

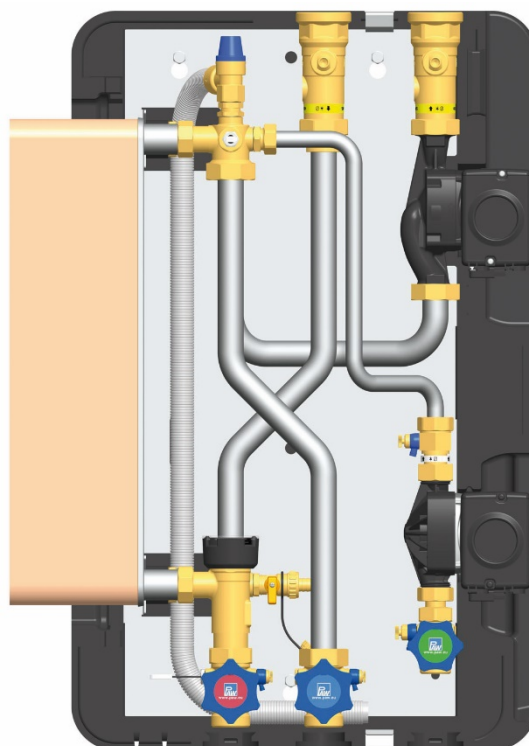
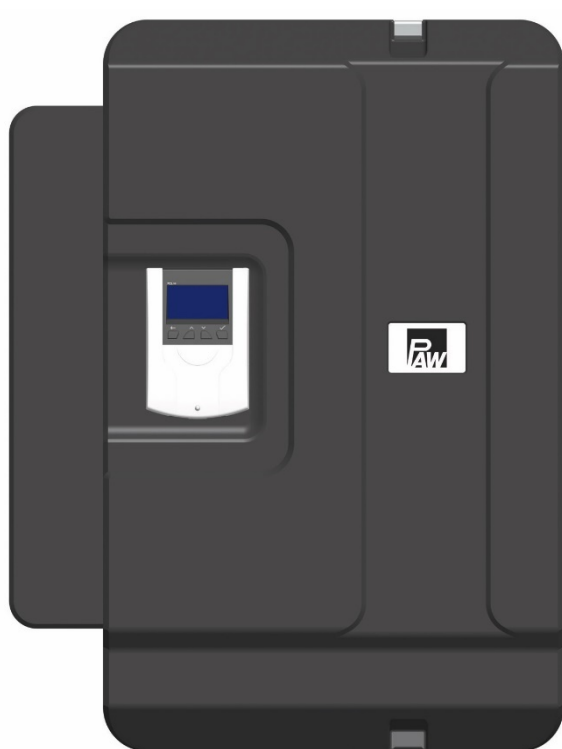


Installation and Operation Instructions

Domestic hot water modules

FriwaMidi – DN 20

FriwaMaxi – DN 25



Item no. 99640x5xx-mub-en - Version V02 - Issued 2020/12

Translation of the original instructions

We reserve the right to make technical changes without notice!

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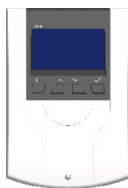
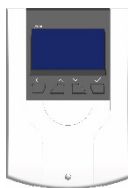


Carefully read these instructions before installation and commissioning.
Save these instructions in the vicinity of the installation for future reference.

1 General Information

1.1 Scope of these instructions

These instructions describe the installation, commissioning, function and operation of the domestic hot water modules FriwaMidi and FriwaMaxi. The chapters called [specialist] are intended for specialists only. For other components of the system, such as tanks, controllers and pumps, please observe the instructions of the corresponding manufacturer.

Station	Item no.	Contr.FC3.10	Primary pump	Circulation	Heat exch.
FriwaMidi	6405510		Grundfos UPM2 25-75 LowFlow	/	Copper solder, 40 plates
FriwaMidi with circulation	6405515		Grundfos UPM2 25-75 LowFlow	Grundfos UPM2 15-75 CIL2	
FriwaMidi	6405530		Grundfos UPM2 25-75 LowFlow	/	coated, 40 plates
FriwaMidi with circulation	6405535		Grundfos UPM2 25-75 LowFlow	Grundfos UPM2 15-75 CIL2	
Station	Item no.	Contr.FC3.10	Primary pump	Circulation	Heat exch.
FriwaMaxi	6406510		Grundfos UPML 25-105	/	Copper solder, 60 plates
FriwaMaxi with circulation	6406515		Grundfos UPML 25-105	Grundfos UPM2 15-75 CIL2	
FriwaMaxi	6406530		Grundfos UPML 25-105	/	coated, 60 plates
FriwaMaxi with circulation	6406535		Grundfos UPML 25-105	Grundfos UPM2 15-75 CIL2	

CE Declaration of Conformity

The domestic hot water module 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

The FriwaMidi and FriwaMaxi are domestic hot water modules which heat potable water operating on the principle of a flow-type water heater.

The domestic hot water module is a premounted group of fittings checked for tightness and used to transfer the heat between the buffer tank and the domestic hot water circuit. It contains a preset controller and important fittings for the operation of the system:

- Ball valves in the primary circuit
- Piston valves in the secondary circuit
- Pressure relief valve in the secondary circuit
- Premounted controller
- Temperature sensor at the cold water inlet
- Temperature sensor in the heating circuit flow line
- Temperature sensor at the domestic hot water outlet
- Flow meter at the domestic hot water outlet
- Fill and drain valve to drain the heat exchanger
- Vent plug to vent the heat exchanger

1.3 Designated use

The domestic hot water module must only be mounted in heating installations between the buffer tank and the domestic hot water circuit. Due to its design, the station must be mounted and operated in a vertical position! 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 module 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
	<p>Danger of scalding due to hot water!</p> <p>Undesirable circulation of water in the primary circuit can cause the exit of 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 of a heating circuit.

	 CAUTION
	<p>Risk of burns!</p> <p>The valves, fittings and the pump may heat up to more than 95 °C during operation.</p> <ul style="list-style-type: none"> ➤ The insulating shell must remain closed during operation.

ATTENTION

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.

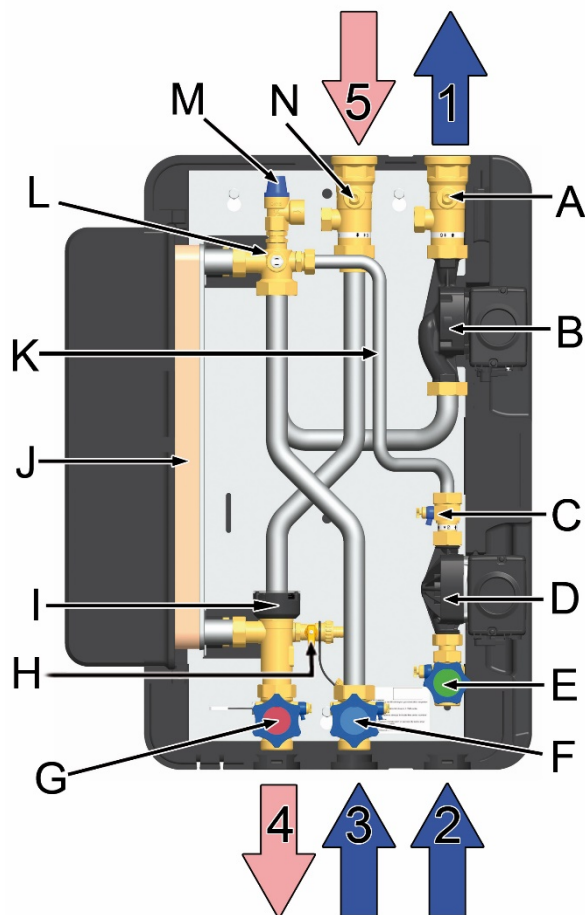
- It is imperative to prevent the EPDM sealing elements from making contact with substances containing mineral oils.
- Use a silicone- or polyalkylene-based lubricant free of mineral oil such as Unisilikon L250L and Syntheso Glep 1 from Klüber or a silicone spray.

ATTENTION

Malfunction!

- The domestic hot water module must be integrated in the potential equalisation of the electric installation. If this is not guaranteed by the pipe system, establish a potential equalisation connection to the main potential connection according to regulations.

