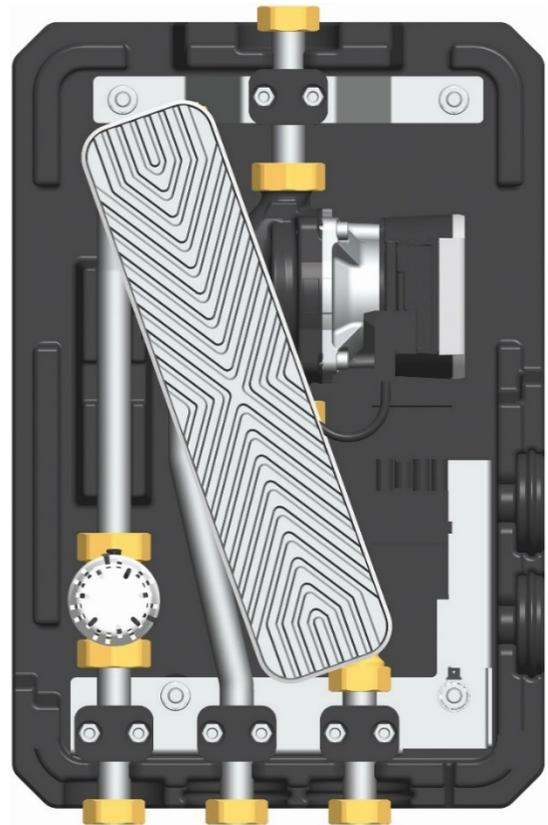




## Installation and Operation Instructions

### Domestic hot water module

### FriwaMicro - DN 15





Item no. 9964000x0-mub-en - Version V01 - Issued 2019/12

Translation of the original instructions

We reserve the right to make technical changes without notice!

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

## 1 General Information

### 1.1 Scope of these instructions

These instructions describe the installation, commissioning, function and operation of the domestic hot water module FriwaMicro. The chapters called [specialist] are intended for specialists only.

For other components of the system, such as tanks or pumps, please observe the instructions of the corresponding manufacturer.

Station	Item number	Pump	Heat exchanger
FriwaMicro	6400010	Wilo Para 15/6 SC	Copper solder, 24 plates
FriwaMicro	6400030	Wilo Para 15/6 SC	Sealix® sealing, 24 plates

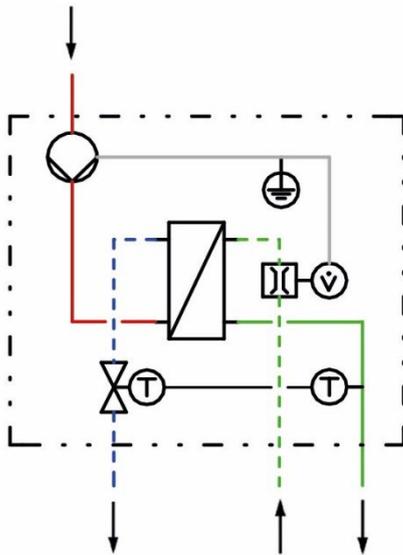
### CE Declaration of Conformity

The domestic hot water module complies with the relevant directives and is therefore labelled with the CE mark. The Declaration of Conformity is available upon request, please contact the manufacturer.

## 1.2 About this product

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

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



- Flow switch at the cold water inlet
- Cartridge sensor at the domestic hot water outlet
- Thermostatic valve in the heating return

## 1.3 Designated use

The domestic hot water module must only be mounted in heating installations between the buffer tank and the domestic hot water circuit. Due to its design, the station must be mounted and operated in a vertical position! The technical limit values specified in these instructions must be observed.

Only use PAW accessories with the domestic hot water module.

Improper usage excludes any liability claims.

Do not put the module into operation in case of any visible damage.

## 2 Safety instructions

The installation and commissioning as well as the connection of electrical components require technical knowledge commensurate with a recognised vocational qualification as a fitter for plumbing, heating and air conditioning technology, or a profession requiring a comparable level of knowledge [specialist].

The following must be observed during installation and commissioning:

- relevant local and national regulations
- accident prevention regulations of the professional association
- instructions and safety instructions of this manual

### NOTICE

#### Material damage due to mineral oils!

Mineral oil products cause lasting damage to seals made of EPDM, whereby the sealant properties get lost. We do not assume liability nor provide warranty for damage to property resulting from sealants damaged in this way.

