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English

Installation and Operation Instructions
Pipe set for FriwaMega cascade



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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 FriwaMega cascade. The chapters marked with [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 FriwaMega DN 32 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 FriwaMega. 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

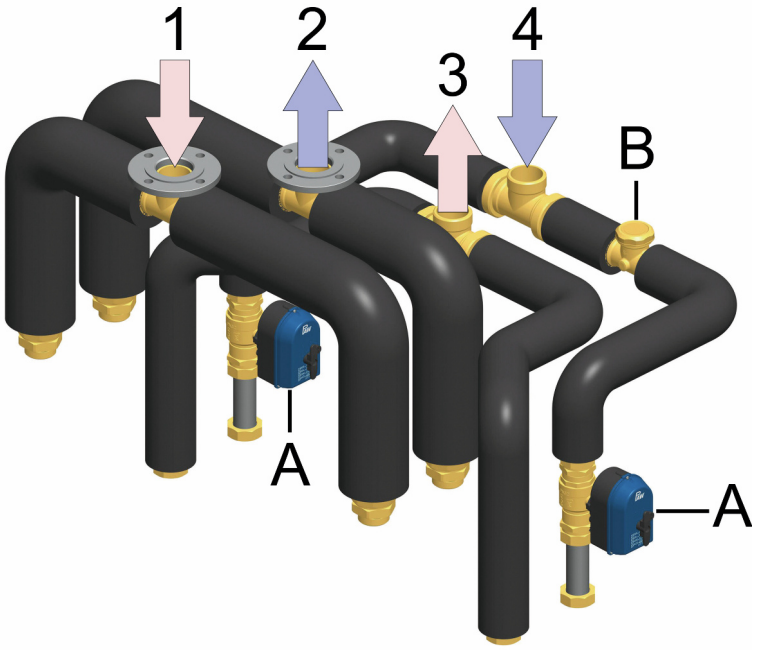
Material damage due to mineral oils!

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 Primary side: Flow from the buffer tank

2 Primary side: Return to the buffer tank

3 Secondary side: Domestic hot water outlet

4 Secondary side: Cold water inlet

Equipment

A 2-way zone valve

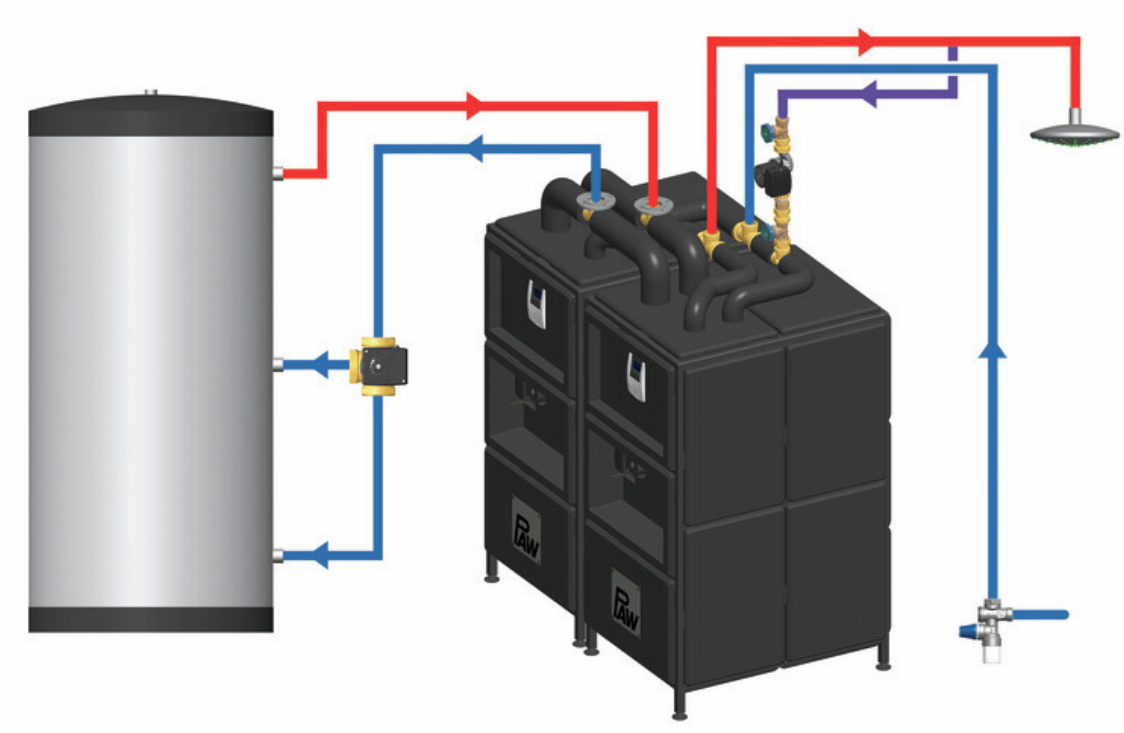
B Connection for circulation, with cap

4 Dimensioning and planning

The FriwaMega 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:



FriwaMega cascade with optional circulation set (additionally required, item no. 6404136GM7, 6404136GH10, 6404136GH12) and optional return distribution set (item no. 6404244).

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



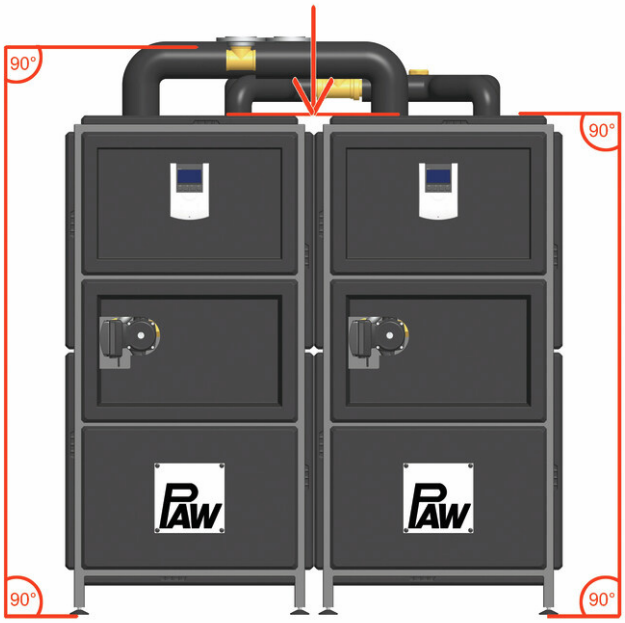
Risk to life and limb due to electric shock!

