Heat Command 5AV

INSTALLATION AND OPERATION MANUAL

DESCRIPTION

The Sunlover HC5AV is a premium automatic solar controller designed for retrofitted solar pool heating systems. It features adjustable temperature settings, manual override, standby mode, and cooling functionality. The controller operates an actuated valve that directs water to the roof when heating is required. This unit includes an optional current detection feature on the PUMP power socket. When enabled, it allows the sanitiser to be powered from this outlet, ensuring the solar valve only activates if the current load on the PUMP socket falls within the configured operating range.

sunlover
sunlover heating oasis aquatics oasis heat pumps

Head Office
6-8 Austral Place
Hallam VIC 3803
T: 03 9887 2131

New South Wales
Unit 2, 10 Boden Road
Seven Hills NSW 2147
T: 02 9838 0000

Queensland
11 Andy Court
Upper Coomera QLD 4209
T: 07 5679 6821

SPASA MEMBER
sunloverheating.com.au
sales@sunloverheating.com.au

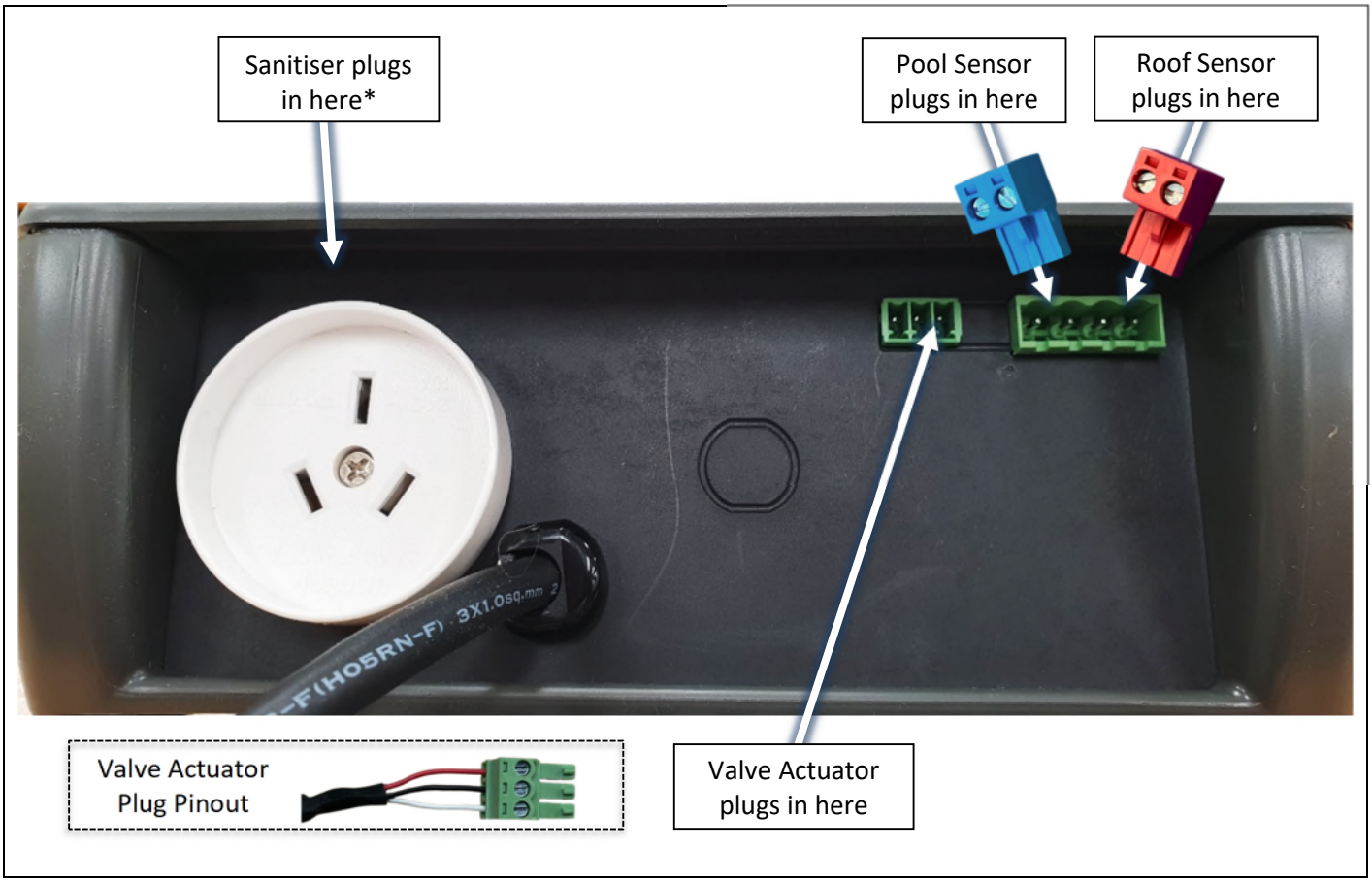
INSTALLATION INSTRUCTIONS

⚠	THIS APPLIANCE IS NOT INTENDED FOR USE BY YOUNG CHILDREN OR INFIRM PERSONS WITHOUT SUPERVISION. PLEASE ENSURE THAT YOUNG CHILDREN ARE SUPERVISED TO ENSURE THAT THEY DO NOT PLAY WITH THE APPLIANCE.

Ideally - as with all pool equipment - the controller should be installed out of direct weather.

