

# PUMP UNIT TO DELIVER FRESH HOT DOMESTIC WATER (DHW) MODvFRESH 2 T

## Directions for installation



### List of features of main components

**(A) Miscelatore termostatico**  
The thermostatic mixing valve allows to set the requested temperature from 35°C up to 60°C. Please rotate clockwise to reduce and anticlockwise to increase the temperature, the requested value (\*) must clash to the reference marked on the valve body. Usually it is appropriate to assure that the supply temperature from the storage tank is almost 10 K more than the requested temperature.

**(G) Heat exchanger**  
Weld-braided plate heat exchanger made in stainless steel AISI 316. The heat exchanger can be easily removed for the service and/or the cleaning.

**(F) High efficiency circulating pump.** High efficiency circulating pump compliant with European Directive 2009/125/CE.

#### TAKE CARE

In this application, the circulator must be set in **constant speed** mode. Declared performances are reached by selecting curve III.



**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.

**(B) Check valve**  
Installed into the hot domestic water connection, prevents back flow of energy.

**(C) Electric shunt box**  
The pump unit is supplied pre-wired. It is not necessary to operate on the electrical connections.

**(D) Flow switch**  
The flow switch detects the water flow starting from 1.5 L/min, consequently activating the circulator.

**(E) Check valve**  
Installed into the return connection to the storage tank, prevents back flow of energy.



#### 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.

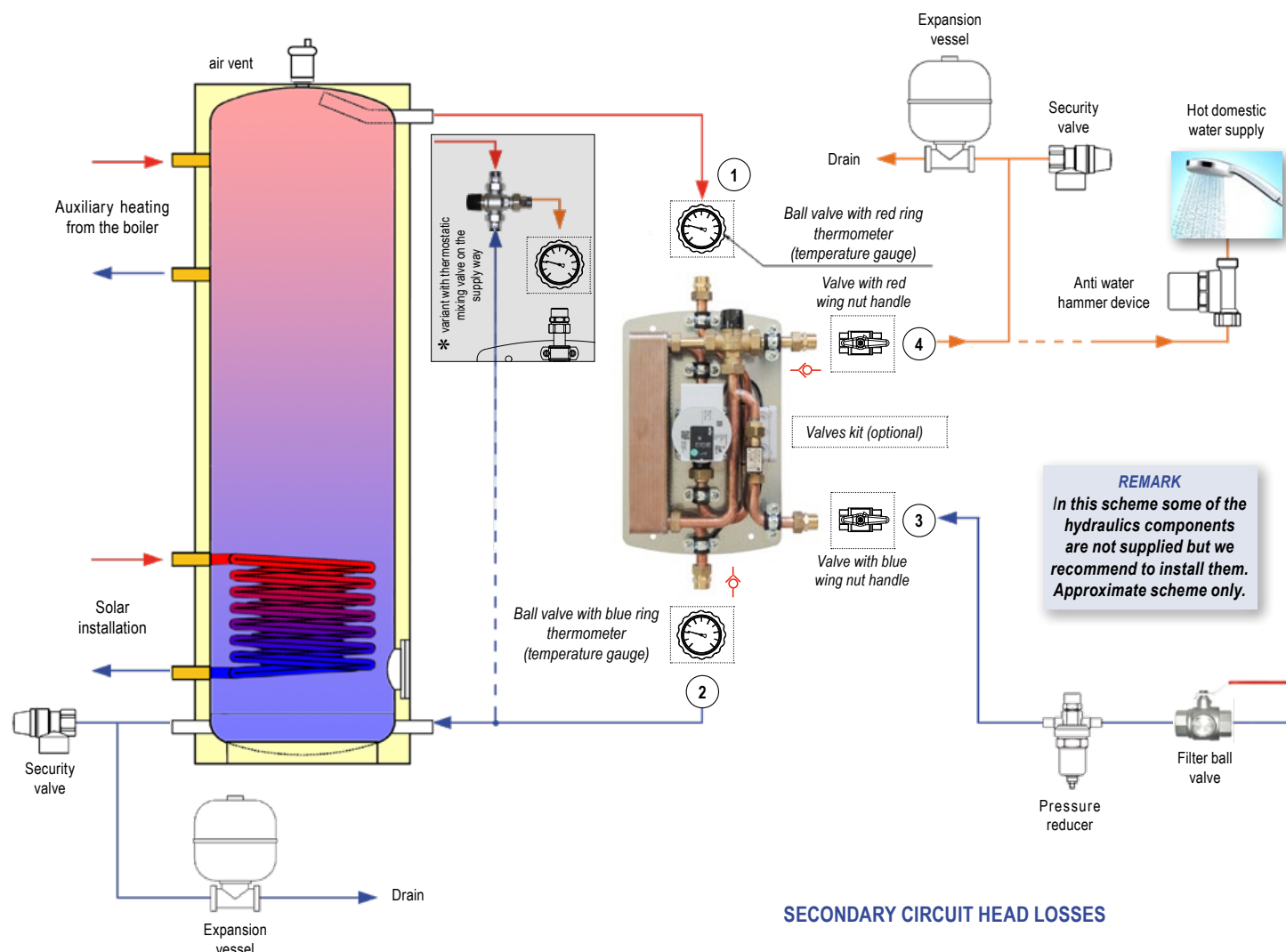
(\*) Knob corresponding temperature (with cold water 10°C and 65°C storage tank)

