

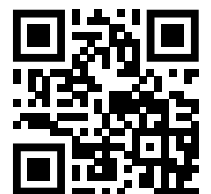


Friwa
Domestic hot water technology



 **Product range Friwa**

Technical data and product information





FriwaMini

FriwaMega

Friwa modules heat domestic water comfortably and hygienically operating on the principle of a flow-type water heater. Other than in conventional domestic hot water tanks, domestic water as food is not used for energy storage and is not stored as domestic hot water for hours or days. An efficient plate heat exchanger heats it when necessary. The energy required for the hygienic heating of the domestic hot water comes from a buffer tank which can be heated via various systems.

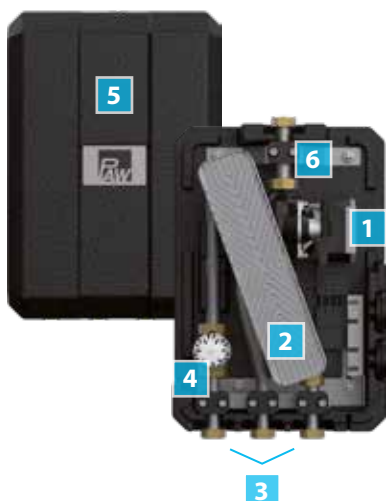
Using efficient plate heat exchangers makes it possible to consistently have low return temperatures, thus increasing the efficiency of systems such as condensing boilers, heat pumps and solar thermal installations.

Advantages of the PAW domestic hot water modules:

- Use in combination with heat pumps possible
- Optional circulation
- Versatile application possibilities due to a great range of performance
- Fast response time thanks to a special control algorithm, greater comfort
- Ideal connection to the building control system via Modbus protocol
- Optional Internet module for system monitoring and parametrisation
- Easy cascading of the modules thanks to premounted pipe sets
- Special heat exchangers for different water qualities (more information on page 9.)



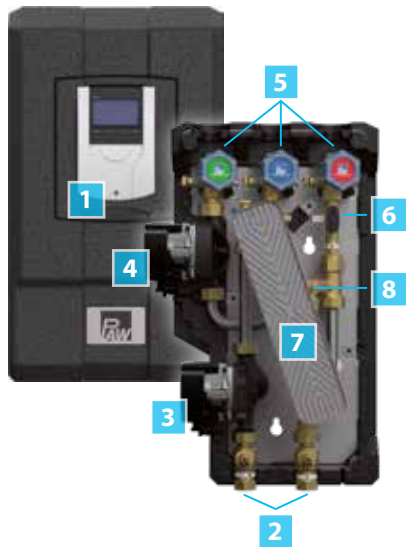
FriwaMicro



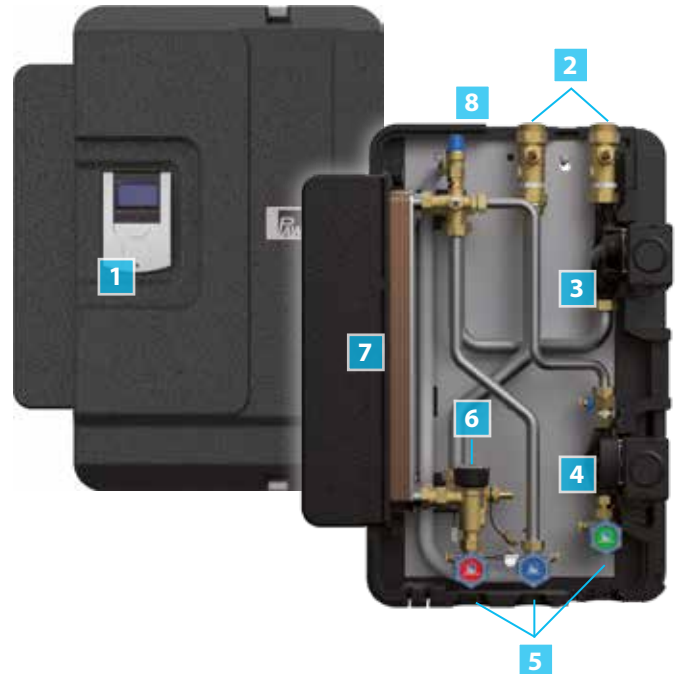
- 1 Primary pump**
High-efficiency pump
- 2 Heat exchanger**
Highly efficient plate heat exchanger, coated premium version optionally available for special water qualities. For further information on the product, see page 9.
- 3 Connections** (from left to right)
Return to the buffer tank
Cold water inlet
Hot water outlet
- 4 Thermostatic valve**
For the setting of the desired temperature range
- 5 Insulation**
- 6 Flow from the buffer tank**



FriwaMini



FriwaMidi/Maxi



FriwaMega



- 1 Friwa controller FC3.10**
with connection to the building control system and optional Internet module
- 2 Shut-off valve**
ball valve with integrated check valve
- 3 Primary pump**
High-efficiency pump
- 4 Circulation pump**
High-efficiency pump; optional for Mini, Midi, Maxi and Mega
- 5 Piston valves**
maintenance-free and easy to service
- 6 Flow rate measurement device**
Measuring range
Mini: 2 – 40 l/min
Midi: 1 – 130 l/min
Maxi: 1 – 130 l/min
Mega: 4 – 260 l/min
- 7 Heat exchanger**
Highly efficient plate heat exchanger, coated premium version optionally available for special water qualities. For further information on the product, see page 9.
- 8 Pressure relief valve**
integrated pressure relief valve, 10 bar



Product range Friwa

The Friwa product range can be adapted to almost every individual demand for domestic hot water. From the FriwaMini in a single-family house to the FriwaMega in the hotel industry, any withdrawal flow rates can be covered comfortably.

Overview domestic hot water modules and equipment					
Module / type	FriwaMicro	FriwaMini	FriwaMidi	FriwaMaxi	FriwaMega
Application range*	up to 20 l/min	up to 28 l/min	up to 50 l/min	up to 77 l/min	up to 123 l/min
Basic module without circulation	6400010	6401510	6405511	6406511	6407511
	6400030 (coated heat exchanger)	6401530 (coated heat exchanger)	6405531 (coated heat exchanger)	6406531 (coated heat exchanger)	6407530 (coated heat exchanger)
Module with circulation (internal)**	thermally controlled	6401515	6405516	6406516	6407517
		6401535 (coated heat exchanger)	6405536 (coated heat exchanger)	6406536 (coated heat exchanger)	6407535 (coated heat exchanger)

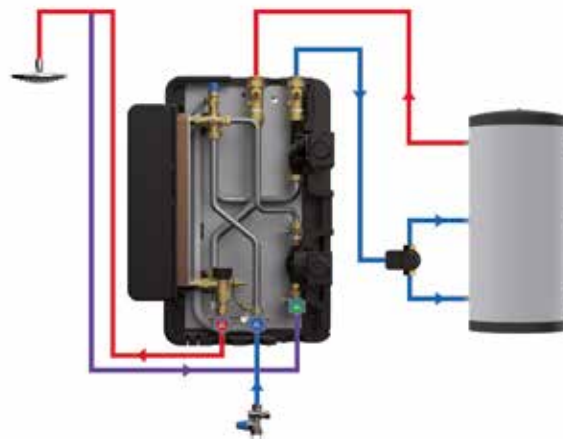
* Range of application at performance indicator 1 (LK 1, as per SPF test procedure): storage tank 60 °C, hot water = 45 °C, cold water = 10 °C

**Friwa modules can be equipped subsequently with internal circulation lines - see equipment



In addition to the Mini, Midi, Maxi and Mega modules, the product range also includes cascade solutions. To cover larger withdrawal flow rates, such as in the hotel industry or in hospitals, the basic module without a circulation line can be extended to a double, triple or quadruple cascade by using a pipe set. For retrofitting, the cascade can be subsequently equipped with an external circulation set as needed. On the right side, the selection options for the cascade solutions are illustrated.

Example FriwaMidi-Kaskade





Required module and pipe set for double cascade*** - example FriwaMini								
Example:	2x		+		+		+	
		Basic module		Pipe set for FriwaMini-Kaskade		Return distribution set		Circulation line
		FriwaMini						
Basic modules		2x 6401510 2x 6401530 (coated heat exchanger)						
Pipe set Friwa cascade		64042933						
Return distribution set		5675431						
Optional: circulation line		6404111						
Optional accessories: WiFi3.10 Internet Gateway module and MB3.10 Modbus RTU module								

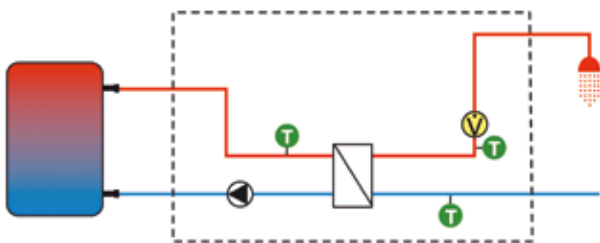
Required module and pipe set for double cascade*** - example FriwaMidi								
Example:	2x		+		+		+	
		Basic module		Pipe set for FriwaMidi-Kaskade		Return distribution set		Circulation line
				FriwaMidi		FriwaMaxi		FriwaMega
Basic modules				2x 6405511 2x 6405531 (coated heat exchanger)		2x 6406511 2x 6406531 (coated heat exchanger)		2x 6407511 2x 6407530 (coated heat exchanger)
Pipe set Friwa cascade				64042943		64042953		64042963
Return distribution set				5675431		6404242		6404244
Optional: circulation line				6404136GM7 6404136GH10 6404136GH12		6404136GM7 6404136GH10 6404136GH12		6404136GM7 6404136GH10 6404136GH12
Optional accessories: WiFi3.10 Internet Gateway module and MB3.10 Modbus RTU module								

Required module for triple or quadruple cascade*** - example FriwaMidi									
Example:	3x or 4x		+		oder	+		+	
		Basic module		Accessory set FriwaMidi-Kaskade		Return distribution set		Circulation line	
				FriwaMidi		FriwaMaxi		FriwaMega	
Basic modules				3x or 4x 6405511 3x or 4x 6405531 (coated heat exchanger)		3x or 4x 6406511 3x or 4x 6406531 (coated heat exchanger)		3x or 4x 6407511 3x or 4x 6407530 (coated heat exchanger)	
Accessory set for Friwa cascade				64042622 (2-fold) 64042632 (3-fold) 64042642 (4-fold)		64042722 (2-fold) 64042732 (3-fold) 64042742 (4-fold)		64042820 (2-fold) 64042830 (3-fold) 64042840 (4-fold)	
Return distribution set				6404242		6404242		6404244	
Optional: circulation line				6404136GM7 6404136GH10 6404136GH12		6404136GM7 6404136GH10 6404136GH12		6404136GM7 6404136GH10 6404136GH12	
Optional accessories: WiFi3.10 Internet Gateway module and MB3.10 Modbus RTU module									

