



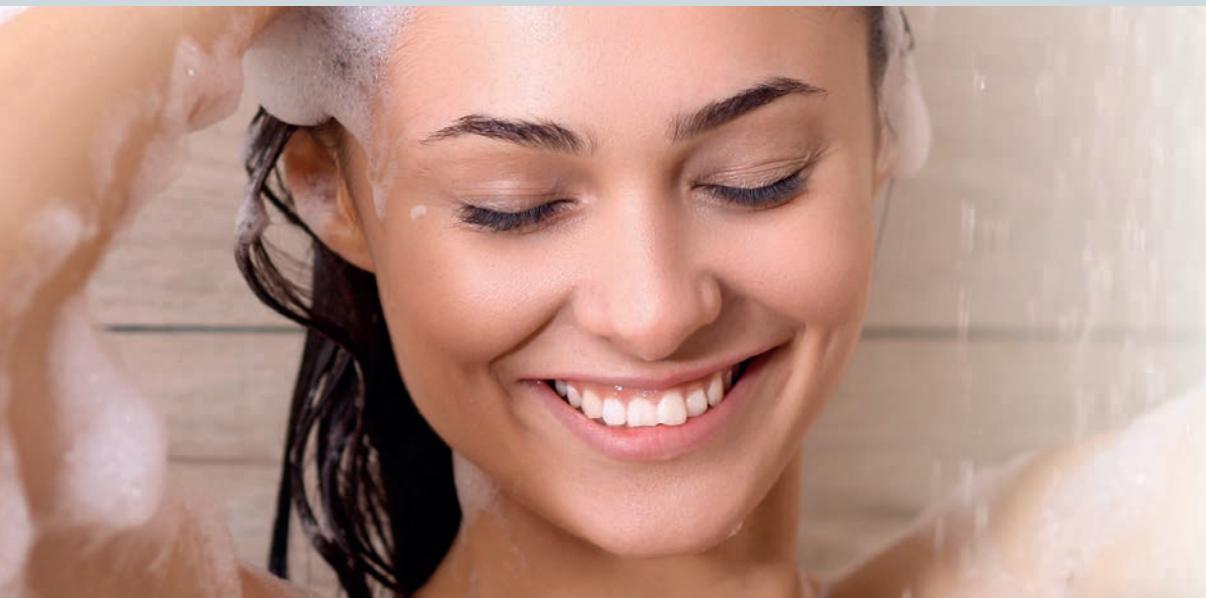
**Friwa**

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 cascability of the modules due 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

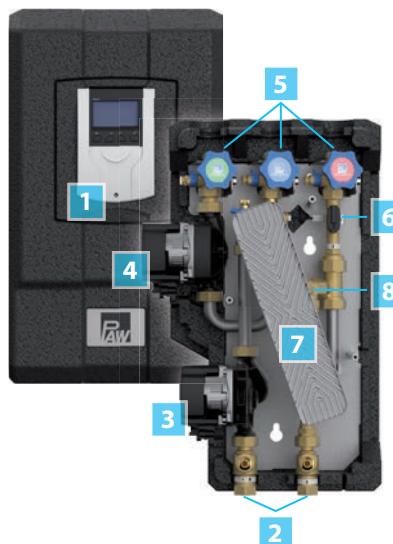
For the setting of the desired temperature range

#### 5 Insulation

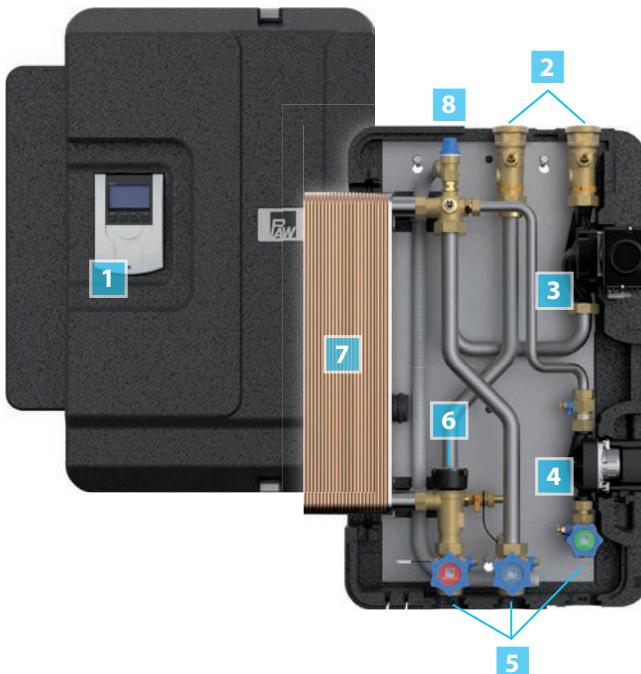
#### 6 Flow from the buffer tank



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: 2 – 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 bars



## 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 rate can be covered comfortably.

Overview Friwa modules and equipment					
Station/type	FriwaMicro	FriwaMini	FriwaMidi	FriwaMaxi	FriwaMega
<b>Application range*</b>	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
<b>Basic module without circulation</b>	6400010***	6401510	6405510	6406510	6407510
	6400030*** (coated heat exchanger)	6401530 (coated heat exchanger)	6405530 (coated heat exchanger)	6406530 (coated heat exchanger)	6407530 (coated heat exchanger)
<b>Module with circulation (internal)**</b>	–	6401515	6405515	6406515	6407515
	–	6401535 (coated heat exchanger)	6405535 (coated heat exchanger)	6406535 (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

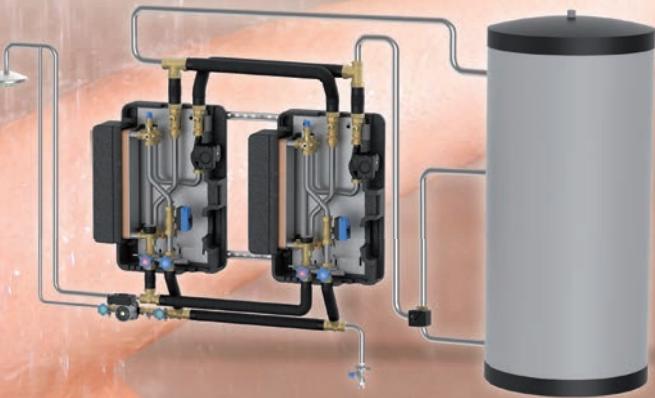
\*\*Friwa modules can be equipped subsequently with internal circulation lines - see equipment

\*\*\* thermally controlled



The product range comprises not only the modules Mini, Midi, Maxi and Mega but also 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 FriwaMaxi Cascade





## Required module and pipe set for double cascade\*\*\* - example FriwaMini

<b>Example:</b>	2x Basic module	+ Pipe set for cascade	+ Return distribution set	+ Circulation line
	<b>FriwaMini</b>			
<b>Basic modules</b>	2x 6401510			
	2x 6401530 (coated heat exchanger)			
<b>Pipe set for cascade</b>	64042932			
<b>Return distribution set</b>	640425			
<b>Optional: circulation line</b>	6404111			
<b>Optional accessories: WiFi3.10 Internet Gateway Module and MB3.10 Modbus RTU Module, see page 6</b>				

## Required module and pipe set for double cascade\*\*\* - example FriwaMidi

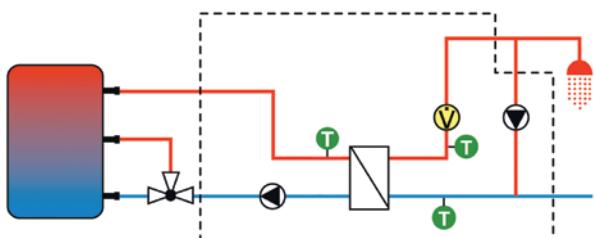
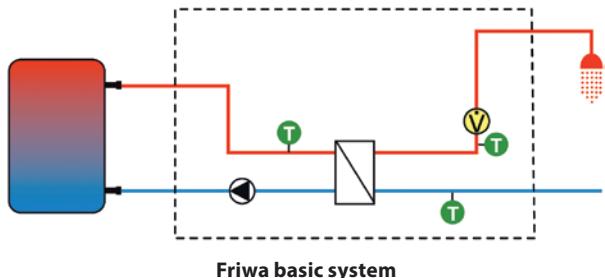
<b>Example:</b>	2x Basic module	+ Pipe set for cascade	+ Return distribution set	+ Circulation line
	<b>FriwaMidi</b>	<b>FriwaMaxi</b>	<b>FriwaMega</b>	
<b>Basic modules</b>	2x 6401510	2x 6406510	2x 6407510	
	2x 6401530 (coated heat exchanger)	2x 6406530 (coated heat exchanger)	2x 6407530 (coated heat exchanger)	
<b>Pipe set for cascade</b>	64042932	64042952	1x 64042962	
<b>Return distribution set</b>	6404242	6404242	6404244	
<b>Optional: circulation line</b>	640425	6404136GH7	6404136GH7	
	6404111	6404136GH10	6404136GH10	
		6404136GH12	6404136GH12	
<b>Optional accessories: WiFi3.10 Internet Gateway Module and MB3.10 Modbus RTU Module, see page 6</b>				

