



**SAFETY:** Please read carefully the mounting and setting up directions before setting the system going, in order to avoid accidents and failures of the installation caused by an improper use of the product. Keep this manual for future consultations. Take into consideration also the technical documentation and the instructions of the controller.

### List and basic technical features of the main components

#### Secondary circuit: Hot domestic water.

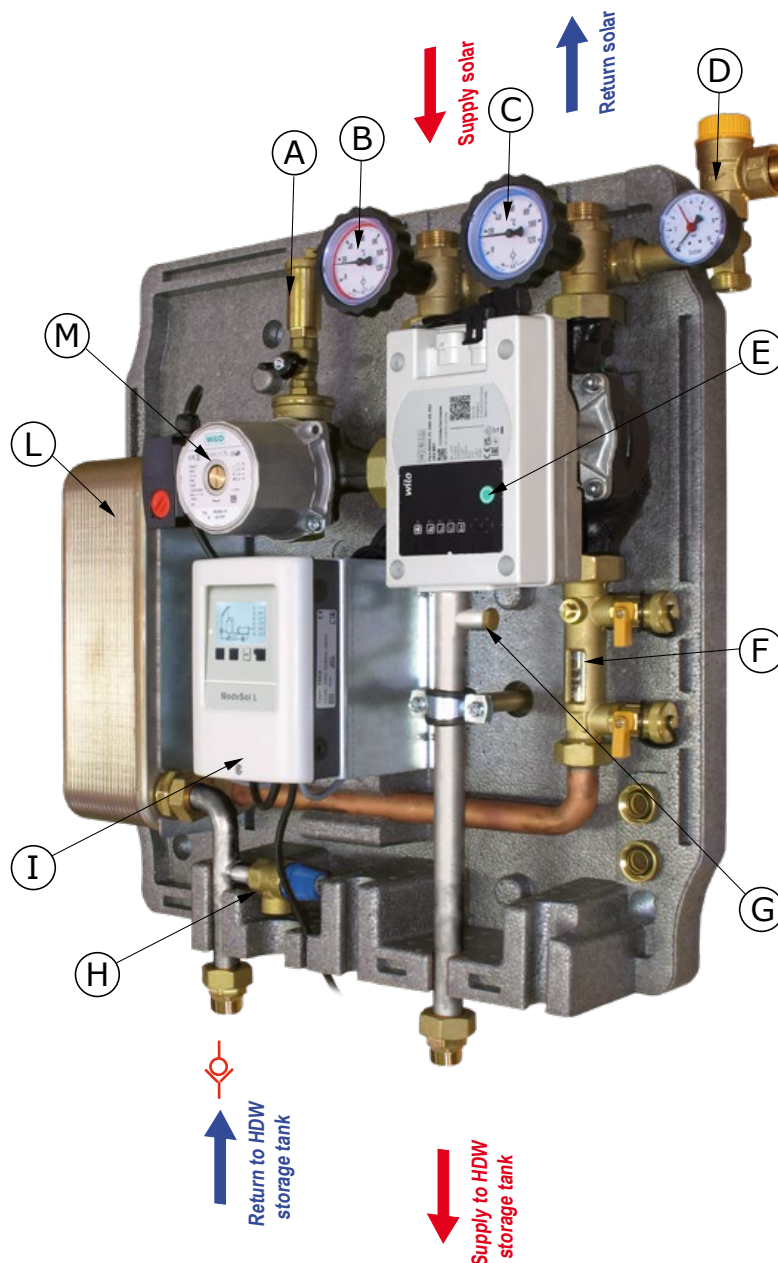
**(L) Heat exchanger.** Heat exchanger made of stainless steel AISI 316, weld-braided, 24 or 40 plates for different powers.

**(M) Secondary circuit circulating pump.**  
Asynchronous circulating pump (lifting power: 6 m).

**(G) Sensor holder pit.**  
Sensor holder pit prepared to the certified metering of the energy produced (a supplementary energy meter is required).

**(H) Security valve suitable for drinking water.**  
TÜV approved, it protects the secondary circuit against overpressures. 6 bar setting, maximum power 50 kW.

**(I) Modvsol L controller.**  
Differential solar controller, fully prewired, suitable for the whole management of the pump unit.



