

PUMP UNIT TO DELIVER FRESH DOMESTIC HOT WATER (DHW) ModvFRESH 2

Directions for installation

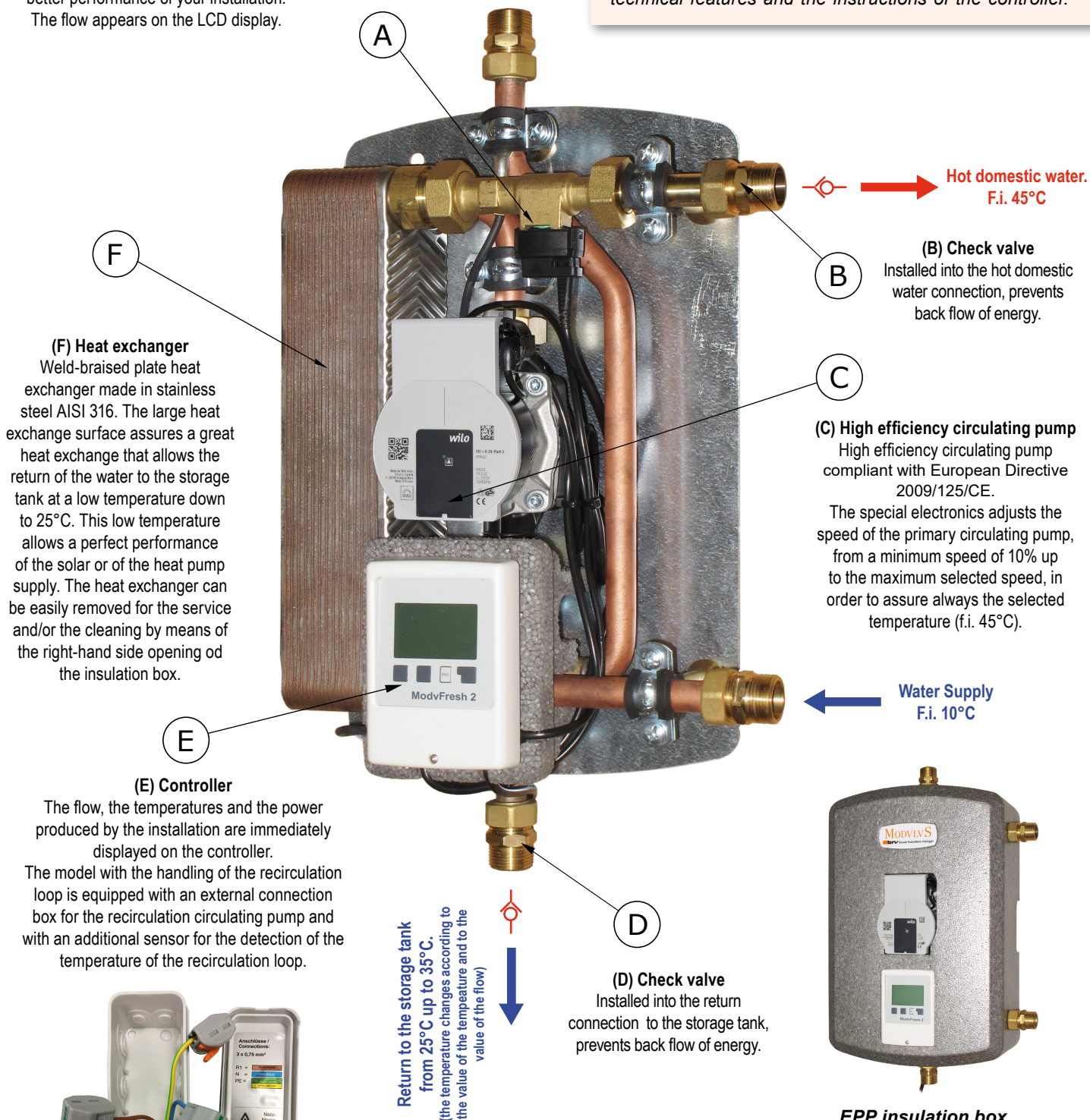
List of features of main components

(A) VFS digital flow counter

Thanks to this special device the regulations and the settings of the pump unit are no longer required. The required variation of flow is immediately read by the digital sensor, therefore the controller adjusts the speed of the circulating pump to get the better performance of your installation. The flow appears on the LCD display.