## Required module for triple or quadruple cascade\*\*\* - example FriwaMidi

<b>Example:</b>	3x or 4x Basic module	+ Accessory kit for cascade	+ Return distribution set	+ Circulation line
	<b>FriwaMidi</b>	<b>FriwaMaxi</b>	<b>FriwaMega</b>	
<b>Basic modules</b>	3x or 4x 6405510	3x or 4x 6406510	3x or 4x 6407510	
	3x or 4x 6405530 (coated heat exchanger)	3x or 4x 6406530 (coated heat exchanger)	3x or 4x 6407530 (coated heat exchanger)	
<b>Pipe set for cascade</b>	64042641	64042741	2x 64042962	
<b>Return distribution set</b>	6404242	6404242	6404244	
<b>Optional: circulation line</b>	6404136GH7	6404136GH7	6404136GH7	
	6404136GH10	6404136GH10	6404136GH10	
	6404136GH12	6404136GH12	6404136GH12	
<b>Optional accessories: WiFi3.10 Internet Gateway Module and MB3.10 Modbus RTU Module, see page 6</b>				

<b>Further accessories</b>	see page 9 / 11	see page 13	see page 15	see page 17
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\*\*\* The cascade solution is available on request; / = not possible


**Preset systems:**

**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 56 l/min\*
- for FriwaMidi up to 50 l/min\* / cascade up to 100 l/min\*
- for FriwaMaxi up to 77 l/min\*/ cascade up to 154 l/min\*
- for FriwaMega up to 123 l/min\* / cascade up to 246 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 rotation speed control
Eingängelinputs	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 activated functions and graphic overview of the nominal values
- ✓ E-mail notification in case of error messages
- ✓ Display of the alarms 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 bars, secondary: 10 bars
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*	49 kW

## Technical data

Equipment	Dimensions	Materials
Heat exchanger	Nominal diameter DN 15 (½")	Valves and fittings Brass
Cartridge sensor	Connections ¾" int. thread, flat sealing	Gaskets AFM34, asbestos-free
Flow switch	Centre distance Width Height Depth Installation length Height	Insulation Cartridge sensor Flow switch Thermostatic valve Gaskets: EPDM Heat exchanger Stainless steel Noryl Housing / valve plate: brass Solder: copper Plates + connecting pieces: stainless steel 1.4401 Coating (optional): based on silica



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



**FriwaMicro - DN 15 (1/2")**

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.
	<b>Safety group for domestic hot water tank</b> 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 bars, max. power 10 kW
	<b>Accessory set FriwaMicro</b> 64042001  Consisting of: 3x ball valve DN 15  For locking the station during servicing Authorisation according to DVGW Connections: 3/4" ext. thread

**Coated heat exchanger – premium variant**

- ✓ 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

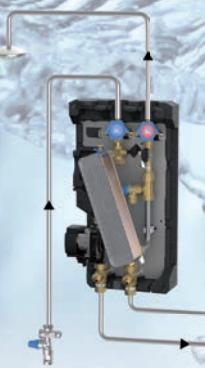
Max. pressure	primary: 3 bars, secondary: 10 bars
Max. operating temperature	95 °C
Min. flow rate	2 l/min
Max. flow rate as per SPF LK 1*	28 l/min
Transmission performance 1 as per SPF LK 1*	65 kW

## Technical data

Equipment	Dimensions	Materials
Check valve	Nominal diameter	Valves and fittings
primary: 1 x 200 mm wc	DN 15 (½")	Brass
Circulation line	Connections	Gaskets
optional	primary: ¾" int. thread secondary: ¾" ext. thread, flat sealing	AFM34 / EPDM
Heat exchanger	Circulation line	Insulation
32 plates, type E8ASW-N	1" ext. thread	EPP
Sensors	Width	Heat exchanger
2 x Pt1000 1 x VFS 2-40 l/min	309 mm / 345 mm	Solder: copper Plates + connecting pieces: stainless steel Coating (optional): based on silica
Controller	Centre distance, prim.	
FC3.10	90 mm	
WiFi3.10	Centre distance, sec.	
optional	90 mm	
MB3.10	Height	
optional	539 mm	
	Installation length	
	494 mm	
	Depth	
	314 mm	



## FriwaMini Mounting example



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 (1/2")**

**Item no.**



**FriwaMini without circulation**

prim.: Grundfos UPM3 15-75

**6401510**

**FriwaMini with circulation**

prim.: Grundfos UPM3 15-75, sec.: Grundfos UPM3 15-70 CIL3

**6401515**

**FriwaMini without circulation, heat exchanger coated**

prim.: Grundfos UPM3 15-75

**6401530**

**FriwaMini with circulation, heat exchanger coated**

prim.: Grundfos UPM3 15-75, sec.: Grundfos UPM3 15-70 CIL3

**6401535**

**Accessories**

**Item no.**



**Return distribution set, 1" int. thread**

**640425**

3-way valve with actuator, Kvs value: 11  
for FriwaMini



**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 bars, max. power 10 kW



**Withdrawal valve**

**640422**

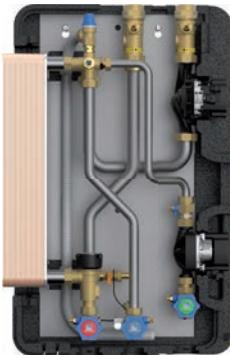
Flame-treated valves for sterile withdrawal of water.  
For the subsequent installation inside the Friwa module, on each piston valve of the domestic hot water circuit.



**Pipe set for FriwaMini-Kaskade**

**64042932**

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 bars, secondary: 10 bars
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*	121 kW

#### Technical data

Equipment	Dimensions	Materials
Check valve	Nominal diameter	Valves and fittings
primary: 2 x 190 mm wc	DN 20 (¾")	Brass
Circulation line	Connections	Gaskets
optional	primary: 1½" ext. thread secondary: 1" ext. thread	AFM34 / EPDM
Heat exchanger		Insulation
40 plates, type B25TH		EPP
Sensors	Circulation line	Heat exchanger
primary: 1x Pt1000 secondary: 2x Pt1000 1x flow meter	1" ext. thread	Solder: copper Plates + connecting pieces: stainless steel Coating (optional): based on silica
Controller	Width	
FC3.10	602 mm	
	Centre distance, prim.	
	120 mm	
	Centre distance, sec.	
	100 mm	
	Height	
	795 mm	
	Installation length	
	711 mm / 757 mm	
	Depth	
	298 mm	



#### FriwaMidi Mounting example



**FriwaMidi with circulation**



**Cascade with 2 basic modules and pipe set for cascade**



FriwaMidi – DN 20 (3/4")		Item no.
	<b>FriwaMidi without circulation</b> prim.: Grundfos UPM2 25-75	<b>6405510</b>
	<b>FriwaMidi with circulation</b> prim.: Grundfos UPM2 25-75, sec.: Grundfos UPM2 15-75 CIL2	<b>6405515</b>
	<b>FriwaMidi without circulation, heat exchanger coated</b> prim.: Grundfos UPM2 25-75	<b>6405530</b>
	<b>FriwaMidi, with circulation, heat exchanger coated</b> prim.: Grundfos UPM2 25-75, sec.: Grundfos UPM2 15-75 CIL2	<b>6405535</b>
Accessories		Item no.
	<b>Circulation set for internal retrofitting (FriwaMidi/Maxi)</b> - with high-efficiency pump Grundfos UPM2 15-75 CIL2 - with piston valve and non-return valve Connection: 1" ext. thread	<b>640412</b>
	<b>Return distribution set 1 1/4" int. thread</b> 3-way valve with actuator, setting time for 90°: 18 sec., Kvs value: 15 for FriwaMidi, tank heat transfer module Midi	<b>640423</b>
	<b>Withdrawal valve</b> 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.	<b>640422</b>
	<b>Pipe set for FriwaMidi Cascade, 2-fold</b> Insulated pipe set for the cascading of two Friwa modules (item no. 6405510). - with two 2-way valves for switching - with mounting rail for an easy wall assembly	<b>64042942</b>
	<b>Accessory set for FriwaMidi Cascade, 3-fold</b> Pipe set for the cascading of three Friwa modules (item no. 6405510) - with three 2-way valves for switching <i>The pipe set for cascade must be obtained by the customer!</i>	<b>64042631</b>
	<b>Accessory set for FriwaMidi Cascade, 4-fold</b> Pipe set for the cascading of four Friwa modules (item no. 6405510) - with four 2-way valves for switching <i>The pipe set for cascade must be obtained by the customer!</i>	<b>64042641</b>
	<b>Return distribution set 1 1/2" int. thread</b> 3-way valve with actuator, setting time for 90°: 35 sec., Kvs value: 25 for FriwaMidi/Maxi Cascade, FriwaMega	<b>6404242</b>
	<b>Circulation set for Friwa Cascade (Midi, Maxi, Mega)</b> - with high-efficiency pump Grundfos UPM2 15-75 CIL - with piston valves, non-return valve and drain valve Connection: 1" ext. thread	<b>6404136GH7</b>
	<b>Circulation set for Friwa Cascade (Midi, Maxi, Mega)</b> - High-efficiency pump Grundfos UPML 25-105 N - with piston valves, non-return valve and drain valve Connection: 1 1/2" ext. thread	<b>6404136GH10</b>



