Solamiser

V3 User Manual

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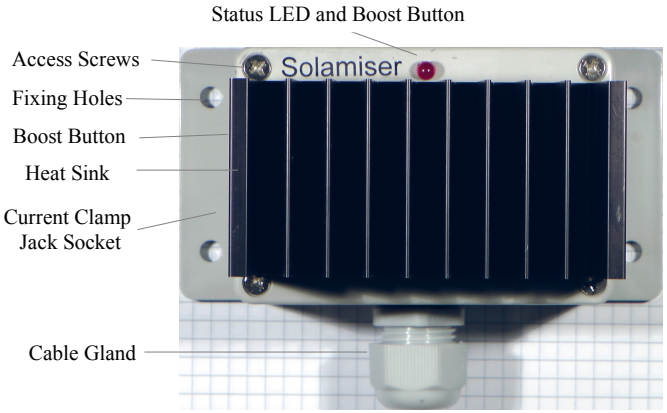
INSTALLATION INSTRUCTIONS

Warning: Danger of electric shock. Solamiser is connected directly to the mains consumer unit and should be installed by a Part P registered competent person in accordance with IEE wiring regulations.



MOUNTING SOLAMISER

a) Mount Solamiser where the ambient temperature will not exceed 30° C. The black heat sink on the front of the unit must not be obstructed. This is to allow free airflow through its fins to prevent power devices from overheating.

b) Using the 4 Fixing holes and screws provided, Install Solamiser on a vertical surface as close as possible to the mains consumer unit.

c) Ensure that there is at least 150 mm of clearance both above and below Solamiser and 50 mm of clearance to the left of Solamiser to facilitate plugging in the current sensor and access to operate the boost button if necessary.

CONNECTING SOLAMISER

A single five core 1.5 mm² flying lead is supplied with the unit and it should not be necessary to open the Solamiser box unless the cable needs to be extended.

Core colours are as follows:

Yellow and green = E (Earth);
Core 1 = Brown = L (Line);
Core 2 = Blue = N (Neutral);
Core 3 = Black = H1 (Immersion Heater 1 Line);
Core 4 = Grey = H2 (Storage Heater 2 Line).

With its main switch turned OFF remove the front cover of the consumer unit. Refer to the diagram below.

a) Identify and disconnect the immersion heater's L (Line) cable from its circuit breaker.
Note: Solamiser does not have an internal fuse or circuit breaker as circuit protection is provided by the consumer unit's immersion heater circuit breaker. The rating of this circuit breaker should not exceed 16 A.

b) Connect the brown core of the five core cable Marked 'L–MCB16A' to the consumer unit immersion heater circuit breaker output.

c) Connect the blue core of the five core cable marked 'N-Busbar' to the consumer unit (N) neutral busbar.

d) Connect the yellow and green core of the five core cable marked 'E-Busbar' to the consumer unit's (E) earth busbar.

e) Connect the black core of the five core cable marked “H1-Imm Htr” to the previously disconnected immersion heater feed cable inside of the consumer unit. This can be done with the in-line crimp connector supplies.