#### Primary circuit: Solar.

**(B) Ball valve on the supply way**  
(coded red thermometer, range 0-120°C) with "Solar" check valve.

**(A) De-aeration unit.**  
Air vent made of brass provided with automatic vent valve and isolating valve.

**(F) Flow meter.** Flow meter with side valves to fill/drain the installation. A graduate window allows to see the value of the flow circulating inside the system, by reading the position of the special mobile indicator. Flow rate range 8-28 l/min or 8-38 l/min according to the purchased model.

**(E) Primary circuit circulating pump.**  
Synchronous circulating pump with permanent magnets (lifting power 8 m)

**(C) Ball valve on the return way**  
(coded blue thermometer, range 0-120°C) with "Solar" check valve.

**"Solar" check valve:** inside the ball valve both on the supply and on the return way. It allows seal and low head losses.

**(D) Security unit.**  
The security unit, CE and TÜV approved, protects the system against overpressures. It is set at 6 bar, over this pressure the security unit acts. Moreover it is also equipped with a manometer and with a connection towards the expansion vessel by means of the flexible kit 3/4" (optional).  
Max. power 50 kW.

#### VFS flow meter



#### Models equipped with digital flow meter VFS 2-40 l/min

It is present in the models that mount it as an alternative to the mechanical flow meter. Thanks to this device, settings or adjustments of the solar system are no longer required. In fact the electronic controller will adjust the speed of the circulating pump to get the best output of the system. The flow will be displayed on the LCD display. Flow rate range: 2-40 l/min. Moreover it makes the matched record of flow and temperature that, together with another temperature sensor on the heating circuit secondary), allows the metering of the energy produced by the solar.

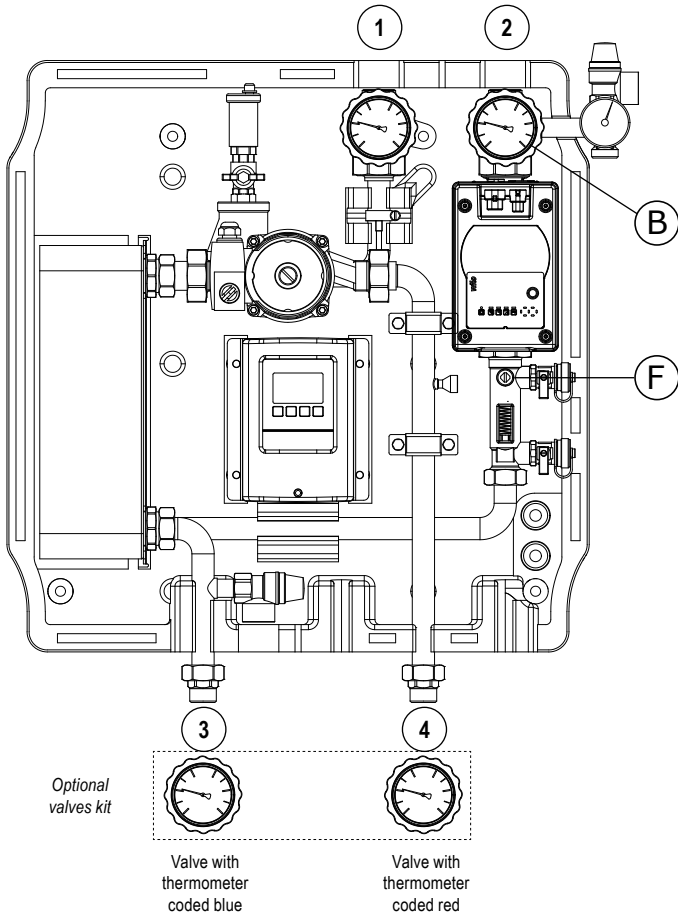


#### Filling kit.

It is included in the equipment of the pump units supplied with VFS digital flow meter.

By means of this special kit it is possible to fill the system easily. It must be connected between the flexible (optional) and the expansion vessel.

## External connections



Pict. 1: scheme of connections and of optional valves kit

### PRIMARY CIRCUIT (SOLAR)

- 1 **Solar supply:** 1" ISO 228 male connection. Minimum piping diameter DN20 (Cu 22x1).
- 2 **Solar return:** 1" ISO 228 male connection. Minimum piping diameter DN20 (Cu 22x1).