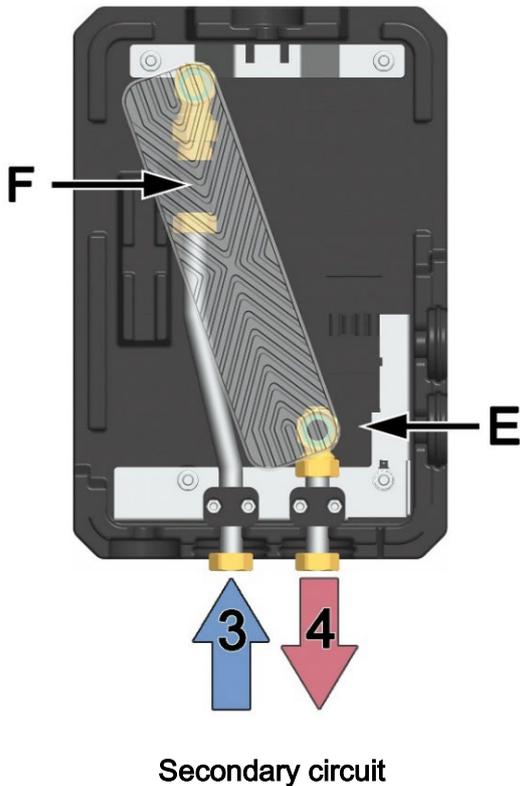
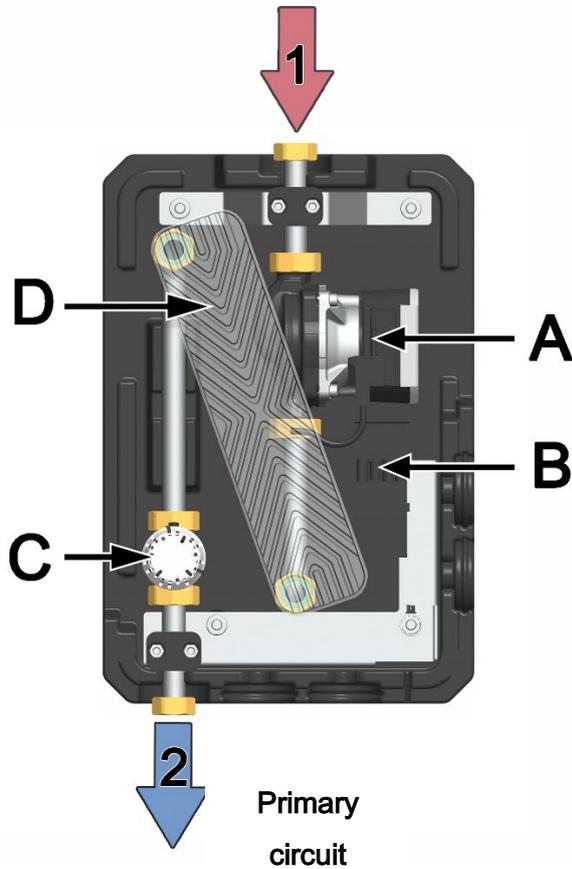
- It is imperative to avoid that EPDM gets in contact with substances containing mineral oils.
- Use a lubricant based on silicone or polyalkylene and free from mineral oils, such as Unisilikon L250L and Syntheso Glep 1 of the Klüber company or a silicone spray.

### NOTICE

#### Malfunction!

- The domestic hot water module must be integrated in the potential equalisation of the electric installation. This can be guaranteed by establishing a potential equalisation connection to the main potential connection according to regulations or by the connected pipe system.

### 3 Product description



#### Connections

- 1 Primary side/heating side:  
Flow from the buffer tank
- 2 Primary side/heating side:  
Return to the buffer tank
- 3 Secondary side/DHW side:  
Cold water supply
- 4 Secondary side/DHW side:  
Hot water outlet

#### Equipment primary circuit

- A Primary pump
- B Insulation
- C Thermostatic valve
- D Heat exchanger

#### Equipment secondary circuit

- E Cartridge sensor  
(hot water outlet)
- F Flow switch  
(cold water supply)

## 4 Dimensioning and planning

The domestic hot water module will only work flawlessly if the installation meets certain requirements. Please take some time to plan the installation.

### 4.1 Dimensioning of the tank

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

Temperature in the buffer tank	Domestic hot water temperature set at the thermostatic valve	Required tank volume per litre of hot water
50 °C	45 °C	1.8 litres
60 °C*	45 °C	<b>0.9 litres</b>
	50 °C	1.3 litres
	55 °C	2.0 litres
70 °C	50 °C	0.9 litres
	55 °C	1.1 litres
	60 °C	1.4 litres
80 °C	50 °C	0.7 litres
	55 °C	0.8 litres
	60 °C	1.0 litres

#### \*Calculation example for the dimensioning of the buffer tank:

Temperature of the buffer tank: 60 °C

Maximum withdrawal quantity needed: 20 l/min

Domestic hot water temperature set at the thermostatic valve: ca. 45 °C

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

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

$$400 \text{ l} \times 0.9 = 360 \text{ l}$$

The heated part of the buffer tank must have a volume of 360 litres.

## 4.2 Water quality requirements

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

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

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

Please observe the following table:

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

Water content	Concentration (mg/l or ppm)	Time limits	Heat exchanger with copper solder	Heat exchanger with Sealix® sealing
Alkalinity (HCO <sub>3</sub> <sup>-</sup> )	< 70	within of 24 hours	0	+
	70-300		+	+
	> 300		0/+	+
Sulphate (SO <sub>4</sub> <sup>2-</sup> )	< 70	no limit	+	+
	70-300		0/-	+
	> 300		-	+
HCO <sub>3</sub> <sup>-</sup> / SO <sub>4</sub> <sup>2-</sup>	> 1.0	no limit	+	+
	< 1.0		0/-	+
Electrical conductivity	< 10 µS/cm	no limit	0	+
	10-500 µS/cm		+	+
	> 500 µS/cm		0	+
pH value	< 6.0	within of 24 hours	0	+
	6.0-7.5		0	+
	7.5-9.0		+	+
	9.0-10		0	0
	> 10.0		0	-

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

+ Good durability under normal conditions

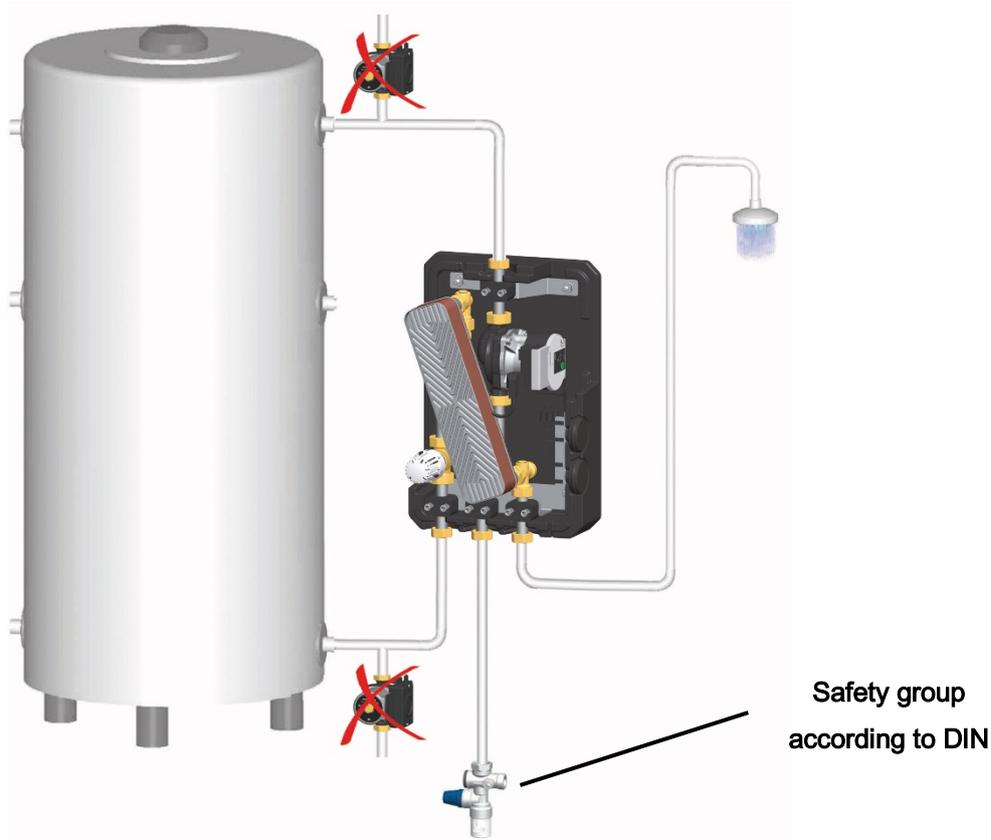
0 Corrosion may occur, especially if further factors are evaluated with 0

- Use is not recommended

## 5 Mounting and installation [specialist]

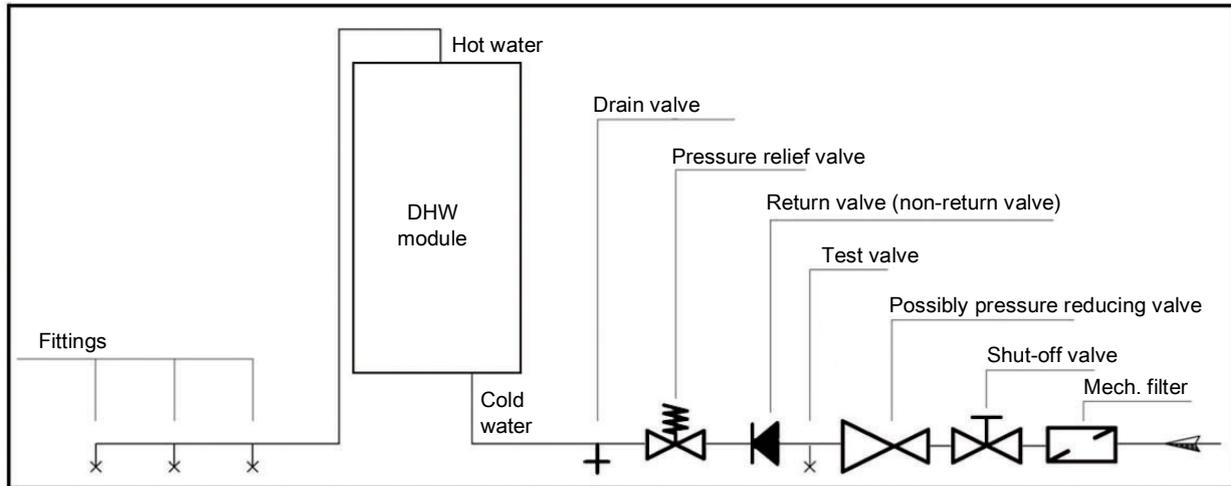
The domestic hot water module must only be connected with the storage tank by separate connections for the flow and return. External pumps must not be installed between the domestic hot water module and the buffer tank. The circulation of water causes considerable temperature fluctuations.