T°	MIN	1	2	3	4	5	MAX
35-60°C	37	40	44	49	53	57	59

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## Hydraulic and connection scheme

\* In presence of calcareous water, the high temperature of the supply way from the buffer tank 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).



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

### Technical Features

Maximum allowed pressure (without water hammer):

10 bar

Working temperature:

2 ÷ 95°C

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

5 mH<sub>2</sub>O

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

10 mH<sub>2</sub>O

## Connections and links

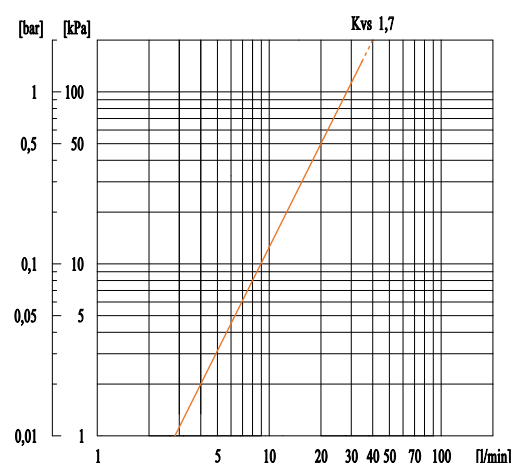
### PRIMARY CIRCUIT

- 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).

### SECONDARY CIRCUIT HEAD LOSSES



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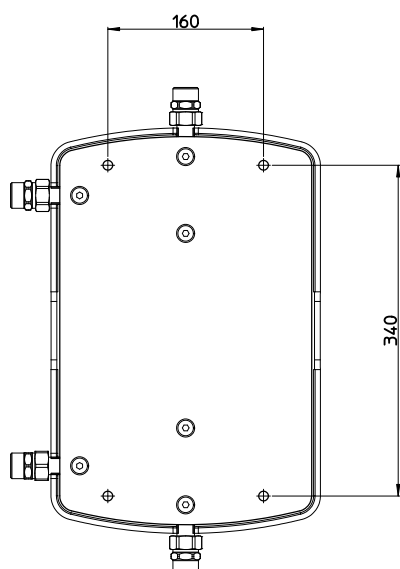
## Materials

Pipe fittings	Piping	Insulation	Heat exchanger	Gaskets	Circulating pump
Copper alloy CW617N / CW614N	Copper	EPP	Stainless steel AISI 316 L Copper	EPDM	Cast iron