### SECONDARY CIRCUIT (HDW) Stainless steel AISI 316 pipings.

- 3 **Return to storage tank :** 3/4" ISO 228 male connection with Check Valve. Minimum piping diameter DN20. Maximum length: 3 m.
- 4 **Supply to HDW storage tank:** 3/4" ISO 228 male connection. Minimum piping diameter DN20. Maximum length: 3 m.

### Field of utilization

For power up to 35 kW; for one HDW storage tank.

### Technical features

PN 10. Constant operating temperature 120°C;  
short term temperature: 160°C (max 20 sec).  
Maximum temperature of the secondary circuit: 110°C.

## Insulation box

**EPP insulation box**  
**Measurements:**  
**565 x 585 x 190 mm.**

The insulation box has two outlets for cables/sensors in the upper part and in the lower part. On the base of the insulation box there are special notches for the housing of 22 mm pipes. A special metallic back plate holds the unit in the insulation box while allowing fast fitting to the wall.



## Service

To service/replace the circulating pump of the primary circuit you must close the ball valve (B) and the flow meter (F) by turning their respective knobs clockwise. Once the service finished, open again the ball valve and the flow meter to restore the flow in the installation.

To service periodically the secondary circuit (e.g. replacement of the heat exchanger or of the pump), we recommend to put the special isolating ball valves kit (optional).



The valves kit, if moved to close, isolates the security valve of the next circuit (return to storage tank). We recommend to place another or more external nearby the storage tanks.

## 20 mbar SOLAR check valve

It is present into the ball valves of the supply way (1) and of the return way (2) of the solar circuit (primary), it prevents a possible circulation of the fluid in the opposite direction.



To prevent the circulation in the opposite direction, the check valve must be in working mode, that is with the ball valve fully open.

The notch on the knob, nearby the temperature indication of 60°C, must be on axis with the fluid direction.



To empty the circuit, shut out the Check Valve by rotating the knob with thermometer coded blue of 45° clockwise, starting from the fully open position (see picture at side).

The notch on the knob, nearby the temperature indication of 60°C, must make an angle of 45° with the fluid direction.

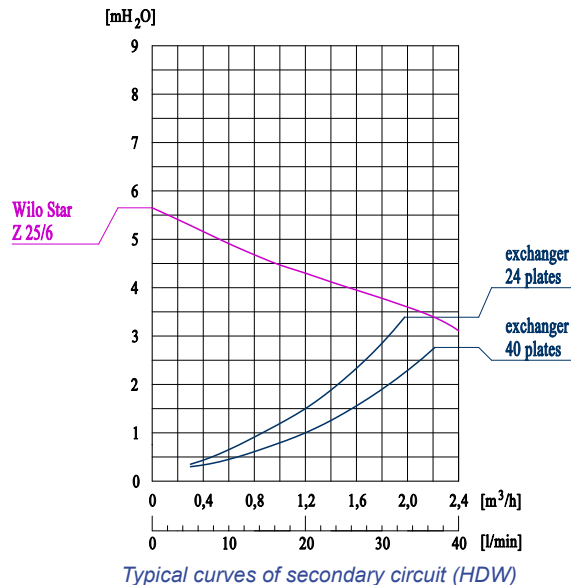
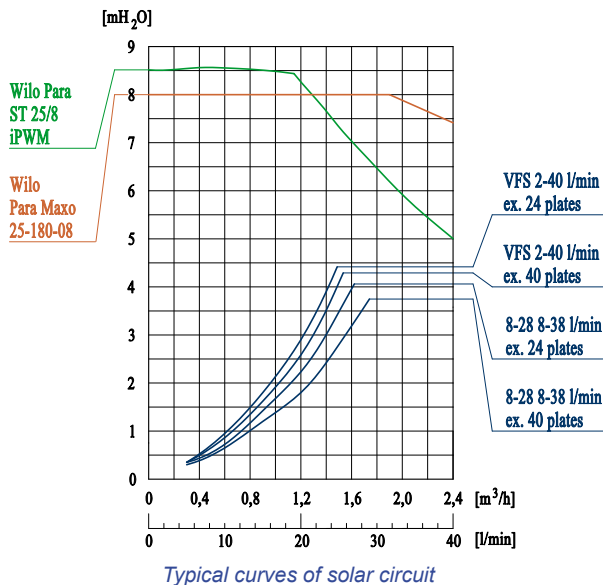


When service is required, fully close the ball valve by rotating the knob of 90° clockwise.