SAFETY: Please read carefully the mounting and the setting working instructions before starting the unit, in order to avoid accidents and failures caused by an incorrect use of the product. Please keep this manual for future consultations. Please also read the technical features and the instructions of the controller.



EPP insulation box

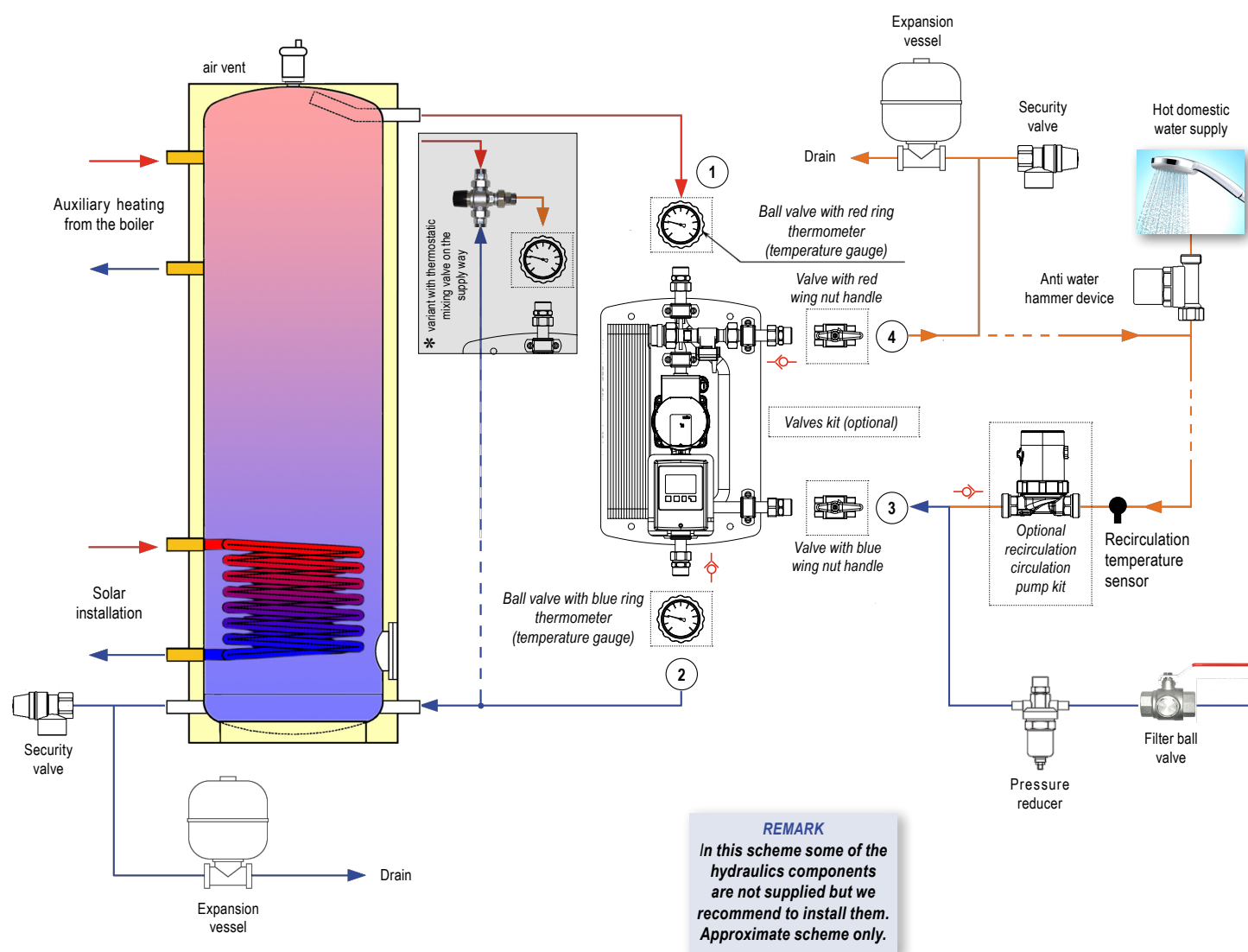
Measurements: 277 x 417 x 137 mm.

A special metal back plate fixes the unit to the insulation box and it allows a quick fitting to the wall or to the storage tank.



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Hydraulic and connection scheme



Pict. 1: Layout of a plant for delivering fresh domestic water by using ModvFresh 2

Technical Features

Maximum allowed pressure (without water hammer):

Working temperature:

Headloss in the secondary circuit at the flow of 20 l/min (50 kW model):

Headloss in the secondary circuit at the flow of 30 l/min (70 kW model):

Headloss in the secondary circuit at the flow of 35 l/min (85 kW model):

10 bar

2 ÷ 95°C

3 mH₂O

6,5 mH₂O

7,5 mH₂O

* In presence of calcareous water, the high temperature of the supply way from the heat exchanger can make calcareous scales inside the heat exchanger. Therefore we suggest you to limit this temperature, by means of a thermostatic mixing valve adjusted to the needed value (as indicated in the grey square).

Connections and links

PRIMARY CIRCUIT

- ① **Supply from the storage tank:** 3/4" ISO 228 male connection. Minimum diameter of the pipe DN20 (Cu 22x1). Maximum length: 3 m.
- ② **Return to the storage tank:** 3/4" ISO 228 male connection with check valve. Minimum diameter of the pipe DN20 (Cu 22x1). Maximum length: 3 m.

SECONDARY CIRCUIT

- ③ **Cold water supply:** 3/4" ISO 228 male connection. Minimum diameter of the pipe DN20 (Cu 22x1).
- ④ **Hot domestic water outlet:** 3/4" ISO 228 male connection with check valve. Minimum diameter of the pipe DN20 (Cu 22x1).

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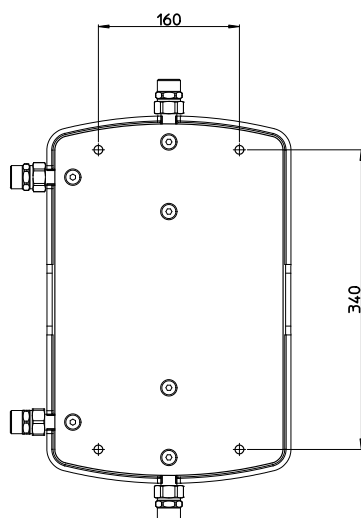
Materials

Pipe fittings	Piping	Insulation	Heat exchanger	Gaskets	Circulating pump
Copper alloy CW617N / CW614N	Copper	EPP	Stainless steel AISI 316 L Copper	EPDM	Cast iron or composite material, depending on the model

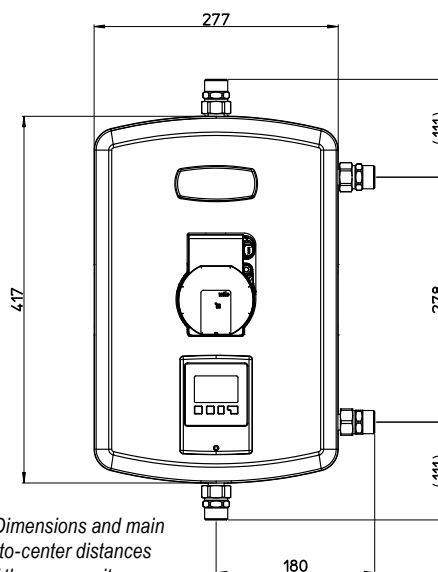
Installation

The pump unit can be mounted directly on the storage tank, if it is provided with the proper connections or to the wall, near by. For the wall mounting follow the directions:

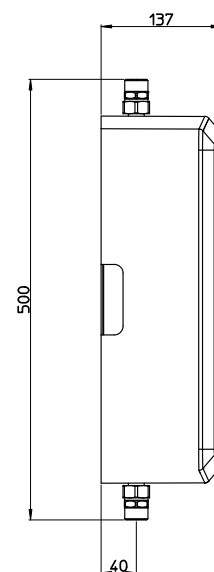
- ✓ Find the position of the 4 holes to be made into the wall according to the scheme *Pict.2*;
- ✓ Bore and put the proper screw anchors;
- ✓ Remove the cover and fix the pump unit;
- ✓ Mount the connection valves set (optional) according to the *Pict.1*;
- ✓ If the recirculation kit (optional) is used: install the circulating pump and place the recirculation temperature sensor according to what is indicated in the *illustration 1*;
- ✓ Connect the pipes in accordance to the connection scheme following the directions in *Pict.3*.



Pict. 2: Back plate for wall mounting



Pict. 3: Dimensions and main center-to-center distances of the pump unit



Wiring of the optional recirculation circulation pump

The controller is supplied already wired-up. The power supply cable, wired-up too, must be connected to the 230 VAC electric system only after having finished the connection of the recirculation circulating pump, if present. For a quick and functional connection of the circulating pump it is not necessary to operate on the controller, it is enough to put the cable into the automatic connector of the connection box.

To do these operations, please use only qualified staff.

Anschlüsse / Connections:

3 x 0,75 mm²

R1	=	braun/brown
N	=	blau/blue
PE	=	grün/green gelb/yellow

- ✓ To connect the circulating pump to the connection box:

The connection must be done following the scheme here at side. The connection box must be fixed near the pump unit.

N: Neutral;

PE: Ground;

R1: Phase of the circulating pump

Filling

The pump unit has been tested under pressure leaking in the factory. Anyway we recommend to check again the connections.

The storage tank must be put under pressure (about 2 bar).

- ✓ Open slowly the valve in the position 1 (supply from the storage tank), purge the circuit, open slowly the valve in the position 2 (return to the storage tank);
- ✓ Open slowly the valve in the position 3 (cold water supply);
- ✓ If the optional recirculation kit equipped with ball valve has been installed, open the valve very slowly.
- ✓ Open slowly the valve in the position 4 (hot domestic water outlet);
- ✓ Open slowly one or more outlets for some minutes to let the air going out from the secondary circuit;
- ✓ Close the outlets;
- ✓ Bleed the storage tank and in case restore the pressure.

Electrical connections



DANGER

**The pump unit is pre-wired.
A Shuko plug is necessary to connect it to the electric system.**

Voltage: 230 VAC ± 10%.

Frequency: 50÷60 Hz.

Maximum absorbed power: 50W.

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Setting up

- ✓ Read carefully the instructions of the controller;
- ✓ Plug;
- ✓ Select the desired language, set the hour and the date as described in manual's pages.

Recommendations

- ✓ Try to avoid pressure peaks during the working and the filling of the installation, to avoid to damage the VFS sensor. Eventually put nearby an anti-water hammer device.
- ✓ The VFS sensor begins to record the flow rate starting from 2 l/min. For a correct working following is recommended a minimum flow rate: 3÷4 l/min.
- ✓ Be sure that the electric installation is provided with an efficient ground tap.

Suggestions / Remarks on the delivery capacity

The temperature into the storage tank must be almost 5K higher than the desired temperature of the domestic water. Higher differences of temperature allow to extend the delivery time of the hot water. In presence of calcareous water we recommend not to exceed the temperature of 70°C (supply from the storage tank) to avoid limescale into the secondary side of the plate exchanger, in case put a thermostatic valve (*Pict. 1*).



DANGER: SCALDS

To avoid scalds to the user the supplied water must never be over 60°C. This temperature limit is preselected into the controller, anyway it can be reduced.

Minimum delivery capacity

To ensure a constant temperature of the DHW delivered, a minimum flow of delivery capacity is required. In the following table there is an example of delivery with a cold water temperature of 10°C on the supply: minimum deliveries are shown necessary to ensure stability at 45°C requested by the user, making various assumptions of water temperatures provided by the tank.

