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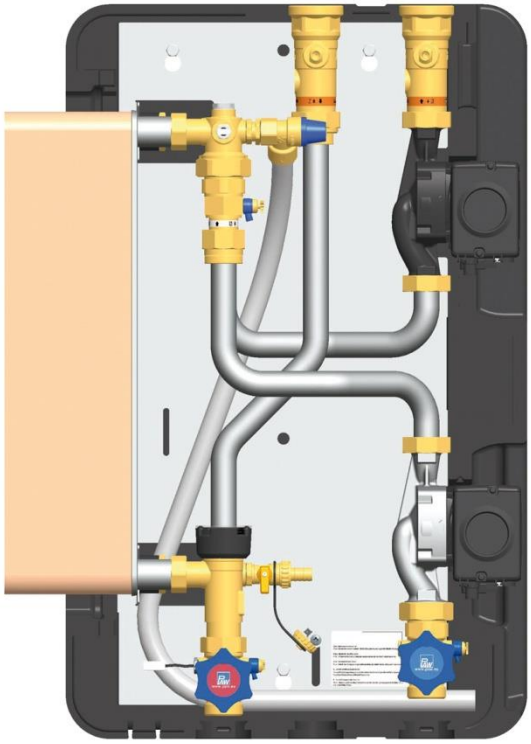
English

Installation and operation Instructions

Tank heat transfer module

Midi – DN 20 / Maxi – DN 25



Item no. 99643x4x5-mub-en - Version V04 – Date 2017/04

Translation of the original instructions

We reserve the right to make technical changes without notice!

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Contents

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 tank heat transfer modules Midi and Maxi.
The chapters called [specialist] are intended for specialists only.
For other components of the system, such as tanks, controllers or pumps, please observe the instructions of the corresponding manufacturer.

Type	Item number	Controller FC4.13	Pump primary	Pump secondary	Heat exchanger
Midi	**6435445**		Grundfos UPM2 25-75	Grundfos UPM2 15-75 CIL2	40 plates
Maxi	**6436465**		Grundfos UPML 25-105	Grundfos UPML 25-105 N	60 plates

1.2 About this product

The tank heat transfer module is a premounted fitting group checked for tightness and used to transfer the heat between a heat source (f. ex. buffer tank, boiler) and a (domestic hot water) storage tank. It contains a preset controller and important fittings for the operation of the system:

- Ball valves in the primary circuit (heat source, f. ex. buffer tank, boiler)
- Check valves to avoid undesired gravity circulation in the flow and return of the primary circuit
- Piston valves in the secondary circuit (domestic hot water circuit)
- Pressure relief valve in the secondary circuit to avoid inadmissible overpressures in the module
- Fill and drain valve for draining the heat exchanger
- Vent plug for venting the heat exchanger
- Electronic flow rate sensor FlowSonic in the secondary circuit as well as integrated temperature sensors for a performance-related speed control of the pumps and heat quantity measurement (secondary)

The switch valve (Midi: Item no. 640423; Maxi: Item no. 640424) for the stratified storage tank is not part of this module and must be ordered separately.
The withdrawal valve (Item no. 640422) for the sterile withdrawal of water according to the German Drinking Water Ordinance (TrinkwV 2011) is also available separately.

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

1.3 Designated use

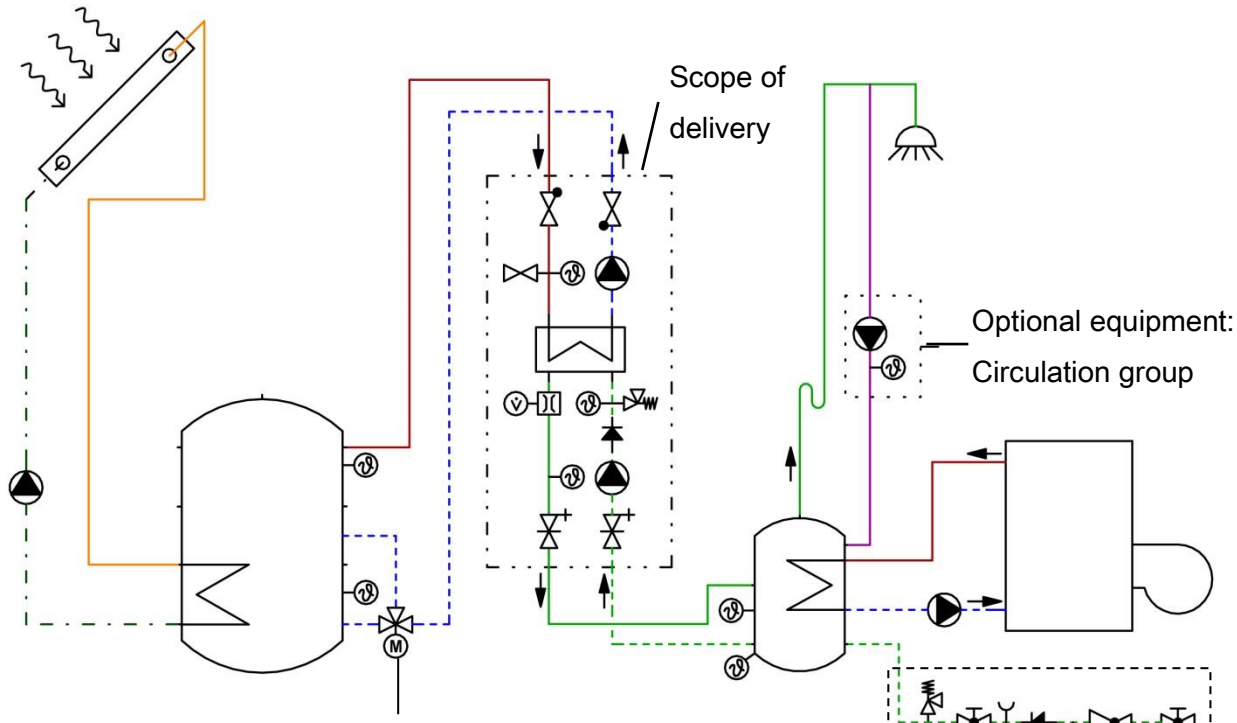
The tank heat transfer module may only be mounted in heating installations for the heat transfer between the heat source (f. ex. buffer tank, boiler) and the domestic hot water tank. Due to its design, the station must only be mounted and operated as described in these instructions!
The technical data specified in these instructions must be observed.

Only use PAW accessories with the domestic hot water module.

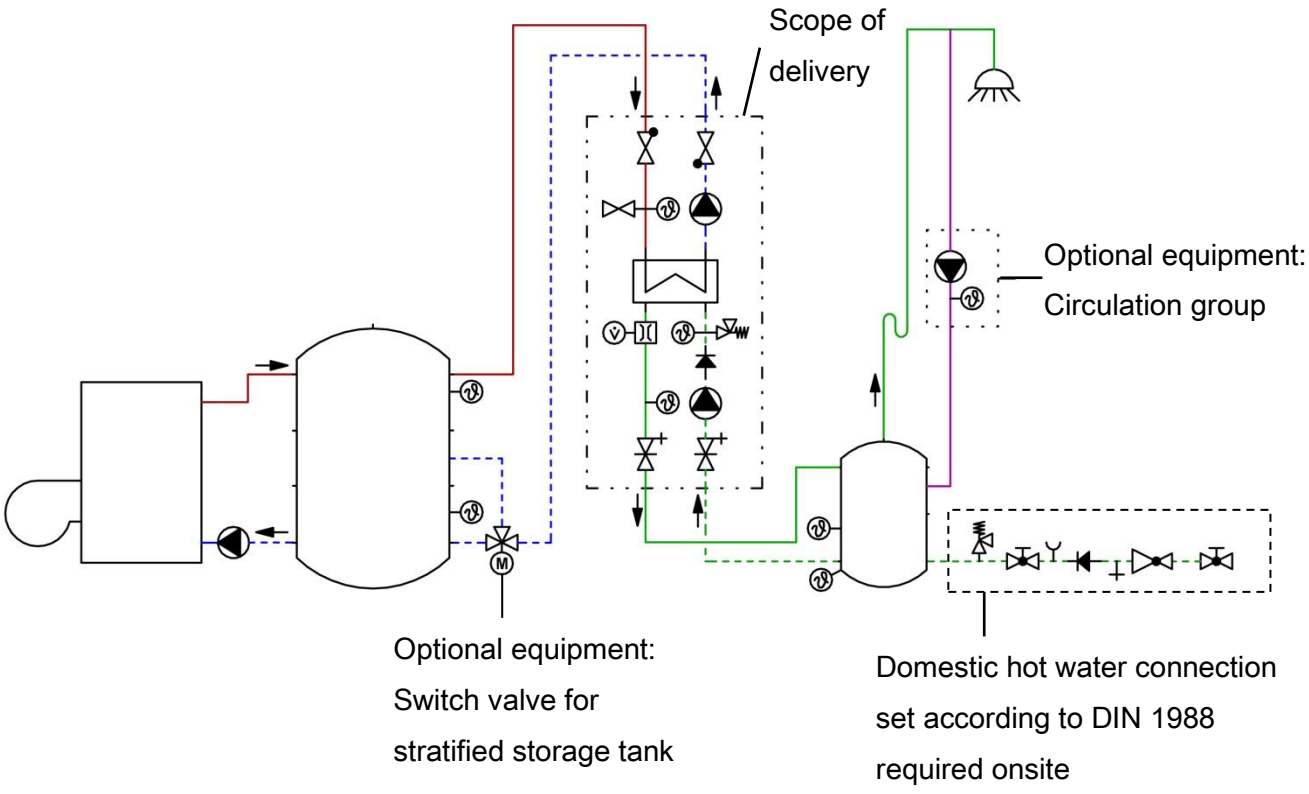
Improper usage excludes any liability claims.

