

Operating and installation instructions

REMKO EFS series

Fresh water station

Instructions for users and specialists

EFS 21





Read these operating instructions carefully before commissioning / using this device!

These instructions are an integral part of the system and must always be kept near or on the device.

Subject to modifications; No liability accepted for errors or misprints!

Translation of the original

Table of contents

1	Safety and usage instructions	4
1.1	General safety notes	4
1.2	Identification of notes	4
1.3	Personnel qualifications	4
1.4	Dangers of failure to observe the safety notes	4
1.5	Safety-conscious working	4
1.6	Safety instructions for the operator	5
1.7	Safety notes for installation and inspection tasks	5
1.8	Unauthorised modification and changes	5
1.9	Intended use	6
1.10	Safety-conscious working	6
1.11	Warranty	6
1.12	Transportation and packaging	6
1.13	Environmental protection and recycling	6
2	Technical data	7
2.1	Unit data	7
2.2	Unit dimensions and space requirements	8
2.3	Pump data	8
3	Design and planning	10
3.1	General notes	10
3.2	Design of the storage tank	11
3.3	Setting the Temperature	12
3.4	Corrosion protection	13
3.5	Calcification protection	14
4	Assembly	15
5	Hydraulic connection	16
6	Electrical wiring	17
7	Commissioning (specialist)	18
7.1	Leak test and filling of the system	18
7.2	Initial commissioning	18
7.3	Gravity brake	18
7.4	Maximum dispensing medium flow rate	19
7.5	Circulation operation	21
7.6	Commissioning report	22
8	Shutdown	22
9	Troubleshooting and customer service	23
10	Care and maintenance	24
11	View of the unit and spare parts	25
12	Index	26

REMKO EFS series

1 Safety and usage instructions

1.1 General safety notes

Carefully read the operating manual before commissioning the units for the first time. It contains useful tips and notes such as hazard warnings to prevent personal injury and material damage. Failure to follow the directions in this manual not only presents a danger to people, the environment and the system itself, but will void any claims for liability.

Keep this operating manual and the refrigerant data sheet near to the units.

1.2 Identification of notes

This section provides an overview of all important safety aspects for proper protection of people and safe and fault-free operation. The instructions and safety notes contained within this manual must be observed in order to prevent accidents, personal injury and material damage.

Notes attached directly to the units must be observed in their entirety and be kept in a fully legible condition.

Safety notes in this manual are indicated by symbols. Safety notes are introduced with signal words which help to highlight the magnitude of the danger in question.

DANGER!

Contact with live parts poses an immediate danger of death due to electric shock. Damage to the insulation or individual components may pose a danger of death.

DANGER!

This combination of symbol and signal word warns of a situation in which there is immediate danger, which if not avoided may be fatal or cause serious injury.

WARNING!

This combination of symbol and signal word warns of a potentially hazardous situation, which if not avoided may be fatal or cause serious injury.

CAUTION!

This combination of symbol and signal word warns of a potentially hazardous situation, which if not avoided may cause injury or material and environmental damage.

NOTICE!

This combination of symbol and signal word warns of a potentially hazardous situation, which if not avoided may cause material and environmental damage.



This symbol highlights useful tips and recommendations as well as information for efficient and fault-free operation.

1.3 Personnel qualifications

Personnel responsible for commissioning, operation, maintenance, inspection and installation must be able to demonstrate that they hold a qualification which proves their ability to undertake the work.

1.4 Dangers of failure to observe the safety notes

Failure to observe the safety notes may pose a risk to people, the environment and the units. Failure to observe the safety notes may void any claims for damages.

In particular, failure to observe the safety notes may pose the following risks:

- The failure of important unit functions.
- The failure of prescribed methods of maintenance and repair.
- Danger to people on account of electrical and mechanical effects.

1.5 Safety-conscious working

The safety notes contained in this manual, the existing national regulations concerning accident prevention as well as any internal company working, operating and safety regulations must be observed.

1.6 Safety instructions for the operator

The operational safety of the units and components is only assured providing they are used as intended and in a fully assembled state.

- The units and components may only be set up, installed and maintained by qualified personnel.
- The existing regulations concerning accident prevention must be adhered to.
- Do not operate units or components with obvious defects or signs of damage.
- Contact with equipment parts or components can lead to burns or injury.
- Ensure that electrical energy does not pose a risk.
- Regulations of the VDE and the local energy supply company must be adhered to.

! NOTICE!

Material damage due to mineral oils!

Mineral oil products permanently damage EPDM seal elements; the sealing properties may therefore be lost. We do not take responsibility or provide warranty replacements for damage caused by seals that are damaged in this way.

- It is essential that you prevent EPDM from coming into contact with mineral oil substances.
- Use a lubricant that is free of mineral oil and has a silicone or polyalkylene basis, such as Unisilikon L250L and Syntheso Glep 1 made by Klüber, or a silicon spray.

1.7 Safety notes for installation and inspection tasks

- The operator must ensure that all inspection and installation work is carried out by authorised and qualified personnel who have thoroughly read the operating manual.
- Works on the pump/system may only be carried out whilst at a standstill as a matter of principle.
- Appropriate hazard prevention measures must be taken to prevent risks to people when performing installation, repair, maintenance or cleaning work on the units.
- The setup, connection and operation of the units and its components must be undertaken in accordance with the usage and operating conditions stipulated in this manual and comply with all applicable regional regulations.
- Regional regulations and laws as well as the Water Ecology Act must be observed.
- The power supply should be adapted to the requirements of the units.
- The units and components must be kept at an adequate distance from flammable, explosive, combustible, abrasive and dirty areas or atmospheres.
- Safety devices may not be modified or bypassed.

! NOTICE!

Malfunction!

The fresh water module must be integrated into the equipotential bonding system of the electrical installation. If this is not ensured by the pipe network, set up an approved potential equalisation connection to the main potential connection.

1.8 Unauthorised modification and changes

The operational safety of the fresh water module that was delivered is guaranteed only with intended use in accordance with section 1.8 of the operating instructions. Under no circumstances should the threshold values specified in the data-sheet be exceeded.

Modifications or changes to units and components are not permitted and may cause malfunctions. Safety devices may not be modified or bypassed. Original replacement parts and accessories authorised by the manufacturer ensure safety. The use of other parts may invalidate liability for resulting consequences.

REMKO EFS series

1.9 Intended use

The fresh water module is only permitted to be installed in heating systems between the buffer tank and the domestic water circuit. Depending on the design, it may only be installed and operated vertically!

Use only REMKO accessories in conjunction with the fresh water module.

Any different or additional use is a non-intended use. The manufacturer/supplier assumes no liability for damages arising from a non-intended use. The user bears the sole risk in such cases.

Intended use also includes working in accordance with the operating and installation instructions and complying with the maintenance requirements.

The threshold values specified in the technical data must not be exceeded.

1.10 Safety-conscious working

The safety notes contained in this manual, the existing national regulations concerning accident prevention as well as any internal company working, operating and safety regulations must be observed.

1.11 Warranty

For warranty claims to be considered, it is essential that the ordering party or its representative complete and return the "certificate of warranty" to REMKO GmbH & Co. KG at the time when the units are purchased and commissioned.

