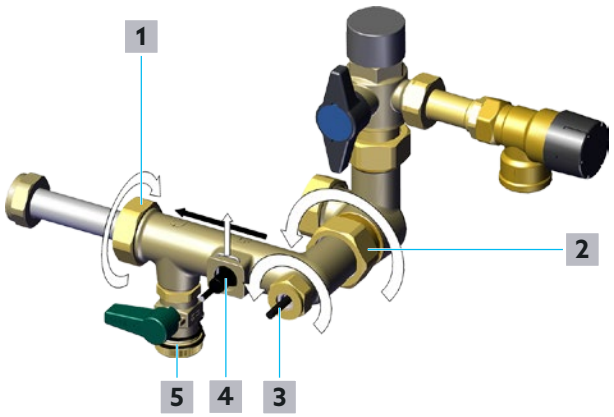

Fig. 32: Cleaning of the measuring turbine

1	Union nut heat exchanger side
2	Union nut cold potable water supply
3	Temperature sensor for potable water (cold)/ circulation S3
4	Volume flow sensor for potable water circuit
5	Fill and drain ball valve for potable water (cold)

7 Loosen the clamp of the volume flow sensor (position 4 in Fig. 32 on page 50) and put it aside.

8 Loosen the union nut of the temperature sensor for potable water (cold)/circulation S3 (position 3 in Fig. 32 on page 50).

9 Carefully pull the volume flow sensor for potable water circuit (position 4 in Fig. 32 on page 50) and the temperature sensor for potable water (cold)/ circulation S3 (position 3 in Fig. 32 on page 50) out of the fitting.

10 Remove the O-ring of the temperature sensor and and keep it protected against dirt until it is reinstalled.

11 Loosen the union nut potable water supply (position 2 in Fig. 32 on page 50) with a 38 mm spanner.

12 Loosen the union nut heat exchanger side (position 1 in Fig. 32 on page 50) with a 37 mm spanner.

13 Carefully remove the fitting from the station.

NOTICE

Overheating of the measuring turbine!

The bearing of the measuring turbine is cooled by the water flow during operation. The use of compressed air for cleaning can lead to irreparable damage due to overheating.

! Clean the measuring turbine with running water only.

14 Clean the sleeve with measuring turbine. Remove residues such as hemp residues with (running) water. Direct the flowing water through the fitting in the opposite direction to the direction of flow (from the direction of position 1 to the direction of position 2 in Fig. 32 on page 50). A water hose with an appropriate spray nozzle is particularly suitable for this purpose.

15 Check that the measuring turbine has been cleared of foreign substances and is running smoothly again.

16 If the cleaning was successful, install the fitting in the reverse order of removal.

If the measuring turbine is still blocked, you must remove the sleeve with measuring turbine as described in section 9.4.2.1.

The removed flat seals are not reusable. Use new seals for reassembly

17 Close the fill and drain ball valve for potable water (hot) (position 10 in Fig. 31 on page 49 and position 16 in Fig. 2 on page 12).

18 Vent the potable water circuit (see section 7.2 on page 26)

19 Restore the power supply.

9.4.2.1 Removal of the measuring turbine

Required tools

Circlip pliers J2 (e.g. EAN 4003773-048534).

1 Loosen the circlip (position 1 in Fig. 33 on page 50) with suitable circlip pliers.

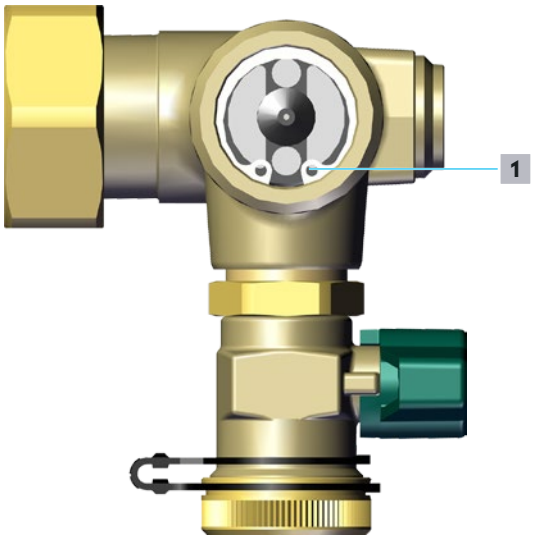

Fig. 33: Circlip

1	Circlip

2 Remove the circlip.

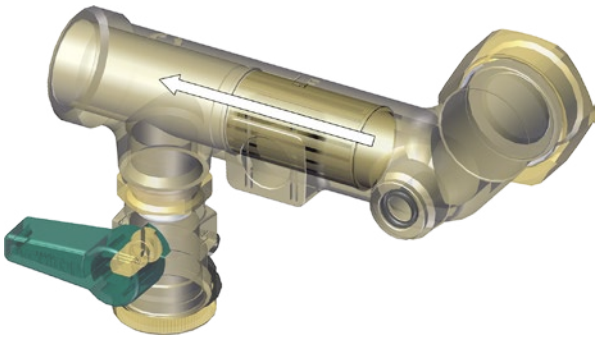

Fig. 34: Loosening of the measuring turbine

3 Carefully push the sleeve with measuring turbine out with your finger in the direction of flow until it can be moved freely.

4 Remove the sleeve with measuring turbine.

NOTICE

Overheating of the measuring turbine!

The bearing of the measuring turbine is cooled by the water flow during operation. The use of compressed air for cleaning can lead to irreparable damage due to overheating.

! Clean the measuring turbine with running water only.

5 Clean the sleeve with measuring turbine. Remove residues such as hemp remains with (running) water. Direct the flowing water through the sleeve in the opposite direction to the direction of flow. A water hose with an appropriate spray nozzle is particularly suitable for this purpose.

6 Check that the measuring turbine has been cleared of foreign substances and is running smoothly again.

7 If the measuring turbine cannot be loosened even when removed, the sleeve with measuring turbine must be replaced.

9.4.2.2 Installation of the measuring turbine

Observe the flow direction of the measuring turbine.

The removed flat seals are not reusable. Use new seals for reassembly (available as accessories).

Fig. 35: Installation of the measuring turbine

1 Guide the sleeve with measuring turbine back into the fitting in the reverse direction of removal.

2 Insert the circlip (position 1 in Fig. 33 on page 50).

3 Install the fitting in the reverse order of removal.

4 Install the volume flow sensor for potable water circuit (position 4 in Fig. 32 on page 50) and the temperature sensor for potable water (cold)/ circulation S3 (position 3 in Fig. 32 on page 50).

Make sure that the O-ring is positioned correctly.

5 Close the fill and drain ball valve for potable water (hot) (position 10 in Fig. 31 on page 49 and position 16 in Fig. 2 on page 12).

6 Vent the potable water circuit (see section 7.2 on page 26)

7 Restore the power supply.

10. Maintenance

CAUTION

Risk of scalding due to hot media!
If the station has been in operation, there is a risk of scalding due to unintentional escape of hot water or water steam.

- ! Allow the system to cool down.
- ! Wear safety goggles.

CAUTION

Risk of burns on hot components!
Touching hot components can cause burns.

- ! Wear safety gloves.

10.1 Maintenance

Carry out the following maintenance work once a year.

Complete the maintenance report promptly after the completion of each maintenance. You will find a corresponding form in the appendix. Sign the report and provide the operator with a copy.

10.1.1 Leakage check (visual inspection)

- ▶ Check all connections to the outside to the pipework and inside the station for moisture. If necessary, retighten screw connections or replace defective seals.
- ▶ Check the heat exchanger for damp spots.

Especially in connection with discolouration, damp spots indicate the formation of corrosion. Leaking heat exchangers must be replaced.

10.1.2 System pressure check

- ▶ Compare the actual values in the storage cylinder and the potable water circuit with the last maintenance or handover report.
- ▶ Readjust deviations in the potable water circuit at the pressure reducer.
- ▶ If the pressure in the storage cylinder circuit is too low, increase the water pressure.
- ▶ If the pressure in the storage cylinder is too high, there could be a corrosion problem in the heat exchanger. Defective heat exchangers must be replaced.

10.1.3 Functional check of the safety valves (potable water circuit)

Check the function of the safety valves at six-month intervals in accordance with DIN EN 806-5.

10.1.4 Water sampling

If required by law for your application environment, take samples from the potable water circuit of your installation at the prescribed intervals.

To do this, connect a water sampling valve to the fill and drain ball valve for potable water (hot) (position 16 in Fig. 2 on page 12).

Another sample must be taken at the furthest draw-off point.

Insofar as an additional pipe is used for circulation operation, connect a third water sampling valve to the intended connection and take an appropriate water sample there.

10.1.5 Actuation of the four shutoff ball valves

NOTICE

Risk of damage due to pressure surge!
The abrupt injection of water into the station can lead to damage, e.g. to the sensors or sealing points.

- ! Always open and close ball valves slowly..

In the course of maintenance, actuate the four shutoff ball valves (positions 10, 11, 1 and 2 in Fig. 2 on page 12). This loosens deposits and keeps the valves operable.

10.1.6 Electrical components and plug connections

Check:

- the cable plug connections of all components connected to the controller for firm seating and integrity.
- the correct positioning of the temperature sensors.

10.1.7 Functional control of the check valve of the circulation set

If you use a circulation set in the potable water system, check the check valve for correct functioning. Observe the documentation of the potable water circulation set.

The annual control of the check valve is a normative requirement according to DIN EN 806-5.

10.1.8 Replacement of the potable water filter insert

During maintenance, also consider the potable water filter installed in the cold water inlet of the station.

- Replace the filter insert annually with a new one (item no. 6125101).

11. Notes for the operator

Have the specialist tradespeople instruct you in the safe and intended use of the station and the necessary maintenance work.

- Carry out a visual inspection at least once a month. When doing so, pay attention to whether moisture is leaking. In case of water leakage, inform the responsible installation company.
- Trigger the station safety valve (position 12 in Fig. 2 on page 12) once every six months.
  To do this, turn the plastic cap of the valve anticlockwise until a "click" sound is clearly audible.

General notes on setting the potable water temperature

The controller is preset to a potable water temperature of 60 °C. In principle, however, you have the option of increasing the potable water temperature at the draw-off points via the controller. Since this temperature is detected by a sensor at the hot water outlet of the heat exchanger, it is not the same as the hot water temperatures at the draw-off points.

If you want to increase the water temperature at the draw-off points, you can increase the potable water setpoint temperature via the "+" key (e.g. in 5 °C steps).

