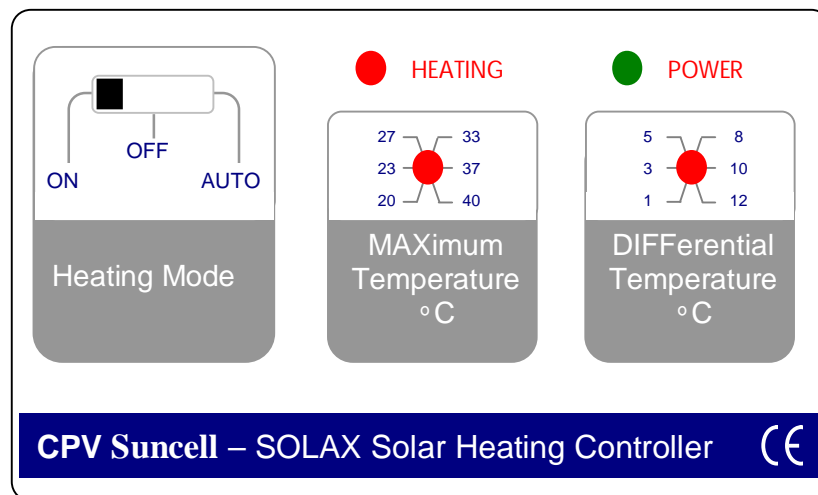


# Suncell

## SOLAX

### SOLAR HEATING CONTROLLER



**INSTALLATION INSTRUCTIONS**

## SAFETY

All swimming pool installations are classed as special so electrical work must be done by a Registered Electrician Part P (UK) and conform to the regulations of the local electricity authority.

**The control unit must be securely fixed into the base unit and must never be removed from or inserted into the base unit while the power is on.**

- § The Solar Controller operates on mains voltage 220 – 240 volts AC.
- § The power supply has to be via a double pole switch with a contact gap exceeding 3mm and must be protected by a fast acting fuse or circuit breaker rated according to the load (pump and/or valve). Maximum permissible output 2 x 3.5 A.
- § The Solar Controller and all connected components (pump and valve) must be earthed.
- § The Solar Controller can be damaged if a short circuit occurs.

## FUNCTION

For solar heating to operate efficiently the pool water should only be allowed to circulate through the panels when there is sufficient solar radiation to ensure a nett heat gain to the pool.

The SOLAX differential temperature controller (SDTC) senses the temperature difference between the pool water and the solar panel and activates a motorised valve or pump when there is sufficient solar energy. The maximum temperature limiter (MAX) prevents the pool from overheating in very hot weather.

## TECHNICAL INFORMATION







|                                    |   |                         |
|------------------------------------|---|-------------------------|
| Power supply                       | : | 230V +/-10%. 50Hz + 20% |
| Power consumption                  | : | < 3VA                   |
| Switching Capacity                 | : | 2 x 800VA               |
| Protection                         | : | IP50                    |
| Range of Max. temperature shut-off | : | 20°C - 40°C             |

The unit conforms to EU guidelines 73/23 EWG, 89/336 EWG.

The conformity is shown by the CE mark.

## SOLAX CONTROL KIT

The SDTC Kit (Part no. **SC.048.SOL** for 1½” adaptors, or **SC.050.SOL** for 50mm adaptors) comprises the following components

