



INSTALLATION AND OPERATING MANUAL

COSMO FRESH WATER MODUL

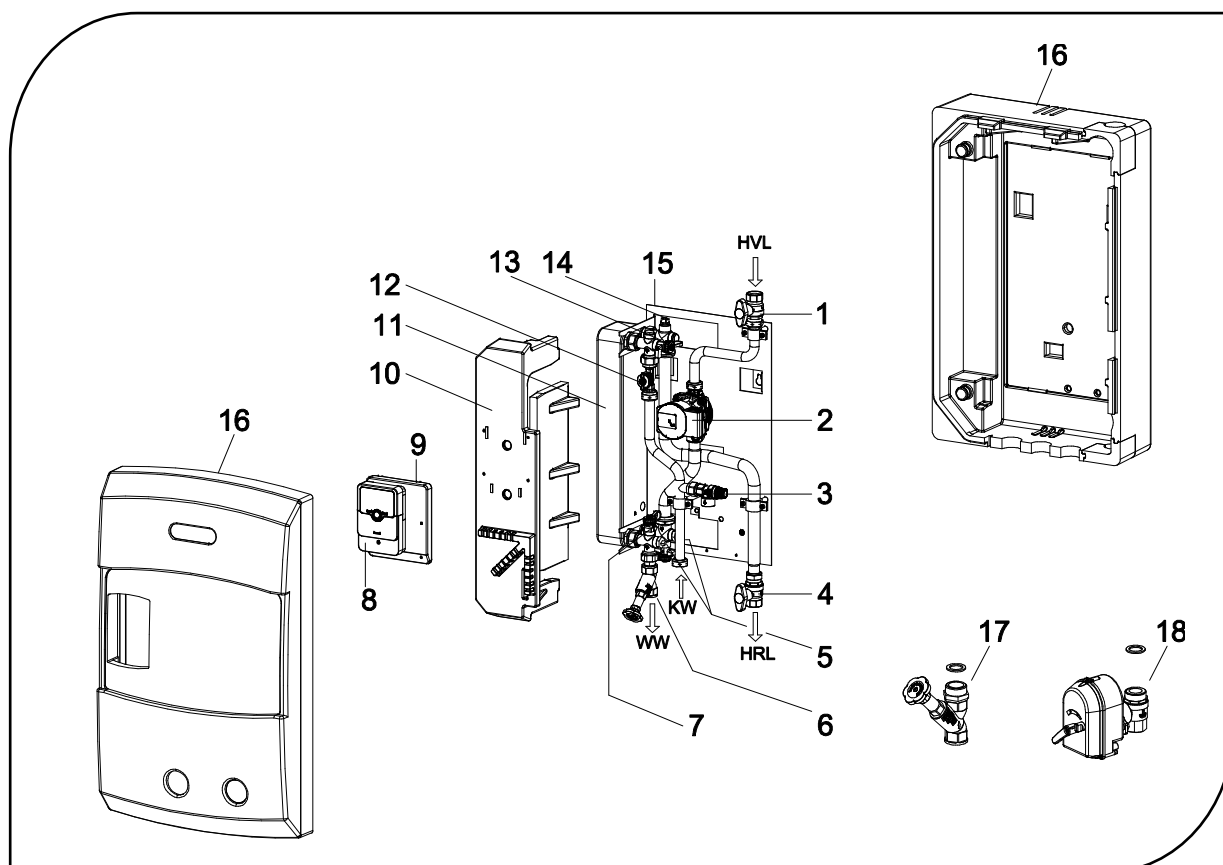
CFWMEXL / CFWMVEEXL



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1 Scope of delivery



Pos.	Bezeichnung
1	Ball valve for heating flow (HVL)
2	Circulation pump
3	Safety valve
4	Ball valve for heating return (HRL)
5	Front: temperature sensor (HW) Back: temperature sensor (HVL)
6	Shut-off valve for hot water (WW)
7	Flush valve/drain (WW)
8	Control unit
9	Bracket for control unit
10	Plate heat exchanger insulation plate
11	Plate heat exchanger
12	Flow sensor DN15 type 235 3,5l/min - 50 l/min
13	Flush valve for cold water (KW)
14	Cross piece including backflow preventer and hand vent valve
15	Mounting plate
16	Insulation
17	Shut-off valve for cold water (KW) (required for single station)
18	Cascade valve (KW) + actuator (required for cascade station)
KW	Cold water
WW	Hot water

The Replacement parts number can be found under 10 Replacement parts / accessories

1.1 Delivery and transport

Check to make sure the product is complete and undamaged immediately after receipt. Any damage or complaints must be reported immediately.

Observe the labels on the packaging without fail! The fresh water modul should only be removed from its packaging at the place of installation.

2 Standards and guidelines

Please observe the following standards, regulations and guidelines with regard to installation and operation:

- DIN EN 806 / DIN EN 1717 / DIN EN 806 / DIN 4708 / EN 12975
- DVGW worksheet W 551 / worksheet W 553
- EnEG (Energy Conservation Act)
- EnEV (Energy Saving Ordinance)
- Local regulations
- DIN 18 380 (Heating systems and central water heating systems)
- DIN 18 381 Gas, water and wastewater installation work
- DIN 18 421 Thermal insulation work on thermotechnical systems
- VDI 2035 (Prevention of damage in water heating installations)
- DIN 4753 (Water heaters and water heating installations for drinking water and service water)
- VDE 0100 (Installation of electrical equipment)
- VDE 0190 (Main equipotential bonding of electrical systems)
- TrinkwV (Drinking Water Ordinance)
- BGV (Accident prevention regulations of workers' compensation associations)

3 Safety

3.1 Safety instructions

In addition to country-specific guidelines and local directives, the following technical regulations must also be taken into account:



Important - risk of burning!

- As the system can reach temperatures > 60 °C, there is a risk of scalding and burning through contact with the components.



Danger – Electric shock!

- Risk of fatal electric shock as a result of incorrect electrical connections.
- Electrical connections must exclusively be created by electricians approved by energy suppliers and as per the locally applicable regulations.
- Disconnect the supply voltage prior to conducting any work.



Attention: Observe the water quality!

- Risk of calcification: For mass concentrations of calcium carbonate of > 1.5 mmol/l, the primary temperature must be limited to < 65°C. For mass concentrations of calcium carbonate of > 2.5 mmol/l, a softening system must be installed.
- Corrosion: If the limit values under point 6.4 are exceeded, a solid stainless steel heat exchanger must be used.
- Solid stainless steel heat exchangers are to be used for aggressive drinking water qualities that exhibit an electrical conductivity of > 500 µS/cm; please observe the detailed limit value table

The respective personal protective equipment must be worn when conducting any work on the system/device; this includes ear protection, eye protection, safety shoes, hard hat, protective clothing and protective gloves. Information regarding the personal protective equipment can be found in the national directives of the respective country of operation.

4 General information regarding the installation and operating manual

This manual describes the installation, operation and maintenance of the **CFWMEXL/CFWMVEEXL** fresh water modul.

This manual is intended for trained specialists with an adequate level of expertise in handling heating systems, water pipe installations and electrical installations.

The installation and commissioning procedures should only be conducted by qualified, specialist personnel.

The fresh water modul must only be installed and operated in dry areas that are protected from frost.

Read this manual carefully before starting any installation work.