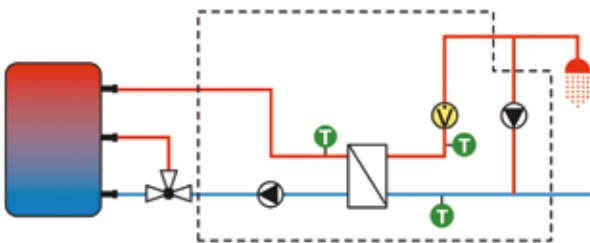
*** The cascade solution is available on request; / = not possible



Preset systems:



Friwa basic system



Friwa basic system with circulation and return distribution

*Indication of performance as per SPF test procedure, LK1 = performance indicator 1, at a set hot water temperature of 45 °C, at a primary flow temperature of 60 °C

Controller FC3.10 for DHW modules

- for FriwaMini up to 28 l/min* / cascade up to 112 l/min*
- for FriwaMidi up to 50 l/min* / cascade up to 200 l/min*
- for FriwaMaxi up to 77 l/min*/ cascade up to 308 l/min*
- for FriwaMega up to 123 l/min* / cascade up to 492 l/min* (as per SPF LK 1)*

The controller FC3.10 sets the hot water temperature of the domestic hot water module via the rotation speed control of the primary pump. During operation, a special algorithm adjusts the control functions even faster to the given system conditions.

As additional functions, the controller performs the circulation control and the switching of the return distribution valve. Different circulation modes are possible and can be adapted individually to the system requirements. The controller can, for example in a single-family house, be integrated in the BMS without additional hardware.

The optionally available Internet Gateway module WiFi3.10 allows a monitoring and parametrisation of the system. The connection to the building control system is established via the Modbus protocol. For cascade solutions, the integration in the BMS can be carried out via the optional MB3.10 module. See below.

Function overview controller FC3.10

Display	Graphically animated LCD display
Operation	4 push buttons
Relay outputs	3 x 230 V, switching relay 2 x PWM signal for speed control
Inputs	4 x Pt1000
Flow rate sensors	yes
Heat quantity balancing	yes
Circulation (time-controlled / temperature-controlled / impulse driven)	yes
Return distribution	yes



**Characteristics WiFi3.10
Internet Gateway Module**

- ✓ For the connection of DHW modules to an internet platform with the controller FC3.10
- ✓ System monitoring and parametrisation
- ✓ Display of the alarm history and graphic overview of the nominal values
- ✓ E-mail notification in case of error messages
- ✓ Display of the alarm history



Item no. 1339003



**Characteristics MB3.10
Modbus RTU Module**

- ✓ Connection of a cascade to a BMS
- ✓ The controller FC3.10 offers 2500 registers that can be processed by means of the MB3.10
- ✓ Communication status visible via LED codification
- ✓ Modbus RTU protocol
- ✓ Modbus specific parameters can be set at the controller – high flexibility and possibility to adapt to an existing BMS



Item no. 1339002





Application range

- Domestic hot water preparation operating on the principle of a flow-type water heater

The CE-conformity of the module has been certified according to DIN EN 60335 and SVGW.

Application range

- in thermal solar installations,
- in systems with a solid fuel boiler, oil or gas boiler,
- connection to a buffer tank

*For information on **design data**, see page 18 to 23.

Operating data

Max. pressure	primary: 3 bar, secondary: 10 bar
Max. operating temperature	2-80 °C
Min. flow rate	2 l/min
Max. flow rate as per SPF LK 1*	20 l/min
Transmission performance 1 as per SPF LK 1*	48 kW

Technical data

Equipment

Heat exchanger	24 plates, type E8ASW-N
Cartridge sensor	30-60 °C
Flow switch	Type 1.3 l/min

Dimensions

Nominal diameter	DN 15 (1/2")
Connections	3/4" int. thread, flat sealing
Centre distance	65 mm
Width	282 mm
Height	420 mm
Depth	265 mm
Installation length	418 mm
Height	420 mm

Materials

Valves and fittings	Brass
Seals	EPDM / AFM 34
Insulation	EPP
Cartridge sensor	Stainless steel
Flow switch	Noryl
Thermostatic valve	Housing / valve plate: brass
Heat exchanger	Solder: copper Plates + connecting pieces: stainless steel; Coating (optional): Based on silica



Mounting example: FriwaMicro without circulation, with safety group for domestic hot water tank



FriwaMicro - DN 15 (½") **Item no.**



FriwaMicro, thermally controlled

prim.: Wilo Para SC 15/6-43 **6400010**

FriwaMicro, thermally controlled, with coated heat exchanger

prim.: Wilo Para SC 15/6-43 **6400030**

Accessories	Item no.
	<p>Safety group for domestic hot water tank 563907</p> <p>Safety group for hot water storage tank, with shut-off valve and adjustable check valve. For horizontal installation. With seat made of stainless steel. Brass housing. Chromed. Certified according to EN 1487. Opening pressure 7 bar, max. power 10 kW</p>
	<p>Accessory set FriwaMicro 64042001</p> <p>Consisting of: 3x ball valve DN 15</p> <p>For locking the module during servicing Authorisation according to DVGW Connections: ¾" ext. thread</p>



- ✓ Sealed surface with thin film coating
- ✓ Specifically designed for drinking water applications
- ✓ Additional corrosion protection in case of special water qualities
- ✓ Reduced deposit formation
- ✓ Diffusion barrier
- ✓ Greater durability and therefore longer service life
- ✓ Greater reliability of the system
- ✓ Lower maintenance costs
- ✓ Thermal and hydraulic performance of the heat exchanger remains unchanged



Application range

- Domestic hot water preparation operating on the principle of a flow-type water heater

The CE-conformity of the module has been certified according to DIN EN 60335 and SVGW.

Application range

- combined with thermal solar installations,
- in systems with a solid fuel boiler, oil or gas boiler,
- for the connection to a buffer tank

*For information on **design data**, see page 18 to 23.

Operating data

Max. pressure	primary: 3 bar, secondary: 10 bar
Max. operating temperature	95 °C
Min. flow rate	2 l/min
Max. flow rate as per SPF LK 1*	28 l/min
Transmission performance 1 as per SPF LK 1*	69 kW

Technical data

Equipment

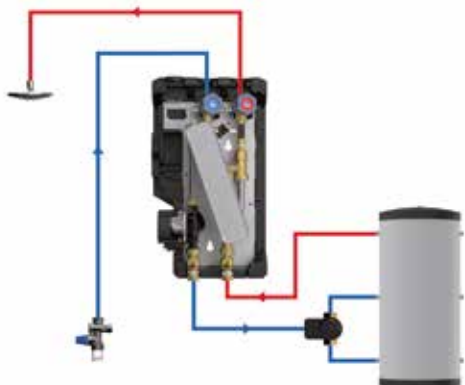
Check valve	primary: 1 x 200 mm wc
Circulation line	optional
Heat exchanger	32 plates, type E8ASW-N
Sensors	2 x Pt1000 1 x VFS 2-40 l/min
Controller	FC3.10
WiFi3.10	optional
MB3.10	optional

Dimensions

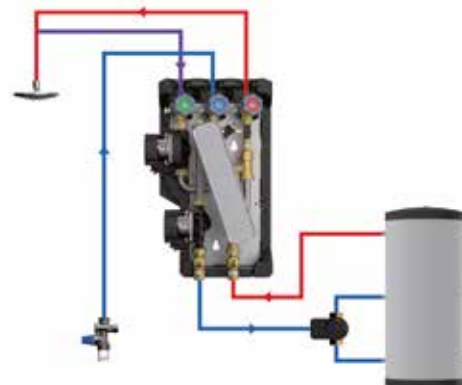
Nominal diameter	DN 15 (1/2")
Connections	primary: 3/4" int. thread secondary: 3/4" ext. thread, flat sealing
Circulation line	1" ext. thread
Width	309 mm
Centre distance, prim.	90 mm
Centre distance, sec.	90 mm
Height	539 mm
Installation length	494 mm
Depth	314 mm

Materials

Valves and fittings	Brass
Seals	AFM34 / EPDM
Insulation	EPP
Heat exchanger	Solder: copper Plates + connecting pieces: stainless steel Coating (optional): based on silica








Mounting example: FriwaMini without circulation, with safety group for domestic hot water tank



Mounting example: FriwaMini with circulation, return distribution set and safety group for domestic hot water tank



FriwaMini - DN 15 (½")	Item no.
	FriwaMini without circulation
	prim.: Grundfos UPM4 15-75 6401510
	FriwaMini with circulation
	prim.: Grundfos UPM4 15-75, sec.: Grundfos UPM4 15-70 CIL3 6401515
FriwaMini without circulation, coated heat exchanger	6401530
prim.: Grundfos UPM4 15-75	
FriwaMini with circulation, coated heat exchanger	6401535
prim.: Grundfos UPM4 15-75, sec.: Grundfos UPM4 15-70 CIL3	

Accessories	Item no.
	PAW 3-way switch valve PV3 DN 25 5675431
	with 2-point control for managing different temperature zones in the buffer tank, e.g. for return flow distribution or enabling additional buffer tanks Setting time: 13 sec., rotation angle: 90°, torque: 5 Nm, Kvs value: 15.5
	Safety group for domestic hot water tank 563907
	Safety group for hot water storage tank, with shut-off valve and adjustable check valve. For horizontal installation. With seat made of stainless steel. Brass housing. Chromed. Certified according to EN 1487. Opening pressure 7 bar, max. power 10 kW
	Withdrawal valve 640422
	Flame-treated valves for sterile withdrawal of water. For the subsequent installation inside the Friwa module, on each piston valve of the domestic hot water circuit.
	Pipe set for FriwaMini-Kaskade 64042933
	3-way valve with actuator, Kvs value: 11 for FriwaMini



Application range

- Domestic hot water preparation operating on the principle of a flow-type water heater

The CE-conformity of the module has been certified according to DIN EN 60335 and SVGW.

