

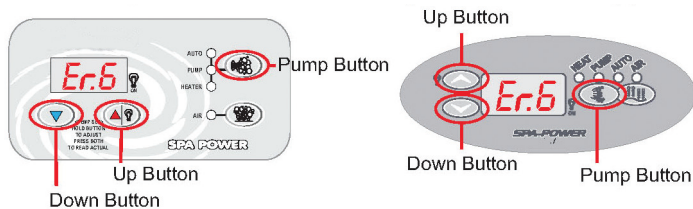
8 Self-Diagnostic Error Codes

The Spa Power controller has extensive self diagnostic capabilities. In the event of a problem it will indicate an error number according to the nature of the problem. The error numbers and their meanings are listed below.

Note: When in an error state the alarm can be muted by pushing the AIR/AUX button.

Error 1 (H2O) - Prime Failed

This is not necessarily a problem with the controller itself, but indicates that no water is being detected in the heater housing. Prime failed is a special case in that it can be recovered from by pushing a button. A push of the pump button will run the pump for 10 seconds to try to get water to the heater. If successful normal operation will resume. If unsuccessful, Error 1(H2O) will be indicated on the display again. **With any Error 3-8, spa operation will stop and not continue until the controller is reset. The controller can only be reset by pushing the UP, DOWN and PUMP buttons simultaneously.** The controller will remain in an error condition even when reset at mains power, controller will only continue normal operation after the UP, DOWN and PUMP buttons are pushed simultaneously (see below).



Error 3 - Stuck Button

This error indicates that one of the buttons in the touchpad is stuck or has been held down for more than one minute. This may be caused by the pool cover pressing on the touchpad or by water getting into the touchpad or by damage to the touchpad or its cable. Try to reset the spa. If there is still a problem then contact your spa pool supplier.

Error 4 - No Water Sensor

This error indicates a problem with the optical water sensor in the heater. The problem may be caused by the sensor being disconnected or by damage to the sensor. Try to reset the spa. If there is still a problem then contact your spa pool supplier.

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 may not be a problem with the controller, it may be caused by excessive pump use in hot weather, or pump failure. Turn off the spa and allow time for the water to cool. If there is still a problem then contact your spa pool supplier.

Error 6 - Thermal Cut Out Tripped

This error indicates that the safety electromechanical over temperature cut out on the heater has operated. This is not necessarily a problem with the controller. It may have occurred from an air lock around the element, high temperatures during shipping, or failure of the pump. This automatic cut out will only reset once the element has cooled below about 38 C. The unit must then be reset before it will resume operation. Manually push the UP, DOWN and PUMP buttons simultaneously.

Error 7 - Stuck Relay

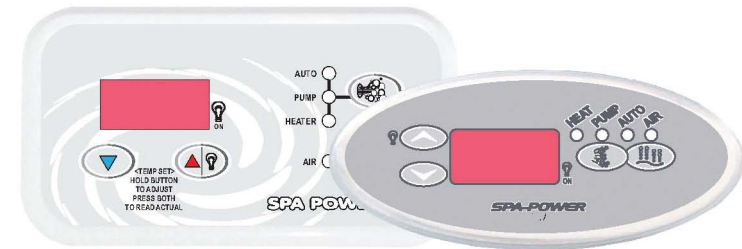
This error indicates a problem with the heater control circuitry inside the unit. Contact your spa pool supplier.

Error 8 - No Temperature Data

This error indicates a problem with the digital temperature sensor in the heater or pool wall or that both the in heater and in pool sensors are connected. Check that only one sensor is connected and that it has not become disconnected or damaged. Try to reset the spa. If there is still a problem then contact your spa pool supplier.



SP400P & SP601



User's Guide

Models:

SP400P, Q400PAU-10, Q400PAU-15

SP601AU-15, SP601AU-15T

Q601AU-20, SP601AU-20T

Q601AU-30, SP601AU-30T



Rainbow Pool Products

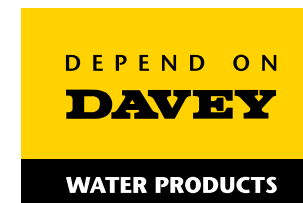
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Congratulations on choosing the latest Spa Power control system. This controller makes use of the latest technology, including innovative optical and digital sensor designs. The greater variety of optional accessories, user-friendly touchpad and reliable components provide you with the most sophisticated controller in its class.

Installation & Safety Notes

1. When installing this spa pool control system, refer to the appropriate local wiring rules. In particular refer to AS/NZS 3000:2007 (AS /NZ) and EN60364 (EU). Follow the wiring rules to ensure equipment is located in the correct zones for water protection. This spa pool control system must be protected from water in an IPX5 enclosure or cabinet.
2. It is recommended that the steel reinforcing in any concrete base on which the pool is sitting be equipotential bonded to the earth conductor in the supply to the spa. This is to protect against the possibility of low voltage shocks caused by differential earth voltages. Refer to the appropriate local wiring rules, e.g. AS/NZS3000:2007 Sections 5.6 & 6.3 or EN 60364.
3. Parts containing live parts must be inaccessible to a person in the spa, except parts supplied with safety extra-low voltage not exceeding 12V (e.g. touch pads and LED lights).
4. Parts incorporating electrical components, except remote control devices, must be located or fixed so that they cannot fall into the spa. Portable appliances must not be located above the spa during use.
5. The appliance must be supplied through a residual current device (RCD) having a rated residual current not exceeding 30mA.
6. If a supply plug is not fitted or if the system is installed in Europe then the system must be permanently connected to fixed wiring. Means for all pole disconnection must be provided in the fixed wiring in accordance with the wiring rules.
7. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
8. This 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 should be supervised to ensure that they do not play with the appliance.
9. In order to avoid the possibility of hyperthermia (heat stress) occurring, it is recommended that the average temperature of spa pool water should not exceed 40°C.
10. For proper operation the spa pool must be fitted with an effective thermally insulating cover when not in use.

7 Sleep Timer (Optional Timeclock)

If the optional time clock has been fitted, sleep mode is used to disable automatic temperature maintenance and filtration in order to silence the spa pool during your hours of sleep. The sleep time setting is done using the digital time clock on the front of the control box (See below for setting instructions). If the spa is in use it will not enter sleep mode until 30 minutes after the last manual button push, even if the clock is calling for sleep mode. The spa can still be used manually within sleep mode times as normal. On wake up from sleep the system will run the blower for 15 seconds to purge the blower plumbing. This prevents any stagnant water from collecting in the pipes if the pool is not used for an extended period.



7.1 To Set Current Time and Day

1. Press the **RESET** button before use. NOTE: This is optional. It will clear the current time and program settings.
2. Hold down the **CLOCK** button and press the **DAY** button until the correct day is selected. Release both buttons.
3. Hold down the **CLOCK** button and press the **HOUR** button until the correct hour is set. Release both buttons.
4. Hold down the **CLOCK** button and press the **MIN** button until the correct minute is set. Release both buttons.
5. After setting the weekday and time, the seconds will reset automatically and the clock will begin keeping time.

7.2 To Set Programs

1. Press the **TIMER** button. "1ON" will appear at the left side of the display. This is the start time of the first programmed sleep block (the time you want the spa to enter the sleep mode).
2. Press the **DAY** button to select the days on which this sleep program will operate. There are 15 settings to choose from.
3. Press the **HOUR** button to set the hour of the desired time to enter sleep mode.
4. Press the **MIN** button to set the minutes of the desired time to enter sleep mode.
5. Now the start time has been set, press the **TIMER** button again. "1OFF" will appear on the display. This is the end time of the first programmed sleep block (the time you want the spa to resume normal operation).
6. Repeat the same procedure (2 to 4 above) until the "1OFF" time is set. (Be careful to set the same days as used in the "1ON" time).
7. Your timer gives you up to 8 different programmable periods. You can use all 8 settings, or as few as you like.
8. To Review your set programs press the **TIMER** button and keep pressing it to advance through each setting.

IMPORTANT NOTE: The "MANUAL" button on the clock can be used to override the programmed sleep settings. It is very important to ensure that the clock is set to "AUTO" so that the programmed times can operate. If the clock is manually set to ON then the pool will stay in sleep mode and THE WATER WILL GO COLD. If it is left in "OFF" then the pool will not enter the sleep mode. The clock does not return to "AUTO" by itself.



NOTE: If the "MANUAL" button on the clock is used the spa will not return to the programmed settings until the next programmed time after being returned to Auto.

6 Auto Sanitising (Filtration)

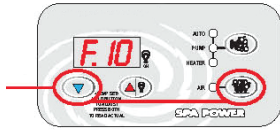
6.1 No 24hr Circulation Pump Fitted

The Spa Power controller automatically maintains the filtration/sanitising of the spa pool water. The minimum amount of filtration time is programmable by the user and can be adjusted between 0 and 15 minutes per hour (0 to 6 hours per day). In order to maintain correct filtration of the pool water, the controller monitors the time for which the pump runs in normal pool operation. If the pump has only run for a short time, the system will automatically run the pump for an additional period every hour to reach the minimum filtration time set by the user.

6.1.1 Adjusting Minimum Filtration Time (No 24hr circulation pump fitted)



First push the Down  and Air/Aux  buttons together to display the filtration time setting on the digital readout

Press both buttons simultaneously




Press both buttons simultaneously



The default setting is 10 minutes per hour (= 4 hours per day). Holding down the Up Button  or Down Button  will adjust the filtration time setting between 0 and 15 minutes per hour. (= 0 to 6 hrs per day).

6.1.2 Clean Up Cycle

If desired, a clean up cycle can be initiated to filter the water after the spa pool has been used. This is done by simply pushing the Pump Button  to leave auto mode and switch on the pump. This will circulate the water through the filter for 90 minutes. After 90 minutes the system will return to auto mode and maintain the temperature ready for the next time the spa pool is used.

6.2 24hr Circulation Pump Fitted

The Spa Power controller continuously filters the spa pool to ensure the water is clean and crystal clear for each and every spa use. A near silent energy efficient circulation pump constantly passes water through the filter and since the circulation pump runs all the time (except for when the time clock has been set to sleep or in an error condition) and the heater is controlled automatically there is no need for any user controls for these features. With a 24hr circulation pump fitted there is no need to program any filtration cycles, and the noise of a large jet pump running during filtration has been removed.

6.3 My Spa Is Too Hot In Summer!

During warm periods of the year there may be times when the actual water temperature exceeds the desired temperature set by the user. E.g. If the spa is set to heat to 35°C, but the actual water temperature is hotter than 35°C. Please consider this - In the winter your spa gets cold because the air temperature is cold. To combat this we heat the water and keep the spa covered when not in use. If the spa is turned off and the ambient temperature is 15°C, eventually the spa water will lose heat until it too is 15°C. In the summer the same applies but in reverse - you can turn the heater down, even turn the pump off, but if the ambient daytime temperature is 35°C - 42°C then the spa water will also remain at that temperature. Manufacturers make no attempt to supply a system that cools water. The quickest way to combat the problem is to change the water, but even this new water will eventually heat up to the air temperature. Turn the set temperature down so the heater does not come on. Reduce the minimum filtration time (non circ pump models only) so the pump runs less. The less the pump runs the more the water will cool. If the night time temperature is low, leave the cover off the spa to let heat escape, but put it back on during the day to keep heat out. If the optional time clock is fitted increase the sleep time period otherwise turn the spa off overnight. Also make sure the spa is shaded from direct sunlight.

Installation & Safety Notes (cont'd)

11. The floor or base on which the pool is installed has to be capable of supporting the expected load.
12. Precautions should be taken to ensure that spa pool water is disposed of appropriately.
13. An adequate drainage system should be provided to deal with overflow water.
14. Precautions should be taken to avoid damage due to water freezing in the pipes and fittings.
15. Precautions should be taken to avoid damage when the pool is left empty for an extended period.

Spa Water Treatment

Recommended Chemical Values

Chlorine.....1.5-3.0PPM(Parts Per Million)
pH.....7.2-7.6
Total alkalinity.....80-120PPM

It is important to maintain your spa water chemistry to the above values to ensure a healthy experience both for you as bathers and for your spa pool equipment.

PH

This is a measure of how acid or alkaline the spa water is (below 7.0 is acid, above 7.0 is alkaline). Low pH will cause corrosion of any metalwork in the water (element, thermostat pockets). High pH will cause scale formation and cloudy water.

Total Alkalinity

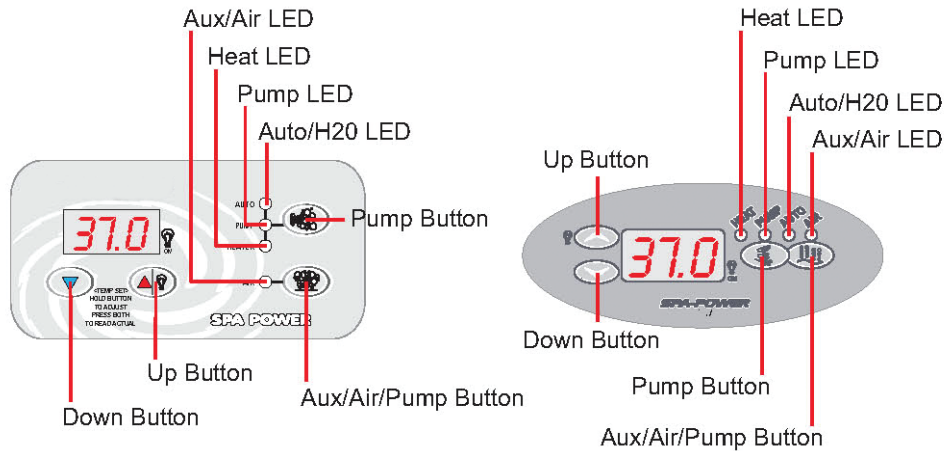
This is a measure of how resistant your spa water is to change of pH. A low TA (0-80ppm) will allow the pH to fluctuate rapidly normally to the acid end and will make it very hard to correct the pH back to the ideal range.

Chlorine

Levels of sanitiser are important to prevent the build up of bacteria, and algae in the pool water. Chlorine is not the only sanitiser available to do this. Other sanitisers are Bromine, Ozone.

Damage to the element, thermostat pockets and associated metalwork due to the poor maintenance of water chemistry is not covered by warranty.

1 Touch Pads



● Auto LED (No 24hr circulation pump fitted)

The yellow Auto indicator light will appear on the touch pad whenever the system is in full automatic control mode. In this mode the system automatically activates the pump and heater to filter the water and maintain the set water temperature. If this light is flashing the water sensor is not detecting any water.

● H2O LED (24hr circulation pump fitted)

The yellow H2O light indicates if water is present in the heater. If no water is detected then the LED will flash and the unit will not operate except to run the circulation pump to try to get water to the heater. If no water reaches the heater for one minute then an H2O error will occur. If this happens then pushing the pump button will run the circulation pump for another minute.

● Pump LED

The green Pump indicator light will appear on the touch pad whenever the pump is running, in both auto and manual use mode. If this light is flashing, the spa is in Sleep Mode.

● Heat LED


The red Heater indicator light will appear on the touch pad whenever the heater element is on, in both auto and manual use mode. For safety the heater is always automatically controlled. Usually switching on the air blower accessory will cause the heater to switch off (load shedding). This is in order to keep the total power load to a safe level. If this light is flashing the system has an error (see section 8).

● Aux/Air LED

The Aux/Air indicator LED will appear on the touch pad whenever the Aux/Air button is pushed and conversely will disappear when the button is pushed again. Note: If the spa does not have a load connected to the controller the LED will still operate as described above.

5 Light Operation

Your spa may have been fitted with either of two different LED lights; a Spa Power Coloured Light (SPCL) or a Spa Power Variable Coloured Light (SPVCL). The Spa Power Coloured Light is a single coloured light that is either on or off. The Spa Power Variable Coloured light is a light that has the ability to change between 12 different colours and white (see below for user instructions).

The multi-function Light Button  is used to turn the light on and off (SPCL) and select through the different operating modes of the Spa Power Variable Colour Light. Two short presses of the button will turn the Spa Power Coloured Light on and off or five short presses of the button will cycle the Spa Power Variable Coloured Light as follows:


Light Button

Push 1 - Light ON	(SPCL - On) (SPVCL Colour - White)
Push 2 - Light ADJUST	(SPCL - Off) (SPVCL Adjustable Colour Mode)
Push 3 - Light CYCLE SLOW	(SPVCL Cycle through colours - slowly)
Push 4 - Light CYCLE FAST	(SPVCL Cycle through colours - quickly)
Push 5 - Light OFF	(Default State)

Note: This is a multi-function button which performs the following -

- 1) Short presses of this button activate the light functions as detailed above.
- 2) Holding this button will begin to increase the set temperature of the spa.
- 3) When a Spa Power Variable Speed Blower is fitted and is turned on this button increases the blower speed.

5.1 Adjustable Colour Mode (SPVCL only)

When the light is on, short presses of the Down button  will put the light into adjustable colour mode and then sequentially select through all the available colours. The last colour set in this mode will be remembered the next time the light is used.

5.2 Indicator Light

A small red dot in the bottom corner of the digital readout indicates when the light is turned on. If left on the light will automatically switch off after 30 minutes.



4 Auxiliary Air Button

The Air Button controls an auxiliary air blower. It is used to turn the blower on and off, and select different operating modes if a Spa Power Variable-Speed Blower (SPVSB) has been fitted. 2 pushes (STD) or 4 pushes (SPVSB) of the air button cycles the blower as follows: Note: In some spas an additional jet pump or pool light etc may be fitted instead of a standard air blower.

Standard Air Blower (STD)

Push 1 - Blower ON
Push 2 - Blower OFF

Spa Power Variable-Speed Blower (SPVSB) (if fitted)

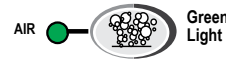
Push 1 - Blower ON (Full Speed)



Push 2 - Blower ADJUSTABLE (Adjustable Speed)



Push 3 - Blower OSCILLATING (Oscillating Speed)



Push 4 - Blower OFF (Default State)



Note: If left on, this accessory will automatically switch off after 20 minutes. If the heater element is on, switching on this accessory may cause the heater to loadshed and switch off. This is to keep the total power load to a safe level.

4.1 Adjustable Speed Mode (SPVSB only)

If a Spa Power Variable-Speed Blower is fitted, the spa user has the ability to adjust the blower speed to any desired setting. The Up and Down buttons are used to set the desired blower speed. Note: If the blower is in Full Speed or Oscillating modes then pushing the Up or Down button will put it into Adjustable Speed mode and then adjust the speed.

Step 1) Press Air Button **twice** to set Adjustable Speed Mode



Step 2) Press Up  to **increase** speed of blower

Step 3) Press Down  to **decrease** speed of blower

2 Temperature Control

The Spa Power controller automatically controls the pump and heater to filter the water and maintain it at the desired temperature set by the user (see below). The user can leave the system to look after the spa and know it will be at the correct temperature when ever he or she wants to use it.

2.1 Adjusting Set Temperature

The Spa Power controller gives the user direct control of the pool temperature from the poolside control panel. Holding down the Up or Down button will adjust the temperature set point as shown on the digital readout. There is a slight delay before the buttons operate to reduce the risk of accidental adjustment. The pool temperature will be maintained very close to the set temperature.



UP Increase the set temperature by 0.5°C per beep (Max = 41.5°C)



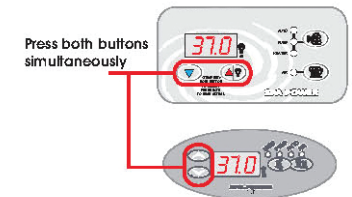
DOWN Decrease the set temperature by 0.5°C per beep (Min = 10.0°C)

Default Display 

The display normally shows the temperature set point, unless the optional in pool temperature sensor is fitted in which case the sensed water temperature is displayed. In either case the temperature set point will be displayed while being adjusted as describe dabove.

2.2 Non-Default Display Value

The non-default display value (either sensed water temperature or temperature set point) can be checked if necessary by pressing the Up &Down buttons simultaneously.

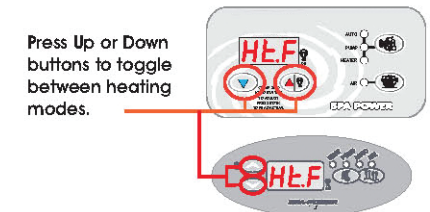
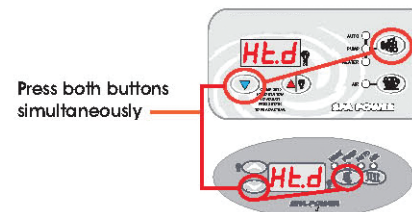


2.3 Heating Mode Selection (24hr circ pump not fitted)

In addition to the temperature setting the user can select the preferred heating mode. The two available heating modes are...

1. Demand Heating (displayed as Ht.d). This is the default setting in which the pump and heater will come on automatically whenever the temperature drops slightly below the set point.
2. