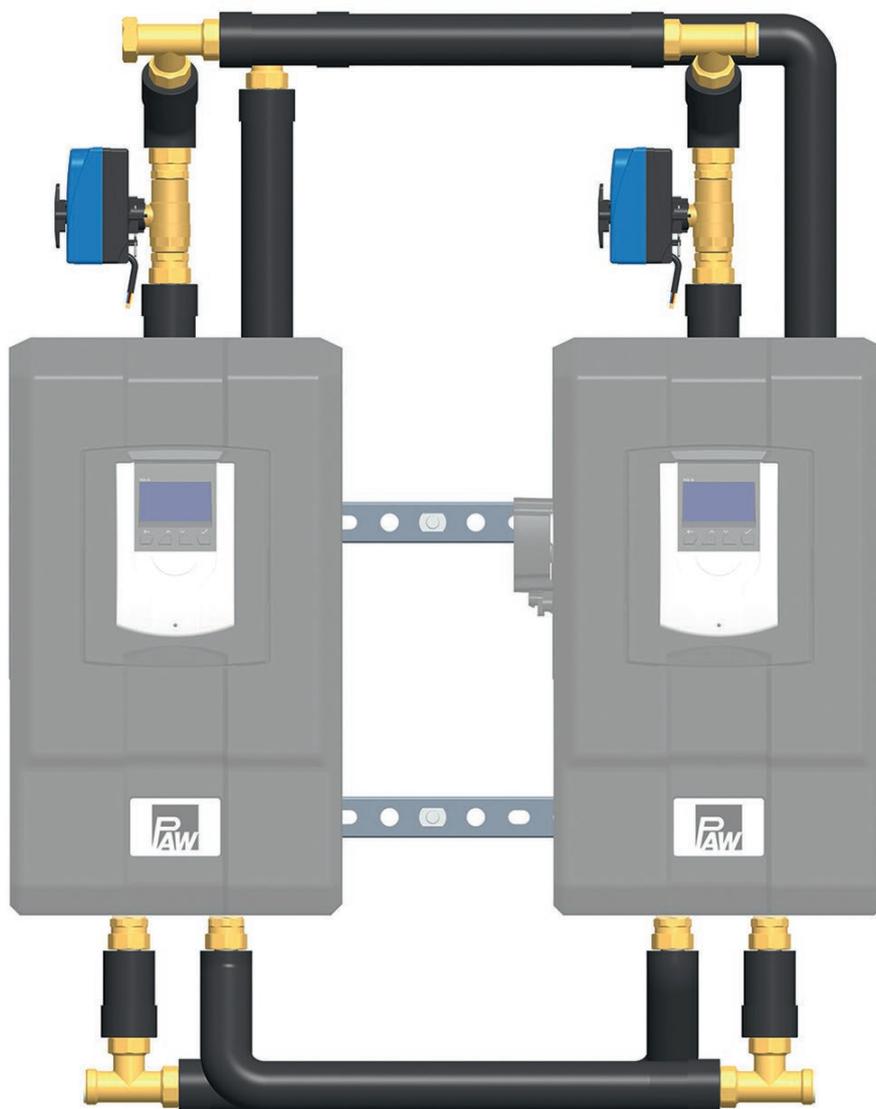




Assembly Instructions

Pipe set for

FriwaMini-Kaskade



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Translation of the original instructions

We reserve the right to make technical changes without notice!

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PAW GmbH & Co. KG

Böcklerstraße 11

31789 Hameln, Germany



Carefully read these instructions before installation and commissioning.
Save these instructions in the vicinity of the installation for future reference.

1 General Information

1.1 Scope of these instructions

These instructions describe the assembly and installation of the pipe set for the FriwaMini-Kaskade. The chapters called [specialist] are intended for specialists only. For other components of the installation, such as the domestic hot water module, the storage tanks, controllers and the pumps, please observe the instructions of the corresponding 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 data specified in these instructions must be observed.

Only use PAW accessories with the pipe set.

Improper usage excludes any liability claims.

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

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 this manual

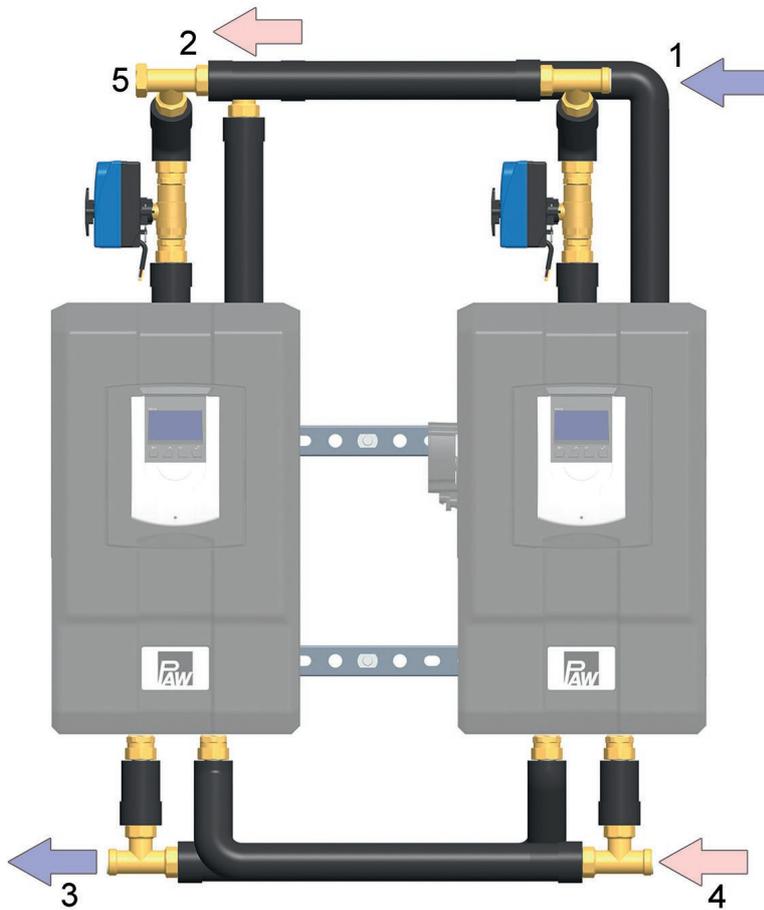
NOTICE

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 avoid that EPDM gets in 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:
Cold water supply
- 2 Secondary side:
Hot water outlet
- 3 Primary side:
Return to the buffer tank
- 4 Primary side:
Flow from the buffer tank
- 5 Connection circulation