Application range

- combined with thermal solar installations,
- in systems with a solid fuel boiler, oil or gas boiler,
- for the connection to a buffer tank,
- up to 200 l/min as a quadruple cascade (as per SPF LK 1*)

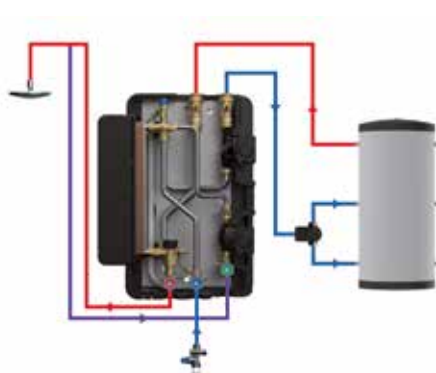
*For information on **design data**, see page 18 to 23.

Operating data

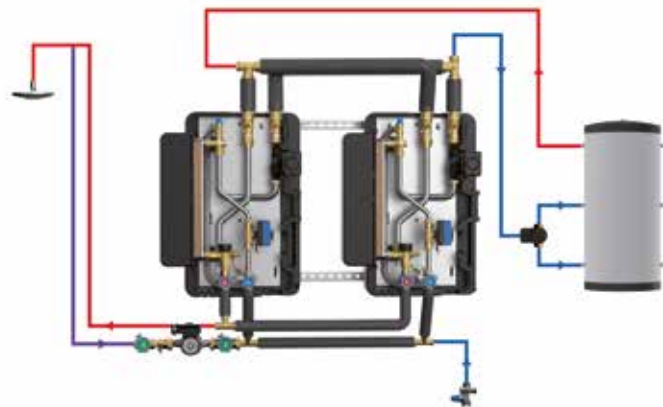
Max. pressure	primary: 3 bar, secondary: 10 bar
Max. operating temperature	95 °C
Min. flow rate	2 l/min
Max. flow rate as per SPF LK 1*	50 l/min
Transmission performance 1 as per SPF LK 1*	129 kW

Technical data

Equipment		Dimensions		Materials	
Check valve	primary: 2 x 190 mm wc	Nominal diameter	DN 20 (¾")	Valves and fittings	Brass
Circulation line	optional	Connections	primary: 1½" ext. thread secondary: 1" ext. thread	Seals	AFM34 / EPDM
Heat exchanger	40 plates, copper solder/coated	Circulation line	1" ext. thread	Insulation	EPP
Sensors	primary: 1x Pt1000 secondary: 2x Pt1000 1 x flow meter	Width	602 mm	Heat exchanger	Solder: copper Plates + connecting pieces: stainless steel Coating (optional): based on silica
Controller	FC3.10	Centre distance, prim.	120 mm		
WiFi3.10	optional	Centre distance, sec.	100 mm		
MB3.10	optional	Height	795 mm		
		Installation length	711 mm / 757 mm		
		Depth	298 mm		




FriwaMidi with circulation



Cascade with 2 basic modules and pipe set for cascade



FriwaMidi – DN 20 (¾")	Item no.
	FriwaMidi without circulation
	prim.: Grundfos UPM2 25-75 LowFlow 6405511
	FriwaMidi with circulation
	prim.: Grundfos UPM2 25-75 LowFlow, sec.: Grundfos UPM2 15-75 CIL2 6405516
	FriwaMidi without circulation, coated heat exchanger
	prim.: Grundfos UPM2 25-75 LowFlow 6405531
	FriwaMidi, with circulation, coated heat exchanger
	prim.: Grundfos UPM2 25-75 LowFlow, sec.: Grundfos UPM2 15-75 CIL2 6405536

Accessories	Item no.
	Circulation set for internal retrofitting (FriwaMidi/Maxi) 6404123
- with high-efficiency pump Grundfos UPM4 15-70 CIL3 - with piston valve and non-return valve Connection: 1" ext. thread	
	Withdrawal valve 640422
Flame-treated valves for sterile withdrawal of water. For the subsequent installation inside the Friwa module, on each piston valve of the domestic hot water circuit.	
	Pipe set for FriwaMidi-Kaskade, 2-fold 64042943
Insulated pipe set for the cascading of two DHW modules (item no. 6405511). - with two 2-way valves for switching - with mounting rail for an easy wall assembly	
	Accessory set for FriwaMidi-Kaskade, 2-fold 64042622
	Accessory set for FriwaMidi-Kaskade, 3-fold 64042632
	Accessory set for FriwaMidi-Kaskade, 4-fold 64042642
	Accessory set for cascading of two, three or four identically constructed domestic hot water modules (item no. 6405511 / 6405531). The two-way valves are pre-assembled and can therefore be easily installed in the cold water line. Thanks to the short opening time of the valve, there is no loss of comfort when connecting or disconnecting single cascade modules. The pipe set for cascade must be obtained by the customer!
	PAW 3-way switch valve PV3 DN 25 5675431
with 2-point control for managing different temperature zones in the buffer tank, e.g. for return flow distribution or enabling additional buffer tanks Setting time: 13 sec., rotation angle: 90°, torque: 5 Nm, Kvs value: 15.5	
	Return distribution set 1½" int. thread 6404242
3-way valve with actuator, setting time for 90°: 35 sec., Kvs value: 25 for FriwaMidi/Maxi-Kaskade, FriwaMega	
	Circulation set for Friwa cascade (Midi, Maxi, Mega) 6404136GM7
	- with high-efficiency pump Grundfos UPM4 15-70 CIL3 - with piston valves, non-return valve and drain valve Connection: 1" ext. thread
Circulation set for Friwa cascade (Midi, Maxi, Mega) 6404136GH10	
- High-efficiency pump Grundfos UPML 25-105 N - with piston valves, non-return valve and drain valve Connection: 1½" ext. thread	



Application range

- Domestic hot water preparation operating on the principle of a flow-type water heater

The CE-conformity of the module has been certified according to DIN EN 60335 and SVGW.

Application range

- combined with thermal solar installations,
- in systems with a solid fuel boiler, oil or gas boiler,
- for the connection to a buffer tank,
- up to 308 l/min as a quadruple cascade (as per SPF LK 1)*

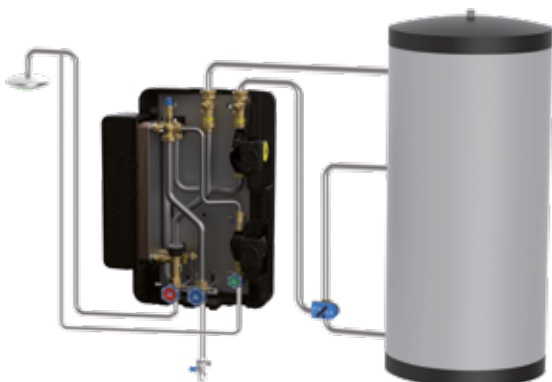
*For information on **design data**, see page 18 to 23.

Operating data

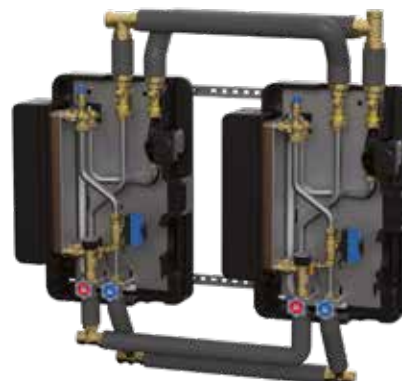
Max. pressure	primary: 3 bar, secondary: 10 bar
Max. operating temperature	95 °C
Min. flow rate	2 l/min
Max. flow rate as per SPF LK 1*	77 l/min
Transmission performance 1 as per SPF LK 1*	187 kW

Technical data

Equipment		Dimensions		Materials	
Check valve	primary: 2 x 400 mm wc	Nominal diameter	DN 25 (1")	Valves and fittings	Brass
Circulation line	optional	Connections	primary: 2" ext. thread secondary: 1¼" ext. thread	Seals	AFM34 / EPDM
Heat exchanger	60 plates, copper solder/coated	Circulation line	1" ext. thread	Insulation	EPP
Sensors	primary: 1x Pt1000 secondary: 2x Pt1000 1 x flow meter	Width	602 mm	Heat exchanger	Solder: copper Plates + connecting pieces: stainless steel Coating (optional): based on silica
Controller	FC3.10	Centre distance, prim.	120 mm		
WiFi3.10	optional	Centre distance, sec.	100 mm		
MB3.10	optional	Height	795 mm		
		Installation length	711 mm / 769 mm		
		Depth	298 mm		









FriwaMaxi with circulation



Cascade with 2 basic modules and pipe set for cascade



FriwaMaxi DN 25 (1")	Item no.
	FriwaMaxi without circulation
	prim.: Grundfos UPML 25-105 6406511
	FriwaMaxi with circulation
	prim.: Grundfos UPML 25-105, sec.: Grundfos UPM2 15-75 CIL2 6406516
	FriwaMaxi without circulation, coated heat exchanger
	prim.: Grundfos UPML 25-105 6406531
FriwaMaxi with circulation, coated heat exchanger	
prim.: Grundfos UPML 25-105, sec.: Grundfos UPM2 15-75 CIL2 6406536	

Accessories	Item no.	
	Circulation set for internal retrofitting (FriwaMidi/Maxi) 6404123	
- with high-efficiency pump Grundfos UPM4 15-70 CIL3 - with piston valve and non-return valve Connection: 1" ext. thread		
	Return distribution set 1 1/4" int. 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 Friwa module, on each piston valve of the domestic hot water circuit.		
	Pipe set for FriwaMaxi-Kaskade, 2-fold 64042953	
Insulated pipe set for the cascading of two DHW modules (item no. 6406511). - with two 2-way valves for switching - with mounting rail for an easy wall assembly		
	Accessory set for FriwaMaxi-Kaskade, 2-fold 64042722	
	Accessory set for FriwaMaxi-Kaskade, 3-fold 64042732	
	Accessory set for FriwaMaxi-Kaskade, 4-fold 64042742	
	Accessory set for cascading of two, three or four identically constructed domestic hot water modules (item no. 6406511 / 6406531). The two-way valves are pre-assembled and can therefore be easily installed in the cold water line. Thanks to the short opening time of the valve, there is no loss of comfort when connecting or disconnecting single cascade modules. The pipe set for cascade must be obtained by the customer!	
	PAW 3-way switch valve PV3 DN 25 5675431	
with 2-point control for managing different temperature zones in the buffer tank, e.g. for return flow distribution or enabling additional buffer tanks Setting time: 13 sec., rotation angle: 90°, torque: 5 Nm, Kvs value: 15.5		
	Return distribution set 1 1/2" int. thread 6404242	
3-way valve with actuator, setting time for 90°: 35 sec., Kvs value: 25 for FriwaMidi/Maxi-Kaskade, FriwaMega		
	Circulation set for Friwa cascade (Midi, Maxi, Mega) 6404136GM7	
	- with high-efficiency pump Grundfos UPM4 15-70 CIL3 - with piston valves, non-return valve and drain valve, connection 1" ext. thread	
	Circulation set for Friwa cascade (Midi, Maxi, Mega) 6404136GH10	
	- High-efficiency pump Grundfos UPML 25-105 N - with piston valves, non-return valve and drain valve, connection 1 1/2" ext. thread	
Circulation set for Friwa cascade (Maxi, Mega) 6404136GH12		
- with high-efficiency pump Grundfos UPMXL GEO 25-125 N - with piston valves, non-return valve and drain valve Connection: 1 1/2" ext. thread		



Application range

- Domestic hot water preparation operating on the principle of a flow-type water heater

The CE-conformity of the module has been certified according to DIN EN 60335 and SVGW.