Increasing the hot water temperature always means increasing the energy consumption and decreasing the hot water temperature always means saving energy.

CAUTION

Risk of scalding due to excessively hot potable water at the draw-off points!

Due to setting or defect of the controller, the hot water temperature at the draw-off points can rise up to the heating water temperature in the buffer storage cylinder.

- ! If there is a risk of scalding in accordance with DIN EN 806 and DIN 1988 due to high heating water temperature in the buffer storage cylinder, you must install scald protections at all draw-off points.
- ! If you do not use scald protections at all draw-off points, regulate the temperature of the storage cylinder circuit down to such an extent that the temperature in the storage cylinder and thus the potable water temperature cannot cause any risk of scalding.

Legionella prevention

Legionella multiply particularly quickly if the hot water temperature is constantly too low or if the water is left standing for a long time(> 72 h) without being tapped.

- Tap water regularly to ensure regular potable water replacement and to prevent prolonged periods of standing potable water.
- After each standing period of 72 h or more, run the water at all draw-off points for a short time to replace the potable water in the pipes.
- When using a circulation pipe, the hot water temperature must be at least 60 °C.

12. Dismantling and disposal

When the fresh water station reaches the end of its service life or has an irreparable defect, it must be dismantled and disposed of in an environmentally friendly manner or the components must be recycled.

12.1 Dismantling of the station

12.1.1 Disconnection of the station from the power supply

DANGER

Danger to life due to electric current!
There is a danger to life if live components are touched.

- ! Disconnect the product from the power supply at all poles.
- ! Check that no voltage is present.
- ! Secure the product against being switched on again.
- ! Only mount the product in dry indoor areas.

▶ Disconnect the station permanently from the power supply.

▷ The station is de-energised and can be dismantled.

12.1.2 Dismantling of the station

CAUTION

Risk of injury from pressurised media!
Media escaping under pressure can cause injuries.

- ! Only carry out work when the system is depressurised.
- ! Wear safety goggles.

CAUTION

Risk of burns on hot components!
Touching hot components can cause burns.

- ! Allow the system to cool down.
- ! Wear safety gloves.

▶ Dismantle the station.

▷ The station can be disposed of separately according to components.

12.2 Disposal

NOTICE

Risk of environmental pollution!
Incorrect disposal can lead to environmental damage.

- ! Dispose of packaging materials in an environmentally friendly manner.
- ! Dispose of the components properly.

Unless a take-back or disposal agreement has been made, dispose of the station:

▶ If possible, recycle the components.

▶ Dispose of non-recyclable components according to local regulations. Disposal with domestic waste is not permitted.

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14. Appendix

14.1 Characteristic line for Wilo circulation pump

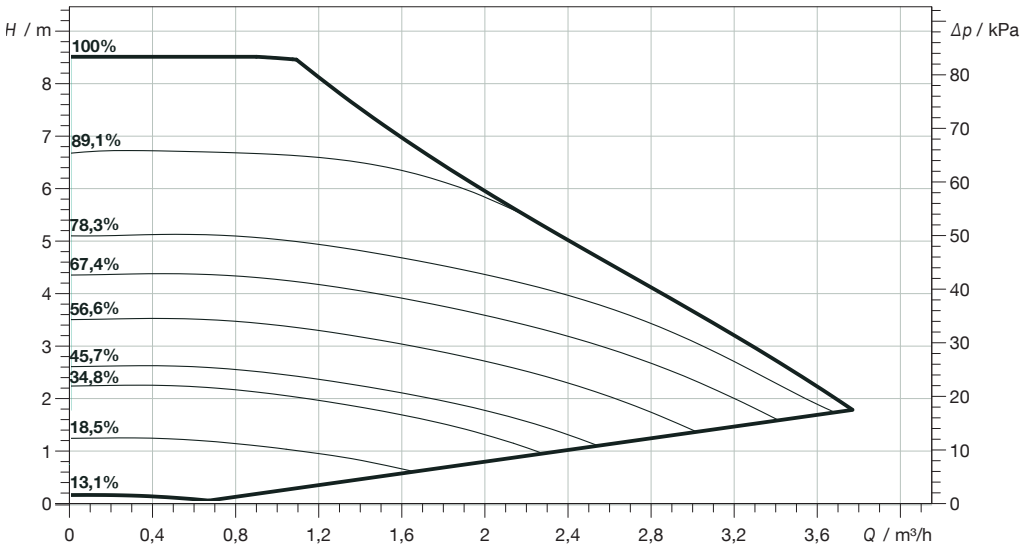

Fig. 36: Characteristic line for Wilo circulation pump (storage cylinder circuit)

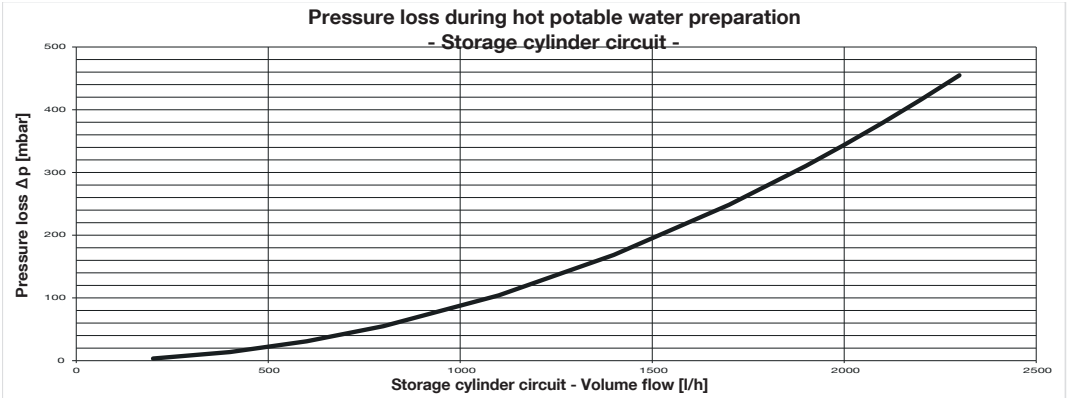

Fig. 37: Characteristic line - Pressure loss during hot potable water preparation (storage cylinder circuit)

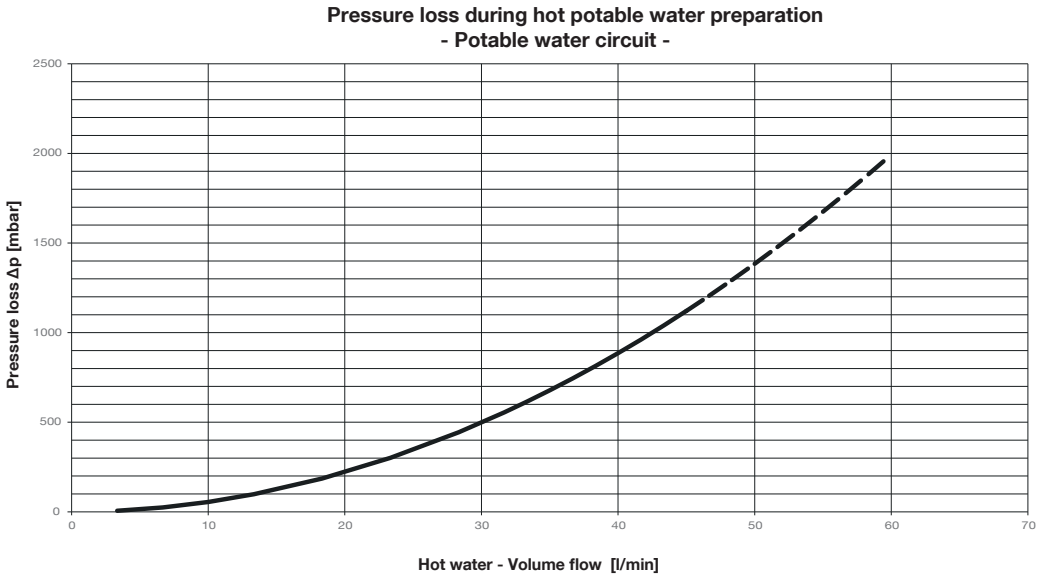

Fig. 38: Characteristic line - Pressure loss during hot potable water preparation (potable water circuit)

14.2 Characteristic line for hot potable water preparation

14.2.1 Heating of potable water from 10 °C to 45 °C

Performance data according to SPF test procedure.

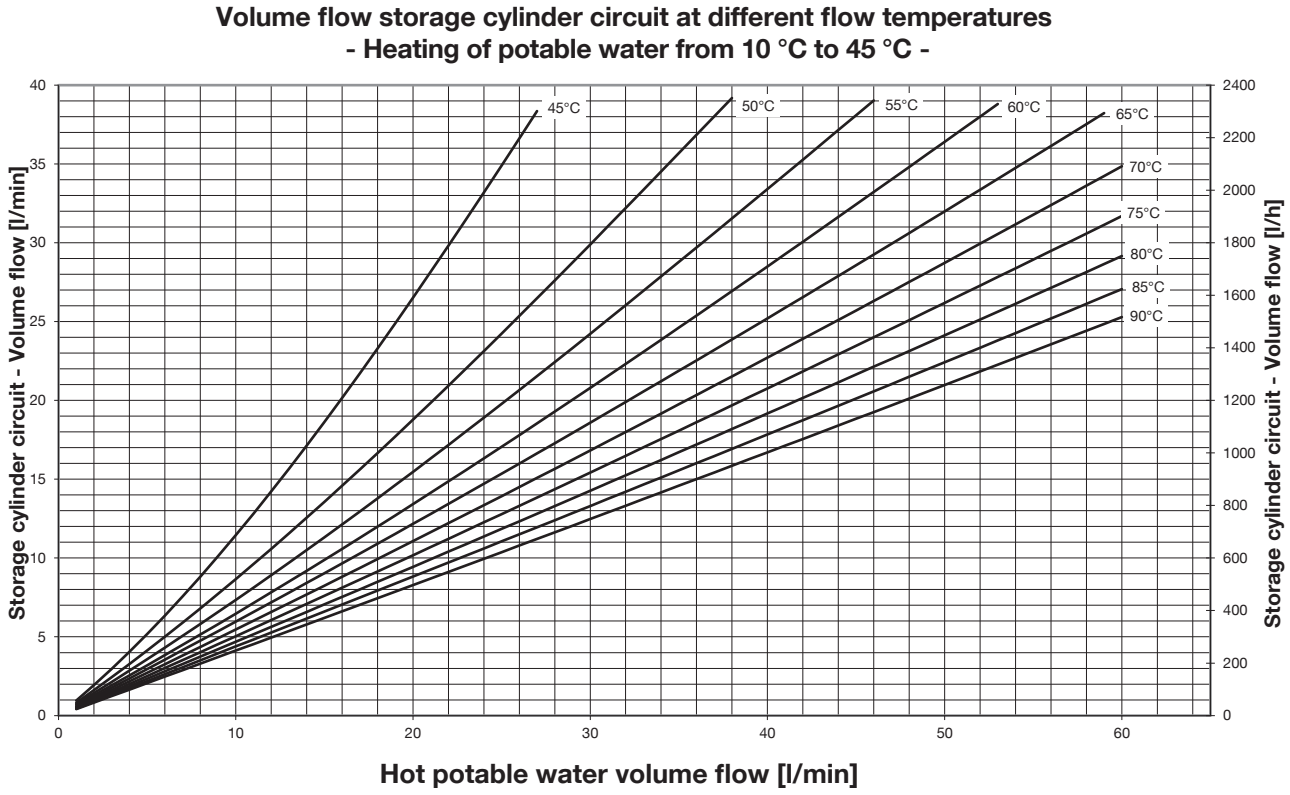

Fig. 39: Storage cylinder circuit volume flow - heating of potable water to 45 °C

