Solar Differential Controller Instructions

- ✓ This unit is designed to switch on a 0.6A 12-volt DC pump when heat is available in the solar collector, and off again when the collector has insufficient heat to benefit.

- ✓ It operates using two temperature sensors. These have been clad in epoxy sealant for protection but may not be 100% waterproof so should be located carefully.

- ✓ The collector sensor (longer 5 metre lead) should be placed in a dry position in contact with the metal pipe work of the collector. Most panels will have a sensor pocket built in, the sensor should be inserted a maximum of 100mm. The tank sensor must be able to read the temperature of the water in the hot storage tank so should be placed in a dry position in contact with a heat conducting area of the tank or pipe work. Typically this would be adjacent to the cold water inlet to the tank.

- ✓ Ideally the leads should be kept apart from other mains wiring to prevent electrical interference, which could possibly cause intermittent temperature reading errors.

- ✓ The first 100mm of the probe wire is heat resistant, to avoid possible melting of the wire insulation. Do not insert the probe into the panel beyond that point.

- ✓ When powered the circuit displays a red LED. A green LED lights when the pump is ON.

- ✓ The logic is controlled by a PIC chip. When the collector temperature is at least 6 deg C hotter than the tank, the pump switches in by making a connection with the 12-volt negative contact of the pump (via yellow wire 5). When heat is no longer present the pump will turn off until it again detects sufficient heat in the collector. It scans for these changes every 15 seconds.

- ✓ This 6 deg C differential allows for the inevitable cooling between collector and tank, thereby ensuring that heat is not pumped out of the tank at night or in dull weather.

- ✓ The program also monitors the temperature in the collector for FROST risk. If the temperature in the collector drops below +5 deg C it will switch the pump on for 20 seconds to circulate the water to avoid unexpected-frost damage to the collector. It will continue to monitor this, pausing for 15 seconds and switch in and out as necessary.

- ✓ The circuit needs a 9 to 14 V DC supply. The pump is powered directly from the circuit. When not in use the supply can be switched off and will resume its program when power is reconnected.

- ✓ The pump leads may safely be extended by 25 feet so the Controller circuit can be placed in a safe dry area. It is usually placed close to the hot water tank.

- ✓ The unit is capable of sending its temperature readings, inc max, min and status to a PC, using a serial or USB type cable connection (not included) Software to manage this is a free download. Please feel free to email for further details- sales@solarproject.co.uk

- ✓ This model now includes the option to fit a mains overheat relay, which is triggered if the tank temperature exceeds 70degC. Two wires (Black and Red) are left unconnected if no relay is fitted. Relays are available for purchase and can switch up to 5A 240V, to power a motorised valve or mains pump.

Connections to Controller:
Wiring Colour code:-
Inside Case
1. Tank sensor signal (blue)
2. 5v -. for sensors (orange/white X 2)
3. 5v +. for sensors (orange X 2)
4. Collector sensor signal (blue)

External
5. Pump 12V negative feed (yellow)
6. 12V negative supply (black)
7. 12V positive supply and Pump 12v pos (Red)
8. Optional- Overheat Relay supply (Black&Red)