Diagnostics

The SP800 controller has extensive self-diagnostic capabilities. In the event of a problem it will sound an alarm (beep) and indicate an error number according to the nature of the problem. Pushing the scroll button will mute the alarm but if left alone it will stop after four minutes. The error numbers and their meanings are listed below.

Error 1 = PRIME FAILED
This is a special case in that it is not a latching error. It is not necessarily a problem with the SP800 itself but indicates that no water is being detected in the heater. The LCD display will show three options on the bottom line of text: Retry:Mute:Demo. Pressing the Down button (Retry) will run the pump associated with the heater (Pump1 or Circ Pump) for 10 or 60 seconds respectively, to try to flood the heater tube. Normal operation will resume if successful. If unsuccessful, Error 1 (H20) will be indicated again.

- *Check valves and jets are open correctly, filter is not blocked, pumps are working and that there is enough water flow through the heater tube.*
- *Check that air is not trapped in the heater tube. See the 'Circulation Pump' section.*
- *Check for leaks (water or air) in pipework, O-rings, seals and loose fittings. If there is air around the water sensor the controller will think the heater is empty. This may occur if there is a small leak so that the water drains out of the heater over time.*
- *If there is water flow then the water sensor may be dirty or faulty. Remove and inspect, replace if necessary. Check the water sensor to circuit board connection for water, corrosion or fouling.*
- *When all other options have been exhausted change the circuit board.*

Error 2 is not used.

Errors 3-8 are latching errors.
Operation will stop and will not continue until the controller is reset (switched off and on again at the main power supply).

Error 3 = STUCK BUTTON
This error indicates that one of the buttons in the control panel is stuck or has been held down for more than one minute. This may be caused by water getting into the panel or by damage to the control panel or its cable, or by the pool cover pressing on the touchpad.

- *Inspect the control panel for damage; test the operation of each button by checking that they all feel the same.*
- *Check the control panel to main circuit board connection and the cable itself for any damage or corrosion.*
- *Disconnect the control panel and run the controller for one minute. If it cuts out on Error 3, then the problem is in the controller.*
- *When all other options have been exhausted change the main circuit board.*

Error 4 = NO WATER SENSOR
This error indicates a problem with the optical water sensor in the heater. It may be caused by the sensor being disconnected or by damage to the sensor.

- *Check the water sensor to circuit board connection for water, corrosion or fouling.*
- *Remove the water sensor and inspect, replace if necessary.*
- *When all other options have been exhausted change the circuit board.*

Error 5 = OVERTEMPERATURE

This error indicates that the digital temperature sensor in the heater or pool has detected a temperature of 45°C or more. This is not necessarily a problem with the SP800 itself. It might be caused by excessive pump use during hot weather. In this case reduce the filtration time and increase the sleep time.

- *Check that another source of heat is not heating the pool excessively. Look at pumps operating for long durations, solar heating, heat pumps, lighting etc.*
- *Check that the ambient temperature is not above or close to 45°C.*
- *If an in heater temperature sensor is used check that there is adequate water flow through the heater. Check that the filter and pump are not blocked and that the jets and valves are open.*
- *Measure the pool temperature and verify the controller's reading. If the controller has an in heater sensor then circulate the water for a few minutes first. If the controller is reading an incorrect temperature then the temperature sensor may be damaged or faulty. Connect another sensor and check that the controller is operating correctly. If it is then change the temperature sensor, if not change the circuit board.*

Error 6 = THERMAL CUTOUT TRIPPED

This error indicates that the safety electromechanical over temperature cutout on the heater has operated. This is not necessarily a problem with the SP800 itself. It may have been caused by high temperatures during shipping or by disconnection or failure of the pump. Waiting for the heater to cool below about 38°C and switching the power off and on again will clear this error.

- *Check valves are open correctly; pumps are working and that there is adequate water flow through the heater tube.*
- *Check that filters are clean and jets are open.*
- *Check thermal cutouts in pumps and other equipment. (Run pump directly from mains to see if it over heats and cuts out.).*
- *Check all connections in the controller are tight and clean.*
- *Make sure air cannot collect in the heater tube. Refer to the 'Circulation Pump' and/or 'Ozone' sections of this manual when using these systems.*
- *When all options have been exhausted change the circuit board.*

Error 7 = STUCK RELAY

This error indicates a problem with the heater control circuitry inside the unit.

- *Check that there are no short circuits across the relay terminals or associated wiring.*
- *Check that all internal wiring is correct and that terminals are tight and clean.*
- *When all options have been exhausted change the circuit board.*

Error 8 = NO TEMPERATURE DATA

This error indicates a problem with the digital temperature sensor in the heater or pool. It might be caused by the sensor being disconnected or by damage to the sensor or cable.

- *Use the diagnositc display to determine which temperature sensor is at fault (see Diagnotsic Displays section).*
- *Check the temperature sensor to circuit board connection for water, corrosion or fouling.*
- *Connect another sensor and check that the controller is operating correctly. If it is then change the temperature sensor, if not change the circuit board.*

Error 9
This error indicates a problem with the real time clock within the SP800.
- *Try reseting the unit by disconecting the power.*
- *If fault continues to occur, change PCB.*

Troubleshooting

1) The thermal cutout keeps operating.
- *Check that there is adequate water flowing through the heater tube and that the plumbing is not blocked.*
- *Check that filters are clean and jets are open.*
- *Check thermal cutouts in pumps and other equipment.*
- *Turn the power supply to the unit off and allow the unit to cool. Turn the power back on.*
- *Check the pump is not heating the pool. A large pump running continuously will heat the pool until the power to it is cut.*
- *If a small circulation pump is in use check there is enough flow through the heater tube and that air is not collecting in the heater tube. Try to measure the flow from the circ pump outlet jet. This can be done by holding a hose on the jet's outlet and timing how long it takes to fill a bucket. Aim for more than 50 L/m. i.e. it should take no longer than 24 seconds to fill a 20 litre bucket.*
- *The unit is faulty and needs to be returned for service.*

2) The unit won't power up.
- Check there is power to the unit and that the control panel is plugged in correctly.
- *Check the control panel for damage or corrosion. Try another control panel.*
- *Check all connections are correct, tight and clean.*
- *Replace the unit.*

3) The unit leaks.
- *First ascertain where the leak is.*
- *Mac-unions. Check that there are O-rings in the mac-unions. Check that the unions are tight, aligned and not distorted.*
- *Heater tube. Inspect the water sensor body for cracks and O-ring location. Tighten or replace if necessary. Tighten the element boss screws to compress the O-ring.*
- *Replace the heater tube if required.*

4) The RCD or Ground Fault Device keeps tripping out.
- *Check for shorts to earth and loose, dangling wires. Check the element earth leakage. Try disconnecting equipment piece by piece until you can identify what is causing the fault.*

- *Check that the RCD is not also an overcurrent circuit breaker. If it is, make sure it is rated for motor start up surges and is not overloaded.*
- *Make sure the unit is not drawing too much current from the supply – see loading calculations.*
- *Check for damage to wiring, pumps, blowers, and lights.*
- *Check for leaks around live parts.*
- *Check earth connections.*
- *Check the supply is wired correctly.*
- *Some older switchboard ELCBs are not compatible with EMC filtered equipment and must be replaced.*
- *The ELCB may be faulty and require replacement.*

5) My pool is getting too hot.

- *Check that another source of heat is not heating the pool excessively. Look at pumps operating for long durations, solar heating, heat pumps, lighting etc.*
- *In extreme climatic conditions where there is a high ambient temperature the normal operation of the unit and pump can cause the pool to over heat. To counter this, remove the pool cover over night to allow the pool to cool. Be sure the pool is safe to leave uncovered. Consider access by children, animals etc.*
- *Increase sleep time and minimise filtration time.*

Diagnostic Displays

The SP800 and 1200 controllers have four diagnostic/information displays that may be of use during service and installation. These displays provide information about:

1) Software versions (firmware) in the controller and switches
2) DIP switch settings
3) Temperature sensor readings and their operational status
4) Logged error codes

The diagnostic displays can only be activated in two display states:

1) When the controller is displaying an error code:
   Press and hold down the SCROLL button for approximately five seconds (until a double beep is produced). The first diagnostic display will be shown.