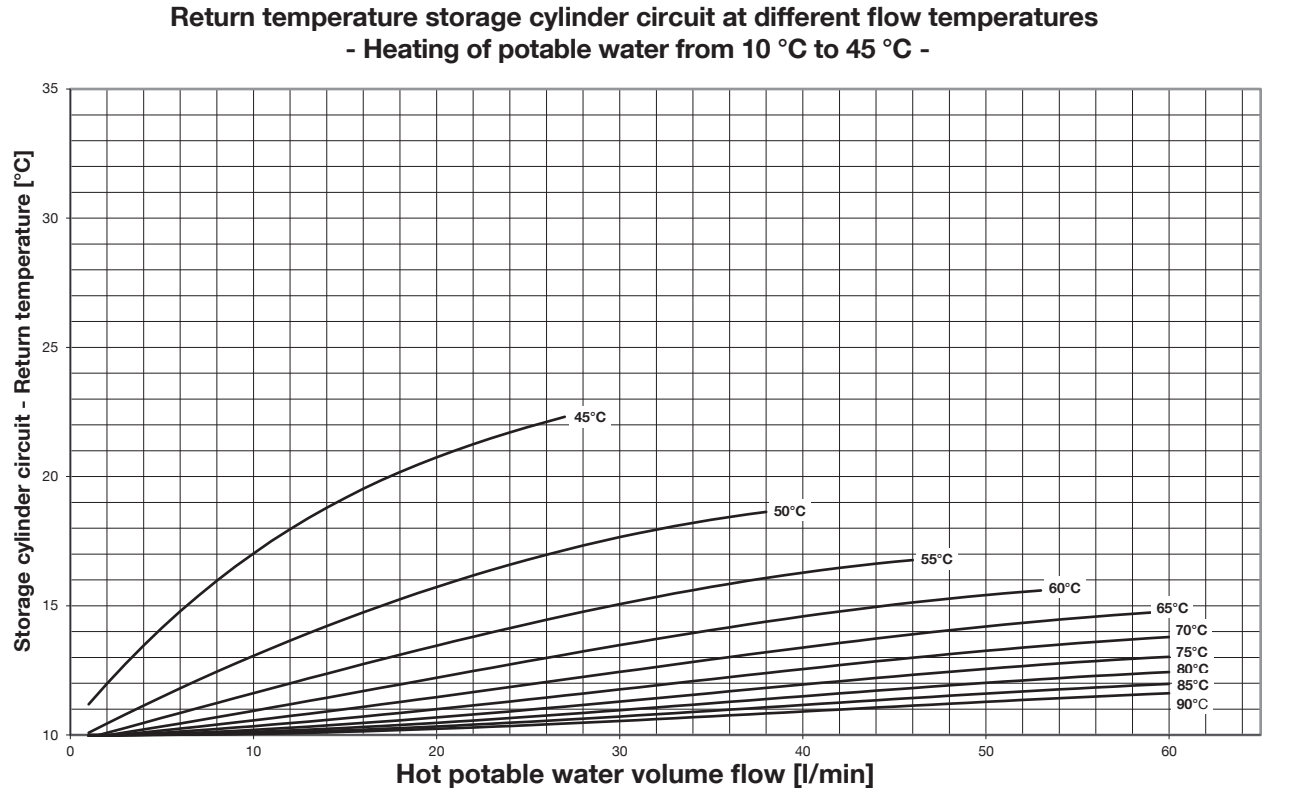

Fig. 40: Storage cylinder circuit return temperature - heating of potable water to 45 °C

14.2.2 Heating of potable water from 10 °C to 50 °C

Performance data according to SPF test procedure.

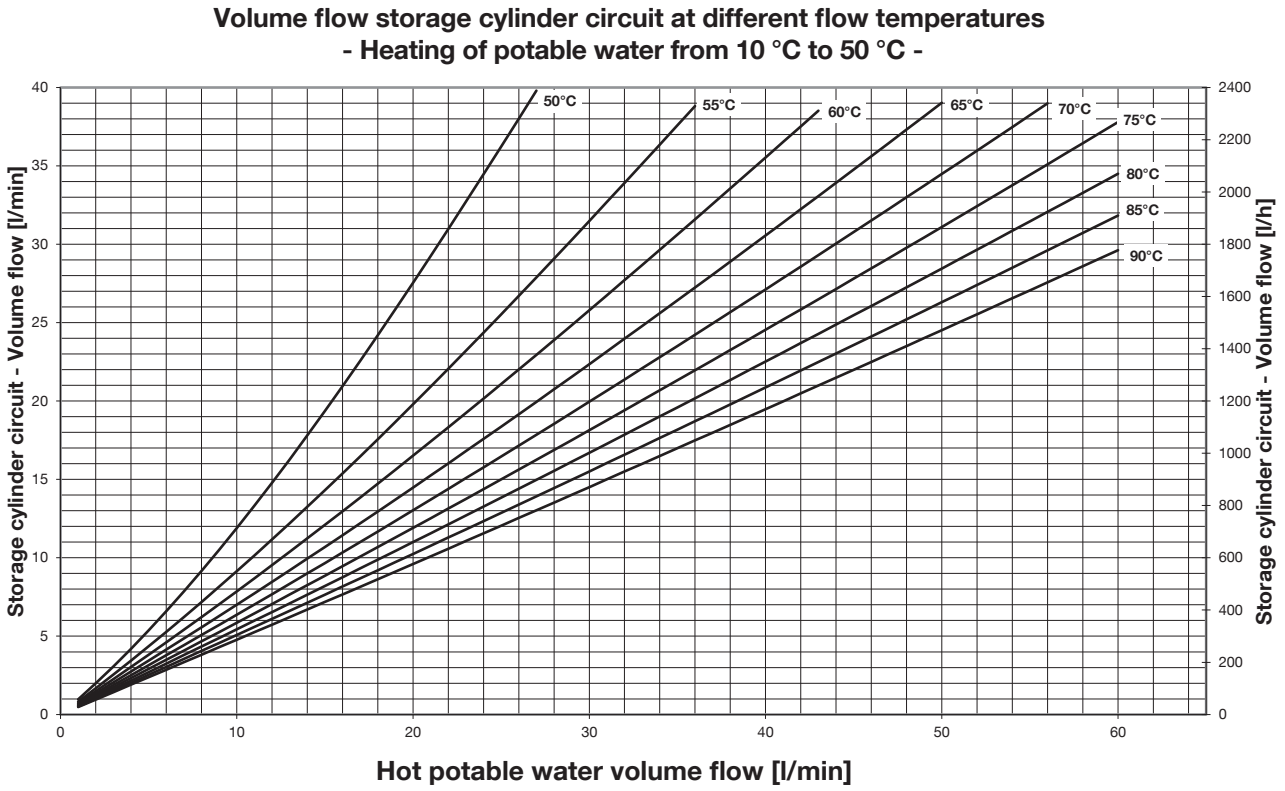

Fig. 41: Storage cylinder circuit volume flow - heating of potable water to 50 °C

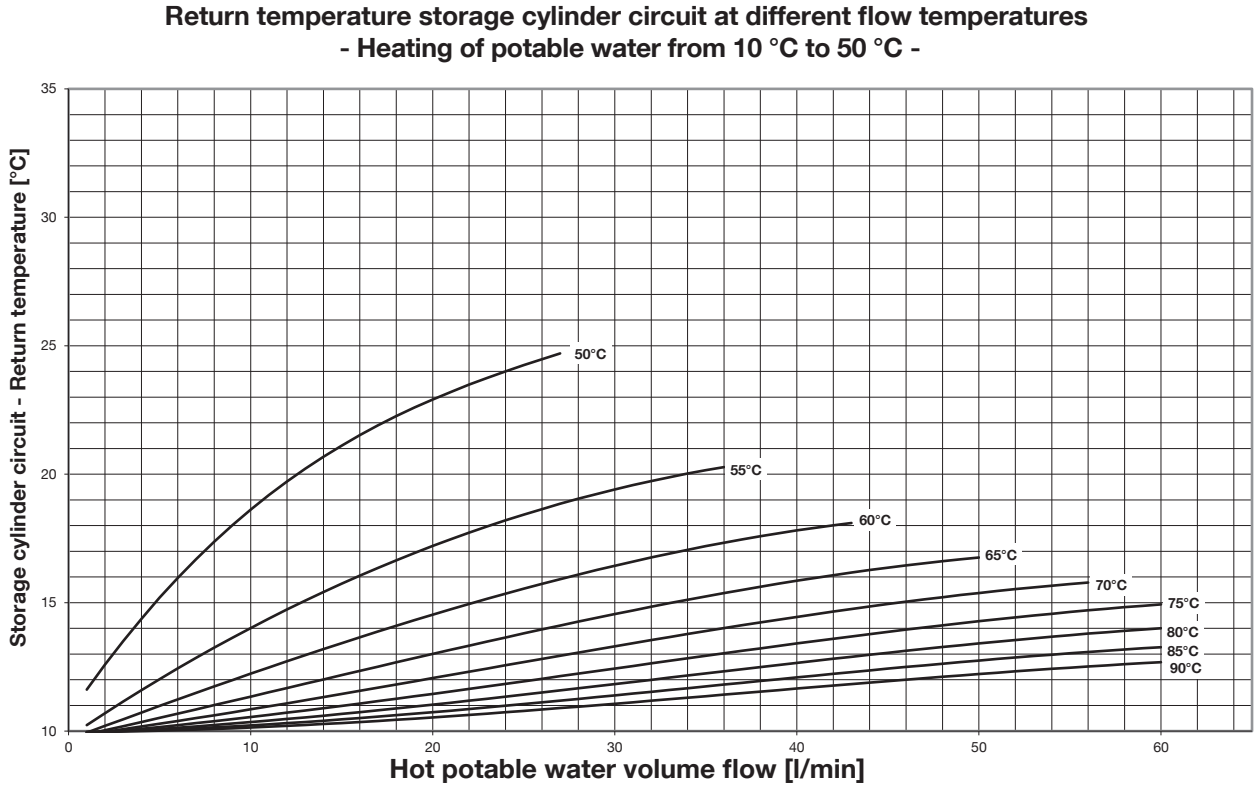

Fig. 42: Storage cylinder circuit return temperature - heating of potable water to 50 °C

14.2.3 Heating of potable water from 10 °C to 55 °C

Performance data according to SPF test procedure.