Non-compliance will invalidate all claims under the guarantee and warranty.

Illustrations are symbolic and may differ from product to product.

Subject to technical changes and errors.

This installation and operating manual must not be reproduced or made available to third parties without prior written consent (section 2 German Copyright Act, section 823 Civil Code).

This installation and operating manual is to be handed over to the system operator and kept in close proximity to the device.

4.1 Regulation

Observe the installation and operating instructions for the control unit used.

4.2 Settings

Set the hot water temperature and the circulation programme if necessary.

Observe the installation and operating instructions for the control unit used.

5 Product description

5.1 Intended purpose

The CFWMEXL/CFWMVEEXL fresh water module is an electronically controlled hydraulic assembly for heating drinking water based on a flow principle.

The tapping flow rate is recorded via an electronic flow rate sensor that has a measuring range ex 2 l/min. The required primary flow rate is determined from the temperature of the storage tank, the flow rate and the nominal temperature of the hot water. In order to achieve a constant hot water temperature, the speed of the primary pump is varied by means of a PWM signal.

The CFWMEXL CFWMEXL/CFWMVEEXL fresh water module should only be used to heat drinking water in accordance with the Drinking Water Ordinance. The primary circuit must be filled with heating water according to VDI 2035.

The CFWMVEEXL fresh water module features solid stainless steel heat exchangers and is intended for aggressive drinking water supplies.

5.2 Applicable documents

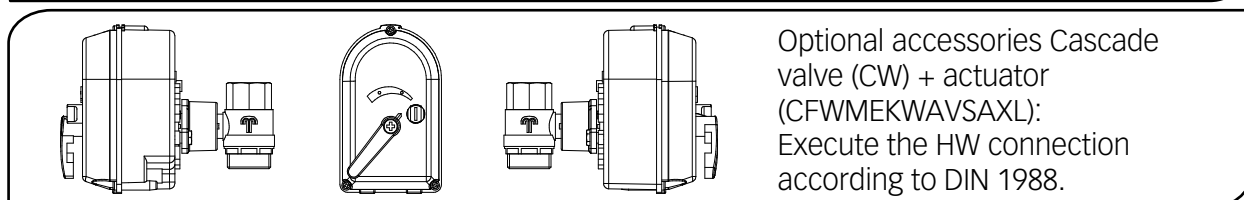
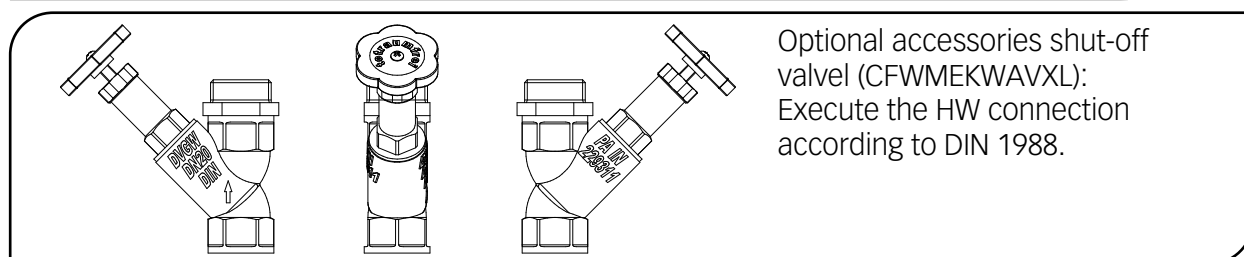
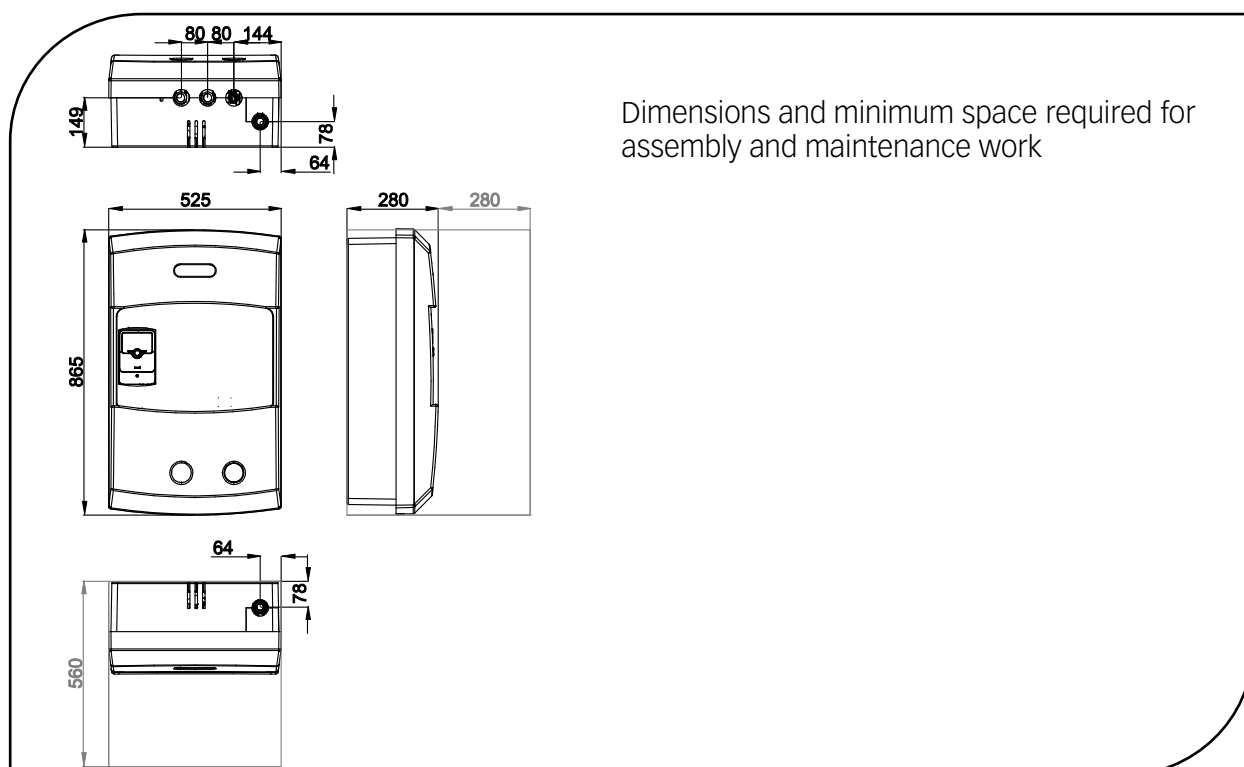
Also observe the installation and operating instructions for the various components used, such as the control unit.