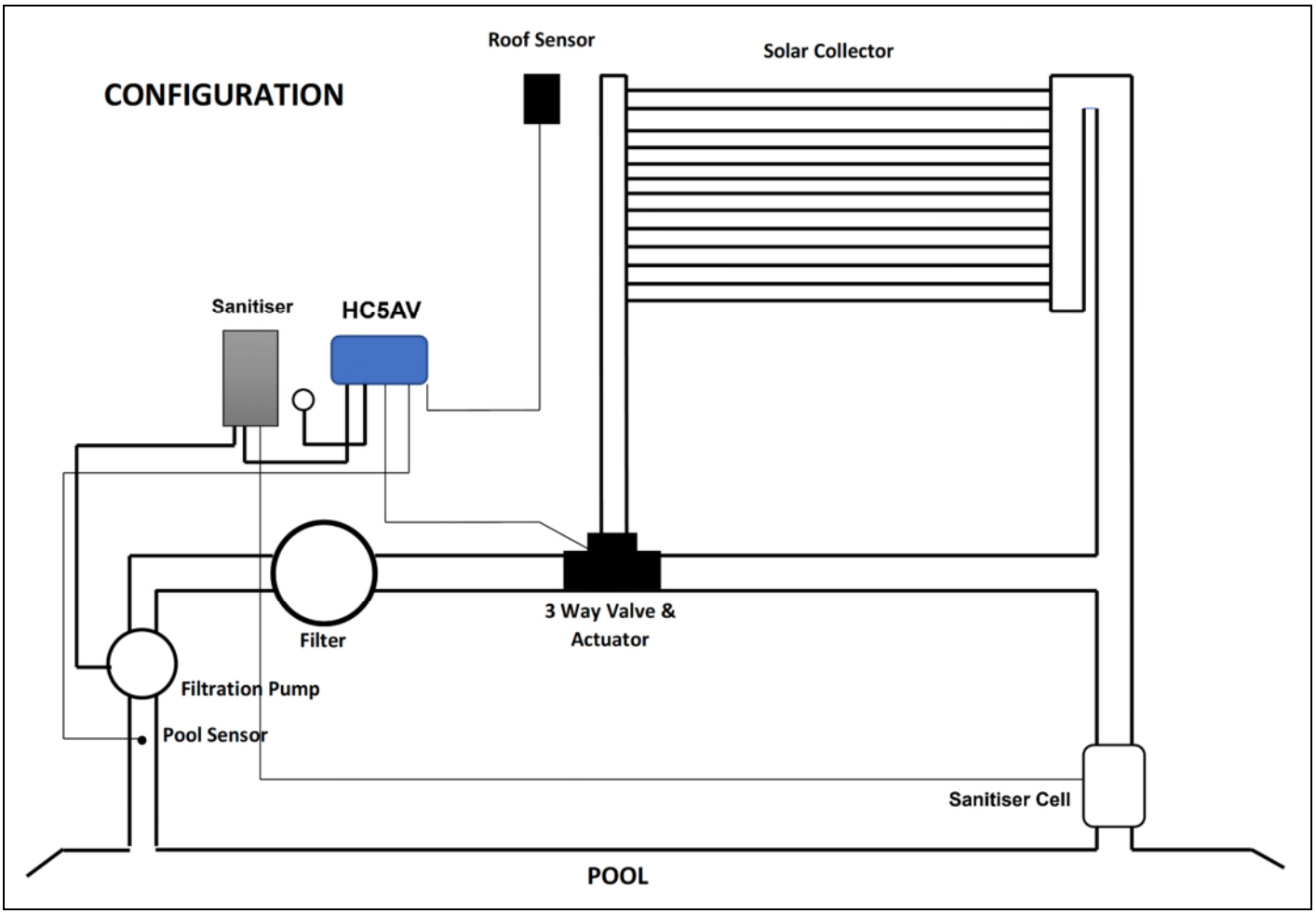
CONTROLLER MOUNTING	Find a suitable location to mount the control box. The controller should be no closer than 3 metres from the water's edge and a minimum 600mm above ground. The power cable is 1.8m long and should be plugged directly into a general power outlet, **not into an extension lead.** Fix the mounting bracket to a solid structure with the screw and wall plug kit provided. Slide the controller on, locking it into place. Adjust the screws on the back of unit to ensure a snug fit. To remove unit, lift and gently pull away from structure.
PUMP CONNECTION	The 240V socket labelled PUMP can be used for pump-on current detection or constant auxiliary power, if desired. When used for current detection, the sanitiser plugs into the 240V PUMP socket. This allows the installer to program the acceptable operating current range via the Installer Menu, enabling the controller to detect when the filter pump is running based on electrical load. The maximum output load for the socket is 9.98 AMPS at 2395W. ***Note:*** *This feature is optional - see Installer Menu for additional information.*
VALVE AND ACTUATOR	A three-way valve is installed in the filter line which allows water flow to be diverted to the rooftop solar collector, instead of using a solar pump. Connect the valve actuator to the green socket marked VALVE. If wiring your own supplied valve, then wire as per the label on the bottom of the controller: red, black then white *(see image overleaf*). Red and white are for direction control and black is the common. Ensure the switch on the valve actuator is in an ON position. Refer to the valve actuator instructions for mounting requirements and cam adjustments. Maximum power for the VALVE output is 24VAC.