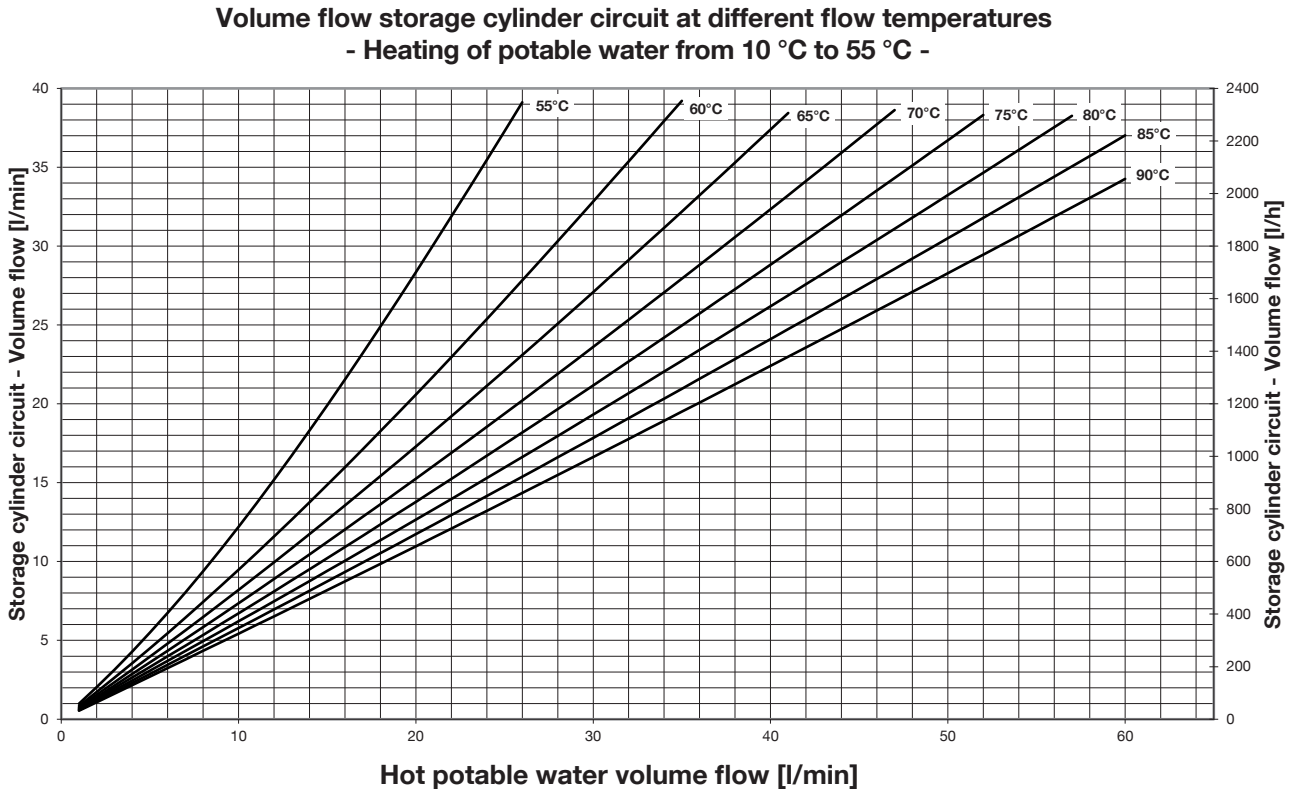

Fig. 43: Storage cylinder circuit volume flow - heating of potable water to 55 °C

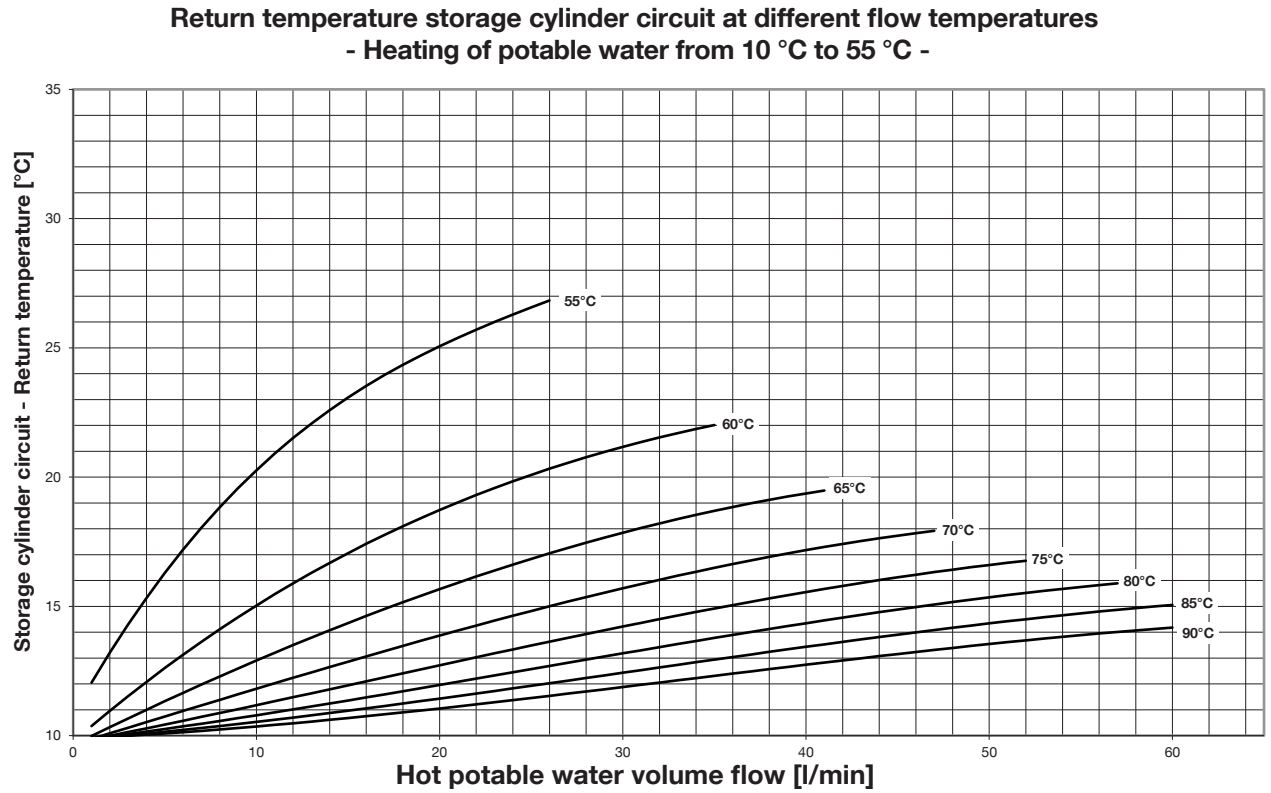

Fig. 44: Storage cylinder circuit return temperature - heating of potable water to 55 °C

14.2.4 Heating of potable water from 10 °C to 60 °C

Performance data according to SPF test procedure.

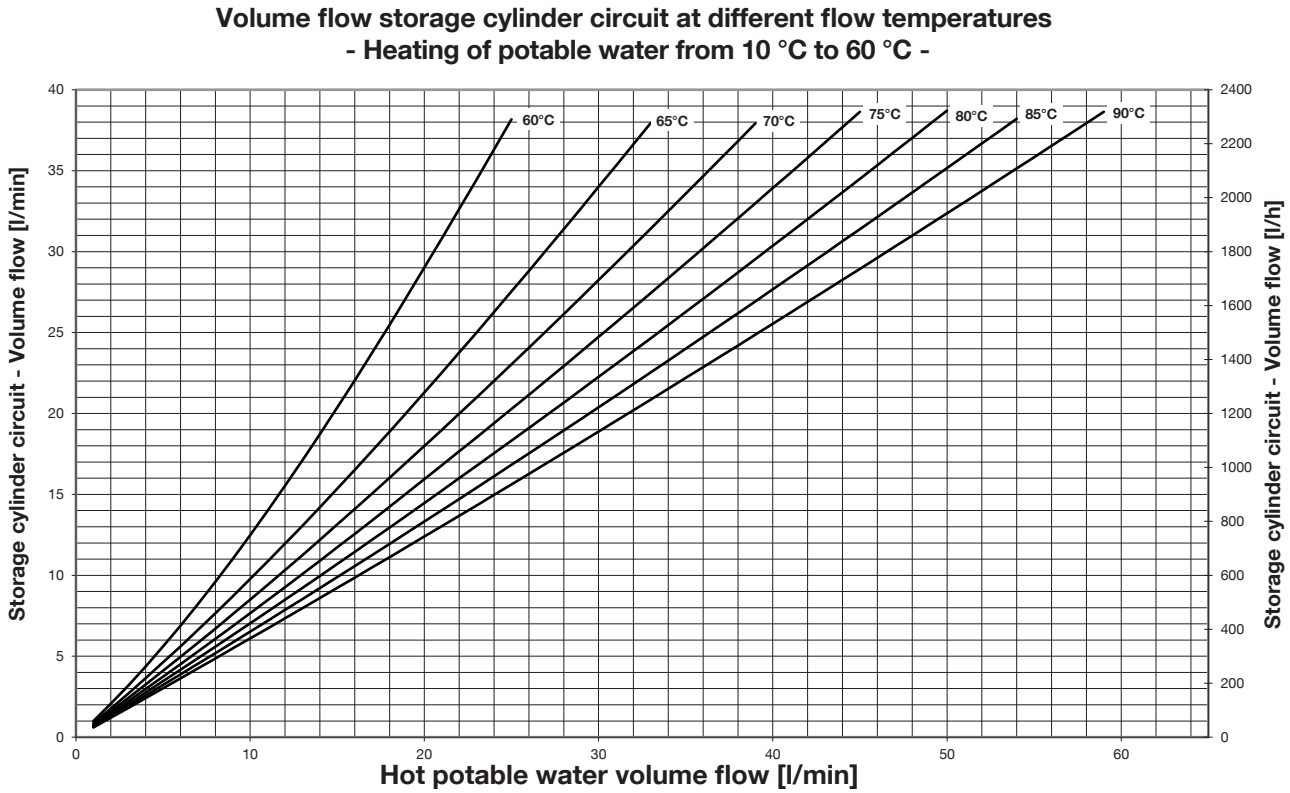

Fig. 45: Storage cylinder circuit volume flow - heating of potable water to 60 °C