The warranty conditions are detailed in the "General business and delivery conditions". Furthermore, only the parties to a contract can conclude special agreements beyond these conditions. In this case, contact your contractual partner in the first instance.

1.12 Transportation and packaging

The units are shipped in sturdy transport packaging or within the heat pump housing. Immediately check the units on delivery and make a note of any damage or missing parts on the delivery note. Inform the forwarding agent and contractual partner. Claims under guarantee made at a later date will not be accepted.



WARNING!

Plastic films and bags etc. are dangerous toys for children!

Why:

- Leave packaging material are not around.
- Packaging material may not be accessible to children!

1.13 Environmental protection and recycling

Disposing of packaging

All products are packed for transport in environmentally friendly materials. Make a valuable contribution to reducing waste and sustaining raw materials. Only dispose of packaging at approved collection points.



Disposing of the units and their components

For the manufacture of the units and components, only recyclable materials have been used. Help protect the environment by ensuring that the units or components (for example batteries) are not disposed of in household waste, but only in accordance with local regulations and in an environmentally safe manner, e.g. using authorised disposal and recycling specialists or council collection points.



2 Technical data

2.1 Unit data

Series		EFS 21
Nominal power at 10-45/65°C (KW-WW/HVL)	kW	100
Tap capacity at nominal power	l/min	41
Min. switch-on flow rate for primary pump	l/min	2.0
NL count at nominal power		9.5
Power at 10-60/75°C (KW-WW/HVL)	kW	104/194/291/388
Tap capacity at 10-60/75°C (incl. cascades)	l/min	30/56/84/112
Capacity at 10-60/75°C, mixed to 45°C DHW	kW	104
Tap capacity at 10-60/75°C, mixed to 45°C DHW (incl. cascades)	l/min	43/80/120/160
NL count at 10-60/75°C (incl. cascades)		10/32/62/96
Max. operating pressure for heating side	bar	3
Max. operating pressure for service water side	bar	10
Max. operating temperature for heating side	°C	95
Max. operating temperature for service water side	°C	65
Connections, heating side	Inches	3/4" IG
Connections, service water side	Inches	3/4" IG / 1" AG
Pressure loss, service water side at nominal power	bar 0.67	
Max. pressure loss for heating side piping	mbar	50
Wilo PARA circulation pump power consumption	W	3-45
Medium flow rate probe		Huba probe type 235 2-40 l/min
Electrical wiring (mains regulation)	V/Hz	230 V AC/50-60 Hz
Housing / Connecting parts		Housing / connecting parts CW617N (2.0402) CW617N (2.0402)
Plate heat exchanger		Cu, soldered
Seals		AFM
Insulation		EPP foam 0.038 W/mK

We reserve the right to make technical changes for the purpose of technical advancement.

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2.2 Unit dimensions and space requirements