4 Dimensioning and planning

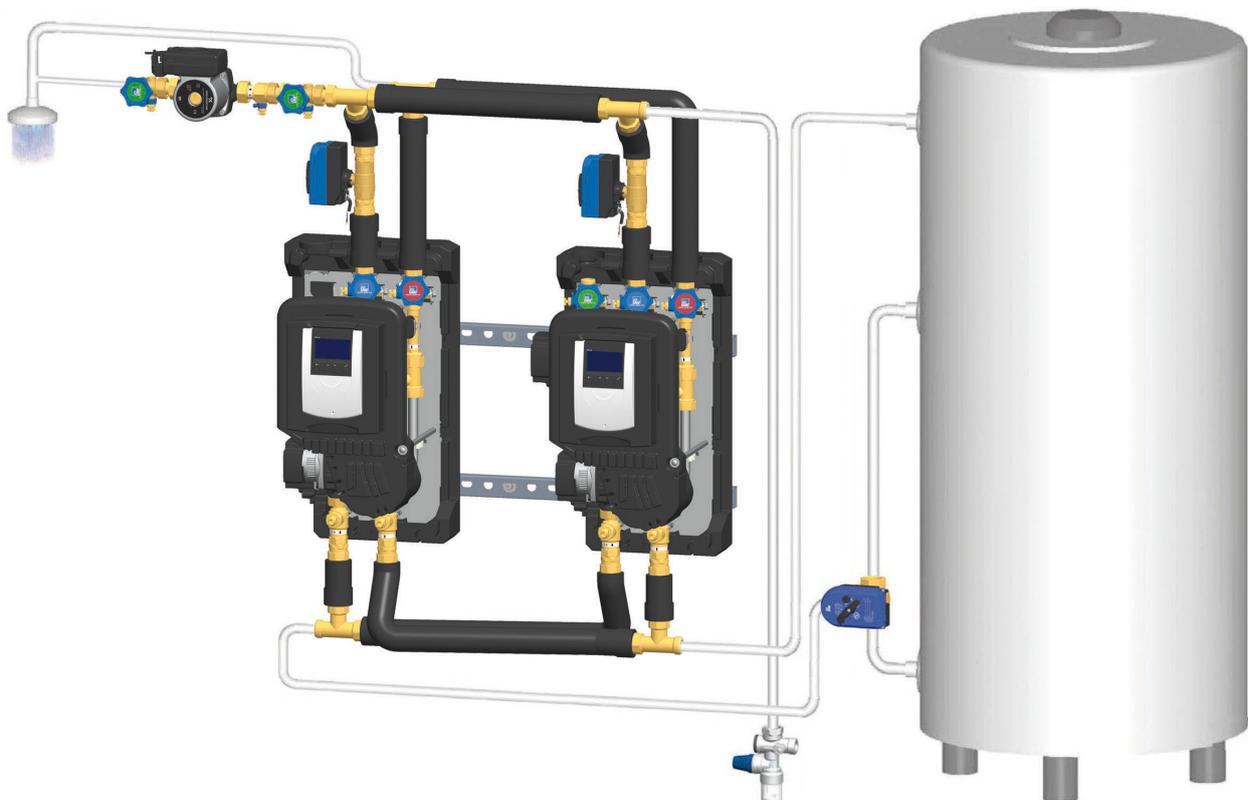
The FriwaMini is a domestic hot water module using the principle of a flow-type water heater.

The FriwaMini will only work flawlessly if the installation meets certain requirements.

Please take some time to plan the installation.

	 WARNING
<p>Danger of scalding due to hot water!</p> <p>Undesirable circulation of the water in the primary circuit can cause the exit of hot water of up to 90 °C at the withdrawal point.</p> <ul style="list-style-type: none"> ➤ 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. 	