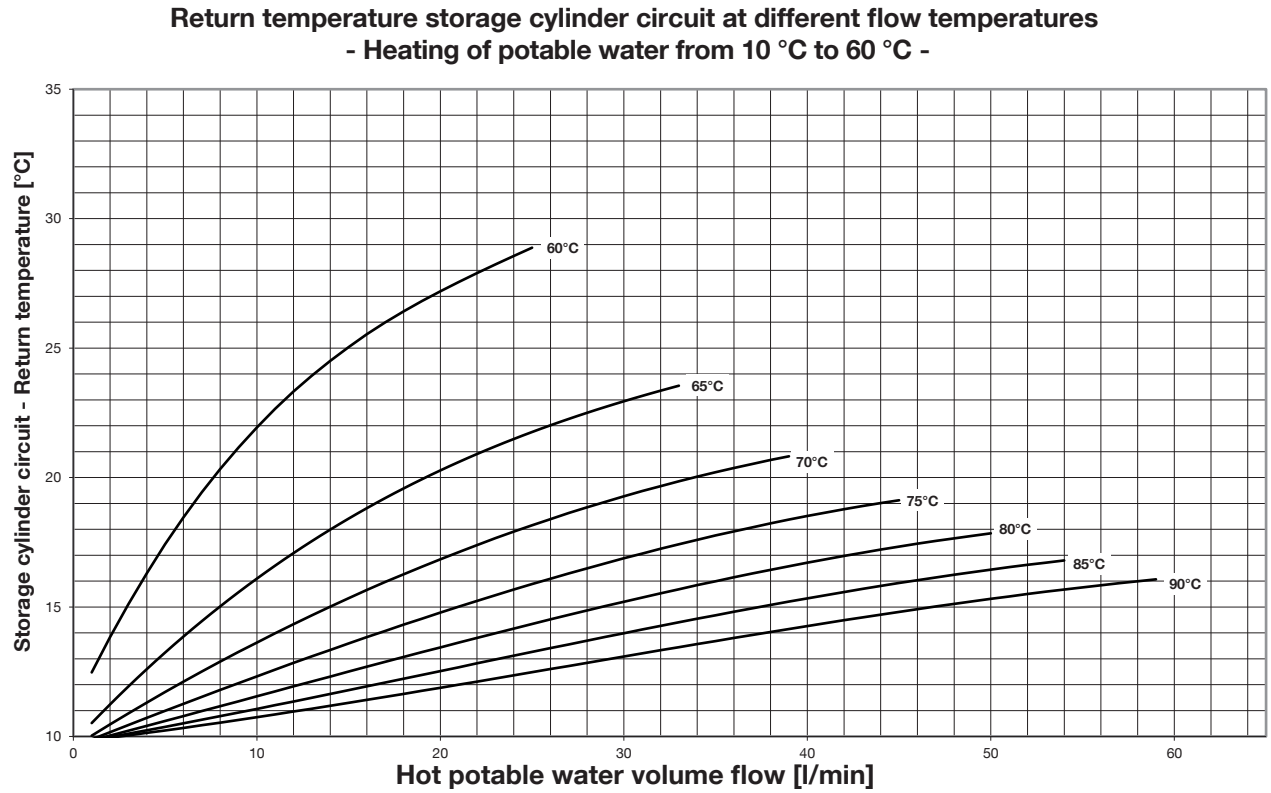

Fig. 46: Storage cylinder circuit return temperature - heating of potable water to 60 °C

14.2.5 Heating of potable water from 10 °C to 65 °C

Performance data according to SPF test procedure.

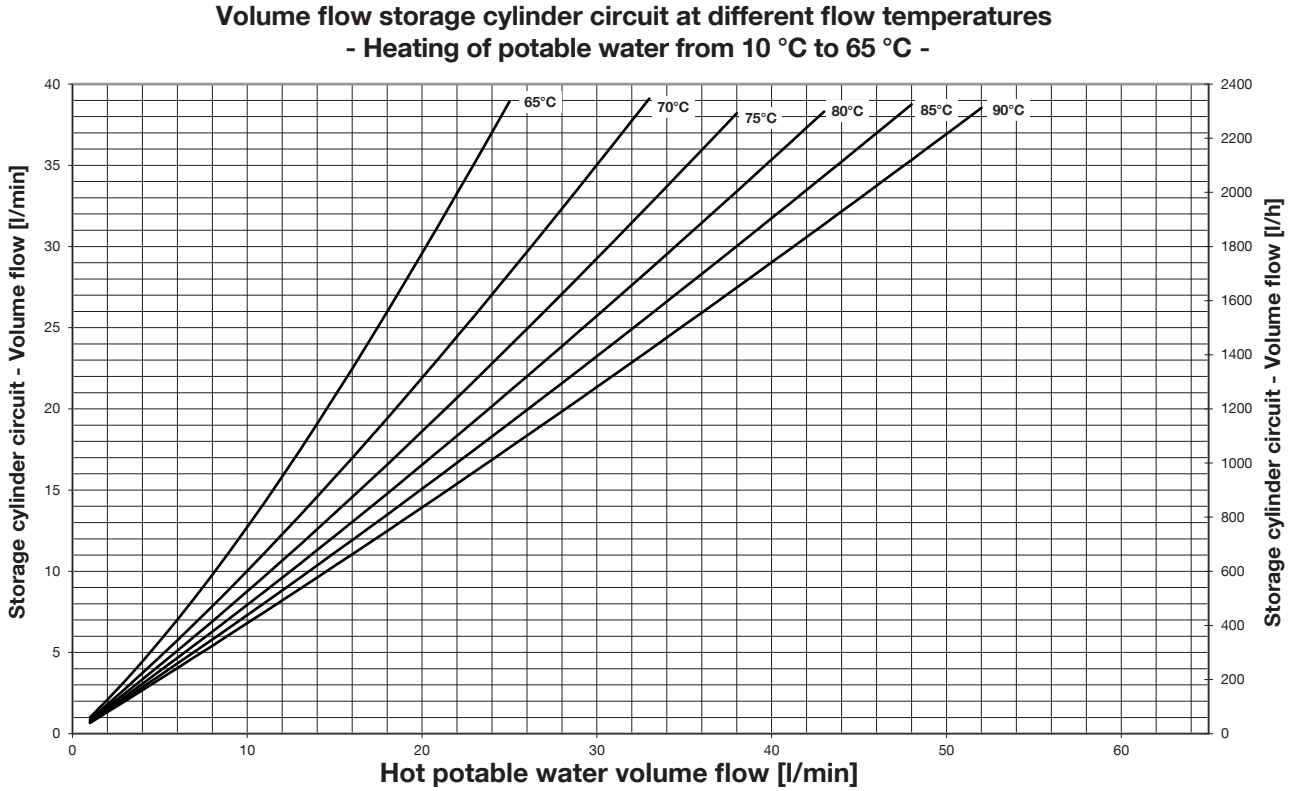

Fig. 47: Storage cylinder circuit volume flow - heating of potable water to 65 °C

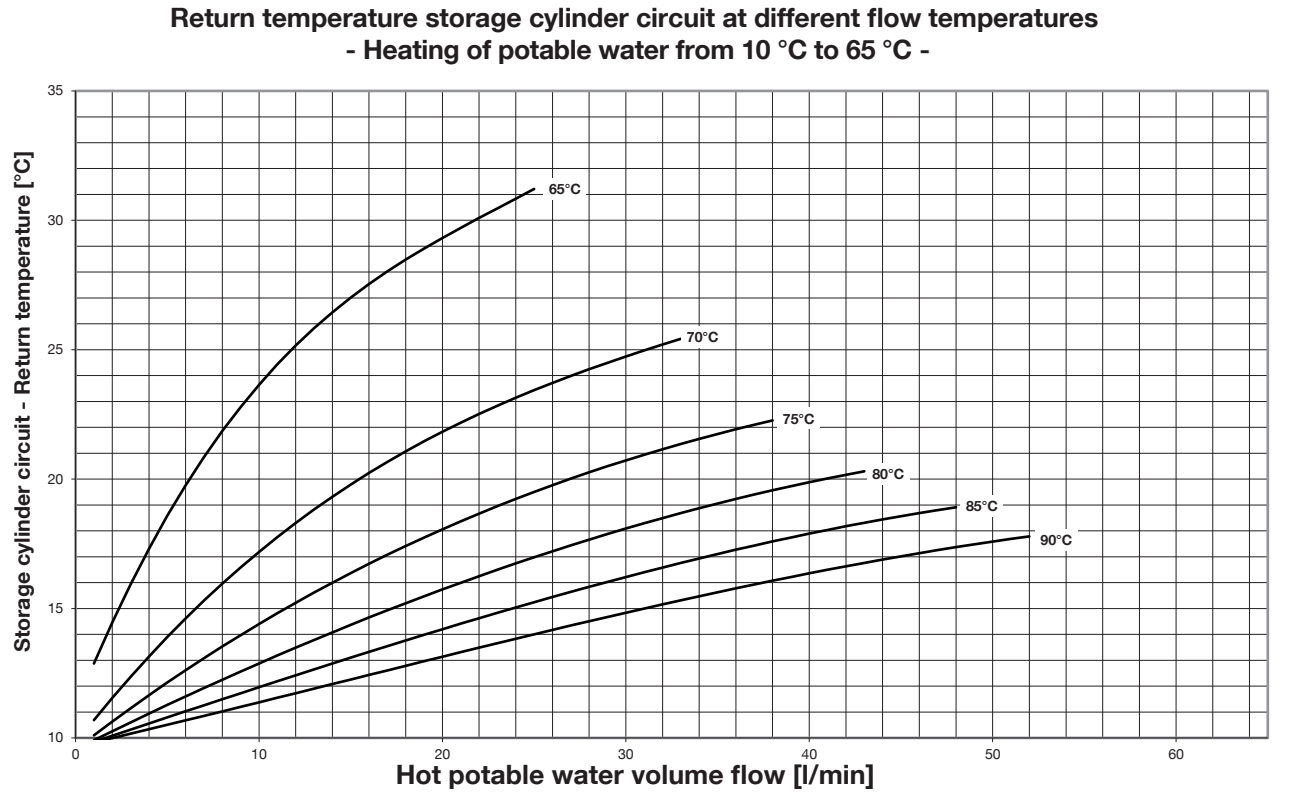

Fig. 48: Storage cylinder circuit return temperature - heating of potable water to 65 °C

14.2.6 Heating of potable water from 10 °C to 70 °C

Performance data according to SPF test procedure.