3 Product description



Example: FriwaMaxi with circulation

Connections



- 1 Primary side: Return to the buffer tank
- 2 Secondary side: hot water circulation, return
- 3 Secondary side: Cold water inlet
- 4 Secondary side: Hot water outlet
- 5 Primary side: Flow from the buffer tank

Equipment

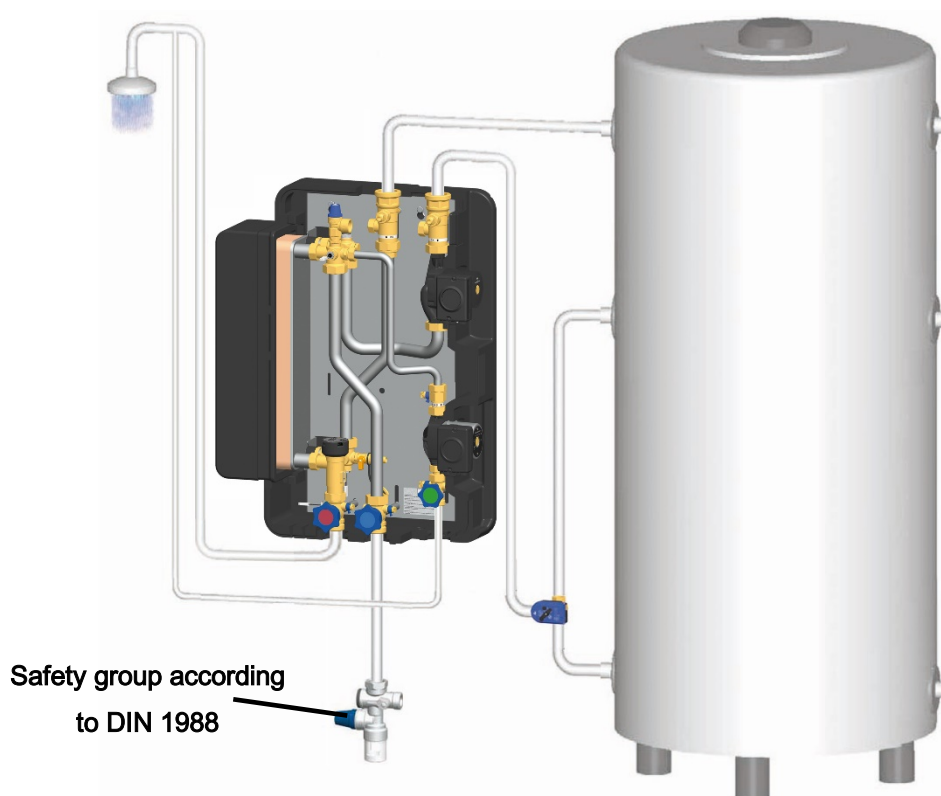
- A Ball valve with check valve
 - B Primary pump
 - C Non-return valve with drain valve
 - D Circulation pump
 - E Piston valve with drain valve
 - F Piston valve with drain valve
 - G Piston valve with drain valve and temperature sensor
 - H Fill and drain valve and temperature sensor
 - I Flow meter FlowSonic
 - J Plate heat exchanger
 - K Circulation line
 - L Vent valve (primary circuit)
 - M Temperature sensor and pressure relief valve 10 bars, suitable for DHW
- Only for the protection of the station.
Does not replace the pressure relief valve that has to be mounted on site!**
- N Ball valve with check valve

4 Dimensioning and planning

The FriwaMidi and FriwaMaxi can only work flawlessly if the installation meets certain requirements. Please take some time to plan the assembly.

	<div style="background-color: yellow; padding: 5px; border: 1px solid black;">  WARNING </div> <p>Danger of scalding due to hot water!</p> <p>Undesirable circulation of water in the primary circuit can cause the exit of 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 of a heating circuit.
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Mounting example



FriwaMidi with optional circulation set (item no. 640412) and with optional return distribution (FriwaMidi: item no. 640423, FriwaMaxi: item no. 640424)

4.1 Dimensioning of the tank

The following table helps you to calculate the approximately required volume of the buffer tank.

Temperature in the buffer tank	Domestic hot water temperature set at the controller	Required tank volume per litre of hot water
50 °C	45 °C	1.3 litres
60 °C	45 °C	0.8 litre
	50 °C	1.0 litre
	55 °C	1.4 litres
70 °C	45 °C	0.7 litre
	50 °C	0.8 litre
	55 °C	0.9 litre
80 °C	45 °C	0.5 litre
	50 °C	0.6 litre
	55 °C	0.7 litre

Calculation example for the dimensioning of the buffer tank:

Temperature of the buffer tank: 60 °C

Required withdrawal flow rate at the tap: 20 l/min

Domestic hot water temperature set at the controller: 45 °C

How large must the tank be to allow for a continuous withdrawal during 20 minutes without post-heating?

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

$$400 \text{ l} \times 0.8 = 320 \text{ l}$$

The heated part of the buffer tank must have a volume of 320 litres.

4.2 Water quality requirements

The domestic hot water modules constructively decrease the precipitation of chalk in the heat exchanger.

For installations with an elevated total hardness of the potable water and/or high temperatures, a water treatment is recommended.

The choice of the heat exchanger depends on the requirements of the installation location. Depending on the chemical composition of the water at the installation site, the adequacy of the plate heat exchanger has to be checked.

Please observe the following table:

Influence of the water quality on the corrosion resistance for domestic hot water applications

Water content	Concentration (mg/l or ppm)	Time limits	Heat exchanger with copper solder	Coated heat exchanger
Alkalinity (HCO_3^-)	< 70	within 24 hours	0	+
	70-300		+	+
	> 300		0/+	+
Sulphate (SO_4^{2-})	< 70	no limit	+	+
	70-300		0/-	+
	> 300		-	+
$\text{HCO}_3^- / \text{SO}_4^{2-}$	> 1.0	no limit	+	+
	< 1.0		0/-	+
Electrical conductivity	< 10 $\mu\text{S}/\text{cm}$	no limit	0	+
	10-500 $\mu\text{S}/\text{cm}$		+	+
	> 500 $\mu\text{S}/\text{cm}$		0	+
pH value	< 6.0	within 24 hours	0	+
	6.0-7.5		0	+
	7.5-9.0		+	+
	9.0-10		0	0
	> 10.0		0	-

Ammonium (NH ₄ ⁺)	< 2	within 24 hours	+	+
	2-20		0	+
	> 20		-	-
Chloride (Cl ⁻)	< 100	no limit	+	+
	100-200		+	+
	200-300		+	+
	> 300		0/+	0
Free chlorine (Cl ₂)	< 1	within 5 hours	+	+
	1-5		0	0
	> 5		0/-	0
Hydrogen sulphide (H ₂ S)	< 0.05	no limit	+	+
	> 0.05		0/-	0
Free (aggressive) carbon dioxide (CO ₂)	< 5	no limit	+	+
	5-20		0	+
	> 20		-	+
Total hardness (°dH)	4.0-8.5	no limit	+	+
Nitrate (NO ₃ ⁻)	< 100	no limit	+	+
	> 100		0	+
Iron (Fe)	< 0.2	no limit	+	+
	> 0.2		0	+
Aluminium (Al)	< 0.2	no limit	+	+
	> 0.2		0	+
Manganese (Mn)	< 0.1	no limit	+	+
	> 0.1		0	+

+ Good resistance under normal conditions

0 Corrosion may occur, especially if further factors are evaluated with 0

- Use is not recommended

5 Circulation mode

The domestic hot water modules FriwaMidi and FriwaMaxi are optionally equipped with a circulation pump.

The FriwaMidi and FriwaMaxi without circulation can be subsequently equipped with a circulation set (item no. 640412).

For the operation of the circulation pump, three possible operation modes are stored in the controller (see controller instructions, chapter *Circulation*).

- **Pulse-controlled operation** (depending on the demand / requirements):

The short actuation of a hot water tap (tap pulse: less than 5 sec.) starts the circulation pump. The circulation pump will then run for several minutes (adjustable).

- **Time-dependent operation:**

The operation of the circulation pump can be set on a week clock within a freely selectable period of time. In this operation mode, the circulation is activated at the beginning of the period of time chosen. The circulation will stop after the end of the chosen period of time.

- **Temperature-dependent operation:**

In this operation mode, the circulation is only activated if the adjustable minimum temperature at the circulation temperature sensor is not reached during the chosen period of operation. The circulation stops after the adjustable nominal temperature has been reached.

The operating modes can be combined with each other as wished, f. ex. the time- and the temperature-dependent operating modes. The circulation is only activated if the temperature at the circulation temperature sensor falls below the required value and if the time window is active.

Outside the time slot, the circulation pump can be activated by a tap pulse if the pulse-controlled operation mode is additionally activated.