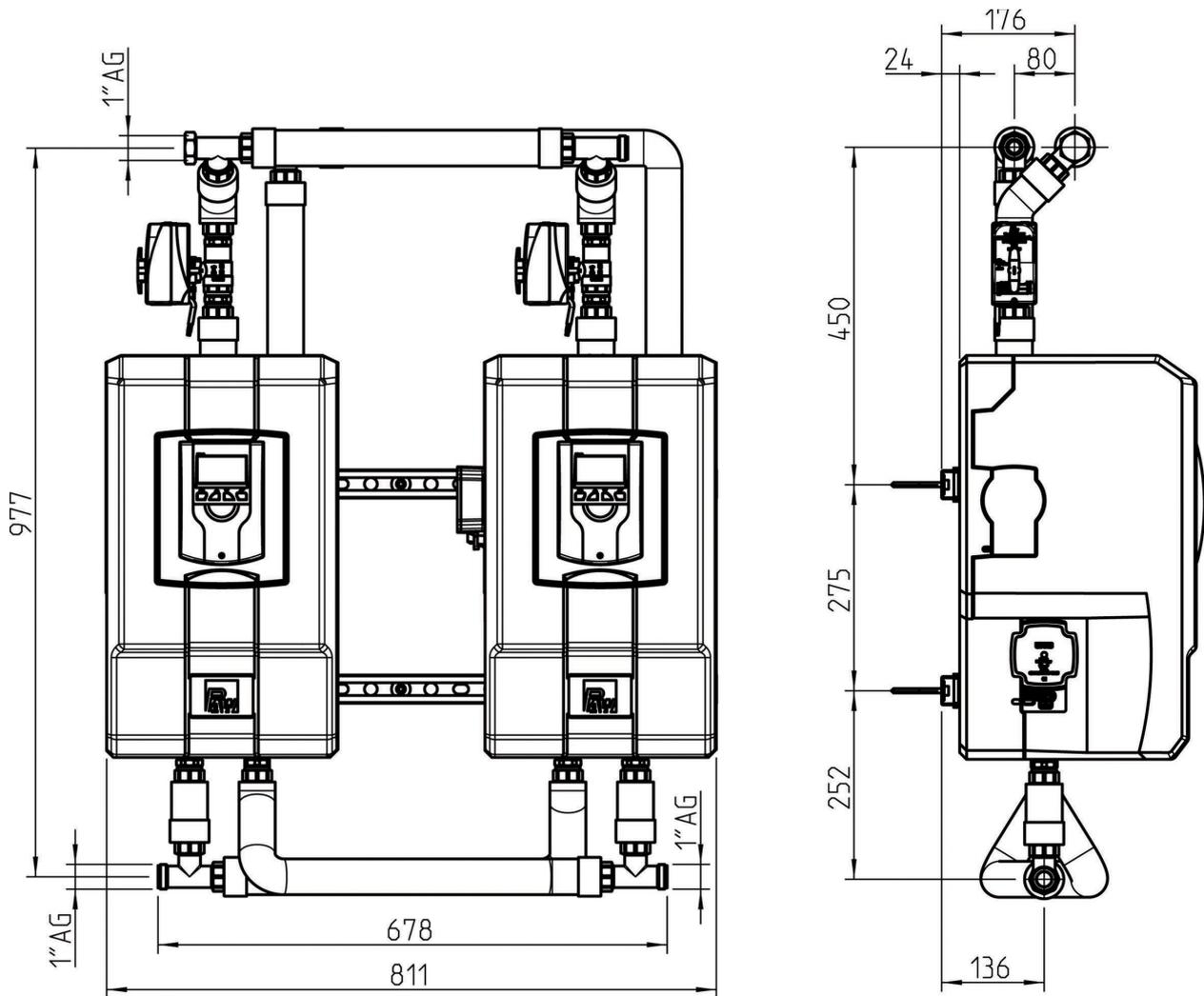
Mounting example



FriwaMini-Kaskade with 2 x FriwaMini, with pipe set and optional circulation set (additionally required, item no. 6404136GH7) and return distribution set (additionally required, item no. 640425)

5 Assembly and installation [specialist]

5.1 Dimensions pipe set



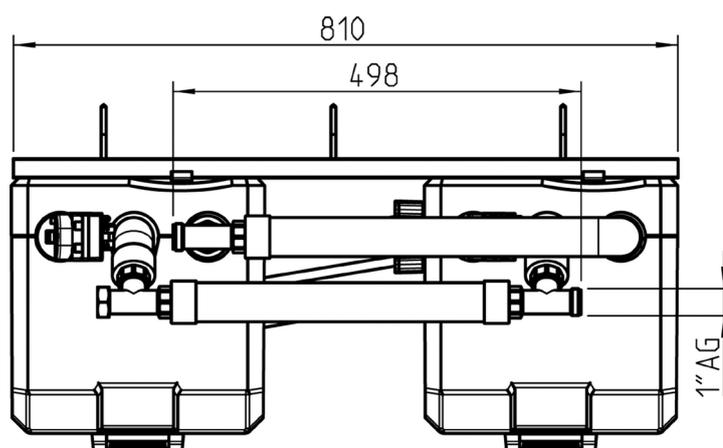
	WARNING
	<p>Risk to life and limb due to electric shock!</p> <ul style="list-style-type: none"> ➤ Prior to commencing electrical work on the controller, pull the mains plug! ➤ Only after completing all installation work, plug the mains plug of the controller into a socket. This avoids an unintentional start of the motors.

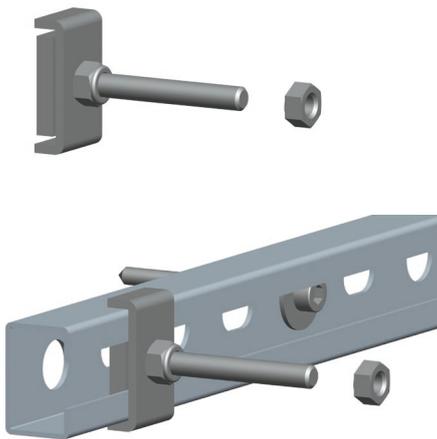
NOTICE

Damage to property!

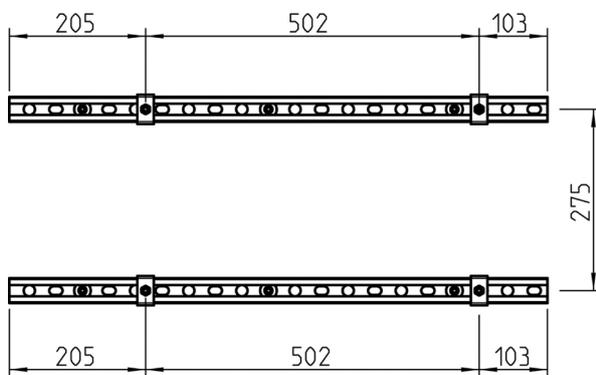
The location of installation must be dry, load-carrying, frost-proof and protected against ultraviolet radiation to prevent material damage to the installation.

1. Determine the mounting location of the cascade near the buffer tank.
2. Mount the upper rail with 4 screws to the wall (recommended height 1.80 m).
The cardboard template of the Friwa shows the position of the drilling holes and the distance between the upper and the lower rail.
3. Fix the lower rail with 2 screws at the wall.
4. Remove the Friwa 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.

