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English

Installation and Operation Instructions
Pipe set for FriwaMini cascade

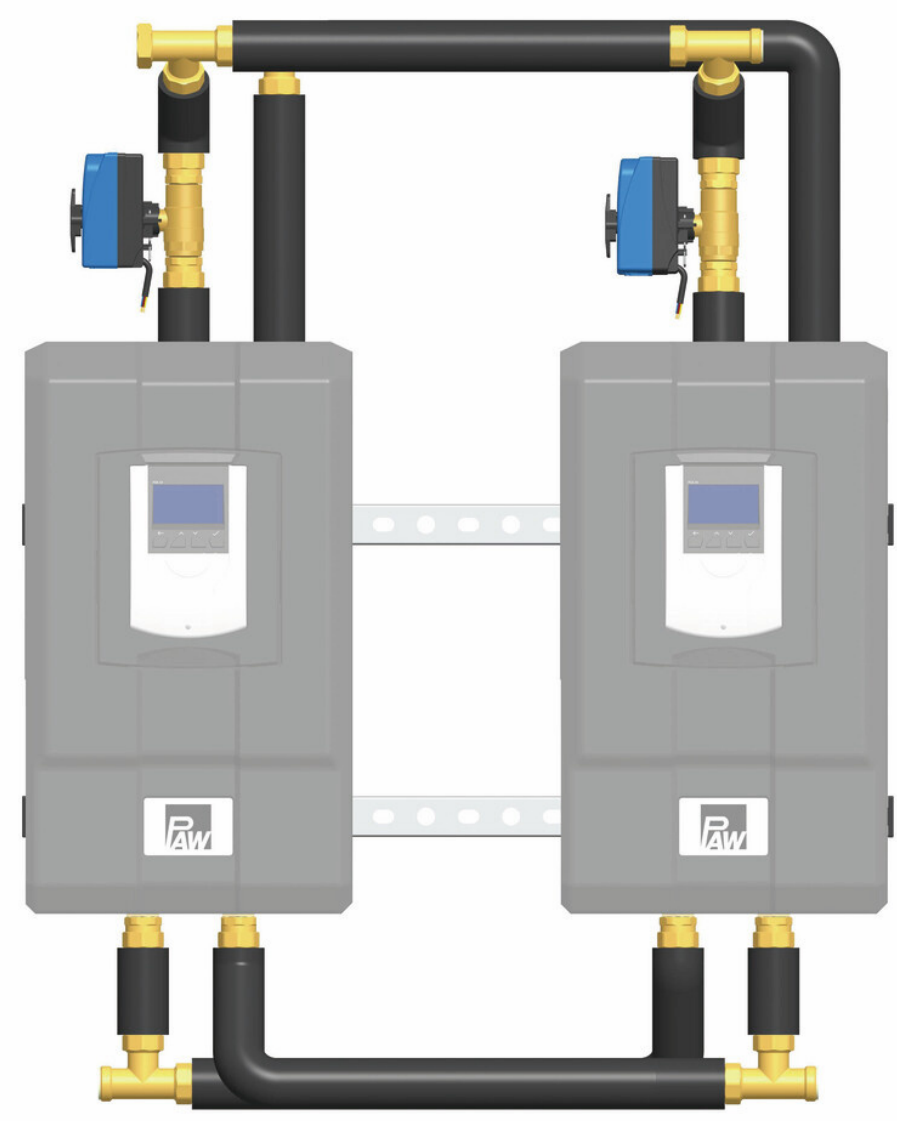


Table of Contents

1 General Information

Carefully read these instructions before installation and commissioning.

Save these instructions in the vicinity of the installation for future reference.

1.1 Scope of these instructions

These instructions describe the assembly and installation of the pipe set for a Friwa cascade.
The chapters called [specialist] are intended for specialists only.

For other components of the installation, such as the domestic hot water modules, storage tanks, controllers and pumps, please observe the instructions of the corresponding manufacturer.

This product complies with the relevant directives and is therefore labelled with the CE mark.
The Declaration of Conformity is available upon request, please contact the manufacturer.

1.2 About this product

With the pipe set, two domestic hot water modules FriwaMini DN 15 can be cascaded.

1.3 Designated use

The pipe set may only be used for the installation of a cascade of two domestic hot water modules FriwaMini. The technical limit values specified in these instructions must be observed.

Only use PAW accessories with the domestic hot water module. Improper usage excludes any liability claims.

Do not put the product into operation in case of any visible damage.

2 Safety instructions

The installation and commissioning as well as the connection of electrical components require technical knowledge commensurate with a recognised vocational qualification as a fitter for plumbing, heating and air conditioning technology, or a profession requiring a comparable level of knowledge [specialist].

The following must be observed during installation and commissioning:

- relevant local and national regulations
- accident prevention regulations of the professional association
- instructions and safety instructions mentioned in these instructions

WARNING

Risk to life and limb due to electric shock!

- ► Prior to commencing electrical work on the controller, pull the mains plug!
- ► Only after completing all work, plug the mains plug into a socket. This avoids an unintentional start of the motors.