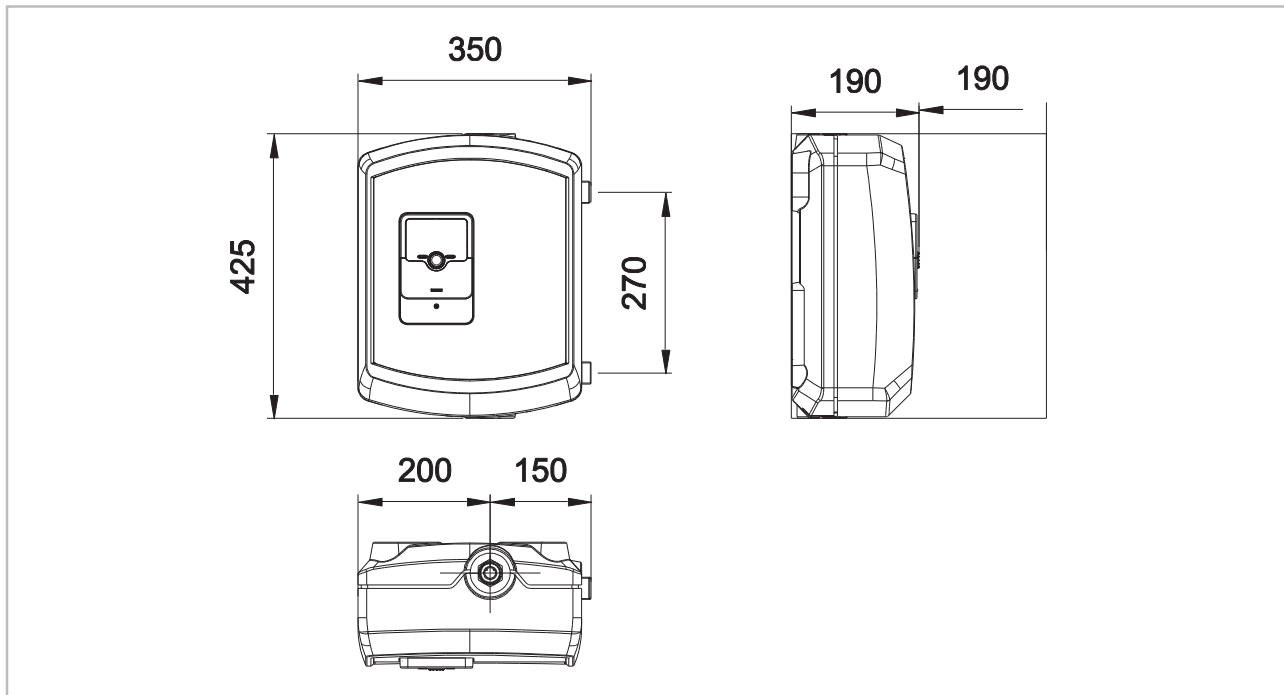


Fig. 1: Unit dimensions

2.3 Pump data

Pressure loss characteristic curve

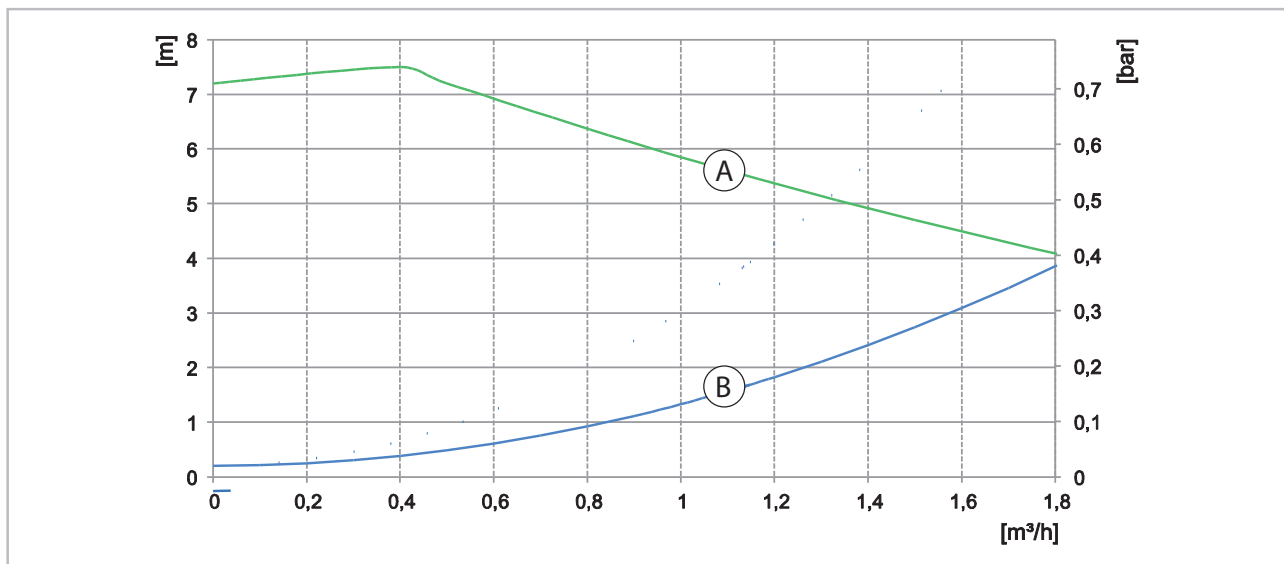


Fig. 2: Pressure loss characteristic curve

A: Wilo PARA 15/7

B: EFS 21

Specified pressure loss valid for heating (primary) and drinking water side (secondary).

PWM logic (PWM 2)

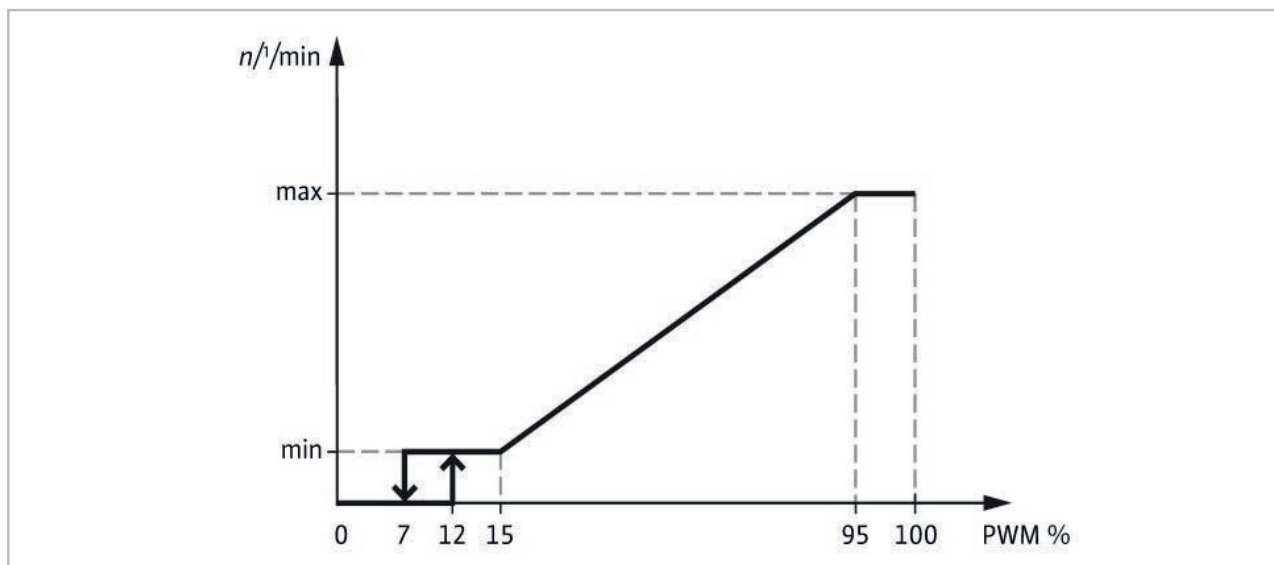


Fig. 3: PWM logic

$< 7\%$ Pump off
 $7-12\%$ Min. performance (operation)
 $12-15\%$ Min. performance (start-up)

$15-95\%$ Proportional performance range
 $> 95\%$ Max. power

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3 Design and planning

3.1 General notes

The fresh water station is a fresh water module that heats domestic water according to the continuous flow heater principle. In order to ensure fault-free operation of the fresh water station, the system must fulfil certain prerequisites. Before installation, take some time for planning.

! NOTICE!

Storage tank mounting is only possible with mounting templates (accessories).

⚠ CAUTION!

Danger of scalding due to hot water!

Due to external circulation in the primary circuit, water with a temperature of up to 90 °C can leak out at the dispensing connection.

- No external pumps are permitted to be installed between the fresh water module and the buffer tank.
- The fresh water module is not permitted to be connected to a heating cycle distributor.

Installation example

**This hydraulic diagram serves merely to assist in planning activities;
the hydraulic system on site must be planned and laid out by the installer!
Subject to technical changes!**

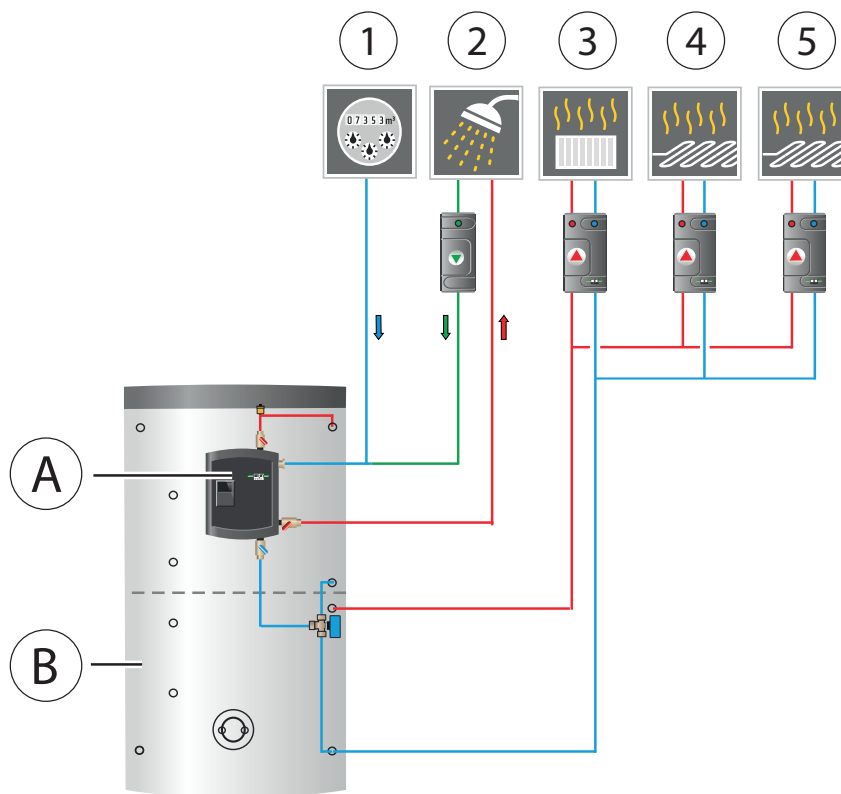


Fig. 4: Fresh water station with optional circulation set and optional return distribution

- A: Fresh water station
B: REMKO MPS storage tank
1: Cold water
2: Hot water

- 3: Unmixed heating cycle
4: Mixed heating cycle 1
5: Mixed heating cycle 2

3.2 Design of the storage tank

You can use the following table to calculate the approximate required volume of the buffer tank.