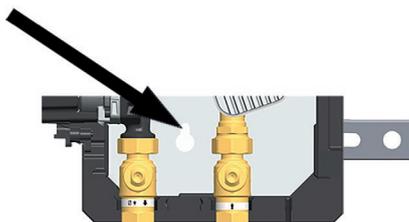


7. Adjust the T-head screws.



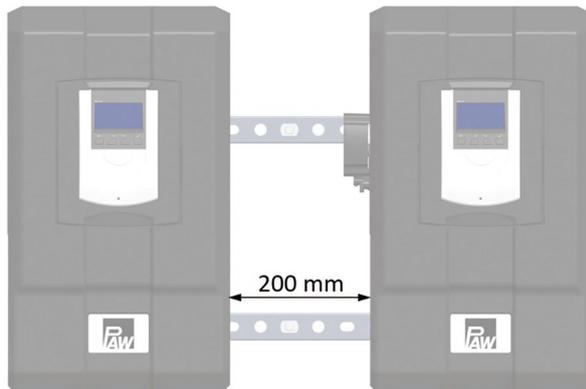
8. Hang the first station onto the screw and make sure that it protrudes beyond the holes in the support sheet.

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. Let the screw protrude beyond it and tighten it with a washer and a nut.

10. Screw all screws manually.



11. In the same way, mount the second Friwa to the wall. Please note the **distance of 200 mm** between the stations.

12. Screw the screws of the second Friwa manually, because it still has to be adjusted during the connection of the pipe set.

13. While the screws are screwed manually the position of the stations onto the rails can be changed. For this, the screws have to be relieved by an easy lifting of the stations.

14. Mount the pipe set as follows.

5.2 Installation and commissioning pipe set with 2-way electro valves

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 (can be found at the top of the support sheet in the module).

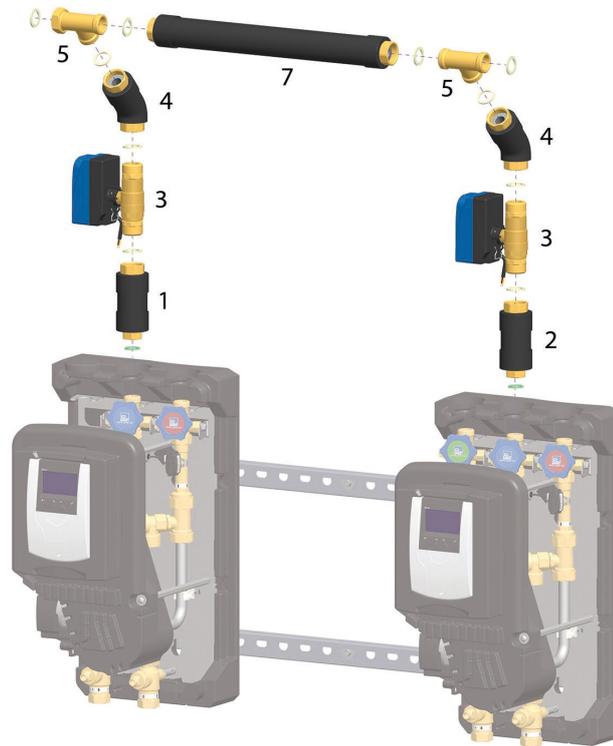
NOTICE

Damage to property!

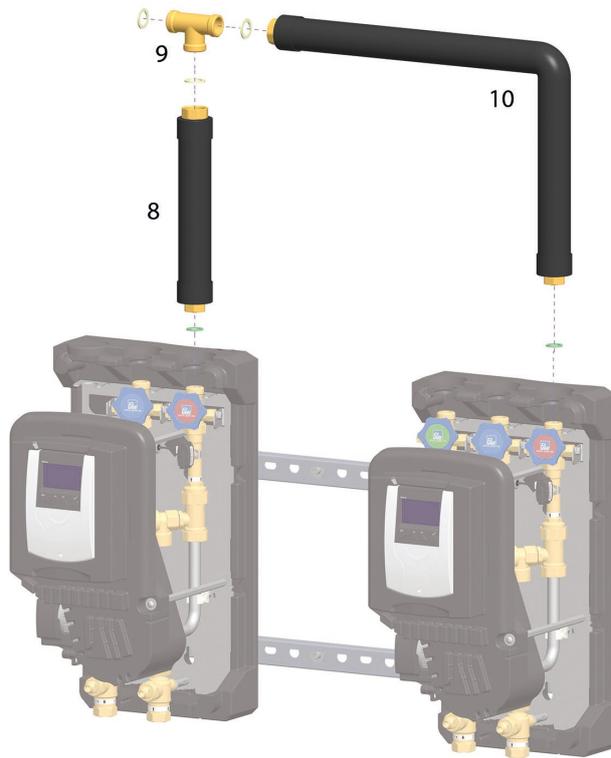
The location of installation must be dry, load-carrying, frost-proof and protected against ultraviolet radiation to prevent material damage to the installation.

NOTICE

Use the new delivered gaskets! Screw the thread connections manually and adjust the pipes in order to guarantee a low-stress installation.



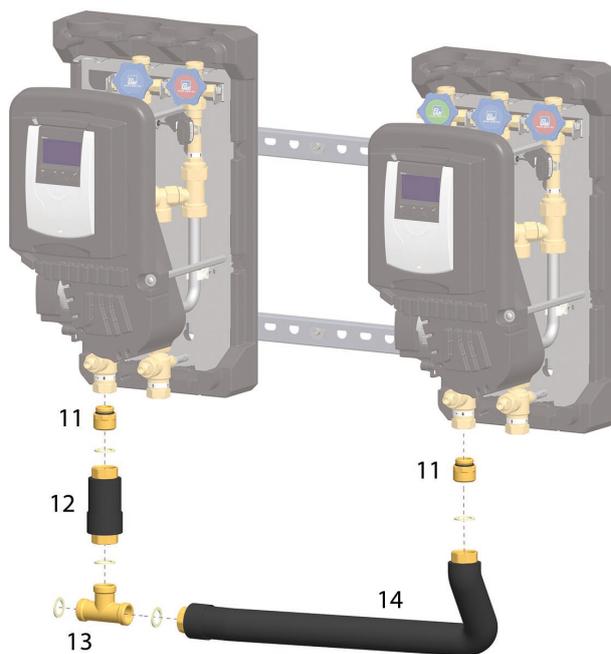
1. Screw a short, straight pipe onto the flow connection of the left domestic hot water module.
2. Screw the second short, straight pipe onto the return connection of the right domestic hot water module.
3. Screw a switch valve to each short pipe.
The actuator has to be aligned at the side and the cable 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 right or from the left.
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 module by using the cap.
7. Screw the long, straight pipe section between the T-pieces.
Notice: For the connection of the pipes you may have to move the stations on the rails slightly.