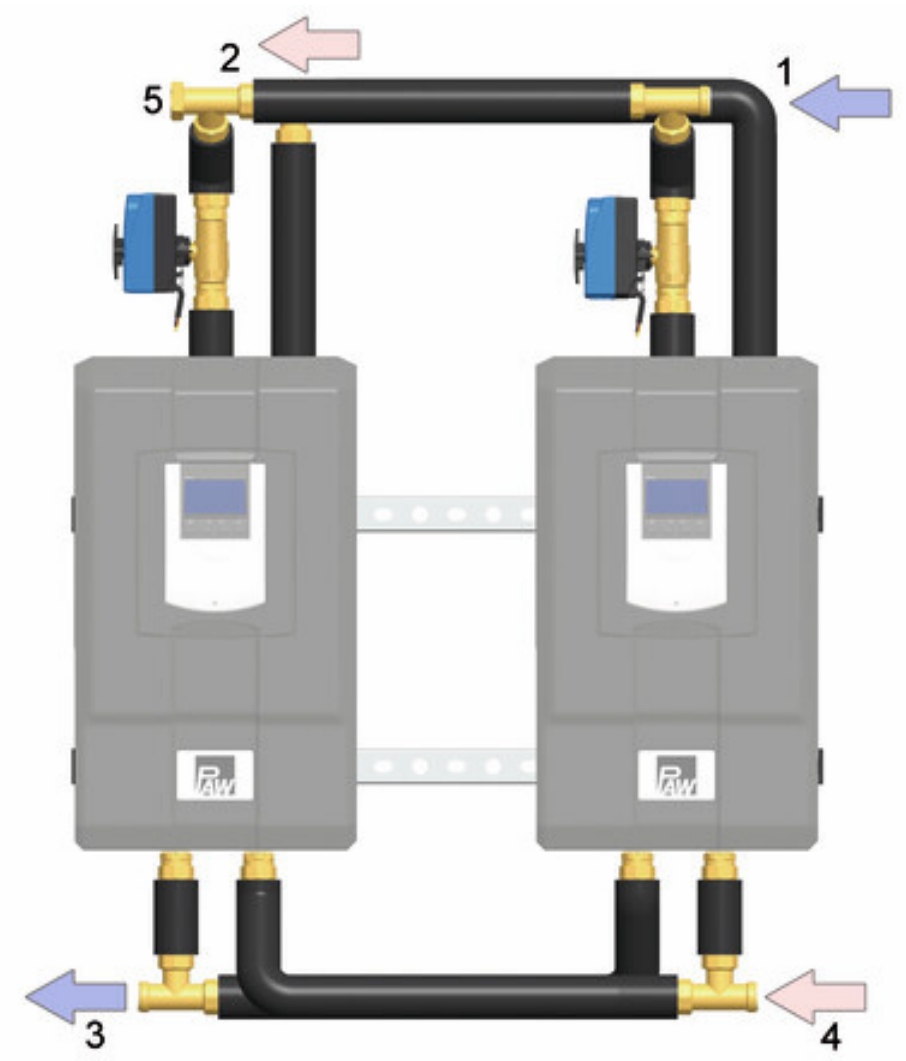
NOTICE

Material damage due to mineral oils!

Mineral oil products cause lasting damage to seals made of EPDM, whereby the sealant properties are lost. We do not assume liability nor provide warranty for damage to property resulting from sealants damaged in this way.

- ► It is imperative to prevent the EPDM sealing elements from making contact with substances containing mineral oils.
- ► Use a silicone- or polyalkylene-based lubricant free of mineral oil such as Unisilikon L250L and Syntheso Glep 1 from Klüber or a silicone spray.

3 Product description



Connections

1 Secondary side/DHW side: Cold water supply

2 Secondary side/DHW side: Hot water outlet

3 Primary side/heating side: Return to the buffer tank

4 Primary side/heating side: Flow from the buffer tank

5 Connection of the circulation

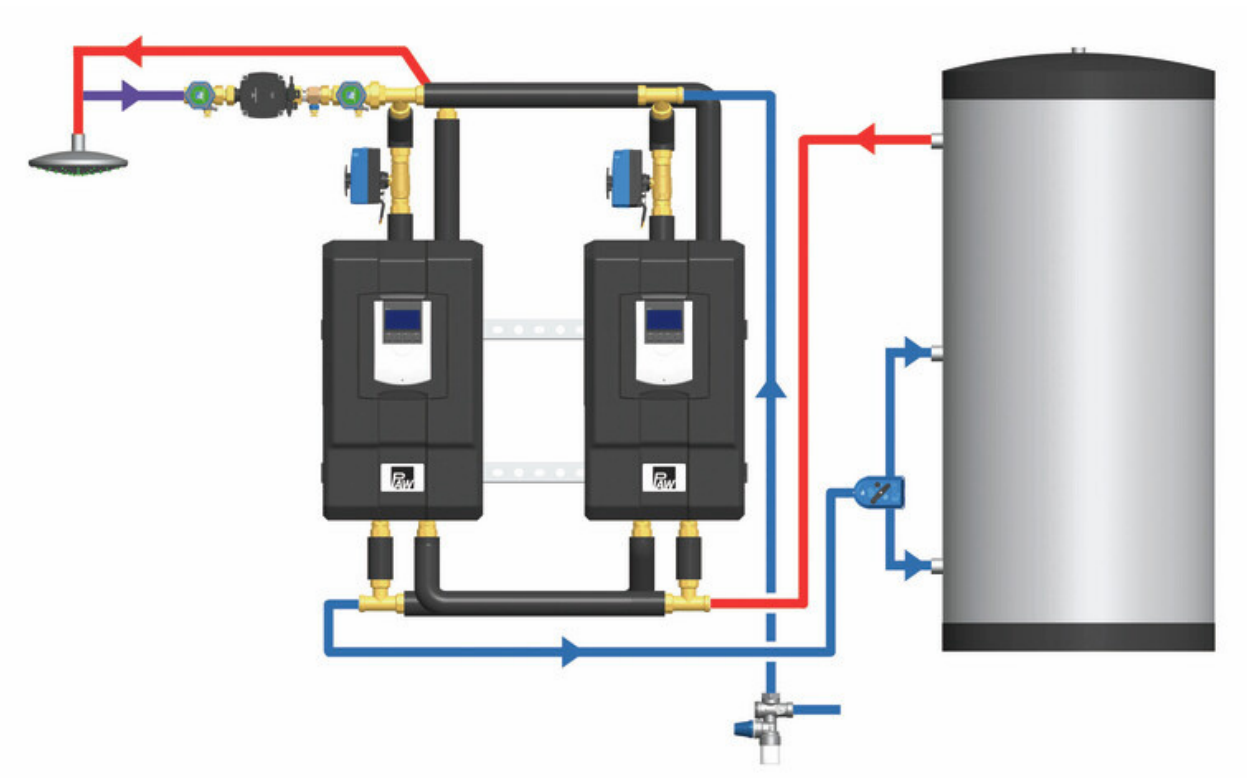
4 Dimensioning and planning

The FriwaMini is a domestic hot water module operating on the principle of a flow-type water heater.

The DHW module will only work flawlessly if the installation meets certain requirements. Please take some time to plan the assembly.

WARNING	
	**Danger of scalding due to hot water!** Undesirable circulation of water in the primary circuit can cause the exit of water of up to 90 °C at the withdrawal point. ▶ External pumps must not be installed between the domestic hot water module and the buffer tank. ▶ The domestic hot water module must not be connected to a distribution manifold of a heating circuit.

Mounting example:



FriwaMini cascade with 2 x FriwaMini, with pipe set and optional circulation set (additionally required, item no. 6404136GM7) and return distribution set (additionally required, item no. 640425)

5 Mounting and installation [specialist]

NOTICE

Damage to property!

The installation site must be dry, stable, frost-proof and protected against ultraviolet radiation in order to prevent material damage of the installation.

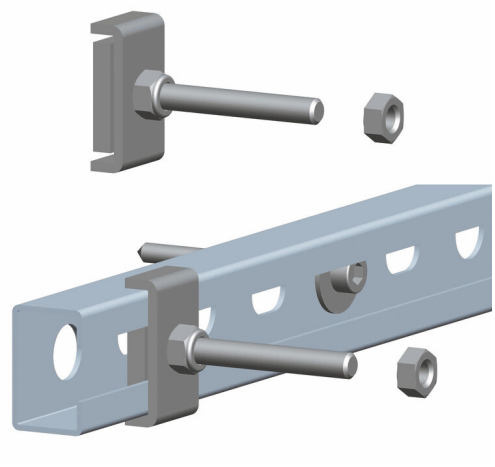
5.1 Mounting the cascade

WARNING

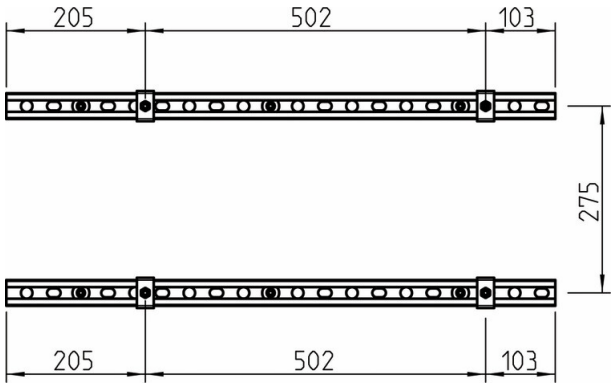
Risk to life and limb due to electric shock!

