smart energy management

SolaStat™ -1-3

An Intelligent Technology Solution for Water Heating

USER GUIDE

CE ISO9001 TECHNOLOGY & QUALITY AWARD Z985

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For technical help contact your installer or maintenance technician.

Distributor Details:

www.senztek.com

INTRODUCING YOUR SOLASTAT™ CONTROLLER

About your SolaStat™ Controller

Your SolaStat™ Controller has a microcomputer, which intelligently and automatically controls water flow and energy inputs into your hot water system.

Your SolaStat™ will balance water flow and energy inputs from solar, and electrical sources so you minimise your energy costs

It has two main aims –

- ⇨ To make sure your hot water is being heated cost-efficiently
- ⇨ To make sure you don't run out of hot water when you need it

How does it work?

Your SolaStat™ Controller works by measuring and comparing the temperature at three different places in the system:

1. the collector (**ROOF**),
2. the top of hot water cylinder (**TANK**) and
3. the bottom of your hot water cylinder (**INLET**).

If the temperature at the ROOF is higher than the TANK temperature by a pre-set amount, then the pump turns on automatically to transfer heated water from your solar collector to your hot water cylinder, and replace it with cooler water from the bottom of the cylinder.

This makes the hot water cylinder heat up and the collector on your roof cool down. When the temperature difference reduces to the pre-set level again, the pump automatically stops.

It can also optimise the timing of heating your water, so heat is only applied to the water in your cylinder when necessary, not all the time.

The SolaStat™ is also designed to protect your hot water system from very high or freezing temperatures.

THE DISPLAY PANEL

The ROOF, TANK and INLET lights indicate which temperature is being displayed.
If any of these lights flashes, the unit is in Smart Shutdown mode and SSd will be displayed.

The DISPLAY PANEL shows the temperatures of the relevant sensors in ^{0}C or ^{0}F.

The PUMP light comes on when the pump is on (in normal or FROST operation or when the PUMP button is pressed).
The PUMP light flashes when the maximum tank temperature has been reached.

HWC
The HWC light is not active in this model.

The TOPOUT light is on when the hot water tank has reached its maximum temperature.

PUMP Button
Press and hold this button to turn the pump on. Repeat this again to turn the pump off.
After the pump has run for ten minutes, it automatically switches off for one minute, to let air escape and prevent overheating

When in Programming Mode, use this to increase the display value on the screen.

HWC Button
Normally used to activate a one-off heat up of the Hot water cylinder element.
Note that this is not active in this model.

When in Programming Mode, use this button to decrease the display value on the screen.

NEXT Button
Press to obtain the next displayed temperature.

TEST Button
Press to test the display of the screen. '888' will be displayed and all the lights (except the PWR light) will be on at the same time for about two seconds. All the lights will then flash and the display will show the number of times the pump has been on (up to 999).

The FROST (and PUMP) light is on when the pump is circulating water to stop the collector from freezing.
CAUTION: Do not turn the power off when the FROST light is on.

Helping you to achieve Power Savings

Your SolaStat™ helps you save power by controlling the amount of hot water that enters your tank.

Your SolaStat™ is set to make the pump automatically turn on or turn off, depending on the temperature in the tank and at the collector.

You can manually alter the amount of water entering your tank by using the **PUMP** button.

USING YOUR SOLASTAT™ CONTROLLER

Reading the Display

The Displayed Value lights show where the current display temperature is being read from: **ROOF**, **TANK** or **INLET**.

To find out the temperate on the other sensor, press the **NEXT** button. The display light will confirm which sensor is being read.

This indicates that the ROOF sensor reading is currently on display, in this case 37^0.

Press **NEXT** to toggle between the ROOF, TANK and INLET sensors.

This indicates that the TANK sensor reading is currently on display, in this case 30^0.

Press **NEXT** to toggle between the ROOF, TANK and INLET sensors.

This indicates that the INLET sensor reading is currently on display, in this case 40^0.

Press **NEXT** to toggle between the ROOF, TANK and INLET sensors.