#### 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 bars, secondary: 10 bars
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	Nominal diameter	Valves and fittings
primary: 2 x 400 mm wc	DN 25 (1")	Brass
Circulation line	Connections	Gaskets
optional	primary: 2" ext. thread secondary: 1 1/4" ext. thread	AFM34 / EPDM
Heat exchanger	Circulation line	Insulation
60 plates, type B25TH	1" ext. thread	EPP
Sensors	Width	Heat exchanger
primary: 1x Pt1000 secondary: 2x Pt1000 1 x flow meter	602 mm	Solder: copper Plates + connecting pieces: stainless steel Coating (optional): based on silica
Controller	Centre distance, prim.	
FC3.10	120 mm	
WiFi3.10	Centre distance, sec.	
optional	100 mm	
MB3.10	Height	
optional	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.
<b>FriwaMaxi without circulation</b>	
prim.: Grundfos UPML 25-105	<b>6406510</b>
<b>FriwaMaxi with circulation</b>	
prim.: Grundfos UPML 25-105, sec.: Grundfos UPM2 15-75 CIL2	<b>6406515</b>
<b>FriwaMaxi without circulation, heat exchanger coated</b>	
prim.: Grundfos UPML 25-105	<b>6406530</b>
<b>FriwaMaxi with circulation , heat exchanger coated</b>	
prim.: Grundfos UPML 25-105, sec.: Grundfos UPM2 15-75 CIL2	<b>6406535</b>
<hr/>	
	<b>Circulation set for internal retrofitting (FriwaMidi/Maxi)</b> <b>640412</b>
- with high-efficiency pump Grundfos UPM2 15-75 CIL2 - with piston valve and non-return valve Connection: 1" ext. thread	
	<b>Return distribution set 1 1/4" int. thread</b> <b>640424</b>
3-way valve with actuator, setting time for 90°: 35 sec., Kvs value: 16 for FriwaMaxi, tank heat transfer module Maxi	
	<b>Withdrawal valve</b> <b>640422</b>
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.	
	<b>Pipe set for FriwaMaxi Cascade, 2-fold</b> <b>64042952</b>
Insulated pipe set for the cascading of two Friwa modules (item no. 6406510). - with two 2-way valves for switching - with mounting rail for an easy wall assembly	
	<b>Accessory set for FriwaMaxi Cascade, 3-fold</b> <b>64042631</b>
Pipe set for the cascading of three Friwa modules (item no. 6406510) - with three 2-way valves for switching <i>The pipe set for cascade must be obtained by the customer!</i>	
	<b>Accessory set for FriwaMaxi Cascade, 4-fold</b> <b>64042641</b>
Pipe set for the cascading of four Friwa modules (item no. 6406510) - with four 2-way valves for switching <i>The pipe set for cascade must be obtained by the customer!</i>	
	<b>Return distribution set 1 1/2" int. thread</b> <b>6404242</b>
3-way valve with actuator, setting time for 90°: 35 sec., Kvs value: 25 for FriwaMidi/Maxi Cascade, FriwaMega	
	<b>Circulation set for Friwa Cascade (Midi, Maxi, Mega)</b> <b>6404136GH7</b>
- with high-efficiency pump Grundfos UPM2 15-75 CIL2 - with piston valves, non-return valve and drain valve Connection: 1" ext. thread	
	<b>Circulation set for Friwa Cascade (Midi, Maxi, Mega)</b> <b>6404136GH10</b>
- High-efficiency pump Grundfos UPML 25-105 N - with piston valves, non-return valve and drain valve Connection: 1 1/2" ext. thread	
	<b>Circulation set for Friwa Cascade (Maxi, Mega)</b> <b>6404136GH12</b>
- 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 bars, secondary: 10 bars
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

Check valve	primary: 2 x 450 mm wc
Circulation line	optional
Heat exchanger	2 x 60 plates, type B25TH
Sensors	primary: 1x Pt1000 secondary: 2x Pt1000 2 x flow meter
Controller	FC3.10

WiFi3.10  
MB3.10

### Dimensions

Nominal diameter	DN 32 (1 1/4")
Connections	primary: 1 1/2" int. thread secondary: 1 1/2" ext. thread
Circulation line	1" ext. thread 1 1/4" ext. thread
Width	660 mm
Centre distance, prim.	158 mm
Centre distance, sec.	158 mm
Height	1499 mm
Installation length	1107 mm / 1205 mm
Depth	920 mm

### Materials

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



## FriwaMega Mounting example



**FriwaMega with circulation**



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



**FriwaMega - DN 32 (1¼")**

**Item no.**



**FriwaMega without circulation**

prim.: Grundfos UPMXL GEO 25-125

**6407510**

**FriwaMega with circulation**

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

**6407515**

**FriwaMega without circulation, heat exchanger coated**

prim.: Grundfos UPMXL GEO 25-125

**6407530**

**FriwaMega with circulation, heat exchanger coated**

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 Friwa 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 Cascade, FriwaMega

**Return distribution set, 2" int. thread**

**6404244**

3-way valve with actuator, setting time for 90°: 35 sec., Kvs value: 40  
for FriwaMega Cascade



**Pipe set for FriwaMega Cascade, 2-fold**

**64042962**

Insulated pipe set for the cascading of two Friwa modules (item no. 6407510).  
- with two 2-way valves for switching

**Pipe set for FriwaMega Cascade, 4-fold**

**2x 64042962**

*Please order 2x 64042962 for a 4-fold FriwaMega Cascade.*



**Circulation set for Friwa Cascade (Midi, Maxi, Mega)**

**6404136GH7**

- with high-efficiency pump Grundfos UPM2 15-75 CIL2
- 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.

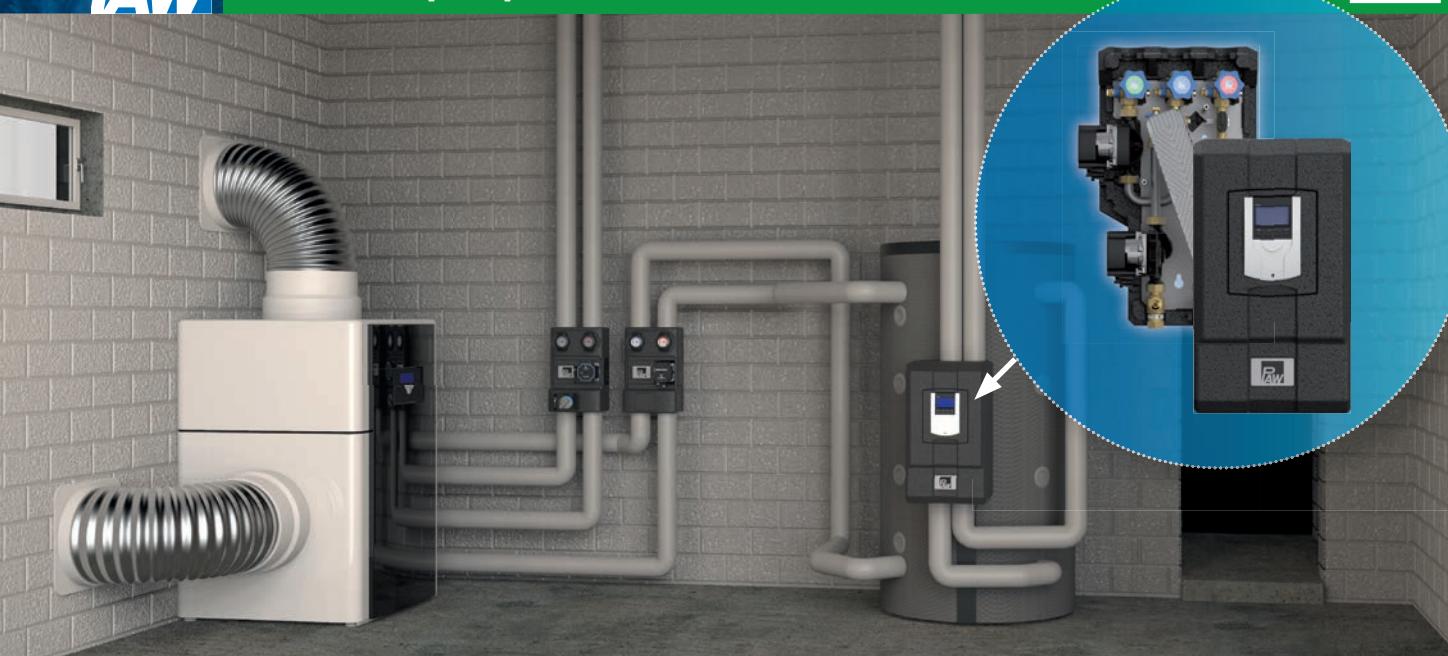
The demand of domestic hot water depends on the flow and the number of consumers. In larger apartment buildings, a certain statistic distribution of withdrawals can be observed. The following table gives a general overview of the application range of the different Friwa modules.