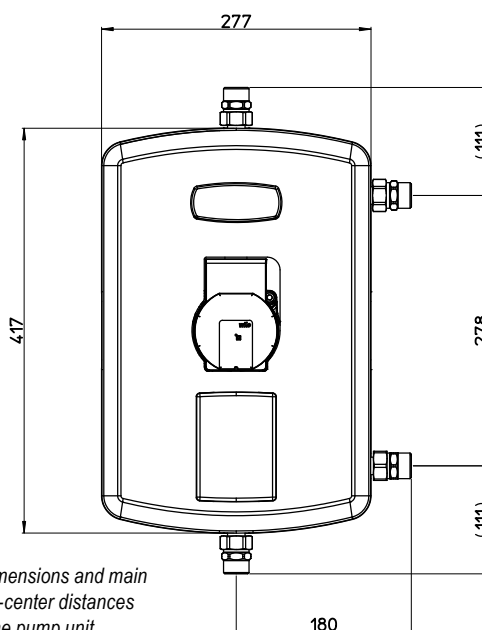
## Installation

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:

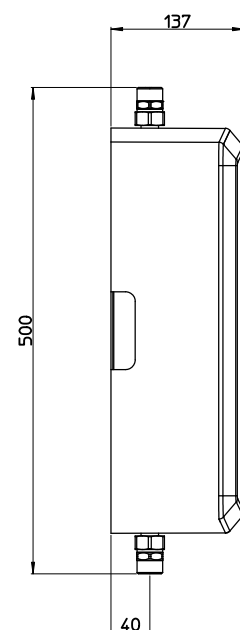
- ✓ Find the position of the 4 holes to be made into the wall according to the scheme *Pict.2*;
- ✓ Bore and put the proper screw anchors;
- ✓ Remove the cover and fix the pump unit;
- ✓ Mount the connection valves set (optional) according to the *Pict.1*;
- ✓ Connect the pipes in accordance to the connection 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



## 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);
- ✓ 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;
- ✓ Breathe out 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  $\pm$  10%.  
Frequency: 50÷60 Hz.  
Maximum absorbed  
power: 43 W.**

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## Suggestions / Remarks on the delivery capacity

The temperature into the storage tank must be almost 10K 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.**

## 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.

Water temperature on supply from the tank	Minimum capacity for the model ModvFresh 2 T 50 kW	Minimum capacity for the model ModvFresh 2 T 70 kW
55 °C	2 l/min	2,5 l/min
60 °C	2,5 l/min	3 l/min
65 °C	3 l/min	3 l/min
70 °C	3 l/min	3,5 l/min
75 °C	3,5 l/min	3,5 l/min
80 °C	4 l/min	4 l/min

## Diagrams of the pump unit performances

The following diagrams relate the user's flow rate and the supply temperature to the buffer storage tank, 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. Vice versa it is also possible to fix which is the maximum usable flow at the selected DHW temperature, at the available supply temperature. Performances are also due to the inlet temperature of the cold water from the water supply system; diagrams show three possibilities with inlet water at 5°C, 10°C and 15°C.

### How to read the diagrams

*Example 1*, shown in the next page (ModvFresh 2 T 50 kW, inlet at 10°C). In this case a DHW flow of 12 l/min at a temperature of 45°C is required. Crossing the desired DHW temperature curve, it follows that the supply from the buffer storage tank must be almost 51,7°C.

*Example 2*, shown in page 6 (ModvFresh 2 T 70 kW, inlet at 10°C). This is the case in which the supply from the buffer storage tank cannot go over 56°C and we want to see what can be the maximum suppliable temperature at the DHW of 45°C. Crossing the desired DHW temperature curve, it follows that the flow cannot be over 19,3 l/min.

