Tank heat transfer modules

Catalogue 01/2018

Domestic hot water technology

Valid for the UK

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Handwerkergarantie · manufacturer's warranty

PAW

Midi DN 20

Maxi DN 25

Tank heat transfer systems

Description:

Tank heat transfer systems are used to transfer large amounts of energy in small domestic hot water tanks. Thus, small and hygienically unproblematic domestic hot water tanks can be used for large amounts of tapped water or for large tap fluctuations. Furthermore, domestic hot water tanks should be of a small size to assure short "dwell periods" of the potable water and to rapidly heat the potable water as long as it is "fresh".

As a result of the heat exchanger integrated in the installation and not in the storage tank, a nearly arbitrary assignment of heat exchanger performances (or boiler outputs) to the storage tank size is possible. The heat exchanger performance is fully available during the withdrawal of domestic hot water as well as immediately after a tapping process. The generously dimensioned heat exchangers result in a large temperature difference. Tank heat transfer systems are therefore optimally suited for the use in combination with district heating and heating value operation.

Using a tank heat transfer module enables a complete and hygienic heating of the storage tank content. Tank heat transfer systems are designed in such a way that the indicated quantity of potable water (see the output capacity tables on pages 207 and 209) is heated up to the nominal temperature chosen in one passage through the station - without temperature fluctuations or overheating. This is also the case if the storage tank content cools down as a result of a longer service life or of the operation of circulation systems above the nominal temperature. In this case, only a reheating (with a considerably smaller temperature difference) must be assured.

The PAW tank heat transfer module is equipped with a controller which has been developed specifically for this case of operation. The desired nominal temperature is set at the controller. The output of the secondary pump can also be set to reduce the transfer capacity or to adapt f. ex. to smaller boilers.

Furthermore, a circulation pump (unregulated as well as controlled by PWM signal) can be connected with the controller. An additional relay can be installed for a targeted stratification. Furthermore, a potential-free relay (f. ex. as boiler demand) and a relay which switches on in parallel with the charging function of the tank heat transfer module are available.

Functioning:

If the temperature in the domestic hot water tank (secondary tank) falls below the nominal temperature set, the charging cycle is started. If the temperature of the heat source is not sufficient, the potential-free relay is switched on (depending on the system) for the reheating demand. If the temperature available on the primary side is not sufficient, the output of the secondary pump is possibly reduced. Depending on the temperatures and the flow rate of the secondary (potable water) side, the primary pump is controlled in such a way that the adjustable nominal temperature is reached. A relay switching on simultaneously with the primary or secondary pump enables the use of a non-return valve or the switching of a 3-way valve (heating operation / domestic hot water operation).

When using a switch valve it is possible, depending on the primary return temperature of the station, to stratify the return flow rate in the primary storage tank in two different levels. An additional relay with a corresponding PWM outlet allows the connection of a controlled circulation pump. The circulation pump can be activated depending on the temperature and the time. Furthermore, the controller contains a time-dependent disinfection control.

## Controller FC4.13 for tank heat transfer module

The controller FC4.13 sets the hot water temperature of the tank heat transfer module via the speed control of the primary pump. The operation of the return distribution valve is an additional function of the controller. Different operating modes are possible which can be adapted to the system requirements. The tank heat transfer module can be used as preheating station or as storage tank system with or without buffer tank.

The pumps are actuated via a PWM signal. An output for switching the return distribution valve is available.

Function overview controller FC4.13

|	
Display	multiline LC-text display, illuminated, with menu navigation (multilingual)
Operation	7 push buttons
Relay outputs	3 x semiconductor relays, 230 V 1 x potential-free relay 4 x PWM signal for speed control
Inputs	9 (10) x Pt1000 1 x impulse input V40
Flow rate sensors	yes
Heat quantity balancing	yes
Return distribution	yes

Preset systems
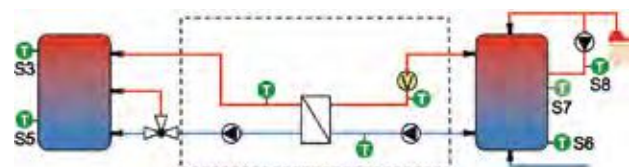
Tank heat transfer module - Basic system with return distribution and circulation

Tank heat transfer module Midi up to 33 l/min (as per SPF LK 1)*
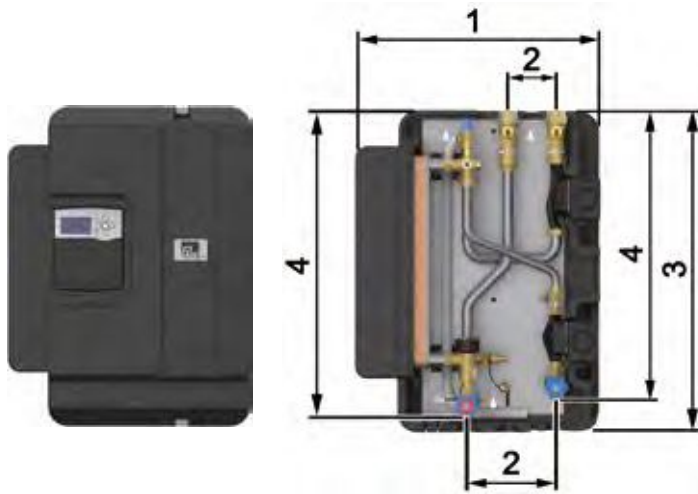
Application range

- for charging/preheating small domestic hot water tanks via large buffer tank systems with high tap performances

The CE-conformity of the module according to DIN EN 60335 has been certified. The module is also SVGW / ACS certified.

