

SOLARGAIN HOT WATER Controller Manual

DOMESTIC SOLAR HOT WATER SYSTEM (Active open loop split system)

The S1000 controller is differential controller specifically designed for forced circulation solar system. It incorporates a microprocessor driven PCB board and a set of highly engineered thermal sensors. The roof sensor is capable of operating under extremely high temperatures.

The controller is user programmable with an access code and features intelligent self-troubleshooting functions. Only authorized installers and technicians have access to the access code for reprogramming.

The circulation pump is activated when the roof sensor temperature reaches a predetermined temperature higher than that of the lower tank sensor port. The circulated water is then heated by the solar energy and then stored in the tank.

An anti-freeze function is available when the roof temperature falls below a predetermined figure. A small amount of water is circulated to the roof and effectively prevents frost damage.

A manual pump operation is featured to allow user to temporarily turn on and off the devices by overriding the preset logic. However, the controller returns to auto mode after 2 hours in manual operation.

Each controller includes a built in self-diagnosis detection and runs error checks continuously. An error message will indicate the specific damaged sensor wire that needs replacing. All LED indicator lights will flash to alarm the users.

The controller is pre - assembled inside the specially designed & weather-proof Solargain Pump Station. The pump station can be mounted on the storage tank or located on a nearby wall inside 1.5m from storage tank. Do not run sensor cables parallel to mains power cable and any additional wiring shall be coiled and shortened by qualified electricians.



WARNING: The appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children must be supervised to ensure that they do not play with the appliance.

This controller appliance is pre-wired with temperature sensor wires, power supply wire and output wires. During installation, the power supply cord must not be allowed to connect with the main electricity supply, until the controller is securely in place and with all output connections already connected.

1.1 Controller Functions and Default Controller Setting

The controller has the following settings programmed and shall not be altered unless authorised by the manufacturer. Any un-authorised changes in settings will result in immediate void of warranty.

- **Circulation pump differential control** - The circulation pump will only be activated when there is sufficient solar energy present on the roof to contribute to the Solargain in the water cylinder. This is achieved by sensing the temperature difference between the roof collector and inlet water temperature. The water circulation will cease when the below temperature differentials are achieved.

“Pump Differential On Temp”: 8°C

“Pump Differential Off Temp”: 2°C

- **Top out protection** - In good solar conditions, the solar collector could harvest the solar energy extremely sufficiently and quickly raise the storage water cylinder temperature. The storage water cylinder internal lining may be damaged by the high temperature water, which can exceed the designed operating temperature range by the tank manufacturer. The top out function prevents the water cylinder reaching dangerously high temperatures by stopping the pump circulation to the collector, so that the water is not heated further.

“Top Out Temp”: 75°C

“Top Out Reset Temp”: 73°C

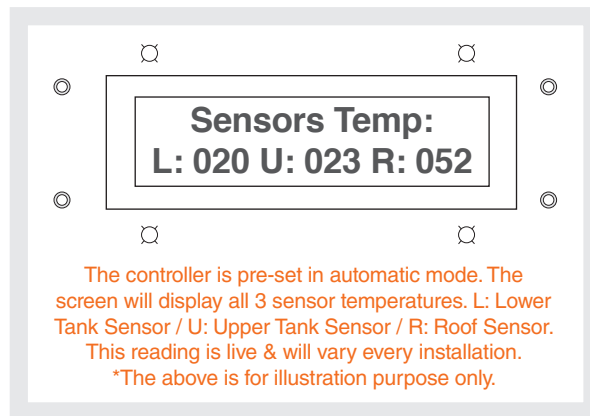
- **Anti-freeze protection** - In frost conditions, the risers in flat plate collector or heat exchangers in evacuated tube collector may freeze. The Anti-freeze protection mode protects the collector by sensing the roof temperature & will active a small amount of water circulation when the below temperatures are achieved.

“Anti-freeze on Temp”: 3°C

“Anti-freeze off Temp”: 5°C

- **Manual pump function** - During the commissioning / servicing of a solar hot water system, a manual pump override may be needed to assist with bleeding the air from the solar loop. Push the “manual pump” button and the controller will enter a manual mode. In this mode, the pump will pump disregarding other control functions. The manual pump mode can be turned off by pressing the “manual pump” button again and the controller re-enters the automatic mode. In case that the user forgets to exit manual mode, the controller will automatically re-engage automatic mode after a maximum of 2 hours.
- **Auto cavitation recovery** - In case of drop of water pressure, air bubbles may form and become trapped inside the circulation pump chamber. This could cause cavitation of the pump, resulting in no water circulation. When the pump has continued working non-stop for 2 hours (a sign of cavitation forming), the auto cavitation recovery function will turn off the pump for 2 minutes and allow the air bubble to escape. When the pump is re-engaged, the cavitation should be recovered in most situations.

1.3 Controller Basic Operation

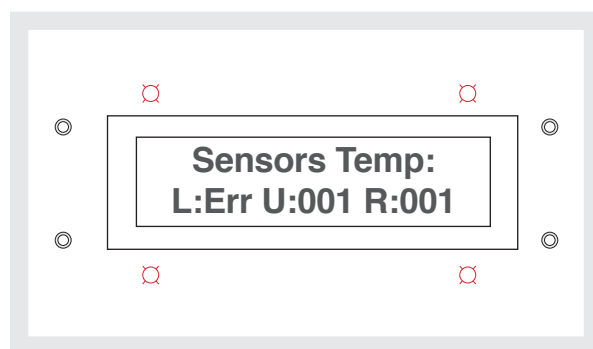


1.4 Error messages and troubleshooting

1.4.1 Faulty sensor indications

The controller continually runs self diagnostic checks & will indicate any faults on the digital display.

When one or more sensors are faulty, all 4 LED lights flash. The lower sensor display window displays "Err". If other sensors are faulty, the "Err" message will appear after the corresponding sensor on the screen.



Troubleshoot: Ensure power is switched off to the controller then check the sensor cable condition for any cuts or defects in the cable. If any defects in cable is found, please contact Solargain service department on 1300 73 93 55. Do not try to repair the cable as this will void warranty.

1.4.2 Manual pump not working

Troubleshoot: Check the top tank temperature first by reading the controller screen. If the top out temperature has been reached, the controller will not allow the pump to manually operate to protect the tank.

1.4.3 The screen is blacked out

Ensure power supply is available to the controller. Test power-point with another approved 3 Pin Plug In appliance. Check safety switch has not tripped. Contact Solargain if problem persists. Do not open controller under any circumstances.

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