6 Technical specifications

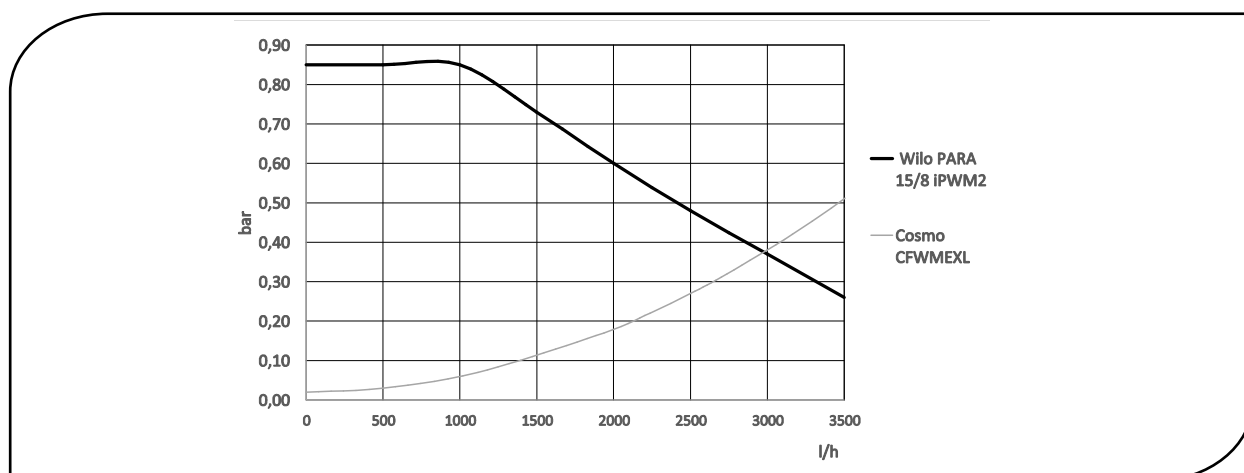
6.1 General instructions

Designation/type		COSMO CFWMEXL/CFWMVEEXL
Nominal output at 10-45/65°C (CW-HW/HF)		158 kW
Tapping capacity at nominal output		65 l/min
NL number at nominal output		23
Tapping capacity at 10-60/75°C (CW-HW/HF)		50 l/min
Output at 10-45/65°C (CW-HW/HF; incl. cascades)		158 / 300 / 450 / 600 kW
Tapping capacity at 10-45/65°C (incl. cascades)		65 / 124 / 185 / 247 l/min
NL number (incl. cascades)		23 / 47 / 87 / 133
Tapping capacity at 10-60/75°C, mixed to 45°C HW (incl. cascades)		50 / 95 / 143 / 190 l/min
Max. operating pressure	Heating circuit Drinking water	3 bar 10 bar
Max. operating temperature	Heating circuit Drinking water	95 °C 65 °C
Connections	Heating circuit Drinking water	G1 Rp¾
Pressure loss on the service water side at nominal output		0,8 bar
Max. pressure loss for piping on the heating side		50 mbar
Circulation pump Power input		Wilo Para 15/8 iPWM2 3-87 W
Flow rate sensor		Sensor Type 235 DN 15 3,5 l/min – 50 l/min
Electrical connection (mains control unit)		230 V AC/ 50-60 Hz
Materials		
Housing/connecting components		CW617N (2.0402)
Plate heat exchanger CFWMEXL		Stainless steel, Cu soldered
Plate heat exchanger CFWMVEEXL		Stainless steel, stainless steel soldered
Seals		AFM
Insulation		EPP foam 0.038 W/mK

6.2 Dimensions / required space



6.3 Pressure loss / pump characteristic curve



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

6.4 Corrosion protection

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

	Copper-soldered	Solid stainless steel
Chloride (CL ⁻)	$< 250 \text{ mg/l at } 50^{\circ}\text{C}$ $< 100 \text{ mg/l at } 75^{\circ}\text{C}$ $< 10 \text{ mg/l at } 90^{\circ}\text{C}$	
Sulphate ¹ (SO ₄ ²⁻)	$< 100 \text{ mg/l}$	$< 400 \text{ mg/l}$
Nitrate ¹ (NO ₃ ⁻)	$< 100 \text{ mg/l}$	No requirement
pH value ¹	7,5 - 9,0	7,0 – 10,0
Electrical conductivity ¹ (at 20°C)	10 - 500 $\mu\text{S/cm}$	No requirement
Hydrogen carbonate ¹ (HCO ₃ ⁻)	70 - 300 mg/l	No requirement
Ratio ¹ HCO ₃ ⁻ / SO ₄ ²⁻	$> 0,5$	No requirement
Ammonia ¹ (NH ₄ ⁺)	$< 2 \text{ mg/l}$	No requirement
Free chlorine gas	$< 0,5 \text{ mg/l}$	
Sulphite ¹	$< 1 \text{ mg/l}$	$< 7 \text{ mg/l}$
Ammonium	$< 2 \text{ mg/l}$	
Hydrogen sulphide ¹ (H ₂ S)	$< 0,05 \text{ mg/l}$	No requirement
Free (aggressive) carbon dioxide ¹ (CO ₂)	$< 5 \text{ mg/l}$	No requirement
Iron ¹ (Fe)	$< 0,2 \text{ mg/l}$	No requirement
Saturation index ¹ SI	$-0,2 < 0 < 0,2$	No requirement
Manganese ¹ (Mn)	$< 0,05 \text{ mg/l}$	No requirement
Degree of hardness (°dH)	$4 - 14$ $[\text{Ca}^{2+}; \text{Mg}^{2+}] / [\text{HCO}_3^{-}] > 0,5$	
Total organic carbon ¹ (TOC)	$< 30 \text{ mg/l}$	No requirement

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



To prevent pitting corrosion in the domestic installation, no new galvanised iron material must be installed downstream in the hot water pipe of the copper-soldered plate heat exchanger without forming a protective layer.

Solid stainless steel plate heat exchangers must be used in mixed installations with zinc-coated iron materials.

The grounding of the fresh water station must be ensured so that no current flow through the heat exchanger triggers electrochemical corrosion (see chapter 7.4.3 Equipotential bonding).



On the buffer tank side (primary side), the heating water quality must fulfill the requirements of VDI 2035.

6.5 Calcification protection

Limescale deposits from the water increase significantly at temperatures $>55^{\circ}\text{C}$ and a water hardness level over 8.5°dH . Because of that the hot water temperature should be set as low as possible taking the drinking water hygiene into account. If necessary reduce calcification by using water softeners or different suitable method.

It should be noted that decalcification using ion exchange does not reduce conductivity.

For this reason, a full stainless steel exchanger must be used from $500\ \mu\text{S} / \text{cm}$. It can be calculated that 14°dH corresponds to a conductivity of $14^{\circ}\text{dH} * 35 = 490\ \mu\text{S} / \text{cm}$.

For safety's sake, a full stainless steel exchanger must be used.

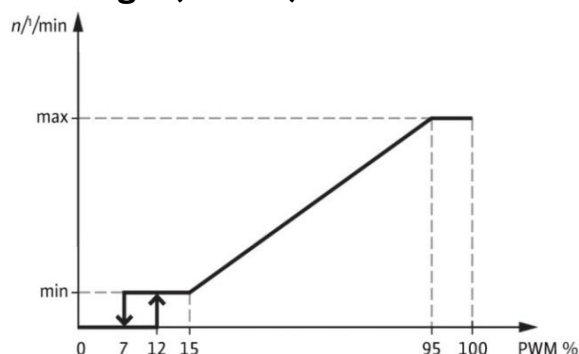
Refer to the Maintenance section for recommendations on cleaning.