Range of application

- in solar thermal systems
- in systems with solid fuel boilers, oil or gas boilers
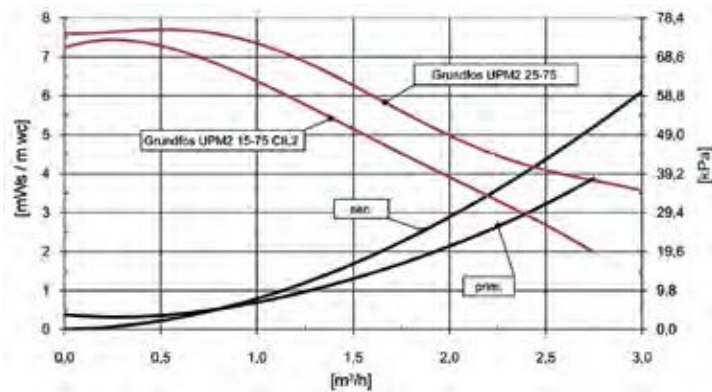- connection to a buffer tank
- up to 33 l/min

Operating data

Max. pressure	prim.: 3 bars, sec.: 10 bars
Max. operating temperature	2-95 °C
Min. flow rate	2 l/min
Max. flow rate	33 l/min
Max. transmission performance	92 kW

Technical data

Equipment		Dimensions		Materials	
Check valve	primary: 2 x 200 mm wc	Nominal diameter	DN 20 (¾")	Valves and fittings	Brass
Heat exchanger	40 plates, type IC25	Connections	prim.: 1½" ext. thread sec.: 1" ext. thread, flat sealing	Gaskets	Flat sealings: AFM34 / EPDM, o-rings: Klingersil / EPDM
Sensors	3 x Pt1000 (integrated) 3 x Pt1000 (enclosed)				
Controller	Controller FC4.13	(1) Width	602 mm	Insulation	EPP
		(2) Centre distance, prim.	120 mm		
		(2) Centre distance, sec.	220 mm		
		(3) Height	795 mm		
		(4) Installation length	757 / 713 mm		
		Depth	298 mm		

Differential pressure diagram

Mounting example tank heat transfer module as storage tank module with buffer tank

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Tank heat transfer module Midi - DN 20 (¾")
Design data, order data

Design data - Tank heat transfer module Midi - DN 20 (¾")

Set hot water temperature	Cold water inlet temperature	Buffer tank flow temperature	Max. transferable power			Buffer tank return temperature
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						
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 °C

*1) Max. flow rate primary = 30 l/min - corresponds to 2.0 m of residual head of the primary pump
*2) Max. flow rate secondary = 33 l/min - corresponds to 2.0 m of residual head of the primary pump

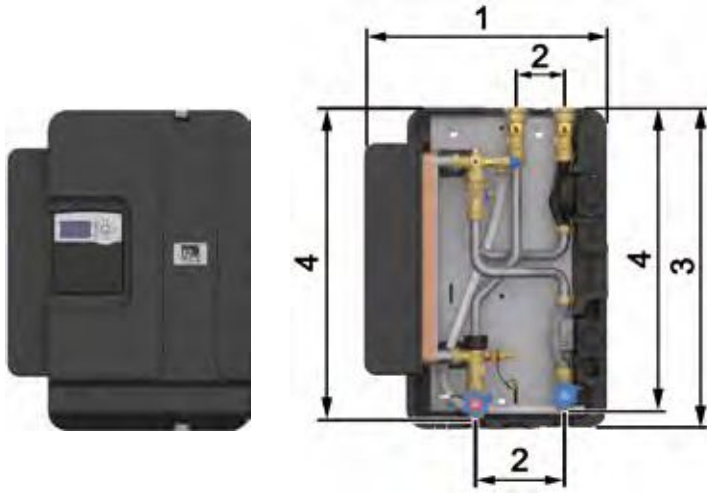| Tank heat transfer module Midi - DN 20 (¾")	Item no.	€ / piece
Tank heat transfer module Midi		
prim.: Grundfos UPM2 25-75, sec.: Grundfos UPM2 15-75 CIL2	**6435445**	-