POOL SENSOR	The pool sensor must be fitted into the filter pump line, before the pump and as close to the pool as practical - preferably in a position out of direct sunlight. It is recommended that a 14.5mm hole be drilled in the side of the PVC pipe, not the top of the pipe where water will collect. This can be carried out using a Dontek PD01 grinding drill or a pilot hole drilled, then a 14.0mm drill-bit spinning in a counterclockwise direction to minimise the chance of shattering the pipe. Insert the grommet dry into the pipe. Lubricate the sensor barb with silicone spray and push the sensor into the grommet. Ideally ~30cm of the cable from the sensor should be tied to the shaded side of the pipe to prevent extreme ambient conditions leeching into the sensor via the copper in the cable. The blue sensor plug is to be fitted to the plug socket marked POOL.
ROOF SENSOR	The roof sensor is to be installed on the same roof as the heating collector, preferably no more than 50cm from the roof gutter (for ease of sensor replacement). If required, the roof sensor can be on a different roof to the solar collector as long as the alignment to the sun is similar to the solar collector. The red sensor plug is to be fitted to the plug socket marked ROOF.
SENSOR NOTES	All excess cable must be removed; coils of cable are not permitted under any circumstances and must not be tied to 240V wiring. If the cable is to be extended with non-genuine cable, a size of 14/020 should be used. Any cable joins should be soldered. Heat shrink is to be used over soldered joints to eliminate moisture ingress, and the cable end is to be refitted to the plug sockets. Once all cables have been correctly fitted the unit can then be switched on.