Water treatment measures to prevent scale formation (water softening)

	Fresh water modul with 50°C hot water-tapping temperature and	
Mass concentration of calcium carbonate	primary flow $<65^{\circ}\text{C}$	primary flow $>65^{\circ}\text{C}$
$< 1.5\ \text{mmol/l}$ ($< 150\ \text{mg/l}$) $< 8.4^{\circ}\text{dH}$	None	None
$1.5\ \text{to}\ 2.5\ \text{mmol/l}$ ($150\ \text{to}\ 250\ \text{mg/l}$) $8.4^{\circ}\text{dH}\ \text{to}\ 14^{\circ}\text{dH}$	None	Recommended
$> 2.5\ \text{mmol/l}$ ($> 250\ \text{mg/l}$) $> 14^{\circ}\text{dH}$	Recommended	Required

6.6 Pump information

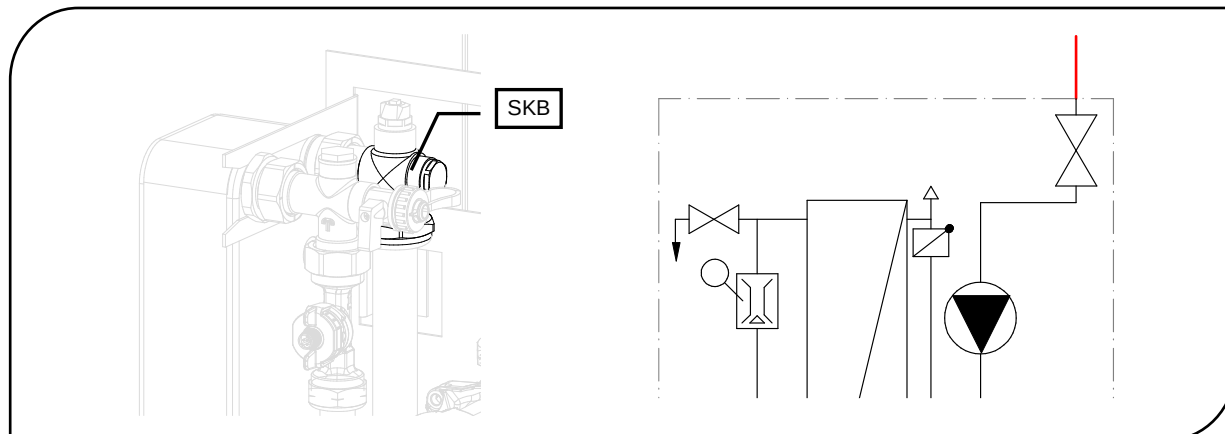
PWM-Logik (iPWM2)



$< 7\%$ pump off
 7-12% Min. output (operation)
 12-15% min. output (start-up)
 15-95% proportional output range
 $> 95\%$ max. output

6.7 Gravity brake

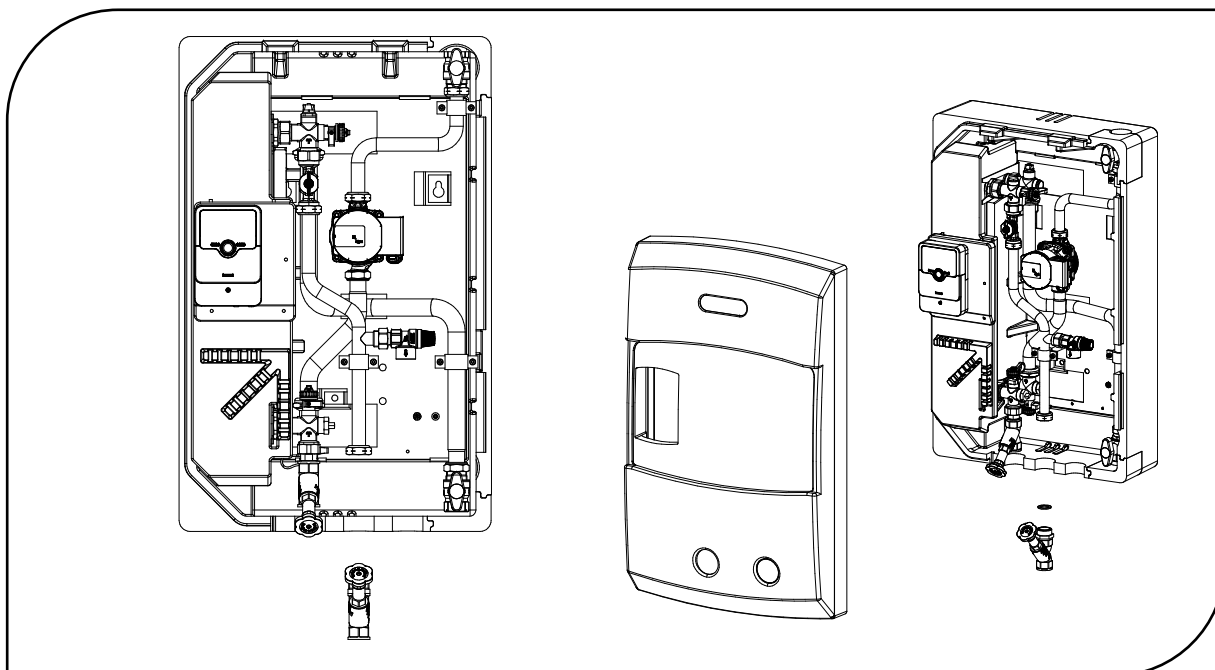
A gravity brake (SKB) is installed in the heating return (HRL) to prevent incorrect circulation. (see fig.)