- ► Prior to commencing electrical work on the controller, pull the mains plug!
- ► Only after completing all installation work as well as the flushing and filling, the mains plug of the controller can be plugged into a socket. This avoids an unintentional start of the motors.

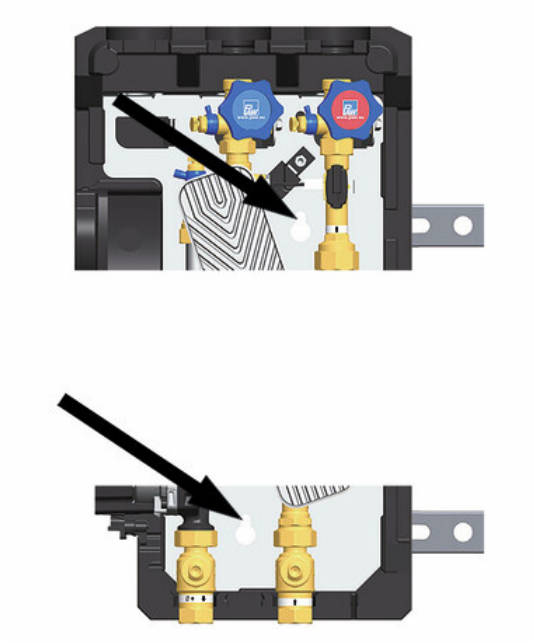
1. Determine the mounting location of the cascade near the buffer tank.
2. Mount the upper rail to the wall with 4 screws (recommended height 1.80 m). The cardboard template of the DHW module shows the position of the drilling holes and the distance between the upper and lower rail.
3. Fix the lower rail at the wall with 2 screws.
4. Remove the DHW module from the packaging and put it on the box.
   Notice: The station is very heavy and should be carried by two persons.
5. Open the insulating front shell.



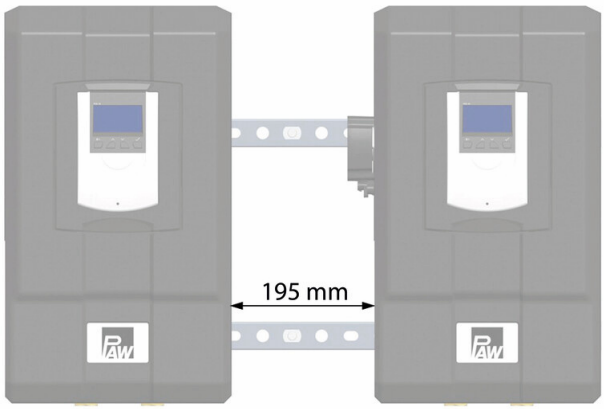
6. Slide the 2 T-head screws onto the upper rail and make sure that the big washer is placed at the outside of the rail.



7. Adjust the T-head screws.



8. Hang the first station onto the screw and make sure that it protrudes beyond the holes in the retaining plate. Tighten the screw with a washer and a nut.
9. Pull the station away from the lower rail towards you and slide the T-head screw onto the lower rail behind the hole. Tighten the screw with a washer and a nut.
10. Tighten all screws manually.



11. In the same way, mount the second DHW module to the wall. Please observe the distance of 195 mm between the stations.
12. Screw the screws of the second DHW module only manually because it still has to be adjusted during the connection of the pipe set.
13. As long as the screws are screwed manually, the position of the stations onto the rails can be changed. For this purpose, the screws have to be relieved by an easy lifting of the stations.
14. Mount the pipe set as follows.

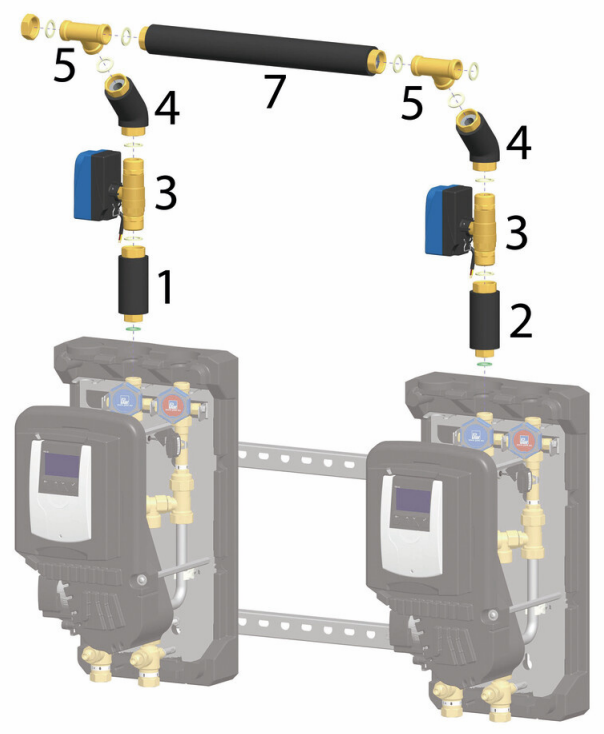
5.2 Mounting the pipe set with 2-way-zone- valve

The switch valve set can only be mounted on domestic hot water modules of the type FriwaMini.

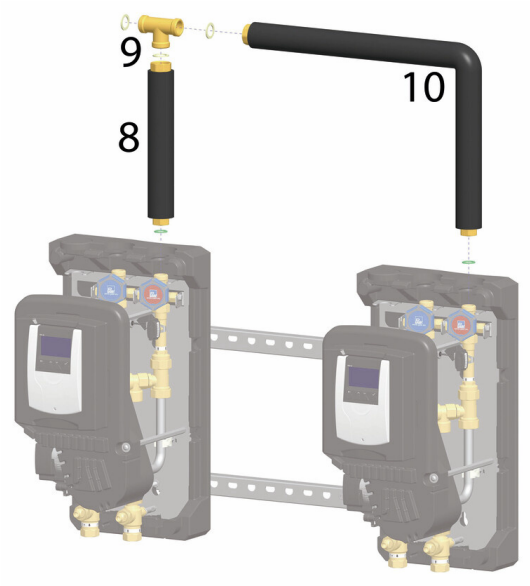
If you have questions about your required spare parts, please keep your serial number ready (is situated at the top of the retaining plate of the station).