Temperature in buffer tank [°C]	HW temperature [°C] set on controller	Reqd. Storage tank volume per litre of HW [Litre]
50	45	1.9
60	45	1.1
	50	1.5
	55	2.1
70	50	1.0
	55	1.2
	60	1.6
80	50	0.8
	55	0.9
	60	1.1

Sample calculation for the design of the buffer tank:

Temperature of buffer tank: 60 °C, required dispensing medium flow rate at water valve: 20 l/min

DHW temperature set on the controller: 45 °C

How large must the Storage tank be if a 20-minute dispensing operation is to take place without reheating?

$20 \text{ l/min} \times 20 \text{ min} = 400 \text{ l}$

$400 \text{ l} \times 1.1 = 440 \text{ l} \Rightarrow$ The heated part of the buffer tank must be 440 litres in size.



The hot water volume depends on the position of the installed S 08 probe (Smart Control hot water probe). The higher this is installed on the buffer tank, the lower the hot water volume.

REMKO EFS series

3.3 Setting the Temperature

Set the required (maximum) domestic hot water temperature on the controller under "Main menu / hot water / target temperature".

To ensure that scalding cannot occur at the water valve, the maximum hot water temperature must not exceed 60 °C.

Primary side

The temperature required in the buffer tank on the primary side depends on the desired hot water temperature and the required dispensing quantity. The temperature in the buffer tank must be at least 5 K above the required hot water temperature.

Secondary side

The possible dispensing medium flow rate [l/min] on the water valve depends on the hot water temperature that is set in the controller and the temperature that is available in the storage tank.

The recommended maximum domestic water medium flow rate through the fresh water module is ~42 l/min.

The following table shows the relationship between the storage tank temperature and the maximum dispensing medium flow rate that is connected when the temperature on the valve is 45°C (e.g. single-lever mixer). If the hot water temperature that is set on the Controller is higher than 45 °C, the dispensing medium flow rate consists of a mixture of hot and cold water.

The transmission capacity that is specified for this is required to warm the water quantity of the dispensing medium flow rate [l/min] from 10 °C to 45 °C.

Temperature in buffer tank probe S08 [°C]	HW temperature set on the controller [°C]	Maximum medium flow rate from the fresh water station with the set. HW temperature [l/min]	Maximum dispensing medium flow rate at the water valve for an HW Temperature of 45 °C [l/min]	Transmission capacity of the fresh water station [kW]
50	45	16	16	40
60	45	28	28	69
	50	22	24	60
	55	15	19	48
70	45	38	38	93
	50	31	35	87
	55	25	32	79
	60	20	28	69
80	45	42*	42	102
	50	40*	45	111
	55	33	42	105
	60	28	39	98

Reheating is not considered if the cold water temperature is 10 °C

* maximum medium flow rate: 42 l/min, pressure loss of the fresh water station is 1000 mbar in this case (higher values are only possible to a limited extent due to hydraulics. Measurement limit of the medium flow rate probe ~ 42 l/min)

3.4 Corrosion protection

To prevent corrosion damage to the plate heat exchanger, the following drinking water values must be observed:

	Copper soldered
Chloride ¹⁾ (CL ⁻)	< 250 mg/l at 50°C < 100 mg/l at 75°C < 10 mg/l at 90°C
Sulphate ¹⁾ (SO ₄ ²⁻)	< 100 mg/l
Nitrate (NO ₃ ⁻)	< 100 mg/l
pH value	7.5-9.0
Electrical conductivity (at 20°C)	10-500 µS/cm
Hydrogencarbonate (HCO ₃ ⁻)	70-300 mg/l
Ratio HCO ₃ ⁻ / SO ₄ ²⁻	> 1
Ammonium (NH ₄ ⁺)	< 2 mg/l
Free chlorine gas	< 0.5 mg/l
Sulphite	< 1 mg/l
Ammonium	< 2 mg/l
Hydrogen sulphide (H ₂ S)	< 0.05 mg/l
Free (aggressive) carbonic acid (CO ₂)	< 5 mg/l
Iron (Fe)	< 0.2 mg/l
Saturation index SI	-0.2 < 0 < 0.2
Manganese (Mn)	< 0.05 mg/l
Total hardness	4-14 [Ca ²⁺ ;Mg ²⁺]/[HCO ₃ ⁻] < 0.5
Total org. carbon (TOC)	< 30 mg/l

¹⁾ If the limit values for copper-soldered plate heat exchangers are exceeded, a full stainless steel plate heat exchanger must be used.

We reserve the right to make technical changes for the purpose of technical advancement.

To prevent pitting corrosion in the installation, no new galvanised ferrous materials should be installed downstream of the copper-soldered plate heat exchanger in the hot water pipe without forming a protective layer. For mixed installations with galvanised ferrous materials, the use of full stainless steel plate heat exchangers (available on request) is required.

REMKO EFS series

3.5 Calcification protection

The precipitation of chalk from the water increases massively at hot water temperatures above 55°C and a water hardness above 8.5°dH. For this reason, the hot water target temperature should be set as low as possible while observing drinking water hygiene and, if necessary, the calcification should be reduced by using a softening or other suitable limescale treatment system.

In heating systems in which the heating water inlet temperature would frequently be above 65°C due to the system, thermal pre-mixing to 65°C makes sense. This applies above all to biomass systems, but also to solar thermal systems. Conversely, pre-mixing can be dispensed with for heat pump heating systems with a relatively low inlet temperature anyway, which means that a higher bulk output can be achieved. Refer to the Maintenance chapter for recommendations on cleaning.

Water treatment measures to prevent calcification		
	Fresh hot water station with 50°C hot water outlet temperature and	
calcium carbonate mass concentration	Inlet < 65°C	Inlet > 65°C
< 1.5 mmol/l (< 150 mg/l) < 8.4°dH	None	None
1.5-2.5 mmol/l (150-250 mg/l) 8.4-14°dH	None	Recommended
> 2.5 mmol/l (> 250 mg/l) > 14°dH	Recommended	Required

4 Assembly

General notes

! NOTICE!

To avoid damage to the system, the installation location must be dry, capable of carrying the load and frost-free.

Wall installation

Proceed as follows for wall mounting:

- Mark and drill two Ø 10 mm holes as shown in the illustration below
- Place expansion anchors
- Screw in the upper screw with washer until the screw head is approx. 1 cm away from the wall
- Hang the station in place
- Align it horizontally and fix with second screw and washer. Tighten both screws evenly

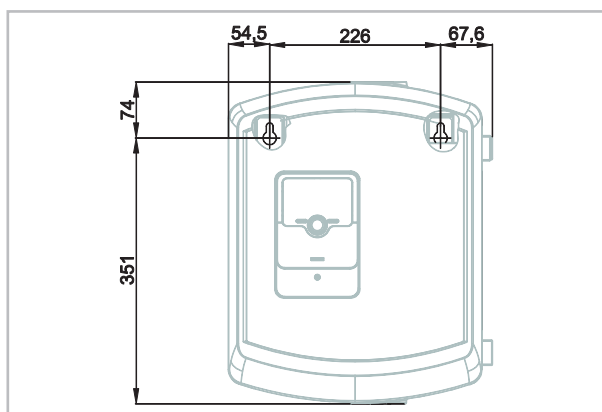


Fig. 5: Wall installation

Storage tank mounting

The fresh water station can be installed directly with a REMKO storage tank charging unit or return stratification kit on a REMKO storage tank. The kit includes a mounting template to assist with mounting the fresh water station directly on the storage tank.

Please refer to the separate installation instructions for the individual installation kits.

Integration in a domestic connection group (safety assembly)

i Please note!

A domestic connection group (safety assembly) is required despite an integrated safety valve (DIN 1988)!

Installation example

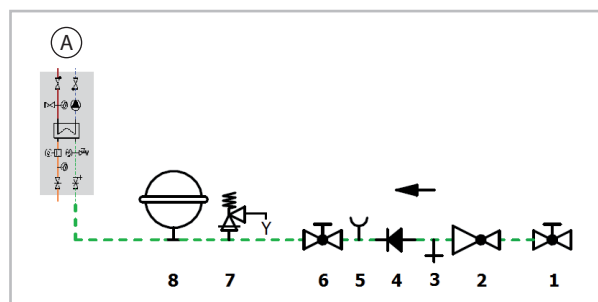


Fig. 6: Installation example

- A: Fresh water station
- 1: Shut-off valve
- 2: Pressure reducer
- 3: Test device
- 4: Check valve
- 5: Connection point for measuring device
- 6: Shut-off valve
- 7: Safety valve with drainage line and funnel trap
- 8: Through-flow membrane expansion vessel (recommended if pressure fluctuations are anticipated on the domestic connection side)

REMKO EFS series

5 Hydraulic connection

The illustration below is an example representation with optional accessories (circulation unit). Other available accessories: Cold water connection kit and piping kit.

This illustration makes no claim to being complete and is no substitute for professional planning.

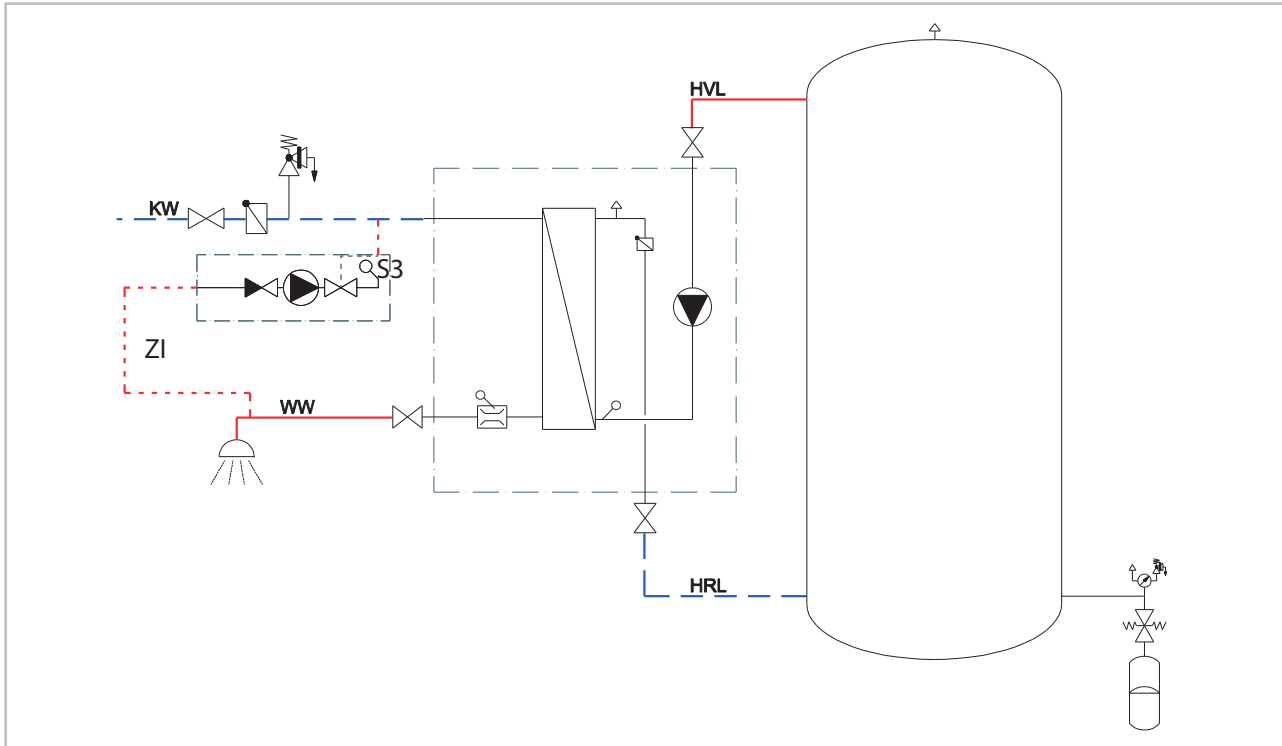


Fig. 7: Hydraulic connection

HRL: Heating return
HVL: Heating supply flow
KW: Cold water

WW: Hot water
ZI: Circulation
S3: Probe

Optional circulation kit

The circulation kit with Wilo Yonos Para Z 15/7.0 130 RKC and PT1000 temperature probe is an optional accessory for the EFS 21. It consists of the circulation pump, 2 shut-off ball valves with a backflow preventer and an immersion sleeve with Pt1000 probe. A temperature probe is always required for all circulation methods.

Dimensions and minimum space requirements for assembly and maintenance work.

For further information, please refer to the separate instructions for the circulation kit.

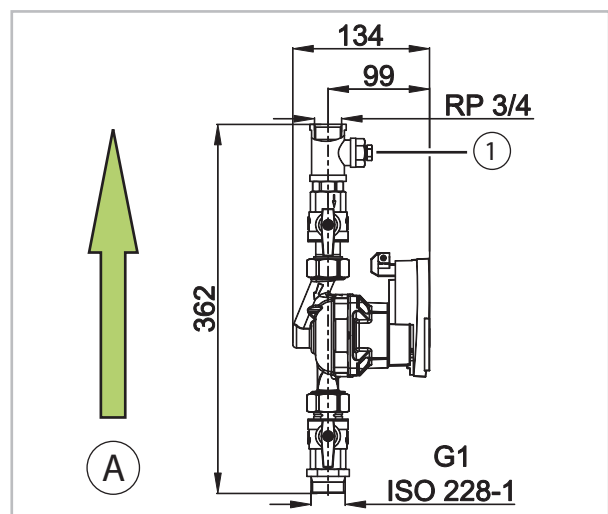


Fig. 8: Optional circulation kit

A: Flow direction
1: Sensor sleeve

6 Electrical wiring

General notes

Work on the electrical system and the opening of electrical enclosures may only be carried out in a de-energised state and only by authorised specialist personnel. Ensure correct terminal assignment and polarity for the connections. Protect the controller and the electrical components from over-voltage.



