

User manual

Solior FL150 Solar hot water system



1. General

Thank you for purchasing a Solior FL150 solar hot water system. The Solior FL150 is a solar hot water system with a combined solar collector and hot water tank. The unit is installed on the roof and connected to your conventional hot water appliance which heats the water to the final temperature for use.

In Western Europe the Solior FL150 can help the average family cut their energy consumption for providing hot water by up to 40%. In Southern Europe this can be as much as 70%. The unit is much easier to install than conventional solar hot water systems.

The Solior FL150 needs hardly any maintenance, just an annual inspection. The unit operates throughout the year, even in cold weather. During the summer holiday you should leave the system connected. **The protective system should always be connected to mains power, so you should leave it plugged in at all times.**



Note:

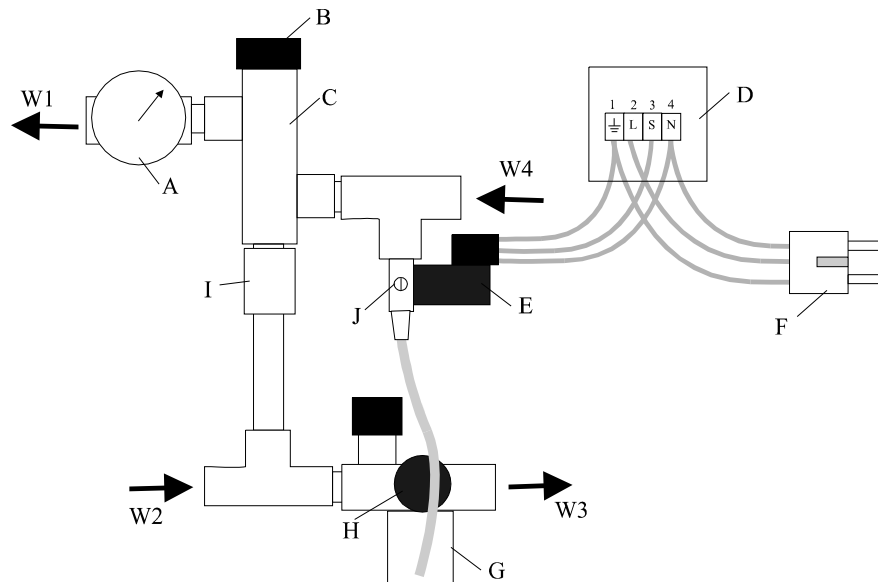
- ***You should NEVER unplug protective system from the mains. This is to ensure that the electronic part of the protective system (the solenoid-operated relief valve) is always ready to operate. However, the Solior FL150 has two protective systems - the thermostatic mixer valve will operate even during mains failure. If you accidentally unplug the unit you can simply plug it back in.***
- ***WARNING: If you open the dome of the Solior FL150 then the guarantee will be voided.***
- ***Warning: Repairs and installation should only be undertaken by a qualified installer; otherwise the system guarantee will be voided.***

1. Operation and settings

The solar collector of the Solior harnesses the light and heat of the sun and converts it to useful heat. As the hot water tank and the collector are integrated the loss of heat associated with conventional, non-integrated systems (where the water is pumped through a heat exchanger) is avoided. The dark blue layer provides insulation and ensures that the unit loses little heat overnight.

The Solior FL150 protective system

The Solior has a protective system to prevent overheating and freezing.



Part	Description	Part	Description
A	Temperature gauge	H	Relief valve (green knob)
B	Temperature adjustment	I	Check valve
C	Thermostatic mixer valve	J	Adjusting screw
D	Junction box	W1	To hot water appliance
E	Solenoid-operated valve	W2	Cold water inlet
F	Mains plug (230 V)	W3	To the solar hot water system on the roof
G	Drain to sewer	W4	From the solar hot water system on the roof

Protective system:

- Protects against excessive pressure.
- Frost protection: if the temperature at the outlet of the Solior's hot water tank falls below 3°C then some water is drained so that warmer water from the mains is admitted to raise the temperature in the tank.
- Overheating protection: if the temperature at the top of the cylinder exceeds 85°C then some water is drained so that colder water from the mains is admitted to reduce the temperature in the tank.
- There is also a thermostatic mixer valve to ensure that the water drawn from the tap is not too hot and to protect the hot water appliance. As the mixer valve does not have a temperature scale and the water temperature should be higher than that of the hot water appliance we recommend that the mixer valve is left at the preset temperature of 65°C. The temperature can be adjusted between 40°C and 65°C by turning the black knob (W = hot, K = cold).
- When drawing hot water the temperature of the water in the Solior FL150 is indicated by the temperature gauge.

System output in European cities, to EN 12976-2

Qd = hot water demand

Ql = system output

Fsol = solar heat contribution to the hot water demand (Ql/Qd)

Stockholm

Hot water	Qd (MJ/year)	Ql (MJ/year)	Fsol (%)
80 l/day	4478	2305	51.5
110 l/day	6150	2810	45.7
140 l/day	7821	3081	39.4
170 l/day	9492	3185	33.6
200 l/day	11164	3217	28.8

Davos

Hot water	Qd (MJ/year)	Ql (MJ/year)	Fsol (%)
80 l/day	4857	3658	75.3
110 l/day	6654	4415	66.4
140 l/day	8483	4762	56.1
170 l/day	10281	4857	47.2
200 l/day	12110	4920	40.6

Würzburg

Hot water	Qd (MJ/year)	Ql (MJ/year)	Fsol (%)
80 l/day	4289	2044	47.7
110 l/day	5897	2463	41.8
140 l/day	7506	2640	35.2
170 l/day	9114	2693	29.5
200 l/day	10691	2725	25.5

Athens

Hot water	Qd (MJ/year)	Ql (MJ/year)	Fsol (%)
80 l/day	3343	2460	73.6
110 l/day	4573	3094	67.7
140 l/day	5834	3564	61.1
170 l/day	7064	3847	54.5
200 l/day	8326	3974	47.7

Drained exposure

The effects of the exposure of a drained system to the sun was tested at a maximum insolation of 1113 W/m² for 1 hour during a total period of 24 days (to EN 12975-2 § 5.4).