Application range

- combined with thermal solar installations,
- in systems with a solid fuel boiler, oil or gas boiler,
- for the connection to a buffer tank,
- up to 492 l/min as a quadruple cascade (as per SPF LK 1)*

*For information on **design data**, see page 18 to 23.

Operating data

Max. pressure	primary: 3 bar, secondary: 10 bar
Max. operating temperature	95 °C
Min. flow rate	4 l/min
Max. flow rate as per SPF LK 1*	123 l/min
Transmission performance 1 as per SPF LK 1*	300 kW

Technical data

Equipment		Dimensions		Materials	
Check valve	primary: 2 x 450 mm wc	Nominal diameter	DN 32 (1¼")	Valves and fittings	Brass
Circulation line	optional	Connections	primary: 1½" int. thread secondary: 1½" ext. thread	Seals	AFM34 / EPDM
Heat exchanger	2 x 60 plates, copper solder/ coated	Circulation line	1" ext. thread 1¼" ext. thread	Insulation	EPP
Sensors	primary: 1x Pt1000 secondary: 2x Pt1000 2 x flow meter	Width	660 mm	Heat exchanger	Solder: copper Plates + connecting pieces: stainless steel Coating (optional): based on silica
Controller	FC3.10	Centre distance, prim.	158 mm		
WiFi3.10	optional	Centre distance, sec.	158 mm		
MB3.10	optional	Height	1423 mm		
		Installation length	1107 mm / 1205 mm		
		Depth	920 mm		



FriwaMega with circulation



Cascade with 2 basic modules, pipe set for cascade and circulation set


FriwaMega without circulation

 prim.: Grundfos UPMXL GEO 25-125 **6407511**
FriwaMega with circulation

 prim.: Grundfos UPMXL GEO 25-125, sec.: Grundfos UPML 25-105 N **6407517**
FriwaMega without circulation, coated heat exchanger

 prim.: Grundfos UPMXL GEO 25-125 **6407530**
FriwaMega with circulation, coated heat exchanger

 prim.: Grundfos UPMXL GEO 25-125, sec.: Grundfos UPML 25-105 N **6407535**

Accessories	Item no.
	Circulation set for internal retrofitting (FriwaMega) 6404135GH10 - with high-efficiency pump Grundfos UPML GEO 25-105 N - with piston valve and non-return valve Connection: 1¼" ext. thread
	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.
	Return distribution set 1½" int. thread 6404242 3-way valve with actuator, setting time for 90°: 35 sec., Kvs value: 25 for FriwaMidi/Maxi-Kaskade, FriwaMega
	Return distribution set, 2" int. thread 6404244 3-way valve with actuator, setting time for 90°: 35 sec., Kvs value: 40 for FriwaMega-Kaskade
	Accessory set for FriwaMega-Kaskade - 2-fold 64042820
	Accessory set for FriwaMega-Kaskade - 3-fold 64042830
	Accessory set for FriwaMega-Kaskade - 4-fold 64042840 Accessory set for cascading of two, three or four identically constructed domestic hot water modules (item no. 6407511 / 6407530). The two-way valves are pre-assembled and can therefore be easily installed in the cold water line. Thanks to the short opening time of the valve, there is no loss of comfort when connecting or disconnecting single cascade modules. The pipe set for cascade must be obtained by the customer!
	Pipe set for FriwaMega-Kaskade, 2-fold 64042963 Insulated pipe set for the cascading of two DHW modules (item no. 6407511). - with two 2-way valves for switching
	Pipe set for FriwaMega-Kaskade, 4-fold 2x 64042963 Please order 2x 64042963 for a 4-fold FriwaMega-Kaskade.
	Circulation set for Friwa cascade (Midi, Maxi, Mega) 6404136GM7 - with high-efficiency pump Grundfos UPM4 15-70 CIL3 - with piston valves, non-return valve and drain valve, connection 1" ext. thread
	Circulation set for Friwa cascade (Midi, Maxi, Mega) 6404136GH10 - High-efficiency pump Grundfos UPML 25-105 N - with piston valves, non-return valve and drain valve, connection 1½" ext. thread
	Circulation set for Friwa cascade (Maxi, Mega) 6404136GH12 - with high-efficiency pump Grundfos UPMXL GEO 25-125 N - with piston valves, non-return valve and drain valve, connection 1½" ext. thread



The performance of the Friwa primarily depends on the temperature in the buffer tank which delivers the energy to heat up the domestic hot water module.

The demand of domestic hot water depends on the flow and the number of consumers. In larger apartment buildings, a certain statistic distribution of withdrawals can be observed. The following table gives a general overview of the application range of the different DHW modules.

Housing unit	70 °C / 60 °C / 10 °C	70 °C / 45 °C / 10 °C ***	60 °C / 50 °C / 10 °C ***
Single-family house (up to two showers)	FriwaMicro	FriwaMicro	FriwaMicro
Single-family house (three or more showers)	FriwaMini	FriwaMini	FriwaMini
Two-family house	FriwaMidi	FriwaMidi	FriwaMidi
3	FriwaMidi	FriwaMidi	FriwaMidi
5	FriwaMidi	FriwaMidi	FriwaMidi
10	FriwaMidi	FriwaMidi	FriwaMidi
15	FriwaMaxi	FriwaMidi	FriwaMaxi
20	FriwaMaxi	FriwaMidi	FriwaMaxi
30	2x FriwaMidi	FriwaMaxi	2x FriwaMidi
50	FriwaMega	2x FriwaMidi	FriwaMega
70	2x FriwaMaxi	FriwaMega	2x FriwaMaxi
100	2x FriwaMega	2x FriwaMaxi	2x FriwaMega

***A DHW temperature below 60 °C during operation does not comply with DVGW 551 (German association for gas and water). The compliance with water quality standards must be observed.

70 °C / 60 °C / 10 °C flow temperature 70 °C / Hot water temperature 60 °C / Cold water temperature 10 °C
The DHW demand of max. 12 l/min and the simultaneity factor according to DIN 4708 represent the basis of calculation.





Temperature of the heating storage tank	Domestic hot water temperature set at the controller	Maximum output capacity* of the Friwa	Transmission performance	Required tank volume per litre of hot water	for an inlet temperature of 10 °C (cold water temperature) - maximum withdrawal quantity** at the mixing valve at				Return temperature to the storage tank
					40 °C	45 °C	50 °C	55 °C	
45 °C	40 °C	18 l/min	38 kW	1.7 litres	/	/	/	/	23 °C
	50 °C	19 l/min	40 kW	1.1 litres	/	/	/	/	21 °C
50 °C	45 °C	15 l/min	36 kW	1.8 litres	17 l/min	/	/	/	24 °C
	55 °C	23 l/min	48 kW	0.9 litre	/	/	/	/	20 °C
55 °C	45 °C	17 l/min	43 kW	1.2 litres	20 l/min	/	/	/	23 °C
	50 °C	15 l/min	42 kW	1.9 litres	20 l/min	17 l/min	/	/	26 °C
60 °C	40 °C	27 l/min	55 kW	0.7 litre	/	/	/	/	20 °C
	45 °C	20 l/min	49 kW	0.9 litre	23 l/min	/	/	/	23 °C
60 °C	50 °C	17 l/min	46 kW	1.3 litres	22 l/min	18 l/min	/	/	26 °C
	55 °C	13 l/min	40 kW	2.0 litres	19 l/min	16 l/min	14 l/min	/	30 °C
65 °C	40 °C	27 l/min	56 kW	0.6 litre	/	/	/	/	19 °C
	45 °C	20 l/min	50 kW	0.8 litre	23 l/min	/	/	/	22 °C
65 °C	50 °C	18 l/min	50 kW	1.0 litre	24 l/min	20 l/min	/	/	25 °C
	55 °C	15 l/min	46 kW	1.3 litres	21 l/min	18 l/min	16 l/min	/	29 °C
65 °C	60 °C	11 l/min	39 kW	2.1 litres	18 l/min	15 l/min	13 l/min	12 l/min	33 °C
	70 °C	27 l/min	56 kW	0.6 litre	/	/	/	/	19 °C
70 °C	45 °C	23 l/min	57 kW	0.7 litre	27 l/min	/	/	/	22 °C
	50 °C	20 l/min	54 kW	0.9 litre	26 l/min	22 l/min	/	/	25 °C
70 °C	55 °C	16 l/min	49 kW	1.1 litres	23 l/min	20 l/min	17 l/min	/	29 °C
	60 °C	14 l/min	48 kW	1.4 litres	23 l/min	19 l/min	17 l/min	15 l/min	33 °C
75 °C	40 °C	27 l/min	57 kW	0.5 litre	/	/	/	/	18 °C
	45 °C	25 l/min	61 kW	0.6 litre	28 l/min	/	/	/	21 °C
75 °C	50 °C	21 l/min	59 kW	0.7 litre	28 l/min	23 l/min	/	/	24 °C
	55 °C	17 l/min	54 kW	0.9 litre	25 l/min	22 l/min	19 l/min	/	28 °C
75 °C	60 °C	14 l/min	49 kW	1.1 litres	23 l/min	19 l/min	17 l/min	15 l/min	32 °C
	80 °C	40 °C	28 l/min***	58 kW	0.5 litre	/	/	/	/
45 °C		26 l/min	64 kW	0.6 litre	30 l/min	/	/	/	20 °C
80 °C	50 °C	23 l/min	63 kW	0.7 litre	30 l/min	25 l/min	/	/	23 °C
	55 °C	19 l/min	58 kW	0.8 litre	27 l/min	23 l/min	20 l/min	/	27 °C
80 °C	60 °C	15 l/min	51 kW	1.0 litre	24 l/min	20 l/min	18 l/min	16 l/min	32 °C

* The maximum output capacity depends on the pressure drop on the primary side.