ATTENTION

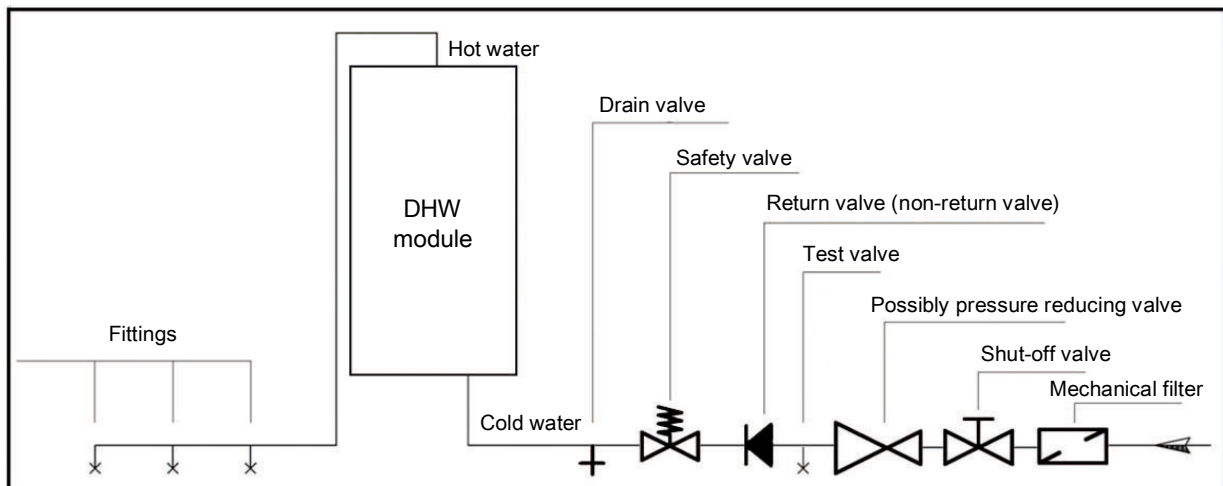
Damage to property!

When the domestic hot water module is delivered, the circulation is not activated (see controller instructions, chapter *Circulation*). Once the circulation line mounted, it is mandatory to select and preset the operation mode. The revolution speed of the circulation pump must be defined by the PWM signal (factory setting: 100 %).

6 Mounting and installation [specialist]

The domestic hot water modules FriwaMidi and FriwaMaxi must only be connected to the storage tank by separate connections for the flow and return. External pumps must not be installed between the domestic hot water module and the buffer tank. The circulation of water causes considerable temperature fluctuations.

The domestic hot water connection must be carried out in accordance with the relevant norms (for example DIN 1988)!



ATTENTION

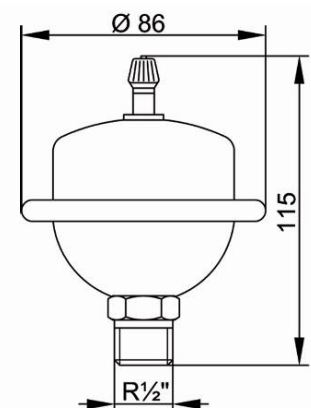
Damage to property!

The pressure relief valve integrated in the station does not replace the safety groups of the potable water connection as per DIN 1988. The pressure relief valve only protects the module from overpressures in case of servicing.



ATTENTION

Damage to property!

If there are water supplies that may cause pressure surges (for example flush valves, washing machines or dishwashers) connected to the same mains as the domestic hot water module, we recommend the installation of water hammer arresters close to the place where these pressure surges may be caused.

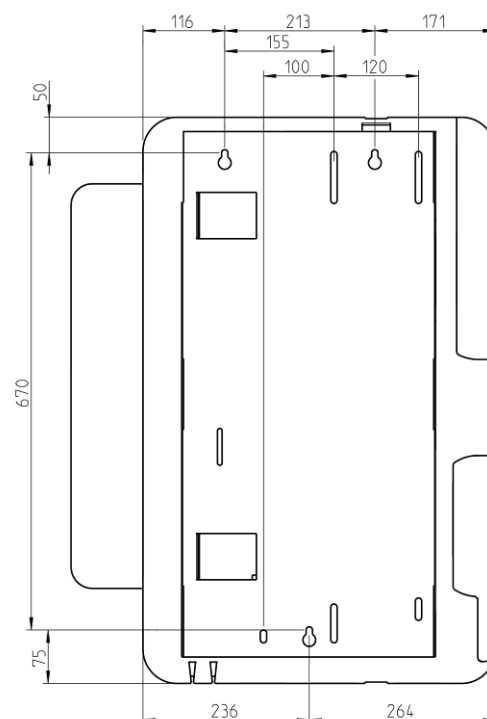


Water hammer arresters

	<div style="background-color: yellow; padding: 5px; border: 1px solid black;">  WARNING </div> <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.
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<div style="background-color: yellow; padding: 5px; border: 1px solid black;"> ATTENTION </div> <p>Damage to property!</p> <p>The installation site must be dry, stable, frost-proof and protected against ultraviolet radiation in order to prevent material damage of the installation.</p>

1. Determine the mounting location of the domestic hot water module near the buffer tank.
For DN 32, the pipes in the heating circuit must not exceed a length of 4 m.
2. A drilling template can be used in order to facilitate the installation. You will find the drilling template on the station.
3. Copy the measures for the mounting holes to the wall.
4. Drill the holes and insert adequate wall plugs into the holes.
5. Turn the screws into the wall plugs in such a way that about 40 mm of each screw still stick out.
6. Remove the station from the packaging.
7. Remove the insulating front shell.
8. Hang the domestic hot water module onto the screws. Tighten the screws, so that the sides of the insulation are flush to the wall.



9. Connect the domestic hot water module with the installation by using the piping according to the adjacent figure.

- 1 **Primary side:**

Return to the buffer tank,

Connection **FriwaMidi**: 1½" ext. thread,

Connection **FriwaMaxi**: 2" ext. thread,

Piping:

FriwaMidi: at least DN 25, 28 x 1.5 mm,

FriwaMaxi: at least DN 32, 35 x 1.5 mm,
maximum length 2 m

- 2 **Secondary side:**

Hot water circulation, return,

connection: 1" ext. thread, flat sealing

- 3 **Secondary side:**

cold water inlet,

connection **FriwaMidi**: 1" ext. thread, flat sealing

Connection **FriwaMaxi**: 1¼" ext. thread,
flat sealing

- 4 **Secondary side:**

hot water outlet,

connection **FriwaMidi**: 1" ext. thread, flat sealing

Connection **FriwaMaxi**: 1¼" ext. thread,
flat sealing

- 5 **Primary side:**

flow from the buffer tank,

connection **FriwaMidi**: 1½" ext. thread,

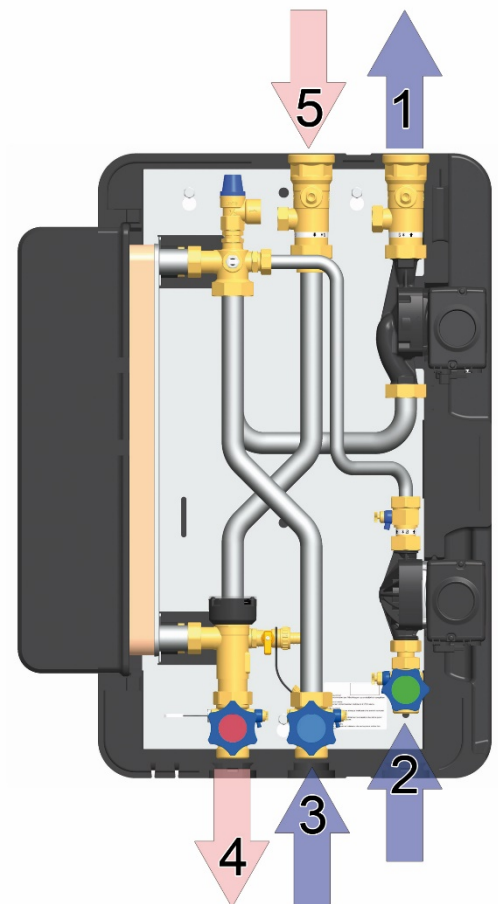
connection **FriwaMaxi**: 2" ext. thread,

Piping:

FriwaMidi: at least DN 25, 28 x 1.5 mm,

FriwaMaxi: at least DN 32, 35 x 1.5 mm,
maximum length 2 m

Pipe distance to the wall
(primary) = 95 mm



Pipe distance to the wall
(secondary) = 167 mm

7 Commissioning [specialist]

NOTICE

Slowly open the valves in the pipes and in the module in order to prevent pressure surges.

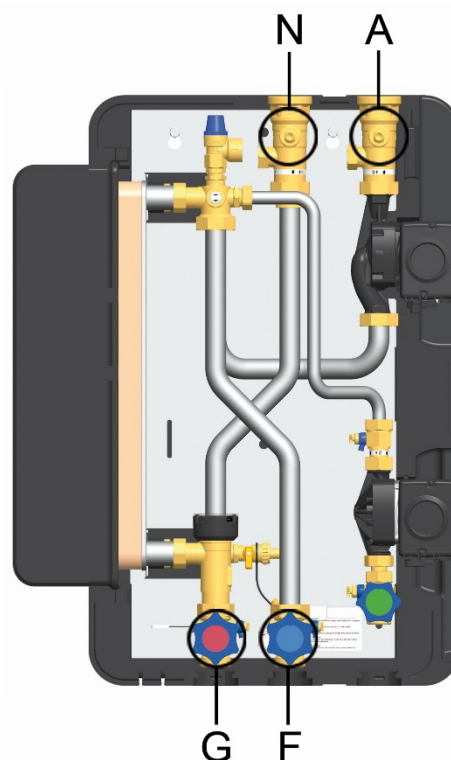
Functioning check valve

The ball valves (A) and (N) in the primary circuit are equipped with a check valve, in order to avoid unwanted gravity circulation.