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





## Output capacity table

### FriwaMicro



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	
<b>45 °C</b>	40 °C	18 l/min	38 kW	1.7 litres	/	/	/	/	23 °C
<b>50 °C</b>	40 °C	19 l/min	40 kW	1.1 litres	/	/	/	/	21 °C
	<b>45 °C</b>	<b>15 l/min</b>	<b>36 kW</b>	<b>1.8 litres</b>	17 l/min	/	/	/	<b>24 °C</b>
<b>55 °C</b>	40 °C	23 l/min	48 kW	0.9 litre	/	/	/	/	20 °C
	<b>45 °C</b>	<b>17 l/min</b>	<b>43 kW</b>	<b>1.2 litres</b>	20 l/min	/	/	/	<b>23 °C</b>
	<b>50 °C</b>	<b>15 l/min</b>	<b>42 kW</b>	<b>1.9 litres</b>	20 l/min	<b>17 l/min</b>	/	/	<b>26 °C</b>
<b>60 °C</b>	40 °C	27 l/min	55 kW	0.7 litre	/	/	/	/	20 °C
	<b>45 °C</b>	<b>20 l/min</b>	<b>49 kW</b>	<b>0.9 litre</b>	23 l/min	/	/	/	<b>23 °C</b>
	<b>50 °C</b>	<b>17 l/min</b>	<b>46 kW</b>	<b>1.3 litres</b>	22 l/min	<b>18 l/min</b>	/	/	<b>26 °C</b>
	<b>55 °C</b>	<b>13 l/min</b>	<b>40 kW</b>	<b>2.0 litres</b>	19 l/min	<b>16 l/min</b>	14 l/min	/	<b>30 °C</b>
<b>65 °C</b>	40 °C	27 l/min	56 kW	0.6 litre	/	/	/	/	19 °C
	<b>45 °C</b>	<b>20 l/min</b>	<b>50 kW</b>	<b>0.8 litre</b>	23 l/min	/	/	/	<b>22 °C</b>
	<b>50 °C</b>	<b>18 l/min</b>	<b>50 kW</b>	<b>1.0 litre</b>	24 l/min	<b>20 l/min</b>	/	/	<b>25 °C</b>
	<b>55 °C</b>	<b>15 l/min</b>	<b>46 kW</b>	<b>1.3 litres</b>	21 l/min	<b>18 l/min</b>	16 l/min	/	<b>29 °C</b>
	60 °C	11 l/min	39 kW	2.1 litres	18 l/min	<b>15 l/min</b>	13 l/min	<b>12 l/min</b>	33 °C
<b>70 °C</b>	40 °C	27 l/min	56 kW	0.6 litre	/	/	/	/	19 °C
	<b>45 °C</b>	<b>23 l/min</b>	<b>57 kW</b>	<b>0.7 litre</b>	27 l/min	/	/	/	<b>22 °C</b>
	<b>50 °C</b>	<b>20 l/min</b>	<b>54 kW</b>	<b>0.9 litre</b>	26 l/min	<b>22 l/min</b>	/	/	<b>25 °C</b>
	<b>55 °C</b>	<b>16 l/min</b>	<b>49 kW</b>	<b>1.1 litres</b>	23 l/min	<b>20 l/min</b>	17 l/min	/	<b>29 °C</b>
	60 °C	14 l/min	48 kW	1.4 litres	23 l/min	<b>19 l/min</b>	17 l/min	<b>15 l/min</b>	33 °C
<b>75 °C</b>	40 °C	27 l/min	57 kW	0.5 litre	/	/	/	/	18 °C
	<b>45 °C</b>	<b>25 l/min</b>	<b>61 kW</b>	<b>0.6 litre</b>	28 l/min	/	/	/	<b>21 °C</b>
	<b>50 °C</b>	<b>21 l/min</b>	<b>59 kW</b>	<b>0.7 litre</b>	28 l/min	<b>23 l/min</b>	/	/	<b>24 °C</b>
	<b>55 °C</b>	<b>17 l/min</b>	<b>54 kW</b>	<b>0.9 litre</b>	25 l/min	<b>22 l/min</b>	19 l/min	/	<b>28 °C</b>
	60 °C	14 l/min	49 kW	1.1 litres	23 l/min	<b>19 l/min</b>	17 l/min	<b>15 l/min</b>	32 °C
<b>80 °C</b>	40 °C	28 l/min***	58 kW	0.5 litre	/	/	/	/	17 °C
	<b>45 °C</b>	<b>26 l/min</b>	<b>64 kW</b>	<b>0.6 litre</b>	30 l/min	/	/	/	<b>20 °C</b>
	<b>50 °C</b>	<b>23 l/min</b>	<b>63 kW</b>	<b>0.7 litre</b>	30 l/min	<b>25 l/min</b>	/	/	<b>23 °C</b>
	<b>55 °C</b>	<b>19 l/min</b>	<b>58 kW</b>	<b>0.8 litre</b>	27 l/min	<b>23 l/min</b>	20 l/min	/	<b>27 °C</b>
	60 °C	15 l/min	51 kW	1.0 litre	24 l/min	<b>20 l/min</b>	18 l/min	<b>16 l/min</b>	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 Friwa of 1000 mbars (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.



## Output capacity table FriwaMini



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	
<b>45 °C</b>	40 °C	17 l/min	36 kW	1.8 litres	/	/	/	/	24 °C
<b>50 °C</b>	40 °C	24 l/min	51 kW	1.3 litres	/	/	/	/	22 °C
	<b>45 °C</b>	<b>16 l/min</b>	<b>40 kW</b>	<b>1.9 litres</b>	19 l/min	/	/	/	<b>27 °C</b>
<b>55 °C</b>	40 °C	30 l/min	64 kW	1.0 litre	/	/	/	/	20 °C
	<b>45 °C</b>	<b>23 l/min</b>	<b>56 kW</b>	<b>1.4 litres</b>	26 l/min	/	/	/	<b>24 °C</b>
	<b>50 °C</b>	<b>16 l/min</b>	<b>44 kW</b>	<b>2.0 litres</b>	21 l/min	<b>18 l/min</b>	/	/	<b>29 °C</b>
<b>60 °C</b>	40 °C	36 l/min	76 kW	0.9 litre	/	/	/	/	20 °C
	<b>45 °C</b>	<b>28 l/min</b>	<b>69 kW</b>	<b>1.1 litres</b>	32 l/min	/	/	/	<b>23 °C</b>
	<b>50 °C</b>	<b>22 l/min</b>	<b>60 kW</b>	<b>1.5 litres</b>	28 l/min	<b>24 l/min</b>	/	/	<b>26 °C</b>
	<b>55 °C</b>	<b>15 l/min</b>	<b>48 kW</b>	<b>2.1 litres</b>	22 l/min	<b>19 l/min</b>	17 l/min	/	<b>32 °C</b>
<b>65 °C</b>	40 °C	42 l/min***	88 kW	0.6 litre	/	/	/	/	19 °C
	<b>45 °C</b>	<b>33 l/min</b>	<b>81 kW</b>	<b>0.9 litre</b>	38 l/min	/	/	/	<b>22 °C</b>
	<b>50 °C</b>	<b>27 l/min</b>	<b>74 kW</b>	<b>1.2 litres</b>	35 l/min	<b>30 l/min</b>	/	/	<b>25 °C</b>
	<b>55 °C</b>	<b>21 l/min</b>	<b>65 kW</b>	<b>1.5 litres</b>	30 l/min	<b>26 l/min</b>	23 l/min	/	<b>29 °C</b>
	60 °C	15 l/min	52 kW	2.1 litres	24 l/min	<b>21 l/min</b>	18 l/min	<b>16 l/min</b>	35 °C
<b>70 °C</b>	40 °C	42 l/min***	88 kW	0.5 litre	/	/	/	/	19 °C
	<b>45 °C</b>	<b>38 l/min</b>	<b>93 kW</b>	<b>0.8 litre</b>	44 l/min	/	/	/	<b>21 °C</b>
	<b>50 °C</b>	<b>31 l/min</b>	<b>87 kW</b>	<b>1.0 litre</b>	41 l/min	<b>35 l/min</b>	/	/	<b>24 °C</b>
	<b>55 °C</b>	<b>25 l/min</b>	<b>79 kW</b>	<b>1.2 litres</b>	37 l/min	<b>32 l/min</b>	28 l/min	/	<b>27 °C</b>
	60 °C	20 l/min	69 kW	1.6 litres	33 l/min	<b>28 l/min</b>	24 l/min	<b>22 l/min</b>	31 °C
<b>75 °C</b>	40 °C	42 l/min***	88 kW	0.5 litre	/	/	/	/	18 °C
	<b>45 °C</b>	<b>42 l/min***</b>	<b>102 kW</b>	<b>0.6 litre</b>	49 l/min	/	/	/	<b>20 °C</b>
	<b>50 °C</b>	<b>36 l/min</b>	<b>99 kW</b>	<b>0.9 litre</b>	47 l/min	<b>40 l/min</b>	/	/	<b>23 °C</b>
	<b>55 °C</b>	<b>29 l/min</b>	<b>92 kW</b>	<b>1.1 litres</b>	44 l/min	<b>37 l/min</b>	32 l/min	/	<b>26 °C</b>
	60 °C	24 l/min	84 kW	1.3 litres	40 l/min	<b>34 l/min</b>	30 l/min	<b>26 l/min</b>	29 °C
<b>80 °C</b>	40 °C	42 l/min***	88 kW	0.4 litre	/	/	/	/	18 °C
	<b>45 °C</b>	<b>42 l/min***</b>	<b>102 kW</b>	<b>0.5 litre</b>	49 l/min	/	/	/	<b>20 °C</b>
	<b>50 °C</b>	<b>40 l/min</b>	<b>111 kW</b>	<b>0.8 litre</b>	52 l/min	<b>45 l/min</b>	/	/	<b>22 °C</b>
	<b>55 °C</b>	<b>33 l/min</b>	<b>105 kW</b>	<b>0.9 litre</b>	50 l/min	<b>42 l/min</b>	37 l/min	/	<b>25 °C</b>
	60 °C	28 l/min	98 kW	1.1 litres	46 l/min	<b>39 l/min</b>	34 l/min	<b>31 l/min</b>	28 °C
<b>85 °C</b>	40 °C	42 l/min***	88 kW	0.4 litre	/	/	/	/	18 °C
	<b>45 °C</b>	<b>42 l/min***</b>	<b>102 kW</b>	<b>0.5 litre</b>	49 l/min	/	/	/	<b>20 °C</b>
	<b>50 °C</b>	<b>42 l/min***</b>	<b>117 kW</b>	<b>0.6 litre</b>	56 l/min	<b>47 l/min</b>	/	/	<b>21 °C</b>
	<b>55 °C</b>	<b>37 l/min</b>	<b>117 kW</b>	<b>0.8 litre</b>	55 l/min	<b>47 l/min</b>	41 l/min	/	<b>24 °C</b>
	60 °C	32 l/min	110 kW	1.0 litre	52 l/min	<b>45 l/min</b>	39 l/min	<b>35 l/min</b>	26 °C
<b>90 °C</b>	40 °C	42 l/min***	88 kW	0.4 litre	/	/	/	/	18 °C
	<b>45 °C</b>	<b>42 l/min***</b>	<b>102 kW</b>	<b>0.4 litre</b>	49 l/min	/	/	/	<b>19 °C</b>
	<b>50 °C</b>	<b>42 l/min***</b>	<b>117 kW</b>	<b>0.5 litre</b>	56 l/min	<b>47 l/min</b>	/	/	<b>21 °C</b>
	<b>55 °C</b>	<b>41 l/min</b>	<b>128 kW</b>	<b>0.6 litre</b>	61 l/min	<b>52 l/min</b>	45 l/min	/	<b>23 °C</b>
	60 °C	35 l/min	122 kW	0.9 litre	58 l/min	<b>50 l/min</b>	43 l/min	<b>38 l/min</b>	25 °C
<b>95 °C</b>	40 °C	42 l/min***	88 kW	0.3 litre	/	/	/	/	17 °C
	<b>45 °C</b>	<b>42 l/min***</b>	<b>102 kW</b>	<b>0.4 litre</b>	49 l/min	/	/	/	<b>19 °C</b>
	<b>50 °C</b>	<b>42 l/min***</b>	<b>117 kW</b>	<b>0.5 litre</b>	56 l/min	<b>47 l/min</b>	/	/	<b>20 °C</b>
	<b>55 °C</b>	<b>42 l/min***</b>	<b>132 kW</b>	<b>0.6 litre</b>	63 l/min	<b>53 l/min</b>	47 l/min	/	<b>22 °C</b>
	60 °C	38 l/min	134 kW	0.8 litre	64 l/min	<b>54 l/min</b>	47 l/min	<b>42 l/min</b>	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 Friwa of 1000 mbars (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.
- to produce 1 litres (100 litres) of warm water there must be - 1.2 litres (120 litres) with 65 °C in the buffer tank
- 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.