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 module by the long, single bent pipe.

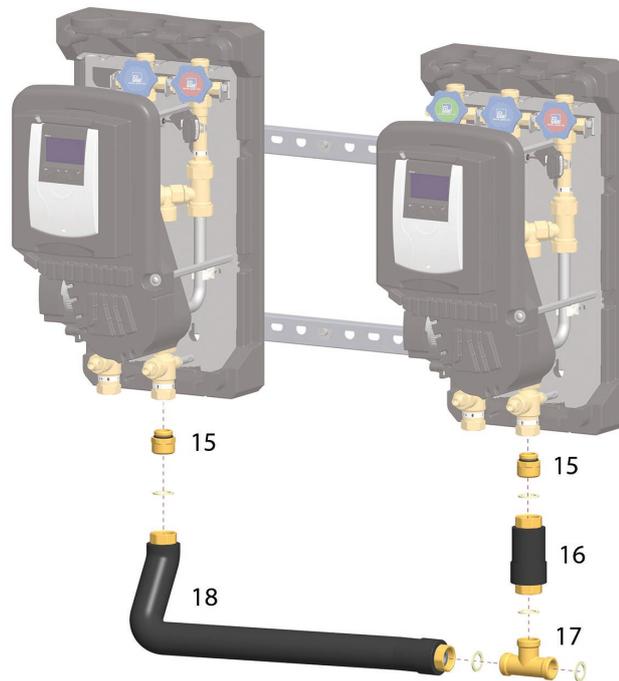


11. Screw a reducing nipple to the storage tank return of both modules.

12. Screw the straight, medium length pipe to the storage tank return of 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.

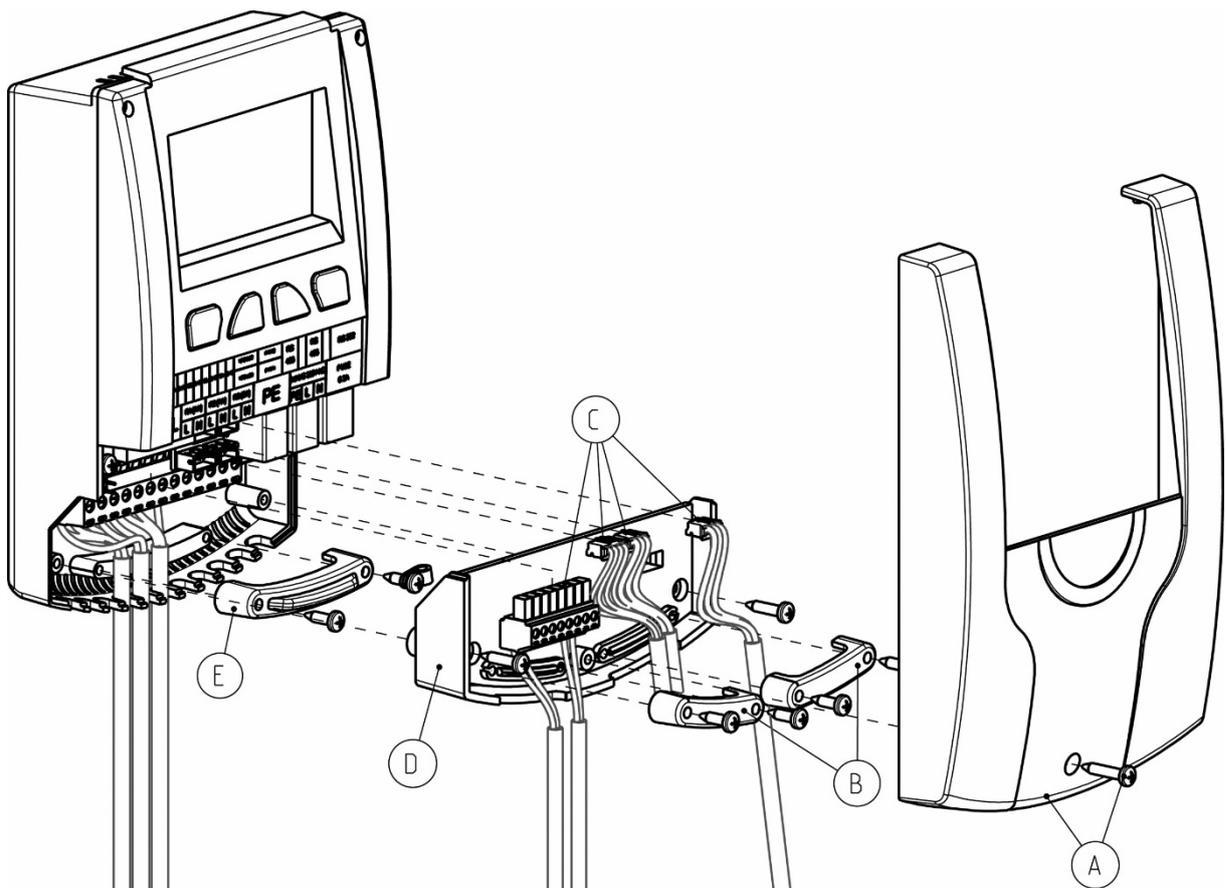


15. Screw a reducing nipple to the storage tank flow of both modules.
16. Screw a straight, medium length pipe at the nipple adaptor at the storage tank flow of the right module.
17. Screw a T-piece to it.
18. Connect the T-piece and the nipple adaptor at the storage tank flow by the long single bent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

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
	<p>Risk to life and limb due to electric shock!</p> <ul style="list-style-type: none">➤ Prior to commencing electrical work on the controller, pull the mains plug and make sure that a restart is not possible.➤ Only after completing all installation work, plug the mains plug of the controller into a socket. This avoids an unintentional start of the motors.