DANGER!

All electrical installation work is to be performed by specialist companies. Disconnect the power supply when connecting the electrical terminals.

The fresh water station is completely pre-assembled and pre-wired at the factory. Connect the mains cable for commissioning. For further details, please refer to the separate controller instructions.

Circulation pump

The pump is controlled exclusively via the external PWM signal. The green flashing LED display shows that the unit is ready for operation (stand-by). A steady green light indicates pump operation at a speed corresponding to the PWM signal. A red LED signals an error.

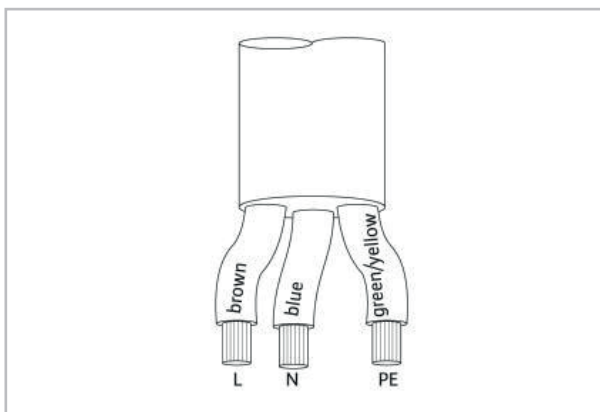


Fig. 9: Electrical wiring, pump

L: Brown
N: Blue
PE: Green/yellow

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7 Commissioning (specialist)

7.1 Leak test and filling of the system

A prerequisite for commissioning is the complete installation of all hydraulic and electrical components.

Check all components of the system, including all elements and stations pre-assembled at the factory, for leaks and seal them accordingly in the event of any leaks. Adjust the test pressure and the test duration to the respective piping system and the respective operating pressure.

Fill the drinking water side only with clean drinking water in accordance with DIN 1988 and press the air out of the pipes with a slight increase in pressure.

! NOTICE!

Avoid tap volume flows > 56 l/min, as these can lead to the destruction of the probe in the long term.

Fill the heating system incl. the primary side of the fresh water system only with water that has been filtered and treated per VDI 2035 if necessary, and completely bleed the system.

7.2 Initial commissioning

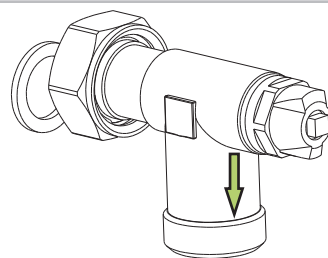
Please observe the corresponding controller instructions for this.

Work step	Procedure	OK
Preparation and checks	<ul style="list-style-type: none"> Visual check of the installation. Are all probes installed and connected in the right place? Are all outputs connected? 	<input type="checkbox"/>
Switch on controller	<ul style="list-style-type: none"> Supply the controller with electrical power. 	<input type="checkbox"/>
Adjust controller	Please follow the instructions for the controller. <ul style="list-style-type: none"> Set the fresh water temperature (hot water temperature). Set circulation (optional). Set return stratification (optional) Configure cascades (optional) 	
More settings	<ul style="list-style-type: none"> Set premix valve (optional) 	
Test outputs	Activate all outputs one after the other and check whether the pumps switch correctly.	<input type="checkbox"/>
Check function	<ul style="list-style-type: none"> Check hot water preparation function. Check the function of the circulation (optional). Check return stratification function (optional) Check cascade function (optional) 	<input type="checkbox"/> <input type="checkbox"/>

7.3 Gravity brake

To prevent incorrect circulation, a gravity brake is installed in the heating return line. (see Fig.)

When commissioning, the heat exchanger must be bled using the manual bleeder.



7.4 Maximum dispensing medium flow rate

The following diagram shows the maximum dispensing medium flow rate depending on the storage tank temperature; this assumes a pre-set **hot water temperature of 45 °C** at the dispensing connection. The integrated regulation prevents the temperature from decreasing as long as the maximum medium flow rate is not exceeded.

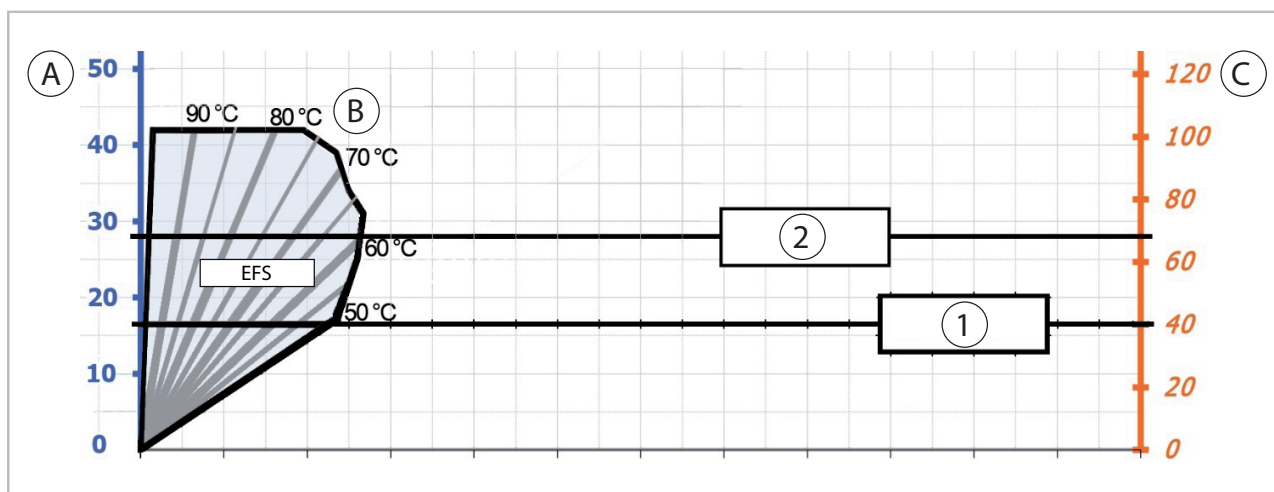


Fig. 10: Maximum dispensing medium flow rate

A: Dispensing medium flow rate [l/min]
 B: Buffer storage temperature
 C: Power [kW]

1: Example 1
 2: Example 2

Boundary conditions:

Cold water temperature: 10 °C,

Maximum pressure loss on the domestic water side of the fresh water station: 1000 mbar

The following examples explain the relationships between the individual variables of the hot water temperature, the dispensing medium flow rate and the buffer tank temperature, and show how these affect the transmission capacity of the fresh water station.

Example 1

Hot water temperature at the dispensing connection: 45 °C

Temperature in the buffer tank: 50 °C

⇒ Maximum dispensing medium flow rate: 16 l/min, transmission capacity: 40 kW

Example 2

Hot water temperature at the dispensing connection: 45 °C

Maximum dispensing medium flow rate: 28 l/min

⇒ Temperature in the buffer tank: 60 °C, transmission capacity: 69 kW



The hot water temperature that is set in the Smart Control controller (S 08 probe) is the reference temperature for the buffer tank. Factory setting: 45 °C.