** The maximum withdrawal quantity at the mixing valve depends on the length and the insulation of the pipes.

*** Maximum flow rate: 30 l/min, with pressure drop of the DHW module of 1000 mbar (for hydraulic reasons, higher values are only partly possible)

Example: The temperature in the heating storage tank (primary) is 65 °C and the hot water temperature set at the controller is 50 °C (secondary):

- With 65 °C in the heating buffer tank, a maximum of 18 litres of domestic water per minute can be heated to 50 °C.
- This withdrawal corresponds to a performance of 50 kW.
- In order to obtain 1 litre (or 100 litres) of hot water with a temperature of 50 °C, the heating buffer tank must contain 1 litre (or 100 litres) with a temperature of 65 °C.
- These 18 litres of warm water per minute with 50 °C can be mixed with cold water (10 °C) at the tap (mixing valve) to obtain 20 litres per minute with 45 °C.

The primary return temperature for a withdrawal of 18 litres of warm water per minute is about 25 °C.



Temperature of the heating storage tank	Domestic hot water temperature set at the controller	Maximum output capacity* of the Friwa	Transmission performance	Required tank volume per litre of hot water	for an inlet temperature of 10 °C (cold water temperature) - maximum withdrawal quantity** at the mixing valve at				Return temperature to the storage tank
					40 °C	45 °C	50 °C	55 °C	
45 °C	40 °C	17 l/min	36 kW	1.8 litres	/	/	/	/	24 °C
	45 °C	16 l/min	40 kW	1.9 litres	19 l/min	/	/	/	27 °C
50 °C	40 °C	24 l/min	51 kW	1.3 litres	/	/	/	/	22 °C
	45 °C	16 l/min	40 kW	1.9 litres	19 l/min	/	/	/	27 °C
	50 °C	16 l/min	44 kW	2.0 litres	21 l/min	18 l/min	/	/	29 °C
55 °C	40 °C	30 l/min	64 kW	1.0 litre	/	/	/	/	20 °C
	45 °C	23 l/min	56 kW	1.4 litres	26 l/min	/	/	/	24 °C
	50 °C	16 l/min	44 kW	2.0 litres	21 l/min	18 l/min	/	/	29 °C
	55 °C	15 l/min	48 kW	2.1 litres	22 l/min	19 l/min	17 l/min	/	32 °C
60 °C	40 °C	36 l/min	76 kW	0.9 litre	/	/	/	/	20 °C
	45 °C	28 l/min	69 kW	1.1 litres	32 l/min	/	/	/	23 °C
	50 °C	22 l/min	60 kW	1.5 litres	28 l/min	24 l/min	/	/	26 °C
	55 °C	15 l/min	48 kW	2.1 litres	22 l/min	19 l/min	17 l/min	/	32 °C
65 °C	40 °C	42 l/min***	88 kW	0.6 litre	/	/	/	/	19 °C
	45 °C	33 l/min	81 kW	0.9 litre	38 l/min	/	/	/	22 °C
	50 °C	27 l/min	74 kW	1.2 litres	35 l/min	30 l/min	/	/	25 °C
	55 °C	21 l/min	65 kW	1.5 litres	30 l/min	26 l/min	23 l/min	/	29 °C
	60 °C	15 l/min	52 kW	2.1 litres	24 l/min	21 l/min	18 l/min	16 l/min	35 °C
70 °C	40 °C	42 l/min***	88 kW	0.5 litre	/	/	/	/	19 °C
	45 °C	38 l/min	93 kW	0.8 litre	44 l/min	/	/	/	21 °C
	50 °C	31 l/min	87 kW	1.0 litre	41 l/min	35 l/min	/	/	24 °C
	55 °C	25 l/min	79 kW	1.2 litres	37 l/min	32 l/min	28 l/min	/	27 °C
	60 °C	20 l/min	69 kW	1.6 litres	33 l/min	28 l/min	24 l/min	22 l/min	31 °C
75 °C	40 °C	42 l/min***	88 kW	0.5 litre	/	/	/	/	18 °C
	45 °C	42 l/min***	102 kW	0.6 litre	49 l/min	/	/	/	20 °C
	50 °C	36 l/min	99 kW	0.9 litre	47 l/min	40 l/min	/	/	23 °C
	55 °C	29 l/min	92 kW	1.1 litres	44 l/min	37 l/min	32 l/min	/	26 °C
	60 °C	24 l/min	84 kW	1.3 litres	40 l/min	34 l/min	30 l/min	26 l/min	29 °C
80 °C	40 °C	42 l/min***	88 kW	0.4 litre	/	/	/	/	18 °C
	45 °C	42 l/min***	102 kW	0.5 litre	49 l/min	/	/	/	20 °C
	50 °C	40 l/min	111 kW	0.8 litre	52 l/min	45 l/min	/	/	22 °C
	55 °C	33 l/min	105 kW	0.9 litre	50 l/min	42 l/min	37 l/min	/	25 °C
	60 °C	28 l/min	98 kW	1.1 litres	46 l/min	39 l/min	34 l/min	31 l/min	28 °C
85 °C	40 °C	42 l/min***	88 kW	0.4 litre	/	/	/	/	18 °C
	45 °C	42 l/min***	102 kW	0.5 litre	49 l/min	/	/	/	20 °C
	50 °C	42 l/min***	117 kW	0.6 litre	56 l/min	47 l/min	/	/	21 °C
	55 °C	37 l/min	117 kW	0.8 litre	55 l/min	47 l/min	41 l/min	/	24 °C
	60 °C	32 l/min	110 kW	1.0 litre	52 l/min	45 l/min	39 l/min	35 l/min	26 °C
90 °C	40 °C	42 l/min***	88 kW	0.4 litre	/	/	/	/	18 °C
	45 °C	42 l/min***	102 kW	0.4 litre	49 l/min	/	/	/	19 °C
	50 °C	42 l/min***	117 kW	0.5 litre	56 l/min	47 l/min	/	/	21 °C
	55 °C	41 l/min	128 kW	0.6 litre	61 l/min	52 l/min	45 l/min	/	23 °C
	60 °C	35 l/min	122 kW	0.9 litre	58 l/min	50 l/min	43 l/min	38 l/min	25 °C
95 °C	40 °C	42 l/min***	88 kW	0.3 litre	/	/	/	/	17 °C
	45 °C	42 l/min***	102 kW	0.4 litre	49 l/min	/	/	/	19 °C
	50 °C	42 l/min***	117 kW	0.5 litre	56 l/min	47 l/min	/	/	20 °C
	55 °C	42 l/min***	132 kW	0.6 litre	63 l/min	53 l/min	47 l/min	/	22 °C
	60 °C	38 l/min	134 kW	0.8 litre	64 l/min	54 l/min	47 l/min	42 l/min	24 °C

* The maximum output capacity depends on the pressure drop on the primary side.

** The maximum withdrawal quantity at the mixing valve depends on the length and the insulation of the pipes.

*** Maximum flow rate: 42 l/min, with pressure drop of the DHW module of 1000 mbar (for hydraulic reasons, higher values are only partly possible, measuring limit of the flow rate sensor ~42 l/min)

Example: The temperature in the heating storage tank (primary) is 65 °C and the hot water temperature set at the controller is 50 °C (secondary):

- With 65 °C in the heating buffer tank, a maximum of 27 litres of domestic water per minute can be heated to 50 °C.

- This withdrawal corresponds to a performance of 74 kW.

- In order to obtain 1 litre (or 100 litres) of hot water with a temperature of 50 °C, the heating buffer tank must contain 1.2 litres (or 120 litres) with a temperature of 65 °C.

- These 27 litres of warm water per minute with 50 °C can be mixed with cold water (10 °C) at the tap (mixing valve) to obtain 30 litres per minute with 45 °C.

The primary return temperature for a withdrawal of 27 litres of warm water per minute is about 25 °C.