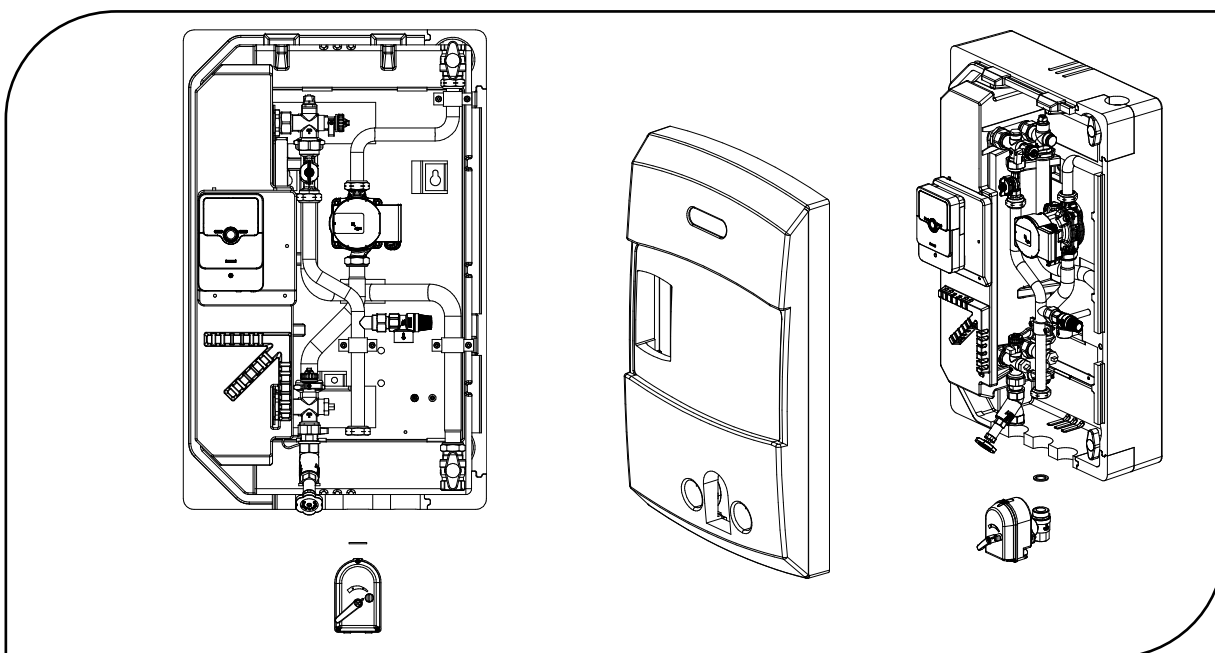
7 Assembly and installation

7.1 Valve assembly

7.1.1 Shut-off valve (CW)

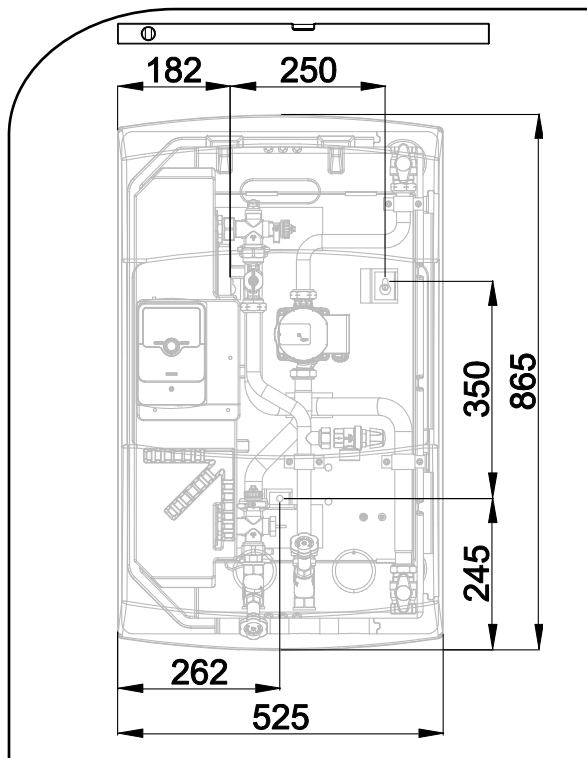


7.1.2 Cascade valve (CW)



7.2 Wall-mounted assembly

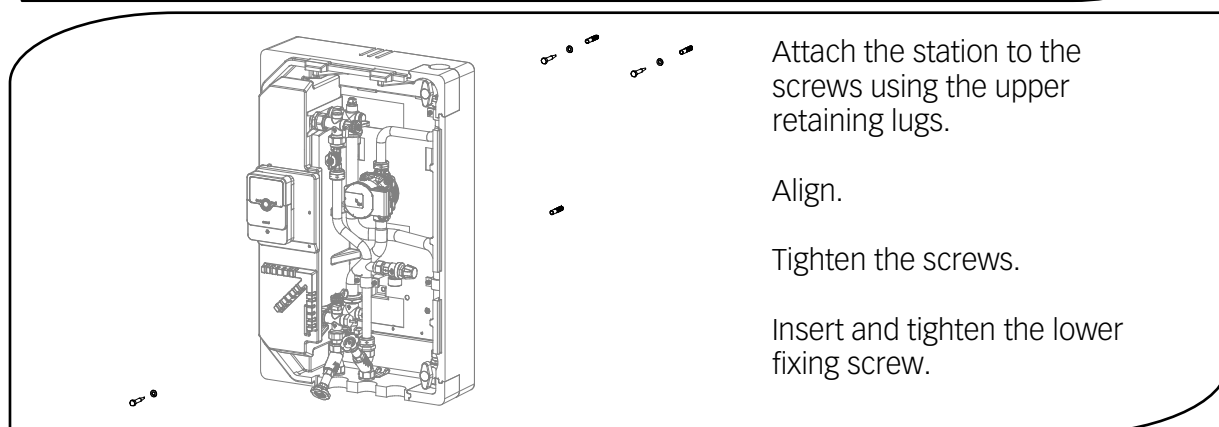
7.2.1 Dimensions



Mark the drilling dimensions as per the drawing and drill with 10 mm.

Insert the rawl plugs.

Tighten the two top screws. Tighten to a clearance of 3 mm between the screw head and the wall.



Attach the station to the screws using the upper retaining lugs.

Align.

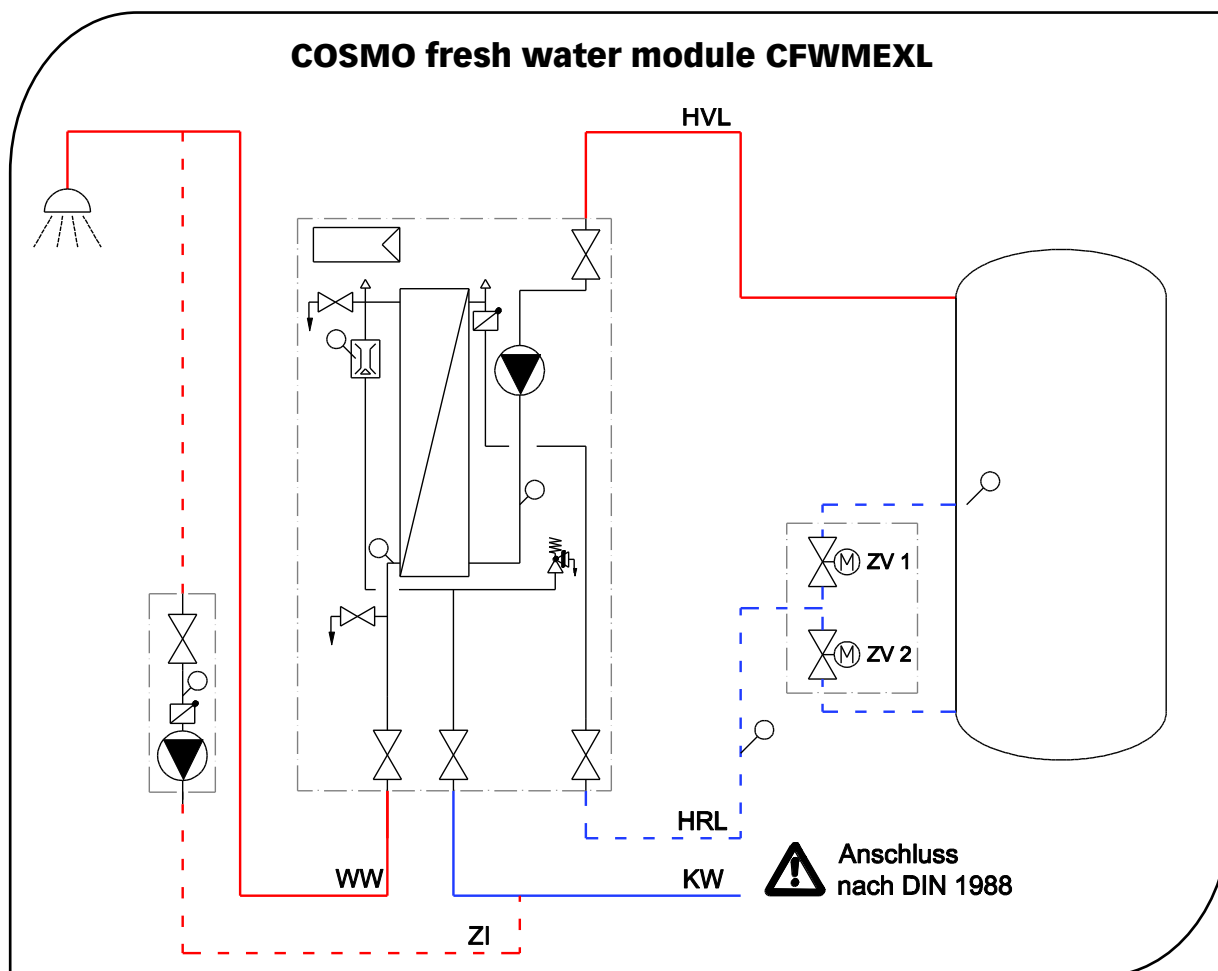
Tighten the screws.