BASE DIAGRAM



**If current detection feature is enabled*

PLUMBING CONFIGURATION



OPERATING INSTRUCTIONS

LCD SCREEN	The LCD screen displays the pool and roof temperatures, solar temperature limit, valve on status, on/off/locked-out status and the time of day & date (clock).
LCD INDICATORS	There are arrow icons on the LCD screen that indicate what actions the controller should currently be doing. These arrows point to text on the label.
MODE BUTTON	Pressing this button changes to the next mode of operation. Once the mode button is no longer being pressed then the selected mode of operation is automatically saved. • ***Heating mode (Auto)*** is the normal operating mode for heating the pool. • ***Manual mode*** allows the solar valve to be overridden to either ON or OFF for testing purposes. • ***Standby mode*** of operation is for off-season/holiday maintenance or if pool heating is not required. This is a better option than turning the controller off, as it will flush treated pool water through the solar system daily. The valve will open for three minutes each day at 10am. Or, where the sanitiser is connected to the PUMP socket and current detection settings are enabled, the valve will open for three minutes shortly after the filtration period has commenced. **The factory default mode is Heating mode.**
↑ AND ↓ BUTTONS (TEMPERATURE SETTING)	Adjusting the temperature limit will allow the controller to heat the pool until the temperature limit is met or exceeded by 0.5°C. Heating will then remain off for 60 minutes, after which the pump will run for 3 minutes to sample the water temperature again. Heating will recommence if the pool temperature drops 0.5°C below the temperature limit setting. Otherwise, sampling will occur again in another 60 minutes. Due to rounding the actual heating hysteresis is ±0.5°C. *****TEMP RANGE: OFF, 20° – 40°*** *The ability to solar heat the pool will depend on weather conditions and other factors.* ***The factory default for SOL. LIMIT is 30°C.***

OPERATING INSTRUCTIONS

ENTER BUTTON	Pressing the ENTER button will turn on the LCD backlight. Pressing the ENTER button while the backlight is lit will enter the SETTINGS MENU. The menu system can be navigated using the ↑ or ↓ buttons. All selectable and changeable values will flash on the LCD screen. Press the ENTER button to accept the currently displayed (flashing) item. **All menu items are shown below:**
1) EXIT	Will save changes and return to automatic operation.
2) CLOCK	Selecting clock, will allow you to set the time of day. Set hours then minutes.

OPERATING INSTRUCTIONS *(continued)*

3) SYSTEM	***EXIT*** - Press ENTER on this menu to return to automatic operation. ***COOLING -*** is for situations where the pool water overheats *beyond* the set temperature limit due to direct heating from the sun. *****Note -*** *for the cooling function to work properly, it is best if the solar run hours have been left at the factory default (See Hours below). This will allow the controller to take the best advantage of the evening and early morning hours to cool the pool.* ***LCD TIME*** – Adjust the number of seconds the backlight remains on after the time a button was pressed. (Select NONE for always on.) ***HOURS*** –. is for hours of solar operation (*24hr Clock)* First selecting the start time in hour intervals *(6:00 – 12:00)* Then the end time *(12:00 – 21:00).* **The f*actory default for solar Run Hours is to run from 12:00-12:00 (24hrs).***
LCD SCREEN	The LCD screen displays the pool and roof temperatures, solar temperature limit, valve on status, on/off/locked-out status and the time of day & date (clock).