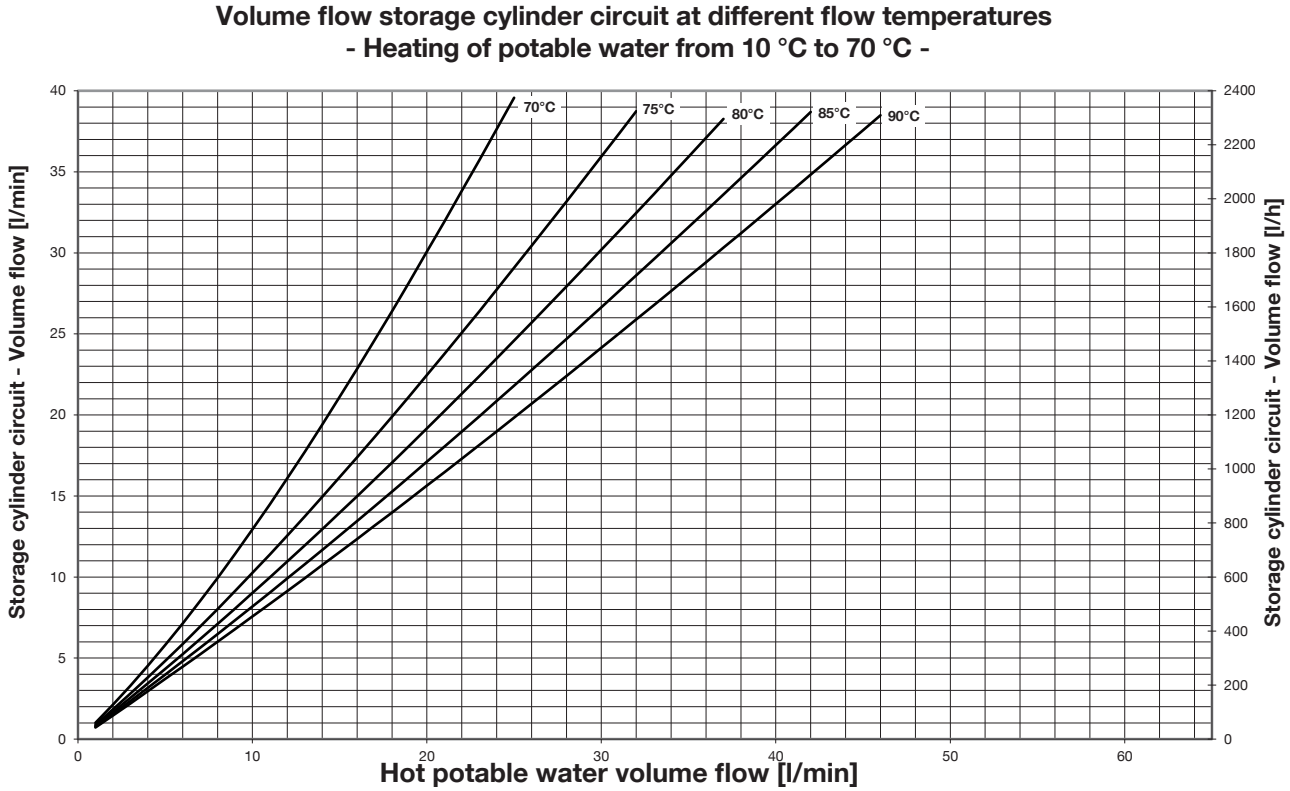

Fig. 49: Storage cylinder circuit volume flow - heating of potable water to 70 °C

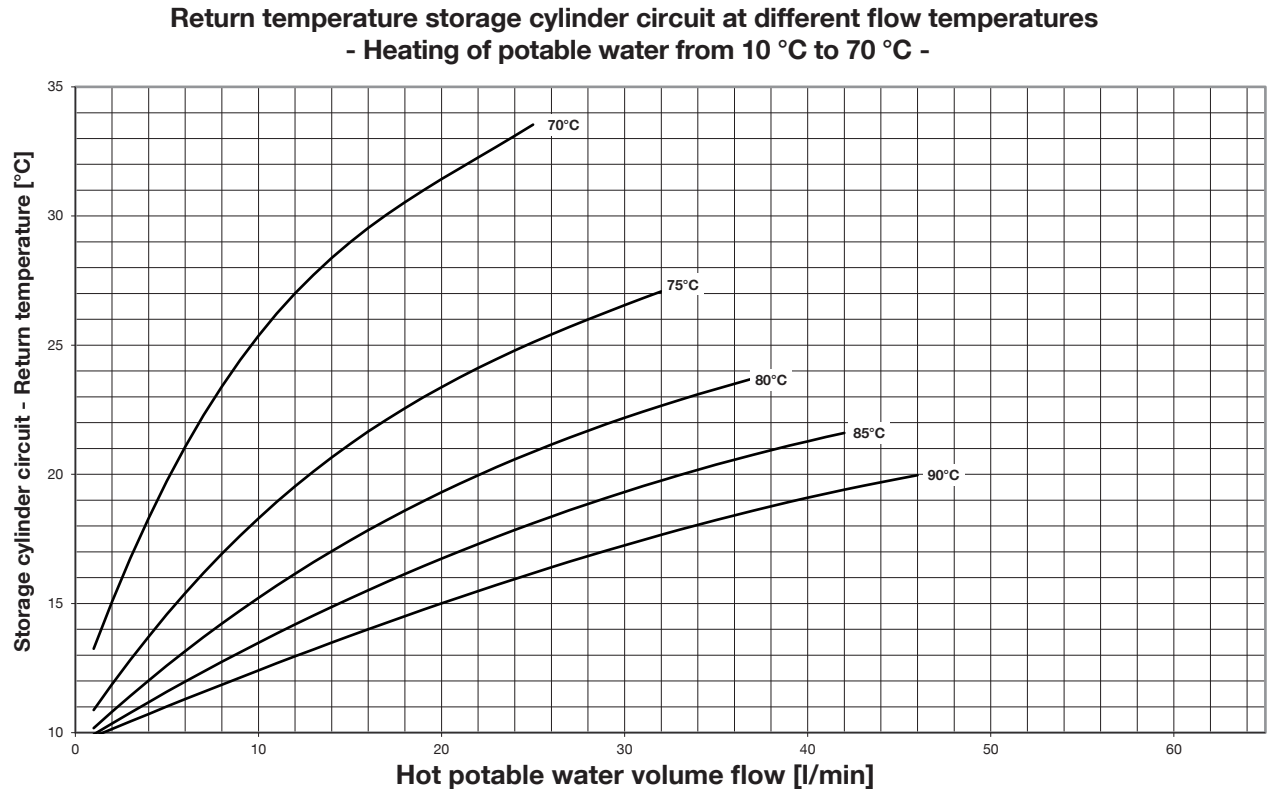

Fig. 50: Storage cylinder circuit return temperature - heating of potable water to 70 °C

14.2.7 Heating of potable water from 10 °C to 75 °C

Performance data according to SPF test procedure.

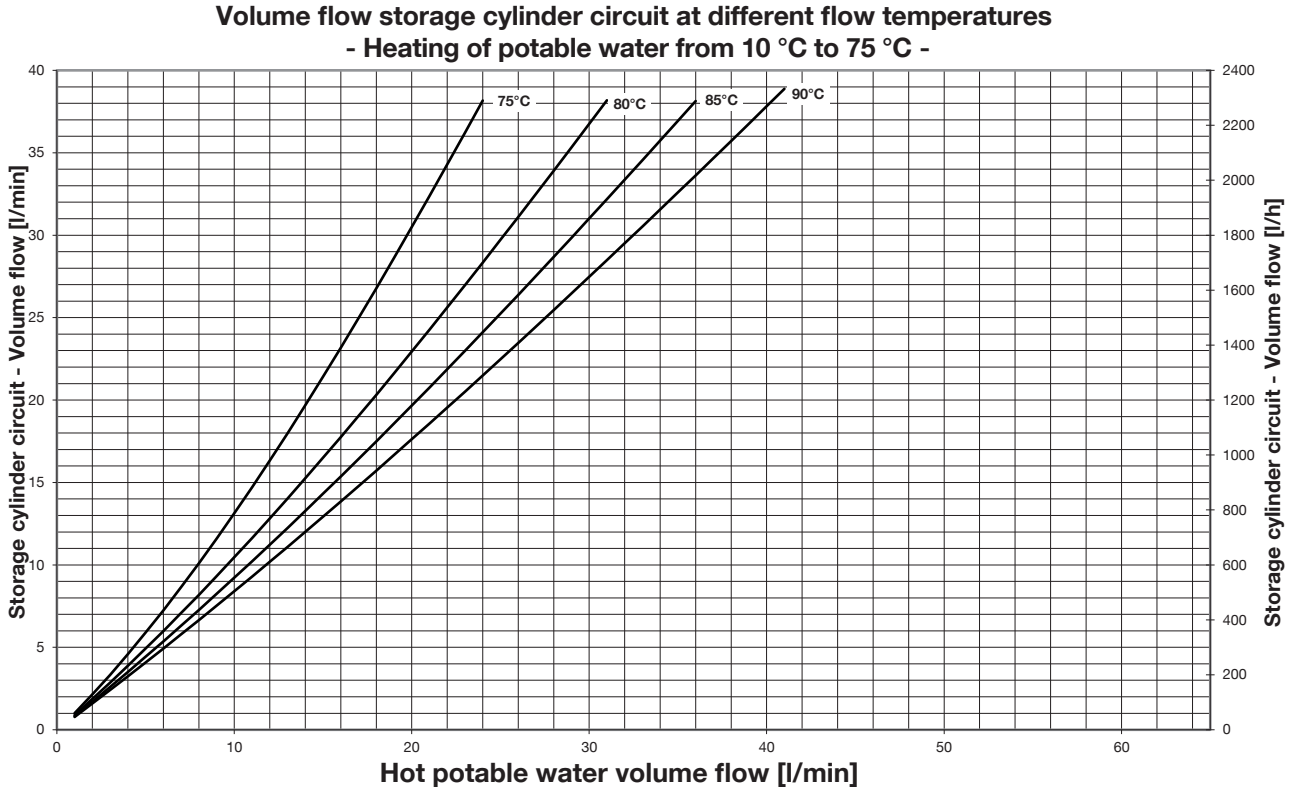

Fig. 51: Storage cylinder circuit volume flow - heating of potable water to 75 °C