- ► 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. The mounting surface (floor) must be clean and flat.
2. Position both FriwaMega modules side by side, flush and without distance to each other. The insulation between the frames remains mounted!

NOTICE

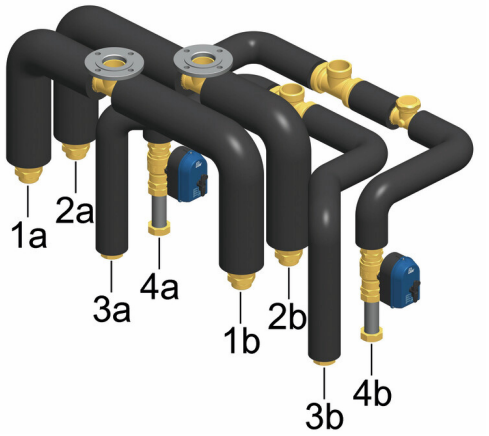
Position the domestic hot water modules in a way that the upper side of each module is in parallel to the floor. The connection pipes must be laid from the module vertically to the floor.



5.2 Mounting sequence and connections of the pipe set

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.



1a, 1b Primary side:

Flow from the buffer tank,

Connection 2" ext. thread or flange DN 50,

additionally required piping at least DN 50,

54 x 2 mm, recommended 64 x 2 mm

2a, 2b Primary side:

Return to the buffer tank,

Connection 2" ext. thread or flange DN 50,

additionally required piping at least DN 50,

54 x 2 mm, recommended 64 x 2 mm

3a, 3b Secondary side:

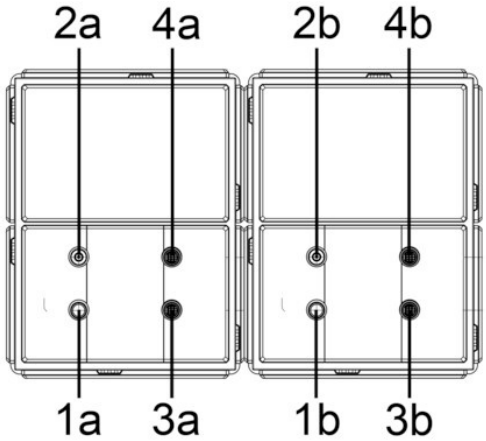
Hot water outlet,

Connection: 2" ext. thread, flat sealing

4a, 4b Secondary side:

Cold water inlet,

Connection: 2" ext. thread, flat sealing



1. Remove the upper insulation at the connections of the domestic hot water modules.
2. Mount the pipe set in the following order:

   - Cold water inlet (4a and 4b)
   - Hot water outlet (3a and 3b)
   - Return to the buffer tank (2a and 2b)
   - Flow from the buffer tank (1a and 1b)

   Note: When mounting the pipe set, the following distances must be observed:

   2a to **4a**: 278 mm

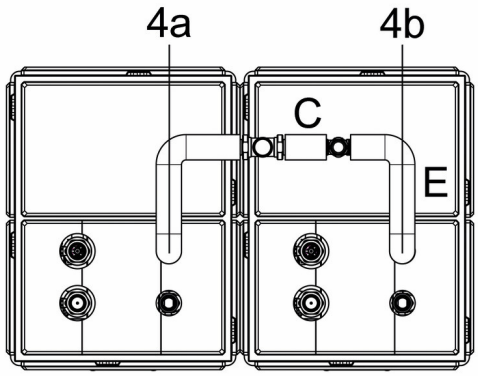
   4a to **2b**: 433 mm

   2b to **4b**: 278 mm

5.3 Mounting the pipe set at the secondary side

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

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).

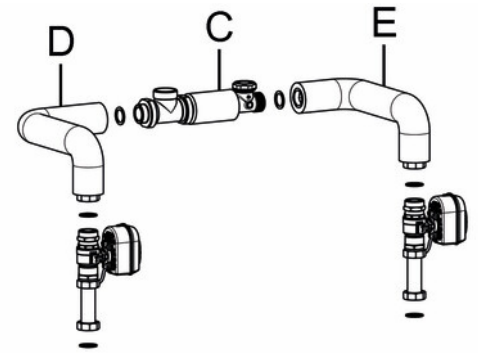


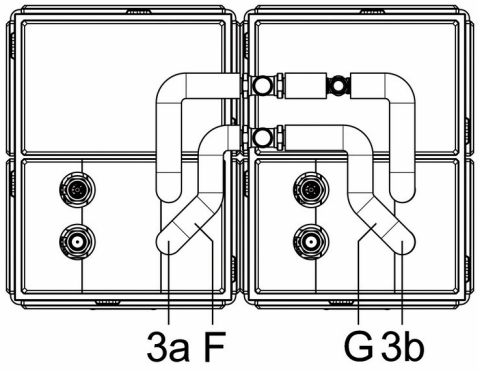
Cold water inlet with 2-way zone valves to 1½" external thread:

1. Mount the pipe sections with the 2-way zone valves on the cold water connections (4a and 4b) in the domestic hot water modules.
2. Mount the pipes (D) and (E) and the connection pipe. Adjust the pipes and screw them manually. Use the 1½" seals for this purpose.

Please note: The connections for the circulation line and the cold water flow can be interchanged.

The circulation connection is closed with a cap.