INSTALLER SETUP

⚠ THE INSTALLER MENU IS INTENDED FOR USE BY QUALIFIED POOL PROFESSIONALS ONLY. INCORRECT ADJUSTMENTS TO THESE SETTINGS MAY RESULT IN EQUIPMENT MALFUNCTION OR DAMAGE.	
ACCESSING INSTALLER MENU	To access the installer menu, press enter to access the settings menu and scroll down until "3) SYSTEM" is flashing. Now, press the MODE button which will take you to the installer menu.
FACTORY DEFAULT? NO/YES	Restore back to factory defaults.
PUMP/FLOW DETECTION *(CURRENT DETECTION)*	*When activated, the current detection feature enables the solar controller to determine when water flow is available by monitoring the electrical load on the controller's PUMP socket. During filtration periods, when the pump is switched on by the sanitiser, the resulting increase in electrical load signals to the controller that the filter pump is running. This ensures that the solar valve only operates when water is actively circulating, preventing false indications that that solar heating is occurring outside of filter times. Additionally, when the system is in standby mode, current detection helps ensure that the daily collector flush only occurs when water flow is available, helping to prolong the life of the system.* **Ensure that the filtration pump is plugged into the Sanitiser and the Sanitiser is plugged into the PUMP power outlet of the controller if you want the valve actuator to be restricted to the systems filtration times.** The controller will ask you if you would like the current detection to be ON or OFF. Use the ↑ or ↓ buttons to select the required option and press the Enter button. If OFF is selected the unit will operate without current detection and the PUMP socket will be **powered constantly**. ***Note:*** *In this instance the valve actuator may open at times and indicate that heating is active (due to there being solar gain), even if no water is flowing through the system.* *--- [ON settings continued overleaf) ---*

INSTALLER SETUP *(continued)*

PUMP/FLOW DETECTION (continued)	If ON is selected, the controller will monitor the load connected to the PUMP socket. *Ensure the filtration pump is fully primed and operating (and at the required speed for variable speed pumps), with the sanitiser powered by the HC5AV controller's PUMP socket, then use the ↑ or ↓ buttons to select either SET AUTO or SET MAN and press the Enter button.* If you select SET AUTO - the unit will display the pump's load value for 5 seconds then automatically sets the threshold levels and returns to automatic operation. When the current draw of the filtration pump drops below the selected threshold levels, the solar valve is forced to switch off. If you select SET MAN. - the unit will display the pump's load value for 5 seconds, take note of this value. When the LCD screen displays RUN=>xxx it indicates the minimum load required to allow solar to run, set this value 15% lower than the displayed LOAD value. ***Note:*** *SET MAN is usually the best option when setting the pump load settings for a variable speed pump as the load value can fluctuate more.*
ROOF TEMPERATURE	***RUN -*** The solar valve will open when the roof temperature is at least X°C higher than the current pool temperature. ***END -*** The solar valve will close when the roof temperature drops to X°C or less above the current pool temperature. ****The** ***factory default settings for roof temperature are:*** • *RUN at +8°C (roof is 8°C warmer than the pool)* • *END at +4°C (roof is 4°C warmer than the pool)*
PIPE PROTECTION? *NO/YES* ***Range 50°C - 95°C***	For use when solar collectors are flooded, flat and may require a wetted roof sensor for this mode. The controller will allow the pool to heat to the selected pool temperature, where it will then force the controller to stop any further solar heating of the system by not allowing the solar valve to turn once the roof temperature reads above the selected Pipe Protection setting. The solar valve will be allowed to turn once the roof temp drops below the selected Pipe Protection temperature. ***Default is NO. If you select Pipe Protect to be YES, the controller will display 80°C. Adjust to required temperature.***
CALIBRATE POOL SENSOR BY:	X.X (RANGE -5.0 TO +5.0°C) This is for the plus series sensor only (TS02P) and allows calibration of the sensor.
NOTES:	1. If any of the menu items are left unattended for 3 minutes the menu will time out and automatically save all settings and return to automatic operation. 2. If a sensor fault is detected, the controller displays which sensor and the fault. 3. Should power be interrupted for any reason, the controller will resume operation when power is restored. All information will have been kept for up to 10 days. 4. The MAX rated output load for the 240V socket is 9.9 Amps / 2370W. 5. Degree of protection against moisture: IP33. 6. Store all pool chemicals safely, at least 3 metres away from all pool equipment.