The tank heat transfer module can be installed in different systems. It is mandatory to select the corresponding system in the controller (see controller instructions).
The following figures show different connection options of the tank heat transfer module.

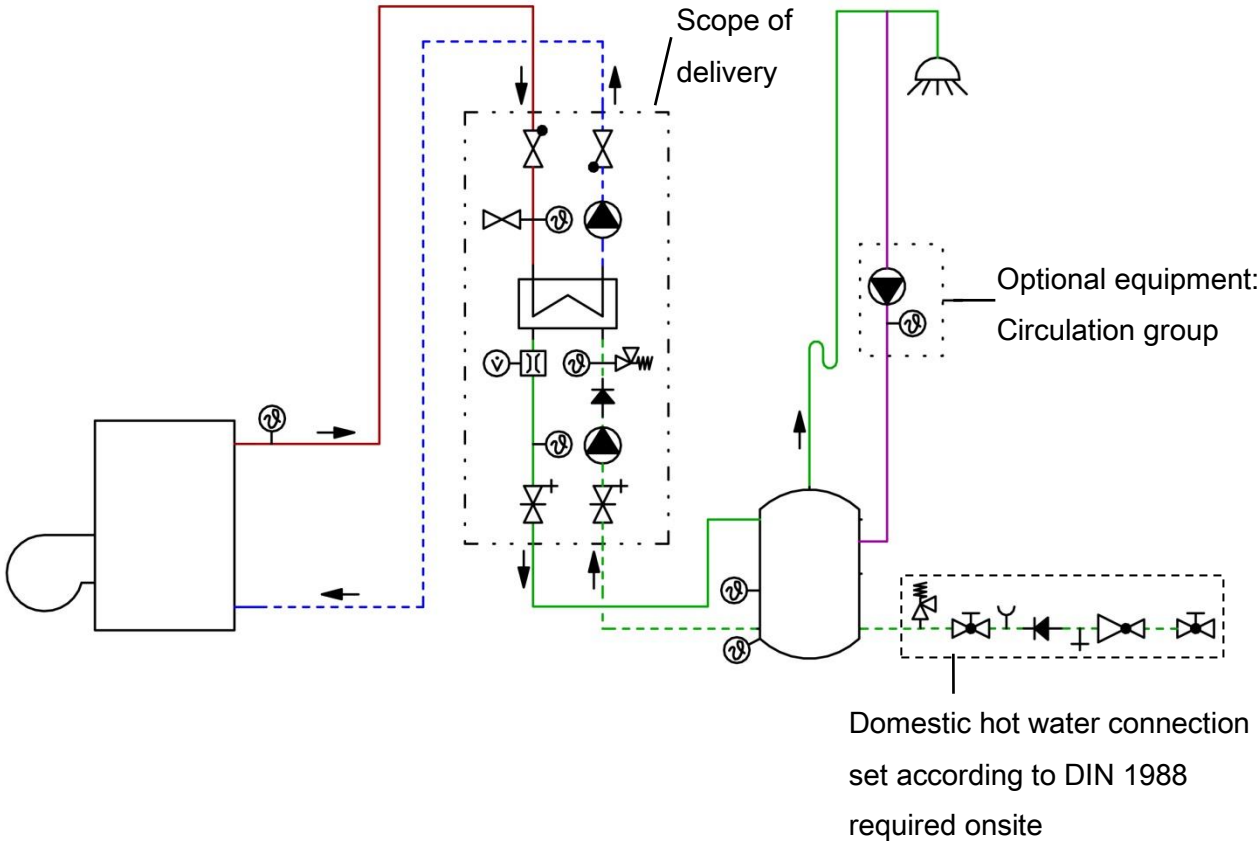
- **as preheating station** = system 1 (scheme as an example):



- **as storage tank module with buffer tank** = system 2 (scheme as an example):



- **as storage tank module without buffer tank** = system 3 (scheme as an example):



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 of this manual

⚠ CAUTION

Risk of burns!

The valves, fittings and the pump may heat up to more than 95 °C during operation.

➢ The insulating shell must remain closed during operation.

NOTICE

Material damage due to mineral oils!

Mineral oil products cause lasting damage to seals made of EPDM, whereby the sealant properties get 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.

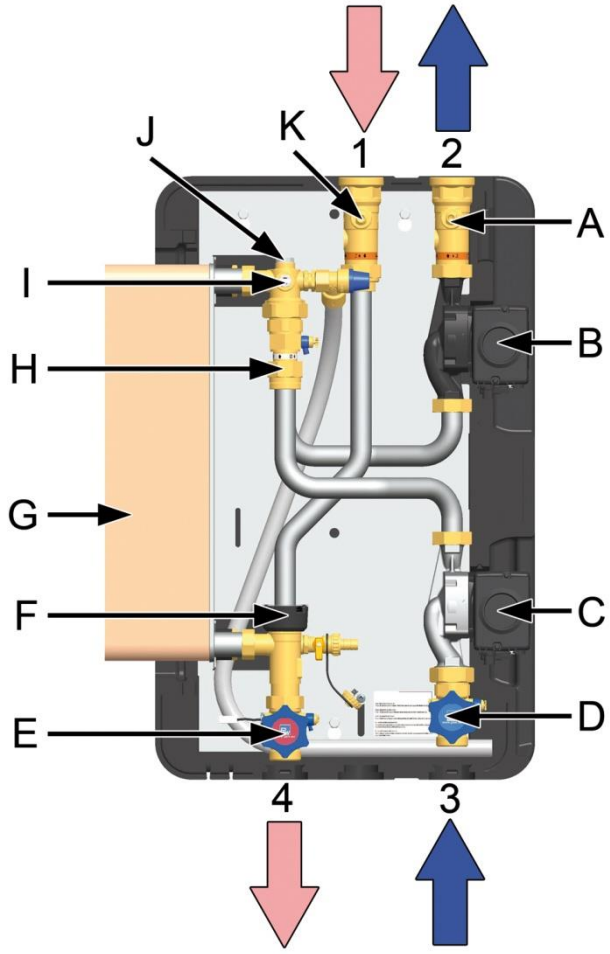
➢ Use a lubricant based on silicone or polyalkylene and free of mineral oils, such as Unisilikon L250L and Syntheso Glep 1 of the Klüber company or a silicone spray.

NOTICE

Malfunction!

➢ The tank heat transfer module must be integrated in the potential equalisation of the electric installation. This can be guaranteed by establishing a potential equalisation connection to the main potential connection according to regulations or by the connected pipe system.

3 Product description



Example: Tank heat transfer module Maxi

Connections

1 Primary side:
Flow from the heat source

2 Primary side:
Return to the heat source

3 Secondary side:
Return from the domestic hot water tank

4 Secondary side:
Flow to the domestic hot water tank

Equipment

A Ball valve with check valve

B Primary pump

C Secondary pump

D Piston valve with drain valve

E Piston valve with drain valve and temperature sensor

F Flow rate sensor FlowSonic

G Plate heat exchanger

H Non-return valve with drain valve

I 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!)

J Vent valve (primary circuit)

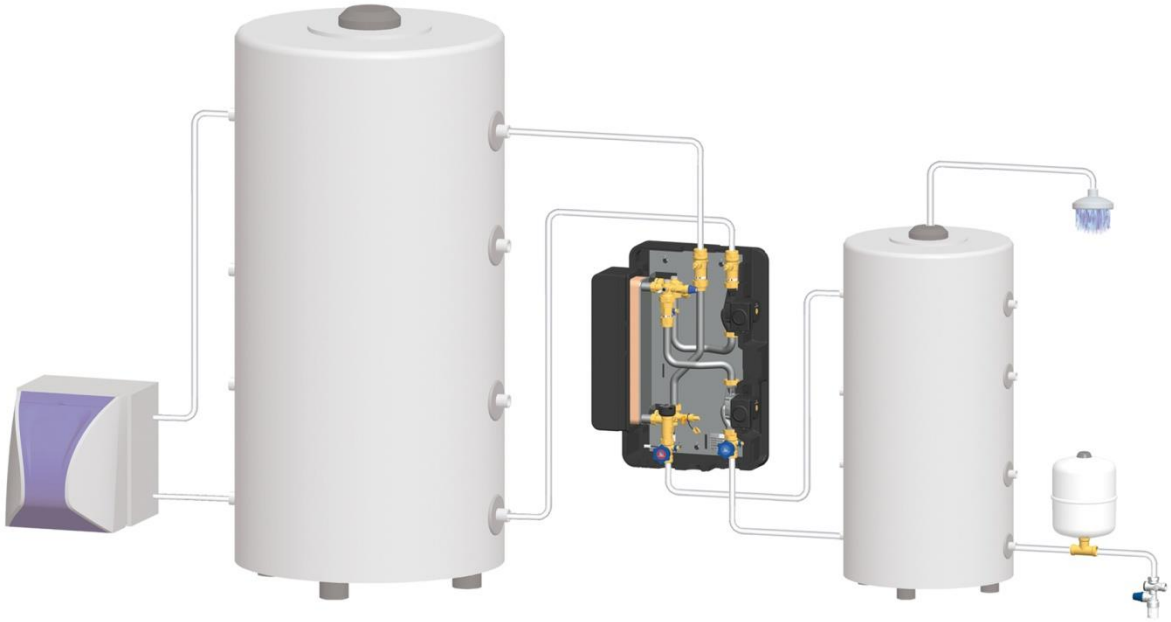
K Ball valve with check valve

4 Dimensioning and planning

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

The tank heat transfer module will only work flawlessly if the installation meets certain requirements. Please take some time to plan the installation.