NOTICE

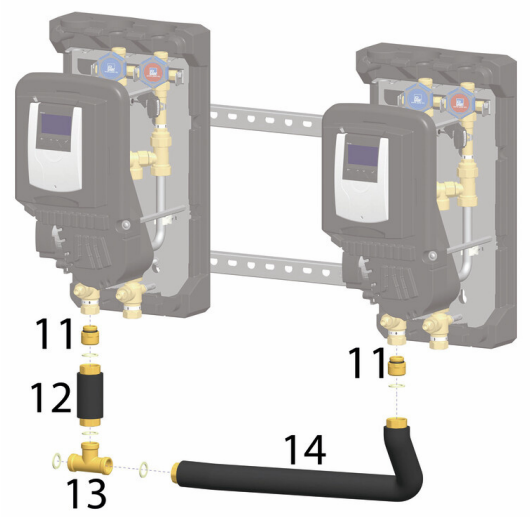
Use the new seals included! Screw the thread connections at first manually and adjust the pipes, in order to guarantee a low-tension installation.



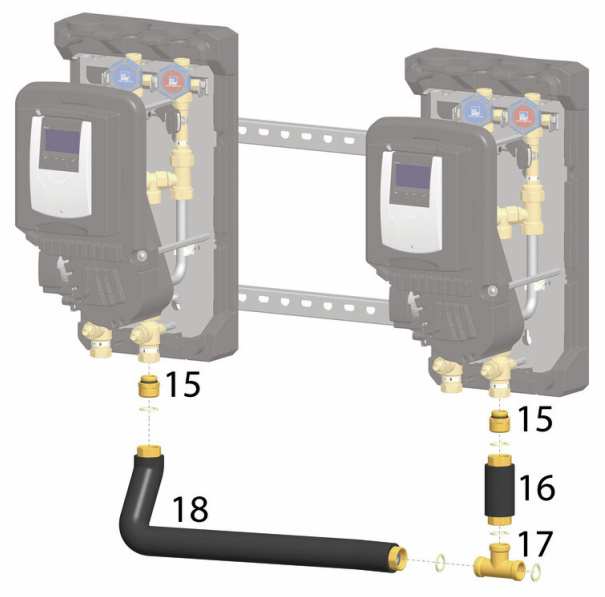
1. Screw a short, straight pipe section onto the cold water connection of the left domestic hot water module.
2. Screw the second short, straight pipe section onto the cold water connection of the right domestic hot water module.
3. Screw a switch valve to each short pipe. The actuator should be aligned at the side and the cable of the actuator has to point down.
4. Screw a single bent pipe onto each switch valve. The opening of the pipes must point forward.
5. Screw a T-piece to each single bent pipe.
   Notice: The cold water inlet can be connected from the left or from the right. A piping according to the Tichelmann principle is recommended. Here: Inlet from the right, outlet to the left.
6. If no circulation is installed, close the circulation line at the T-piece at the return connection of the left station by using the cap.
7. Screw the long, straight pipe section between the T-pieces.
   Notice: For the connection of the pipes, it may be necessary to slightly move the modules on the rails.



8. Screw the straight, medium length pipe to the hot water connection of the left station.
9. Screw a T-piece to the pipe.
10. Connect the T-piece and the hot water connection of the right station by the long, single bent pipe.



11. Screw a reducing nipple to the storage tank return of both modules.
12. Screw the straight, medium length pipe to the storage tank return on the left module.
13. Screw a T-piece to it.
14. Connect the T-piece and the storage tank return of the right module by the long, single bent pipe.

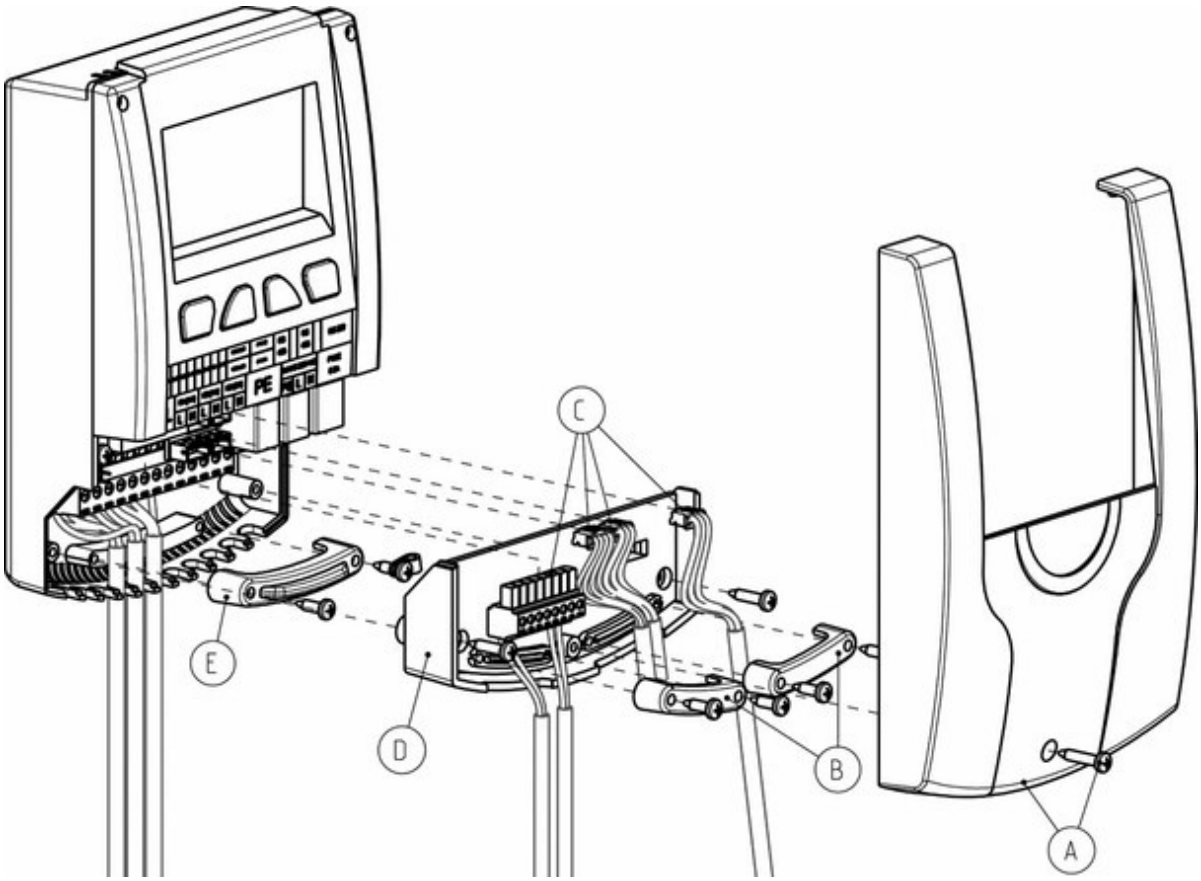


15. Screw a reducing nipple to the storage tank flow of both modules.
16. Screw a straight, medium length pipe at the reducing nipple at the storage tank flow of the right module.
17. Screw a T-piece to it.
18. Connect the T-piece and the reducing nipple at the storage tank flow by the long single bent pipe.
19. Firmly tighten all screw connections and check the piping for tightness.

5.3 Controller connection FC3.10

The following illustrations show how to connect the 2-way zone valves (switch valves) electrically to the controller, and how to connect the controllers with each other in order to establish a communication between them.