TROUBLESHOOTING

ISSUE	POSSIBLE CAUSE
There is no power to the display	Controller power lead is unplugged, or the power point is faulty. Ensure that the controller is plugged in. Test power point with a known working appliance. If the power point is operational, check the controller in another power point and if there is still no display, then send controller for repair.
The pool is not heating	Check the controller LCD screen to see if any sensor faults are present and fix as required. Ensure that the controller is in Heating mode and not Standby. Ensure that the valve actuator is turning correctly when placing the controller into Manual mode. If the if the current detection feature is enabled, ensure that the sanitiser is being powered by the HC5AV PUMP socket and the current detection settings are correct *(see Page 4 – Installer Setup).* If the controller has stopped heating and is displaying a current pool temperature higher than expected, it may be due to the system attempting to heat the pool while the filter pump was switched off (temperature reading was from stagnant water in the pipe). To prevent this, consider enabling the current detection feature, which ensures that heating is only attempted when the filter pump is actively running. *(see Page 4 – Installer Setup)*. If the sensor readings are correct and the valve actuator is turning, contact Sunlover for further assistance. There may be an equipment fault, or the ambient conditions may not be suited to heating the pool with solar.
The valve actuator is not turning	Test the valve by placing the controller into Manual mode. If the valve turns correctly, return the controller to Auto mode and check all onboard settings. If the valve fails to turn, continue with the steps below: Check and ensure that the wires are screwed into the plug properly and in the correct order *(see Page 2 – Base Diagram)*. Check and ensure that the plug is pushed into the VALVE socket properly. Check and ensure that the physical toggle switch on the actuator is in either of the ON positions and not in the middle OFF position. Make sure that the valve can be turned manually to ensure that the valve isn't jammed (debris inside the valve, or valve actuator seized/not working). If the above all checks out, send the actuator and controller for repair.
The filter pump will not switch OFF	Check and ensure that the filter pump is plugged into the sanitiser's pump socket. Next, check the sanitiser settings to confirm that the clock and timer are correctly configured, and that the unit is operating in automatic mode. The sanitiser should then be plugged into a standard wall outlet – or into the HC5AV's PUMP socket if the current detection feature is enabled *(see Page 4 – Installer Setup).*
The filter pump will not switch ON	Ensure that the filter pump is plugged into the sanitiser's pump socket. Next, check the sanitiser settings to confirm that the clock and timer are correctly configured, and that the unit is operating in automatic mode. The sanitiser should then be plugged into a standard wall outlet – or into the HC5AV's PUMP socket if the current detection feature is enabled *(see Page 4 – Installer Setup).* If the pump still won't switch on during the filter times, the pump or sanitiser may be faulty. Refer to the relevant manufacturer's instructions for troubleshooting steps.