Temperature of the heating storage tank	Domestic hot water temperature set at the controller	Maximum output capacity* of the Friwa	Transmission performance	Required tank volume per litre of hot water	for an inlet temperature of 10 °C (cold water temperature) - maximum withdrawal quantity** at the mixing valve at				Return temperature to the storage tank
					40 °C	45 °C	50 °C	55 °C	
45 °C	40 °C	34 l/min	71 kW	1.2 litres	/	/	/	/	20 °C
	50 °C	44 l/min	92 kW	0.9 litre	/	/	/	/	18 °C
50 °C	45 °C	32 l/min	79 kW	1.3 litres	37 l/min	/	/	/	22 °C
	55 °C	53 l/min	111 kW	0.8 litre	/	/	/	/	16 °C
55 °C	45 °C	42 l/min	102 kW	1.0 litre	48 l/min	/	/	/	19 °C
	50 °C	31 l/min	87 kW	1.3 litres	41 l/min	35 l/min	/	/	24 °C
60 °C	40 °C	61 l/min	128 kW	0.7 litre	/	/	/	/	15 °C
	45 °C	50 l/min	121 kW	0.8 litre	58 l/min	/	/	/	17 °C
60 °C	50 °C	40 l/min	111 kW	1.0 litre	53 l/min	45 l/min	/	/	21 °C
	55 °C	30 l/min	95 kW	1.4 litres	45 l/min	39 l/min	34 l/min	/	27 °C
65 °C	40 °C	65 l/min***	135 kW	0.6 litre	/	/	/	/	14 °C
	45 °C	57 l/min	138 kW	0.7 litre	66 l/min	/	/	/	16 °C
65 °C	50 °C	47 l/min	131 kW	0.9 litre	62 l/min	53 l/min	/	/	19 °C
	55 °C	39 l/min	120 kW	1.1 litres	57 l/min	49 l/min	43 l/min	/	23 °C
65 °C	60 °C	30 l/min	103 kW	1.4 litres	49 l/min	42 l/min	37 l/min	33 l/min	29 °C
	70 °C	65 l/min***	135 kW	0.5 litre	/	/	/	/	13 °C
70 °C	45 °C	64 l/min	155 kW	0.7 litre	74 l/min	/	/	/	15 °C
	50 °C	54 l/min	149 kW	0.8 litre	71 l/min	61 l/min	/	/	17 °C
70 °C	55 °C	45 l/min	141 kW	0.9 litre	67 l/min	57 l/min	50 l/min	/	20 °C
	60 °C	37 l/min	129 kW	1.1 litres	62 l/min	53 l/min	46 l/min	41 l/min	24 °C
75 °C	40 °C	65 l/min***	135 kW	0.5 litre	/	/	/	/	12 °C
	45 °C	65 l/min***	158 kW	0.6 litre	75 l/min	/	/	/	14 °C
75 °C	50 °C	60 l/min	166 kW	0.7 litre	79 l/min	68 l/min	/	/	16 °C
	55 °C	51 l/min	159 kW	0.8 litre	76 l/min	65 l/min	57 l/min	/	19 °C
75 °C	60 °C	43 l/min	151 kW	1.0 litre	72 l/min	61 l/min	54 l/min	48 l/min	22 °C
	80 °C	40 °C	65 l/min***	135 kW	0.5 litre	/	/	/	/
45 °C		65 l/min***	158 kW	0.5 litre	75 l/min	/	/	/	13 °C
80 °C	50 °C	65 l/min	181 kW	0.6 litre	87 l/min	74 l/min	/	/	15 °C
	55 °C	57 l/min	176 kW	0.7 litre	84 l/min	72 l/min	63 l/min	/	17 °C
80 °C	60 °C	49 l/min	169 kW	0.8 litre	81 l/min	69 l/min	60 l/min	54 l/min	20 °C
	85 °C	40 °C	65 l/min***	135 kW	0.4 litre	/	/	/	/
45 °C		65 l/min***	158 kW	0.5 litre	75 l/min	/	/	/	13 °C
85 °C	50 °C	65 l/min***	181 kW	0.6 litre	86 l/min	74 l/min	/	/	14 °C
	55 °C	62 l/min	192 kW	0.7 litre	92 l/min	79 l/min	69 l/min	/	16 °C
85 °C	60 °C	54 l/min	187 kW	0.8 litre	89 l/min	76 l/min	67 l/min	59 l/min	18 °C
	90 °C	40 °C	65 l/min***	135 kW	0.4 litre	/	/	/	/
45 °C		65 l/min***	158 kW	0.5 litre	75 l/min	/	/	/	12 °C
90 °C	50 °C	65 l/min***	181 kW	0.5 litre	86 l/min	74 l/min	/	/	14 °C
	55 °C	65 l/min***	203 kW	0.6 litre	97 l/min	83 l/min	72 l/min	/	15 °C
90 °C	60 °C	59 l/min	203 kW	0.7 litre	97 l/min	83 l/min	73 l/min	65 l/min	17 °C
	95 °C	40 °C	65 l/min***	135 kW	0.4 litre	/	/	/	/
45 °C		65 l/min***	158 kW	0.4 litre	75 l/min	/	/	/	12 °C
95 °C	50 °C	65 l/min***	181 kW	0.5 litre	86 l/min	74 l/min	/	/	13 °C
	55 °C	65 l/min***	203 kW	0.6 litre	97 l/min	83 l/min	72 l/min	/	15 °C
95 °C	60 °C	63 l/min	219 kW	0.7 litre	105 l/min	90 l/min	78 l/min	70 l/min	16 °C

* The maximum output capacity depends on the pressure drop on the primary side.

** The maximum withdrawal quantity at the mixing valve depends on the length and the insulation of the pipes.

*** Maximum flow rate: 65 l/min, with pressure drop of the DHW module of 1000 mbar (for hydraulic reasons, higher values are only partly possible, measuring limit of the flow rate sensor ~133 l/min)

Example: The temperature in the heating storage tank (primary) is 65 °C and the hot water temperature set at the controller is 50 °C (secondary):

- With 65 °C in the heating buffer tank, a maximum of 47 litres of domestic water per minute can be heated to 50 °C.
- This withdrawal corresponds to a performance of 131 kW.
- In order to obtain 1 litre (or 100 litres) of hot water with a temperature of 50 °C, the heating buffer tank must contain 0.9 litre (or 90 litres) with a temperature of 65 °C.
- These 47 litres of warm water per minute with 50 °C can be mixed with cold water (10 °C) at the tap (mixing valve) to obtain 53 litres per minute with 45 °C.
- The primary return temperature for a withdrawal of 47 litres of warm water per minute is about 19 °C.



Temperature of the heating storage tank	Domestic hot water temperature set at the controller	Maximum output capacity* of the Friwa	Transmission performance	Required tank volume per litre of hot water	for an inlet temperature of 10 °C (cold water temperature) - maximum withdrawal quantity** at the mixing valve at				Return temperature to the storage tank
					40 °C	45 °C	50 °C	55 °C	
45 °C	40 °C	52 l/min	109 kW	1.2 litres	/	/	/	/	20 °C
	45 °C	50 l/min	122 kW	1.3 litres	58 l/min	/	/	/	22 °C
50 °C	40 °C	69 l/min	143 kW	0.9 litre	/	/	/	/	18 °C
	45 °C	50 l/min	122 kW	1.3 litres	58 l/min	/	/	/	22 °C
55 °C	40 °C	82 l/min	172 kW	0.8 litre	/	/	/	/	16 °C
	45 °C	65 l/min	158 kW	1.0 litre	75 l/min	/	/	/	19 °C
	50 °C	48 l/min	135 kW	1.3 litres	64 l/min	55 l/min	/	/	24 °C
60 °C	40 °C	88 l/min***	183 kW	0.7 litre	/	/	/	/	15 °C
	45 °C	77 l/min	187 kW	0.8 litre	89 l/min	/	/	/	17 °C
	50 °C	62 l/min	172 kW	1.0 litre	82 l/min	70 l/min	/	/	21 °C
	55 °C	47 l/min	147 kW	1.4 litres	70 l/min	60 l/min	52 l/min	/	26 °C
65 °C	40 °C	88 l/min***	183 kW	0.6 litre	/	/	/	/	14 °C
	45 °C	88 l/min	214 kW	0.7 litre	102 l/min	/	/	/	16 °C
	50 °C	73 l/min	203 kW	0.9 litre	96 l/min	83 l/min	/	/	19 °C
	55 °C	60 l/min	186 kW	1.1 litres	89 l/min	76 l/min	66 l/min	/	22 °C
	60 °C	46 l/min	160 kW	1.4 litres	76 l/min	65 l/min	57 l/min	51 l/min	28 °C
70 °C	40 °C	88 l/min***	183 kW	0.5 litre	/	/	/	/	14 °C
	45 °C	88 l/min***	214 kW	0.6 litre	102 l/min	/	/	/	15 °C
	50 °C	83 l/min	230 kW	0.8 litre	109 l/min	94 l/min	/	/	17 °C
	55 °C	70 l/min	218 kW	0.9 litre	104 l/min	89 l/min	78 l/min	/	20 °C
	60 °C	58 l/min	200 kW	1.1 litres	95 l/min	82 l/min	71 l/min	63 l/min	24 °C
75 °C	40 °C	88 l/min***	183 kW	0.5 litre	/	/	/	/	13 °C
	45 °C	88 l/min***	214 kW	0.6 litre	102 l/min	/	/	/	14 °C
	50 °C	88 l/min***	244 kW	0.7 litre	116 l/min	100 l/min	/	/	16 °C
	55 °C	79 l/min	246 kW	0.8 litre	117 l/min	100 l/min	88 l/min	/	18 °C
	60 °C	67 l/min	233 kW	1.0 litre	111 l/min	95 l/min	83 l/min	74 l/min	21 °C
80 °C	40 °C	88 l/min***	183 kW	0.4 litre	/	/	/	/	13 °C
	45 °C	88 l/min***	214 kW	0.5 litre	102 l/min	/	/	/	14 °C
	50 °C	88 l/min***	244 kW	0.6 litre	116 l/min	100 l/min	/	/	15 °C
	55 °C	87 l/min	272 kW	0.7 litre	130 l/min	111 l/min	97 l/min	/	17 °C
	60 °C	75 l/min	262 kW	0.8 litre	125 l/min	107 l/min	93 l/min	83 l/min	20 °C
85 °C	40 °C	88 l/min***	183 kW	0.4 litre	/	/	/	/	12 °C
	45 °C	88 l/min***	214 kW	0.5 litre	102 l/min	/	/	/	13 °C
	50 °C	88 l/min***	244 kW	0.6 litre	116 l/min	100 l/min	/	/	15 °C
	55 °C	88 l/min***	274 kW	0.7 litre	131 l/min	112 l/min	98 l/min	/	16 °C
	60 °C	83 l/min	289 kW	0.8 litre	137 l/min	118 l/min	103 l/min	92 l/min	18 °C
90 °C	40 °C	88 l/min***	183 kW	0.4 litre	/	/	/	/	12 °C
	45 °C	88 l/min***	214 kW	0.5 litre	102 l/min	/	/	/	13 °C
	50 °C	88 l/min***	244 kW	0.5 litre	116 l/min	100 l/min	/	/	14 °C
	55 °C	88 l/min***	274 kW	0.6 litre	131 l/min	112 l/min	98 l/min	/	15 °C
	60 °C	88 l/min	305 kW	0.7 litre	146 l/min	125 l/min	109 l/min	97 l/min	17 °C
95 °C	40 °C	88 l/min***	183 kW	0.4 litre	/	/	/	/	12 °C
	45 °C	88 l/min***	214 kW	0.4 litre	102 l/min	/	/	/	13 °C
	50 °C	88 l/min***	244 kW	0.5 litre	116 l/min	100 l/min	/	/	14 °C
	55 °C	88 l/min***	274 kW	0.6 litre	131 l/min	112 l/min	98 l/min	/	15 °C
	60 °C	88 l/min***	305 kW	0.7 litre	146 l/min	125 l/min	109 l/min	97 l/min	16 °C

* The maximum output capacity depends on the pressure drop on the primary side. Assumption: 1 m wc

In the case of higher pressure drops, the maximum output capacity drops accordingly.