WARNING	
	**Risk to life and limb due to electric shock!** ► Prior to commencing electrical work on the controller, pull the mains plug! ► Only after completing all work, plug the mains plug into a socket. This avoids an unintentional start of the motors.

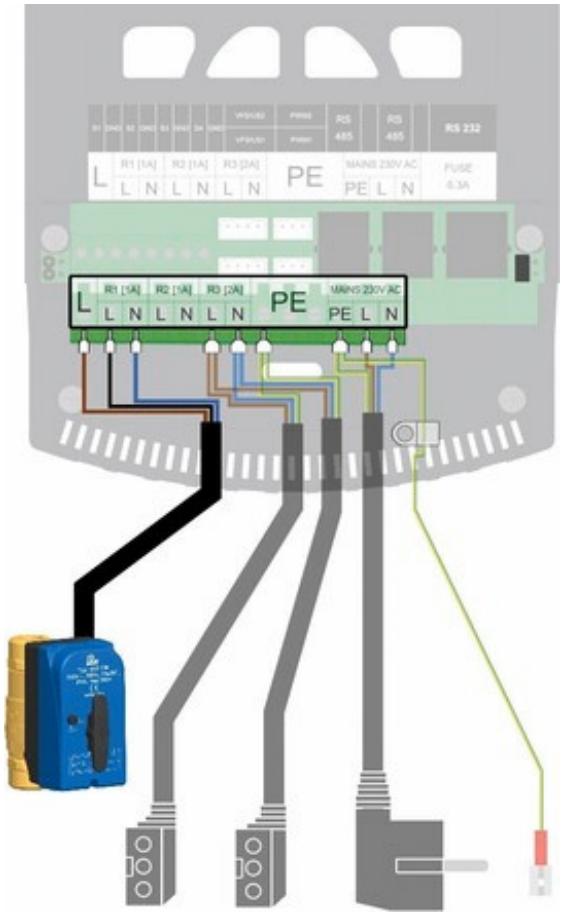


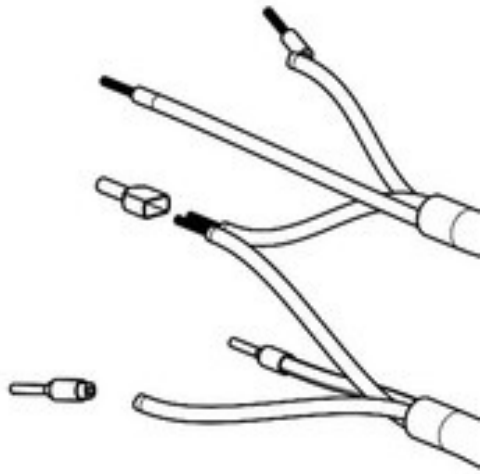
1. Remove the white front panel (A) of the controller.
2. Then, remove the strain reliefs (B).
3. After that, remove the sensor cables of the VFS/US sensors, of the PWM signal and the temperature sensors from the controller circuit board plug connector (C). Alternatively, the entire PCB connector with cables can be pulled out.
4. In the next step, unscrew the two screws to remove the intermediate level (D).
5. Remove the strain relief on the 230 V level (E).
6. Connect the 2-way zone valve to the relay 1. Observe the polarity of the PWM connection:

   Brown: L_{const}

   Black: L

   Blue: N





7. If, in addition to the 2-way zone valve, the 3-way valve for the stratification is also supposed to be connected to the relay 2, connect both wires (L_{const}) to "L" by means of a duo wire end ferrule (twin wire end ferrule).

   See controller instructions, chapter "Stratification".

8. Mount the strain relief of the 230 V level and the intermediate level.
9. Connect the controllers with each other via a bus line. To do this, put the plug of the bus line into the socket marked with "RS 485".

   Recommendation:

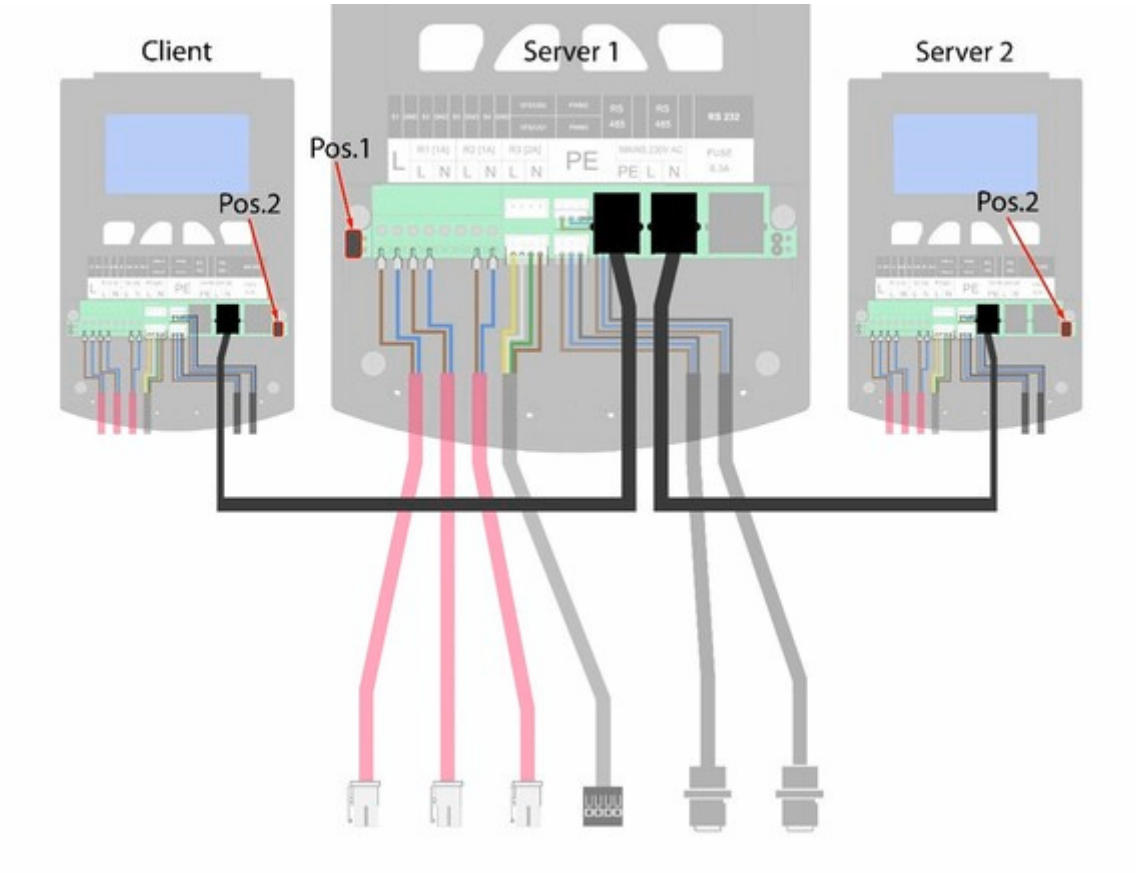
   Arrange the controllers from left to right in the following order:

   client, server 1, server 2, server 3.

