

DOUBLE SOLAR STATION WITH GRUNDFOS PUMP UPM3 SOLAR 15-75

1-6 l/min 2-14 l/min

1. Safety

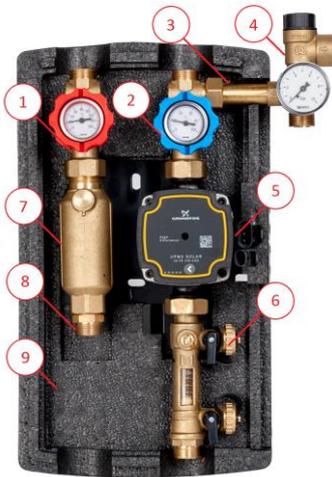
The device is intended only for closed solar installation. Pump group corresponds to the current technical standards and technical safety regulations. Each device is checked for proper operation and safety.

Pump group can be installed and operated only by trained personnel. Untrained personnel can work only under the supervision of an experienced person, knowledgeable way the unit operates. Before any assembly works and installation, the installer and operator must carefully read and understand this manual.

2. Warranty conditions

The manufacturer shall not be liable for any damage or consequences resulting from failure to read and misunderstanding of the manual. Manufacturer will not be responsible for costs or damage incurred by persons using the device, in particular for damage resulting from misuse, improper or faulty connections. In addition, manufacturer is not responsible for damage resulting from any interference inconsistent with the instructions.

3. Description of the device



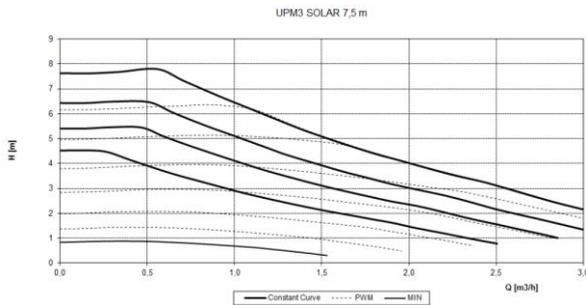
1. BALL VALVE WITH THERMOMETER (HIGH PARAMETER)
2. BALL VALVE WITH THERMOMETER (LOW PARAMETER)
3. GROUP WITH MANOMETER WITH EXPANSION TANK EXIT
4. SAFETY BAR 6 BAR
5. ELECTRONIC CIRCULATION PUMP GRUNDFOS UPM3 SOLAR 15-75
6. ROTAMETER WITH VALVES FOR FILLING AND EMPTYING SOLAR INSTALLATION
7. AIR SEPARATOR WITH MANUAL VENT
8. COUPLING ($\frac{3}{4}$ " x $\frac{3}{4}$ " EXTERNAL THREAD)
9. SOLAR STATION INSULATION

5. Solar station technical data

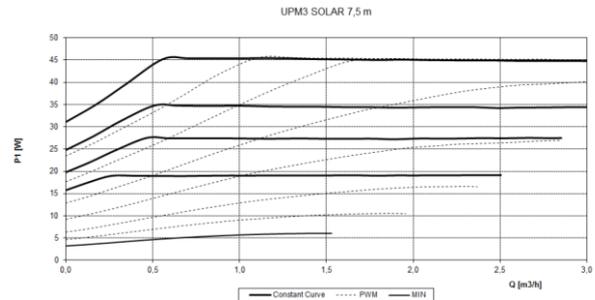
| Parametr | Value |
|-------------------------------------|--|
| Dimensions | 440 x 280 x 150 |
| Temperature range of pump operation | +2°C ÷ +110°C – momentary 130°C |
| Maximum pressure | 6 bar |
| Flow pump | 0-14 l/min |
| Measuring range | 1-6 l/min 2-14 l/min |
| Manometer scale | 0-10 bar |
| Thermometer scale (low parameter) | 0-100°C |
| Thermometer scale (high parameter) | 0-160°C |
| Connection | $\frac{3}{4}$ " M |
| Spacing between connections | 97 mm |
| Pump type | Grundfos Solar UPM3 15-75 |
| Supply voltage | 230V, 50 Hz |
| Pump mounting length | 130 mm |
| Body material | Brass |
| Insulation material | EPP |
| Tightening elements | EPDM |
| Medium | Mixture of non-toxic polypropylene glycol, inhibitors, and dye |