Mounting example



Tank heat transfer module as storage tank module with buffer tank

4.1 Performance data tank heat transfer module Midi

Domestic hot water temperature set at the controller	Cold water inlet temperature	Flow temperature of the heat source	Maximum transmissible power		Return temperature of the heat source
50 °C	10 °C	55 °C	66,4 kW *1)	24.0 l/min	22.8 °C
		60 °C	83,7 kW *1)	30.2 l/min	19.2 °C
		70 °C	91,5 kW *2)	33.0 l/min	15.4 °C
55 °C	10 °C	60 °C	72,7 kW *1)	23.3 l/min	24.6 °C
		70 °C	102,9 kW *2)	33.0 l/min	18.3 °C
60 °C	10 °C	70 °C	97,7 kW *1)	28.2 l/min	22.2 °C
Recharging mode					
50 °C	45 °C	55 °C	11,4 kW *2)	33.0 l/min	45.2 °C
55 °C	50 °C	60 °C	11,4 kW *2)	33.0 l/min	50.2 °C
60 °C	55 °C	70 °C	11,3 kW *2)	33.0 l/min	55.0 °C

*1) Maximum flow rate primary = 30 l/min ≙ 2.0 m of residual head of the primary pump

*2) Maximum flow rate secondary = 33 l/min ≙ 2.0 m of residual head of the secondary pump

4.2 Performance data tank heat transfer module Maxi

Domestic hot water temperature set at the controller	Cold water inlet temperature	Flow temperature of the heat source	Maximum transmissible power		Return temperature of the heat source
50 °C	10 °C	55 °C	127,8 kW *1)	46.0 l/min	23.9 °C
		60 °C	162,9 kW *1)	58.7 l/min	20.4 °C
		70 °C	174,7 kW *2)	63.0 l/min	15.8 °C
55 °C	10 °C	60 °C	170,1 kW *1)	44.9 l/min	26.0 °C
		70 °C	196,6 kW *2)	63.0 l/min	19.4 °C
60 °C	10 °C	70 °C	190,1 kW *1)	54.9 l/min	23.6 °C
Recharging mode					
50 °C	45 °C	55 °C	21,6 kW *2)	63.0 l/min	45.2 °C
55 °C	50 °C	60 °C	21,6 kW *2)	63.0 l/min	50.2 °C
60 °C	55 °C	70 °C	21,6 kW *2)	63.0 l/min	55.1 °C

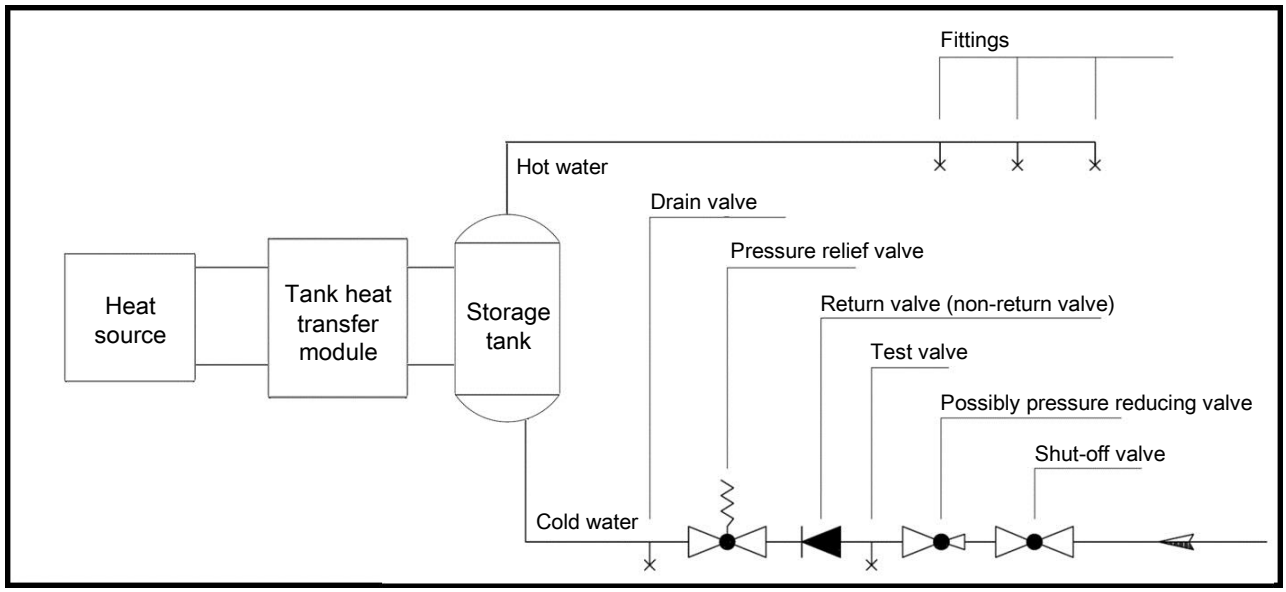
*1) Maximum flow rate primary = 60 l/min ≙ 2.0 m of residual head of the primary pump

*2) Maximum flow rate secondary = 63 l/min ≙ 2.0 m of residual head of the secondary pump

5 Assembly and installation [specialist]

The tank heat transfer module must only be connected with the heat source by separate connections for flow and return. External pumps must not be installed between the tank heat transfer 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)!



NOTICE

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.

NOTICE

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 tank heat transfer module, we recommend the installation of water hammer arresters close to the place where these pressure surges may be caused.

WARNING

Risk to life and limb due to electric shock!

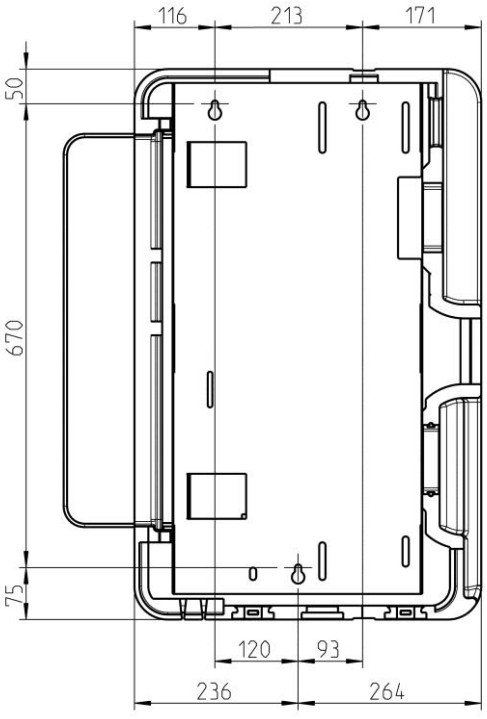
- Prior to commencing electrical work on the controller, pull the mains plug!
- Only after completing all installation work, the mains plug of the controller can be plugged into a socket. Thus, an unintentional start of the motors is avoided.

NOTICE

Damage to property!

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

1. Determine the mounting location of the tank heat transfer module near the heat source.
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, so 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 tank heat transfer module onto the screws. Tighten the screws, so that the sides of the insulation are flush to the wall.



9. Pipe the module with the installation according to the adjacent illustration.

1 **Primary side:**
Flow from the heat source
Connection **Midi**: 1½" external thread
Connection **Maxi**: 2" external thread

2 **Primary side:**
Return to the heat source
Connection **Midi**: 1½" external thread
Connection **Maxi**: 2" external thread

3 **Secondary side:**
Return from the domestic hot water tank
Connection **Midi**: 1" external thread, flat sealing
Connection **Maxi**: 1¼" external thread, flat sealing

4 **Secondary side:**
Flow to the domestic hot water tank
Connection **Midi**: 1" external thread, flat sealing
Connection **Maxi**: 1¼" external thread, flat sealing

Pipe distance to the wall (primary) = 95 mm

Pipe distance to the wall (secondary) = 167 mm

6 Commissioning [specialist]

Note!

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

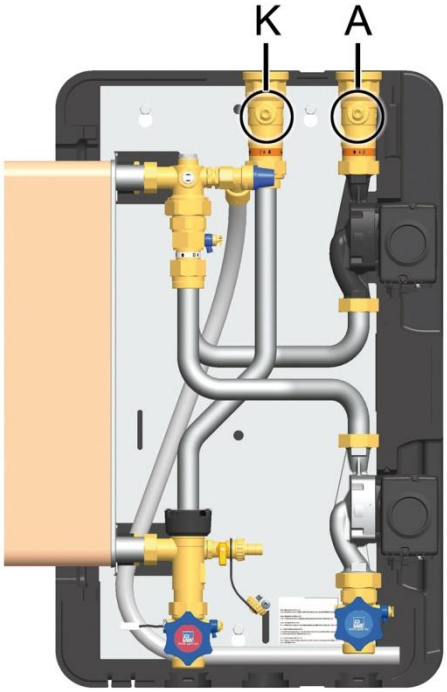
Functioning check valve

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

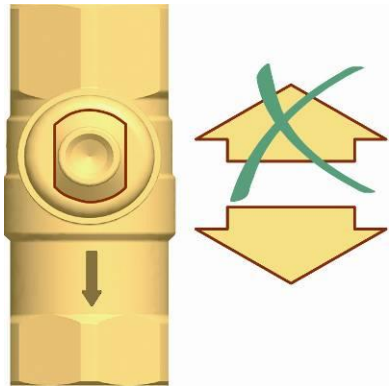
For venting and flushing the installation, the check valves must be open. Turn the ball valves therefore into position **45°.**

The check valve is not operating.