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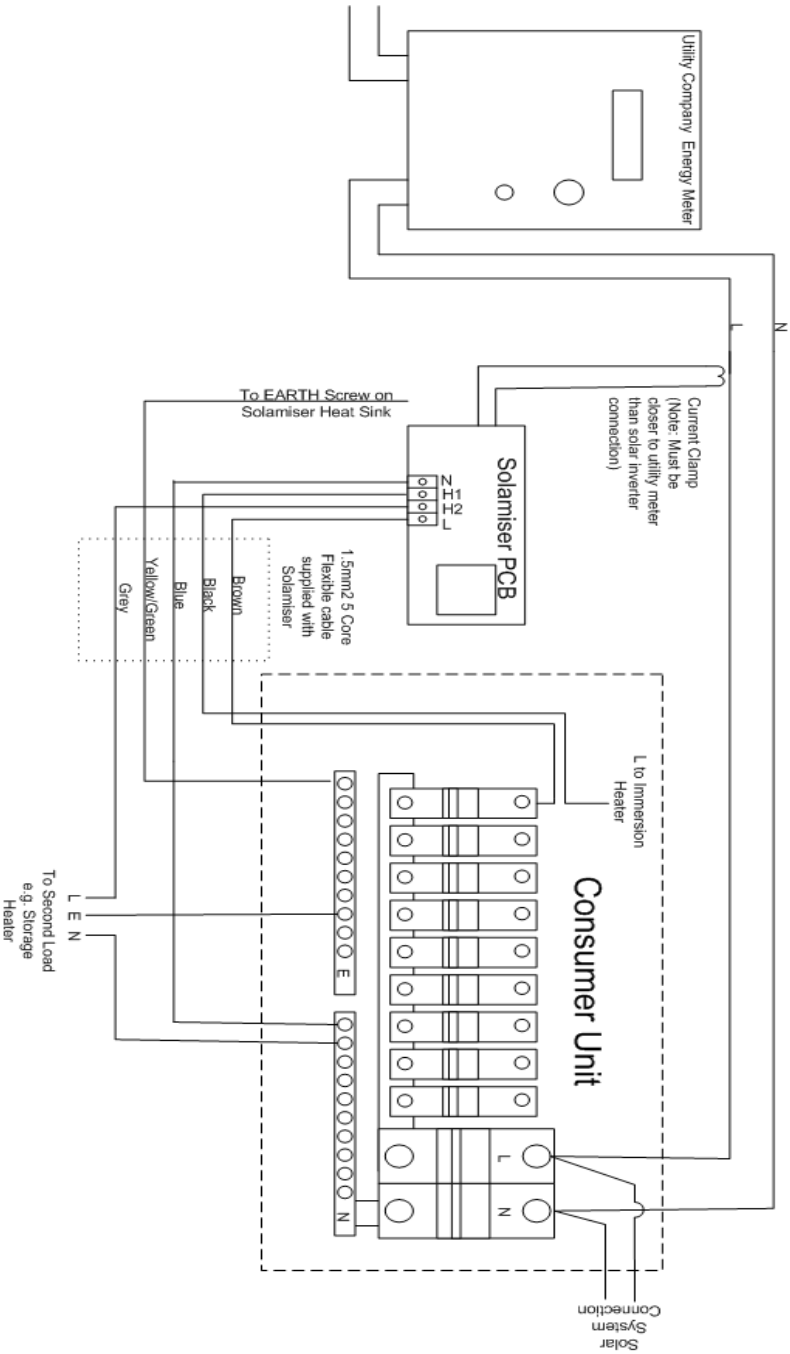

f) If you have a second load, such as a storage heater that Solamiser can switch over to when the immersion heater is up to temperature, the power cable of this device should also be routed to the consumer unit. The (L) of this load can be connected to the grey core of the five core cable marked 'H2-Opt Htr' the Neutral and Earth connections of this load should be connected respectively to the neutral (N) and earth (E) busbars of the consumer unit. Note that this load will be switched ON when the immersion heater is switched OFF. The same immersion heater consumer unit MCB also protects this circuit through Solamiser. This load must not exceed 16A .

g) If you don't have a second load. **Make sure that the unused grey core is not connected to anything and the end is insulated to prevent a short circuit. This grey core will become live when the immersion heater thermostat is satisfied.**

h) The current clamp can usually be mounted on the mains incoming cable inside the consumer unit. Note: For safety reasons, before putting the current clamp onto the mains incoming cable, plug the current clamp into the 3.5mm Jack socket at the left hand side of Solamiser.

COMMISSIONING SOLAMISER

Solamiser senses the current flowing through the house's main incoming power cable at a point between the main electricity meter and the consumer unit. This is accomplished with a non invasive current clamp. There is no need to disconnect the 'sealed' mains cable.