   Observe the controller instructions.

Cascade connection of the domestic hot water modules

The following illustration shows how the three domestic hot water modules must be connected via two bus lines in a cascade connection.



Plug the jumper of the first and the last participant of the modbus communication into the plug connector which is marked as "Pos. 2".

The jumper of the controller which is connected between the first and the last participant must be plugged into the marked "Pos. 1" of the plug connector.

After that, mount the two strain reliefs and the front panel of the controller.

Set up the power supply of the installation and put the controller into operation according to the controller instructions.

The following table shows the required positions of the jumpers, depending on the number of the domestic hot water modules / cascade modules which are part of the cascade connection.

Number of cascade modules	Client	Server 1	Server 2	Server 3
2	Pos. 2	Pos. 2	-	-
3	Pos. 2	Pos. 1	Pos. 2	-
4	Pos. 2	Pos. 1	Pos. 1	Pos. 2

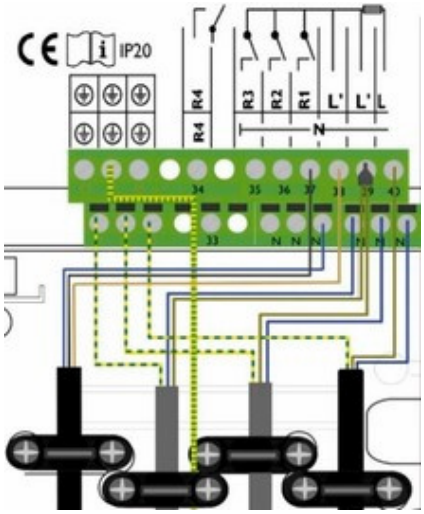
5.4 Controller connection FC4.13

The following illustrations show how to connect the 2-way zone valves (switch valves) electrically to the controller, and how to connect the controllers with each other in order to establish a communication between them.

WARNING

Risk to life and limb due to electric shock!

- ► Prior to commencing electrical work on the controller, pull the mains plug!
- ► Only after completing all work, plug the mains plug into a socket. This avoids an unintentional start of the motors.

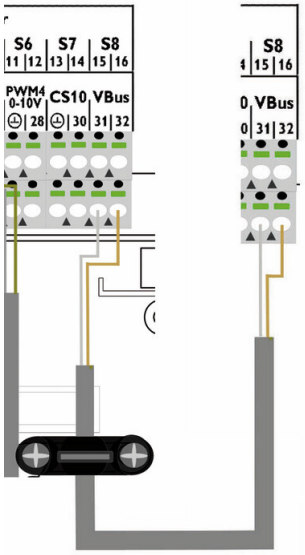


1. Open the front panel of the controller.
2. Connect the 2-way zone valve to the corresponding controller.

   Black: R1

   Blue: N

   Brown: L'



3. Connect all controllers with each other by using the enclosed connecting lines. Observe the polarity of the PWM connection:

   Brown: VBus-

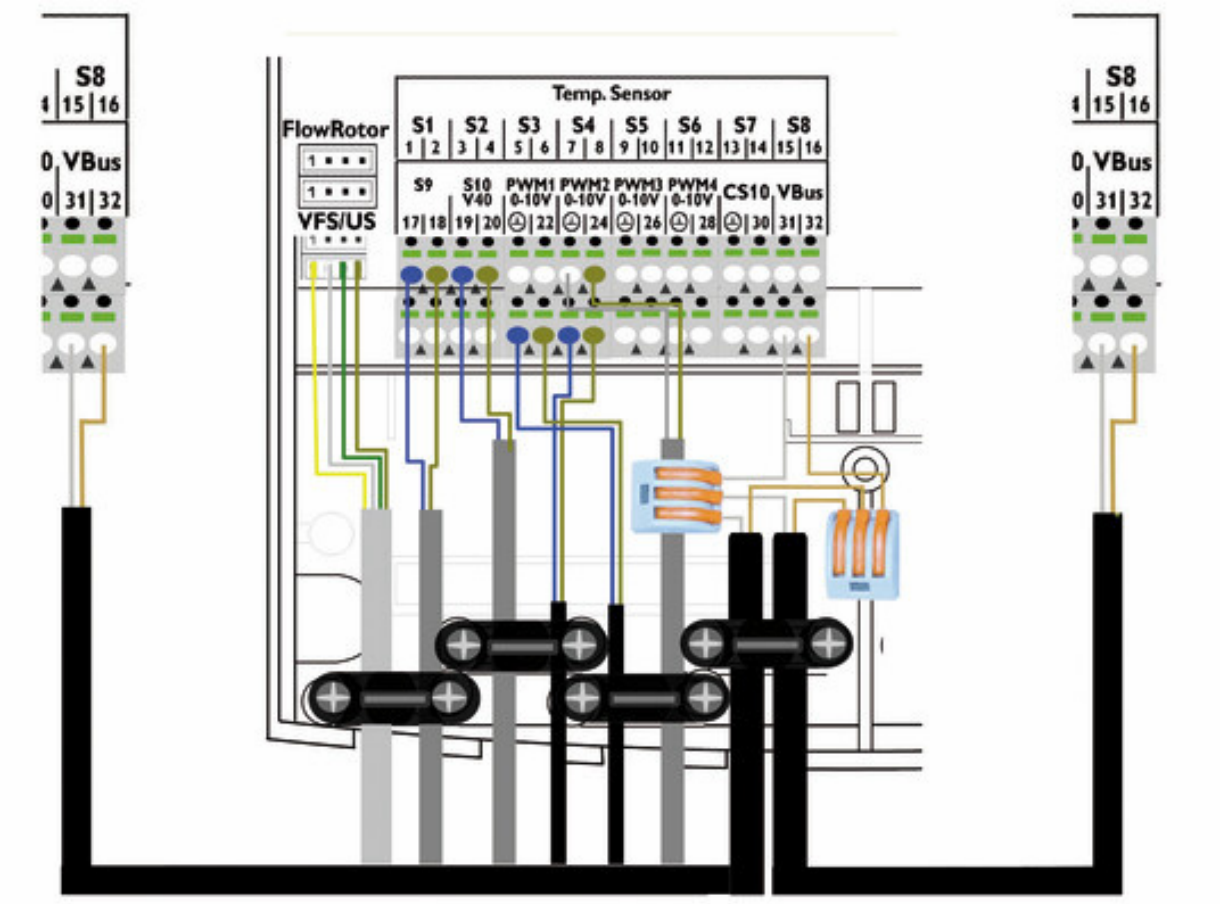
   White: VBus+

4. Mount the strain reliefs.
5. Close the front panel of the controller.
6. Set up the power supply of the installation and put the controllers into operation according to the controller instructions.

When installing a three- or four-fold cascade, two VBus lines are brought together at at least one module. To connect the VBus lines of the two adjacent modules to the centre module, it is necessary to duplicate the VBus terminals in the controller.

The WAGO terminals included in the accessory bag can be used for this purpose. Put **VBus+** and **VBus-** respectively, by means of the lines included, on a WAGO terminal and connect both VBus lines.