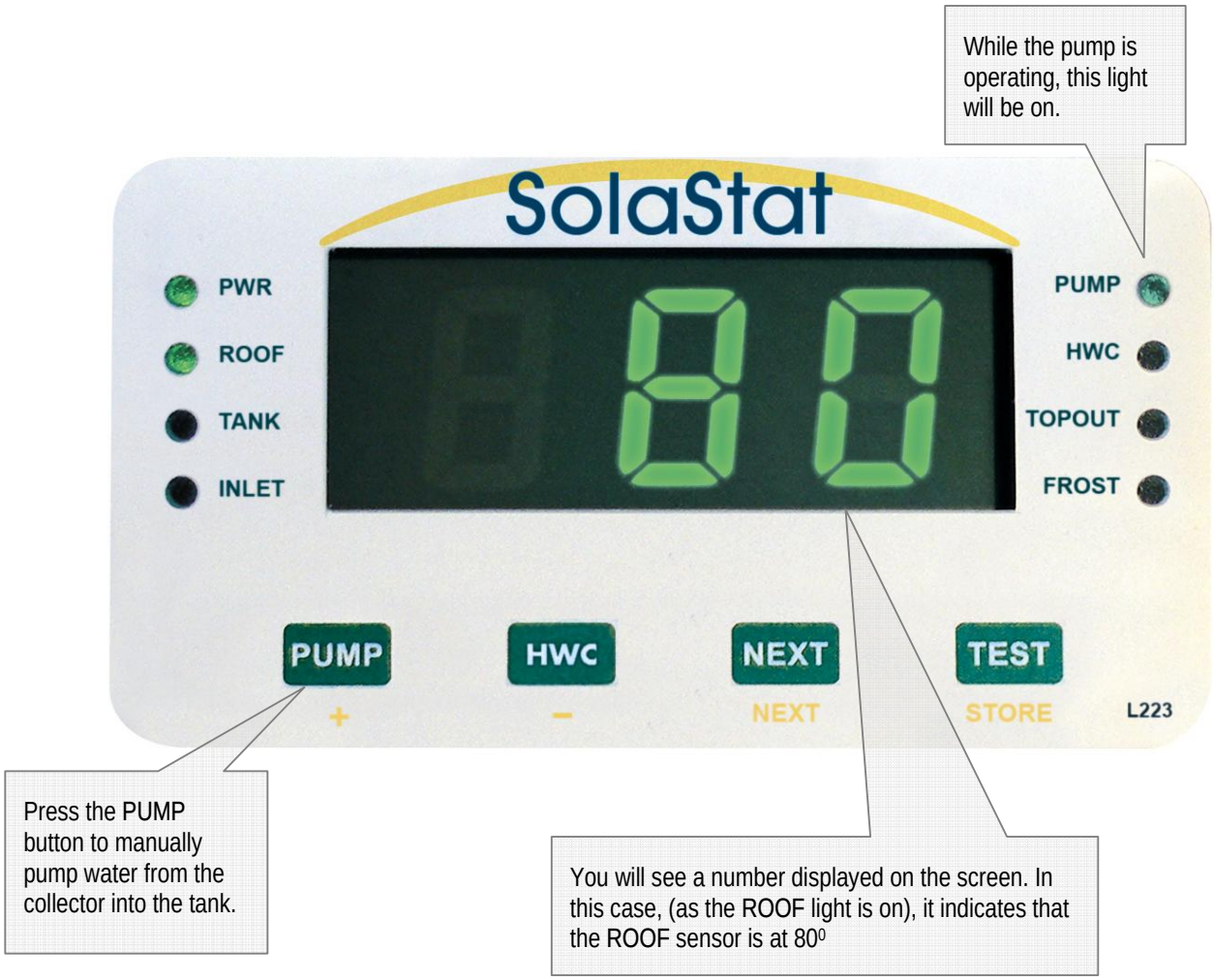
Continued on next page

USING YOUR SOLASTAT™ CONTROLLER, CONTINUED

Pump Activation

Press and hold the **PUMP** button to manually operate the pump. It will circulate the water between the panel and the hot water tank.

After it has run for ten minutes (on automatic or manual), the pump automatically switches off for one minute, to let air escape and prevent overheating.



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USING YOUR SOLASTAT™ CONTROLLER, CONTINUED

Testing Mode

Pressing the **TEST** button will make sure the display panel and all lights in the system are working.

All the lights will stay on, and '888' will be shown for about two seconds.

Then all lights will flash and the display shows how many times the pump has been activated (up to 999) for three seconds.