The notch on the knob, nearby the temperature indication of 60°C, must make an angle of 45° with the fluid direction.

Attention: the movement to close does not isolate the security valve.

## Typical curves of the pump unit and of the circulating pumps



## Installation

In consideration of the big size and weight, we recommend to install the unit to the wall:

- ✓ Locate and identify the position of the 4 holes to be done on the wall according to the scheme in Picture 2;
- ✓ Drill and put into the bore the plug suitable for the kind of wall;
- ✓ Remove the cover, place the unit and fasten it;
- ✓ Mount the valves kit (optional) following the instruction of the picture 1 of the previous page;
- ✓ Connect the pipes according to the connection scheme, following the measurements shown in picture 3.
- ✓ Connect the sensor 1 (*Sensor S1*) to the solar collector. The connection and the wiring must be done by the installer.
- ✓ Connect the sensors 2 (*Sensor S2*) to the specific point made for the kind of installation desired. Usually to the lower part of the storage tank. Concerning this read the controller manual enclosed with the papers. A generic hydraulic scheme is indicated into the section “**Example of hydraulic schemes of connection**” in these directions.

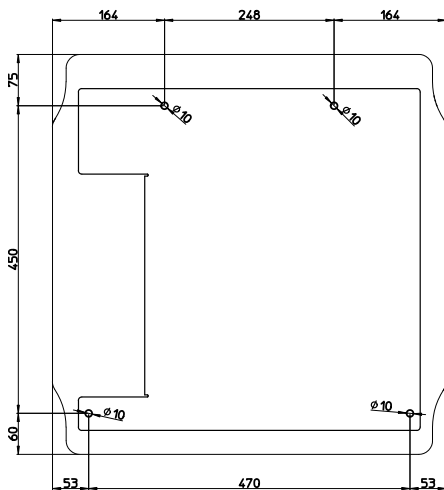


Figure 2: Back plate to fasten the unit to the wall

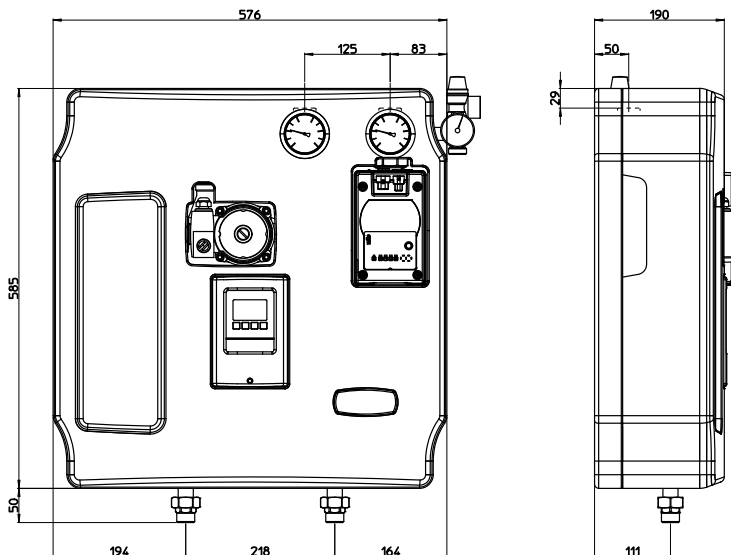


Figure 3: overall measurements and main wheelbases of the unit.