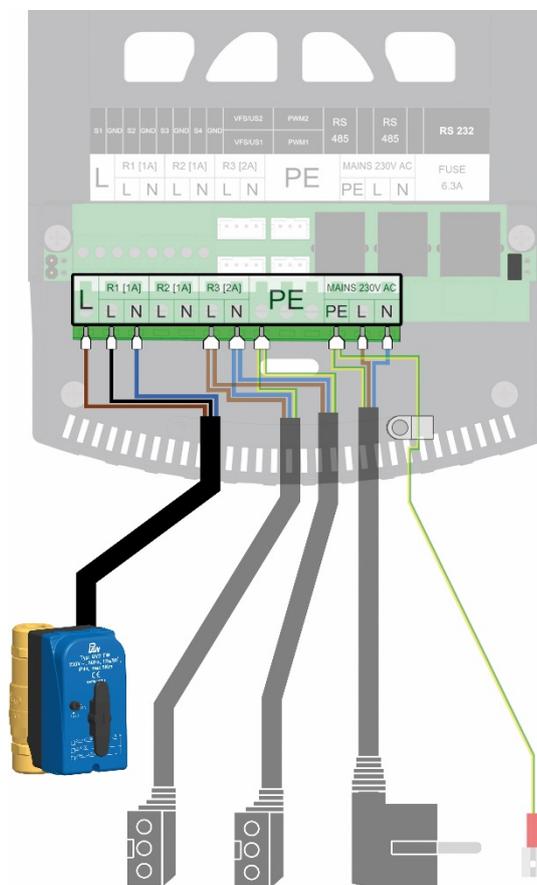


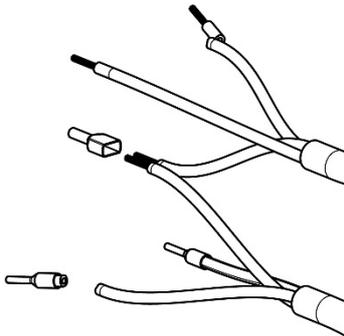
1. Remove the white front panel (A) of the controller.
2. Remove the strain reliefs (B).
3. Remove the sensor cables of the VFS/US sensors, of the PWM signal and of the temperature sensors from the controller circuit board plug connector (C).
4. Unscrew the two screws to remove the intermediate level (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 connection:

Brown: L_{const}

Black: L

Blue: N





7. If, in addition to the 2-way-zone valve, also the 3-way valve for the stratification is meant 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:

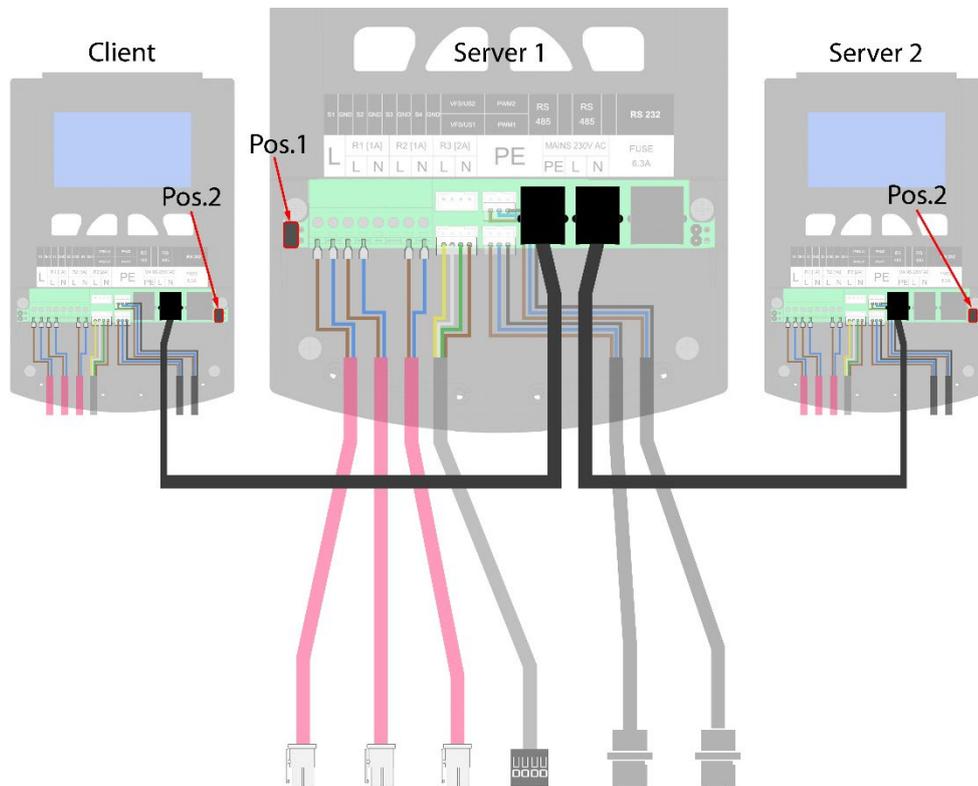
client, server 1, server 2, server 3.

Observe the controller instructions.

You will find a detailed description of the operation of the controller and its functions in the controller instructions.

Cascade connection of the domestic hot water modules

The following illustration shows how you must connect the three domestic hot water modules 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.