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The following diagram shows the maximum dispensing medium flow rate if the hot water temperature is 45°C at the dispensing connection, after being mixed with cold water with a temperature of 10°C. The hot water temperature set on the controller is 60°C.

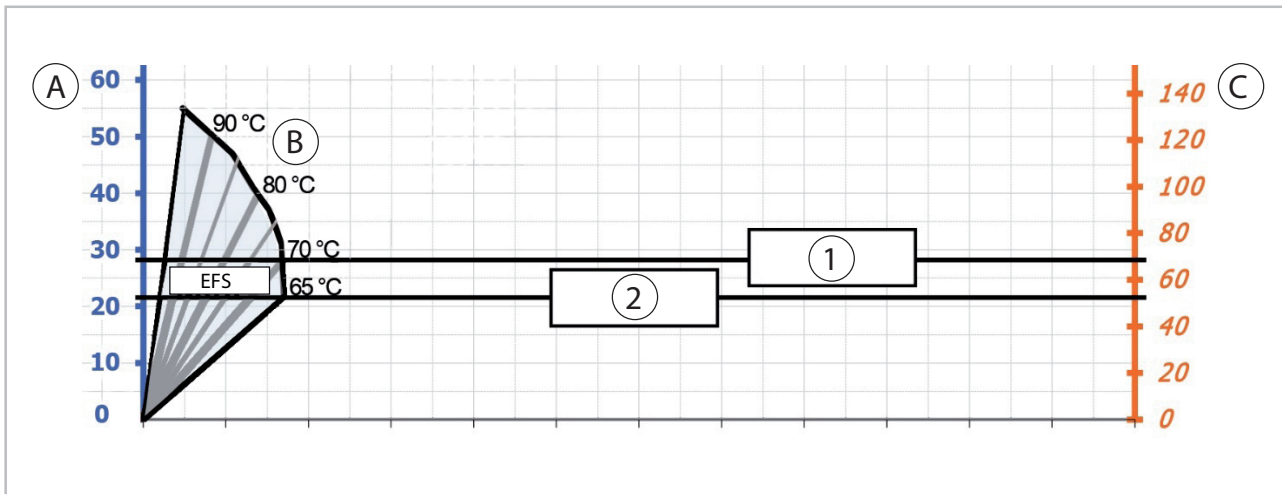


Fig. 11: Maximum dispensing medium flow rate

A: Dispensing medium flow rate [l/min]
 B: Buffer storage temperature
 C: Power [kW]

1: Example 1
 2: Example 2

Boundary conditions:

Cold water temperature: 10 °C,

Example 1

Hot water temperature on the controller: 60 °C

Temperature in the buffer tank: 70 °C

⇒ Maximum dispensing medium flow rate: 28 l/min, transmission capacity: 69 kW

Example 2

Hot water temperature on the controller: 60 °C

Maximum dispensing medium flow rate: 21 l/min

⇒ Temperature in the buffer tank: ~65 °C, transmission capacity: 52 kW

7.5 Circulation operation

The fresh water station can be (optionally) equipped with a circulation pump. Three possible operating modes are stored in the controller to operate the circulation pump (also see the operating instructions of the controller).

- **Pulse-controlled operation** (as necessary / requirement):

Actuating a hot water dispensing connection for a short time (dispensing impulse: less than 5 seconds) starts the circulation pump. The circulation pump then runs for a few minutes.

- **Time-dependent operation:**

Operation of the circulation pump can be adjusted on a weekly timer within a freely-selectable period. In this operating mode, circulation begins at the start of the period that is set. Circulation is deactivated after the set period expires.

- **Temperature-dependent operation:**

In this operating mode, circulation is only started if the temperature falls below the minimum temperature that can be set on the circulation temperature probe within the operation period. Circulation is deactivated after the adjustable target temperature is reached or after the set period expires.

Any of the operating modes can be combined, e.g. time-dependent and temperature-dependent operation. In this case, circulation is only active if the temperature falls below the temperature on the circulation temperature probe and the time window is active. Outside this time window, the circulation pump can be activated via a dispensing pulse if pulse-controlled operation is also activated.

For trouble-free operation, the circulation pump achieve a medium flow rate of min. 2 l/min. The primary pump of the fresh water station is not enabled below 2 l/min.

! NOTICE!

In the delivered state, circulation is not activated (see the operating instructions of the controller). If the REMKO circulation pump is installed, the operating mode must be activated urgently.

REMKO EFS series

7.6 Commissioning report

System operator							
System location							
Serial numbers							
REMKO EFS 21							
- Medium flow rate probes							
- Controller							
- Software version							
Primary piping	Ø =		mm		I =		m
Secondary piping	Ø =		mm		I =		m
Other installations	<input type="checkbox"/>	Circulation set			<input type="checkbox"/>	Return distribution set	
	<input type="checkbox"/>	Miscellaneous:					
Are both circuits cleaned and bled properly? (no air noises in the pump)					<input type="checkbox"/>	Bled	
Are all shut-off valves in the cold water supply opened?					<input type="checkbox"/>	Opened	
Is pressure of at least 1.5 bar present on the primary side?					<input type="checkbox"/>	Checked	
Is pressure of at least 2.5 bar present on the secondary side?					<input type="checkbox"/>	Checked	
Is an error message shown on the display?					<input type="checkbox"/>	No message	
					<input type="checkbox"/>		
					<input type="checkbox"/>		
					<input type="checkbox"/>		
					<input type="checkbox"/>		
					<input type="checkbox"/>		
Installation operation					Date, Signature		

8 Shutdown

If the fresh water station remains out of operation for a longer period of time, the power supply must be disconnected.

If the fresh water station is permanently taken out of service, the power supply to all affected parts of the system must be disconnected and all affected pipes and parts of the system must be completely drained.

Final decommissioning, dismantling and disposal may only be carried out by trained specialist personnel. Components and materials must be disposed of in accordance with current regulations.

9 Troubleshooting and customer service

General troubleshooting

The unit has been manufactured using state-of-the-art production methods and has been tested several times to ensure that it works properly. However, in the event that malfunctions should occur, the unit should be checked against the following list. Please inform your dealer if the unit is still not working correctly after all of the functional checks have been performed.

If there is an error message, it is shown in the display of the control unit. Please observe the corresponding controller instructions for this.

Malfunction	Possible causes	Remedial measures
Pump noises	Air in the system	Bleed
Tap quantity too low	Water pressure too low	Check pressure, increase if necessary
	Calcified heat exchanger	Decalcify/exchange
Tap temperature too low	Incorrect setting on the controller	Check settings
	Excessive pressure loss in the heating side piping	Check piping, change if necessary
No heating of the drinking water	Controller not operating	Check controller
	Air in the system	Bleed
	Hot water flow sensor not connected correctly or defective.	Check, replace if necessary
	Temperature sensor for heating supply flow not connected correctly or defective.	Check, replace if necessary
	Pump defective	Check, replace if necessary
	Volumetric flow sensor defective	Check, replace if necessary

REMKO EFS series

10 Care and maintenance

Care and maintenance

The manufacturer recommends that annual maintenance be carried out by authorised specialists.

Cleaning the heat exchanger:

If the water quality (e.g. high degree of hardness or heavy soiling) is likely to cause a build-up of deposits, cleaning must be carried out at regular intervals. Cleaning restores the heat exchanger to its original condition.

It is possible to clean by rinsing. The heat exchanger must be removed for flushing and descaling. The 3/4" connections of the plate heat exchanger can be connected directly to the flushing connections. Flush the heat exchanger against the normal flow direction with suitable cleaning solution.

If chemicals are used for cleaning, make sure that they are not incompatible with stainless steel, copper or nickel.

Failure to comply with this can lead to the destruction of the heat exchanger!

Use only chloride-free or low-chloride water with low hardness for the cleaning fluid. Select the cleaning agent based on the type of soiling to be removed and compatibility with the heat exchanger plate materials.

In any case, the cleaning agent manufacturer should confirm that the cleaning agent will not attack the plate heat exchanger to be cleaned. Clean the heat exchanger in accordance with the cleaning agent manufacturer's working instructions.

After cleaning, the acid remaining in the system must be neutralised and the metal surfaces passivated. Passivation is absolutely necessary to avoid the onset of corrosion. Always rinse the cleaned heat exchanger and the system sufficiently with clear water. In principle, the detergent manufacturer's instructions for the use of the cleaning agent must be observed.

! NOTICE!

Legionella can develop at temperatures below 60 °C. After longer periods of inactivity, e.g. holidays, it is recommended to flush all pipes thoroughly for a few minutes.

11 View of the unit and spare parts

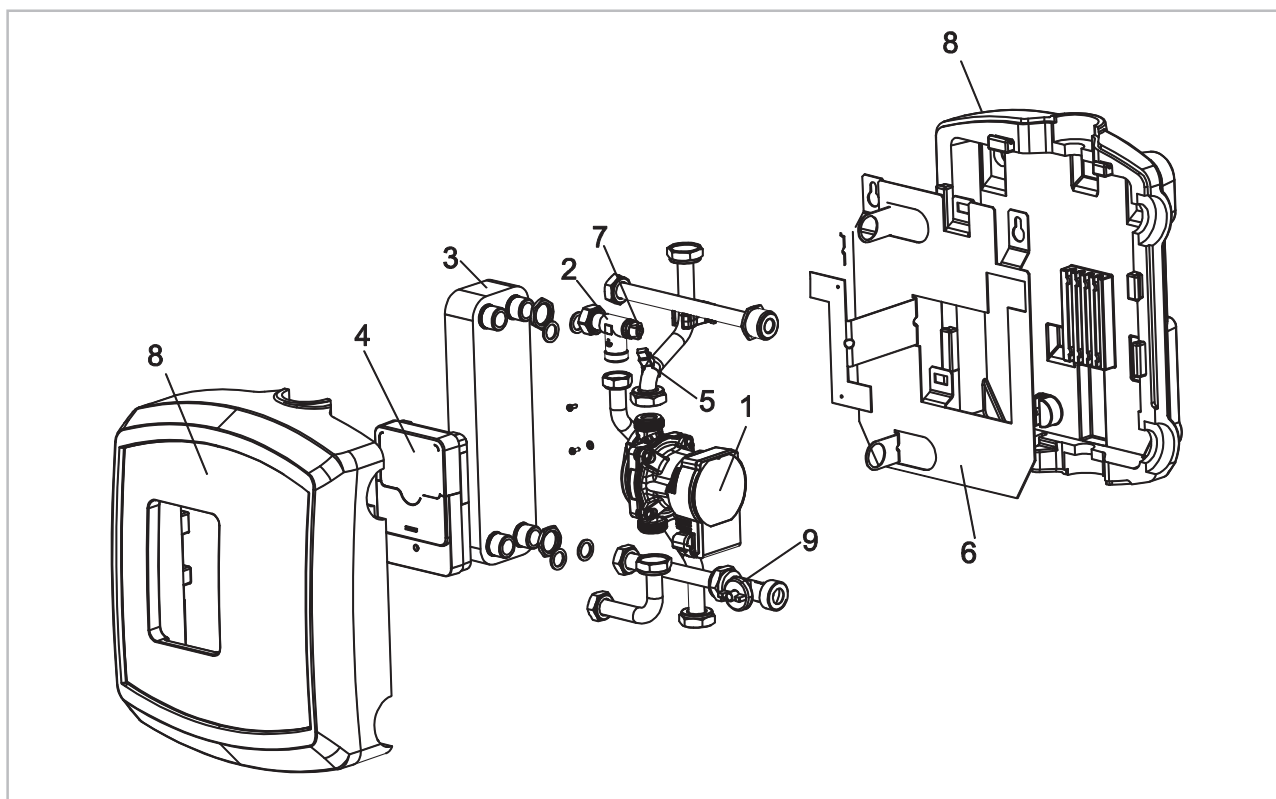


Fig. 12: Spare parts

No.	Designation	EFS 21
1	Wilo PARA 15/7 iPWM2	1125560
2	Heating return with integrated gravity brake	1125561
3	Plate heat exchanger copper-soldered	1125562
4	Regulation	1125563
5	Pt 1000 Buffer supply inlet	1125564
6	Base plate	1125565
7	Manual bleed valve	1125566
8	Thermal insulation shell	1125567
9	Huba probe type 235 2-40 l/min	1125568

We reserve the right to modify the dimensions and design as part of the ongoing technical development process

When ordering spare parts, please always state the EDP number, unit number and unit type (see name plate)!

REMKO EFS series

12 Index

A		
Assembly	15	
On the storage tank	15	
on the wall	15	
C		
Calcification protection	14	
Care and maintenance	24	
Circulation operation	21	
Commissioning	18	
Corrosion protection	13	
D		
Design of the storage tank	11	
Dispensing medium flow rate, maximum	19	
E		
Electrical wiring		
Circulation pump	17	
General notes	17	
Regulation	17	
Environmental protection	6	
F		
Filling the system	18	
G		
Gravity brake	18	
H		
Hydraulic connection	16	
I		
Initial commissioning	18	
Intended use	6	
M		
Maximum dispensing medium flow rate	19	
O		
Ordering spare parts	25	
P		
Packaging, disposal	6	
Pressure loss characteristic curve	8	
Pump data	8	
PWM logic	9	
R		
Recycling	6	
S		
Safety		
Dangers of failure to observe the safety		
notes	4	
General	4	
Identification of notes	4	
Instructions for the operator	5	
Note for inspection work	5	
Note for installation work	5	
Personnel qualifications	4	
Safety-conscious working	4, 6	
Unauthorised modification	5	
Unauthorised replacement part manufacture	5	
Seal inspection	18	
Set the temperature	12	
Setting the Temperature	12	
Shutdown	22	
Spare parts	25	
Storage tank mounting	15	
Storage tank, design	11	
T		
Troubleshooting		
General troubleshooting	23	
U		
Unit dimensions	8	
Unit disposal	6	
W		
Wall installation	15	
Warranty	6	

REMKO QUALITY WITH SYSTEMS

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