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

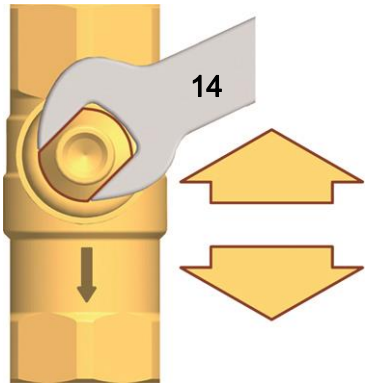


Position 0°



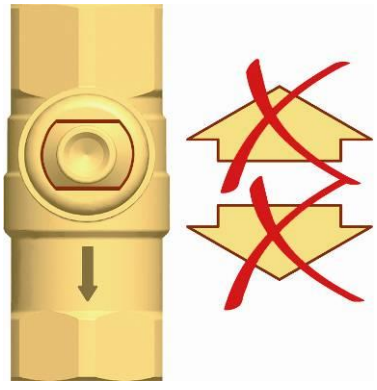
Check valve is operating,
flow only in flow direction.

Position 45°



Check valve is not operating,
flow in both directions.

Position 90°



Ball valve closed,
no flow.

6.1 Filling the primary circuit

WARNING

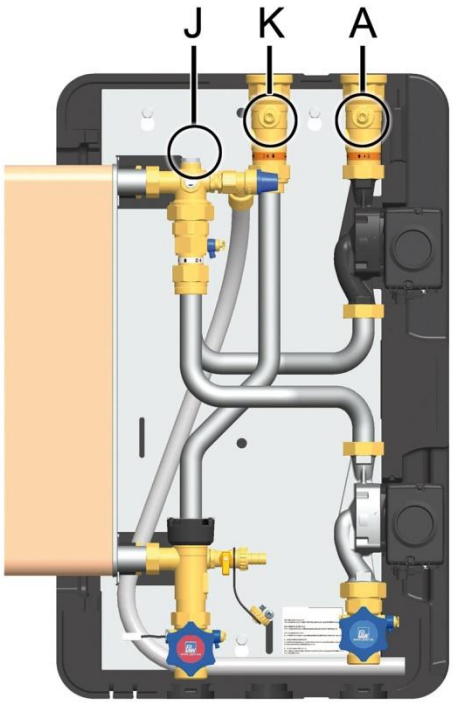
Danger of scalding due to hot water!

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.

- ➢ Open the vent valve slowly and with sufficient distance.

If the storage tank is (partly) filled

1. Open the ball valves [A] and [K] and put the check valves out of operation (**45°**, see page 16).
2. Fill the storage tank using the fill valves available on site until an operating pressure of about 1.5 bars* is reached. Use appropriate water according to VDI 2035 / ÖNorm H5195-1.
3. Manipulate the vent valve (J) cautiously to let the air escape. Make sure that the electrical components do not get wet.
4. Close the vent valve (J).
5. Check the operating pressure of the storage tank after the venting and increase the pressure if necessary.
6. Open the ball valves [A] and [K] completely by turning them into position **0°**.



* 1.5 bars in the primary circuit = recommended minimum value

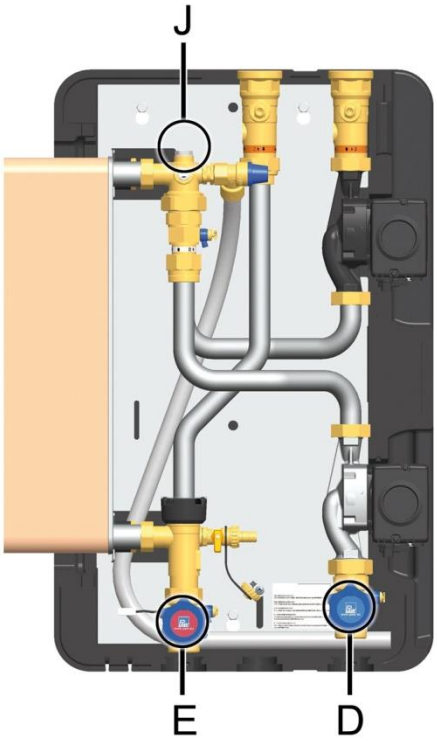
The pressure also depends on the individual system pressures and on the components of the heating installation!

6.2 Filling the secondary circuit

The secondary circuit is filled via the valves at the domestic hot water tank. Make sure that only potable water must be used.

To avoid that dirt particles are washed into the heat exchanger, shut the piston valves of the station and flush out the dirt particles present in the tank **before** the first commissioning.

1. Open the piston valves [D|E].
2. Vent the secondary circuit by actuating the vent valve [J].
   Make sure that the electrical components do not get wet.
3. Fill the secondary circuit via the valves at the domestic hot water tank.
4. During commissioning, vent the station at the vent valve [J] to eliminate the air still present in the heat exchanger.



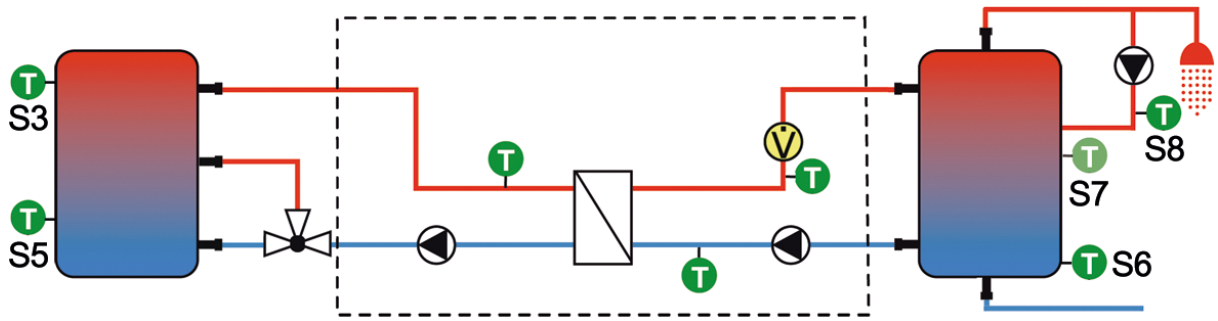
6.3 Controller connection

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.
  Thus, an unintentional start of the motors is avoided.

Connection scheme of the tank heat transfer module



Basic system with optional stratification return and circulation pump

Please observe the separate instructions of the controller FC4.13!

1. Connect the temperature sensors to the controller:
   - S3: Flow heat source or boiler output
   - S6: Domestic hot water tank bottom
   - S7: Domestic hot water tank centre, below the circulation inlet

   Optional: S5: for stratification return
   S8: for circulation
2. Tighten all union nuts and thread connections.

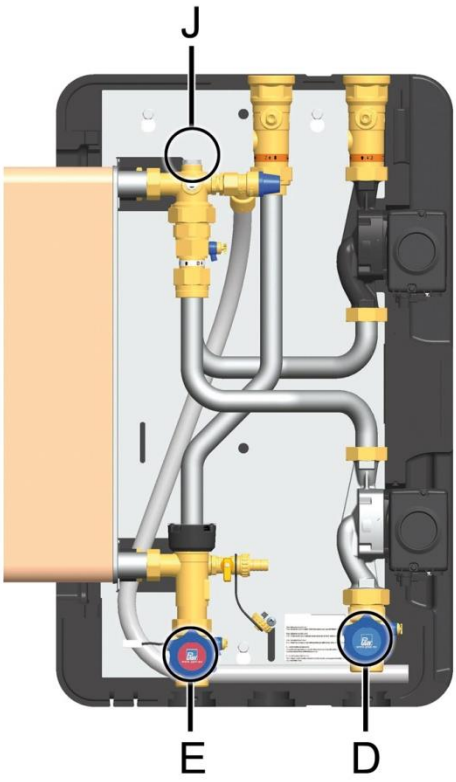
6.4 Commissioning of the controller

WARNING

Risk to life and limb due to electric shock!

- Check if the sensors and the pumps are properly connected to the controller and if the controller housing is closed.
- Only under these circumstances, the mains plug of the controller can be plugged into a socket.

1. Connect the tank heat transfer module to the mains (230 V, 50-60 Hz) with the premounted connection cable.
2. Select the manual mode ("HE1") in the main menu of the controller. Switch on the PWM signal of the pump ("100 %"), see controller instructions.
3. Let the pump run for several minutes to vent the module.
4. If the air noises do not stop, carefully manipulate the vent valve [J] while the pump is still running and let the air escape.
5. If the air noises have stopped, the pump can be switched off. For this purpose, select the manual mode ("HE1") in the main menu of the controller.
6. Repeat the steps 2 - 5 to vent the secondary circuit. For this purpose, select the manual mode ("HE2") in the main menu of the controller.
7. Set the pumps to automatic operation ("Auto").



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 integration of the tank heat transfer module in the potential equalisation of the installation is correct.
10. Set the desired domestic hot water temperature at the controller (see page 21). Please observe the controller instructions for the setting of further system-relevant parameters.
11. The tank heat transfer module is now ready for operation.

6.5 Adjustment of the temperature

During commissioning, set the desired (maximum) domestic hot water temperature in the commissioning menu of the controller (see controller instructions).
After commissioning, the desired (maximum) domestic hot water temperature can be adapted under "Storage tank charging".

WARNING

Danger of scalding due to hot water!

In order to avoid scalding at the tap, the maximum domestic hot water temperature set at the controller must not exceed **60 °C**.