2) When viewing the default display (no error raised and not within the menu system):
   Press and hold down the SCROLL button. The main menu should be displayed. While viewing the main menu, keep holding down the SCROLL button for approximately five seconds (until a double beep is produced). The first diagnostic display will be shown.

Once the first diagnostic display is shown, you may step through the remaining three displays by pressing the SCROLL button. One additional press of the SCROLL button will return you back to the previous display state (error or default display). There is no automatic timeout while viewing the diagnostic displays.

Diagnostic display descriptions

Note: In the text below "L1:" and "L2:" refer to text line one (top) and text line two (bottom) on the switch LCD.

1) Software versions

L1: " **Vxxx DD/MM/YY** " (controller software version)
L2: " **Vxxx DD/MM/YY** " (switch software version)

Where xxx is the software version (1 and beyond) and DD/MM/YY is the release date.

Note 1: The switch software version is created by the switch itself and not the controller. If more than one switch is connected their versions may differ because each switch will display its own version.

2) DIP switch settings

L1: " **DIP SWITCHES:** "
L2: "**BCDEF---------P**"

Each DIP switch is represented by a character on line two of the LCD. There are a total of 16 DIP switches, but switch "A" cannot be read by the micro-controller and is therefore not displayed.

If the letter "B" to "P" is displayed then the given DIP switch is ON. If a "-" is displayed in place of the letter then the DIP switch is OFF. Refer to the DIP Switch Settings section for interpretation of the DIP switch settings and how they affect the controller's configuration. Note that the way the controller interprets the DIP switches may change with different controller software versions.

3) Temperature sensor readings and their operational status

L1: " **TMP-H: *tt.tt,xy*** " (in-heater temperature)
L2: " **TMP-P: *tt.tt,xy*** " (in-pool temperature)

Where tt.tt is the current temperature reading, x is the presence digit and y is the status digit (see below).

Presence digit:
- 0: Sensor presence not logged
- 1: Sensor presence has been logged (currently, or previously fitted)

Status digit:
- 0: Sensor present and responding OK
- 1: Data line always high, no presence pulse (sensor not fitted)
- 2: Data line always low (or shorted to GND)
- 3: Data error (Bad data checksum or configuration byte)
- 4: Sensor returned reset value of 85.00℃

Note 1: After power is applied to the controller or the defaults are loaded, it takes approximately one minute for the controller to log that a given sensor is fitted (presence digit = “1”).

Note 2: Once a sensor starts producing errors, it takes approximately one minute for user to be notified by means of messages on touch pad etc. This only occurs for sensors with a presence digit of “1”.

4) Logged error codes

L1: **“ LOGGED ERRORS ”**
L2: **“14----------”**

Displays the last 15 error codes recorded by the controller. The most recent error is shown first on left hand side of display up to the oldest error on right hand side. Error codes are single digit numbers 1 to 9. If no error has been logged in a given slot then a dash “-“ is shown instead.

Note 1: When the defaults are loaded all logged errors are cleared (display will show all dashes).

Note 2: Errors are stored approximately 4 seconds after they are generated. If power is lost before 4 seconds elapse the error may not be logged.

Language Selection

The software inside the controller is capable of displaying three languages: English, German and French. To change the active language, first hold the down button for four seconds and the selection menu will be shown. Use the up and down buttons to scroll through the available choices and the set button will select the language displayed.

Parts Replacement

Every precaution has been taken to insure the highest quality and reliability is delivered in each SP800. However in the unlikely event that something does go wrong, it is normally a simple operation to replace the faulty section of the controller or the entire controller if necessary.

To avoid unnecessary part replacement it is important that the fault be diagnosed correctly. Refer to the diagnostics and trouble shooting sections before attempting to change any parts. Only authorised service agents should attempt to change parts.