SOLiC 200

User instructions and quick-fit guide

earthwise Products Ltd

July 2013

www.earthwiseproducts.co.uk

WARNING! Electricity can kill. The SOLiC 200 should only ever be installed by a Part P qualified electrician.

To ensure that the SOLiC 200 qualifies for the 10-year return-to-base guarantee, please complete and return the enclosed guarantee reply postcard. It must be signed by the qualified installer at the time of installation.

Introduction and background

The SOLiC 200 is designed to work seamlessly with your solar photovoltaic power generation system and domestic hot water tank.

Its purpose is to divert any surplus generated electrical energy into a standard 3kW domestic immersion heater.

The SOLiC 200 does not interfere with the existing solar PV system in any way, so any warranties, seals and solar wiring are not altered, without the need for any plumbing alterations.

The energy diverted into a typical domestic hot water tank with this system averages at approximately 7kW a day, when available. This provides a noticeable reduction in the amount of fossil fuel required to heat the water without any reductions of FITs you are receiving.

The SOLiC 200 operates automatically, without the need for any user intervention, regulating the amount of energy available for the immersion heater to use.

Basic setup

SOLiC 200 has two installer-set operating modes - mode 1 or mode 2 (default setting is mode 2).

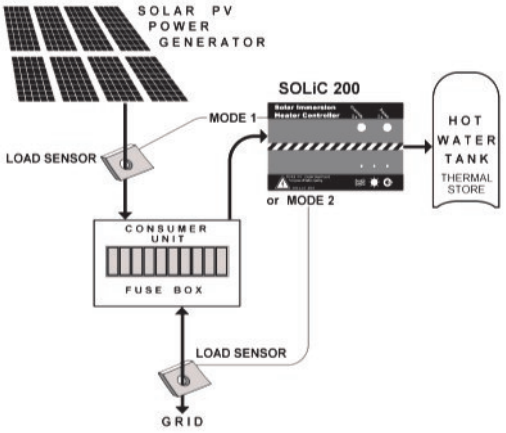


Fig 1 - Installation differences between mode 1 and 2

Differences between mode 1 and 2

Mode 1

The SOLiC 200 senses the power produced by the solar array, and feeds power above a pre-set threshold into the immersion heater.

For example; if the house uses 500W and the solar generator is producing 700W, the SOLiC 200 will only divert the difference above the pre-set threshold. If the threshold is set at 500W, then 200W will feed into the immersion heater.

If the generator is producing 700W, threshold is 500W and the house is now using 400W, then 200W will heat the water and 100W will be exported.

Benefits: This mode can be used for standard off-grid systems. If the average household power use is consistent throughout the day, very little power is exported to the grid.

Mode 2

The SOLiC 200 senses when the house is feeding back into the grid, and then varies the power level available for immersion heater use, until the grid feed-in power is reduced to zero.

For example; if the house uses 500W and the solar generator is producing 700W, the SOLiC 200 will sense that power is being exported. The SOLiC 200 will then increase power available for the immersion heater to use until no power is being returned to the grid. The SOLiC 200 checks itself 20 times a second, striving to keep this export amount at zero.

Benefits: Good efficiency can be achieved for most homes, giving maximum flexibility with the ability to "fit and forget".

Regardless of which mode is used, the SOLiC 200 will divert excess electricity to the immersion heater until the water is hot. The temperature of the water is set by the immersion heater thermostat. Once the water is hot, the immersion heater thermostat will click off. Power will continue to be available to the immersion heater (indicated by the green "immersion power" light), so long as the solar generator system continues to export power. When the immersion heater is powered up by the SOLiC 200, a gradual changeover ensures that a consistent level of power is maintained for the rest of the house to avoid lights flickering.

Pause function

A pause function is provided to suspend heating when the SOLiC 200 is installed in mode 1. The SOLiC 200 remains in pause mode for 30 minutes once the button has been pressed. After 30 minutes has elapsed, automatic operation will resume. To manually resume, press the pause button again. When the system has been paused, the "immersion power light" will flash green.

Override function

An override function is provided for use in both modes to switch the immersion heater on. To turn the immersion heater on – irrespective of whether solar power is being generated or not – press the override button. The SOLiC 200 will offer full mains power to the immersion heater for 90 minutes once the override button has been pressed. This replicates the function of turning on the immersion heater switch. After 90 minutes has elapsed, automatic operation will resume. To manually resume automatic operation, press the override button again. When the SOLiC 200 is overridden, the "immersion power light" will flash red.

Quick fit installation guide

1. Find suitable mounting location close to consumer unit and export tails
2. Turn off immersion circuit breaker
3. Screw SOLiC 200 to wall
4. Connect as per wiring diagram within the SOLiC arranging cable routing through supplied rubber grommets
5. If needed, reroute previously shared immersion cable appliances /sockets
6. Clip on power sensor to the Neutral or Live mains tail (mode 2) or inverter tail (mode 1) as per diagram on page 3
7. Plug sensor's 2.5mm jack plug into socket
8. Ensure correct mode is selected via the DIP switches as per Threshold power setting table on page 10
9. Check for condensation (could damage unit)
10. Carefully insert Pause and Override button stems into position
11. Replace cover
12. Commission SOLiC 200 as per page 8

Commissioning the SOLiC 200

1. Turn up immersion thermostat to ensure house is drawing at least 500W power for commissioning and that the immersion electrical circuit is on
2. Turn off solar inverter and turn on immersion circuit breaker
3. Wait two minutes to allow for calibration – Power light should be green and Generating light should be red
4. If after one minute three red lights show, turn the sensor clip 180° and return to step 2
5. Turn on solar invertor and wait three minutes
6. Check lights are showing correctly as per table on page 11

Troubleshooting

Generally, if there is a problem with the SOLiC 200, three red lights will show, and the system will standby and wait for user intervention.

Turn the power to the SOLiC 200 off , then verify the following:

The sensor is connected to the correct conductor.

The immersion thermostat is closed (on).

The sensor plug is plugged into the circuit board.

The sensor is clean and securely closed.

No damage has been done to the sensor.

The immersion heater switch is closed (on).

The wiring to the immersion heater circuit is correct.

The immersion heater element works.

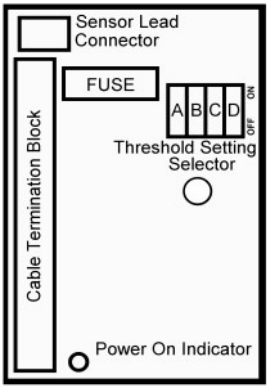
Once these checks are complete, please follow the commissioning process on page 8.

A full installation guide and FAQs are also available from the SOLiC 200 pages on www.earthwiseproducts.co.uk

DIP switches and mode selection

To operate the system in mode 2 ensure all the DIP switches are set to 0 (off). This is the normal factory delivery setting (all selector switches off). This tells the microprocessor that mode 2 has been selected.

To operate the system in mode 1, any other threshold besides 0 should be chosen. To set a new threshold, the power must be turned off, the SOLiC 200 cover removed and the new setting entered. Once the system is powered up again, the new setting will take effect. This must only be undertaken by a qualified electrician or installer.



Threshold Power Setting	Selector Code A	B	C	D
Mode 2	OFF	OFF	OFF	OFF
Mode 1 Settings Below				
100 W	OFF	OFF	OFF	ON
200 W	OFF	OFF	ON	OFF
300 W	OFF	OFF	ON	ON
400 W	OFF	ON	OFF	OFF
500 W	OFF	ON	OFF	ON
600 W	OFF	ON	ON	OFF
700 W	OFF	ON	ON	ON
800 W	ON	OFF	OFF	OFF
900 W	ON	OFF	OFF	ON
1000 W	ON	OFF	ON	OFF
1.1 kW	ON	OFF	ON	ON
1.2 kW	ON	ON	OFF	OFF
1.3 kW	ON	ON	OFF	ON
1.4 kW	ON	ON	ON	OFF
1.5 kW	ON	ON	ON	ON

Fig 2 Threshold power settings

Power light		
Green	The mains quality is good. Power is on	
Red	The mains quality is poor, so the unit is in temporary standby mode. This light is also used to highlight faults or other undesirable conditions, such as power limiting from	
Generating power light		
Mode 1	Green	The solar PV installation is generating power
	Red	The solar PV installation is not generating power
Mode 2	Green	Surplus power is available for use by the immersion heater circuit
	Red	The house is drawing grid power - no surplus power is available
	Flashing red/green	All available surplus power is being supplied to the immersion heater circuit
Immersion power light		
Green	Power is being offered to the immersion heater circuit	
Off	No power is being offered to the immersion heater circuit	
Flashing red	Override function is operating. The immersion heater circuit is being offered full power irrespective of any power being generated	
Flashing green	Pause function is operating. All power offered to the immersion heater circuit has been suspended	

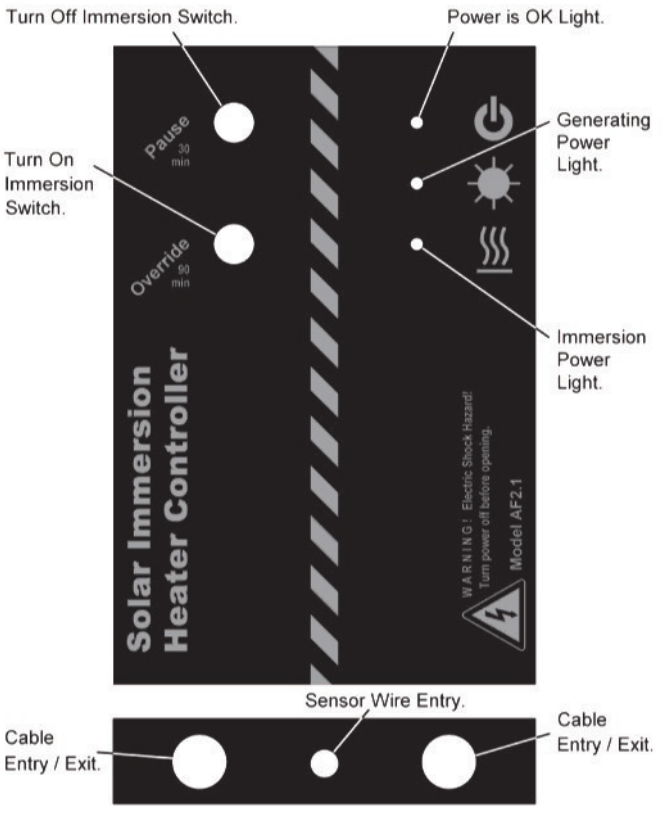


Fig 3 SOLiC 200 external features