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 buffer tank / boiler temperature 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 following tables illustrate the relation between the flow temperature, the back-up heating capacity needed at the corresponding revolution speed of the secondary pump and the corresponding flow rate.
The return flow temperature is calculated at a cold water temperature of 10 °C.
Please note:

- The maximum flow rate of the domestic hot water charge pump depends on the length and the form of the components integrated in the pipelines. A PWM signal of 90% corresponds to the maximum flow rate of the pump. An increase of the PWM signal above 90% does not lead to any performance increase of the pump.
- The performances indicated in the following table can only serve as an approximate value for the dimensioning of the back-up heating. Because of pressure losses and different insulations of the buffer charging circuit, the required performances can be higher as indicated in order to assure a continuous hot water supply.
- If the module is used as storage tank module without buffer tank (system 3), the performance of the module must be adapted to the performance of the boiler by means of the revolution speed of the secondary pump. Only in this way, a switching of the boiler is avoided and it is assured that the desired domestic hot water temperature is achieved.

6.5.1 Performance data tank heat transfer module Midi

Flow temperature of the back-up heating	DHW temperature set at the controller	Back-up heating capacity needed for x % secondary pump (PWM2) and corresponding flow rate (calculated for a cold water temperature of 10 °C)							Return temperature to the buffer tank
		30%	40%	50%	60%	70%	80%	90%	
		9 l/min	14 l/min	19 l/min	25 l/min	29 l/min	31 l/min	33 l/min	
45 °C	40 °C	18 kW	29 kW	39 kW	52 kW	60 kW	64 kW	68 kW	20 °C
50 °C	40 °C	18 kW	29 kW	39 kW	52 kW	60 kW	64 kW	68 kW	17 °C
	45 °C	**21 kW**	**34 kW**	**46 kW**	**60 kW**	**70 kW**	**75 kW**	**80 kW**	**22 °C**
55 °C	40 °C	18 kW	29 kW	39 kW	52 kW	60 kW	64 kW	68 kW	15 °C
	45 °C	**21 kW**	**34 kW**	**46 kW**	**60 kW**	**70 kW**	**75 kW**	**80 kW**	**18 °C**
	50 °C	**24 kW**	**38 kW**	**52 kW**	**69 kW**	**80 kW**	**85 kW**	**91 kW**	**23 °C**
60 °C	40 °C	18 kW	29 kW	39 kW	52 kW	60 kW	64 kW	68 kW	14 °C
	45 °C	**21 kW**	**34 kW**	**46 kW**	**60 kW**	**70 kW**	**75 kW**	**80 kW**	**17 °C**
	50 °C	**24 kW**	**38 kW**	**52 kW**	**69 kW**	**80 kW**	**85 kW**	**91 kW**	**20 °C**
	55 °C	**28 kW**	**43 kW**	**59 kW**	**77 kW**	**90 kW**	**96 kW**	**102**	**25 °C**
65 °C	40 °C	18 kW	29 kW	39 kW	52 kW	60 kW	64 kW	68 kW	13 °C
	45 °C	**21 kW**	**34 kW**	**46 kW**	**60 kW**	**70 kW**	**75 kW**	**80 kW**	**15 °C**
	50 °C	**24 kW**	**38 kW**	**52 kW**	**69 kW**	**80 kW**	**85 kW**	**91 kW**	**18 °C**
	55 °C	**28 kW**	**43 kW**	**59 kW**	**77 kW**	**90 kW**	**96 kW**	**102**	**21 °C**
	60 °C	31 kW	48 kW	65 kW	86 kW	100	107	114	27 °C
70 °C	40 °C	18 kW	29 kW	39 kW	52 kW	60 kW	64 kW	68 kW	13 °C
	45 °C	**21 kW**	**34 kW**	**46 kW**	**60 kW**	**70 kW**	**75 kW**	**80 kW**	**15 °C**
	50 °C	**24 kW**	**38 kW**	**52 kW**	**69 kW**	**80 kW**	**85 kW**	**91 kW**	**16 °C**
	55 °C	**28 kW**	**43 kW**	**59 kW**	**77 kW**	**90 kW**	**96 kW**	**102**	**19 °C**
	60 °C	31 kW	48 kW	65 kW	86 kW	100	107	114	23 °C
75 °C	40 °C	18 kW	29 kW	39 kW	52 kW	60 kW	64 kW	68 kW	12 °C
	45 °C	**21 kW**	**34 kW**	**46 kW**	**60 kW**	**70 kW**	**75 kW**	**80 kW**	**14 °C**
	50 °C	**24 kW**	**38 kW**	**52 kW**	**69 kW**	**80 kW**	**85 kW**	**91 kW**	**15 °C**
	55 °C	**28 kW**	**43 kW**	**59 kW**	**77 kW**	**90 kW**	**96 kW**	**102**	**18 °C**
	60 °C	31 kW	48 kW	65 kW	86 kW	100	107	114	20 °C

Flow temperature of the back-up heating	DHW temperature set at the controller	Back-up heating capacity needed for x % secondary pump (PWM2) and corresponding flow rate (calculated for a cold water temperature of 10 °C)							Return temperature to the buffer tank
		30%	40%	50%	60%	70%	80%	90%	
		9 l/min	14 l/min	19 l/min	25 l/min	29 l/min	31 l/min	33 l/min	
80 °C	40 °C	18 kW	29 kW	39 kW	52 kW	60 kW	64 kW	68 kW	12 °C
	45 °C	21 kW	34 kW	46 kW	60 kW	70 kW	75 kW	80 kW	13 °C
	50 °C	24 kW	38 kW	52 kW	69 kW	80 kW	85 kW	91 kW	15 °C
	55 °C	28 kW	43 kW	59 kW	77 kW	90 kW	96 kW	102	16 °C
	60 °C	31 kW	48 kW	65 kW	86 kW	100	107	114	19 °C
85 °C	40 °C	18 kW	29 kW	39 kW	52 kW	60 kW	64 kW	68 kW	11 °C
	45 °C	21 kW	34 kW	46 kW	60 kW	70 kW	75 kW	80 kW	12 °C
	50 °C	24 kW	38 kW	52 kW	69 kW	80 kW	85 kW	91 kW	14 °C
	55 °C	28 kW	43 kW	59 kW	77 kW	90 kW	96 kW	102	15 °C
	60 °C	31 kW	48 kW	65 kW	86 kW	100	107	114	17 °C
90 °C	40 °C	18 kW	29 kW	39 kW	52 kW	60 kW	64 kW	68 kW	11 °C
	45 °C	21 kW	34 kW	46 kW	60 kW	70 kW	75 kW	80 kW	12 °C
	50 °C	24 kW	38 kW	52 kW	69 kW	80 kW	85 kW	91 kW	13 °C
	55 °C	28 kW	43 kW	59 kW	77 kW	90 kW	96 kW	102	15 °C
	60 °C	31 kW	48 kW	65 kW	86 kW	100	107	114	16 °C
95 °C	40 °C	18 kW	29 kW	39 kW	52 kW	60 kW	64 kW	68 kW	11 °C
	45 °C	21 kW	34 kW	46 kW	60 kW	70 kW	75 kW	80 kW	12 °C
	50 °C	24 kW	38 kW	52 kW	69 kW	80 kW	85 kW	91 kW	13 °C
	55 °C	28 kW	43 kW	59 kW	77 kW	90 kW	96 kW	102	14 °C
	60 °C	31 kW	48 kW	65 kW	86 kW	100	107	114	16 °C

Example for system 1 and system 2 (tank heat transfer module Midi):

Flow temperature of the back-up heating (heat source): 65 °C

Domestic hot water temperature set at the controller: 50 °C

→ Maximum withdrawal flow rate: 33 l/min (for maximum revolution speed of the secondary pump ≥ 90% [PWM2])

→ Transmission performance: 106 kW

→ Primary return temperature for a withdrawal of 33 litres of domestic hot water/minute: 18 °C

Example for system 3 (tank heat transfer module Midi):

Flow temperature of the heat source = minimum nominal temperature set at the boiler = 65 °C

Domestic hot water temperature set at the controller: 50 °C

For a boiler with a performance of 75 kW, the maximum revolution speed of the secondary pump must be set!

- If the revolution speed of the secondary pump (PWM2) is set too high, the domestic hot water temperature set at the controller will not be achieved!
- If the revolution speed of the secondary pump (PWM2) is set too low, the boiler starts to switch because the performance is not transmitted.

Calculation of the adjustment value:

10 % PWM2 correspond to 11 kW in this range of performance (69 kW - 80 kW =)

1 % PWM2 correspond to approx. 1,1 kW

Increase needed: 75 kW - 69 kW = 6 kW

6 kW : 1,1 kW = approx. 5

69 kW = 60 % PWM2 => 75 kW = 65 % PWM2

NOTICE

Damage to property!

This adjustment value must be checked during commissioning!

Minimally lower domestic hot water temperatures are possibly harmless. If necessary, the maximum boiler temperature must be increased in order to avoid a switching of the boiler!

If the tank heat transfer module operates directly at a heating device (system 3), it must be checked during the planning if it is allowed to run the heating device with the achievable cold return temperatures. Otherwise, a return flow temperature maintenance **and** a hydraulic separator may be necessary!

