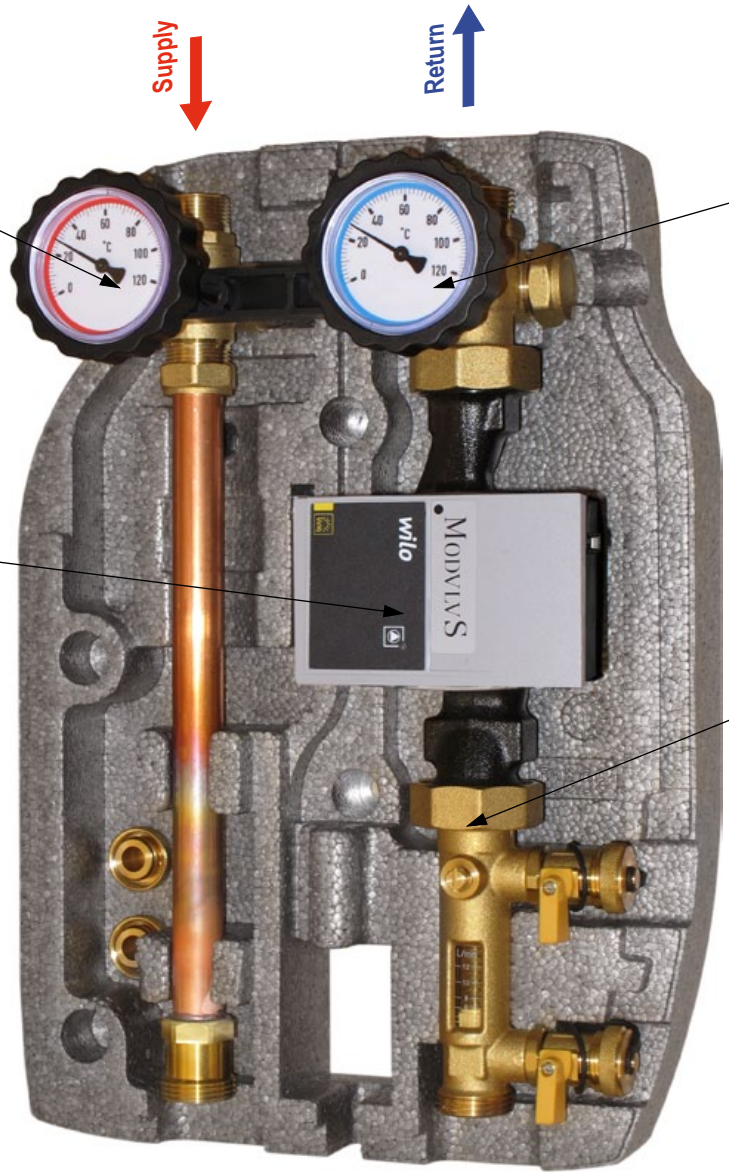
2-Way S2 Solar 20 Drain-Back Pump Unit

Mounting directions

SAFETY: *Please read carefully the mounting and setting up directions before operating the pump unit in order to avoid accidents and damages of the installation caused by an incorrect use of the product. Keep this manual for future consultations. Have also a look at the technical manual and directions of the controller.*

List and basic features of the main components



(A) Supply way ball valve
Equipped with in-handle thermometer coded red and scale range 0°-120°C.

(B) Return way ball valve
Equipped with in-handle thermometer coded blue and scale range 0°-120°C.

(C) Circulating pump
High Efficiency synchrone circulating pump, provided with permanent magnet motor with electronic switching, controlled by ModvSol L controller that regulates its performances as regards the lifting power and the flow rate. Only one circulating pump has a double function: the filling of the installation in the starting phase and the control of the fluid flowing once the system is running. Thanks to the seal of the ball valves before and after the circulating pump, it can be replaced without emptying the installation.

(D) Flow meter
Flow meter with side valves, one of them usable to fill the installation.
The flow setting drive, in this special use, must be always kept in open position.
A graduated window allows to read the flow value of the installation, checking the position of the special slider. Three different flow ranges are available, according to the model purchased:
1-6 l/min, 2-12 l/min e 8-28 l/min.

Technical features

PN10. Constant maximum operating temperature 120°C; short term operating temperature: 160°C (max 20 sec).
External connections available: 22 mm compression, 3/4" M and 1"M.

Service

To service/replace the circulating pump, close the ball valve **(B)** and the flow meter **(D)** by turning their respective handles clockwise. Ocne the service finished, open again the ball valve and the flow meter to re-establish the flowing of the installation.

Attention: *The peculiar feature of the drain-back system is the natural emptying of collectors and pipings (due to gravitational fall) when the flowing stops. For this reason we advise to use simple water instead of the usual glycolic solution.*

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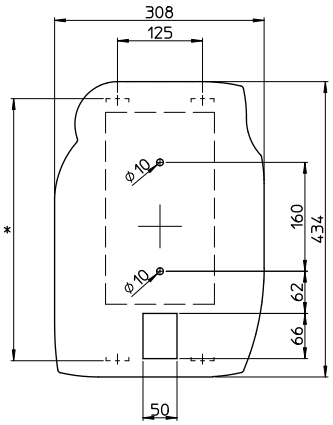
Insulation box and mounting directions

Fixing holes on the back plate. Special ways on the insulation box allow the fixing without disassembling the unit.