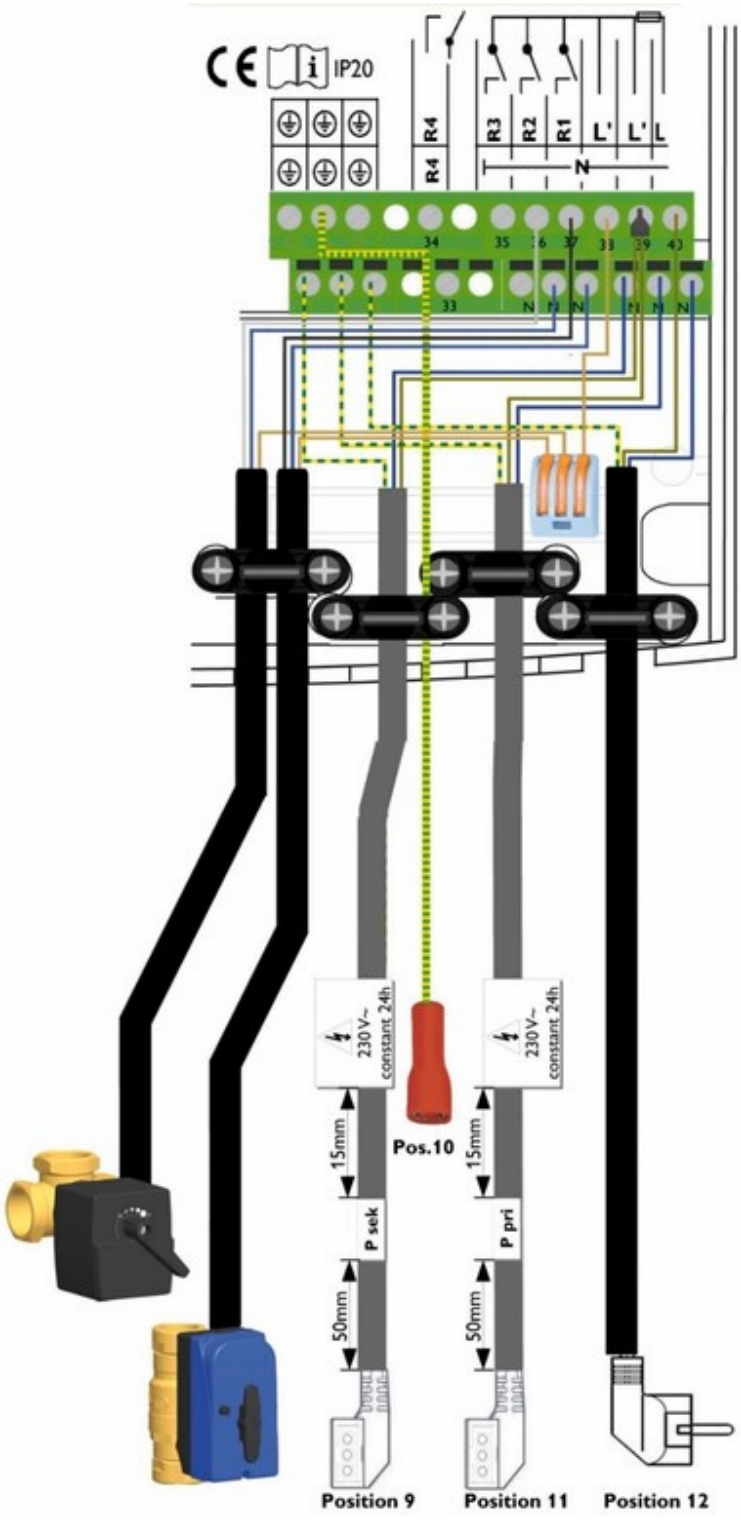
Observe the polarity!



Operation of the controller FC4.13

A detailed description of the commissioning of the controller can be found in the controller instructions.

If not only the switch valve, but also the 3-way valve for stratification is supposed to be connected, double L‘ by means of a WAGO terminal (see example).



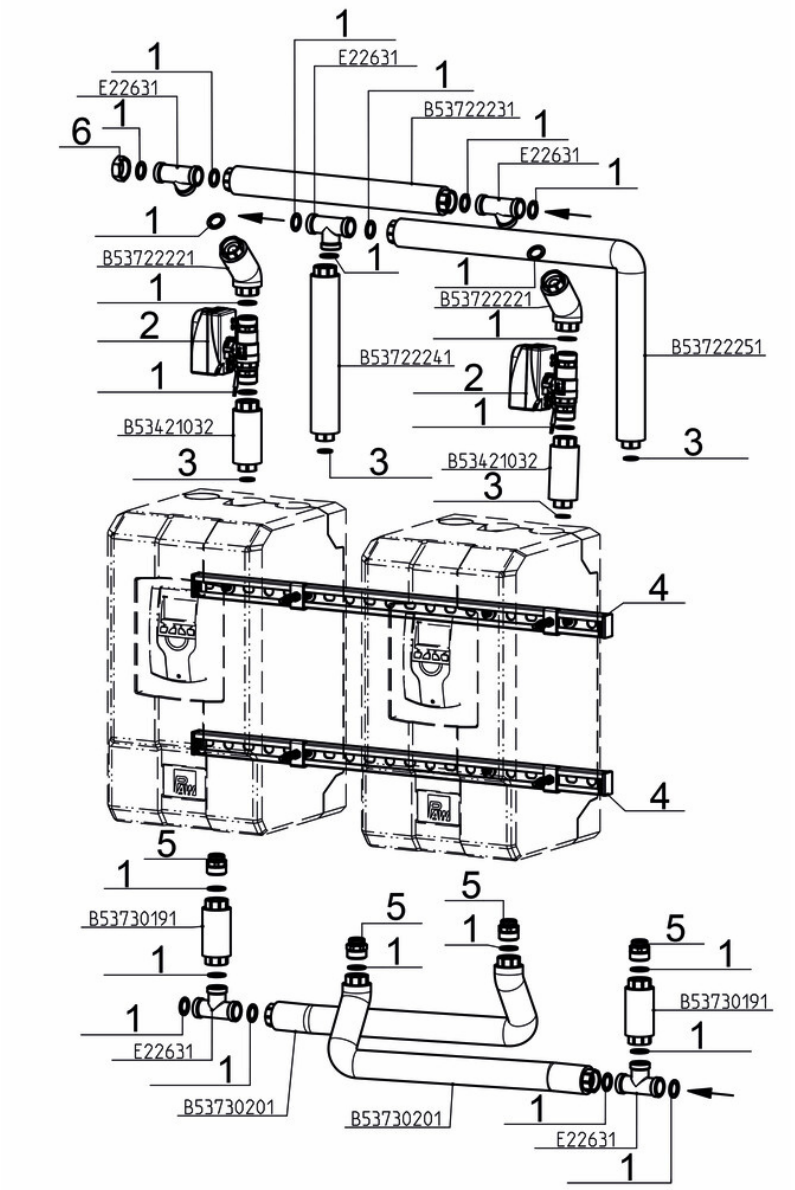
6 Scope of delivery [specialist]

NOTICE

Serial number

Complaints and requests/orders of spare parts will only be processed with information on the serial number!