6.5.2 Performance data tank heat transfer module Maxi

Flow temperature of the back-up heating	DHW temperature set at the controller	Back-up heating capacity needed for x % secondary pump (PWM2) and corresponding flow rate (calculated for a cold water temperature of 10 °C)							Return temperature to the buffer tank
		30%	40%	50%	60%	70%	80%	90%	
		8 l/min	18 l/min	30 l/min	40 l/min	50 l/min	60 l/min	64 l/min	
45 °C	40 °C	17 kW	38 kW	63 kW	83 kW	104	125	133	20 °C
50 °C	40 °C	17 kW	38 kW	63 kW	83 kW	104	125	133	17 °C
	45 °C	19 kW	44 kW	73 kW	97 kW	121	146	155	22 °C
55 °C	40 °C	17 kW	38 kW	63 kW	83 kW	104	125	133	15 °C
	45 °C	19 kW	44 kW	73 kW	97 kW	121	146	155	18 °C
	50 °C	22 kW	50 kW	83 kW	111	139	166	178	23 °C
60 °C	40 °C	17 kW	38 kW	63 kW	83 kW	104	125	133	14 °C
	45 °C	19 kW	44 kW	73 kW	97 kW	121	146	155	17 °C
	50 °C	22 kW	50 kW	83 kW	111	139	166	178	20 °C
	55 °C	25 kW	56 kW	94 kW	125	156	187	200	25 °C
65 °C	40 °C	17 kW	38 kW	63 kW	83 kW	104	125	133	13 °C
	45 °C	19 kW	44 kW	73 kW	97 kW	121	146	155	15 °C
	50 °C	22 kW	50 kW	83 kW	111	139	166	178	18 °C
	55 °C	25 kW	56 kW	94 kW	125	156	187	200	21 °C
	60 °C	28 kW	62 kW	104	138	173	208	222	27 °C
70 °C	40 °C	17 kW	38 kW	63 kW	83 kW	104	125	133	13 °C
	45 °C	19 kW	44 kW	73 kW	97 kW	121	146	155	15 °C
	50 °C	22 kW	50 kW	83 kW	111	139	166	178	16 °C
	55 °C	25 kW	56 kW	94 kW	125	156	187	200	19 °C
	60 °C	28 kW	62 kW	104	138	173	208	222	23 °C
75 °C	40 °C	17 kW	38 kW	63 kW	83 kW	104	125	133	12 °C
	45 °C	19 kW	44 kW	73 kW	97 kW	121	146	155	14 °C
	50 °C	22 kW	50 kW	83 kW	111	139	166	178	15 °C
	55 °C	25 kW	56 kW	94 kW	125	156	187	200	18 °C
	60 °C	28 kW	62 kW	104	138	173	208	222	20 °C

Flow temperature of the back-up heating	DHW temperature set at the controller	Back-up heating capacity needed for x % secondary pump (PWM2) and corresponding flow rate (calculated for a cold water temperature of 10 °C)							Return temperature to the buffer tank
		30%	40%	50%	60%	70%	80%	90%	
		8 l/min	18 l/min	30 l/min	40 l/min	50 l/min	60 l/min	64 l/min	
80 °C	40 °C	17 kW	38 kW	63 kW	83 kW	104 kW	125 kW	133 kW	12 °C
	45 °C	**19 kW**	**44 kW**	**73 kW**	**97 kW**	**121 kW**	**146 kW**	**155 kW**	**13 °C**
	50 °C	**22 kW**	**50 kW**	**83 kW**	**111 kW**	**139 kW**	**166 kW**	**178 kW**	**15 °C**
	55 °C	**25 kW**	**56 kW**	**94 kW**	**125 kW**	**156 kW**	**187 kW**	**200 kW**	**16 °C**
	60 °C	28 kW	62 kW	104 kW	138 kW	173 kW	208 kW	222 kW	19 °C
85 °C	40 °C	17 kW	38 kW	63 kW	83 kW	104 kW	125 kW	133 kW	11 °C
	45 °C	**19 kW**	**44 kW**	**73 kW**	**97 kW**	**121 kW**	**146 kW**	**155 kW**	**12 °C**
	50 °C	**22 kW**	**50 kW**	**83 kW**	**111 kW**	**139 kW**	**166 kW**	**178 kW**	**14 °C**
	55 °C	**25 kW**	**56 kW**	**94 kW**	**125 kW**	**156 kW**	**187 kW**	**200 kW**	**15 °C**
	60 °C	28 kW	62 kW	104 kW	138 kW	173 kW	208 kW	222 kW	17 °C
90 °C	40 °C	17 kW	38 kW	63 kW	83 kW	104 kW	125 kW	133 kW	11 °C
	45 °C	**19 kW**	**44 kW**	**73 kW**	**97 kW**	**121 kW**	**146 kW**	**155 kW**	**12 °C**
	50 °C	**22 kW**	**50 kW**	**83 kW**	**111 kW**	**139 kW**	**166 kW**	**178 kW**	**13 °C**
	55 °C	**25 kW**	**56 kW**	**94 kW**	**125 kW**	**156 kW**	**187 kW**	**200 kW**	**15 °C**
	60 °C	28 kW	62 kW	104 kW	138 kW	173 kW	208 kW	222 kW	16 °C
95 °C	40 °C	17 kW	38 kW	63 kW	83 kW	104 kW	125 kW	133 kW	11 °C
	45 °C	**19 kW**	**44 kW**	**73 kW**	**97 kW**	**121 kW**	**146 kW**	**155 kW**	**12 °C**
	50 °C	**22 kW**	**50 kW**	**83 kW**	**111 kW**	**139 kW**	**166 kW**	**178 kW**	**13 °C**
	55 °C	**25 kW**	**56 kW**	**94 kW**	**125 kW**	**156 kW**	**187 kW**	**200 kW**	**14 °C**
	60 °C	28 kW	62 kW	104 kW	138 kW	173 kW	208 kW	222 kW	16 °C

Example for system 1 and system 2 (tank heat transfer module Maxi):

Flow temperature of the back-up heating (heat source): 65 °C

Domestic hot water temperature set at the controller: 50 °C

→ Maximum withdrawal flow rate: 64 l/min (for maximum revolution speed of the secondary pump ≥ 90% [PWM2])

→ Transmission performance: 178 kW

→ Primary return temperature for a withdrawal of 64 litres of domestic hot water/minute: 18 °C

Example for system 3 (tank heat transfer module Maxi):

Flow temperature of the heat source = minimum nominal temperature set at the boiler = 65 °C

Domestic hot water temperature set at the controller: 50 °C

For a boiler with a performance of 150 kW, the maximum revolution speed of the secondary pump must be set!

- If the revolution speed of the secondary pump (PWM2) is set too high, the domestic hot water temperature set at the controller will not be achieved!
- If the revolution speed of the secondary pump (PWM2) is set too low, the boiler starts to switch because the performance is not transmitted.

Calculation of the adjustment value:

10 % PWM2 correspond to 27 kW in this range of performance (166 kW - 139 kW =)

1 % PWM2 correspond to 2,7 kW

Increase needed: 150 kW - 139 kW = 11 kW

11 kW : 2,7 kW = 4

139 kW = 70 % PWM2 => 150 kW = 74 % PWM2

NOTICE

Damage to property!

This adjustment value must be checked during commissioning!

Minimally lower domestic hot water temperatures are possibly harmless. If necessary, the maximum boiler temperature must be increased in order to avoid a switching of the boiler!

If the tank heat transfer module operates directly at a heating device (system 3), it must be checked during the planning if it is allowed to run the heating device with the achievable cold return temperatures. Otherwise, a return flow temperature maintenance **and** a hydraulic separator may be necessary!

6.6 Circulation mode

The controller can optionally actuate a circulation pump.

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

- **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 required temperature has been reached or after the end of the chosen period of time.

- **Time- and temperature-dependant operation:**

  This operation mode combines the time- and the temperature-dependant operation. The circulation is only actived if the temperature at the circulation temperature sensor falls below the required value and if the time window is active.

NOTICE

Damage to property!

When the DHW module is delivered, the circulation is not activated (see controller instructions). 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 %).

7 Maintenance [specialist]

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

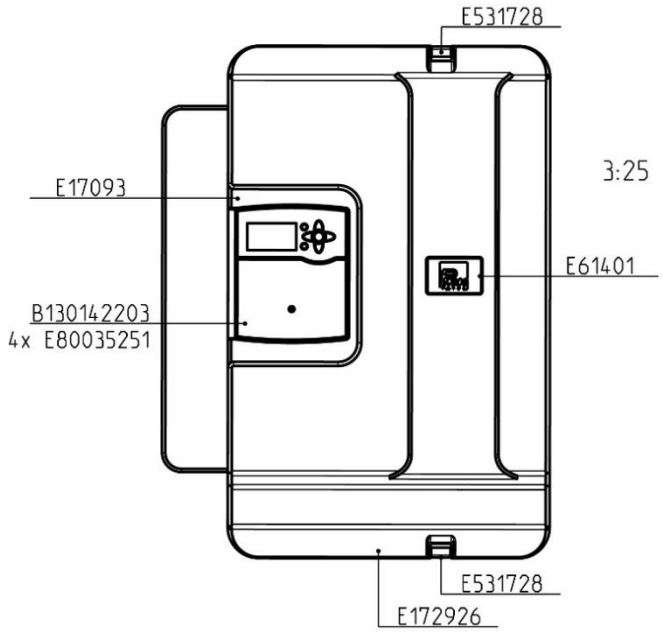
8 Spare parts [specialist]