** The maximum withdrawal quantity at the mixing valve depends on the length and the insulation of the pipes.

*** Maximum flow rate: 88 l/min, with pressure drop of the DHW module of 1000 mbar (for hydraulic reasons, higher values are only partly possible, measuring limit of the flow rate sensor ~133 l/min)

Example: The temperature in the heating storage tank (primary) is 65 °C and the hot water temperature set at the controller is 50 °C (secondary):

- With 65 °C in the heating buffer tank, a maximum of 73 litres of domestic water per minute can be heated to 50 °C.
- This withdrawal corresponds to a performance of 203 kW.
- In order to obtain 1 litre (or 100 litres) of hot water with a temperature of 50 °C, the heating buffer tank must contain 0.9 litre (or 90 litres) with a temperature of 65 °C.
- These 73 litres of warm water per minute with 50 °C can be mixed with cold water (10 °C) at the tap (mixing valve) to obtain 83 litres per minute with 45 °C.
- The primary return temperature for a withdrawal of 73 litres of warm water per minute is about 19 °C.



Temperature of the heating storage tank	Domestic hot water temperature set at the controller	Maximum output capacity* of the Friwa	Transmission performance	Required tank volume per litre of hot water	for an inlet temperature of 10 °C (cold water temperature) - maximum withdrawal quantity** at the mixing valve at				Return temperature to the storage tank
					40 °C	45 °C	50 °C	55 °C	
45 °C	40 °C	85 l/min	178 kW	1.2 litres	/	/	/	/	19 °C
	50 °C	111 l/min	230 kW	0.9 litre	/	/	/	/	17 °C
50 °C	45 °C	82 l/min	199 kW	1.2 litres	95 l/min	/	/	/	21 °C
	55 °C	130 l/min***	271 kW	0.8 litre	/	/	/	/	15 °C
55 °C	45 °C	105 l/min	254 kW	1.0 litre	122 l/min	/	/	/	18 °C
	50 °C	79 l/min	220 kW	1.3 litres	105 l/min	90 l/min	/	/	23 °C
	60 °C	130 l/min***	271 kW	0.7 litre	/	/	/	/	14 °C
60 °C	45 °C	123 l/min	300 kW	0.8 litre	143 l/min	/	/	/	16 °C
	50 °C	100 l/min	278 kW	1.0 litre	133 l/min	114 l/min	/	/	19 °C
	55 °C	77 l/min	240 kW	1.3 litres	115 l/min	98 l/min	86 l/min	/	25 °C
65 °C	40 °C	130 l/min***	271 kW	0.6 litre	/	/	/	/	13 °C
	45 °C	130 l/min***	316 kW	0.7 litre	151 l/min	/	/	/	15 °C
	50 °C	117 l/min	325 kW	0.9 litre	156 l/min	133 l/min	/	/	17 °C
	55 °C	96 l/min	301 kW	1.0 litre	144 l/min	123 l/min	108 l/min	/	21 °C
	60 °C	75 l/min	261 kW	1.3 litres	125 l/min	107 l/min	94 l/min	83 l/min	27 °C
70 °C	40 °C	130 l/min***	271 kW	0.5 litre	/	/	/	/	12 °C
	45 °C	130 l/min***	316 kW	0.6 litre	151 l/min	/	/	/	14 °C
	50 °C	130 l/min***	361 kW	0.8 litre	173 l/min	148 l/min	/	/	16 °C
	55 °C	112 l/min	358 kW	0.9 litre	168 l/min	143 l/min	125 l/min	/	19 °C
	60 °C	94 l/min	324 kW	1.1 litres	155 l/min	133 l/min	116 l/min	103 l/min	22 °C
75 °C	40 °C	130 l/min***	271 kW	0.5 litre	/	/	/	/	11 °C
	45 °C	130 l/min***	316 kW	0.6 litre	151 l/min	/	/	/	13 °C
	50 °C	130 l/min***	361 kW	0.7 litre	173 l/min	148 l/min	/	/	15 °C
	55 °C	126 l/min	393 kW	0.8 litre	189 l/min	161 l/min	141 l/min	/	17 °C
	60 °C	108 l/min	374 kW	0.9 litre	180 l/min	153 l/min	134 l/min	119 l/min	20 °C
80 °C	40 °C	130 l/min***	271 kW	0.4 litre	/	/	/	/	11 °C
	45 °C	130 l/min***	316 kW	0.5 litre	151 l/min	/	/	/	12 °C
	50 °C	130 l/min***	361 kW	0.6 litre	173 l/min	148 l/min	/	/	14 °C
	55 °C	130 l/min***	406 kW	0.7 litre	195 l/min	166 l/min	145 l/min	/	16 °C
	60 °C	121 l/min	419 kW	0.8 litre	201 l/min	172 l/min	150 l/min	134 l/min	18 °C
85 °C	40 °C	130 l/min***	271 kW	0.4 litre	/	/	/	/	11 °C
	45 °C	130 l/min***	316 kW	0.5 litre	151 l/min	/	/	/	12 °C
	50 °C	130 l/min***	361 kW	0.6 litre	173 l/min	148 l/min	/	/	13 °C
	55 °C	130 l/min***	406 kW	0.7 litre	195 l/min	166 l/min	145 l/min	/	14 °C
	60 °C	130 l/min***	451 kW	0.8 litre	216 l/min	185 l/min	162 l/min	144 l/min	17 °C
90 °C	40 °C	130 l/min***	271 kW	0.4 litre	/	/	/	/	10 °C
	45 °C	130 l/min***	316 kW	0.5 litre	151 l/min	/	/	/	11 °C
	50 °C	130 l/min***	361 kW	0.5 litre	173 l/min	148 l/min	/	/	12 °C
	55 °C	130 l/min***	406 kW	0.6 litre	195 l/min	166 l/min	145 l/min	/	14 °C
	60 °C	130 l/min***	451 kW	0.7 litre	216 l/min	185 l/min	162 l/min	144 l/min	15 °C
95 °C	40 °C	130 l/min***	271 kW	0.4 litre	/	/	/	/	10 °C
	45 °C	130 l/min***	316 kW	0.4 litre	151 l/min	/	/	/	11 °C
	50 °C	130 l/min***	361 kW	0.5 litre	173 l/min	148 l/min	/	/	12 °C
	55 °C	130 l/min***	406 kW	0.6 litre	195 l/min	166 l/min	145 l/min	/	13 °C
	60 °C	130 l/min***	451 kW	0.6 litre	216 l/min	185 l/min	162 l/min	144 l/min	14 °C

* The maximum output capacity depends on the pressure drop on the primary side.

** The maximum withdrawal quantity at the mixing valve depends on the length and the insulation of the pipes.

*** Maximum flow rate: 88 l/min, with pressure drop of the DHW module of 1000 mbar (for hydraulic reasons, higher values are only partly possible, measuring limit of the flow rate sensor ~133 l/min)

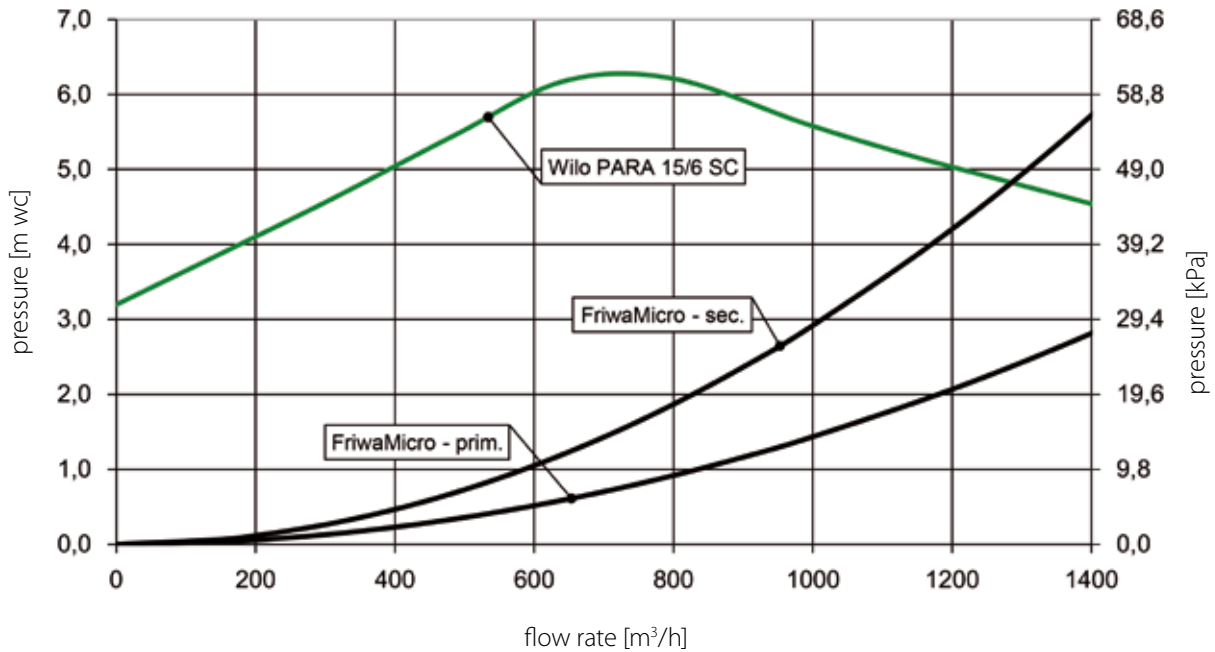
Example: The temperature in the heating storage tank (primary) is 65 °C and the hot water temperature set at the controller is 50 °C (secondary):

- With 65 °C in the heating buffer tank, a maximum of 117 litres of domestic water per minute can be heated to 50 °C.
- This withdrawal corresponds to a performance of 325 kW.
- In order to obtain 1 litre (or 100 litres) of hot water with a temperature of 50 °C, the heating buffer tank must contain 0.9 litre (or 90 litres) with a temperature of 65 °C.
- These 117 litres of warm water per minute with 50 °C can be mixed with cold water (10 °C) at the tap (mixing valve) to obtain 133 litres per minute with 45 °C.