In addition to sensing the amount of current passing between the main electricity meter and the consumer unit the current clamp also senses the direction of the current. It is therefore important that the current clamp is mounted the right way round on main incoming cable otherwise the sensing direction will be reversed and will result in excessive energy use.

Check where the solar microgeneration system connects to the mains power system. This is usually at the 'hot' side of the consumer unit's main isolator switch as shown on the diagram above. The current clamp must be placed around the main incoming cable (L core only) nearer to the main electricity meter than the solar connection point to ensure solar current has already been algebraically summed with mains incoming current at the current clamp's point of measurement.

To get the current clamp the right way round proceed as follows:

a) Plug the current clamp's 3.5mm Jack plug into the Jack socket on the left hand side of Solamiser. It is safer to plug in the current clamp before clipping round the mains cable.

b) Clip the current clamp on the L mains cable between the consumer unit and the electricity meter. At this stage it doesn't matter which way round, just mount it and close the clip and note the orientation.

c) Turn off any appliances which may be operating in the house at this time i.e. all consumer unit MCBs then turn on the consumer unit's main switch.

d) Turn on the consumer unit immersion heater circuit breaker and ensure that any other switches in the immersion heater circuit are also switched on.

e) The LED at the top of Solamiser should start to blink.

f) If the LED is flashing short pulses (0.1 sec ON time, variable OFF time) then Solamiser is balancing the energy from the solar panels minus the energy being consumed by the rest of the

house, with the energy consumed by the immersion heater. Each pulse represents approximately 1 Wh of energy being diverted to the immersion heater (3kW immersion). If the LED is pulsing, say once every two second, then the power to the immersion heater at that moment is approx 1.8 kW i.e. 1800 pulses per hour.

g) If the LED is ON for half a second and then OFF for half a second, Solamiser 'thinks' the house is importing energy from the mains. There is not enough solar energy to supply the house. The immersion heater is turned off to avoid using mains power.

h) If the LED is ON for two seconds then OFF for two seconds, Solamiser 'thinks' the house is exporting energy to the national grid. This should only happen if the energy used by the house and immersion heater is less than the energy produced by the solar panels. This can happen on very sunny days or when the immersion heater thermostat has turned off or the immersion heater has been switched off by the user.

i) If you are doing this installation work during daylight hours and all other electrical appliances in the house besides the immersion heater are turned off, then you would expect Solamiser to be in a balanced state and the LED should be producing 0.1 second pulses as described in f) above.

j) If this is not the case then switch off, remove and replace the current clamp the other way round, then switch on again and observe the LED a second time.

k) If Solamiser's LED is now flashing as described in f) above it is most likely that the current clamp is now in the correct orientation.

l) Check the electricity meter and observe the rate of energy flow. This should be close to zero with a small amount of export energy about -30W.

m) If you are installing after dark there is no solar energy available so you would expect the LED to flash once per second (on for half a second then off for half a second) indicating energy import. If it flashes once every 2 seconds then the current clamp should be reversed.

n) Solamiser is now correctly commissioned.

USING SOLAMISER

Solamiser is a 'fit and forget' device.

It is useful to occasionally look at the flashing LED to check that the device is continuing to function correctly.

The LED can indicate one of five operating modes as follows:

MODE 1 - IMPORT

When the LED flashes ON for half a second then OFF for half a second, Solamiser is detecting import energy. This typically occur after dark. When you are consuming electricity from the grid. The immersion heater and storage heater if fitted are is always switched off in MODE 1.

MODE 2 - EXPORT

When the LED flashes ON for two seconds then OFF for two seconds, Solamiser is detecting export energy. This means that excess energy from your solar panels is being sent back to the grid. This will occur when your immersion heater and storage heater if fitted are both switched off.

MODE 3 – DIVERTING TO IMMERSION HEATER

When producing single pulses Solamiser is detecting that virtually no energy is flowing back to the grid. Nearly all excess electricity being generated by your solar panels is being used by both your house and your immersion heater.