### Mounting example:



	<p><b>! WARNING</b></p> <p><b>Danger of scalding due to hot water!</b></p> <p>Undesirable circulation of water in the primary circuit can cause the exit of water of up to 90 °C at the withdrawal point.</p> <ul style="list-style-type: none"> <li>➤ External pumps must not be installed between the domestic hot water module and the buffer tank.</li> <li>➤ The domestic hot water module must not be connected to a distribution manifold of a heating circuit.</li> </ul>
---	---

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



## NOTICE

### Damage to property!

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

For example the make Flexofit S of the Flamco GmbH company or the make WD of the Reflex Winkelmann GmbH company.



## WARNING

### Risk to life and limb due to electric shock!

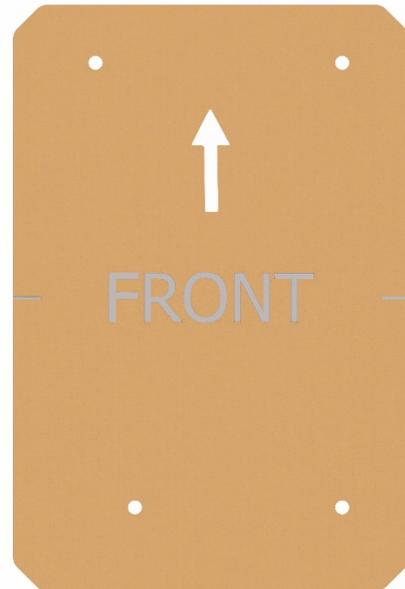


- Prior to commencing electrical work on the station, pull the mains plug!
- Only after completing all work, plug the mains plug into a socket. This avoids an unintentional start of the motors.
- During commissioning, make sure that no water enters into the plug connection.

**NOTICE****Damage to property!**

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

1. Determine the mounting location of the domestic hot water module near the buffer tank. The pipes in the heating circuit must not exceed a length of 4 m for DN 20.
2. Copy the measures for the mounting holes to the wall. You can find a corresponding drilling template (see on the right) on the paper board under the domestic hot water module.
3. Drill the holes and insert adequate wall plugs into the holes.
4. Turn the enclosed stair bolts into the wall plugs in such a way that about 40 mm of each screw still stick out.
5. Remove the insulating front shell.
6. Lift the station together with the insulation back shell and stick the enclosed distance sleeves from the back into the corresponding holes.



drilling template

**NOTICE**

The insulating back shell and the station are not firmly connected to each other! When lifting the station, please make sure that the station does not fall out of the insulating shell.

7. Hang the domestic hot water module onto the stair bolts. Mount the module by using the enclosed washers and nuts.

## NOTICE

### Risk of injury

The retaining plate can have sharp edges.

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

**1 Primary side:**

flow from the buffer tank,  
connection  $\frac{3}{4}$ " int. thread, flat sealing,  
piping  
recommended DN 20: 22 x 1 mm

**2 Primary side:**

return to the buffer tank,  
connection  $\frac{3}{4}$ " int. thread, flat sealing,  
piping  
recommended DN 20: 22 x 1 mm

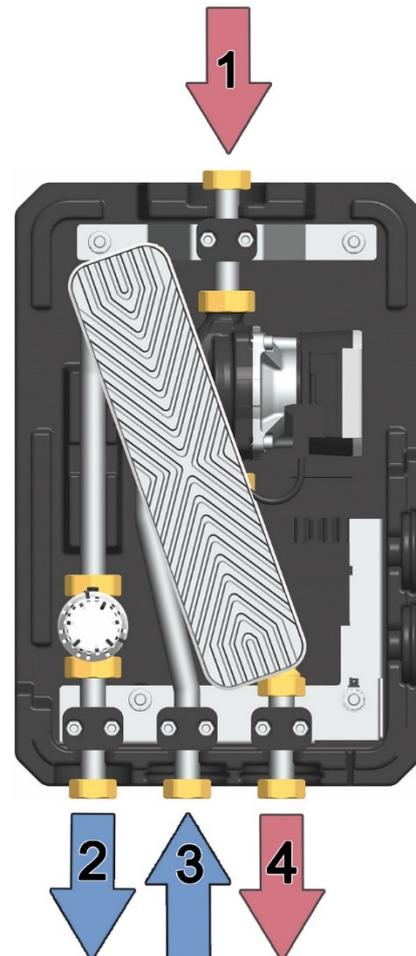
**3 Secondary side:**

cold water inlet,  
connection  $\frac{3}{4}$ " int. thread, flat sealing

**4 Secondary side:**

hot water outlet,  
connection  $\frac{3}{4}$ " int. thread, flat sealing

Pipe distance to the wall  
(secondary) = 92.5 mm



Pipe distance to the wall  
(primary) = 92.5 mm

## NOTICE

In the cold water inlet, there must be no shut-off valve between the module and a pressure relief valve.

## 6 Commissioning [specialist]

### NOTICE

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

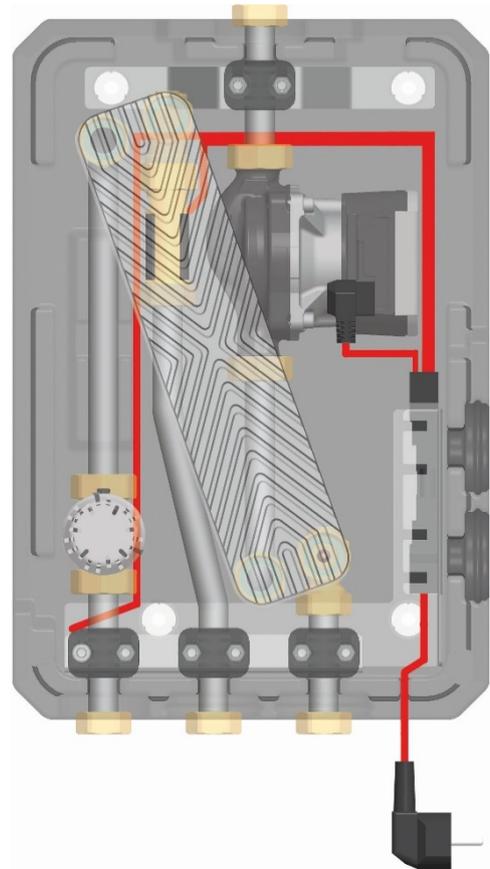
### 6.1 Filling the primary circuit

	<p> <b>WARNING</b></p> <p><b>Danger of scalding due to hot water!</b></p> <p>The system is under pressure. By opening a vent valve, hot water with a temperature of up to 90 °C may exit and cause personal injury.</p> <ul style="list-style-type: none"><li>➤ Open each vent valve slowly and with sufficient distance.</li></ul>
---	--

1. Fill the storage tank using the fill valves available on site until an operating pressure of about 1.5 bars\* is reached. Use heating water compliant with the standards VDI 2035 / ÖNorm H5195-1.
2. Vent the system with the vent valve available on site.
3. Check the operating pressure of the storage tank after the venting and increase the pressure if necessary.

\*1.5 bars in the primary circuit = recommended minimum value

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



Primary circuit

## NOTICE

### Damage to property!

Please make sure that the pipes are conducted as shown in the figure above and that the power supply cable does not touch the fittings that can heat up.

4. Plug the mains plug into a socket.

## 6.2 Adjustment of the temperature

Set the desired temperature range at the thermostatic head of the thermostatic valve.

The pump characteristic curve should not be changed.

As an orientation, the following temperatures apply:

Position 3: ca. 37 °C\*

Position 4: ca. 47 °C\*

Position 5: ca. 53 °C\*

The recommended position is **4**.

\*referring to 60 °C buffer tank temperature and 10 l/min withdrawal flow rate.

### NOTICE

#### Damage to property!

The thermostatic head must not be removed before or during operation in order to prevent damages to the thermostatic valve.



### WARNING



#### Danger of scalding due to hot water!

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

- In case of a high storage tank temperature, check the thermostat settings.

### Primary side

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

### Secondary side

The recommended maximum domestic hot water flow rate through the domestic hot water module is ~30 l/min.

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

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

Temperature in the buffer tank	Domestic hot water temperature set at the thermostatic valve	Maximum flow rate from the DHW module with the set domestic hot water temperature	Maximum withdrawal flow rate at the tap for a domestic hot water temperature of 45 °C	Transfer capacity of the DHW module
50 °C	45 °C	15 l/min	15 l/min	36 kW
60 °C	45 °C	20 l/min	20 l/min	49 kW
	50 °C	17 l/min	18 l/min	46 kW
70 °C	55 °C	13 l/min	16 l/min	40 kW
	45 °C	23 l/min	23 l/min	57 kW
	50 °C	20 l/min	22 l/min	54 kW
	55 °C	16 l/min	20 l/min	49 kW
80 °C	60 °C	14 l/min	19 l/min	48 kW
	45 °C	26 l/min*	26 l/min	64 kW
	50 °C	23 l/min	25 l/min	63 kW
	55 °C	19 l/min	23 l/min	58 kW
	60 °C	15 l/min	20 l/min	51 kW

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

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

## 7 Maintenance

### Optimal operation of the station

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

### NOTICE

#### Hygiene recommendation

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

### Optimal functioning of the thermostatic valve

In regular intervals, turn the thermostatic head to another position for a short time. This prevents that dirt particles may jam the thermostatic head. Afterwards, turn it back to its previous position.

### Optical control

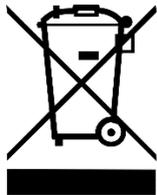
It is recommended to visually check the domestic hot water module every two months to ensure its proper operation. If you notice any problems on the system, consult a specialist.

### Cleaning the station

Clean the station with a damp cloth without any detergent.

## 8 Disposal

### Possibilities to return waste electrical and electronic equipment



Waste electrical and electronic equipment deriving from private households can be disposed at collection points of the public waste management authorities or at disposal points set up by manufacturers or distributors according to the ElektroG (Electrical and Electronic Equipment Act).

You find an online directory of all collection and disposal points here:  
<https://www.ear-system.de/ear-verzeichnis/sammel-und-ruecknahmestellen.jsf>

### Disposal of transport and packaging materials

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

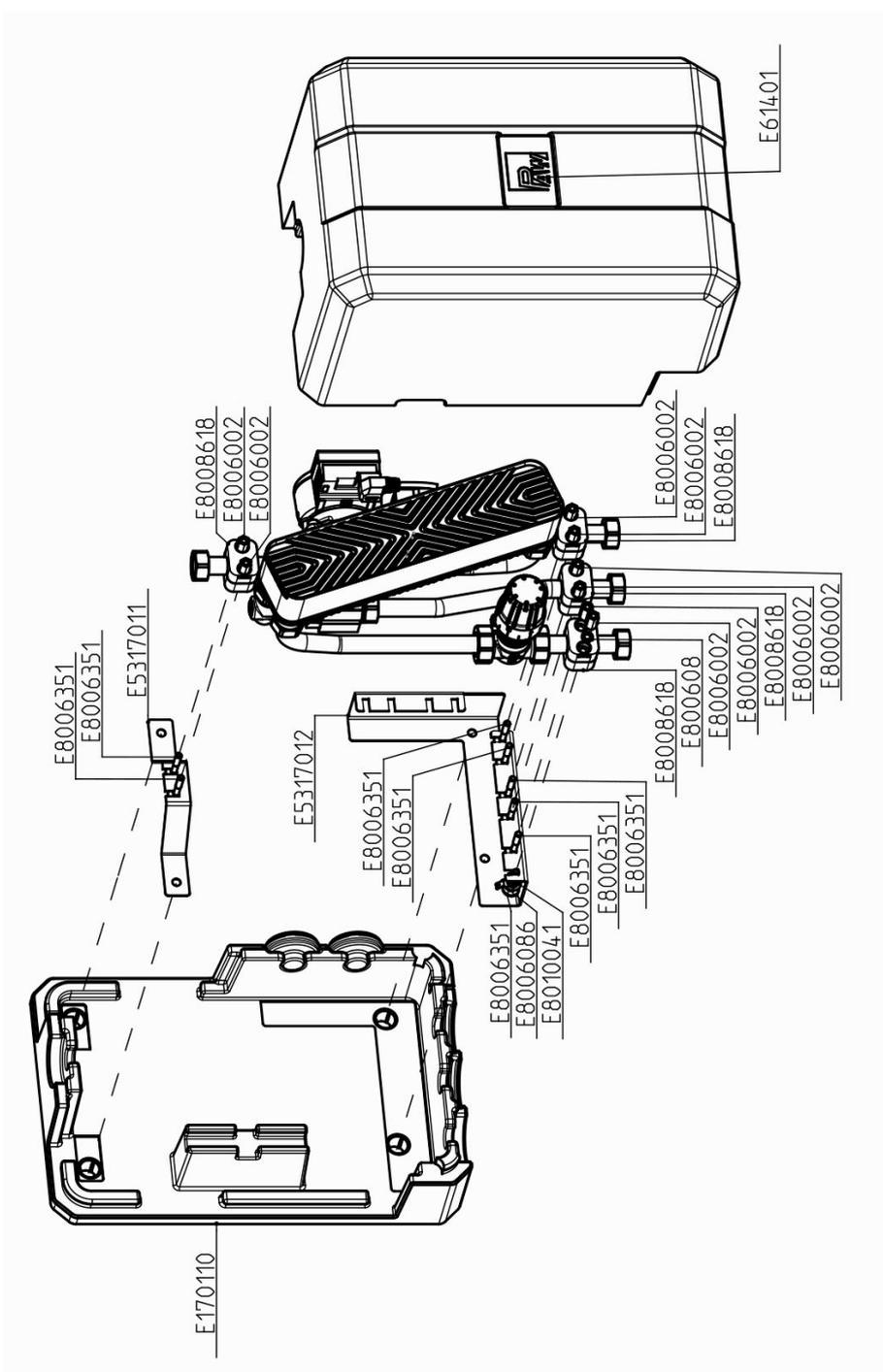
## 9 Spare parts [specialist]