|   |   |
|---|---|
| <b>Base Unit</b>  | <b>Part no. SC.001.BU-</b>  |
|    | <p>A Base unit with 12 no. wiring terminals. The base unit is usually screwed to a wall through ‘knock-out’ holes in the back of the casing. There are also ‘knock-outs’ to allow access for the wiring connections to the motorised valve, pump and sensors.</p> |
| <b>Control Unit</b>   | <b>Part no. SC.001.SDC</b>  |
|    | <p>A control unit which is factory sealed and not user serviceable. The control unit is slotted into the base unit to make the connection with the wiring terminals.<br/>The control unit and the base unit are bolted together.</p>                              |
| <b>Panel Sensor</b>   | <b>Part no. SC.001.PS-</b>  |
|  | <p>A panel sensor in a plain aluminium jacket 37mm x 15mm x 15mm. Lead length 300mm.</p>  |
| <b>Water Sensor</b>   | <b>Part no. SC.001.WS-</b>  |
|  | <p>A water sensor in a brass case 30mm x 10mm OD. The water sensor is located into the water sensor pocket(s). Lead length 300mm.</p>   |
| <b>Water Sensor Pocket</b>  | <b>Part no. SC.001.WSP</b>  |
|  | <p>A chromed brass water sensor pocket with a ½” MBSP thread (wrap PTFE tape around the thread). Insert depth 30mm.</p>   |
| <b>Water Sensor Adaptor</b>   | <b>Part no. SC.048.WSA (1½”) or SC.050.WSA (50mm)</b>   |
|  | <p>A 1½” or 50mm Grey ABS adaptor bush with ½” FBSP threaded socket to accommodate the water sensor pocket (use PTFE tape to effect a seal).The adaptor bush should be solvent welded into the branch of a 1½” or 50mm Tee.</p>                                   |

## INSTALLATION

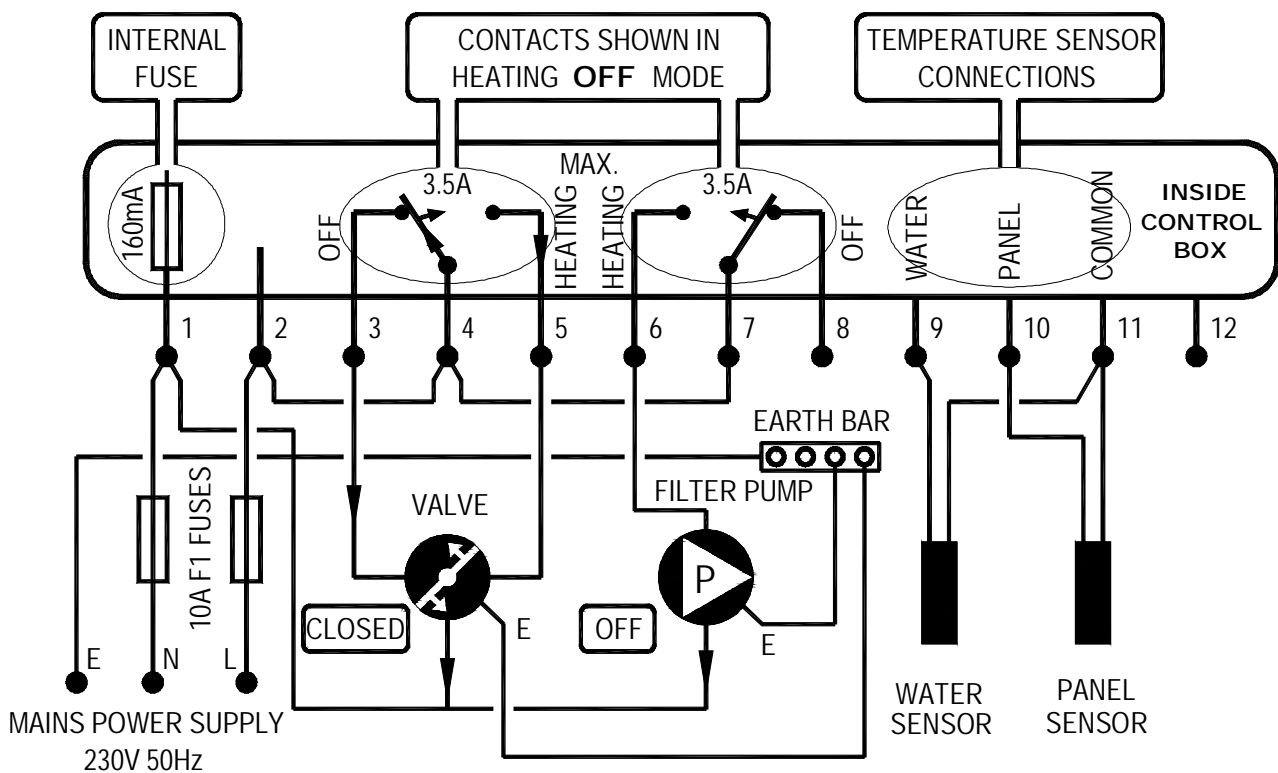
The base unit should be installed on a wall (usually in the pump room) in a dry and clean location with a temperature between  $-10^{\circ}\text{C}$  and  $30^{\circ}\text{C}$

The base unit should be wired up in accordance with one of the diagrams below.

The incoming mains should be protected by a fast acting fuse or a circuit breaker rated according to the load (pump and/or valve). Maximum output  $2 \times 3.5\text{A}$ .

The SDTC operates two internal relays which operate in tandem switching ON or OFF simultaneously, which can operate a pump and/or motorised valve.

The example below shows the SDTC controlling a Filter Pump and Motorised Valve:

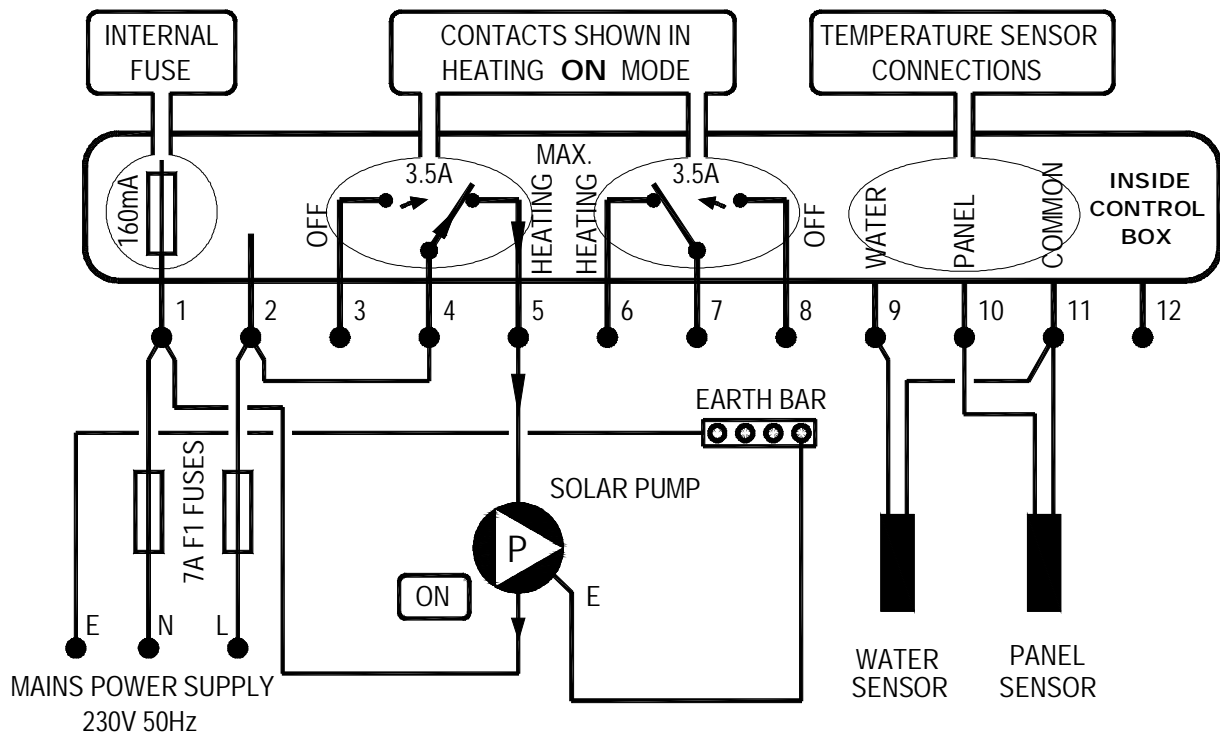


The diagram shows the SDTC with the filter pump and valve in the OFF mode. The water sensor is warmer than the panel sensor.