Insert and tighten the lower fixing screw.

7.2.2 Installation requirements

- The upper flow pipe can be shortened. The lower pipe has a constant length
- The distances between the connections are within the illustrated range.
- For further information, please refer to the separate instructions for the connection set.

7.3 Hydraulic connection with accessories



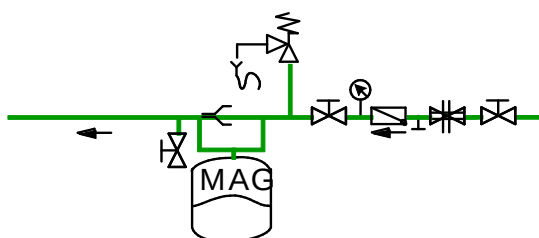
Designation	Description
WW	Hot water
KW	Cold water
HVL	Heating flow
HRL	Heating return
ZI	Circulation
ZV1	Zone valve 1
ZV2	Zone valve 2

CFWMERES32: Return stratification with 2 zone valve and two PT1000 temperature sensors (storage tank center & storage tank return)

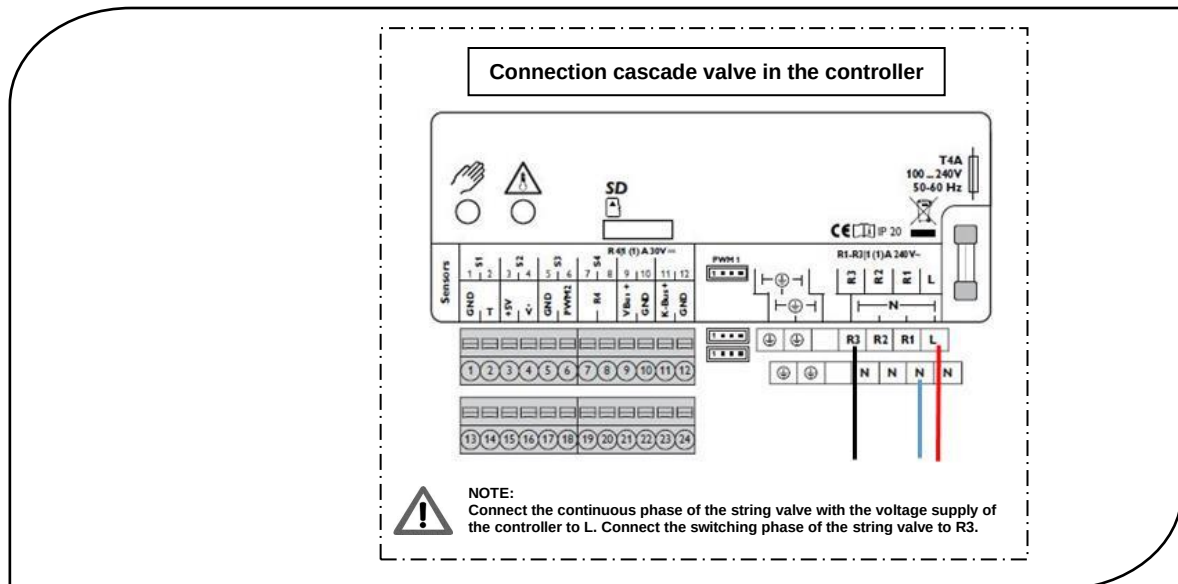


Note:

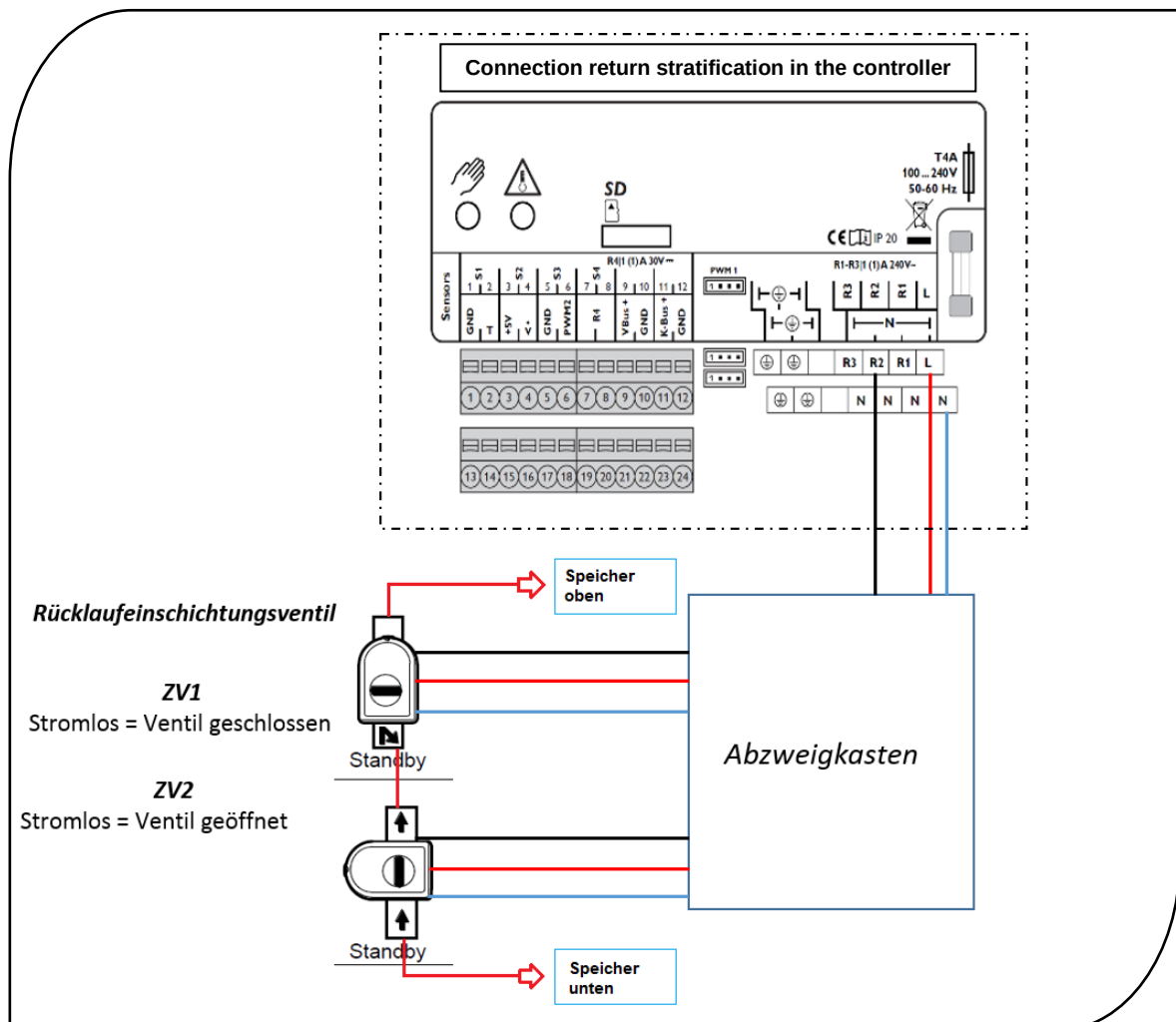
When installing Cosmo fresh water modules in accordance with DIN1988-200, a cold water expansion vessel (minimum water hammer damper) must be installed in addition to a safety valve in order to avoid pressure surges in the stations. Pressure surges can lead to a defect in the sensor system in the fresh water module and thus render the fresh water heating system inoperative.