## Output capacity table

### FriwaMidi



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	
<b>45 °C</b>	40 °C	34 l/min	71 kW	1.2 litres	/	/	/	/	20 °C
<b>50 °C</b>	40 °C	44 l/min	92 kW	0.9 litre	/	/	/	/	18 °C
	<b>45 °C</b>	<b>32 l/min</b>	<b>79 kW</b>	<b>1.3 litres</b>	37 l/min	/	/	/	<b>22 °C</b>
<b>55 °C</b>	40 °C	53 l/min	111 kW	0.8 litre	/	/	/	/	16 °C
	<b>45 °C</b>	<b>42 l/min</b>	<b>102 kW</b>	<b>1.0 litre</b>	48 l/min	/	/	/	<b>19 °C</b>
	<b>50 °C</b>	<b>31 l/min</b>	<b>87 kW</b>	<b>1.3 litres</b>	41 l/min	<b>35 l/min</b>	/	/	<b>24 °C</b>
<b>60 °C</b>	40 °C	61 l/min	128 kW	0.7 litre	/	/	/	/	15 °C
	<b>45 °C</b>	<b>50 l/min</b>	<b>121 kW</b>	<b>0.8 litre</b>	58 l/min	/	/	/	<b>17 °C</b>
	<b>50 °C</b>	<b>40 l/min</b>	<b>111 kW</b>	<b>1.0 litre</b>	53 l/min	<b>45 l/min</b>	/	/	<b>21 °C</b>
	<b>55 °C</b>	<b>30 l/min</b>	<b>95 kW</b>	<b>1.4 litres</b>	45 l/min	<b>39 l/min</b>	34 l/min	/	<b>27 °C</b>
<b>65 °C</b>	40 °C	65 l/min***	135 kW	0.6 litre	/	/	/	/	14 °C
	<b>45 °C</b>	<b>57 l/min</b>	<b>138 kW</b>	<b>0.7 litre</b>	66 l/min	/	/	/	<b>16 °C</b>
	<b>50 °C</b>	<b>47 l/min</b>	<b>131 kW</b>	<b>0.9 litre</b>	62 l/min	<b>53 l/min</b>	/	/	<b>19 °C</b>
	<b>55 °C</b>	<b>39 l/min</b>	<b>120 kW</b>	<b>1.1 litres</b>	57 l/min	<b>49 l/min</b>	43 l/min	/	<b>23 °C</b>
	60 °C	30 l/min	103 kW	1.4 litres	49 l/min	<b>42 l/min</b>	37 l/min	<b>33 l/min</b>	29 °C
<b>70 °C</b>	40 °C	65 l/min***	135 kW	0.5 litre	/	/	/	/	13 °C
	<b>45 °C</b>	<b>64 l/min</b>	<b>155 kW</b>	<b>0.7 litre</b>	74 l/min	/	/	/	<b>15 °C</b>
	<b>50 °C</b>	<b>54 l/min</b>	<b>149 kW</b>	<b>0.8 litre</b>	71 l/min	<b>61 l/min</b>	/	/	<b>17 °C</b>
	<b>55 °C</b>	<b>45 l/min</b>	<b>141 kW</b>	<b>0.9 litre</b>	67 l/min	<b>57 l/min</b>	50 l/min	/	<b>20 °C</b>
	60 °C	37 l/min	129 kW	1.1 litres	62 l/min	<b>53 l/min</b>	46 l/min	<b>41 l/min</b>	24 °C
<b>75 °C</b>	40 °C	65 l/min***	135 kW	0.5 litre	/	/	/	/	12 °C
	<b>45 °C</b>	<b>65 l/min***</b>	<b>158 kW</b>	<b>0.6 litre</b>	75 l/min	/	/	/	<b>14 °C</b>
	<b>50 °C</b>	<b>60 l/min</b>	<b>166 kW</b>	<b>0.7 litre</b>	79 l/min	<b>68 l/min</b>	/	/	<b>16 °C</b>
	<b>55 °C</b>	<b>51 l/min</b>	<b>159 kW</b>	<b>0.8 litre</b>	76 l/min	<b>65 l/min</b>	57 l/min	/	<b>19 °C</b>
	60 °C	43 l/min	151 kW	1.0 litre	72 l/min	<b>61 l/min</b>	54 l/min	<b>48 l/min</b>	22 °C
<b>80 °C</b>	40 °C	65 l/min***	135 kW	0.5 litre	/	/	/	/	12 °C
	<b>45 °C</b>	<b>65 l/min***</b>	<b>158 kW</b>	<b>0.5 litre</b>	75 l/min	/	/	/	<b>13 °C</b>
	<b>50 °C</b>	<b>65 l/min</b>	<b>181 kW</b>	<b>0.6 litre</b>	87 l/min	<b>74 l/min</b>	/	/	<b>15 °C</b>
	<b>55 °C</b>	<b>57 l/min</b>	<b>176 kW</b>	<b>0.7 litre</b>	84 l/min	<b>72 l/min</b>	63 l/min	/	<b>17 °C</b>
	60 °C	49 l/min	169 kW	0.8 litre	81 l/min	<b>69 l/min</b>	60 l/min	<b>54 l/min</b>	20 °C
<b>85 °C</b>	40 °C	65 l/min***	135 kW	0.4 litre	/	/	/	/	12 °C
	<b>45 °C</b>	<b>65 l/min***</b>	<b>158 kW</b>	<b>0.5 litre</b>	75 l/min	/	/	/	<b>13 °C</b>
	<b>50 °C</b>	<b>65 l/min***</b>	<b>181 kW</b>	<b>0.6 litre</b>	86 l/min	<b>74 l/min</b>	/	/	<b>14 °C</b>
	<b>55 °C</b>	<b>62 l/min</b>	<b>192 kW</b>	<b>0.7 litre</b>	92 l/min	<b>79 l/min</b>	69 l/min	/	<b>16 °C</b>
	60 °C	54 l/min	187 kW	0.8 litre	89 l/min	<b>76 l/min</b>	67 l/min	<b>59 l/min</b>	18 °C
<b>90 °C</b>	40 °C	65 l/min***	135 kW	0.4 litre	/	/	/	/	11 °C
	<b>45 °C</b>	<b>65 l/min***</b>	<b>158 kW</b>	<b>0.5 litre</b>	75 l/min	/	/	/	<b>12 °C</b>
	<b>50 °C</b>	<b>65 l/min***</b>	<b>181 kW</b>	<b>0.5 litre</b>	86 l/min	<b>74 l/min</b>	/	/	<b>14 °C</b>
	<b>55 °C</b>	<b>65 l/min***</b>	<b>203 kW</b>	<b>0.6 litre</b>	97 l/min	<b>83 l/min</b>	72 l/min	/	<b>15 °C</b>
	60 °C	59 l/min	203 kW	0.7 litre	97 l/min	<b>83 l/min</b>	73 l/min	<b>65 l/min</b>	17 °C
<b>95 °C</b>	40 °C	65 l/min***	135 kW	0.4 litre	/	/	/	/	11 °C
	<b>45 °C</b>	<b>65 l/min***</b>	<b>158 kW</b>	<b>0.4 litre</b>	75 l/min	/	/	/	<b>12 °C</b>
	<b>50 °C</b>	<b>65 l/min***</b>	<b>181 kW</b>	<b>0.5 litre</b>	86 l/min	<b>74 l/min</b>	/	/	<b>13 °C</b>
	<b>55 °C</b>	<b>65 l/min***</b>	<b>203 kW</b>	<b>0.6 litre</b>	97 l/min	<b>83 l/min</b>	72 l/min	/	<b>15 °C</b>
	60 °C	63 l/min	219 kW	0.7 litre	105 l/min	<b>90 l/min</b>	78 l/min	<b>70 l/min</b>	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 Friwa of 1000 mbars (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	