The valve connections must be made in such a way as to direct pumped water to the panels at the same time as the pump is switched on.

Note: Terminals 4 and 7 must be connected to live terminal 2 within the base unit.

The example below shows the SDTC controlling a solar pump:



The diagram shows the SDTC with the solar pump in the ON mode. The panel sensor is warmer than the water sensor.

Note: Terminal 4 must be connected to live terminal 2 within the base unit.

**Caution:** If the power requirement of the load (pump and/or valves) exceeds 800VA per switched output then this output must be used to control the coil of a relay or motor starter which in turn controls the load.

ALL COMPONENTS i.e. SDTC, MOTORISED VALVE, AND PUMP MUST BE EARTHED. All yellow green leads are connected to an earthing terminal in the centre of the base unit.

#### Sensor Connections:

The water sensor is located in the chromed brass pocket (SC.001.WSP) which in turn is screwed in to the ABS adaptor (SC.001.WSA) which is solvent welded in to the branch of a Tee in the filtration circulation line, preferably between pump and filter.

To extend the sensor leads any twin cable of minimum cross-section 0.15mm<sup>2</sup> may be used. However, if cable lengths are longer than 5m, we recommend the use of twin core screened cable to avoid interference from other electrical cables or thunderstorms. The braided screening should be earthed in the base unit.

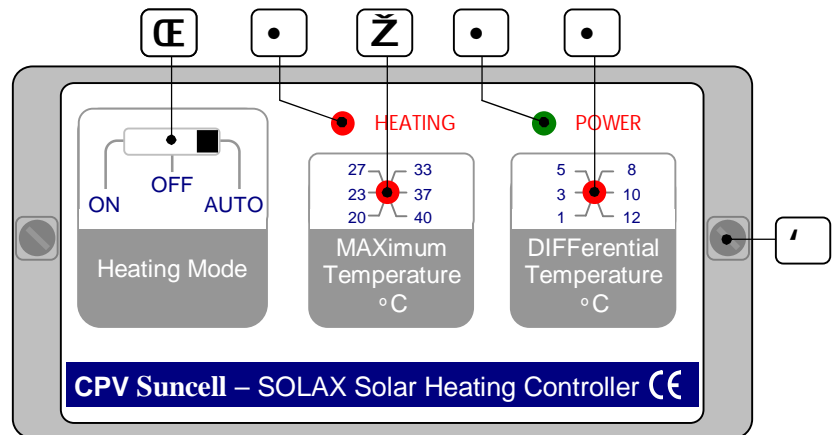
Adhesive lined shrink sleeves are included in the kit to waterproof the extension joints.

The panel sensor should be located in a plane parallel to the face of the panels, so that it absorbs the same radiation per unit area as the panels. It may typically be located on the pump room roof or other convenient position and should be fixed to an insulating material such as wood to avoid temperature distortions. Ensure that both the panels and the panel sensor are situated in the open and are not overshadowed.

## SETTING THE SDTC

1. Set the selector switch on the front of the control unit to AUTO so that the SDTC can turn the solar heating on and off automatically.

2. To select the temperature differential between panel and pool required to activate the solar heating, adjust the DIFF knob. Swimming pool solar panels work most efficiently with a high velocity flow and a low temperature rise across the panels and we recommend a DIFF setting of 2°C.