Hot water outlet to 1½" external thread:

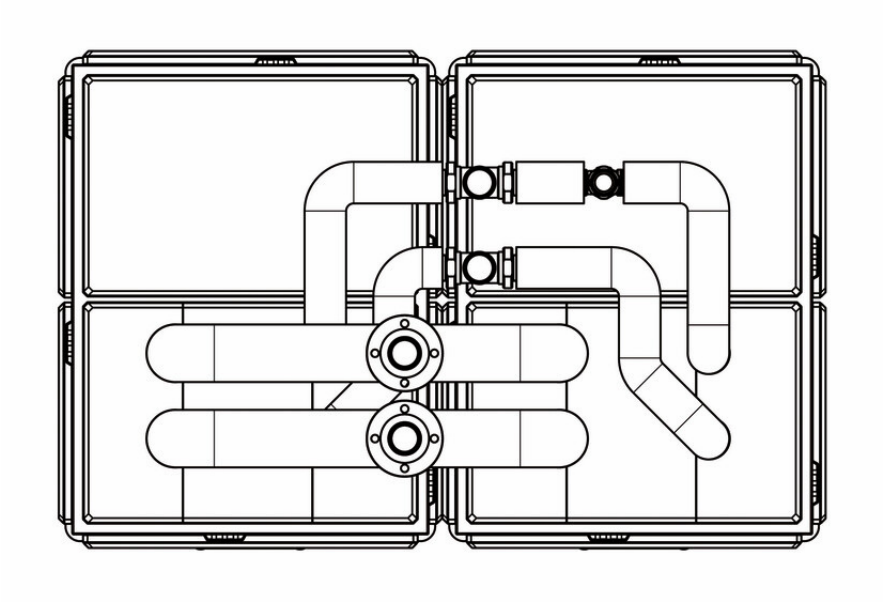
1. Connect the connection pipes (F) and (G) with the T-piece. Use the 1½" seals for this purpose.
2. Put the entire pipe on the hot water connections (3a and 3b) of the domestic hot water modules. Adjust the pipe and screw it manually. Use the 1½" seals for this purpose.

After adjusting the pipes and stations, firmly tighten the screw connections.

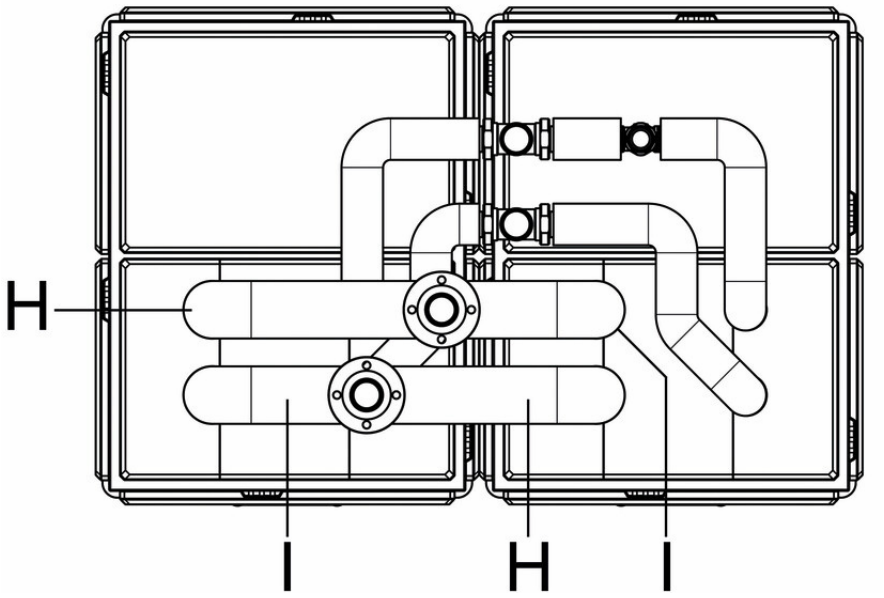
5.4 Mounting the pipe set at the primary side

The pipelines for the heating-side connection consist respectively of a long (H) and a short (I) pipe. The connections for the continuing piping can thus be mounted

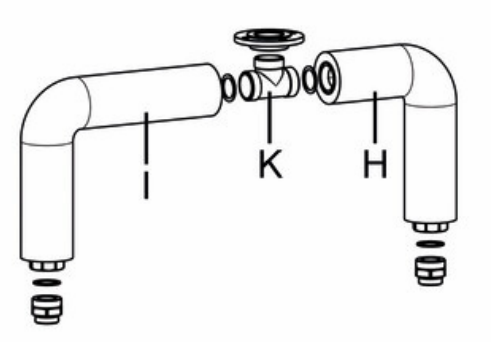
- one behind the other on the right or left:



- in shifted positions (on the left/right or on the right/left):

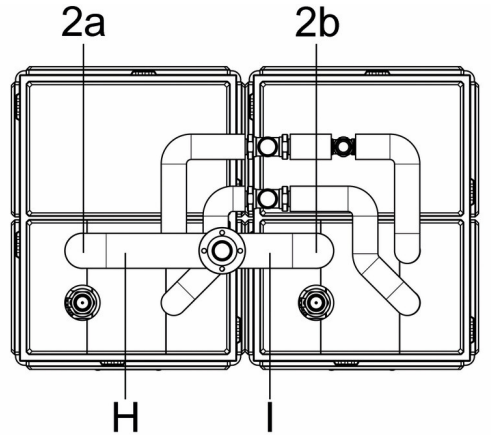


The cascade pipe set can be screwed directly onto the ball valves.