6. Pump characteristics

a) characteristics Q(H)



b) energy consumption characteristics



7. Mounting of the device

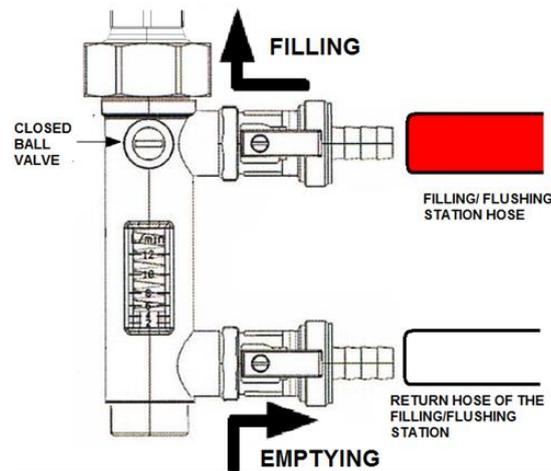
Solar station has to be installed in such place to isolate it from the surroundings. Station cannot be under the temperature which is too high, such as occur, for example, during welding or soldering. Solar station has to be mounted after such works. Before mounting of the solar station an installation has to be flushed and one has to make sure that the fluid which is introduced to the installation doesn't make any damage to the elements of the solar station.

Pump group is designed for wall mounting in an upright position.

8. Filling of the installation

In order to fill the installation:

- For filling and venting of the solar system, we can use a ready pump set with the pump flow to 12l / min and a lifting height of 7,5m and a solar tank.
- At the time of filling and venting of the solar installation expansion vessel should not be connected.
- Pour solar liquid only to a clean container of solar filling/ flushing/ venting station
- Remove the air from the hose in the filling/ flushing/venting station for solar installations.
- Connect the hose to the rotameter in the pump group as shown below



- Close the valve on the rotameter - so that the indentation on the ball valve rotameter is in a horizontal position (see figure)
- Connect the return hose (drain) to the rotameter in the pump group as shown in Figure
- Turn on the pump and open the shut-off valve on the flow and return of the rotameter. Rotameter control valves are still closed. Watch glycol level in the tank of a filling station, adding if necessary.
- Pumping of the solar fluid should last for at least 30 minutes, until in the transparent hose connected to the back of a filling station does not show any air bubbles flowing and the glycol is clear.
- During this time, you can check the tightness of the system, connect the electric pump in the pump group with solar sensors.
- Ensuring that returning to the container solar fluid is clear, you should proceed to so called 'pressure peaks'. This involves closing of the return valve with the pump running at a filling station. We observe the pressure gauge(manometer) of the pump as the pressure increases. The slow increase in pressure tells us that the air has remained in the solar system. Rapid opening the valve on the return to the filling station will lower the pressure. Repeat until the pressure increase after the closing return valve rapidly reaches the maximum pressure (4 - 5.5 bar).
- After the removal of air from the solar system, close the valve on the return, bring the pressure of glycol in the solar system to

the level of 4-5.5 bar, turn off the pump and close the valve in the supply of solar installation. Gently open the valve on the return and empty installation to the operating pressure of the solar system. According to the formula:

- $h \leq 5 \text{ m}$ $P_{\text{solar instalation}} = 1,5 \text{ bar}$
- $5 < h < 10 \text{ m}$ $P_{\text{solar instalation}} = 2 \text{ bar}$
- $10 < h < 15$ $P_{\text{solar instalation}} = 2,5 \text{ bar}$
- h – Static height of the instalation

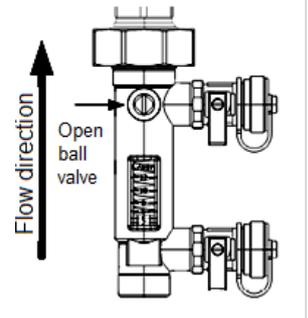
The minimum pressure in the solar system is 1.5 bar.

- Unscrew the hoses filling station, turn to the vertical rotameter control valve, seal shut-off valves on the rotameter, see the figure below. Pump group is prepared for controlling of the flow
- In the disconnected expansion vessel to refill the pressure of the gas cushion to be equal to the formula:

$$P_{\text{gas cushion}} = (1,5 + 0,1 * h)$$

h – Static height of the instalation

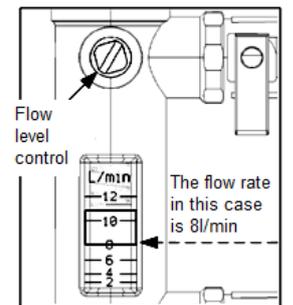
- reconnect the expansion tank



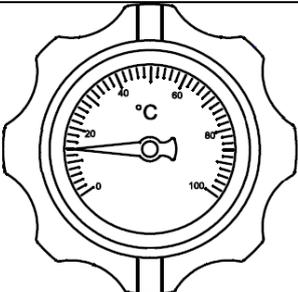
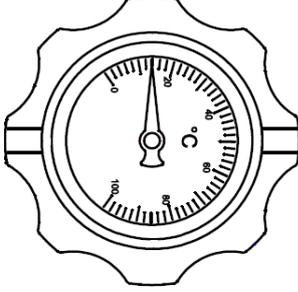
Flow control:

- switch on the speed selector of the pump and set to 1st gear, flow meter control valve is completely open, at the solar controller set the manual control of the solar pump without the regulation onf the rotation speed (100% the speed of rotation of the solar pump)
- Using a screwdriver or wrench turn the adjusting screw until the rotameter sets required flow.
- If you cannot achieve the required flow rate, the pump gear should be increased.

An indicator of the flow on the rotameter
The lower edge of the float indicates the flow as shown

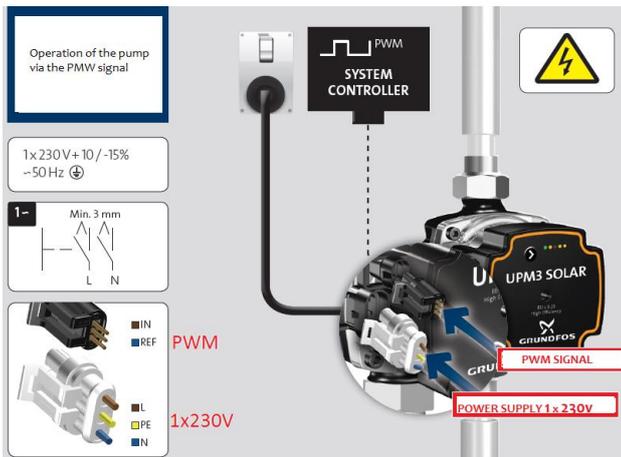


9. Ball valve handling

| Position the thermometer in ball valve | | |
|---|-----------|------------------------------------|
|  | Angle 0° | Normal operation – ball valve open |
|  | Angle 90° | maintenance – ball valve closed |

10. Setting of the UPM3 pump

Connecting of the pump:
The pump may be connected in two ways.

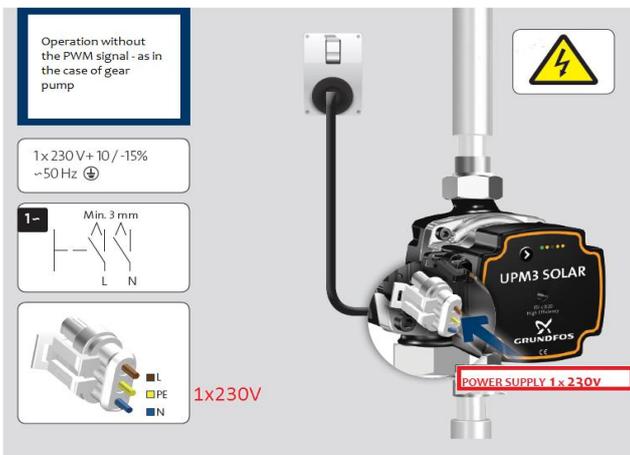


A – operation via PWM signal

With PWM control, the pump will operate in the energy-saving mode. In this case, connect the two wires supplied to the pump group (see figure below).

ATTENTION:

1. No PWM signal from the controller or lack of its connection means that the pump will not work!
2. For pump operation via the PWM signal the driver which generates the PWM signal is required.

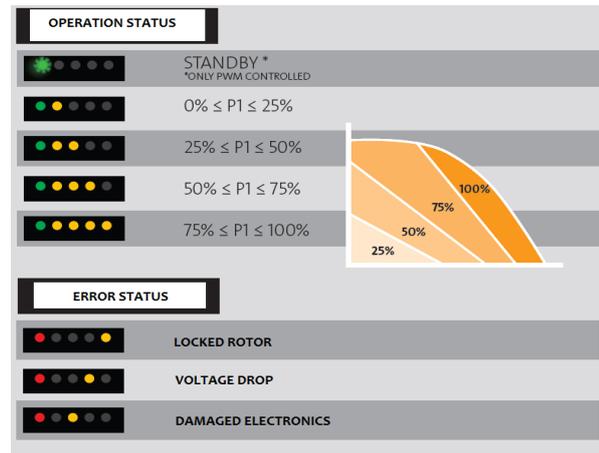


B - Operation without the PWM signal, just like in the case of gear pumps

When not using the PWM control signal, connect only the power cable marked with 230V.

Operational pump status.

On the front of the pump diodes are placed by which we can check the status of the pump operation, ie. the degree of engine downforce or error status.



To see how to set the pump, briefly press the button . For the duration of 3 seconds the pump will display one of the following codes, which indicates its setting.

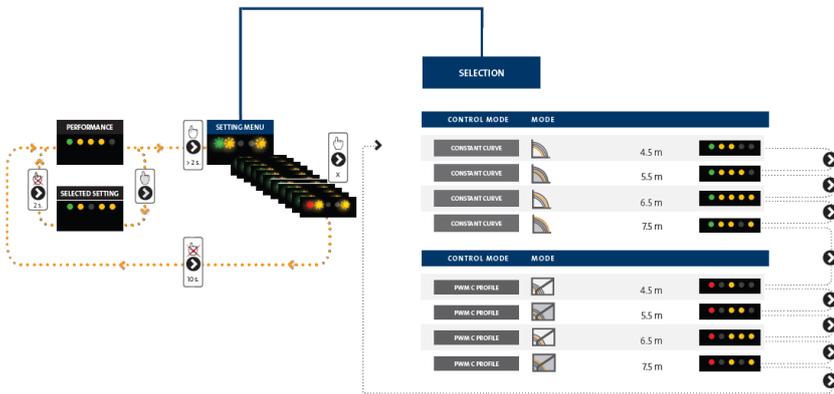
OPERATED WITHOUT THE PWM SIGNAL - AS IN THE CASE OF GEAR PUMP

OPERATED BY THE PWM SIGNAL

| Setting | Diode Pattern | Setting | Diode Pattern |
|----------------------|----------------------------|---------------------|--|
| CONSTANT CURVE 4.5 m | 1 green, 3 black, 1 yellow | PWM C PROFILE 4.5 m | 1 red, 1 yellow, 3 black |
| CONSTANT CURVE 5.5 m | 2 green, 2 black, 1 yellow | PWM C PROFILE 5.5 m | 1 red, 1 yellow, 1 green, 2 black |
| CONSTANT CURVE 6.5 m | 3 green, 1 black, 1 yellow | PWM C PROFILE 6.5 m | 1 red, 1 yellow, 1 green, 1 black, 1 white |
| CONSTANT CURVE 7.5 m | 4 green, 1 yellow | PWM C PROFILE 7.5 m | 1 red, 1 yellow, 1 green, 1 black, 1 white |

Changing pump settings

When the button  is held for more than 2 seconds, diodes will start to flash. This indicates that the pump is in the setting change mode. Each brief button  pressing will cause the change of setting for the next one.



Saving of the settings

After 10 seconds of the button  not being pressed, the pump will save current setting

ATTENTION:

Key lock 

Undesirable key lock  occurs when the button is being pressed for over 10 seconds. Locking is signaled by double flash of all the diodes with always the green diode at first position.

Unlocking is possible by pressing of the button for 10 seconds again.

Unlocking is signaled by double flash of all the diodes with always the green diode at first position.