EPP insulation box
Measurements: 308 x 434 x 169 mm.

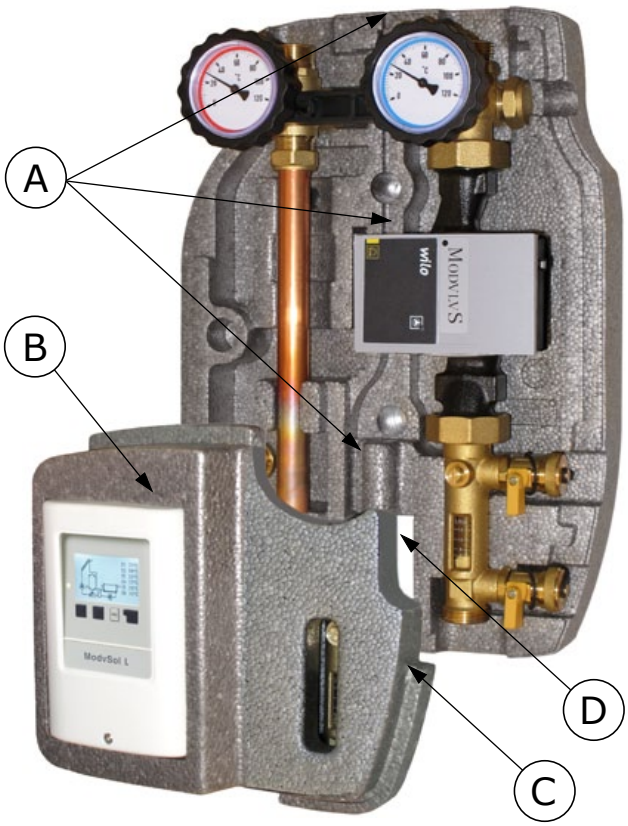
It includes a controller holder fit for the passage of power supply cables and sensors. Inside notches for the housing of 22 mm supply way pipe. A special opening allows to read the flow without removing the cover. A special metal back plate fixes the unit to insulation box and it allows a quick fitting to the wall or to the water tank.



(*) Distance of threaded connections:
22 mm a compression: 405 mm
3/4"M e 1"M: 385 mm

Mounting position

To make easy the mounting operations, it is possible to place temporarily the controller holder in a side position. This expedient allows to easily approach to the filling valve, avoiding to hold the controller by hand: it is sufficient to use the 22 mm notch located in the lower part of the insulation box to hang the controller holder to the supply way pipe. Once the mounting operations are finished it is possible to put again the controller holder into its final housing.



(A) - Cable way for solar collector sensor.

(B) - Controller housing seat: son the back wall of the controller holder there is a special way that allows the controller cables to reach the central room of cables outlet.

(C) - Circulating pump cable:the controller holder has a special way for the power supply cable of the circulating pump. This housing unwinds itself along the external outline of the controller holder, that usually is covered with the insulation cover, and it allows to guide the cable along an exact way insulated from heat sources.

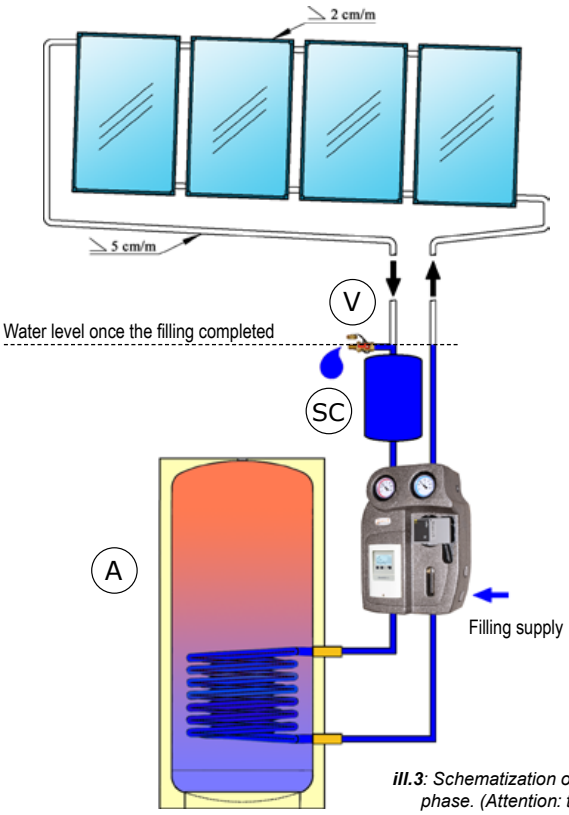
(D) - Cables outlet room: in this part, thermally insulated from the other parts of the unit, all the cables (power supply cable, special Molex cable for circulating pump, temperature sensors) are collected and sorted out. Thanks to the double opening of the insulation box, the cables can go out both towards the lower part and towards the back part, according to the installation needs.