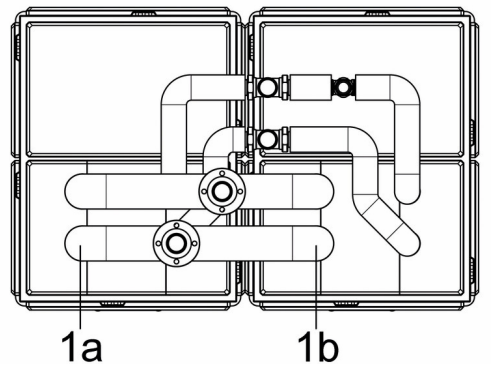
Connection return piping:

1. Connect the T-piece (K) with a short (I) and a long (H) pipe. Use the 2" seals for this purpose.
2. Mount the reducers 1½" x 2" (with o-ring on the 1½" side) in the heating ball valves of the domestic hot water modules.
3. Mount the connection pipe onto the connections (2a and 2b). Use the flat seals for this purpose.
4. Adjust the pipe.
5. Firmly tighten the screw connections.
6. The continuing piping can be connected to 2" external thread or to flange DN 50. For this purpose, an additional seal must be added to the flange DN 50 on site.
7. Mount a vent valve at the highest point in the pipeline on site.



Connection flow piping:

1. Repeat the steps 1. to 7. for the connection of the flow from the buffer tank (connections 1a and 1b).
2. Connect the piping network on site to the pipe set.
3. Fill the installation. Observe the indications in the instructions of the domestic hot water module FriwaMega.
4. Check all connections for tightness.
5. Mount the upper insulation of the domestic hot water modules. Make sure that the pipe insulation is flush with the insulation of the domestic hot water module.



5.5 Connection controller FC3.10

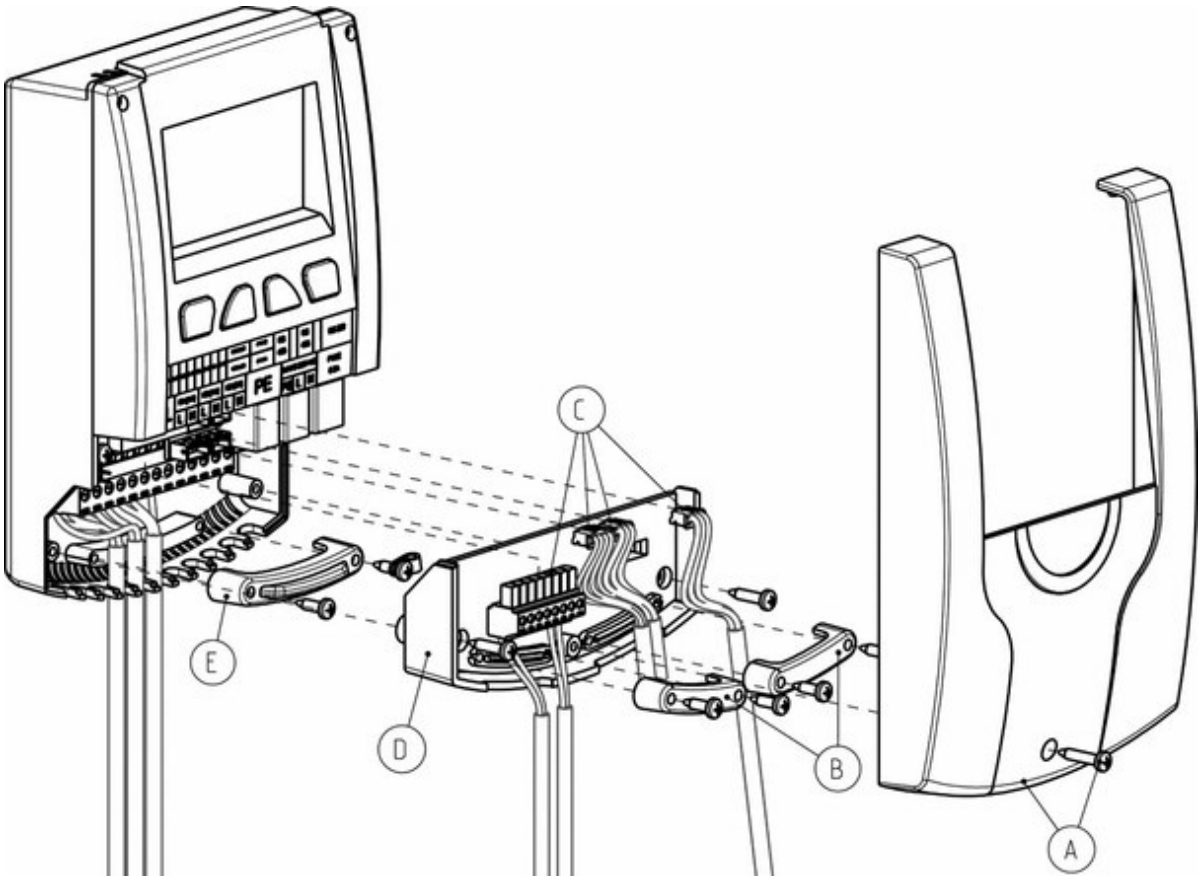
The following illustrations show how to connect the 2-way zone valves (switch valves) electrically to the controller, and how to connect the controllers with each other in order to establish a communication between them.

⚠ WARNING

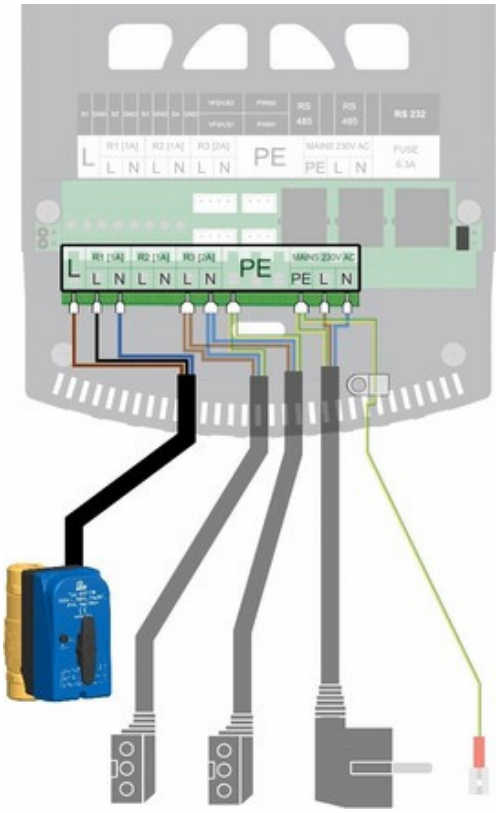


Risk to life and limb due to electric shock!