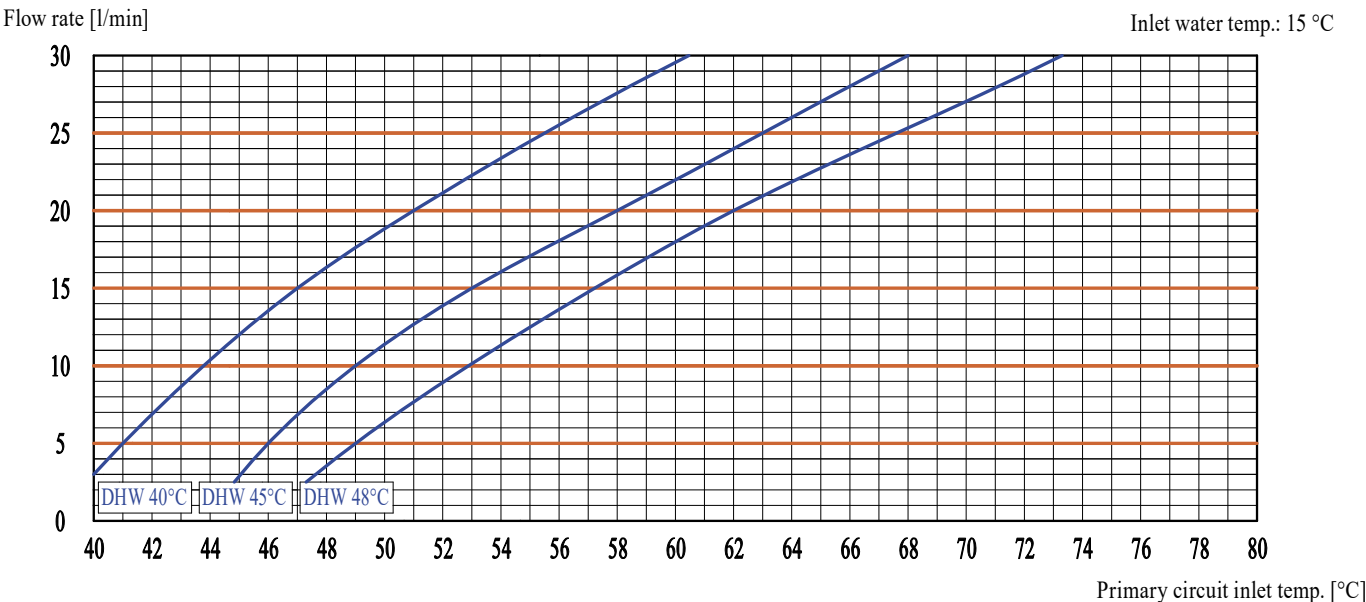
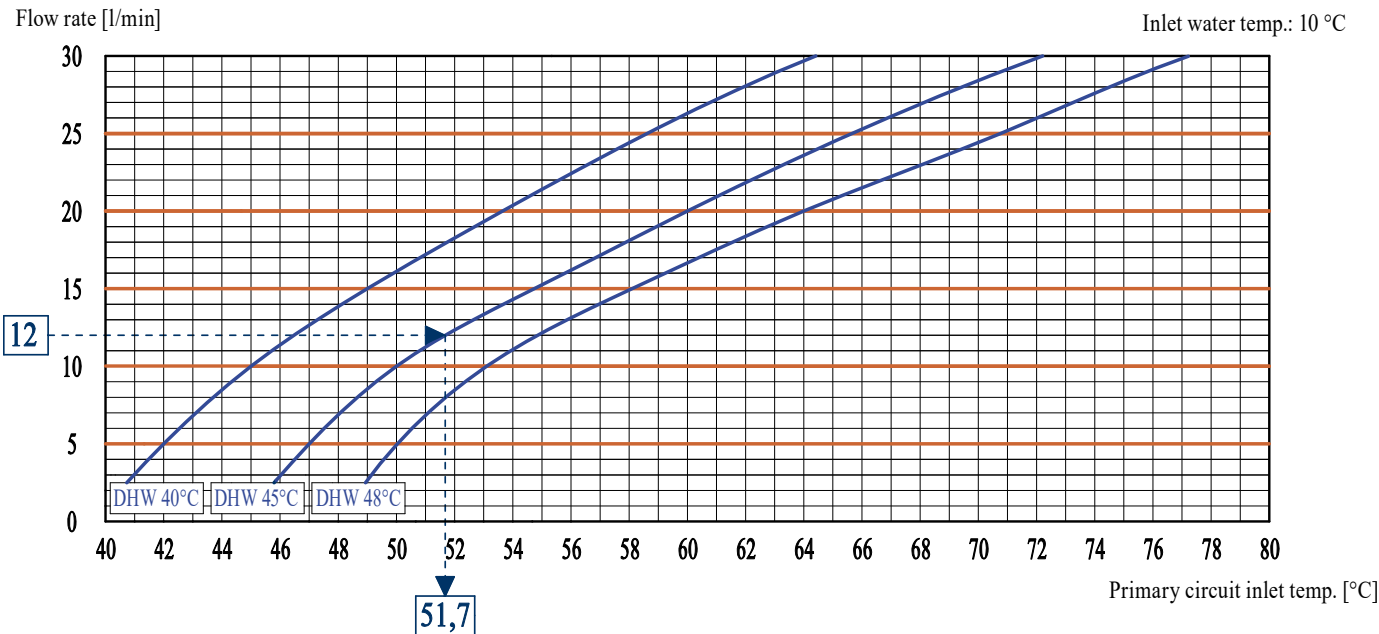