### NOTICE

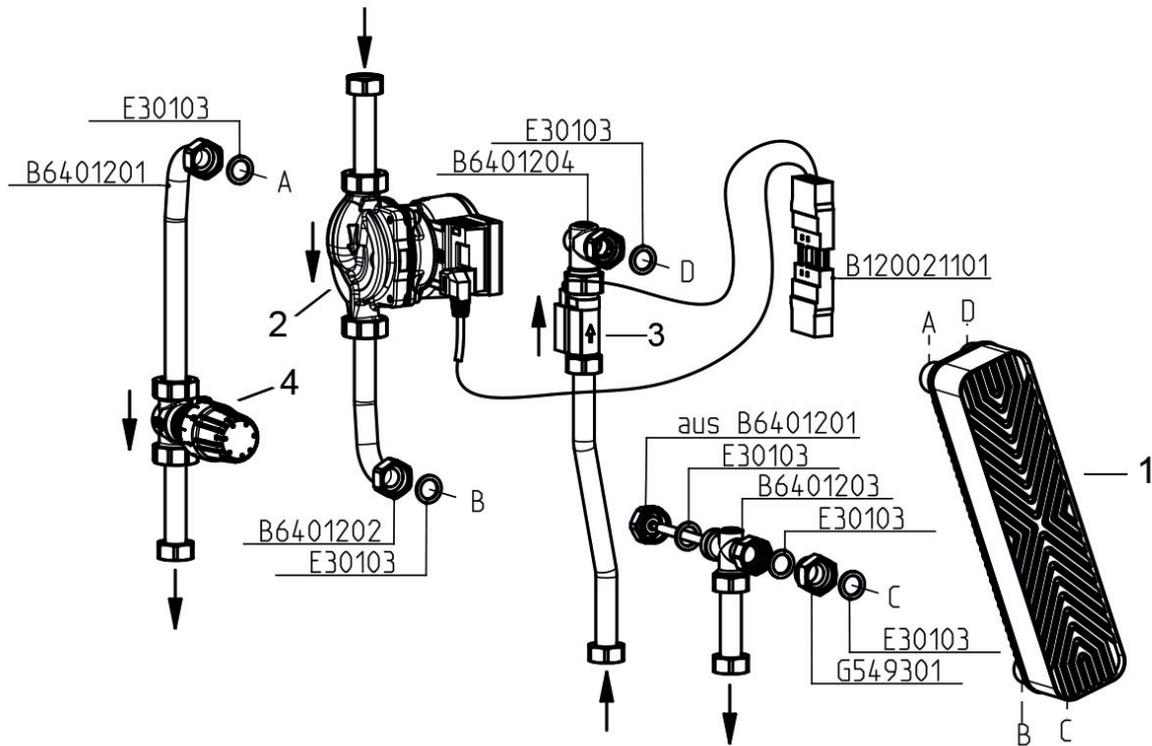
Complaints and requests/orders of spare parts will only be processed with information on the serial number!

The serial number is placed in the upper right corner of the insulating back shell.

### 9.1 Spare parts holder and insulation



## 9.2 Spare parts hydraulics



Position no.	Spare part	Scope of delivery	Item no.
1	Heat exchanger	Heat exchanger copper solder with 4 seals	N00264
		Coated heat exchanger with 4 seals	N00268
2	Primary pump	Primary pump with 2 seals, without cable	N00265
3	Flow switch	Flow switch with 2 seals, cable, pump cable and plug connector	N00266
4	Thermostatic valve	Thermostatic valve with 2 seals	N00267

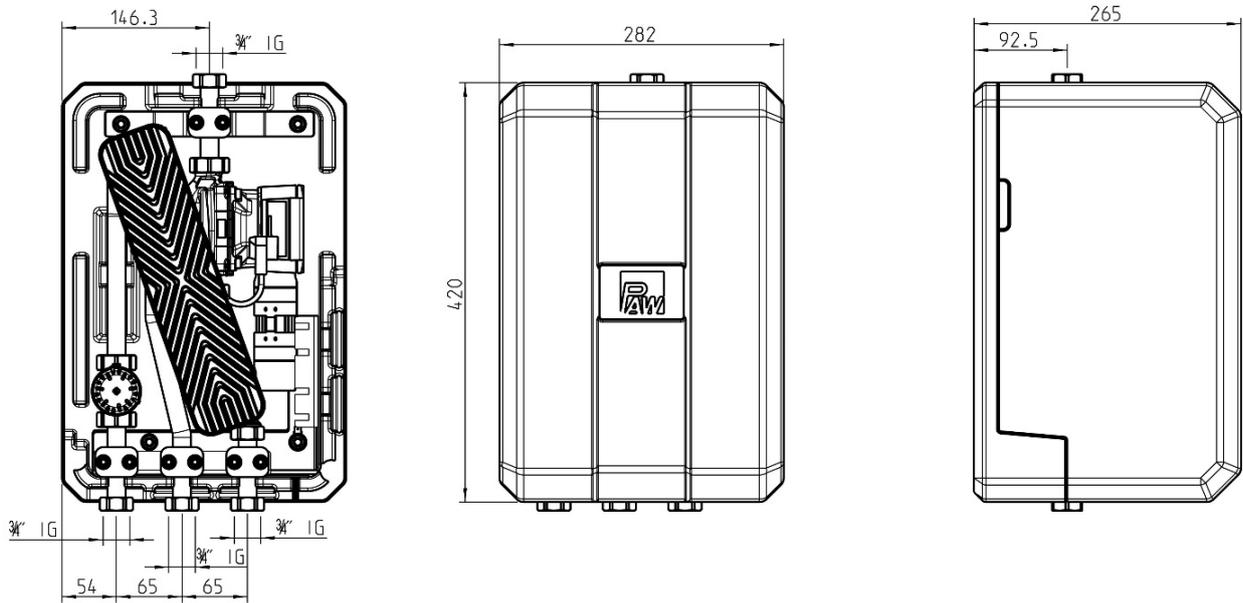
## Optional accessories

Spare part	Scope of delivery	Item no.
	Accessory set FriwaMicro 3x ball valve DN 15; blue/red/green, 3/4" ext. thread	64042001
	Safety group for domestic hot water tank DN 20, opening pressure 7 bars, brass body, chromed	563907