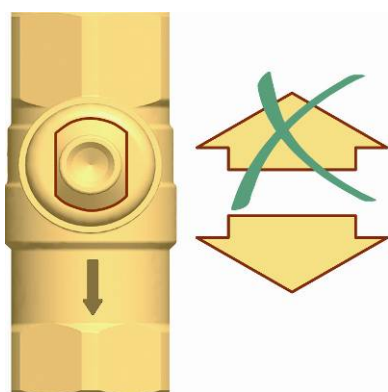
To vent and flush the installation, the check valves must be open. For this purpose, turn the ball valves into the position **45°**.

The check valve is not operating.

For the operation of the installation, all (ball) valves must be **completely** open (position **0°**).

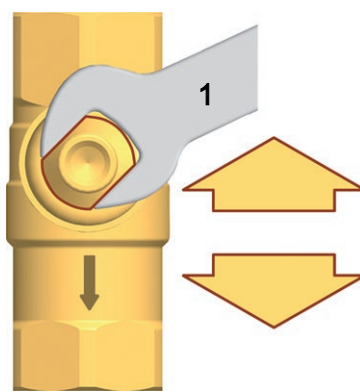


Position 0°



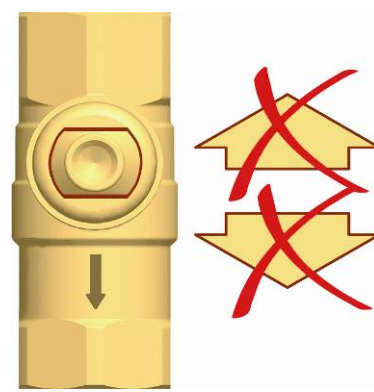
Check valve is operating,
flow only in flow direction.

Position 45°





Check valve is not operating,
flow in both directions.

Position 90°



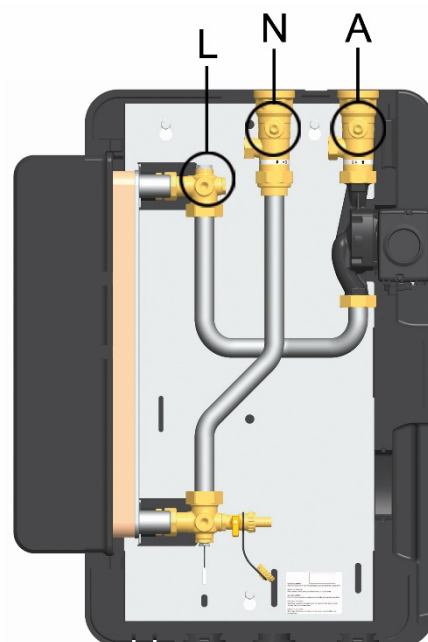
Ball valve closed,
no flow.

7.1 Filling the primary circuit

	<div style="background-color: yellow; padding: 5px; border: 1px solid black;">  WARNING </div> <p>Danger of scalding due to hot water!</p> <p>The system is under pressure. By opening the vent valve, hot water with a temperature of up to 90 °C may exit and cause personal injury.</p> <ul style="list-style-type: none"> ➤ Open the vent valve slowly and with sufficient distance.
---	--

If the storage tank is (partly) filled

1. Slowly open the ball valve (N) by turning it to position 0°.
2. Fill the storage tank using the fill valves available on site until an operating pressure of about 1.5 bars* is reached. Use heating water compliant with the standards VDI 2035 / ÖNorm H5195-1.
3. Manipulate the vent valve (L) cautiously to let the air escape.
5. Close the vent valve (L).
6. Close the ball valve (N) by turning it into position 90°.
7. Check the operating pressure of the storage tank after the venting and increase the pressure if necessary.
8. Open the ball valves (A) and (N) completely by turning them into position 0°.





Primary circuit

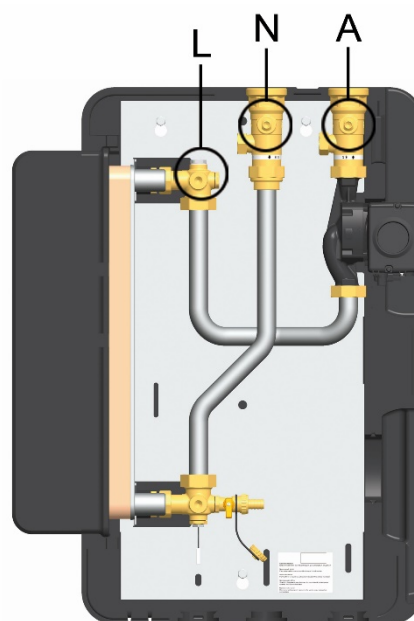
* 1.5 bars in the primary circuit = recommended minimum value

The pressure also depends on the individual system pressures and on the components of the heating installation!

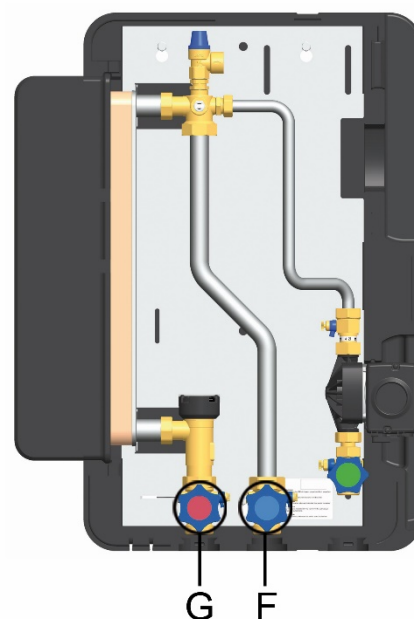
7.2 Commissioning of the controller

	<div style="background-color: yellow; padding: 5px; border: 1px solid black;">  WARNING </div> <p>Risk to life and limb due to electric shock!</p> <ul style="list-style-type: none"> ➤ Check whether the sensors and pumps have been connected to the controller and the controller housing is closed. ➤ Only under these circumstances, the mains plug of the controller can be plugged into a socket.
---	---

1. Connect the domestic hot water module to the mains (230 V, 50 Hz) by using the premounted connection cable.
2. Carry out the commissioning of the controller (see controller instructions, chapter *Commissioning*). After that, start the pump in the automatic/manual mode (PWM signal = 100 %, see controller instructions chapter *Automatic/manual mode*).
3. Let the pump run for several minutes to vent the domestic hot water module.
4. If the air noises do not stop, carefully manipulate the vent valve (L) while the pump is still running and let the air escape.
5. If the air noises have stopped, the pump can be switched off.
6. To do so, in the automatic/manual mode, set the pump to "Automatic".
7. Slowly open the piston valves (F) and (G) on the secondary side.

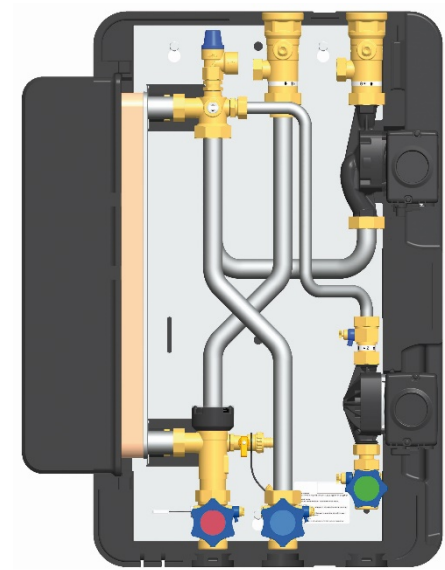


Primary circuit



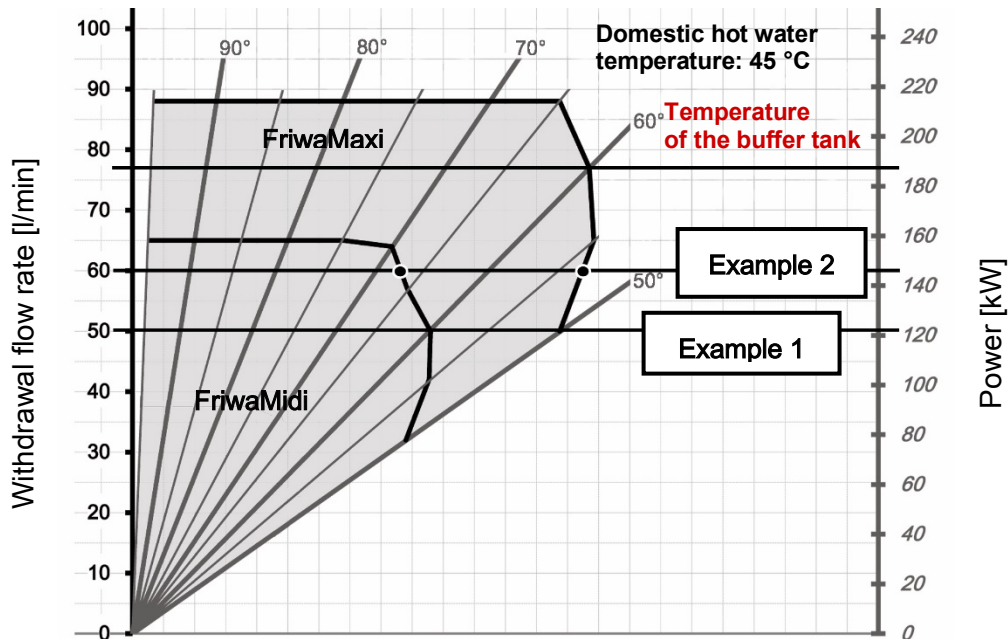
Secondary circuit

8. Open a withdrawal point for domestic hot water (for example a tap) with a flow rate of at least 10 l/min and let the water run for about 2 minutes to vent the secondary circuit. Close all withdrawal points of the secondary circuit afterwards.
9. Make sure that the domestic hot water module is correctly integrated into the potential equalisation of the installation.
10. The FriwaMidi / FriwaMaxi is now ready for operation.



7.3 Maximum withdrawal flow rate

The following diagram illustrates the maximum withdrawal flow rate depending on the tank temperature with a preset hot water temperature of 45 °C at the tap. The integrated control avoids temperature drops as long as the maximum flow rate is not exceeded.



Boundary conditions: Cold water temperature: 10 °C

Maximum pressure loss at the domestic hot water side of the
DHW module: 1000 mbars

The following examples illustrate the correlation between the domestic hot water temperature, the withdrawal flow rate and the temperature of the buffer tank and show their impact on the heat transfer capacity of the DHW module.

Example 1

Domestic hot water temperature at the withdrawal point: 45 °C

Temperature in the buffer tank: 60 °C

→ FriwaMidi: maximum withdrawal flow rate: 50 l/min, transfer capacity: 121 kW

→ FriwaMaxi: maximum withdrawal flow rate: 77 l/min, transfer capacity: 187 kW

Example 2

Domestic hot water temperature at the withdrawal point: 45 °C

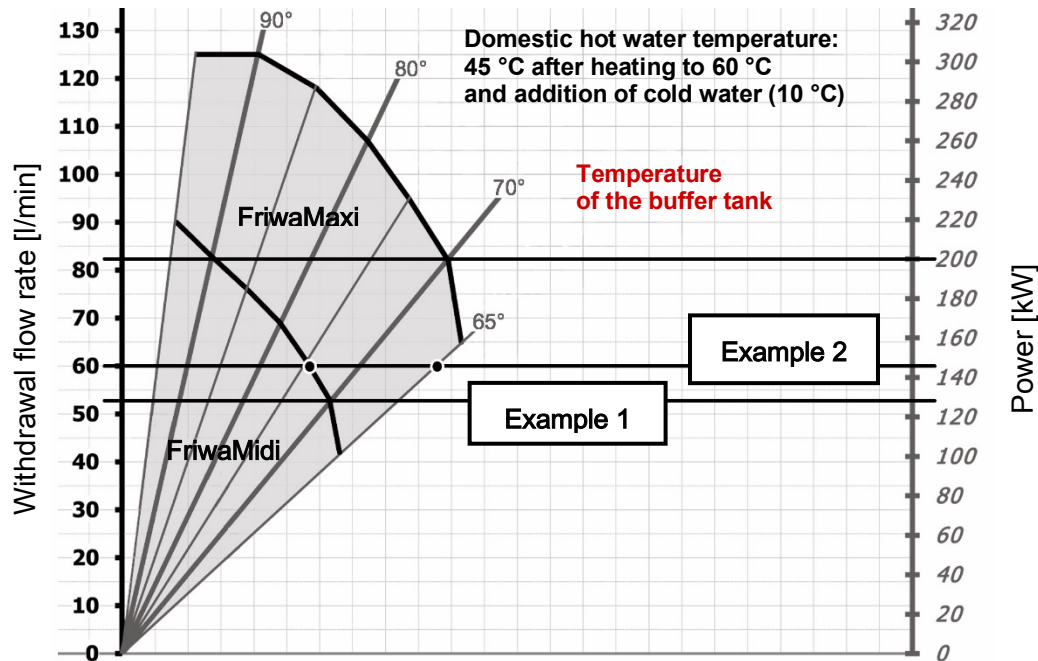
Maximum withdrawal flow rate: 60 l/min

→ FriwaMidi: temperature in the buffer tank: ~70 °C, transfer capacity: 145 kW

→ FriwaMaxi: temperature in the buffer tank: ~55 °C, transfer capacity: 145 kW

The following diagram illustrates the maximum withdrawal flow rate at a domestic hot water temperature of 45 °C at the tap, after the addition of cold water of 10 °C.

The domestic hot water temperature set at the controller is of 60 °C.



Boundary conditions: Cold water temperature: 10 °C

Example 1

Domestic hot water temperature at the controller: 60 °C

Temperature in the buffer tank: 70 °C

→ FriwaMidi: maximum withdrawal flow rate: 53 l/min, transfer capacity: 129 kW

→ FriwaMaxi: maximum withdrawal flow rate: 82 l/min, transfer capacity: 200 kW

Example 2

Domestic hot water temperature at the controller: 60 °C



Maximum withdrawal flow rate: 60 l/min

→ FriwaMidi: temperature in the buffer tank: ~75 °C, transfer capacity: 150 kW

→ FriwaMaxi: temperature in the buffer tank: ~65 °C, transfer capacity: 150 kW

7.4 Adjustment of the temperature

Set the desired (maximum) domestic hot water temperature at the controller under "**Main menu / Domestic hot water / Nominal temperature**" (see controller instructions, chapter *Domestic hot water*).

	<div style="background-color: yellow; padding: 5px; border: 1px solid black;">  WARNING </div> <p>Danger of scalding due to hot water!</p> <p>In order to avoid scalding at the tap, the maximum domestic hot water temperature set at the controller must not exceed 60 °C.</p>
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Primary side

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

Secondary side

The possible withdrawal flow rate [l/min] at the tap depends on the domestic hot water temperature set at the controller and on the temperature available in the storage tank.

The recommended maximum domestic hot water flow rate through the domestic hot water module **FriwaMidi** is 65 l/min. The flow rate of the **FriwaMaxi** is 88 l/min.

The following table illustrates the correlation between the storage tank temperature and the maximum withdrawal flow rate at a water temperature of 45 °C at the tap (f. ex. single lever tap). If the domestic hot water temperature set at the controller is above 45 °C, the tap flow rate consists of a mixture of hot and cold water.

The indicated heat transfer capacity is necessary to heat up the water quantity of the withdrawal flow rate [l/min] from 10 °C to 45 °C.

Temp. in the buffer tank	Domestic hot water temp.set at the controller	Maximum flow rate from the DHW module with the set domestic hot water temperature		Max. withdrawal flow rate at the tap with a temperature of 45 °C		Heat transfer capacity of the DHW module	
		Midi	Maxi	Midi	Maxi	Midi	Maxi
50 °C	45 °C	32 l/min	50 l/min	32 l/min	50 l/min	79 kW	122 kW
60 °C	45 °C	50 l/min	77 l/min	50 l/min	77 l/min	121 kW	187 kW
	50 °C	40 l/min	62 l/min	45 l/min	70 l/min	111 kW	172 kW
	55 °C	30 l/min	47 l/min	38 l/min	60 l/min	95 kW	148 kW
70 °C	45 °C	63 l/min	88 l/min	63 l/min	88 l/min	155 kW	215 kW
	50 °C	53 l/min	83 l/min	60 l/min	94 l/min	149 kW	230 kW
	55 °C	45 l/min	70 l/min	57 l/min	89 l/min	141 kW	218 kW
	60 °C	37 l/min	58 l/min	52 l/min	81 l/min	130 kW	201 kW
80 °C	45 °C	65* l/min	88 l/min**	65* l/min	88 l/min**	159 kW	215 kW
	50 °C	65* l/min	88 l/min**	74 l/min	100 l/min	181 kW	245 kW
	55 °C	56 l/min	87 l/min	72 l/min	111 l/min	176 kW	273 kW
	60 °C	49 l/min	75 l/min	69 l/min	107 l/min	170 kW	262 kW

at a cold water temperature of 10 °C, reheating not considered

*Maximum flow rate: 65 l/min, with a pressure loss of the FriwaMidi of 1000 mbars

(for hydraulic reasons, higher values are only partly possible, measuring limit of the flow rate sensor ~133 l/min)

** Maximum flow rate: 88 l/min, with a pressure loss of the FriwaMaxi of 1000 mbars

(for hydraulic reasons, higher values are only partly possible, measuring limit of the flow rate sensor ~133 l/min)

8 Maintenance

Optimal operation of the station

In order to guarantee an optimal control, no additional hydraulic pressure losses should occur on the primary side (f. ex. due to the installation of a mud strainer, a strainer or a mixing valve).

NOTICE

Hygiene recommendation

At temperatures below 60 °C, legionella bacteria can occur. After a longer downtime such as holidays, it is recommended to thoroughly flush all pipes for some minutes.

Optical control

It is recommended to visually check the domestic hot water module every two months to ensure its proper operation. If you notice any problems on the system, consult a specialist.

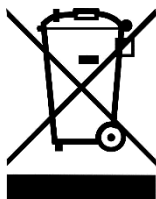
Cleaning the station

Clean the station with a damp cloth without any detergent.

9 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.

10 Spare parts [specialist]

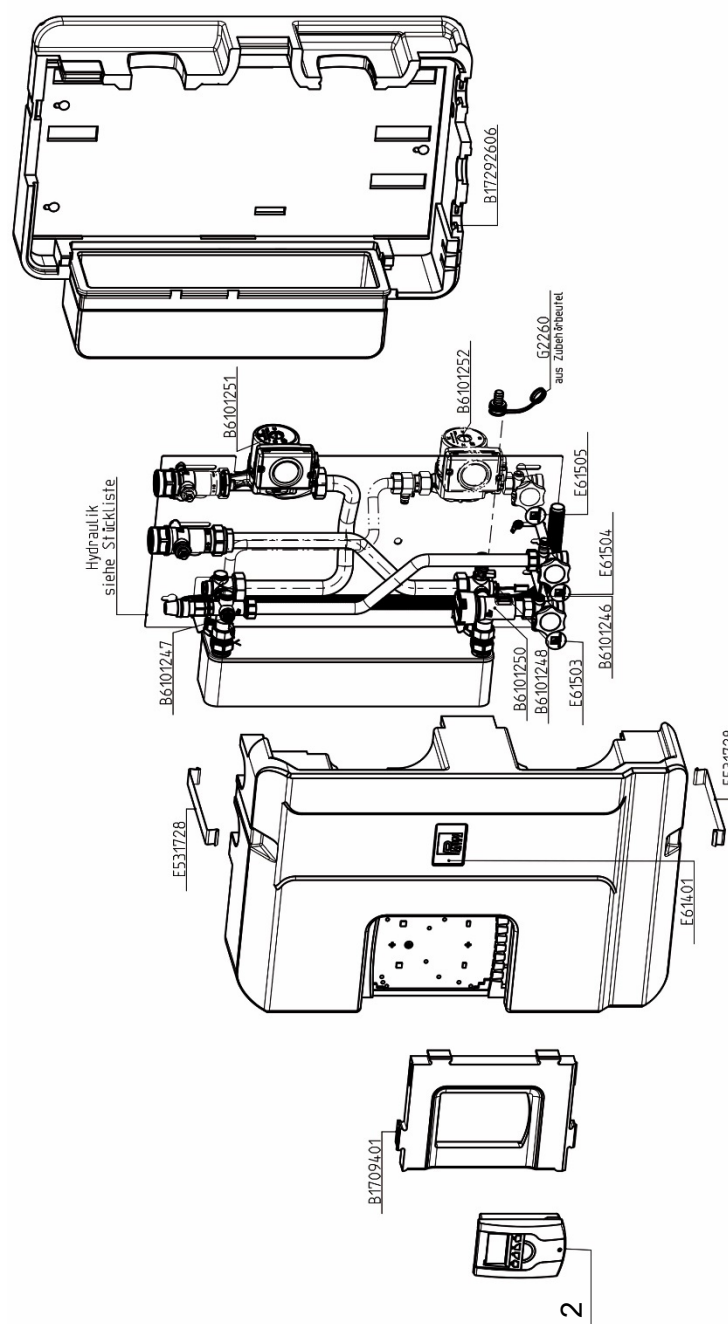
NOTICE

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

The serial number is placed in the lower right corner of the support sheet of the station.

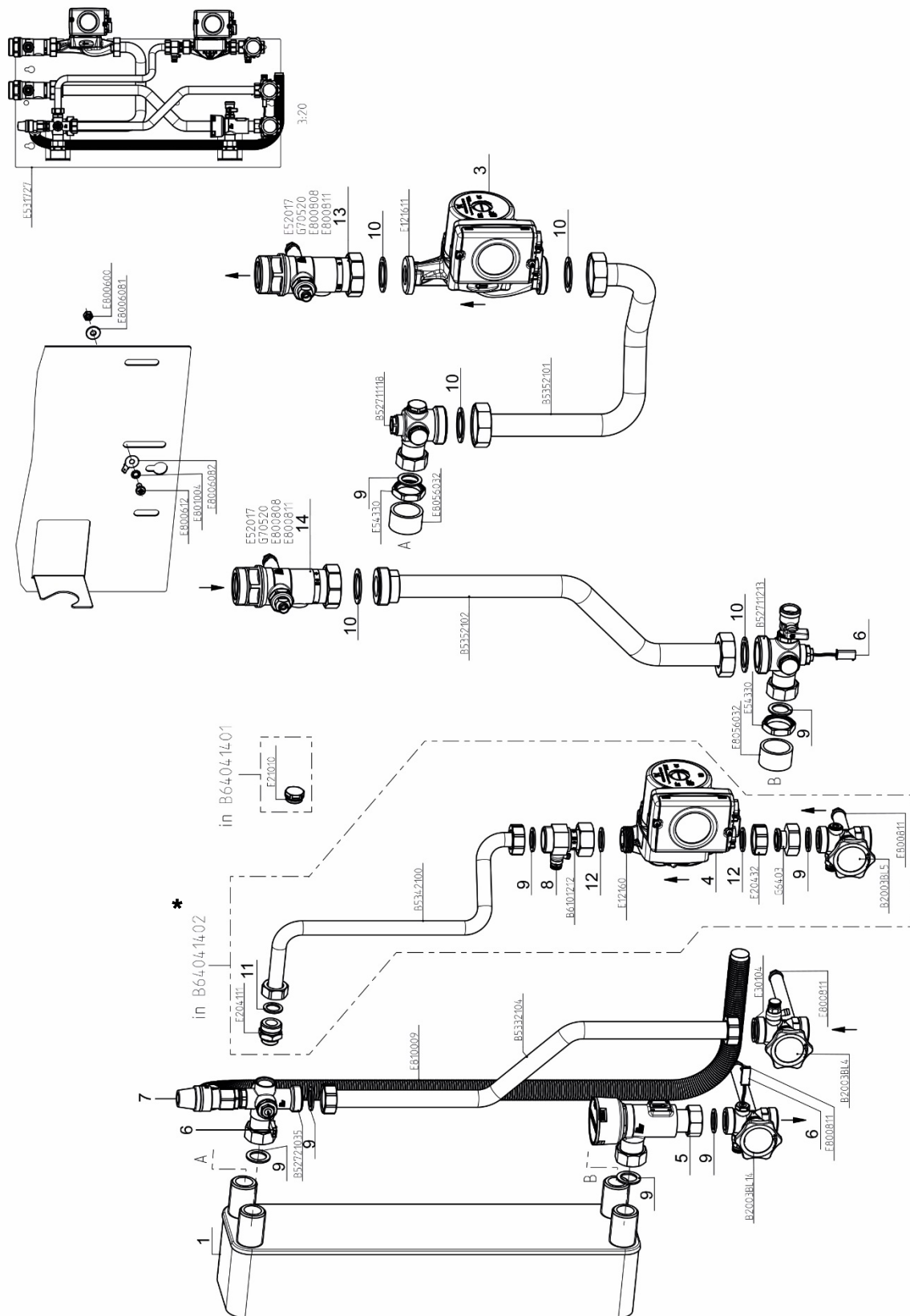
10.1 Spare parts control and insulation

FriwaMidi without circulation (6405510 + 6405530) / with circulation (6405515 + 6405535)



10.2 Spare parts hydraulics

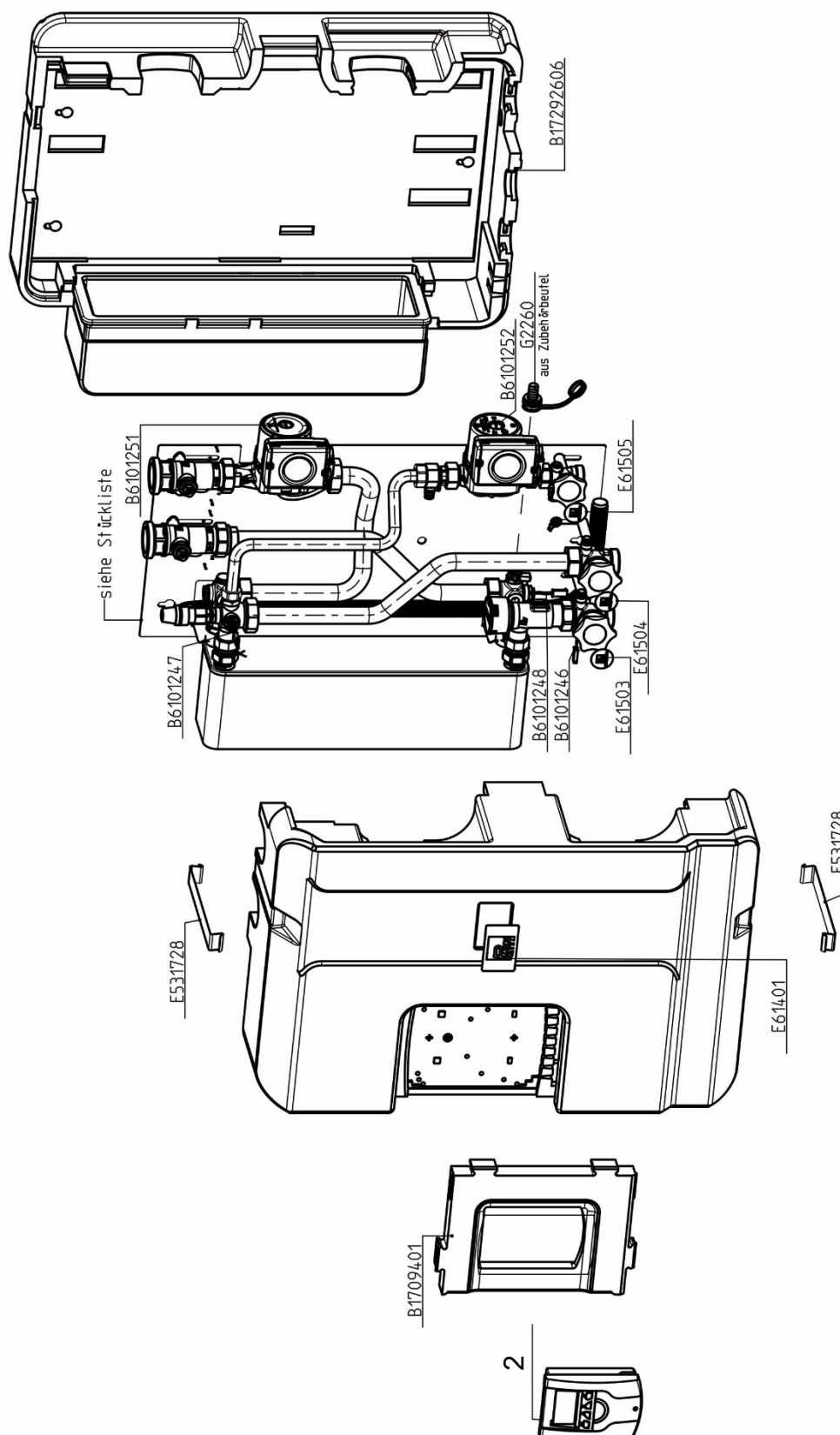
FriwaMidi without circulation (6405510 + 6405530) / with circulation (6405515 + 6405535)



***only included in the scope of delivery of 6405515 and 6405535**

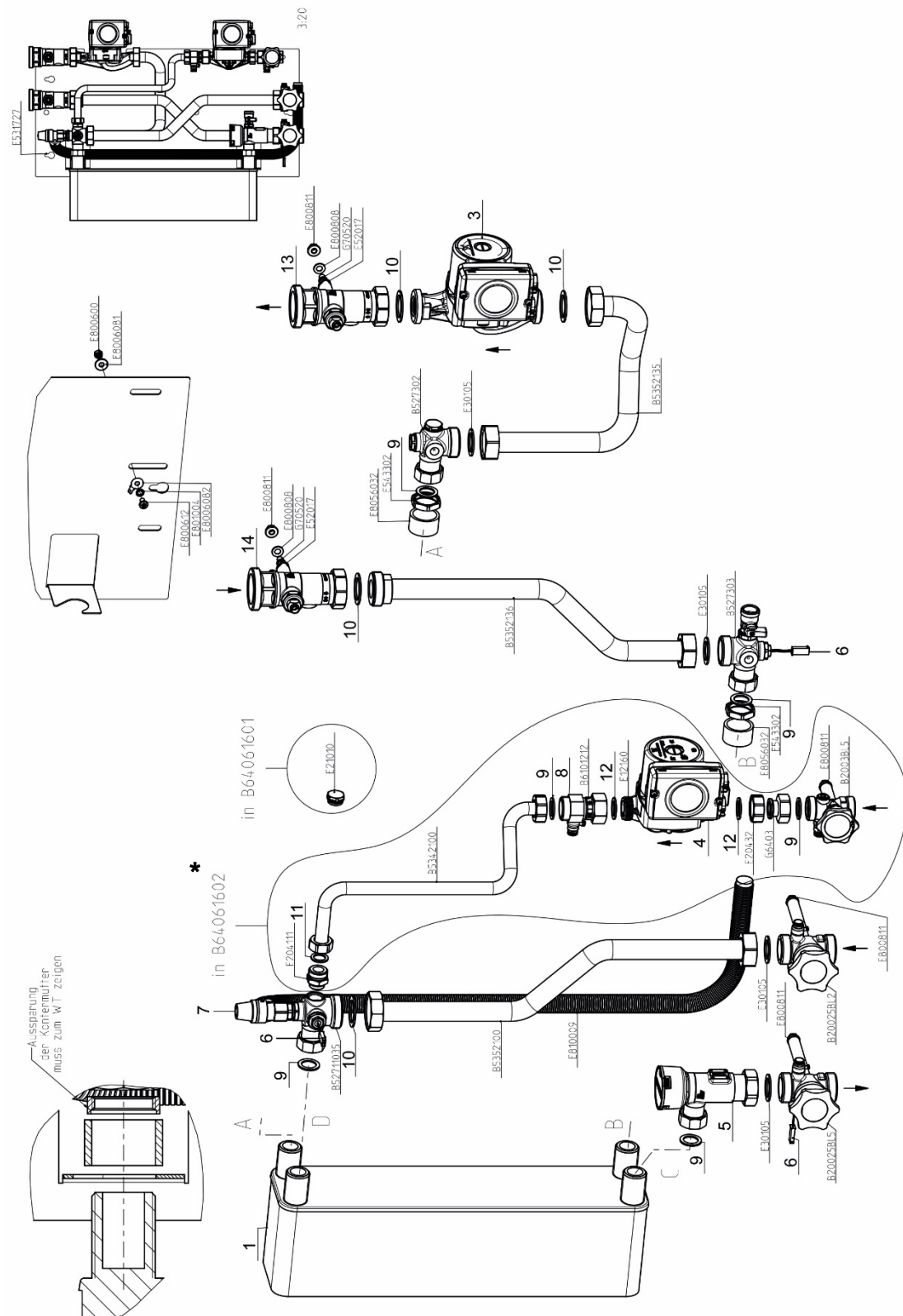
10.3 Spare parts control and insulation

FriwaMaxi without circulation (6406510 + 6406530)/with circulation (6406515 + 6406535)



10.4 Spare parts hydraulics

FriwaMaxi without circulation (6406510 + 6406530)/with circulation (6406515 + 6406535)



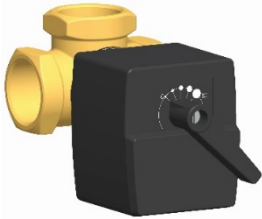



***only included in the scope of delivery of 6406515 and 6406535**

Position no.	Spare part	Item number
1	Heat exchanger, copper solder, with gaskets, for station 6405510 and 6405515	N00278
	Heat exchanger, copper solder, with gaskets, for station 6406510 and 6406515	N00280
	Heat exchanger, coated, with seals, for station 6405530 and 6405535, 6405510 and 6405515	N00279
	Heat exchanger, coated, with seals, for station 6406530 and 6406535, 6406510 and 6406515	N00281
2	Controller FC3.10 FriwaMidi / Maxi with wiring harness (1x Molex) for station 6405510, 6405530, 6406510, 6406530	N00098
	Controller FC3.10 FriwaMidi / Maxi with wiring harness (2x Molex) for station 6405515, 6405535, 6406515, 6406535	N00099
3	Primary pump Grundfos UPM2 25-75, with gaskets, for FriwaMidi	N00273
	Primary pump Grundfos UPML 25-105, with gaskets, for FriwaMaxi	N00274
4	Circulation pump Grundfos UPM2 15-75 CIL2, with gaskets	N00275
5	FlowSonic DN 20, with gaskets, for FriwaMidi	N00276
	FlowSonic DN 25, with gaskets, for FriwaMaxi	N00277
6	Temperature sensor Pt1000-B, with connection cable	N00005
7	Pressure relief valve ½" x ¾", MSV 10 bars	N00008
8	Non-return valve DN 20 for circulation line	N00283
9	Gasket 30.0 x 21.0 x 2.0, ½", for thread connection 1", AFM, 10 pieces	N00024
10	Gasket 44.0 x 32.0 x 2.0, 1", for thread connection 1½", AFM, 10 pieces	N00036
11	Gasket 24.0 x 17.0 x 2.0, ¼", for thread connection ¾", AFM, 10 pieces	N00030
12	Gasket 30.0 x 21.0 x 2.0, ½", for thread connection 1", EPDM, 10 pieces	N00129