Press the TEST button to check that all lights in the system are working

For the next two seconds, all the lights come on and 888 is shown on the screen.

Then, all the lights will flash (except the PWR light) , and the display will tell you how many times the pump has been activated (in this case, 123 times).

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USING YOUR SOLASTAT™ CONTROLLER, CONTINUED

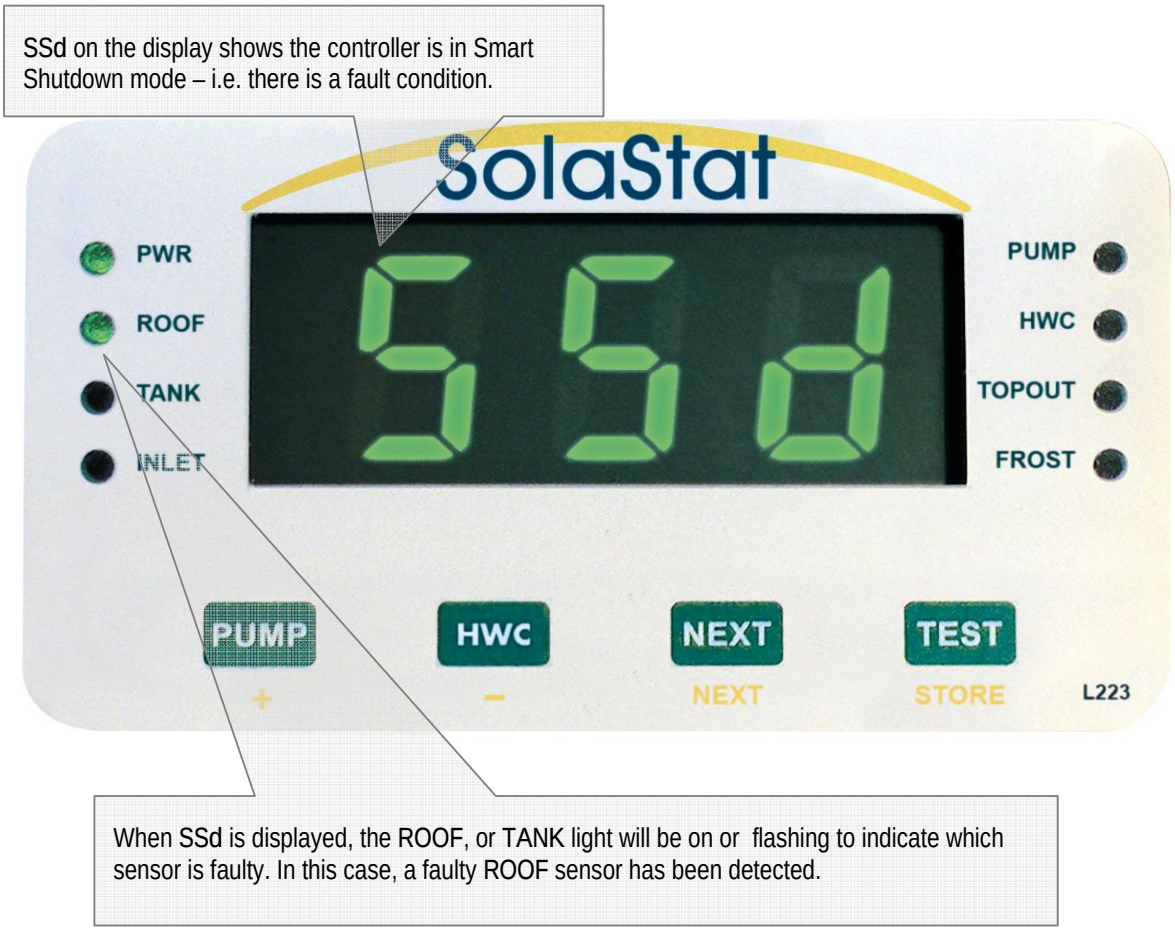
Smart Shut Down Mode

'Smart Shutdown' is a mode that your Controller will enter to minimise damage. It can be activated when the temperature at the ROOF Sensor is less than -40°C [-40°F] or more than 162°C [324°F].

This may also occur if:

- ⇨ there is a fault in the sensor wiring, OR
- ⇨ the solar collector has reached a very high temperature.

If Smart Shutdown mode is activated, you will see SSd on the display as shown on the screen below.