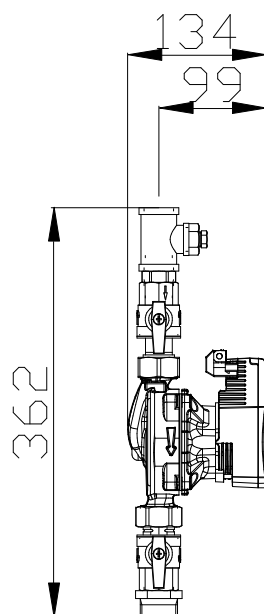


Electrical connection for cascade valve



Electrical connection for return stratification



Optional circulation set**Description:**

The CFWMEZS circulation set is an optional accessory for the CFWMEXL system. The set consists of the circulation pump, 2 shut-off ball valves with a backflow preventer and a thermowell with PT1000 sensor. A temperature sensor is always required for all circulation methods.

Dimensions and minimum space required for assembly and maintenance work.

The temperature difference between the circulation return and hot water is adjusted via the red adjusting knob on the pump

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

7.4 Electrical connection

7.4.1 General instructions



Only authorised, specialist personnel are permitted to open electrical housings and work on the electrical system after de-energising the equipment. When establishing connections, make sure the terminal assignments and polarity are correct. Protect the control unit and electrical components against excess voltage.

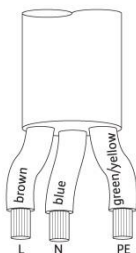
The fresh water modul **CFWMEXL** / **CFWMVEEXL** is pre-installed and wired ex works. Connect the power cable to commission.

Please refer to the separate control unit instructions for more details.

7.4.2 Circulation pump

The pump is controlled exclusively via an external PWM signal. The green flashing LED display indicates the standby mode. A green continuous light indicates the pump is operating at a speed corresponding to the PWM signal. A red LED signals an error.

Electrical pump connection



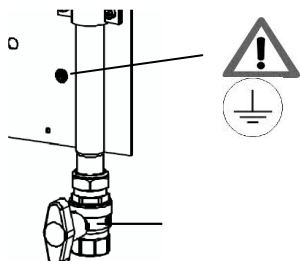
L = brown
N = blue
PE = green/yellow

PWM connection



+ = brown
- = blue

7.4.3 Equipotential bonding



The terminal point on the mounting plate must be professionally connected to the building potential equalization

7.4.4 Regulation

Refer to the separate operating manual of the corresponding control unit for more detailed information.

8 Commissioning, functional test, Decommissioning

Complete installation of all hydraulic and electrical components is a precondition for commissioning.

8.1 Start-up

8.1.1 Leak testing and filling the system

Check all system components, including all pre-fabricated elements and stations, to ensure they are leak-tight; seal any detected leaks accordingly. When doing so, adapt the test pressure and test duration to match the respective piping system and the respective operating pressure.

Fill the drinking water side with clean drinking water as per DIN 1988 only; bleed the air from the system by gradually increasing the pressure.



Note:
Tapping flow rates of > 70 l/min are to be avoided, as these can in long term result in permanent damage to the sensor.

Open the taps and slowly open the ball valve.

Only fill the heating system, including the primary side of the fresh water system, with water as per VDI 2035; bleed the system completely.

8.1.2 Initial commissioning process and functional test

Please observe the corresponding instructions for the control unit.

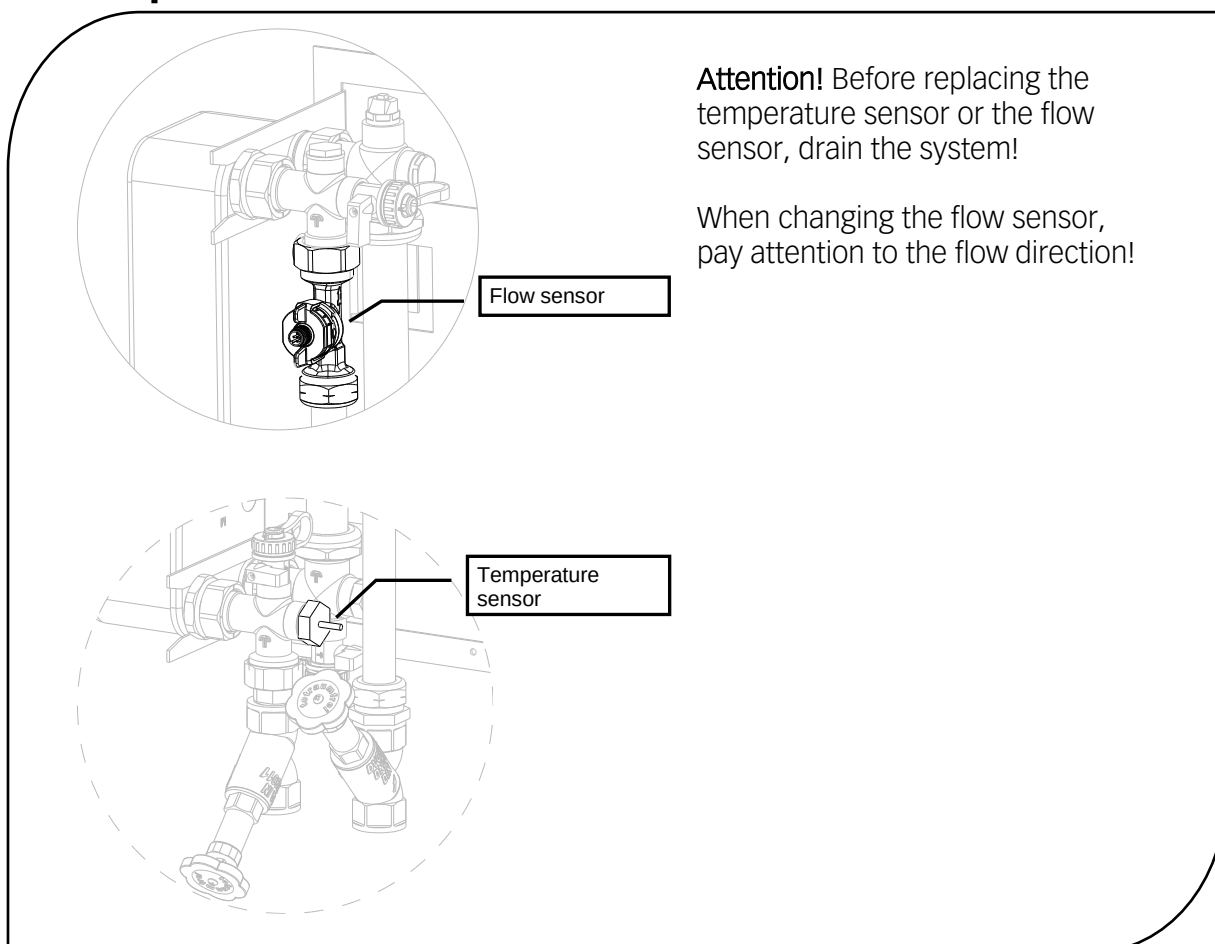
Task	Procedure	OK
Preparation and inspection	- Visual inspection of the installation. - Are all of the sensors installed and connected at the correct locations? - Are all outputs connected?	☐ ☐ ☐
Switch on the control unit	Supply power to the control unit	☐
Set up the control unit	Please observe the instructions for the control unit. - Set the fresh water temperature (hot water temperature). - Adjust the circulation (optional). In circulation mode, ensure a minimum flow rate of 3.5 l/min. - Adjust the return stratification (optional) - Configure the cascades (optional)	 — — — —
Additional settings	Adjust the pre-mix valve (optional)	— —
Test the outputs	Activate all of the outputs individually in sequence and check to make sure the pumps switch correctly.	☐
Check function	- Check the functionality of the hot water supply. - Check the functionality of the circulation (optional). - Check functionality of the return stratification (optional) - Check functionality of the cascades (optional)	☐ ☐