<b>45 °C</b>	40 °C	52 l/min	109 kW	1.2 litres	/	/	/	/	20 °C
<b>50 °C</b>	40 °C	69 l/min	143 kW	0.9 litre	/	/	/	/	18 °C
	<b>45 °C</b>	<b>50 l/min</b>	<b>122 kW</b>	<b>1.3 litres</b>	58 l/min	/	/	/	<b>22 °C</b>
<b>55 °C</b>	40 °C	82 l/min	172 kW	0.8 litre	/	/	/	/	16 °C
	<b>45 °C</b>	<b>65 l/min</b>	<b>158 kW</b>	<b>1.0 litre</b>	75 l/min	/	/	/	<b>19 °C</b>
	<b>50 °C</b>	<b>48 l/min</b>	<b>135 kW</b>	<b>1.3 litres</b>	64 l/min	<b>55 l/min</b>	/	/	<b>24 °C</b>
<b>60 °C</b>	40 °C	88 l/min***	183 kW	0.7 litre	/	/	/	/	15 °C
	<b>45 °C</b>	<b>77 l/min</b>	<b>187 kW</b>	<b>0.8 litre</b>	89 l/min	/	/	/	<b>17 °C</b>
	<b>50 °C</b>	<b>62 l/min</b>	<b>172 kW</b>	<b>1.0 litre</b>	82 l/min	<b>70 l/min</b>	/	/	<b>21 °C</b>
	<b>55 °C</b>	<b>47 l/min</b>	<b>147 kW</b>	<b>1.4 litres</b>	70 l/min	<b>60 l/min</b>	52 l/min	/	<b>26 °C</b>
<b>65 °C</b>	40 °C	88 l/min***	183 kW	0.6 litre	/	/	/	/	14 °C
	<b>45 °C</b>	<b>88 l/min</b>	<b>214 kW</b>	<b>0.7 litre</b>	102 l/min	/	/	/	<b>16 °C</b>
	<b>50 °C</b>	<b>73 l/min</b>	<b>203 kW</b>	<b>0.9 litre</b>	96 l/min	<b>83 l/min</b>	/	/	<b>19 °C</b>
	<b>55 °C</b>	<b>60 l/min</b>	<b>186 kW</b>	<b>1.1 litres</b>	89 l/min	<b>76 l/min</b>	66 l/min	/	<b>22 °C</b>
	60 °C	46 l/min	160 kW	1.4 litres	76 l/min	<b>65 l/min</b>	57 l/min	<b>51 l/min</b>	28 °C
<b>70 °C</b>	40 °C	88 l/min***	183 kW	0.5 litre	/	/	/	/	14 °C
	<b>45 °C</b>	<b>88 l/min***</b>	<b>214 kW</b>	<b>0.6 litre</b>	102 l/min	/	/	/	<b>15 °C</b>
	<b>50 °C</b>	<b>83 l/min</b>	<b>230 kW</b>	<b>0.8 litre</b>	109 l/min	<b>94 l/min</b>	/	/	<b>17 °C</b>
	<b>55 °C</b>	<b>70 l/min</b>	<b>218 kW</b>	<b>0.9 litre</b>	104 l/min	<b>89 l/min</b>	78 l/min	/	<b>20 °C</b>
	60 °C	58 l/min	200 kW	1.1 litres	95 l/min	<b>82 l/min</b>	71 l/min	<b>63 l/min</b>	24 °C
<b>75 °C</b>	40 °C	88 l/min***	183 kW	0.5 litre	/	/	/	/	13 °C
	<b>45 °C</b>	<b>88 l/min***</b>	<b>214 kW</b>	<b>0.6 litre</b>	102 l/min	/	/	/	<b>14 °C</b>
	<b>50 °C</b>	<b>88 l/min***</b>	<b>244 kW</b>	<b>0.7 litre</b>	116 l/min	<b>100 l/min</b>	/	/	<b>16 °C</b>
	<b>55 °C</b>	<b>79 l/min</b>	<b>246 kW</b>	<b>0.8 litre</b>	117 l/min	<b>100 l/min</b>	88 l/min	/	<b>18 °C</b>
	60 °C	67 l/min	233 kW	1.0 litre	111 l/min	<b>95 l/min</b>	83 l/min	<b>74 l/min</b>	21 °C
<b>80 °C</b>	40 °C	88 l/min***	183 kW	0.4 litre	/	/	/	/	13 °C
	<b>45 °C</b>	<b>88 l/min***</b>	<b>214 kW</b>	<b>0.5 litre</b>	102 l/min	/	/	/	<b>14 °C</b>
	<b>50 °C</b>	<b>88 l/min***</b>	<b>244 kW</b>	<b>0.6 litre</b>	116 l/min	<b>100 l/min</b>	/	/	<b>15 °C</b>
	<b>55 °C</b>	<b>87 l/min</b>	<b>272 kW</b>	<b>0.7 litre</b>	130 l/min	<b>111 l/min</b>	97 l/min	/	<b>17 °C</b>
	60 °C	75 l/min	262 kW	0.8 litre	125 l/min	<b>107 l/min</b>	93 l/min	<b>83 l/min</b>	20 °C
<b>85 °C</b>	40 °C	88 l/min***	183 kW	0.4 litre	/	/	/	/	12 °C
	<b>45 °C</b>	<b>88 l/min***</b>	<b>214 kW</b>	<b>0.5 litre</b>	102 l/min	/	/	/	<b>13 °C</b>
	<b>50 °C</b>	<b>88 l/min***</b>	<b>244 kW</b>	<b>0.6 litre</b>	116 l/min	<b>100 l/min</b>	/	/	<b>15 °C</b>
	<b>55 °C</b>	<b>88 l/min***</b>	<b>274 kW</b>	<b>0.7 litre</b>	131 l/min	<b>112 l/min</b>	98 l/min	/	<b>16 °C</b>
	60 °C	83 l/min	289 kW	0.8 litre	137 l/min	<b>118 l/min</b>	103 l/min	<b>92 l/min</b>	18 °C
<b>90 °C</b>	40 °C	88 l/min***	183 kW	0.4 litre	/	/	/	/	12 °C
	<b>45 °C</b>	<b>88 l/min***</b>	<b>214 kW</b>	<b>0.5 litre</b>	102 l/min	/	/	/	<b>13 °C</b>
	<b>50 °C</b>	<b>88 l/min***</b>	<b>244 kW</b>	<b>0.5 litre</b>	116 l/min	<b>100 l/min</b>	/	/	<b>14 °C</b>
	<b>55 °C</b>	<b>88 l/min***</b>	<b>274 kW</b>	<b>0.6 litre</b>	131 l/min	<b>112 l/min</b>	98 l/min	/	<b>15 °C</b>
	60 °C	88 l/min	305 kW	0.7 litre	146 l/min	<b>125 l/min</b>	109 l/min	<b>97 l/min</b>	17 °C
<b>95 °C</b>	40 °C	88 l/min***	183 kW	0.4 litre	/	/	/	/	12 °C
	<b>45 °C</b>	<b>88 l/min***</b>	<b>214 kW</b>	<b>0.4 litre</b>	102 l/min	/	/	/	<b>13 °C</b>
	<b>50 °C</b>	<b>88 l/min***</b>	<b>244 kW</b>	<b>0.5 litre</b>	116 l/min	<b>100 l/min</b>	/	/	<b>14 °C</b>
	<b>55 °C</b>	<b>88 l/min***</b>	<b>274 kW</b>	<b>0.6 litre</b>	131 l/min	<b>112 l/min</b>	98 l/min	/	<b>15 °C</b>
	60 °C	88 l/min***	305 kW	0.7 litre	146 l/min	<b>125 l/min</b>	109 l/min	<b>97 l/min</b>	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 Friwa of 1000 mbars (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.