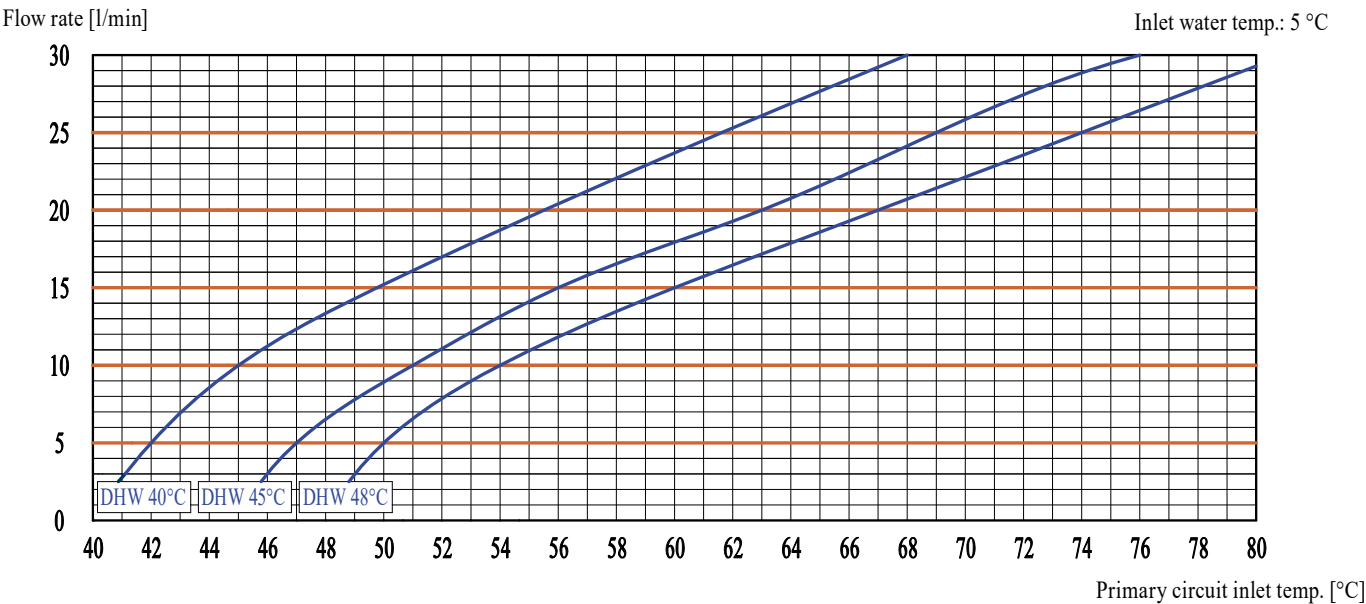
## Calculation of performances