The Roof sensor temperature may reduce to a safe level by itself, and the unit will return to normal operation. SSd will no longer appear on the display.

This is a normal condition and it is not necessary to contact your installer or maintenance technician unless 'SSd' is on the display for more than 12 hours.

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USING YOUR SOLASTAT™ CONTROLLER, CONTINUED

Lockout Mode

The Lockout Mode is activated when the water temperature in the collector is less than 20°C [68°F]. In this case, the collector will not contribute any useful heat, even to cold water.

In this (Lockout) mode, the Controller will not turn on the pump even if the correct temperature differential is reached.

However, if a frost condition is detected, this lockout mode is overridden and the pump operates to protect the system from freezing.

Frost Mode

The **FROST** value is set by your installer. It is shown on the Programming Table on Page9.

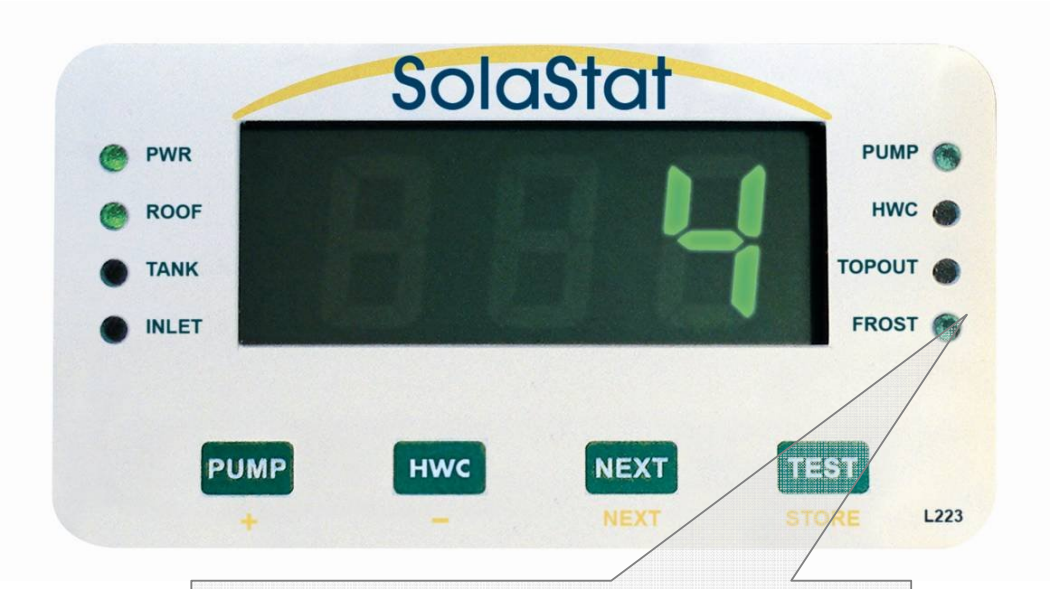
This function is designed to protect your collector and hot water system from freezing and bursting.

When the **FROST** temperature is reached, the pump will come on just enough to raise the temperature of water by 2 - 3°C/ 4 – 8 ºF.

Only a small amount of warm water is needed to protect the collector and plumbing.

When the unit is in Frost Mode, the **FROST** and **PUMP** lights will come on.

CAUTION: Do not turn the power off when the Frost light is on.



As soon as the collector reaches the **FROST** temperature, the **FROST** and **PUMP** lights will turn on.