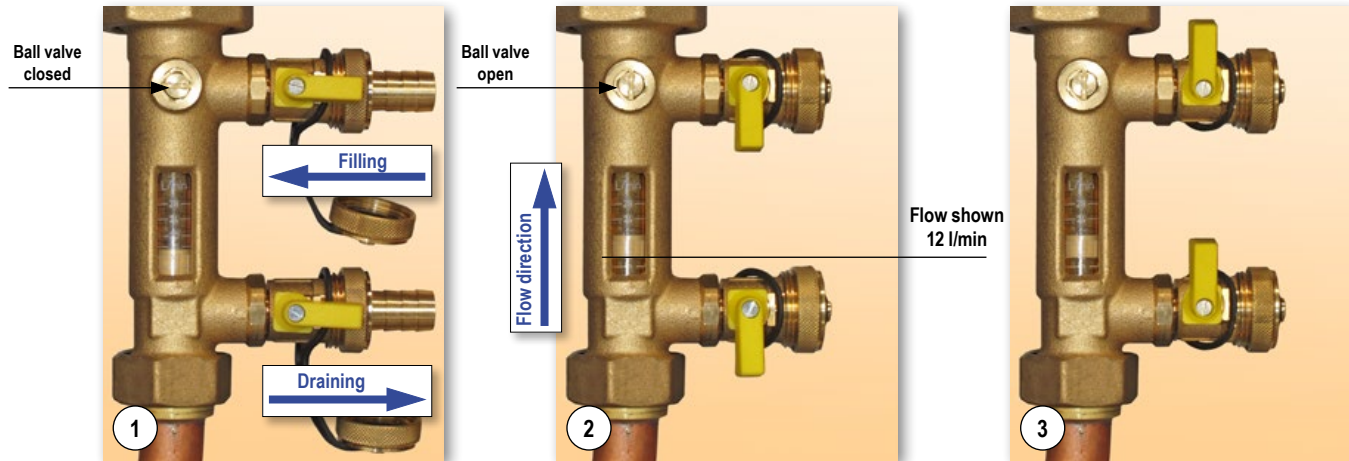
### Electrical connections

The unit is fully pre wired. Use a Shuko plug for the connection to the electric system.  
Voltage: 230 VAC +/- 10%  
Frequency: 50-60 Hz.

### Differential solar controller

As regards the directions for the installation and the working of the controller, please look it up in the enclosed manual.

## Filling and starting of the primary circuit (solar) - Models with mechanical flow meter



### (1) - Filling of the installation:

Remove the plug from the side valves and connect the hose union. Close the ball valve and open the knobs of the side filling and draining valves. Go on with the filling of the installation at the desired pressure.

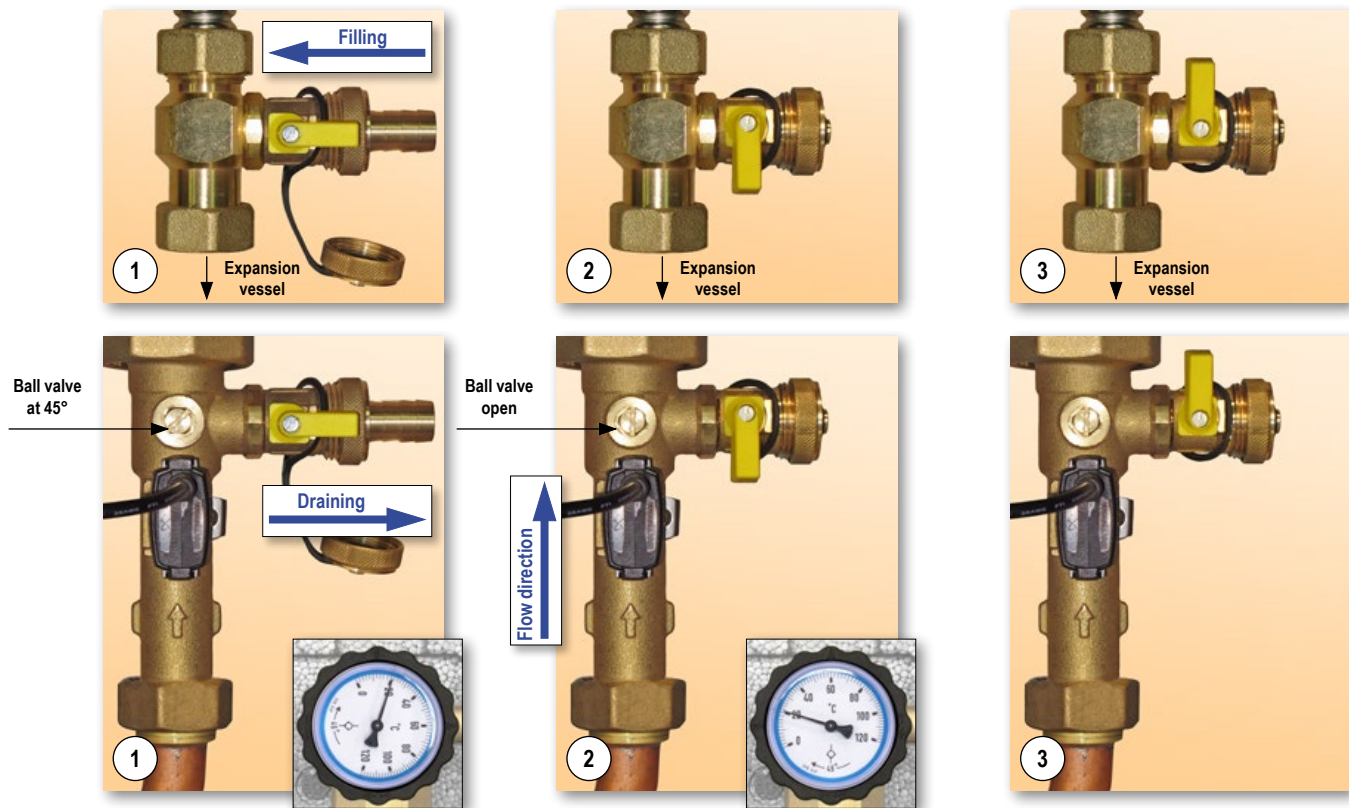
### (2) - Starting of the installation:

Open the ball valve and close the side filling and draining valves. Remove the hose unions and screw again the plugs. It is possible to read the fluid flow in correspondence of the lower edge of the slider indicator.

### Knobs locking

In order to avoid an accidental opening of the side valves, it is recommended to lock the knobs in closed position. Unscrew the fixing screw, take out the knob and put it again turned of 180°.

## Filling and starting of the primary circuit (solar) - Models with digital VFS



### (1) - Filling of the installation:

Remove the plug from the filling and draining valves and connect the hose union. Close the return solar ball valve (thermometer coded blue). Put the VFS at about 45°. Open the filling and draining valves. Fill the installation at the desired pressure. (\*)

### (2) - Starting of the installation:

Close the filling and draining valves; remove the hose unions and screw again the plugs. Open the return solar ball valve (thermometer code blue) and the ball valve of the VFS flow meter.

### Knobs locking

In order to avoid an accidental opening of the side valves, it is recommended to lock the knobs in closed position. Unscrew the fixing screw, take out the knob and put it again turned of 180°.



(\*) Filling of the installation in the presence of VFS flow meter. This operation has to be done very slowly and at a low filling pressure, in order to avoid the risk of damaging the VFS sensor.

## Filling and starting of the secondary circuit (hot domestic water)

The pump unit, during the test step at the factory, is submitted to a seal test under pressure. Anyway we recommend, before going on with the filling operations, to check again all the connections. Special operations are not required, anyway please check the following indications:

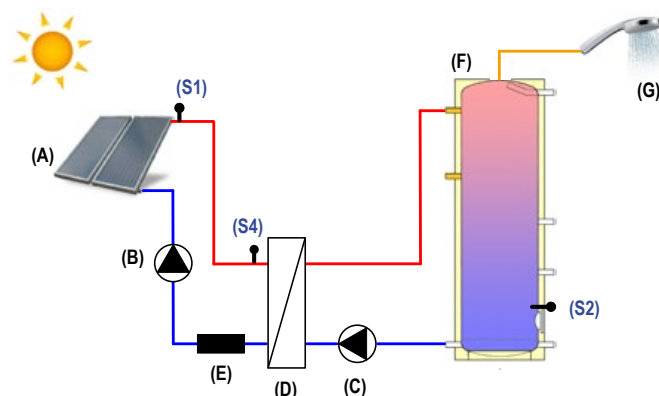
- ✓ Control that the circuit is correctly purged.
- ✓ Ensure that the selector of the primary circuit circulating pump (HDW) is set at the desired value.
- ✓ De-aerate the buffer tank, in case re-establish the pressure.