- ► 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. 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. Unscrew the two screws to remove the intermediate level (D).
5. Remove the strain relief on the 230 V level (E).

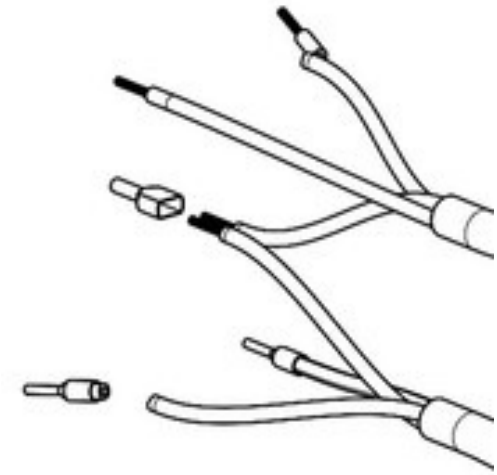


6. Connect the 2-way zone valve to the relay 1. Observe the polarity of the PWM connection:

   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".

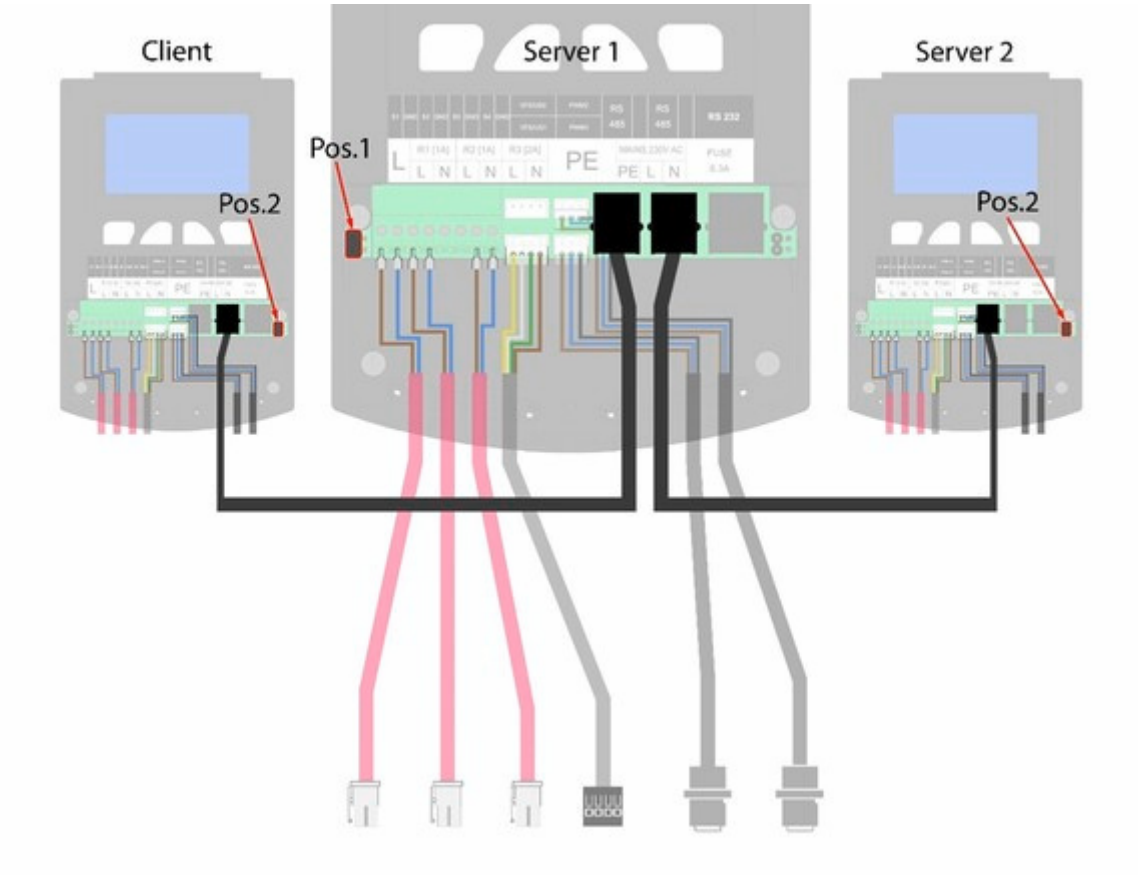
Recommendation: Arrange the controllers from left to right in the following order:

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 "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

5.6 Controller connection FC4.13

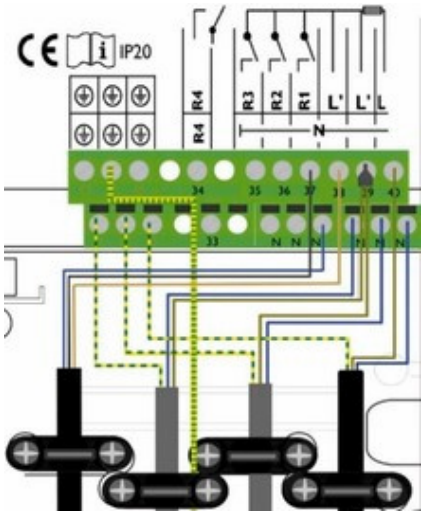
The following illustrations show how to connect the 2-way zone valves (switch valves) electrically to the controller, and how to connect the controllers with each other in order to establish a communication between them.

⚠ 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.

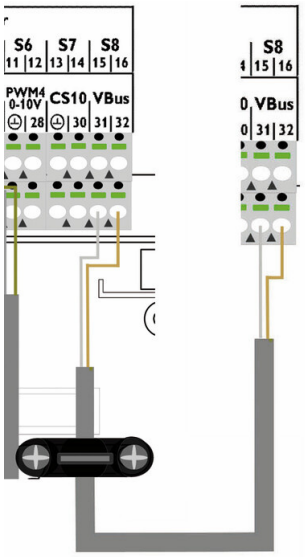


1. Open the front panel of the controller.
2. Connect the 2-way zone valve to the corresponding controller.

   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:

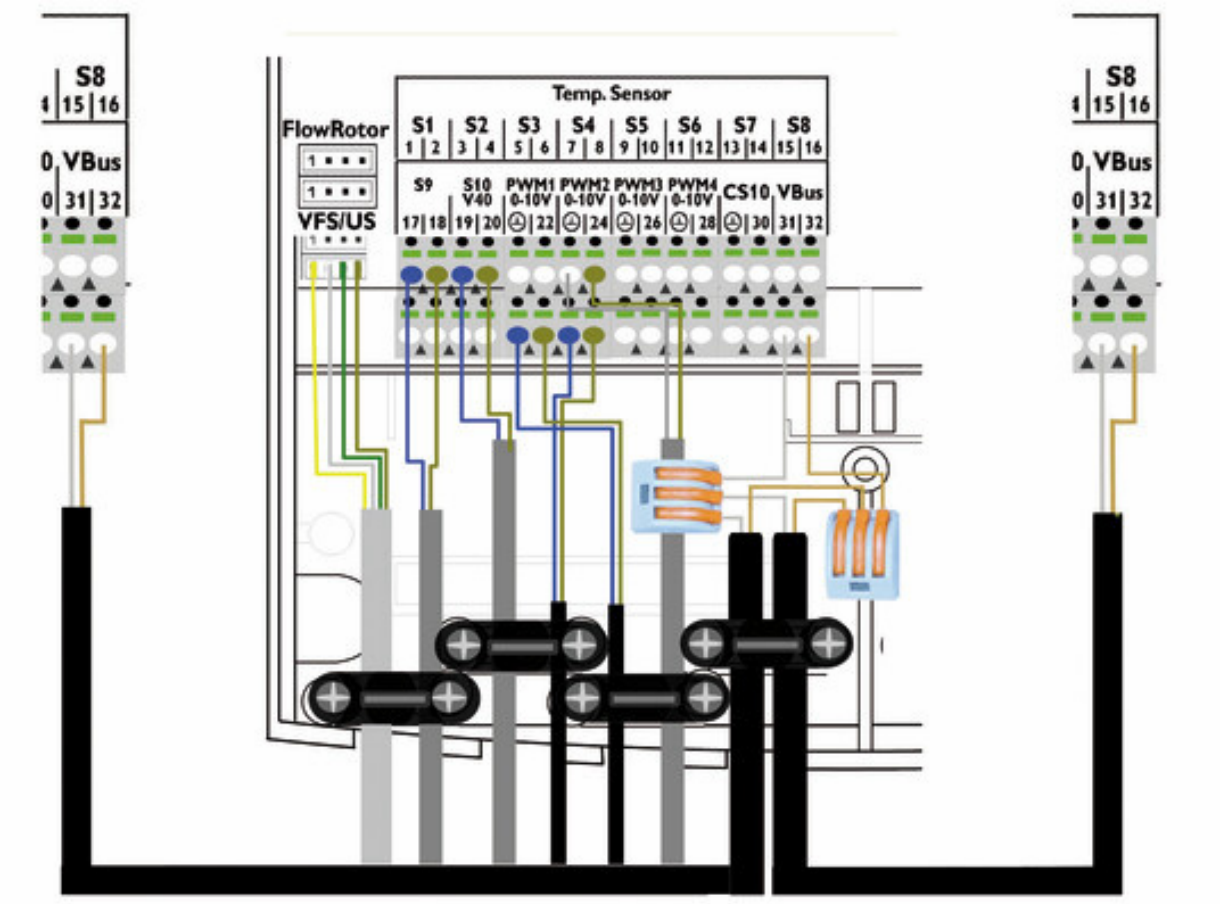
   Brown: VBus-

   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.

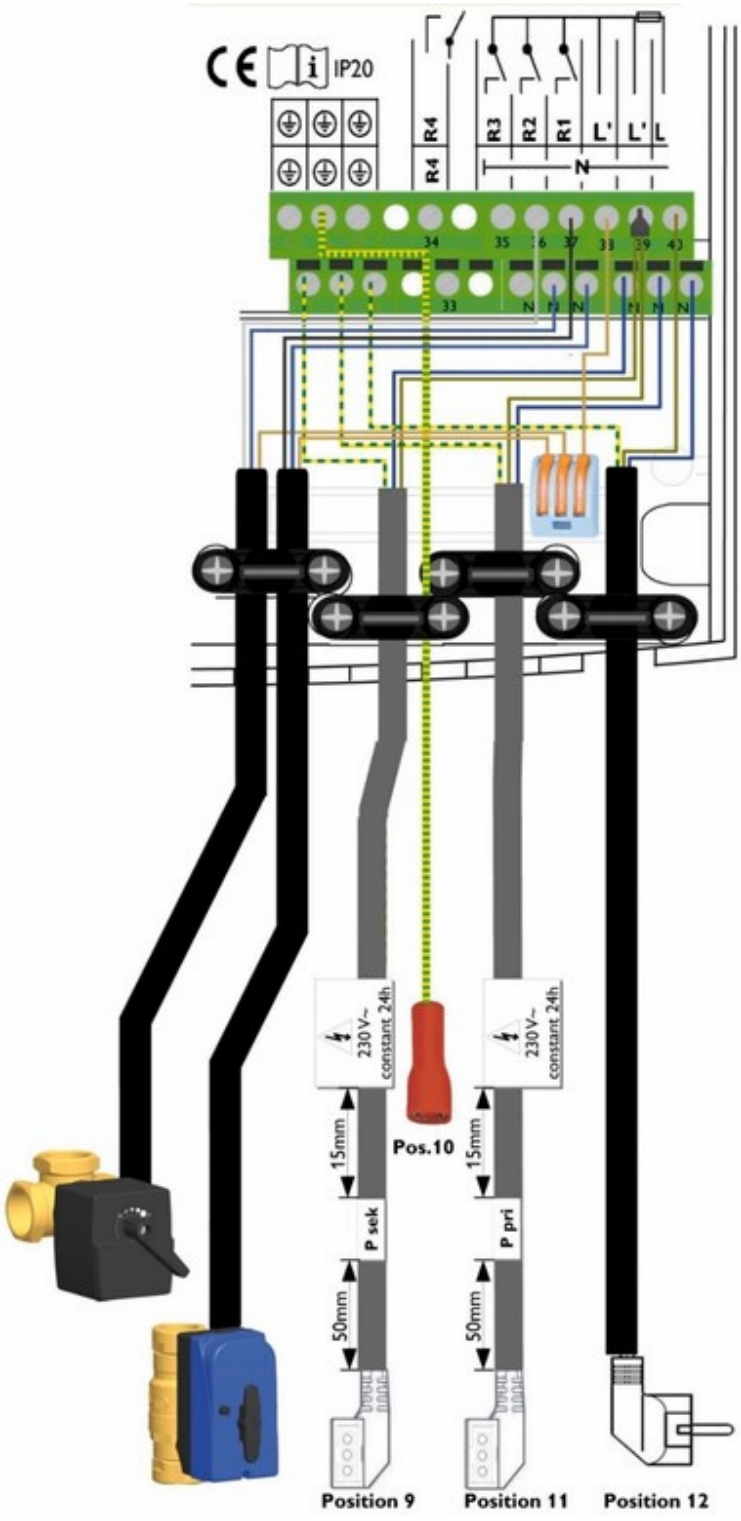
Observe the polarity!