DANGER

***Electric wiring:* the unit is fully prewired. Please provide a Shuko plug for the connection to the electric system. Voltage: 230 VAC +/- 10%. Frequency: 50 – 60 Hz**

Filling the system and some special notes

The operations to fill up the system must be carried on keeping a condition of low flow and low head; therefore, if necessary, we recommend to operate the filling valve to regulate the flow.
During this phase, the water introduced into the system progressively fills the water tank coil (**A**) and, afterwards, the drain back tank (**SC**). The filling must be done until the tank is completely filled and until the water is flowing out from the overflow valve (**V**) placed on the top. We remember you that, once the filling completed, the level of the fluid in the system will be the same both on the supply and on the return way, as shown by the scheme of *ill.3*.



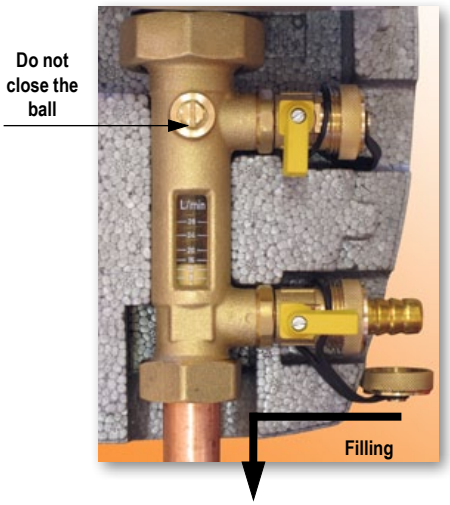
***ill.3**: Schematization of a drain-back system during the filling phase. (Attention: the scheme is just as an indication)*

Instructions for a correct working

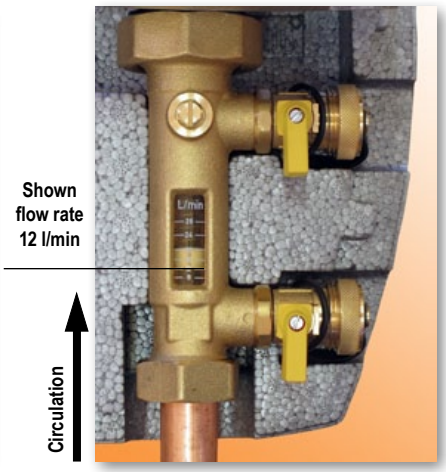
The solar collectors, in order to improve the draining, in addition to have such a constructional typology as to allow the emptying, must be installed with a minimum inclination of 2 cm/m towards the inlet placed in the lower part of them, and all the pipes must have a minimum inclination of 5 cm/m towards the water tank. The drain-back tank must have a total capacity at least equal to 1,5 times the capacity of the part of the circuit overlooking the tank itself (including the collectors); moreover it must be placed at a height lower than the minimum height of the collectors, in order to allow the complete draining of the circuit. Finally we remember that the water tank, the pump unit and the drain-back tank must be placed of necessity in a room protected from the intense cold.

***Attention:** Once the filling operation finished, the system must be of necessity a closed circuit. This configuration avoids the air exchange inside the pipes that, in a longtime, would improve corrosion. Therefore please be sure that the overflow valve is fully closed.*

Directions to fill the system



(1) - Filling the system:
Remove the cover of the lower side valve and connect the hose union. **Do not close the ball valve.** Then open the lever to start the filling, until the water is going out from the overflow valve.



(2) - Starting the system:
Close the side filling valve, remove the hose union and screw again the cover. **You may read the fluid flow in correspondence of the lower edge of the sliding cursor.**

Levers locking
To avoid casual opening of the side valves we advise you to lock the levers in closed position. Unscrew the fixing screw, remove the lever and replace it turned by 180°.

ModvSol L controller and working logic of the system

Figura 4: *centralina ModvSol L*

The differential temperature controller ModvSol L built-in the solar pump unit controls and adjusts the working of the drain-back system thanks to a series of special functions, specific to control the high efficiency circulating pump.

If the irradiation is enough and the water tank can receive more heat the controller start the circulation. During this starting step the circulating pump runs at maximum speed (assuring high lifting power) to allow the filling of the solar collectors. Once the purging time is finished, the controller slows down the circulating pump until reaching the minimum speed possible, variable according to the solar collectors temperature and therefore to the irradiation conditions.

An absolutely necessary setting time (preset at 4 minutes) is selected, it allows the correct working of the circulating pump: the selected default value corresponds to the minimum slot within which the full process of control from a minimum to a maximum speed happens. This constraint avoids sudden increases/decreases of temperature in a very short time.

When finally the target temperature is obtained or when the minimum working conditions do not exist, the controller stops the circulating pump; in this condition the process of self and spontaneous drain-back of the solar collectors carries out and the water contained in them goes toward the compensation tank simply by means of gravitational fall.

Attention: *The controller is pre-wired and pre-set with parameters specific for the control of the drain-back circuit. During the installation no other setting or wiring operations are required. If a restoration of the "factory setup" of the controller is required, please get in touch with your dealer.*

Typical curves of pump unit and circulating pumps