<i>Water temperature on supply from the tank</i>	<i>Minimum capacity</i>
55 °C	2.5 l/min
60 °C	3 l/min
65 °C	3 l/min
70 °C	3.5 l/min
75 °C	3.5 l/min
80 °C	4 l/min

Diagrams of the pump unit performances

Diagrams are available showing the relationship between the the user's flow rate, the supply temperature from the buffer storage tank and the return temperature, according to the requested temperature of DHW. This allows to identify the minimum supply temperature needed to supply DHW at a required temperature and flow and, consequently, to determine the return temperature to the storage tank. Vice versa it is also possible to fix which is the maximum usable flow at the selected DHW temperature, at the available supply temperature.



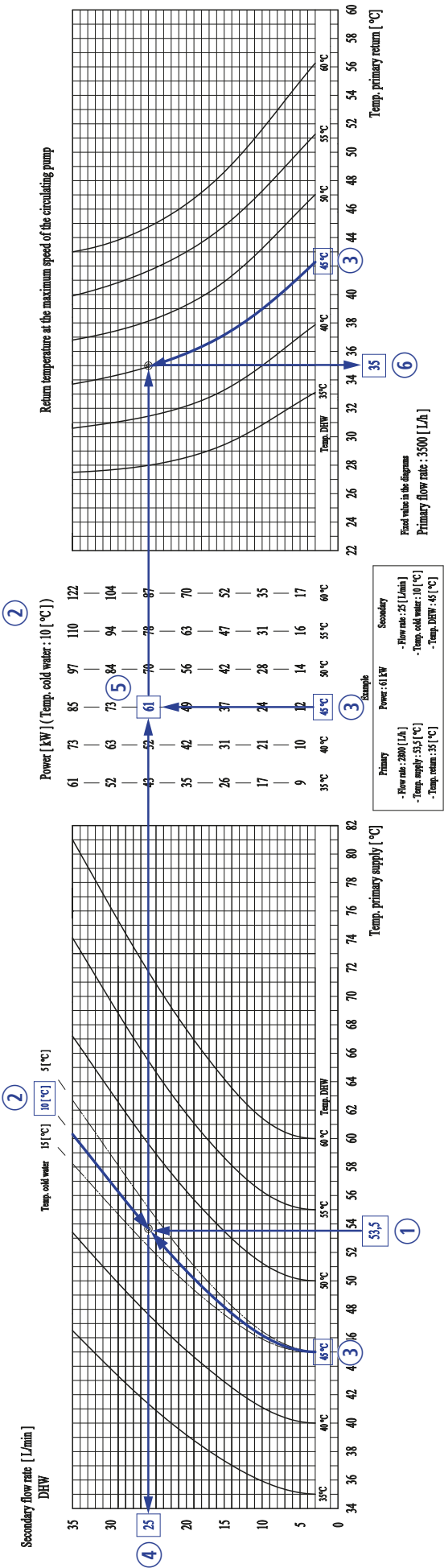
See the example of how to interpret the diagrams on the next page

Calculation of performances



It is also possible to download an excel file dedicated to the calculation of the performances of the ModvFresh 2 unit from where you can get: output power, time of delivery, the overall delivery capacity and recovery time of the temperature in the tank.

Example of how to interpret diagrams



On the diagram on the left, starting from the primary supply temperature ①, move vertically until intersecting the curve corresponding to the DHW temperature ③ required by the user(s) (taking into account any deviation due to the incoming cold water temperature ②).

From the intersection point obtained, the delivered DHW flow rate ④ can be read on the scale on the left. By moving horizontally to the right, the developed output table ⑤ is reached, where the output can be read in the column corresponding to the selected DHW temperature ③.

Continuing horizontally, the return temperature diagram is reached. Here again, intersect the curve corresponding to the selected DHW temperature ③. From this intersection point, move vertically downward to read the buffer tank return temperature ⑥.

Following the suggested example:

Primary supply temperature ① : 53,5 °C ; Cold water temperature ② : 10 °C ; DHW temperature ③ : 45 °C

DHW flow rate ④ : 25 L/min ; Output ⑤ : 61 kW ; Tank return temperature ⑥ : 35 °C