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]

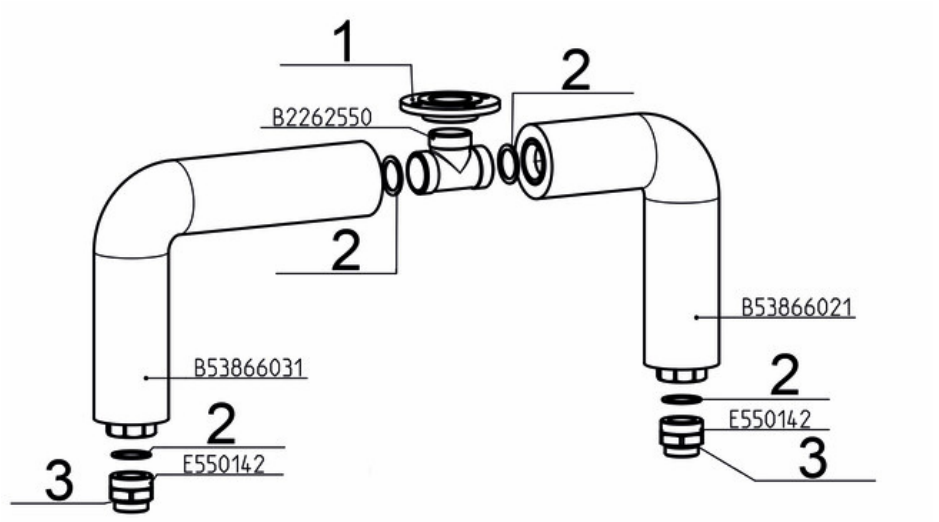
NOTICE

Serial number

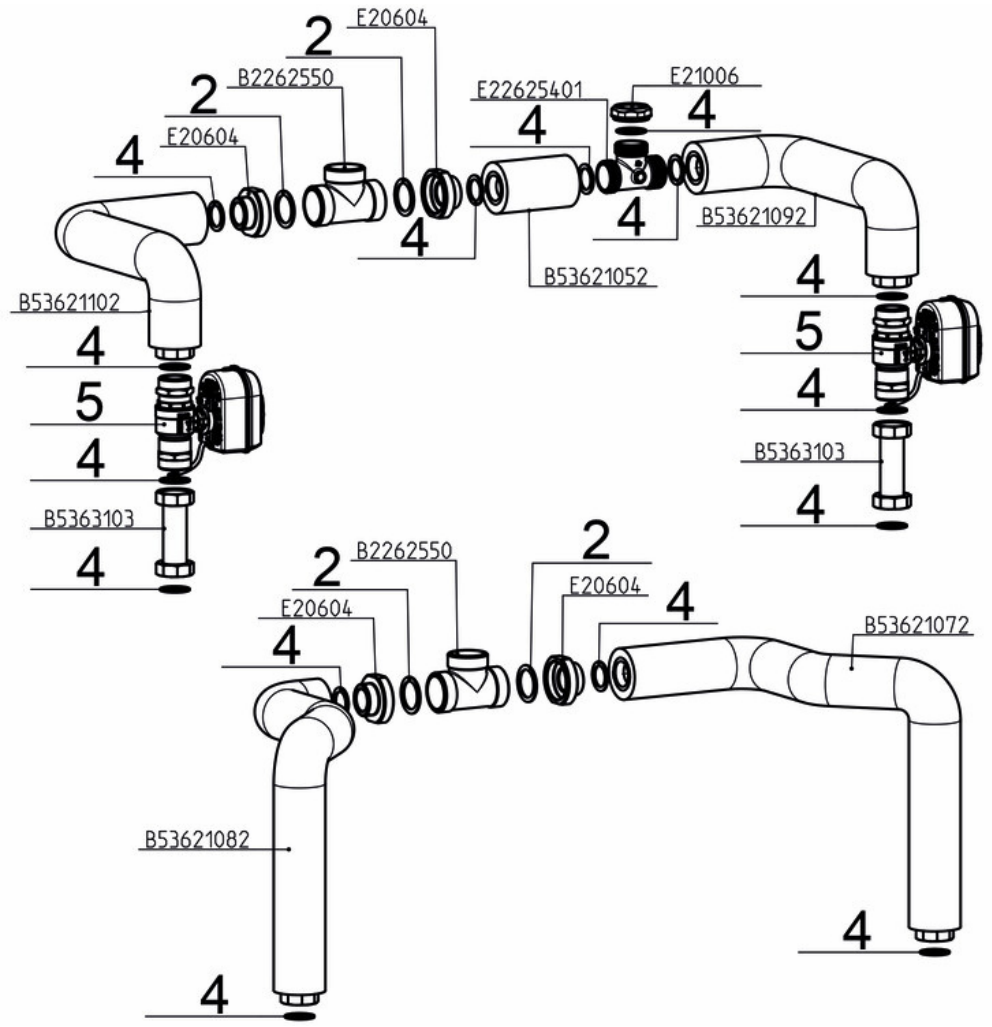
Complaints and requests/orders of spare parts will only be processed with information on the serial number!