Accessories

Return distribution set 1¼" internal thread 3-way valve with actuator, setting time 90°: 18 sec., Kvs value: 15 for FriwaMidi, tank heat transfer module Midi	640423	-
Withdrawal valve Flame-treated valves for sterile withdrawal of water. For the subsequent installation inside the DHW module, on each piston valve of the domestic hot water circuit.	640422	-
2-way zone valve - DN 25 (1") for connecting and disconnecting single storage tanks, DN 25, 1" internal thread, setting time for 90°: 30 sec.	563542	-
Circulation set for Friwa Midi-/Maxi-/Mega-Kaskade - with high-efficiency pump Grundfos UPM2 15-75 CIL2 - with piston valves, non-return valve and draining Connection: 1" external thread	6404136GH7	-

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PAW

Tank heat transfer module Maxi
up to 63 l/min (as per SPF LK 1)*

CE · EnEV

Application range

- for charging/preheating small domestic hot water tanks
  via large buffer tank systems with high tap performances

The CE-conformity of the module according to DIN EN 60335 has been certified. The module is also SVGW / ACS certified.

Range of application

- in solar thermal systems
- in systems with solid fuel boilers, oil or gas boilers
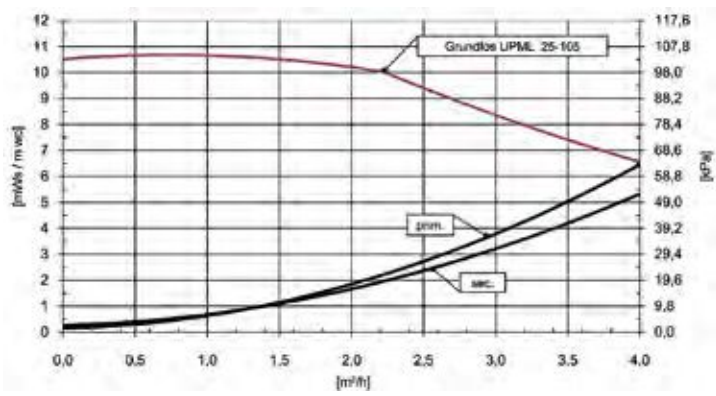- connection to a buffer tank
- up to 63 l/min

Operating data

Max. pressure	prim.: 3 bars, sec.: 10 bars
Max. operating temperature	2-95 °C
Min. flow rate	2 l/min
Max. flow rate	63 l/min
Max. transmission performance	175 kW

Technical data

Equipment

Check valve	primary: 2 x 400 mm wc
Heat exchanger	60 plates, type IC25
Sensors	3 x Pt1000 (integrated) 3 x Pt1000 (enclosed)
Controller	Controller FC4.13

Dimensions

Nominal diameter	DN 25 (1")
Connections	prim.: 2" ext. thread sec.: 1¼" ext. thread, flat sealing
(1) Width	602 mm
(2) Centre distance, prim.	120 mm
(2) Centre distance, sec.	220 mm
(3) Height	795 mm
(4) Installation length	769 / 750 mm
Depth	298 mm

Materials

Valves and fittings	Brass
Gaskets	Flat sealings: AFM34 / EPDM, o-rings: Klingersil / EPDM
Insulation	EPP

Differential pressure diagram

Mounting example tank heat transfer module as storage tank module with buffer tank

Tank heat transfer module

Design data - Tank heat transfer module Maxi - DN 25 (1")

Set hot water temperature	Cold water inlet temperature	Buffer tank flow temperature	Max. transferable power			Buffer tank return temperature
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	140.1 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						
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) Max. flow rate primary = 60 l/min - corresponds to 2.0 m of residual head of the primary pump
*2) Max. flow rate secondary = 63 l/min - corresponds to 2.0 m of residual head of the primary pump

Tank heat transfer module Maxi - DN 25 (1")	Item no.	€ / piece
Tank heat transfer module Maxi		
prim.: Grundfos UPML 25-105 PWM-C, sec.: Grundfos UPML 25-105 N PWM	**6436465**	-

Accessories

		Item no.	€ / piece
	Return distribution set 1¼" internal thread	640424	-
	3-way valve with actuator, setting time for 90°: 35 sec., Kvs value: 16 for FriwaMaxi, tank heat transfer module Maxi		
	Withdrawal valve	640422	-
	Flame-treated valves for sterile withdrawal of water. For the subsequent installation inside the DHW module, on each piston valve of the domestic hot water circuit.		
	2-way zone valve - DN 32 (1¼")	563552	-
	for connecting and disconnecting single storage tanks, DN 32, 1¼" internal thread, setting time for 90°: 30 sec.		
	Circulation set for Friwa Midi-/Maxi-/Mega-Kaskade	6404136GH7	-
	- with high-efficiency pump Grundfos UPM2 15-75 CIL2 - with piston valves, non-return valve and draining Connection: 1" external thread		
	Circulation set for Friwa Midi-/Maxi-/Mega-Kaskade	6404136GH10	-
	- with high-efficiency pump Grundfos UPML 25-105 N - with piston valves, non-return valve and draining Connection: 1½" external thread		

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