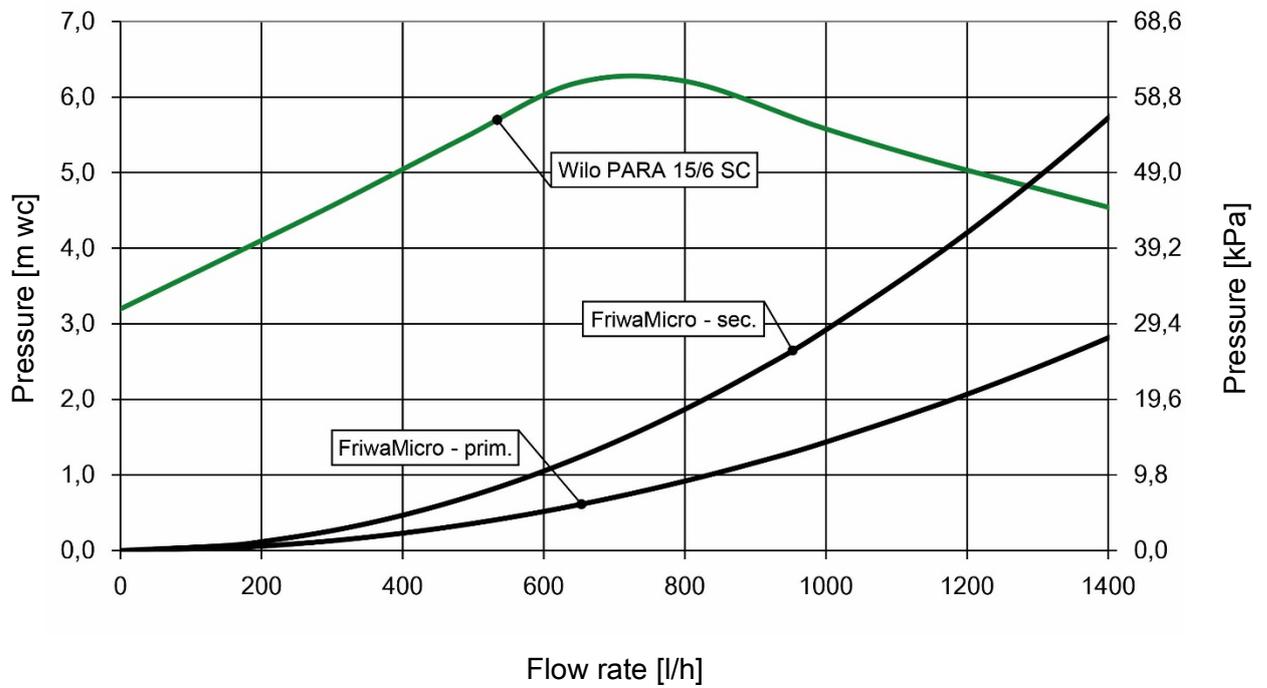
## 10 Technical data

Dimensions	FriwaMicro
Height (with insulation)	420 mm
Width	282 mm
Depth (with insulation)	265 mm
Centre distance prim./sec.	65 mm
Pipe connections	
Primary circuit (storage tank circuit)	¾" internal thread, flat sealing
Secondary circuit (DHW circuit)	¾" internal thread, flat sealing
Operating data	
Max. admissible pressure	primary: 3 bars, secondary: 10 bars
Operating temperature	2 – 80 °C
Equipment	
Primary pump	self-regulating HE pump, 3-43 W
Heat exchanger	24 plates
Materials	
Valves and fittings	Brass
Flat sealings	AFM34, asbestos-free
Plate heat exchanger	Stainless steel 1.4401 / solder: 99.99% Cu Coating: SiO <sub>2</sub>
Insulation	EPP
Flow switch	Noryl
Cartridge sensor	Stainless steel
Thermostatic valve	Body / valve plate: brass Seals: EPDM

### 10.1 Dimensional drawing



### 10.2 Pressure drop and pump characteristic curve



## 11 Commissioning report

Installation operator \_\_\_\_\_

Location of installation \_\_\_\_\_

Serial number of domestic hot water module \_\_\_\_\_

Pipes primary       $\varnothing =$                   mm                  | =                  m

Pipes secondary       $\varnothing =$                   mm                  | =                  m

Other additionally installed components \_\_\_\_\_

Have both circuits been flushed and vented correctly?

(no air noises in the pump)

Vented

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

Open

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

Checked

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

Checked

Is the pump set on proportional pressure?



Checked

Is the pump set on level III?



Checked

(source: WILO SE)

Installation company

Date, signature



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