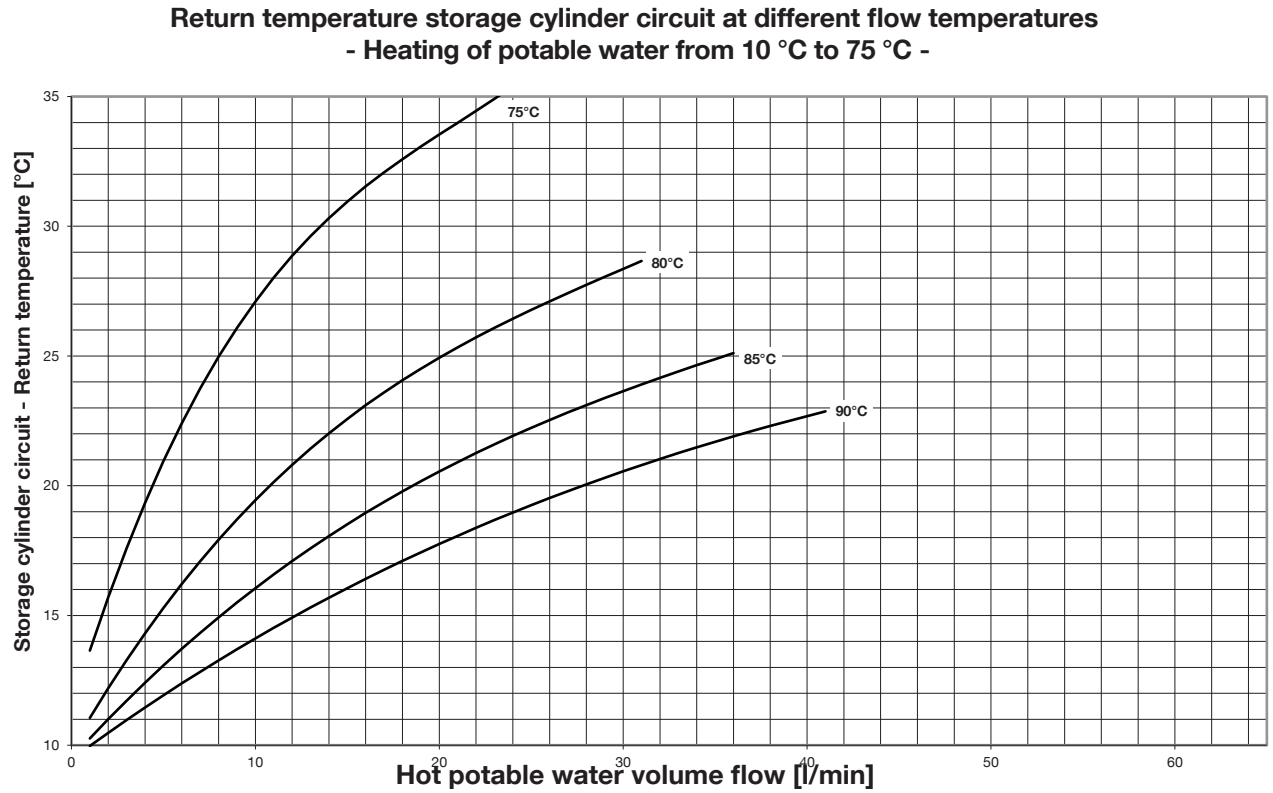

Fig. 52: Storage cylinder circuit return temperature - heating of potable water to 75 °C

14.3 EU Declaration of conformity

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EU Declaration of Conformity

Product identification:	Fresh water station "Regumaq X-45"
Manufacturer:	Oventrop GmbH & Co. KG
Adress:	Paul-Oventrop-Straße 1 59939 Olsberg GERMANY

This declaration of conformity is issued under sole responsibility of the manufaturer.

Object of the declaration:

Item no.	Type
1381140	copper brazed plate heat exchanger
1381142	fully sealed plate heat exchanger

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

Machinery directive

DIRECTIVE **2006/42/EC** OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 May 2006on machinery, and amending Directive 95/16/EC (recast)

The conformity of the product described above with the provisions of the applied Directive(s) is demonstrated by compliance with the following Standards/ regulations:

DIN EN ISO 12100:2010 + AC:2013

DIN EN 60204-1:2007 + A1:2009 + AC:2010

DIN EN 60670-1:2014

DIN EN 60730-1:2016

Electromagnetic Compatibility Directive

DIRECTIVE **2014/30/EU** OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility

The conformity of the product described above with the provisions of the applied Directive(s) is demonstrated by compliance with the following Standards/ regulations:

EN 55014-1:2006 + A1:2009 + A2:2011

EN 55014-2:1997 + A1:2001 + A2:2008

EN 61000-3-2:2014

EN 61000-3-3:2013

DIN EN 60730-1:2016

RoHS

DIRECTIVE **2011/65/EU** OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (recast)

Pressure Equipment directive

These articles fall under **Article 4(3)** of the Pressure Equipment Directive **2014/68/EU** and are designed and manufactured in accordance with good engineering practice.

59939 Olsberg, 22.07.2019
Signed for and behalf of:
Oventrop GmbH & Co. KG

i.V. .....
Dr.-Ing. Roland Foitzik
Head of pre-serial development

i.V. .....
Dipl.-Ing. Thomas Droste
Group Leader Development

The materials used in the Oventrop fresh water and dwelling stations are selected and processed in accordance with strict quality specifications. The plate material used (stainless steel 1.4401) for the heat exchangers has proven itself over the long term in potable water applications. Nevertheless, **depending on the water quality, especially with high chloride concentrations > 100 mg/l** , it is possible that **leaks may form due to corrosion** on the heat exchangers.

It is therefore very important that the system designer and/or operator ensures that the fresh water and dwelling stations are only operated with **potable water** whose chemical composition does **not** have a **corrosive** effect on the components.

If necessary, coordinate with the local water supply company.

The following table contains limit values of potable water constituents when using heat exchangers with different **brazing materials** (copper, nickel or stainless steel).

Particular attention should be paid to the fact that there can be **interactions** between certain water constituents that can lead to special stresses on the material.

This includes, among other things, the combination of hydrogen carbonate with chloride and / or sulphate (see next page).

The selection of a suitable heat exchanger must therefore be made depending on the water quality. Corresponding analyses are provided by the local water supply company.

Water quality requirements

		Stainless steel heat exchanger brazed with:		
CONSTITUENTS	CONCENTRATION (mg/l or ppm)	COPPER	NICKEL / STAINLESS STEEL	COPPER with protective layer
⚠ Chlorides (Cl^-) at 60 °C See chart on next page!	< 100 100 - 150 > 150	+ - -	+ - -	+ + 0
Hydrogen carbonate (HCO_3^-)	< 70 70 - 300 > 300	0 + 0	+ + +	+ + +
Sulphate (SO_4^{2-})	< 70 > 70	+ -	+ +	+ +
HCO_3^- / SO_4^{2-}	> 1.0 < 1.0	+ -	+ +	+ +
Electrical conductivity at 20°C	< 50 µS/cm 50 - 500 µS/cm > 500 µS/cm	0 + 0	+ + +	+ + +
pH In general, a low pH value (below 6) increases the risk of corrosion and a high pH value (above 7.5) reduces the risk of corrosion.	< 6.0 6.0 - 7.5 7.5 - 9.0 9.0 - 9.5 >9.5	0 0 + 0 0	0 + + + +	+ + + + 0
Free chlorine (Cl_2)	< 1 > 1	+ -	+ -	+ 0
Ammonium (NH_4^+)	< 2 2 - 20 > 20	+ 0 -	+ + +	+ + -
Hydrogen sulphide (H_2S)	< 0.05 > 0.05	+ -	+ +	+ 0
Free (aggressive) carbon dioxide (CO_2)	< 5 5 - 20 > 20	+ 0 -	+ + +	+ + +
Nitrate (NO_3^-)	< 100 > 100	+ 0	+ +	+ +

EXPLANATIONS:		
	+	Good resistance under normal conditions
	0	Corrosion may occur
	-	Use not recommended

The chemical composition of potable water can be subject to temporal fluctuations.

Special notes for corrosion protection

NOTICE

High media temperatures (>60 °C) increase the risk of corrosion!

! Do not set the hot water temperature and the flow temperature of the heating water higher than necessary.

NOTICE

Long stagnation periods increase the risk of corrosion!

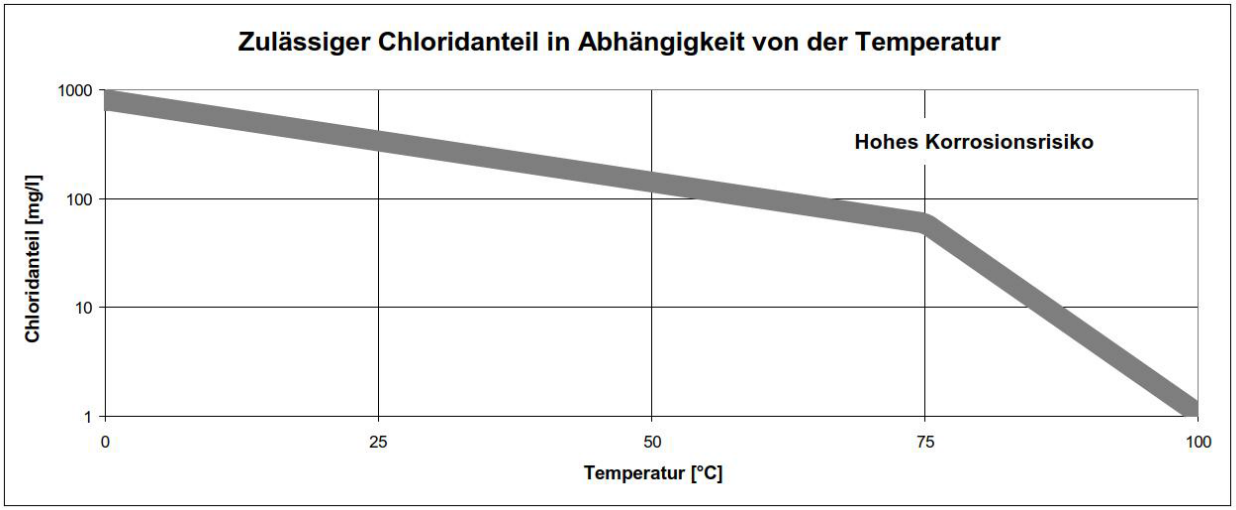
! Flush the system manually or automatically on a regular basis if longer stagnation periods are to be expected all the time (VDI/DVGW 6023).