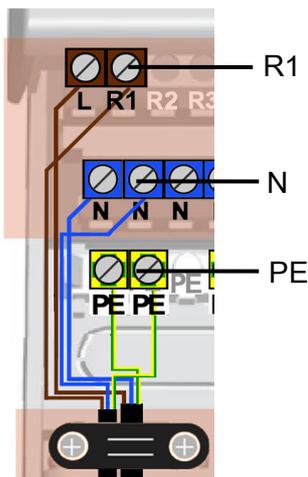
Number of cascade module	Client	Server 1	Server 2	Server 3
2	Pos. 2	Pos. 2	-	-
3	Pos. 2	Pos. 1	Pos. 2	-
4	Pos. 2	Pos. 1	Pos. 1	Pos. 2

5.4 Controller connection FC4.13

The following figures show how to connect the 2-way zone valves with the controller and how to connect the controllers with each other.

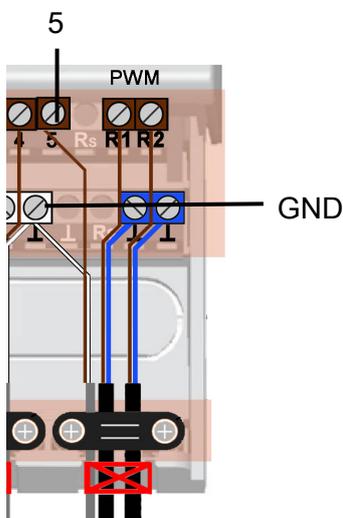
	WARNING
	<p>Risk to life and limb due to electric shock!</p> <ul style="list-style-type: none"> ➤ Prior to commencing electrical work on the controller, pull the mains plug and make sure that a restart is not possible. ➤ Only after completing all installation work, plug the mains plug of the controller into a socket. This avoids an unintentional start of the motors.

1. Open the front panel of the controller.

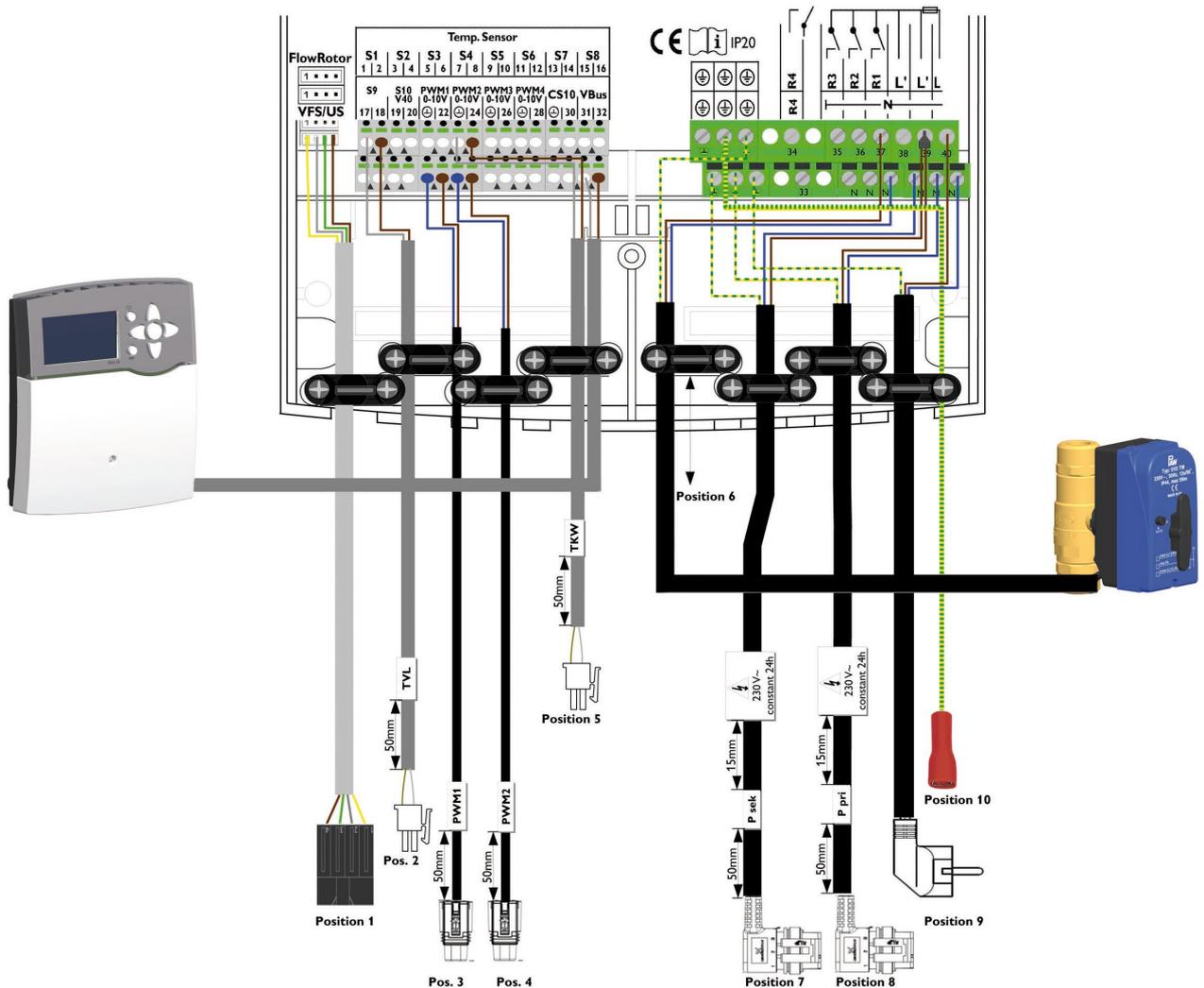


2. Connect the 2-way zone valve to the corresponding controller. Observe the polarity of the connection:

Brown: R1
 Blue: N
 Green-yellow: PE



3. Connect the connecting cable to both controllers. Observe the polarity of the connection:
 - Brown: 5
 - White: GND (±)
4. Mount the strain reliefs.
5. Provide power supply to the installation and start the controller according to the controller instructions.

Wiring plan:

Operation of the controller

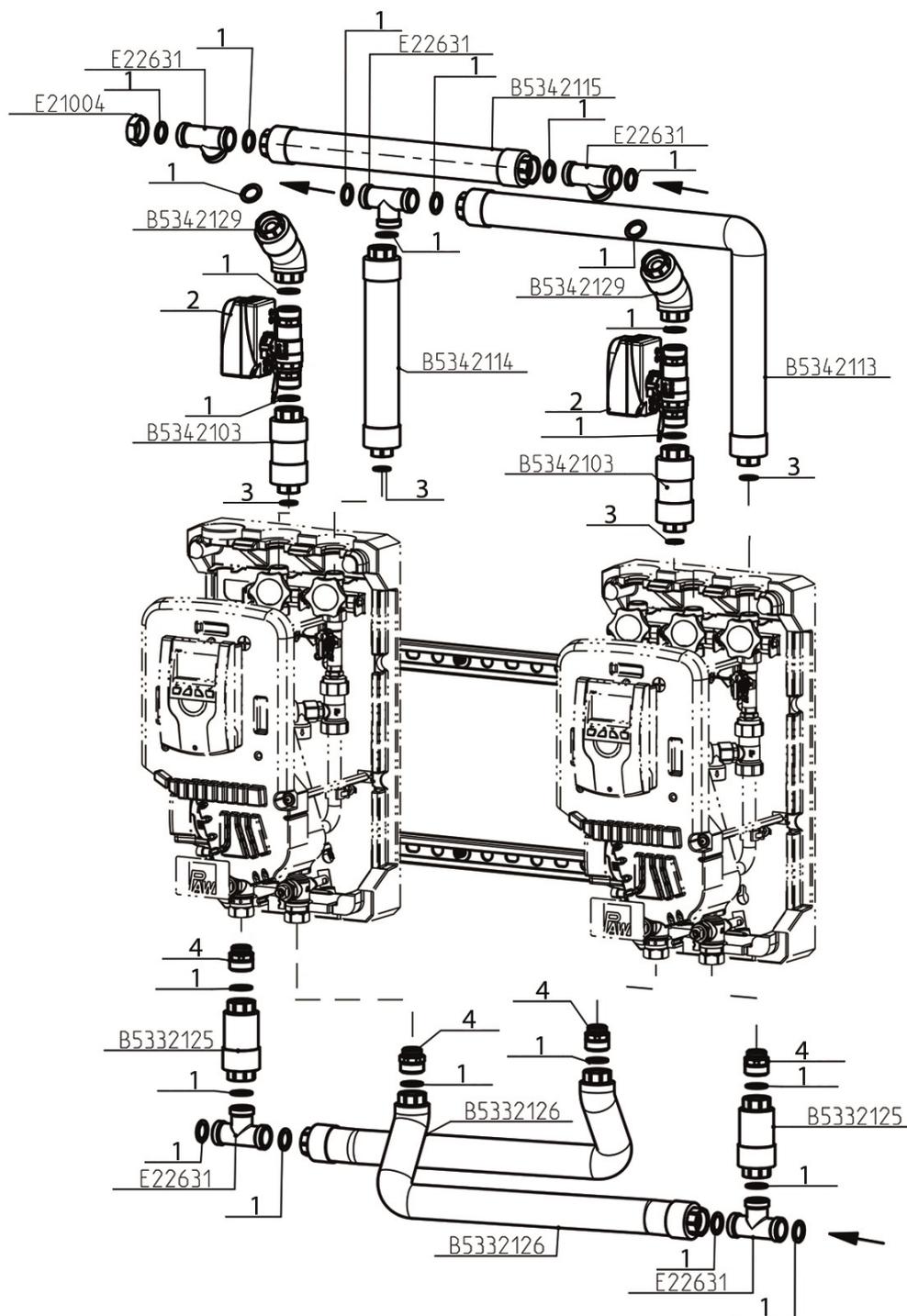
You can find a detailed description for the operation of the controller and its functions in the controller instructions.

1. In both controllers activate the cascade operation mode F:09 (on).
2. In the function F:09 set one controller as master (MA) and the other controller as slave (SL).
3. The PWM cable of the circulation pump (optional) and the switch valve of the return distribution set (optional) must be connected to the master controller, if required.
4. Commission the station according to the instructions.

6 Scope of delivery

NOTICE

Complaints and requests/orders of spare parts will only be processed with information on the serial number! The serial number is placed in the upper right corner of the support sheet in the station.



Position	Spare part	Item no
1	Sealing kit, 10 pieces, ½", for thread connection 1"	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	Sealing kit, 10 pieces, ¼", for thread connection ¾"	N00030
4	Reducing nipple, 1" ext. thread flat-sealing x ¾" ext. thread self-sealing	548340

7 Technical data 2-way zone valve

Operating data	
Degree of protection	IP22 (standard IEC 529)
Nominal voltage	230 V AC
Nominal pressure	PN 10
Max. temperature of medium	110 °C
Aperture time	10 sec.
Closing time	4 sec.
Material	
Valves and fittings, valve housing	Brass
Retaining spring	Stainless steel
Cover of servomotor	Self-extinguishing ABS
Gaskets	O-ring: EPDM

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.



9 Commissioning report

Installation operator _____

Location of installation _____

Serial numbers _____

Valve R1: _____

Valve R2: _____

Valve R3: _____

Valve R4: _____

Function during manual
operation

Valve R1: OK

Valve R2: OK

Valve R3: OK (optional)

Valve R4: OK (optional)

Pipes

∅ = _____ mm l = _____ m

Equipment

with circulation line without circulation line

Are all pipes in the primary and secondary circuit checked for leaks? Checked

Are all cables properly connected? Checked

Are the controllers set for cascade operation mode? Checked

Plumbing company

Date, Signature

PAW GmbH & Co. KG
Böcklerstraße 11
31789 Hameln, Germany

www.paw.eu
Phone: +49 (0) 5151 9856 - 0
Fax: +49 (0) 5151 9856 - 98