It is also possible to download an excel file from the site [www.modvlvs.com](http://www.modvlvs.com) dedicated to the calculation of the performances of the ModvFresh 2 T unit from where you can get: output power, time of delivery, the overall delivery capacity and recovery time of the temperature in the tank.

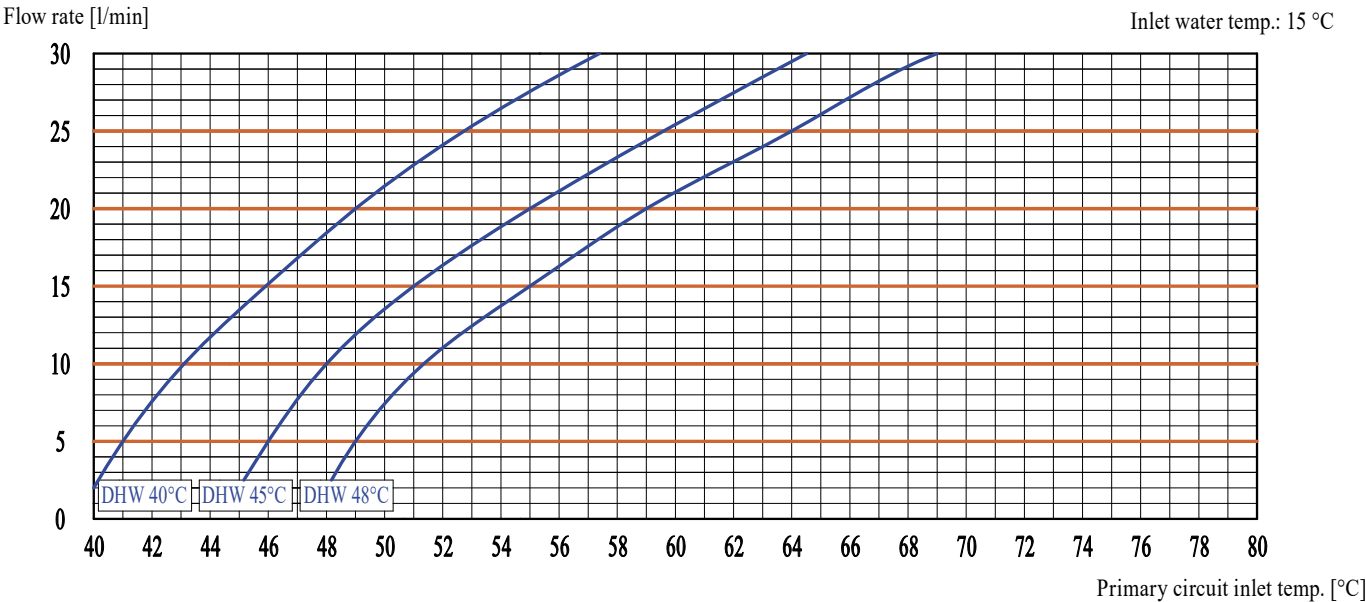
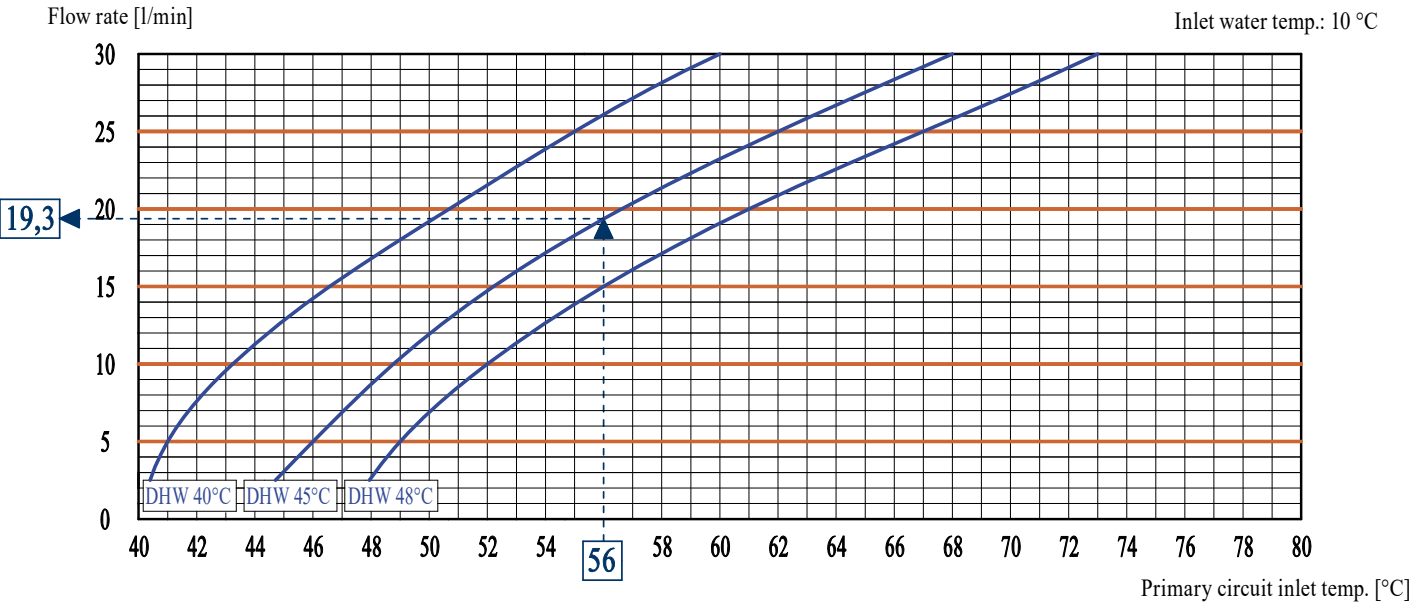
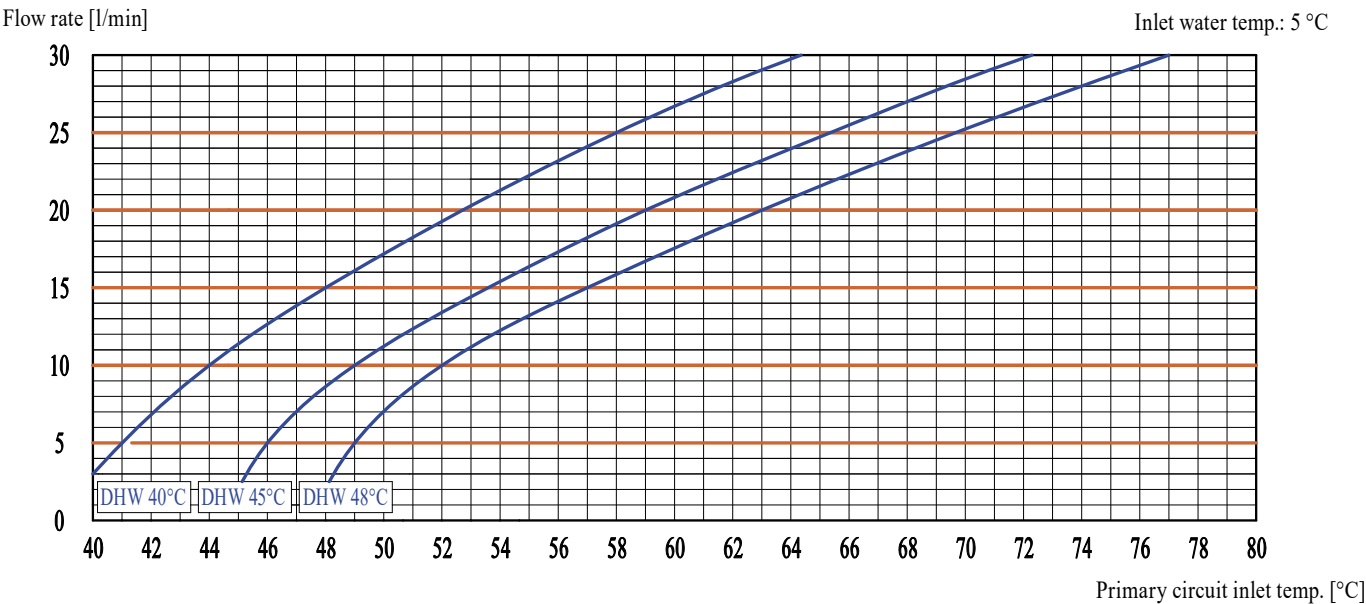
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## DHW pump unit: *ModvFresh 2 T* - 50 kW