- Caution is always advised with the combination of hydrogen carbonate and chloride. **Low hydrogen carbonate contents combined with high chloride contents increase the risk of corrosion.**
- Caution is advised with the combination of hydrogen carbonate and sulphate.. **For copper brazed heat exchangers, the hydrogen carbonate content in the water must not be lower than the sulphate content.** If this is the case, a nickel brazed, stainless steel brazed heat exchanger or a heat exchanger with protective layer must be used.
- If the water constituents are not within the specified limits, a **water treatment system** must be installed if necessary.

NOTICE

An incorrectly operated water treatment system can increase the risk of corrosion!

- **In mixed installations, the "flow rule" must be observed when using copper brazed heat exchangers in conjunction with galvanised steel pipes.** You can find more information on this in the DIN EN 12502 standard.
- **Flush all supply pipes** before **mounting** the station (DIN EN 806-4), to remove any dirt particles and residues from the system.
- When **maintaining** the station, take into account that **cleaning agents can also promote corrosion of the heat exchanger**. In this context, observe the DVGW specifications, such as work sheets W291 and W319.
- When using a copper brazed heat exchanger without protective layer, the electrical conductivity of the water may range between 50 and 500 µS/cm. Take this into account, among other things, during water treatment in accordance with VDI2035.



NOTICE

Corrosion and stone formation in the system!

! It is the responsibility of the system designer and system operator to take into account water constituents and factors that influence the corrosion and stone formation of the system and to evaluate them for the specific application. In critical water supply areas, coordination should therefore take place in advance with the local water supply company.

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Fresh water station Regumaq X-45
Handover report

Date:	
Installation location address / building	
Address operator	
Address installation company	
Regumaq X-45 serial number	

Give reasons for items that have not been carried out or for items that have been answered with No in the Remarks field!		Tick as appropriate or enter value/number		Remarks / Settings
		Yes	No	
Installation of potable water station				
1	Number of installed stations			
2	Number of stations with circulation			
3	Designation of the circulation pump(s) if you do not use the Oventrop circulation set			
4	When installing several stations			
4.1	Has the piping been carried out according to Tichelmann?	☐	☐	
4.2	Have check valves been installed in the potable water supply pipe (PWC)?	☐	☐	
5	Has an additional safety valve of sufficient dimension been installed in the potable water circuit?	☐	☐	
6	System pressure on the potable water side		**bar**	
7	Has an expansion tank been installed in the potable water circuit?	☐	☐	
8	System pressure on the storage cylinder side		**bar**	
9	Has the storage cylinder side been vented?	☐	☐	
10	Has/have the air vent(s) been checked for function?	☐	☐	
11	Capacity, type and version of the heat generator		**kW**	
12	Storage cylinder volume		**l**	
13	Has/have the station(s) been hydraulically decoupled?	☐	☐	
14	When using Oventrop storage cylinders. Has/have the station(s) been connected according to specifications?	☐	☐	
15	Has an expansion tank of sufficient dimension been installed in the storage cylinder circuit?	☐	☐	

16	Which setpoint temperature for the storage cylinder has been set at the heat generator?		**°C**	
17	Are all ball valves open?	☐	☐	

Give reasons for items that have not been carried out or for items that have been answered with No in the Remarks field!		Tick as appropriate or enter value/number		Remarks / Settings
		Yes	No	
Controller settings				
1	Which software version is installed on the controller (visible in the touch control panel when the supply voltage is established [version X.XX])?	**Version**		
2	Have the basic settings (date, time, ...) been entered correctly?	☐	☐	
3	Which potable water temperature has been set?		°C	
4	Has the circulation been activated (see controller operating instructions, paragraph Circulation)?	☐	☐	
4.1	Which mode has been activated?			
4.2	What settings have been made in the mode?			
5	Have additional functions been activated (see controller operating instructions, paragraph Additional functions)?	☐	☐	
5.1	Which additional functions have been activated?			
	1.			
	2.			
	3.			
5.2	Which settings have been made in the additional function(s)?			
	in 1.			
	in 2.			
	in 3.			
6	Is there an SD card for data recording in the controller?	☐	☐	
7	Is an error displayed?	☐	☐	
8	Have any other modifications been made to the settings of the controller?	☐	☐	

Give reasons for items that have not been carried out or for items that have been answered with No in the Remarks field!	Tick as appropriate or enter value/number		Remarks / Settings
	Yes	No	

Final inspection				
1	Has the installation been tested for leaks (DIN EN 806)?	☐	☐	
2	Has the functional check been carried out according to the operating instructions?	☐	☐	

Relay assignment		
Relay	Function	Sensors
R1		
R2		
R3		
R4		
R5		

Instruction/Handover	
The installer has instructed the operator in the function and intended use of the fresh water station.	☐
The installer has advised the operator of the intended operation of potable water installations.	☐
The installer has handed over the necessary documents to the operator.	☐

Information on the intended operation of potable water installations:

- Stagnation must be avoided, regular potable water exchange must be ensured
- TPWH >= 60 °C must be maintained at the hot water outlet
- The circulation system must be designed in such a way that the potable water temperature does not fall below the station outlet temperature of >= 60 °C by more than 5 K
- TPWC must be maintained at < 25 °C

at the cold water outlet

Installer / Installation company

_____

Date / Signature / Stamp

Operator

Handover report received

_____

Date / Signature

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Fresh water station Regumaq X-45
Maintenance report

Date:	
Installation location address / building	
Address operator	
Address installation company	
Regumaq X-45 serial number	

	Give reasons for items that have not been carried out or for items that have been answered with No in the Remarks field!	Tick as appropriate or enter value/number		Remarks / Settings
		Yes	No	
System information				
1	Number of installed stations			
2	Number of stations with circulation			
3	Designation of the circulation pump(s) if you do not use the Oventrop circulation set			
4	System pressure on the potable water side		**bar**	
5	System pressure on the storage cylinder side (Carry out a **check with the handover report.** In case of deviations, please note the troubleshooting table!)		**bar**	
6	Capacity, type and version of the heat generator		**kW**	
7	Storage cylinder volume		**l**	
8	Which setpoint temperature for the storage cylinder has been set at the heat generator?		**°C**	

	Give reasons for items that have not been carried out or for items that have been answered with No in the Remarks field!	Tick as appropriate or enter value/number		Remarks / Settings
		Yes	No	
Maintenance work				
1	Has the station been tested for leaks (visual inspection)?	☐	☐	
2	Have the electrical components been checked for firm seating and integrity?	☐	☐	
3	Has a functional test of the safety valve been carried out (DIN EN 806-5)?	☐	☐	
4	Has a functional test of the check valve in the circulation pipe been carried out (DIN EN 806-5)?	☐	☐	
5	Has the potable water circuit been sampled for microbiological testing (TrinkWV (German Decree for Potable Water) 2012)?	☐	☐	

6	Has the heat exchanger been checked for external leaks?	☐	☐	
7	Has a functional test been carried out to verify performance (see operating instructions for functional control)?	☐	☐	
8	Have all ball valves been checked for free movement?	☐	☐	
9	Have any strainers installed on site been cleaned?	☐	☐	
10	Are all shutoff fittings open?	☐	☐	
11	Has the storage cylinder side been vented and the air vents been checked for opening and function?	☐	☐	
12	Have the controller settings been compared with the specifications in the handover report (if necessary, document changes in remarks)?	☐	☐	

Give reasons for items that have not been carried out or for items that have been answered with No in the Remarks field!		Tick as appropriate or enter value/number		Remarks / Settings
		Yes	No	
Controller settings				
1	Has a software update been carried out (document the new software version)?	☐	☐	**Version**
2	Have the basic settings (date, time, ...) been entered correctly?	☐	☐	
3	Which potable water temperature has been set?		°C	
4	Has the circulation been activated (see controller operating instructions, paragraph Circulation)?	☐	☐	
4.1	Which mode has been activated?			
4.2	What settings have been made in the mode?			
5	Have additional functions been activated (see controller operating instructions, paragraph Additional functions)?	☐	☐	
5.1	Which additional functions have been activated?			
	1.			
	2.			
	3.			
5.2	Which settings have been made in the additional function(s)?			
	in 1.			
	in 2.			
	in 3.			
6	Is there an SD card for data recording in the controller?	☐	☐	

7	Is an error displayed?	☐	☐	
8	Have any other modifications been made to the settings of the controller?	☐	☐	

Give reasons for items that have not been carried out or for items that have been answered with No in the Remarks field!		Tick as appropriate or enter value/number		Remarks / Settings
		Yes	No	
Repair work (only fill in in case of repair or replacement of components)				
1	Which component has been replaced?			
1.1	Reason for replacement			
2	Which component has been replaced?			
2.1	Reason for replacement			
3	Which component has been replaced?			
3.1	Reason for replacement			
4	After repair work, has the functional check been carried out in accordance with the operating instructions?	☐	☐	

Relay assignment		
Relay	Function	Sensors
R1		
R2		
R3		
R4		
R5		

Instruction/Handover	
The installer has informed the operator about the maintenance work carried out.	☐
The installer has informed the operator about possible modifications and repair work.	☐
The installer has handed over the necessary documents to the operator.	☐

Information on the intended operation of potable water installations:

- Stagnation must be avoided, regular potable water exchange must be ensured

- TPWH >= 60 °C must be maintained at the hot water outlet

- The circulation system must be designed in such a way that the potable water temperature does not fall below the station outlet temperature of >= 60 °C by more than 5 K

- TPWC must be maintained at < 25 °C

at the cold water outlet

Installer / Installation company

_____

Date / Signature / Stamp

Operator

Maintenance report received

_____

Date / Signature

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Wir regeln das. Seit 1851.

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