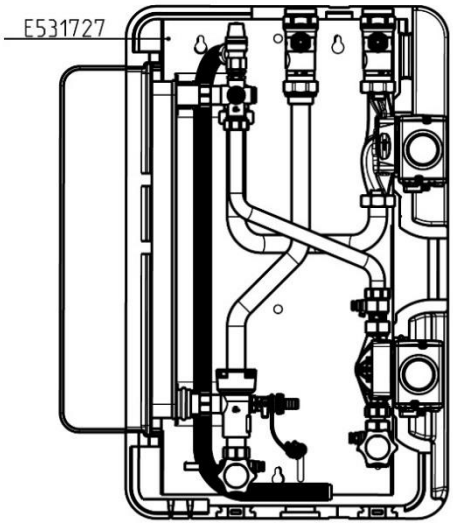
NOTICE

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

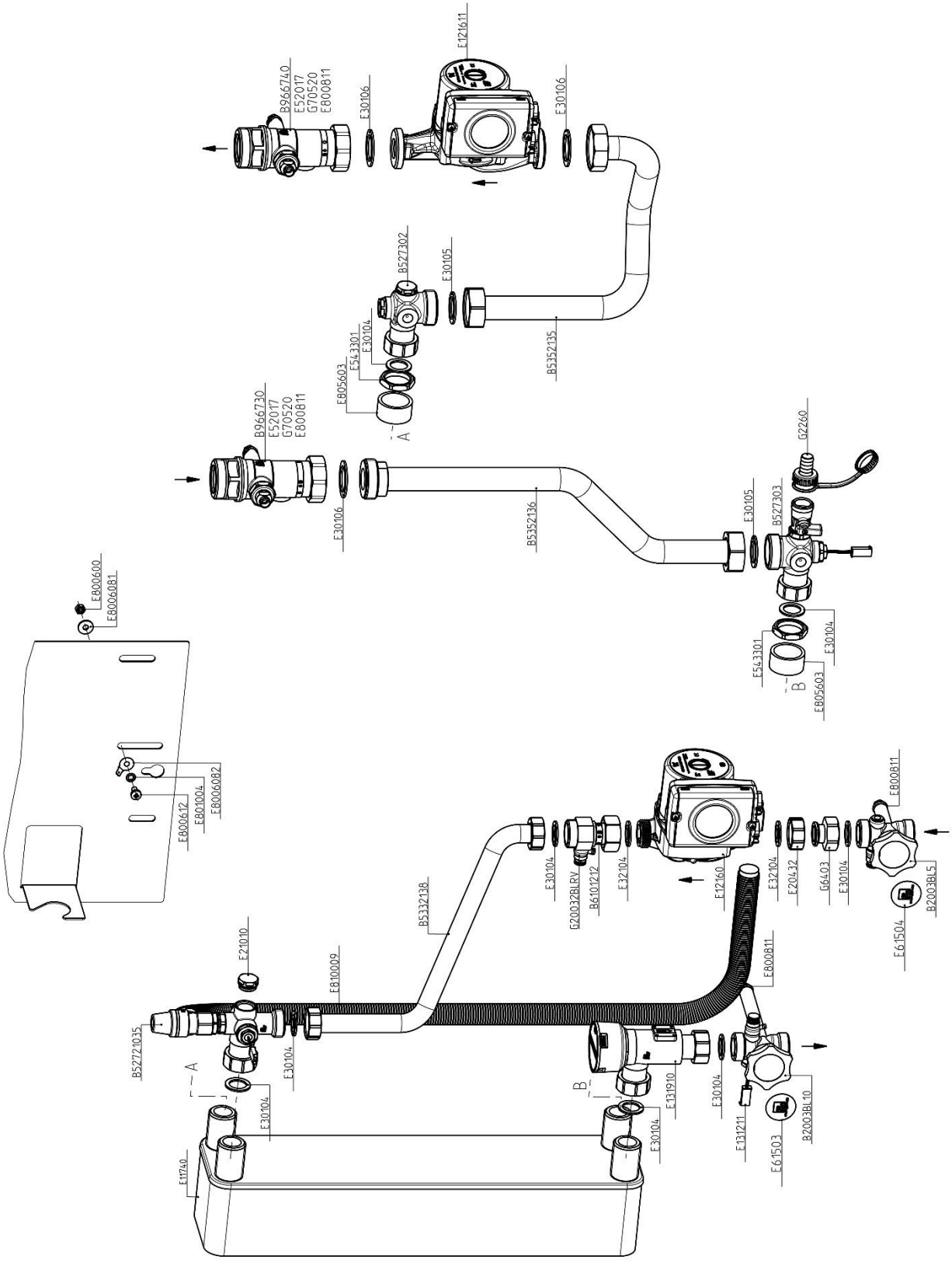
The serial number is placed in the lower right corner of the support sheet of the station.