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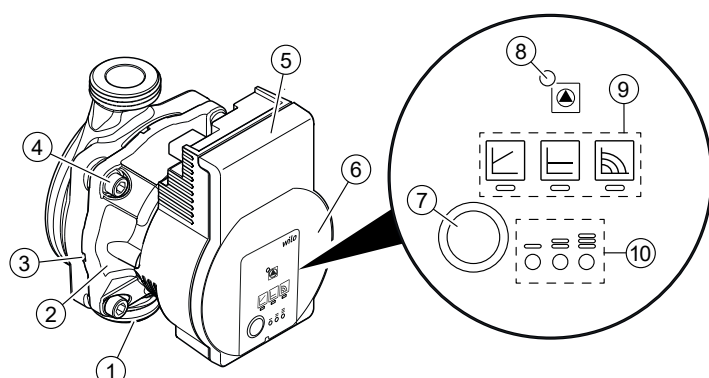
DHW pump unit: *ModvFresh 2 T* - 70 kW





# PUMP UNIT TO DELIVER FRESH HOT DOMESTIC WATER (DHW) MODvFRESH 2 T

## Synchrone high efficiency circulating pump Wilo Para SC



1. Pump housing with screwed connections
2. Glandless motor
3. Condensate drain openings (4x around circumference)
4. Housing screws
5. Control module
6. Rating plate
7. Operating button for pump adjustment
8. Run/fault signal LED
9. Display of selected control mode
10. Display of selected pump curve (I, II, III)

### Indicator lights (LEDs)



- Signal display
- LED is lit up in green in normal operation
- LED lights up/flashes in case of fault



- Display of selected control mode  $\Delta p$ -v,  $\Delta p$ -c and constant speed



- Display of selected pump curve (I, II, III) within the control mode



- LED indicator combinations during pump venting function, manual restart and key lock

### Operating button

#### Press

- Select control mode
- Select pump curve (I, II, III) within the control mode

#### Press and hold

- Activate the pump venting function (press for 3 seconds)
- Activate manual restart (press for 5 seconds)
- Lock/unlock button (press for 8 seconds)

### Funzioni

#### Venting

The pump venting function is activated by pressing and holding the operating button (for 3 seconds) and automatically vents the pump.

The top and bottom LED rows flash in turn at 1 second intervals. To cancel, press and hold the operating button for 3 seconds.

The heating system is not vented.

#### Manual restart

A manual restart is initiated by pressing and holding the operating button (for 5 seconds) and unblocks the pump if required

(e.g. after long standstill period in summer).

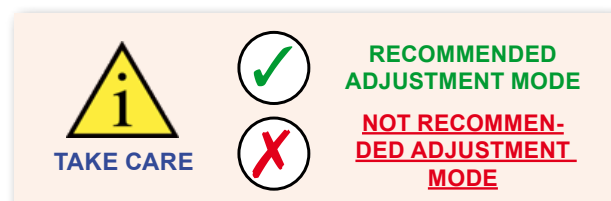
#### Lock/unlock the button

The key lock is activated by pressing and holding the operating button (for 8 seconds) and locks the pump's current settings. It protects against undesired or unauthorised adjustment of the pump.

### Control modes

- The LED selection of control modes and corresponding pump curves takes place in clockwise succession.
- Press the operating button briefly (approx. 1 second).
- LEDs display the set control mode and pump curve.

	LED display	Control mode	Pump curve
1		Constant speed	II
2		Constant speed	I
3		Variable differential pressure $\Delta p$ -v	III
4		Variable differential pressure $\Delta p$ -v	II



	LED display	Control mode	Pump curve
5		Variable differential pressure $\Delta p$ -v	I
6		Constant differential pressure $\Delta p$ -c	III
7		Constant differential pressure $\Delta p$ -c	II
8		Constant differential pressure $\Delta p$ -c	I
9		Constant speed	III