13	Ball valve DN 32 with check valve 190 mm wc, for station 6405510, 6405515, 6405530, 6405535	N00378
	Ball valve DN 32 with check valve 400 mm wc, for station 6406510, 6406515, 6406530, 6406535	N00365
14	Ball valve DN 32 with check valve 190 mm wc, for station 6405510, 6405515, 6405530, 6405535	N00377
	Ball valve DN 32 with check valve 400 mm wc, for station 6406510, 6406515, 6406530, 6406535	N00364

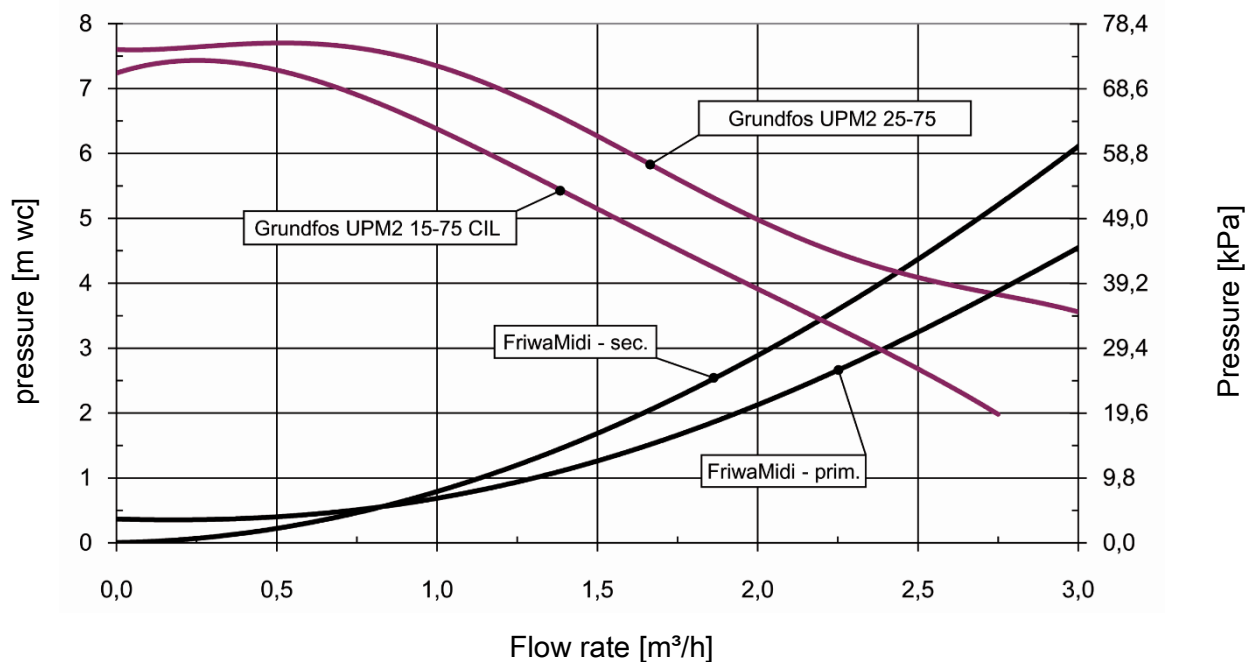
Optional accessories

Illustration	Scope of delivery	Item no.
	Circulation set for internal retrofitting (FriwaMidi/Maxi) with high-efficiency pump Grundfos UPM2 15-75 CIL2 with piston valve and non-return valve	640412
	Return distribution set DN 32 for FriwaMidi 3-way valve with actuator K _{VS} value: 15	640423
	Return distribution set DN 32 for FriwaMaxi 3-way valve with actuator K _{VS} value: 16	640424
	Withdrawal valve flame-resistant, 1/4" ext. thread, self-sealing, 5 mm square-head wrench Note: One withdrawal valve is required for each piston valve.	640422

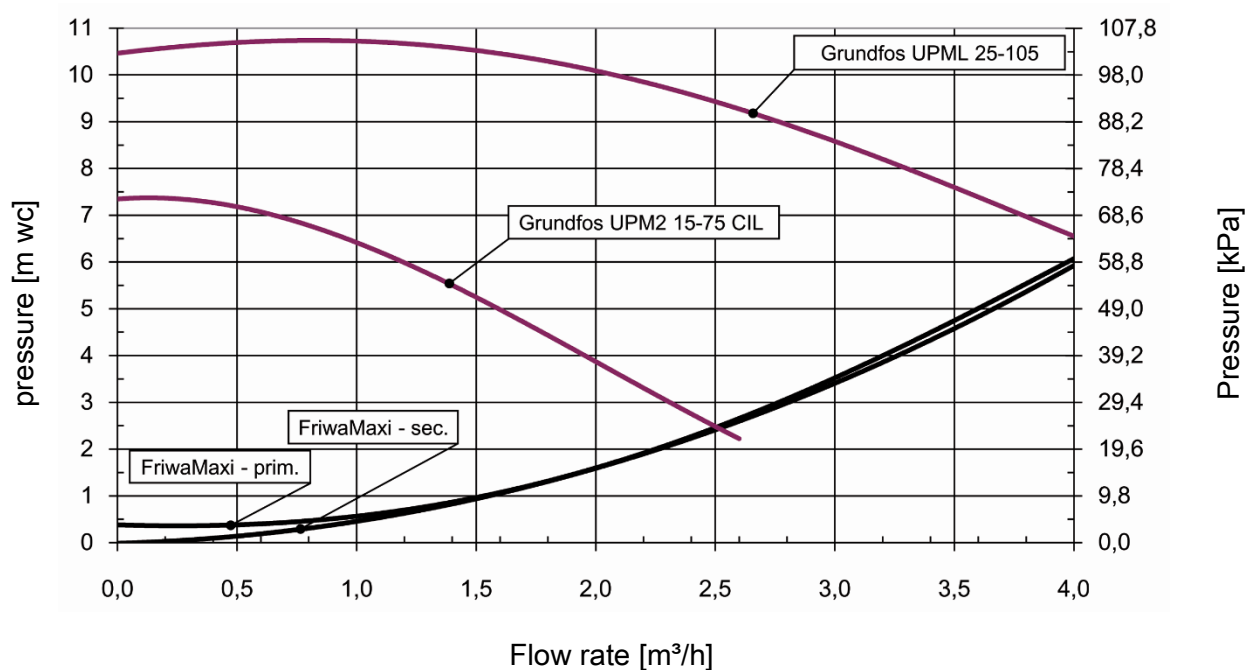
11 Technical data

Dimensions	FriwaMidi	FriwaMaxi
Height (with insulation)	795 mm	
Width (with insulation)	602 mm	
Depth (with insulation)	298 mm	
Centre distance top	120 mm	
Centre distance bottom	100 mm	
Pipe connections		
Primary circuit (storage tank circuit)	1½" ext. thread	2" ext. thread
Secondary circuit (DHW circuit)	1" ext. thread, flat sealing	1¼" ext. thread, flat sealing
Secondary circuit (circulation)	1" ext. thread, flat sealing	
Operating data		
Max. admissible pressure	primary: 3 bars, secondary: 10 bars	
Operating temperature	2 – 95 °C	
Equipment		
Check valve	2 x 190 mm wc	2 x 400 mm wc
Primary pump	High-efficiency pump with PWM control, 3-70 W	High-efficiency pump with PWM control, 6-140 W
Secondary pump	(optional) High-efficiency pump with PWM control, 5-63 W	
Heat exchanger	40 plates	60 plates
Flow meter	FlowSonic, measuring range: 1-133 l/min	
Temperature sensor	3 x Pt1000, rapid	
Materials		
Valves and fittings	Brass	
Gaskets	AFM34 / EPDM	
Plate heat exchanger	<ul style="list-style-type: none"> - uncoated: stainless steel / solder: copper - coated: based on silica 	
Insulation	EPP	
Check valve	Brass	

11.1 Pressure drop characteristic curve FriwaMidi



11.2 Pressure drop characteristic curve FriwaMaxi



12 Commissioning report

System operator

Location of installation

Serial numbers:

FriwaMidi

FriwaMaxi

Flow rate sensor

Controller

Software version

Pipes primary

 $\varnothing =$ mm l = m

Pipes secondary

 $\varnothing =$ mm l = m

Other additionally
installed components

☐ Circulation set ☐ Return distribution set

☐ Others:

Have both circuits been flushed and vented correctly?

(no air noises in the pump)

☐ Vented

Are all shut-off valves open in the cold water line?

☐ Open

Is there a pressure of at least 1.5 bars on the primary side?

☐ Checked

Is there a pressure of at least 2.5 bars on the secondary side?

☐ Checked

Is there an error message on the display?

☐ No message

Installation company

Date, signature

PAW GmbH & Co.KG

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