8.2 Troubleshooting

If an error message is output, it appears on the control unit display.
Please observe the corresponding instructions for the control unit.

Malfunction	Possible cause	Remedy
Pump noise	Air in the system	Vent
Insufficient tapping quantity	Insufficient water pressure	Check pressure, increase if necessary
	Calcification in heat exchanger	Decalcify/replace
Insufficient tapping temperature	Incorrect adjustment on the control unit	Check settings
	Excessive pressure loss in the piping on the heating side	Check the piping, change if necessary
Drinking water does not heat up	Control unit not in operation.	Check control unit
	Air in the system.	Vent
	HW flow sensor not connected correctly, or defective.	Check, replace if applicable
	Heating flow temperature sensor not connected correctly or faulty.	Check, replace if applicable
	Pump faulty	Check, replace if applicable
	Flow rate too low	Ensure a minimum flow rate of 3.5 l/min for circulation and hot water tapping
	Flow rate sensor defective	Check and replace if applicable

8.3 Temperature sensor / Flow sensor



8.4 Decommissioning

If the **CFWMEXL / CFWMVEEXL** is decommissioned for a prolonged period, the power supply must be disconnected.

For final decommissioning of the **CFWMEXL / CFWMVEEXL** the power supply for all of the corresponding system components must be disconnected; all of the relevant pipes and components must be completely drained.

The decommissioning, dismantling and disposal processes should only be conducted by qualified, specialist personnel. Components and materials must be disposed of in accordance with the current applicable regulations.

9 Maintenance

The manufacturer demands having the system serviced annually by authorised, specialist personnel.

Maintenance measures to be carried out:

- Check function, temperature values and volume flow for plausibility,
- Check switching operations of circulation and return-settling,
(use manual operation in the controller for this - then set to AUTO again)
- Switch all ball valves once,
- Check the hot water output, if it has decreased significantly, the heat exchanger must be cleaned => see 9.1 Cleaning the heat exchanger

9.1 Cleaning the heat exchanger

Regularly clean the unit if deposit build-up can be expected due to unfavourable water quality (e.g. extremely hard water or pronounced soiling). The cleaning process restores the original condition of the heat exchanger.

There is the option of cleaning the unit by flushing it. Use the flushing connections in the station for this.

Flush the heat exchanger in the direction opposite to the normal flow direction using a suitable cleaning solution.

Make sure any chemicals used for cleaning are suitable for stainless steel, copper or nickel. Non-compliance may result in permanent damage to the heat exchanger! Use only chloride-free water or water with a low chloride content and water hardness for cleaning solutions. Choose the cleaning agent to match the type of contamination and resistance of the heat exchanger plates. It is important to obtain confirmation from the cleaning agent manufacturer that the cleaning agent will not cause corrosion of the heat exchanger plates to be cleaned. Clean the heat exchanger as per the cleaning agent manufacturer's work instructions. Neutralise any remaining acids in the system after cleaning; passivate all metal surfaces. Passivation is mandatory to prevent any development of corrosion. Always rinse the clean heat exchanger and system using a sufficient amount of fresh water. Always observe the specifications provided by the cleaning agent manufacturer regarding use of the cleaning agent.

10 Replacement parts / accessories

Cosmo ET Number	Bezeichnung	
YCO1301588	Primary pump Wilo Para 15/8 iPWM2	130.15.88.00.18
YCO9076505	Plate heat exchanger CFWMEXL	907.65.05.00.18
YCO9077005	Plate heat exchanger CFWMVEEXL	907.70.05.00.18
YCO9076604	Fresh water controller incl. wiring harness	907.66.04.18.18
YCO0900519	Fresh water-, storage tank sensor Pt1000, G1/2"	090.05.19.00.18
YCO9076507	Flow rate sensor Typ235 DN15	907.65.07.00.18
CFWMEKWAVXL	CW ball valve	600.43.23.00.18
YCO6004324	HW ball valve	600.43.24.00.18
YCO6722184	Cascade valve DN 20	672.21.84.00.18
YCO4551511	Safety valve	455.15.11.00.18
YCO5841241	KFE valve HW	584.12.41.00.18
YCO5841231	KFE valve CW	584.12.31.00.18
YCO6762645	Ball valve storage tank flow/return	676.26.45.00.18
YCO6004054	Servo motor for cascade valve	600.40.54.00.18

11 COSMO hotline

Technical hotline:

For questions about our products

Telephone number: +49 (0)4080030 – 430

Monday to Thursday from 07.15 am to 5.45 pm.

Fridays from 07.15 am to 12:30 pm.

12 EU Declaration of Conformity

For the following product:

Device:

Fresh water module

Type:

CFWMEXL/CFWMVEEXL

We hereby declare that the design and construction of the products designated below, as well as the version we have introduced, comply with the relevant basic health and safety requirements of the EU Directive – in particular 4004/108/EC, 2006/95/EC, 2014/30/EU, 2014/35/EU, 2011/65/EU and 2009/125/EC. This declaration shall become void should any alterations be made to the products without our express approval.

Manufacturer COSMO GMBH Brandstücken 31 22549 Hamburg	
	Hermann – Josef Lüken
	Managing Director

13 Warranty, availability guarantee, imprint



1st edition may 2024

Subject to errors and alterations.

All specifications relating to images, products, dimensions and designs are correct at the time of printing.

Subject to technical changes and changes to the colour or shape of the illustrated products.

Deviations in terms of colour cannot be ruled out due to technical reasons in the printing process.

Claims relating to the model and product cannot be asserted.

Within the framework of the current legal provisions of the Purchase Contract Law (BGB [Civil Code] with respect to warranty claims), COSMO has a limitation period of 5 years from the date of delivery.



COSMO GMBH

Brandstücken 31 · 22549 Hamburg

info@cosmo-info.de

www.cosmo-info.de