8.1 Insulation and controller tank heat transfer module Midi (6435445)

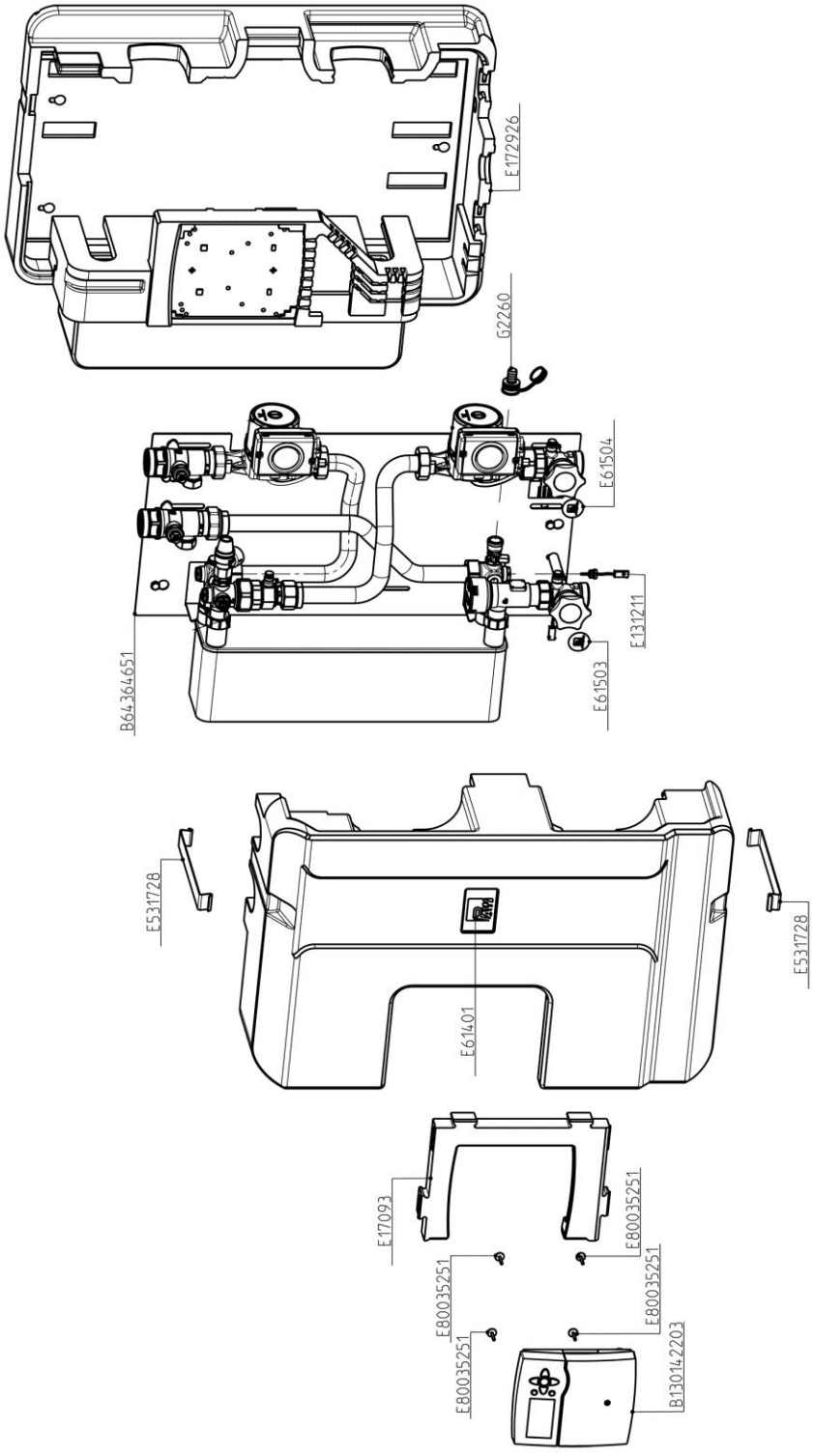




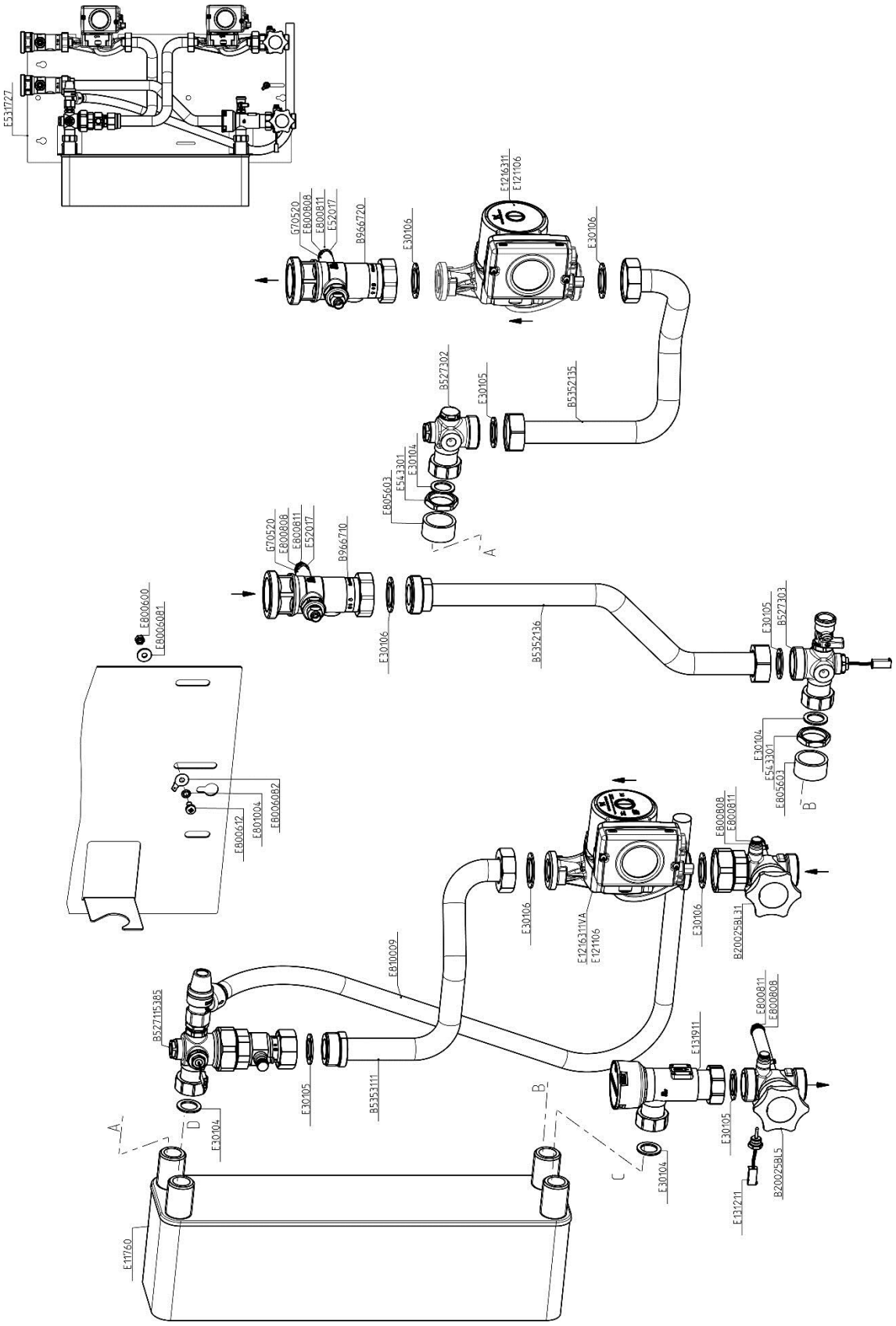
8.2 Hydraulics tank heat transfer module Midi (6435445)



8.3 Insulation and controller tank heat transfer module Maxi (6436465)



8.4 Hydraulics tank heat transfer module Maxi (6436465)

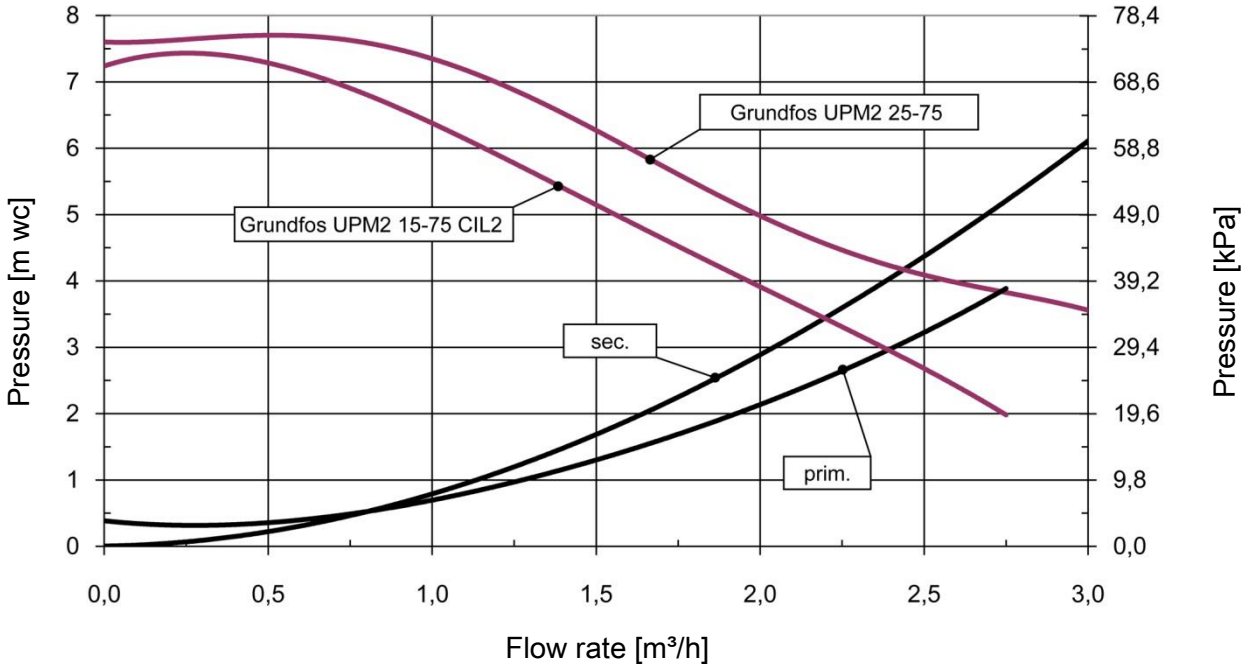


9 Technical data

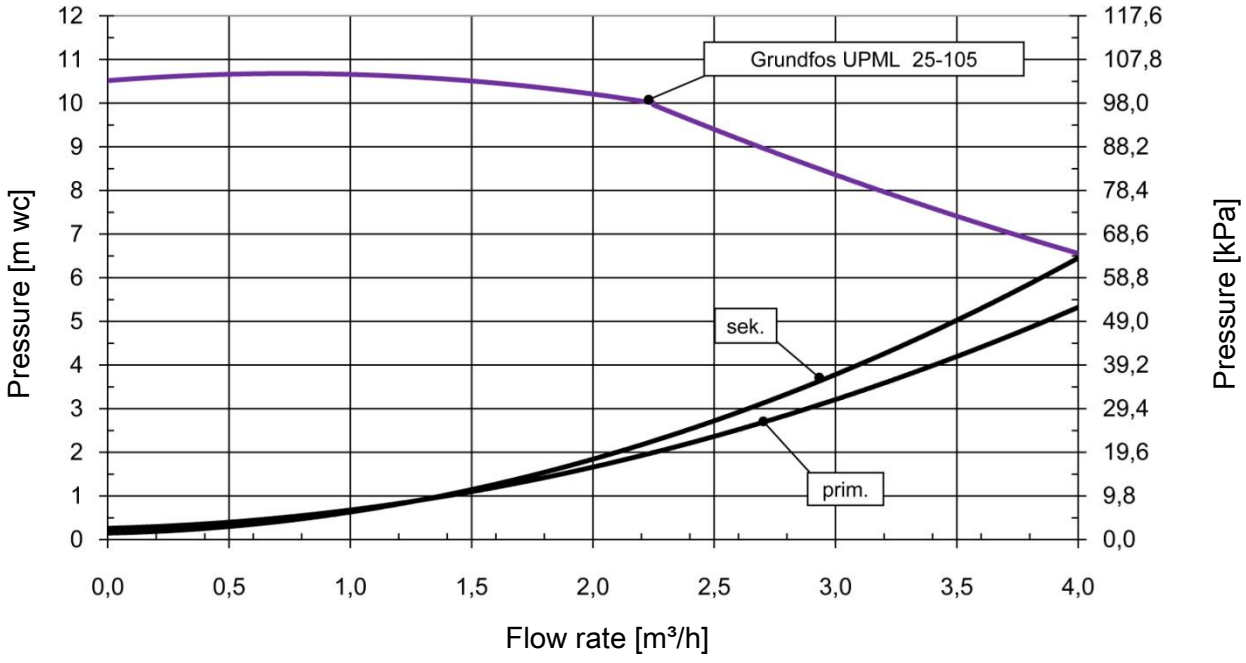
Dimensions	Tank heat transfer module Midi	Tank heat transfer module Maxi
Height (with insulation)	795 mm	
Width (with insulation)	602 mm	
Depth (with insulation)	298 mm	
Centre distance top	120 mm	
Centre distance bottom	220 mm	
Pipe connections		
Primary circuit (buffer tank circuit)	1½" external thread	2" external thread
Secondary circuit (domestic hot water circuit)	1" external thread, flat sealing	1¼" external thread, flat sealing
Operating data		
Maximum admissible pressure	Primary: 3 bars, secondary: 10 bars	
Operating temperature	2 – 95 °C	
Equipment		
Check valve	Primary: 2 x 200 mm wc Secondary: 1 x 150 mm wc	
Primary pump	HE pump with PWM control, 3-70 W	HE pump with PWM control, 3-140 W
Secondary pump	HE pump with PWM control, 3-70 W	HE pump with PWM control, 3-140 W
Heat exchanger	40 plates	60 plates
Flow rate sensor	FlowSonic, measuring range: 1-130 l/min	
Temperature sensor	3 x Pt1000 (integrated), 3 x Pt1000 (enclosed)	
Materials		
Valves and fittings	Brass	
Gaskets: o-rings	Klingersil / EPDM	
Flat sealings	AFM 34, asbestos-free	
Plate heat exchanger	Stainless steel 1.4401 / solder: 99.99% Cu	
Insulation	EPP	
Check valve	Brass	

9.1 Pressure drop characteristic curves

Tank heat transfer module Midi



Tank heat transfer module Maxi



10 Commissioning report

Installation operator				
Location of installation				
Serial numbers:				
Tank heat transfer module				
Flow rate sensor				
Controller				
Software version				
Pipes primary	⌀ =	mm	l =	m
Pipes secondary	⌀ =	mm	l =	m
Other additionally installed components	☐ Return distribution set		☐ Others:	

Have both circuits been correctly flushed and vented? (no air noises in the pump)	☐ Vented
Are all the 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

Plumbing company

Date, signature

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