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

Primary circuit



Secondary circuit

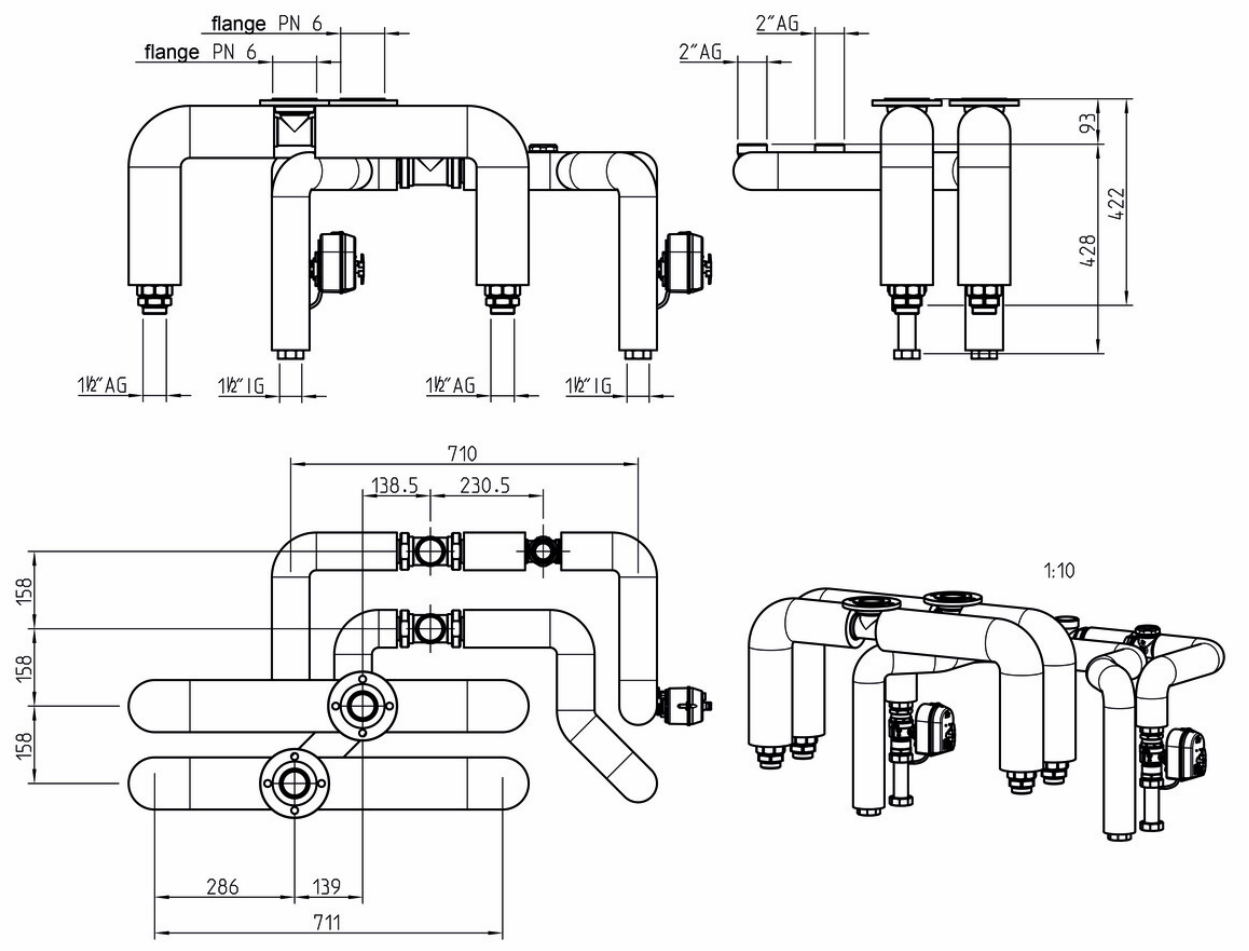


Position	Spare part	Item no.
1	Screwed flange DN 50 PN 6, 2" int. thread	N00154
2	Seal 55.0 x 42.0 x 2.0, 1¼", for thread connection 2", 10 pieces	N00047
3	Set of seals for distribution manifold DN 40	N00061
4	Seal 44.0 x 32.0 x 2.0, 1", for thread connection 1½", 10 pieces	N00036
5	2-way zone valve DN 32, drinking water, 2x 1½" ext. thread, Kvs value 100, with actuator 230 V / 50 Hz - 16s/90	N00434

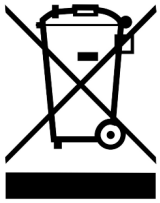
7 Technical data

	Pipe set FriwaMega cascade
Dimensions	
Height	521 mm
Width (pipe set primary circuit)	711 mm
Width (pipe set secondary circuit)	710 mm
Depth (centre pipes)	474 mm
Pipe connections	
Primary circuit (storage tank circuit)	2" ext. thread or flange DN 50
Secondary circuit (DHW circuit)	2" ext. thread, flat sealing
Operating data	
Degree of protection	IP44 (standard IEC 529)
Nominal voltage	230 V AC
Nominal pressure	PN 6
Max. temperature of medium	110 °C
Setting time of the valve	16 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.

NOTICE	
	**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. 9964042963-mub-en
Translation of the original instructions
We reserve the right to make technical changes without notice!
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