2. Commissioning and decommissioning the unit

Filling the Solior FL150 with water

Ensure that hot water appliance used for final heating is switched off and that the mains plug of the protective system is unplugged. A hot water tap somewhere in the house should be opened to vent the system. Open the valve of the inlet combination by turning the black knob anticlockwise. The system will take some time to fill as the tank has a large capacity (150 l). You will hear and feel air escaping from the open tap. Caution: the air can be extremely hot. Once water is flowing from the tap continuously, without air bubbles, you should close the tap, switch the hot water appliance on and plug the protective system into the mains.

Draining the Solior FL150

Switch the hot water appliance used for final heating off and unplug the protective system from the mains. Shut the water supply to the Solior FL150 of by closing the main stop valve. Next, open a hot water tap (to admit air to the system), and drain the system by turning the green button of the protective system open towards the arrow. The system will take some time to drain as it contains 150 l of water.

Note:

- If the system is left on the roof for some time without being filled with water then the Solior FL150 should be secured to the roof.
- As long as the system is connected and empty, a hot water tap should be left open.

Decommissioning

The Solior FL150 is designed for easy disassembly and recycling of its components. Some parts are actually made of recycled materials: the black HDPE base (up to 100%), the steel components (up to 50%) and the aluminium components (up to 60%).

Note:

- Unplug the Solior FL150 from the mains outlet before removing the unit;
- Drain the tank before removing the Solior FL150;
- Observe the relevant safety measures when working on the roof;

The solar hot water system can easily be disassembled by removing all the screws and bolts. Practically all components can be recycled; hardly any components are made of mixed materials. The only mixed material components are the feet which are made of glass fibre reinforced nylon. This material can be reused as structural filler.

Materials:

- | | |
|-----------------------------------|--|
| • Black base | HDPE |
| • Clear dome | PMMA |
| • Clear cover inside the dome | PC |
| • Tank | Stainless steel 1.4521 (iron with 18 % chromium) |
| • Mirrors | Aluminium |
| • Sun-absorbing layer on the tank | Aluminium |
| • Frame | Galvanised steel |
| • Rear bracket | Galvanised steel |
| • Protective system | Copper and brass |
| • Wiring | Copper wire with plastic insulation |
| • Feet | Glass fibre reinforced nylon |

3. Recommendations

Maintenance

The proper operation of the Solior FL150 should be checked once a year. This is best done on a sunny day (strong solar radiation) when the water in the system is hot. If you have a maintenance contract for the system then the contractor will inspect the system.

- Check if there is any damage to the Solior FL150 and if there is excessive dust on the dome. Dust can be washed off with water.
- Check if there is any water leaking from the pipes and connections of the system.
- Check the operation of the solenoid-operated valve of the protective system by turning the adjusting screw on the brass valve body from 0 to 1. Water should now drain from the valve. Turn the adjusting screw back to 0; the valve should now close. If this does not happen then contact your installer to clean or replace the valve.
- Check if the protective system is still plugged into the mains.
- Open a hot water tap and check if preheated water flows from the Solior FL150 to the hot water appliance. You can read the temperature of water out on the temperature gauge of the protective system. If you turn the black knob of the mixer valve from hot (W) to cold (K) the temperature should fall. Then turn the knob back to hot (W).

4. Faults

What to do if....?

You see condensation on the dome of the Solior FL150

Minor condensation may occur under certain circumstances. This will disappear after some time.

Water is discharged through the drain

Every time the water in the tank heats up, some water will be discharged because water expands as it heats up. This is perfectly normal. The Solior FL150 will also discharge some water under exceptional conditions (extremely cold weather with cloud cover, and extremely hot weather without cloud cover). In this case the solenoid-operated valve of the protective system will discharge some water. If the discharge does not stop, although the temperature in the system is between the normal extremes of approximately 10°C and 75°C, then the valve is faulty. You can check this by opening a hot water tap and reading the temperature out on the temperature gauge. In this case you should contact the installer.

There are leaks from couplings or other components

Under some conditions, condensation may occur on the pipes of the system. This is perfectly normal and the condensation will disappear from some time. If there is a leak you should unplug the protective system immediately. If a coupling leaks you can try to tighten it with the appropriate tools. If that is impossible you will have to drain the system to stop the leak (see the section on draining the system). Contact your installer immediately.

The dome is covered by dust or algae

The dome normally stays clean because the rain washes any contamination away. However, under certain circumstances some dust may collect or algae may grow on the dome. In that case, you will have to clean the dome once a year with water.

There is not enough water or the water is not hot enough

If it has been cloudy for a few days the water from the Solior FL150 will not be hot enough for use and the hot water appliance will have to heat it further. If this does not happen then your installer will have to check the hot water appliance. If, after a few sunny days, the water in the Solior FL150 is not hot enough (you can check this by opening a hot water tap and reading out the temperature gauge) then the following may have happened:

- A large volume of hot water has been used (more than the tank contents of 150 l per day) as a result of which the water has not had the chance to warm up.
- The mixer valve may have been set to a low temperature. You can set the valve to a higher temperature by turning the black knob of the mixer valve towards the W.

If the above do not apply then the Solior FL150 may have developed a fault. Check the unit for any damage and contact your installer.