## Output capacity table

### FriwaMega



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	
<b>45 °C</b>	40 °C	85 l/min	178 kW	1.2 litres	/	/	/	/	19 °C
<b>50 °C</b>	40 °C	111 l/min	230 kW	0.9 litre	/	/	/	/	17 °C
	<b>45 °C</b>	<b>82 l/min</b>	<b>199 kW</b>	<b>1.2 litres</b>	95 l/min	/	/	/	<b>21 °C</b>
<b>55 °C</b>	40 °C	130 l/min***	271 kW	0.8 litre	/	/	/	/	15 °C
	<b>45 °C</b>	<b>105 l/min</b>	<b>254 kW</b>	<b>1.0 litre</b>	122 l/min	/	/	/	<b>18 °C</b>
	<b>50 °C</b>	<b>79 l/min</b>	<b>220 kW</b>	<b>1.3 litres</b>	105 l/min	<b>90 l/min</b>	/	/	<b>23 °C</b>
<b>60 °C</b>	40 °C	130 l/min***	271 kW	0.7 litre	/	/	/	/	14 °C
	<b>45 °C</b>	<b>123 l/min</b>	<b>300 kW</b>	<b>0.8 litre</b>	143 l/min	/	/	/	<b>16 °C</b>
	<b>50 °C</b>	<b>100 l/min</b>	<b>278 kW</b>	<b>1.0 litre</b>	133 l/min	<b>114 l/min</b>	/	/	<b>19 °C</b>
	<b>55 °C</b>	<b>77 l/min</b>	<b>240 kW</b>	<b>1.3 litres</b>	115 l/min	<b>98 l/min</b>	86 l/min	/	<b>25 °C</b>
<b>65 °C</b>	40 °C	130 l/min***	271 kW	0.6 litre	/	/	/	/	13 °C
	<b>45 °C</b>	<b>130 l/min***</b>	<b>316 kW</b>	<b>0.7 litre</b>	151 l/min	/	/	/	<b>15 °C</b>
	<b>50 °C</b>	<b>117 l/min</b>	<b>325 kW</b>	<b>0.9 litre</b>	156 l/min	<b>133 l/min</b>	/	/	<b>17 °C</b>
	<b>55 °C</b>	<b>96 l/min</b>	<b>301 kW</b>	<b>1.0 litre</b>	144 l/min	<b>123 l/min</b>	108 l/min	/	<b>21 °C</b>
	60 °C	75 l/min	261 kW	1.3 litres	125 l/min	<b>107 l/min</b>	94 l/min	<b>83 l/min</b>	27 °C
<b>70 °C</b>	40 °C	130 l/min***	271 kW	0.5 litre	/	/	/	/	12 °C
	<b>45 °C</b>	<b>130 l/min***</b>	<b>316 kW</b>	<b>0.6 litre</b>	151 l/min	/	/	/	<b>14 °C</b>
	<b>50 °C</b>	<b>130 l/min***</b>	<b>361 kW</b>	<b>0.8 litre</b>	173 l/min	<b>148 l/min</b>	/	/	<b>16 °C</b>
	<b>55 °C</b>	<b>112 l/min</b>	<b>358 kW</b>	<b>0.9 litre</b>	168 l/min	<b>143 l/min</b>	125 l/min	/	<b>19 °C</b>
	60 °C	94 l/min	324 kW	1.1 litres	155 l/min	<b>133 l/min</b>	116 l/min	<b>103 l/min</b>	22 °C
<b>75 °C</b>	40 °C	130 l/min***	271 kW	0.5 litre	/	/	/	/	11 °C
	<b>45 °C</b>	<b>130 l/min***</b>	<b>316 kW</b>	<b>0.6 litre</b>	151 l/min	/	/	/	<b>13 °C</b>
	<b>50 °C</b>	<b>130 l/min***</b>	<b>361 kW</b>	<b>0.7 litre</b>	173 l/min	<b>148 l/min</b>	/	/	<b>15 °C</b>
	<b>55 °C</b>	<b>126 l/min</b>	<b>393 kW</b>	<b>0.8 litre</b>	189 l/min	<b>161 l/min</b>	141 l/min	/	<b>17 °C</b>
	60 °C	108 l/min	374 kW	0.9 litre	180 l/min	<b>153 l/min</b>	134 l/min	<b>119 l/min</b>	20 °C
<b>80 °C</b>	40 °C	130 l/min***	271 kW	0.4 litre	/	/	/	/	11 °C
	<b>45 °C</b>	<b>130 l/min***</b>	<b>316 kW</b>	<b>0.5 litre</b>	151 l/min	/	/	/	<b>12 °C</b>
	<b>50 °C</b>	<b>130 l/min***</b>	<b>361 kW</b>	<b>0.6 litre</b>	173 l/min	<b>148 l/min</b>	/	/	<b>14 °C</b>
	<b>55 °C</b>	<b>130 l/min***</b>	<b>406 kW</b>	<b>0.7 litre</b>	195 l/min	<b>166 l/min</b>	145 l/min	/	<b>16 °C</b>
	60 °C	121 l/min	419 kW	0.8 litre	201 l/min	<b>172 l/min</b>	150 l/min	<b>134 l/min</b>	18 °C
<b>85 °C</b>	40 °C	130 l/min***	271 kW	0.4 litre	/	/	/	/	11 °C
	<b>45 °C</b>	<b>130 l/min***</b>	<b>316 kW</b>	<b>0.5 litre</b>	151 l/min	/	/	/	<b>12 °C</b>
	<b>50 °C</b>	<b>130 l/min***</b>	<b>361 kW</b>	<b>0.6 litre</b>	173 l/min	<b>148 l/min</b>	/	/	<b>13 °C</b>
	<b>55 °C</b>	<b>130 l/min***</b>	<b>406 kW</b>	<b>0.7 litre</b>	195 l/min	<b>166 l/min</b>	145 l/min	/	<b>14 °C</b>
	60 °C	130 l/min***	451 kW	0.8 litre	216 l/min	<b>185 l/min</b>	162 l/min	<b>144 l/min</b>	17 °C
<b>90 °C</b>	40 °C	130 l/min***	271 kW	0.4 litre	/	/	/	/	10 °C
	<b>45 °C</b>	<b>130 l/min***</b>	<b>316 kW</b>	<b>0.5 litre</b>	151 l/min	/	/	/	<b>11 °C</b>
	<b>50 °C</b>	<b>130 l/min***</b>	<b>361 kW</b>	<b>0.5 litre</b>	173 l/min	<b>148 l/min</b>	/	/	<b>12 °C</b>
	<b>55 °C</b>	<b>130 l/min***</b>	<b>406 kW</b>	<b>0.6 litre</b>	195 l/min	<b>166 l/min</b>	145 l/min	/	<b>14 °C</b>
	60 °C	130 l/min***	451 kW	0.7 litre	216 l/min	<b>185 l/min</b>	162 l/min	<b>144 l/min</b>	15 °C
<b>95 °C</b>	40 °C	130 l/min***	271 kW	0.4 litre	/	/	/	/	10 °C
	<b>45 °C</b>	<b>130 l/min***</b>	<b>316 kW</b>	<b>0.4 litre</b>	151 l/min	/	/	/	<b>11 °C</b>
	<b>50 °C</b>	<b>130 l/min***</b>	<b>361 kW</b>	<b>0.5 litre</b>	173 l/min	<b>148 l/min</b>	/	/	<b>12 °C</b>
	<b>55 °C</b>	<b>130 l/min***</b>	<b>406 kW</b>	<b>0.6 litre</b>	195 l/min	<b>166 l/min</b>	145 l/min	/	<b>13 °C</b>
	60 °C	130 l/min***	451 kW	0.6 litre	216 l/min	<b>185 l/min</b>	162 l/min	<b>144 l/min</b>	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 Friwa of 1000 mbars (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):

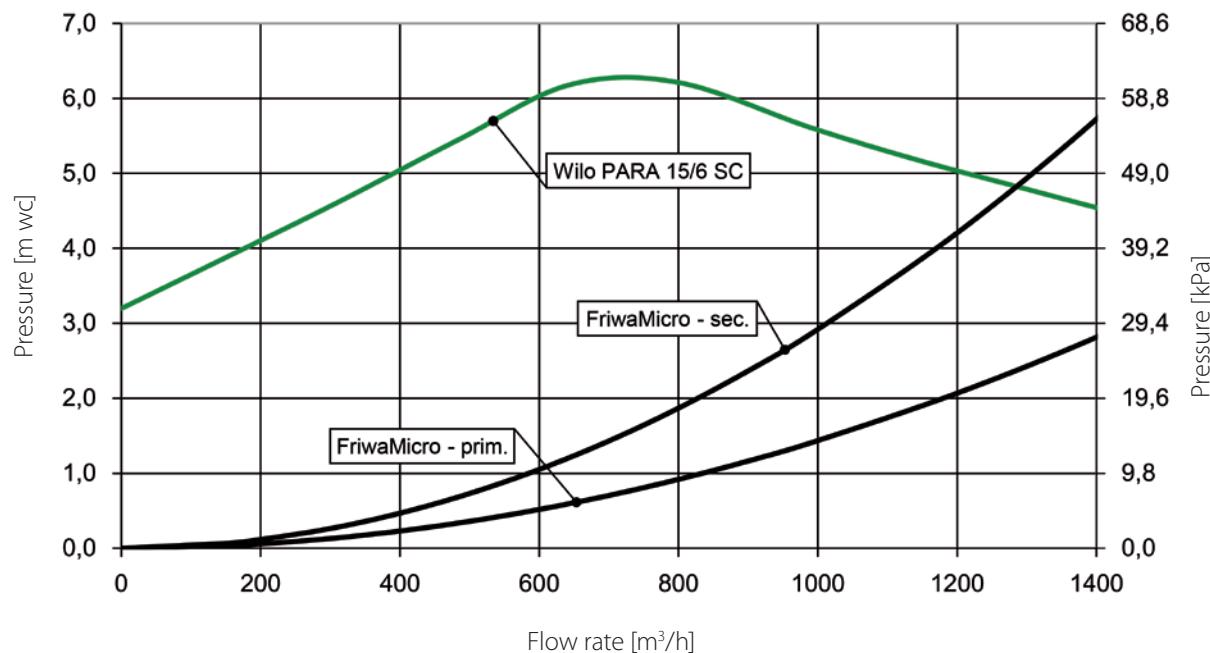
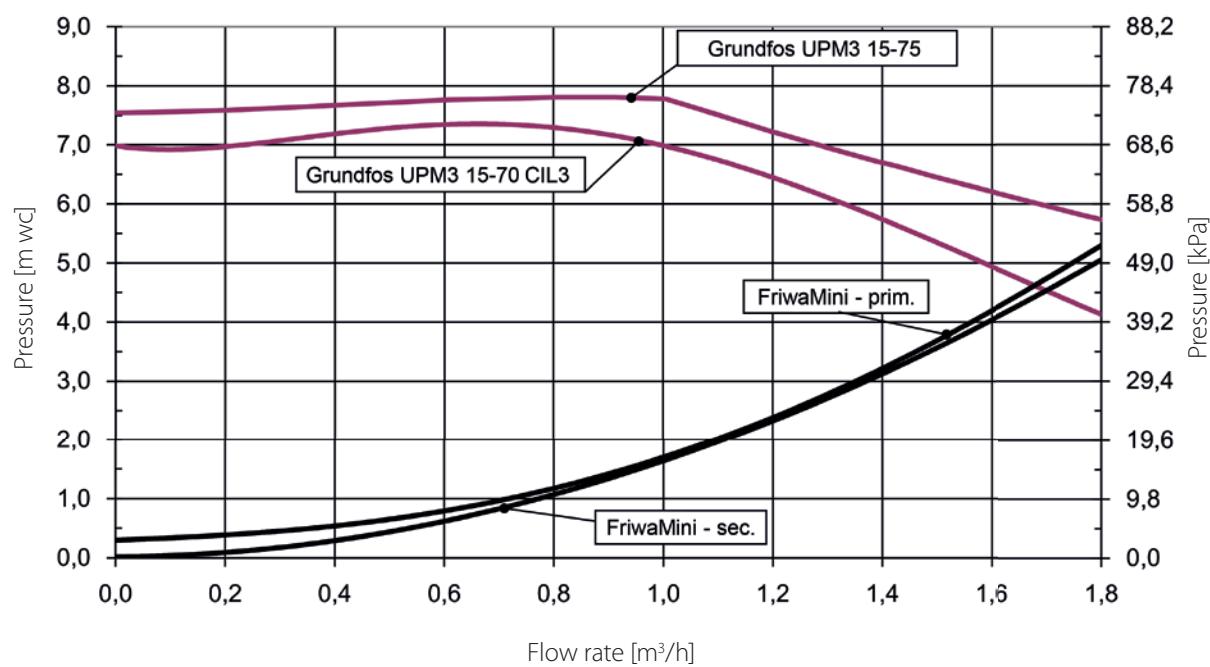
- With 65 °C in the heating buffer tank, a maximum of 117 litres of domestic water per minute can be heated to 50 °C.