TROUBLE SHOOTING GUIDE

Symptom	Cause	Solution
No operation, no display and no lights.	⇨ No power/fault	⇨ Check mains outlet. ⇨ Check fuses.
POWER light ON but no display or corrupted display.	⇨ Power brown out (mains power not running at full voltage) ⇨ Unit faulty	⇨ Switch off power while mains power is in brown out condition. ⇨ Switch off power for 10 minutes, switch on power and see if unit is operating. If not, unit needs repair. Contact installer.
Display on, pump not running, but sunny outside. Pump light ON	⇨ Pump damaged or disconnected. ⇨ Pump timer has turned pump off	⇨ See if pump has become unplugged ⇨ Wait one minute for the pump to restart.
Pump is running continuously	⇨ Pump is cavitating ⇨ Special Installation ⇨ Setting is incorrect ⇨ Airlock in pipe	⇨ If pump sounds like stones are passing through it, the pump may be cavitating. Contact your installer or maintenance technician ⇨ Long pump times may be normal for a special installation ⇨ Contact your installer or maintenance technician
Hot water drops significantly at night, yet little or no draw off be user	⇨ System is reverse thermo-siphoning ⇨ System is in a high frost area ⇨ Tank is losing heat	⇨ The non-return valve is not fitted correctly or is malfunctioning ⇨ Discuss non-frost sensitive options with your energy provider ⇨ Install better insulation on hot water tank
HWC light never comes on	⇨ There is no HWC function on this model.	⇨ Normal operation
'Lo' on display	⇨ Sensor below -20°C [-4°F]	⇨ Check outside temperature
'Hi' on display	⇨ Sensor above 159°C [318°F]	⇨ Check Collector has water in it
'SSd' on display	⇨ System is in 'Smart Shut Down' mode	⇨ Contact your installer or maintenance technician if the display shows 'SSd' for more than 12 hours.

Note: When power is removed, the internal timer will keep running for at least seven days.

PROGRAMMING TABLE

Your installer may enter special programming information for your controller in the table below. Settings can be changed by a qualified installer or maintenance technician.

Caution: incorrect settings of these values could damage the solar collector and/ or the pump.

Programming Table for Adjustable Values					
Adjustable Values	**Function**	**Light indication**	**Pre-Set Value**	**Range**	**Installation Values**
Pump Off	The temperature difference between the Roof and the Tank that will turn the pump off	Flash Pump Off value in °C or °F	6°C 43°F	1-20°C 34 - 68°F	____ °C ____ °F
Pump On	The temperature difference between the Roof and the Tank that will turn the pump on	Pump On value in °C or °F	12°C 54°F	2-21°C 36 – 70°F	____ °C ____ °F
Holdoff Timer	How long the timer will override the element coming on (as long as the tank temperature is above Reheat Lower)	HWC on, Timer value in hours (approx)	OFF	1 – 23 hours >23 hours = OFF <1 hour = thr	(Not programmable on this model)
Reheat Lower	The tank temperature at which the heating element will automatically start to reheat the water in your cylinder.	HWC slow flash Lower value in °C or °F	OFF	1-70°C 33.8 - 158°F <1ºC/ 34°F = OFF Set Holdoff Timer to thr = OFF	(Not programmable on this model)
Reheat Upper	The temperature (in the tank) at which the heating element will automatically stop reheating the water in your cylinder.	HWC fast flash Upper value in °C or °F	OFF	2-90°C 36 - 194°F Set Holdoff Timer to off = OFF	(Not programmable on this model)
BioSafe	BioSafe target temperature	No lights (except Power) BioSafe value in °C or °F	OFF	50-70°C 122-158°F < 50°C/ 122 °F = OFF	(Not programmable on this model)
Topout	Maximum allowable tank temperature before the pump is de-activated to protect system from overheating	Topout on, Value in °C or °F	80°C 176°F	1-120°C 34 - 248°F <1°C/ 34°F = OFF	____ °C ____ °F
Frost	Minimum allowable panel temperature before the pump is activated to protect system from freezing damage.	Frost on, Value in °C or°F	4°C 39°F	1-10°C 34 - 50°F >10°C = OFF	____ °C ____ °F
Celsius or Fahrenheit	Display temperature in Celsius or Fahrenheit	Temperature in either Celsius or Fahrenheit	C	C or F	C/ F

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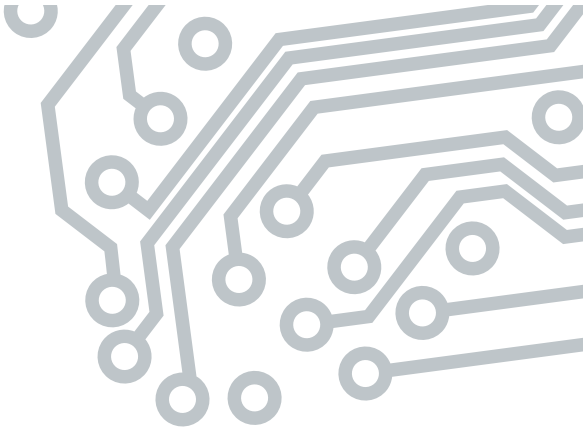

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