The serial number is placed on the support sheet of the station.

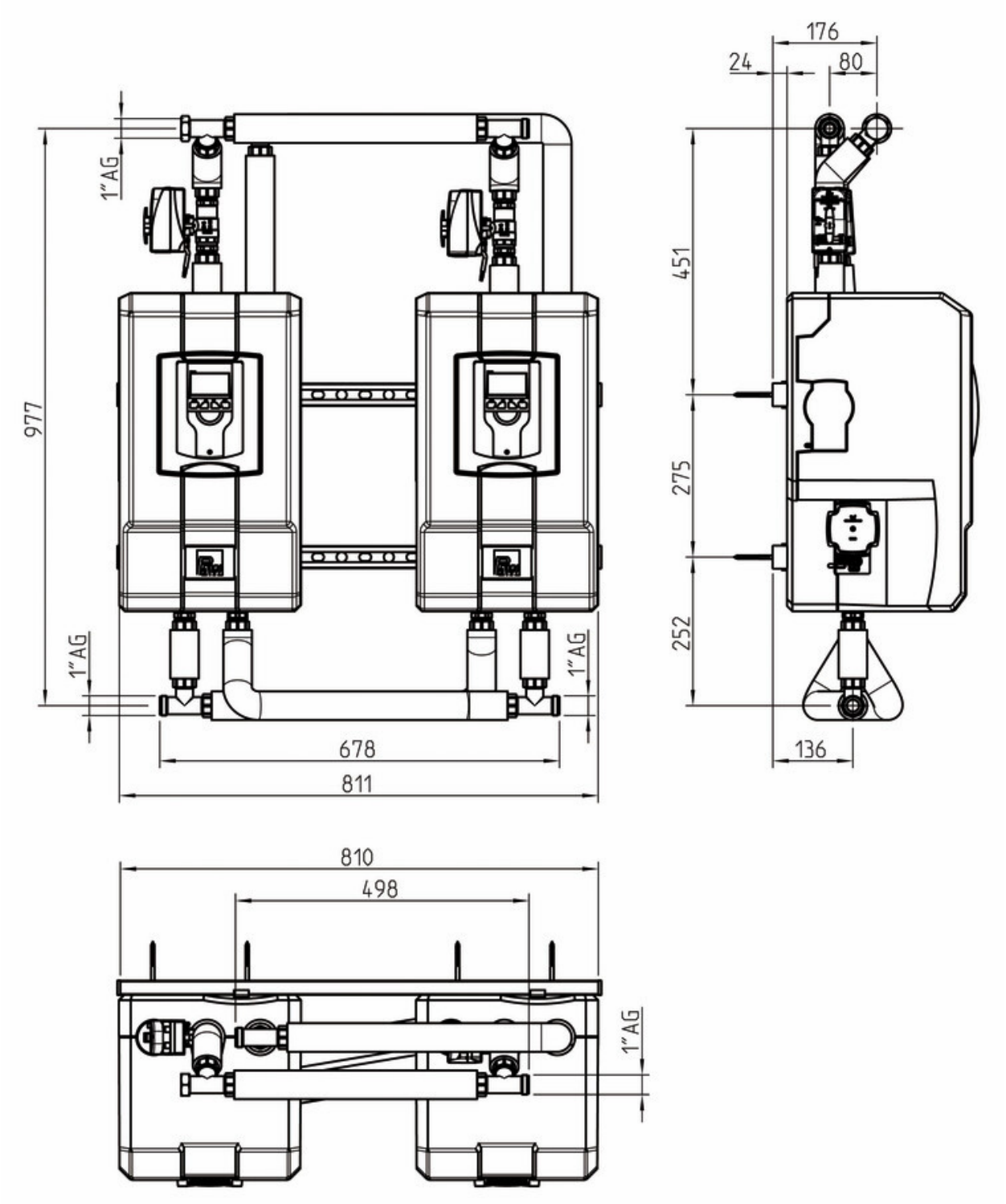


Position	Spare part	Item no.
1	Seal 30.0 x 21.0 x 2.0, ½", for thread connection 1", AFM, 10 pieces	N00024
2	2-way zone valve DN 20, drinking water, 2 x ¾" int. thread, Kvs value: 45, with actuator 230 V / 50 Hz - 12s/90°	563541
3	Seal 24.0 x 17.0 x 2.0, ¼", for thread connection ¾", AFM, 10 pieces	N00030
4	Wall mounting rail set, profile 28x24, galvanised, 1.15 m	N00435
5	Reducing nipple, 1" ext. thread flat-seal. x ¾" ext. thread self-seal.	548340
6	Brass cap 1"	N00453

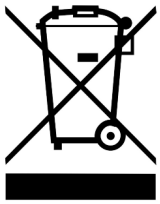
7 Technical data

	Pipe set for FriwaMini cascade
Dimensions	
Height (centre pipe connection)	977 mm
Width (pipe set primary circuit)	678 mm
Width (pipe set secondary circuit)	498 mm
Width (with domestic hot water modules)	811 mm
Depth (centre pipe connection)	176 mm
Pipe connections	
Primary circuit (storage tank circuit)	1" ext. thread
Secondary circuit (DHW circuit)	1" ext. thread
Operating data	
Degree of protection	IP22 (standard IEC 529)
Nominal voltage	230 V AC
Nominal pressure	PN 10
Max. temperature of medium	110 °C
Setting time of the valve	12 sec. / 90°
Materials	
Valves and fittings, valve housing	Brass
Seals: o-rings	EPDM
Retaining spring	Stainless steel
Insulation	EPP
Cover of actuator	Self-extinguishing ABS

Dimensional drawing



8 Disposal

NOTICE	
	Electrical and electronic devices must not be disposed of in the household waste. For your return, there are free collection points for electrical appliances and, if necessary, additional points of acceptance for the reuse of the devices in your area. The addresses can be obtained from your city or communal administration. If the old electrical or electronic device contains personal data, you are responsible for deleting it before returning the device. Batteries and rechargeable batteries must be removed prior to the disposal of the product. Depending on the product equipment (partly with optional accessories), single components can also contain batteries and rechargeable batteries. Please observe the disposal symbols on the components.

Disposal of transport and packaging materials

The packaging materials are made of recyclable materials and can be disposed of with recyclable materials.

9 Commissioning report

System operator		
Location of installation		
Serial numbers		
Valve R1		
Valve R2		
Valve R3		
Valve R4		
Functioning during manual operation mode		
Valve R1	☐	OK
Valve R2	☐	OK
Valve R3	☐	OK (optional)
Valve R4	☐	OK (optional)
Pipeline	Diameter = mm	Length = m
Equipment	☐ with circulation line	☐ without circulation line
Have all the pipes of the primary and secondary circuit been checked for tightness?		☐ checked
Are all cables properly connected?		☐ checked
Are the controllers set to cascade operation mode?		☐ checked
Installation company		Date, signature

Item no. 996404293x-mub-en
Translation of the original instructions

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