Variable amounts of energy are diverted to your immersion heater to maintain this balanced state. For example, if you turn on the TV, the amount of energy going to the immersion heater will reduce by the amount used by the TV. If the sun goes behind a cloud Solamiser will reduce power to the immersion heater to maintain balance.

The pulse rate of the LED in MODE 3 reflects the amount of energy being diverted to the immersion heater i.e. approximately 1 pulse per Wh.

MODE 4 – DIVERTING TO OPTIONAL SECOND LOAD

When producing double pulses Solamiser is diverting to an optional second load e.g. a storage heater. The purpose of the double pulse is to indicate that the second load is now connected and immersion heating has finished. Similar to MODE 3, a double pulse is produced for approximately each 1 Wh consumed by the second load.

MODE 5 – BOOSTING HOT WATER

Solamiser has a single control which allows hot water to be produced in winter when no solar energy is available. The LED flashes 3 short pulses every second all the time the boost function is active. Once activated the boost timer heats water for 30 minutes or until the immersion heater thermostat is satisfied.

To switch ON the boost function press the boost button located on the left of Solamiser above the current clamp jack socket.

To switch OFF the boost function press the boost button located on the left of Solamiser above the current clamp jack socket. The LED should then revert to another flashing mode.

Note: The boost function will operate at any time overriding solar energy diversion.

Important Information

1) Legionares

To avoid Legionares disease, hot water should reach 60 Deg C at least once per week. If the thermostat of the immersion heater is set to 60 deg C and it opens at least once per week there should be no legionares risk . When the thermostat opens Solamiser automatically switches to channel 2. This is an easy way to know that 60 Deg C has been reached.

2) Integral Safe Thermostat

To prevent overheating of water, Solamiser must only be used with an immersion heater which has its own integral safe thermostat.

3) Thermostat state detection.

When the immersion heater reaches temperature Solamiser will switch automatically to channel 2 this is done by detecting the state of the immersion heater thermostat. Should the thermostat close again Solamiser will switch back to channel 1 to raise the water temperature again so long as there is sufficient daylight.

4) Immersion heater/storage heater power indicator lights.

If your immersion heater has a neon light that indicates when it is ON you will notice that when Solamiser is diverting to the immersion heater the light will pulse and vary in brightness depending on how much solar energy is available. This is caused by the action of Solamiser's controller regulating the power to the immersion heater. Once the immersion heater is up to temperature its thermostat will open and the neon will stop pulsing and remain ON full indicating that the immersion heater is switched ON and is up to temperature with its thermostat open not drawing current. Solamiser produces just enough power for the immersion heater's neon indicator even when channel H1 is switched off and channel H2 is in operation. Power to the neon is supplied by the output triac's snubber capacitor when the triac is switched off. This means that both channels are never completely off. To avoid possible electric shock, you MUST always isolate Solamiser's power supply MCB before connecting or disconnecting heaters.

TROUBLESHOOTING

If the LED flashes in MODE 1 only at all times you may have a faulty immersion.

If the LED flashes in MODE 2 only at all times Solamiser is either incorrectly installed or faulty and your immersion may be consuming import energy at a cost.

SPECIFICATIONS

Rated Voltage 240V a.c.
Rated Output Current 16A rms.
Rated Frequency 50 Hz.

Maximum Mains Cable Current through Current Clamp: 100A rms.
Maximum Load Current 16A rms per load.
Maximum Ambient Temperature 40 Deg C.

Power balance point fixed at -1% i.e. exporting approx 30W to avoid import when solar energy is available.

Boost Button – Supplies full current from mains to immersion heater for 30 mins can be used at any time or when no solar energy is available.

Outputs - switch from H1 immersion to H2 Optional heater when the Immersion thermostat is satisfied. Switches back to H1 when the immersion thermostat starts calling again. Proportional power forward phase control.

Dimensions
Width 132mm x Height 68mm x Depth 100mm
Weight 700g

To be installed in accordance with IEE wiring regulations.