## Example of connection hydraulic schemes

The pump unit, as shown in the exemplifying schemes at side, gets heat by means of the primary circuit (solar) and carries it into the heat exchanger. Then the thermic energy is transferred to the secondary circuit that, in the specific case of **ModvSol Solo 1 HDW**, feeds directly and only the hot domestic water storage tank.

- (A) - Solar collectors
- (B) - Primary circulating pump
- (C) - Secondary circulating pump
- (D) - Heat exchanger
- (E) - Mechanical flow meter or digital VFS sensor
- (F) - Buffer tank
- (S1) - Sensor S1 - For solar collector
- (S2) - Sensor S2 - Storage tank sensor
- (S4) - Sensor S4 - Heat exchanger sensor

*NOTE: the schemes are to be considered just as indication.*



## Peculiar notes for models equipped with digital VFS flow meter

### Display of the thermic output of the plant.

The **ModvSol L** controller, more than displaying the flow and the instantaneous thermic output (Picture 1) in the main menu, is able to calculate the production of thermic energy supplied. In fact in menu "2. Statistics" it is possible to display the "Heat quantity" (menu 2.2) total, per year, per month, per week and per day (Picture 2). These data, marked in kWh, are readable even disguised as graph (menu 2.3).

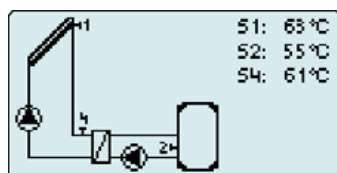


Fig. 1

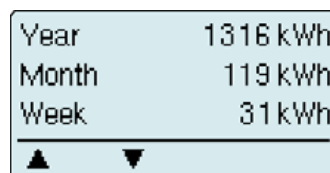


Fig. 2

### VFS problems.

*In case of malfunction or anomaly of the VFS flow meter we ask you to follow the following rules:*

- Check that the VFS sensor mounted into the pump unit clashes with the one selected in menu **6.9.2.1. VFS Type (VFS1)**. If it does not clash please change the selection.
- Check that the minimum speed of the circulating pump (menu **6.3.5. Minimum Speed** 30% default option) gives almost a minimum flow of 3,5 l/min. If at the minimum speed the VFS does not read any value please increase this parameter (e.g. 40%).
- Check that the maximum rotation speed of the circulating pump (Menu **6.3.4. Maximum Speed** 100% default option) does not give a flow more than 40 l/min. In this case please reduce this value (e.g. 90%).
- VFS precision with water and glycol mixture 40%: +/- 5%.

## Solo 1 ACS High Flow

Article code	Tapping surface of solar collectors	Delivered thermic power	$\Delta t$	Primary circuit circulating pump	Secondary circuit circulating pump
<b>Solo 1 ACS</b>					
031230-24-(28/40)-LT	30 m <sup>2</sup>	15 kW	10 K	Wilco Para ST 25/8 iPWM	Wilco Star Z 25/6
031230-40-(38/40)-LT	46 m <sup>2</sup>	23 kW	10 K	Wilco Para Maxo 25-180-08	Wilco Star Z 25/6

## Solo 1 ACS Low Flow

Article code	Tapping surface of solar collectors	Delivered thermic power	$\Delta t$	Primary circuit circulating pump	Secondary circuit circulating pump
<b>Solo 1 ACS</b>					
031230-24-(28/40)-LT	50 m <sup>2</sup>	25 kW	25 K	Wilco Para ST 25/8 iPWM	Wilco Star Z 25/6
031230-40-(38/40)-LT	70 m <sup>2</sup>	35 kW	25 K	Wilco Para Maxo 25-180-08	Wilco Star Z 25/6

It is possible to select two versions for each model indicated in the above table: one with mechanical flowmeter, another with digital VFS sensor.

- **Models with mechanical flowmeter:** the flowmeter has a measuring range of 8-28 or 8-38 l/m, default value according to the specific model selected. Product codes of these models have respectively the options **28** or **38**. Esempio: For instance: Solo 1 ACS, High Flow, with an exchanged power of 23kW: code 031230-40-**38**-LT.
- **Models with digital VFS sensor:** all these models have the VFS sensor with a measuring range of 2-40 l/min. Product code of these models have the option **40**. For instance: Solo 1 ACS, High Flow, with an exchanged power of 23 kW: code 031230-40-**40**-LT.