- 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.

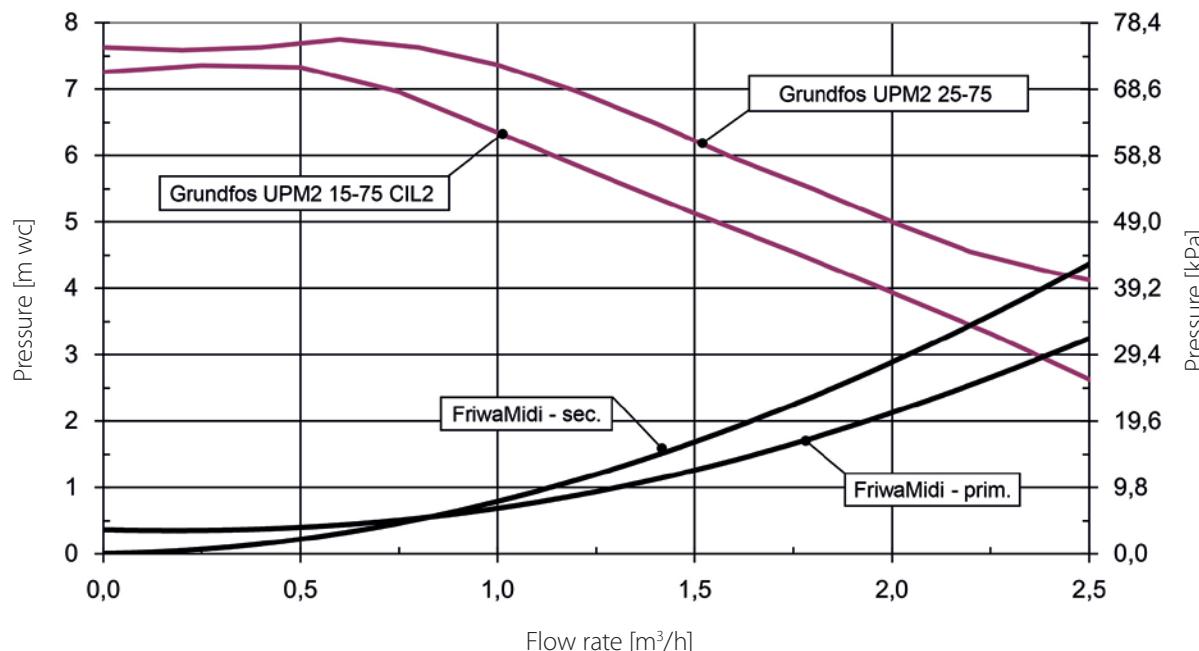
- These 117 litres of warm water per minute with 50 °C can be mixed with cold water (10 °C) at the tap (mixing valve) to obtain 133 litres per minute with 45 °C.

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

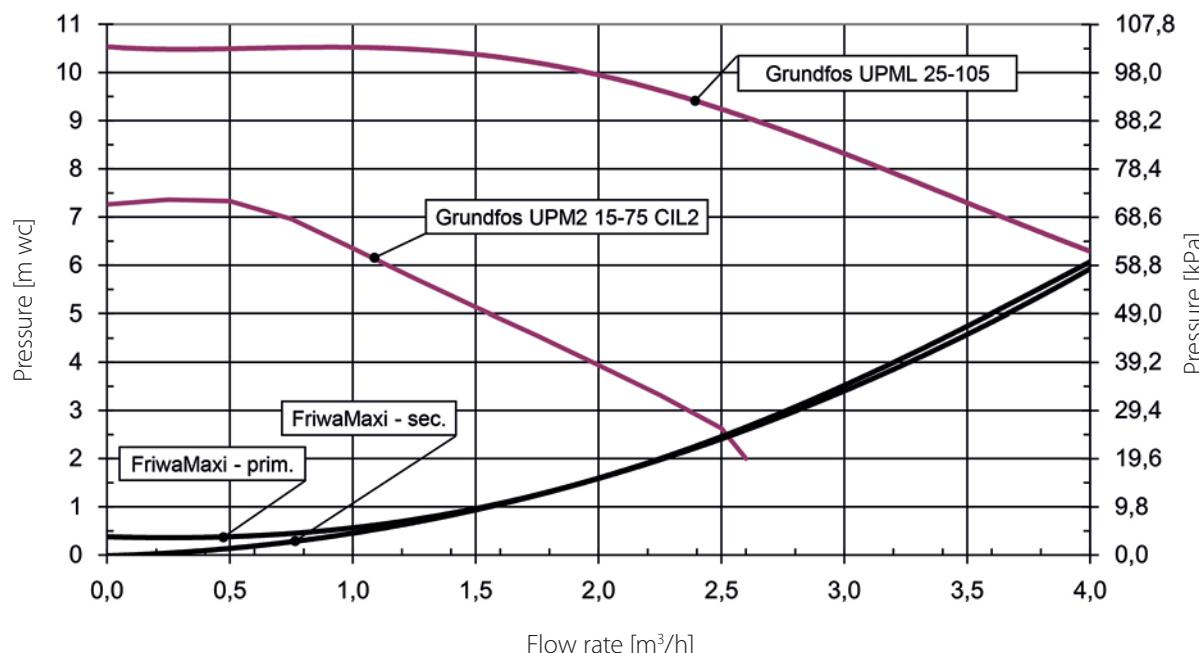
**FriwaMicro**  
up to 20 l/min**FriwaMini**  
up to 28 l/min

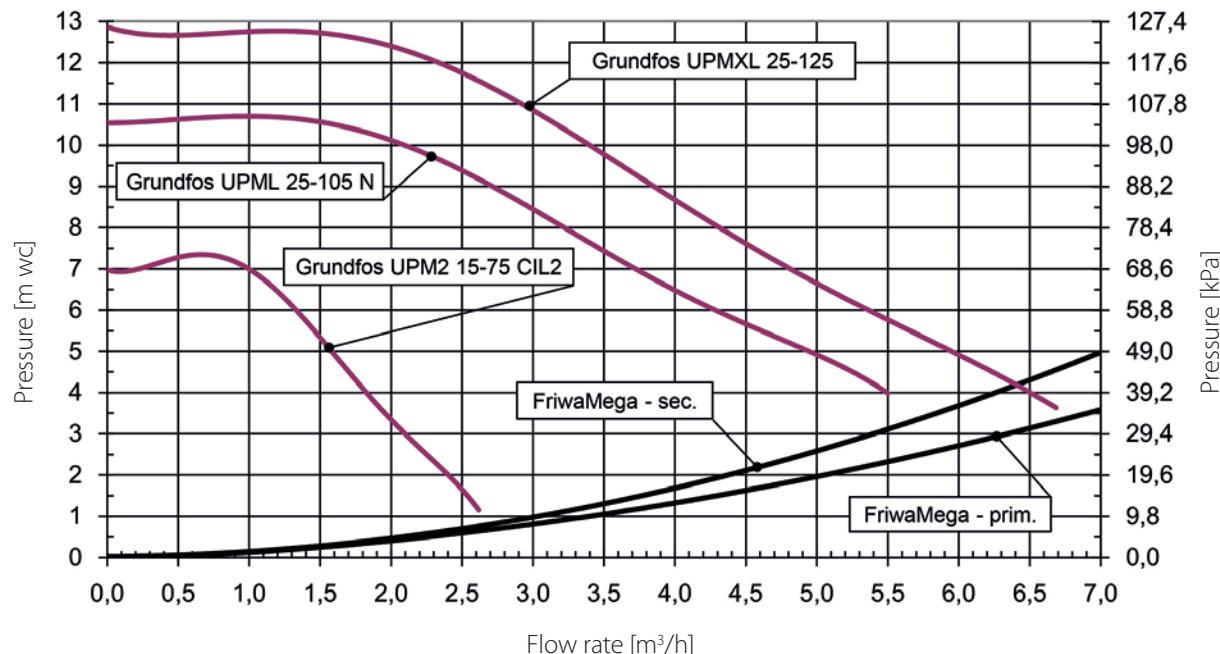


**FriwaMidi**  
**up to 50 l/min**



**FriwaMaxi**  
**up to 77 l/min**



**FriwaMega**  
up to 123 l/min

Notes

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