TROUBLESHOOTING *(continued)*

ISSUE	POSSIBLE CAUSE
The controller is displaying a fault message	In the event of a detected fault condition, the controller will display one or more messages which will scroll across the screen. Observe the message and note down the exact text which is being displayed as you may have more than one fault being detected. For sensor faults, these refer to the two temperature sensors: PIPE SENSOR: This is the pool temperature sensor which is pushed into a rubber grommet inside one of the water pipes, usually on the inlet side of the filter pump. It has a blue connector which plugs into the controller socket marked 'POOL'. ROOF SENSOR: This is the roof temperature sensor which is located on the roof, usually in close proximity to the solar heating collector. This measures the physical temperature of the roof surface to indicate whether there is heat gain available. The sensor cable runs back to the controller location and in some installations will travel underground via a conduit tube which was installed when the pool was constructed. It has a red connector which plugs into the controller socket marked 'POOL'.
PIPE SENSOR DISCONNECTED OR OPEN CIRCUIT	Sensor cable unplugged from controller, cable damaged or sensor is faulty. Unplug the roof and pool sensor and plug them into the opposite sockets for testing. If the fault description changes to 'ROOF', this confirms the issue is with the blue pool sensor. Replace the sensor as required and retest.
PIPE SENSOR SHORT CIRCUIT OR REVERSED	Sensor cable is damaged or sensor is faulty. Unplug the roof and pool sensor and plug them into the opposite sockets for testing. If the fault description changes to 'ROOF', this confirms the issue is with the blue pool sensor. Replace the sensor as required and retest.
ROOF SENSOR DISCONNECTED OR OPEN CIRCUIT	Sensor cable unplugged from controller, cable damaged, bad cable join, or sensor is faulty. Unplug the roof and pool sensor and plug them into the opposite sockets for testing. If the fault description changes to 'PIPE', this confirms the issue is with the sensor or cable. Repair or replace the sensor or cable as required and retest.
ROOF SENSOR SHORT CIRCUIT OR REVERSED	Sensor cable or cable join polarity is incorrect, or sensor is damaged. The positive side of the cable (grey coloured wire) should be wired to the righthand side of the plug, with the screws facing towards you and the sensor cable entry at the bottom of the plug. If the cable has been joined, ensure no polarity reversal occurs. Unplug the roof and pool sensor and plug them into the opposite sockets for testing. If the fault description changes to 'PIPE', this confirms the issue is with the sensor or cable. Repair or replace the sensor or cable as required and retest.
RTC-FAIL	This can occur if the unit has been turned off for a prolonged period of time. Switch off the power point and leave the unit powered down for 30 seconds, then turn it on for 30 seconds before turning it back off again. Wait 30 seconds and restart the controller. If the fault continues to appear, send controller for repair.
NO FLOW	Ensure that the sanitiser is being powered by the HC5AV PUMP socket and the filter pump is plugged into the sanitiser. Check that the filter pump is fully primed and running. If flow is still not detected, reset the pump load settings. *(see Page 4 – Installer Setup)*.

Tip: For sensor faults, start by checking the red and blue sensor connectors which plug into the base of the controller. If one of these connector plugs is damaged or corroded, generic replacement plugs can be purchased from some electronics stores. If a connector is missing, check the pool equipment area for any cables which may have fallen out and reconnect them as required.

FACTORY RESET

To perform a factory reset, switch off the controller. Hold down the ENTER button and switch power on. Continue holding button for 5 seconds after powering up.

WARRANTY

AUSTRALIAN CONSUMER LAW

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

This range of product is covered by a limited three-year back to base warranty against component failure or faulty workmanship from the date of installation. Temperature sensors and valve actuators are covered by a 12-month warranty at the discretion of their manufacturer.

Defective equipment must be returned to the manufacturer or dealer as soon as the purchaser becomes aware of the defect and all transport must be prepaid.

Damage to the unit due to misuse, power surges, corrosion from pool chemical fumes, lightning strikes, insect infestation and or installation that is not in accordance with the manufacturer's instruction may void the warranty.

The warranty does not include on-site labour or travel costs to or from the installation site.

Valves and actuators are covered by their own separate warranties – refer to the relevant manufacturer.

⚠ IF THE POWER CORD IS DAMAGED, IMMEDIATELY SWITCH OFF AND DISCONNECT THE CONTROLLER. RETURN THE UNIT TO THE MANUFACTURER FOR ASSESSMENT AND REPAIR.

For all technical assistance and warranty enquiries, please contact your local distributor or contact Sunlover Heating directly:

SUNLOVER HEATING

Phone: 1800 815 913

Website: sunloverheating.com.au

Email: sales@sunloverheating.com.au

More troubleshooting resources are available online at Sunlover Heating

Troubleshooting

NOTES

NOTES

Victoria
6-8 Austral Place
Hallam VIC 3803
Australia
T: 03 9887 2131

New South Wales
Unit 2, 10 Boden Road
Seven Hills NSW 2147
Australia
T: 02 9838 0000

Queensland
11 Andy Court
Upper Coomera QLD 4209
Australia
T: 07 5679 6821

sunloverheating.com.au