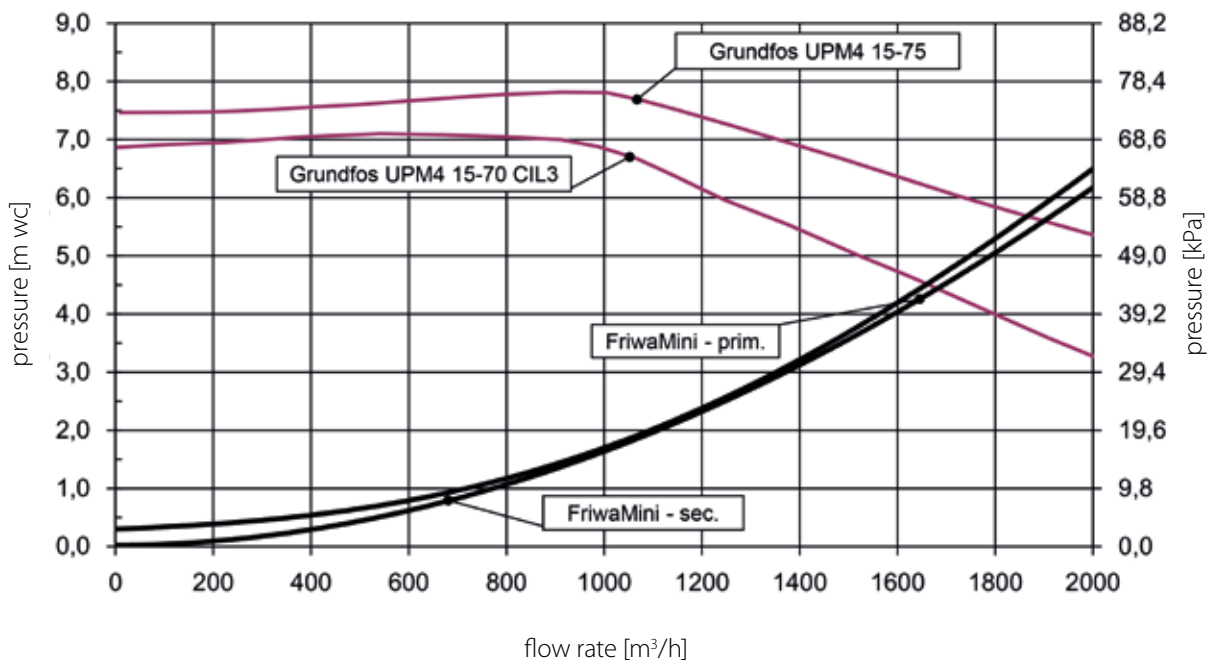
The primary return temperature for a withdrawal of 117 litres of warm water per minute is about 17 °C.



FriwaMicro
up to 20 l/min

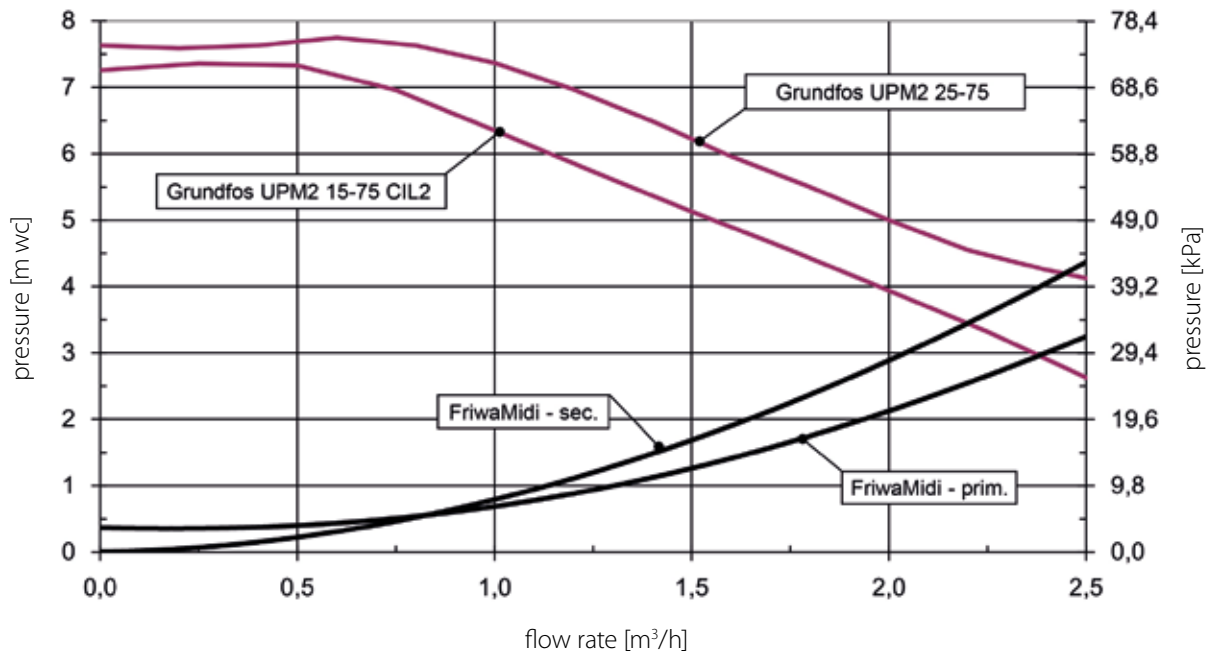


FriwaMini
up to 28 l/min

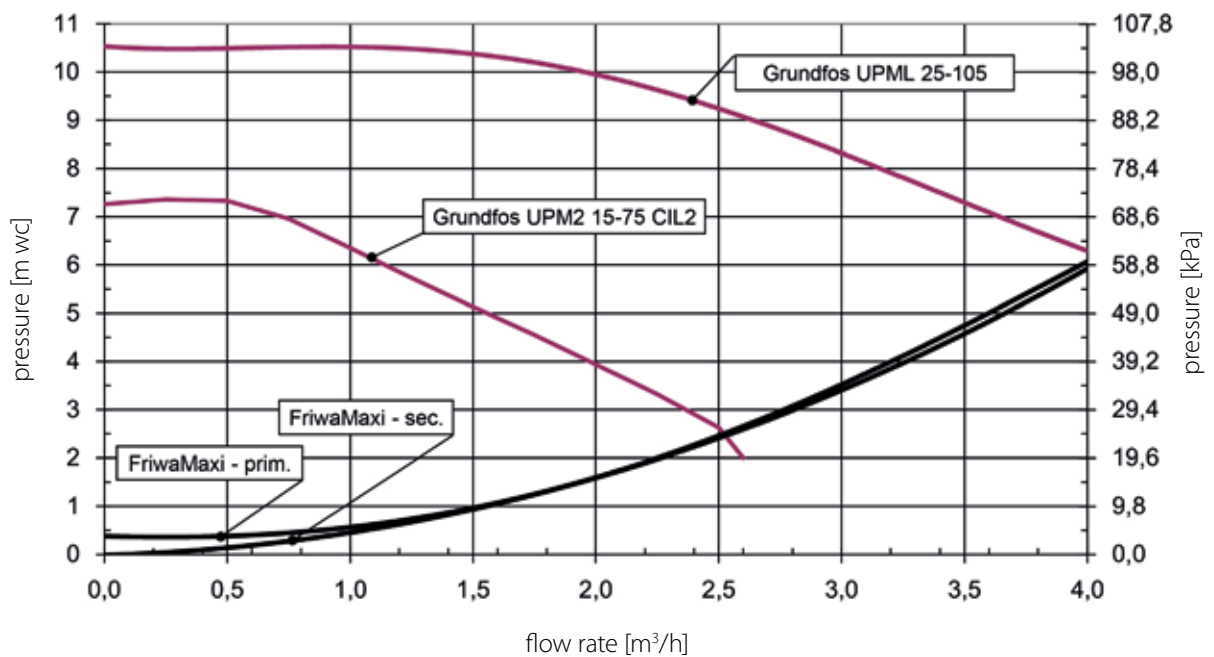




FriwaMidi up to 50 l/min

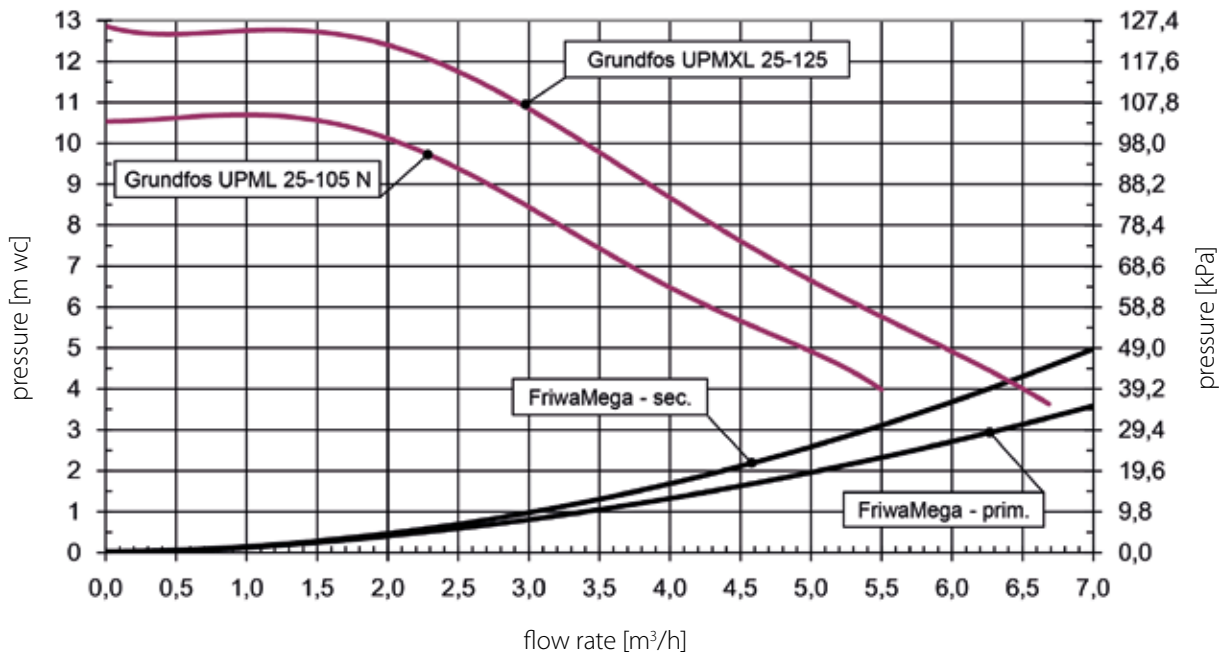


FriwaMaxi up to 77 l/min





FriwaMega
up to 123 l/min







PAW GmbH & Co. KG

Böcklerstraße 11

31789 Hameln

Germany

☎ +49-5151-9856-0

☎ +49-5151-9856-98

@ info@paw.eu

🌐 www.paw.eu



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