3. To set the temperature above which the solar heating will not be activated adjust the MAX knob. This temperature will normally be 28 - 30°C.
4. When the SDTC is connected to the mains the POWER lamp is illuminated.
5. The HEATING lamp is illuminated when the solar heating is activated.
6. The two bolts must be securely tightened to ensure proper contact between controller and base unit.

## TROUBLESHOOTING

| Symptom   |   | Action  |
|---|---|---|
| Power light (green) OFF                                     | ➔ | No power to SDTC ➔ Check 230v connection to terminals 1 & 2.<br>Check internal 160mA fuse   |
| Warm and sunny and heating light is ON but water stays cool | ➔ | SDTC is working ➔ Check pump is running, valve is open and water is flowing through panels  |
| Warm and sunny yet heating light is OFF                     | ➔ | The SDTC DIFF is wrongly set ➔ Switch on AUTO<br>DIFF too high – set to 2°C<br>Check MAX temperature setting<br>Check sensor connections in base unit |
| No sunshine yet heating light is ON                         | ➔ | Problem with sensor ➔ Switch on AUTO<br>Check sensor connections in base unit   |

If the preceding actions do not rectify the fault try the following:

1. Take the pool sensor out of its pocket and dip the tip into a container of water and ice cubes. The heating light should show. Then warm the pool sensor in a container of hot water and the heating light should turn off. If these tests do not produce the correct result then there is a fault in the sensor(s), SDTC or wiring.
2. Switch off the mains power.
3. The SDTC control unit may have insufficient contact in the base unit. Separate the base and control units and lightly press down each contact in the base unit to increase the contact area.
4. Check if the pool and panel sensors have been connected to the correct terminals – they may have been switched accidentally.
5. Disconnect the pool and panel sensors from the terminals in the base unit. Test the resistance with a multimeter:  
10°C - 1783Ω; 15°C - 1854Ω; 20°C - 1927 Ω; 25°C - 2000 Ω; 30°C - 2076 Ω;  
35°C - 2152 Ω; 40°C - 2230 Ω.

## **GUARANTEE**

If your Solar Controller becomes defective due to faulty materials and workmanship within 24 months from the date of purchase we guarantee to either replace all defective parts or at our discretion replace the unit free of charge provided that:

1. The Solar Controller is returned to us with evidence of purchase (invoice or receipt) and stating the reason for return.
2. It has not been subject to misuse or neglect, accidents, ignorance of the operating instructions, wrong application, alterations carried out by persons other than our service staff, moisture, corrosion, delivery, power surges or other unusual operating and working conditions.

The guarantee does not cover wear and tear or consequential damages or losses due to the use of this product or in connection with it, even if we have been notified of the possibility of such damages.

This guarantee is offered as an extra benefit and is additional to your statutory rights.

All rights reserved CPV Ltd.

## **QUALITY**

In line with our policy of continual product development we reserve the right to alter any specification without prior notification.

## **AFTER SALES SERVICE**

It is our aim that all CPV Ltd customers should be totally satisfied with our Suncell solar heating products and after sales service.

If you have need of help or advice please contact your local Suncell dealer or our sales department on [sales@cpv.co.uk](mailto:sales@cpv.co.uk) or tel. +44(0) 1794 322884 and we will be happy to assist you.

## ANCILLARY ITEMS

### PVC Water Sensor Pocket

Part no. **SC.001.PSP**



A PVC insert for solvent welding (PVC gap filler cement) into a 20mm hole drilled into a fitting in the circulation pipework. This item is normally only used to retro-fit a sensor into existing pipework.

### 3-Port Motorised Valve

Part no. **SC.048.TMV (1 1/2")** or **SC.060.TMV (2")**  
Part no. **SC.050.TMV (50mm)**



For smaller installations with up to 24 panels (3 banks), flow diversion through the solar panels is normally achieved by installing a Suncell 3-Port Motorised Valve in the filtration circuit after the filter, to divert water to the panels when the Solax controller switches to heating mode.

See publication SUN E08 for more details.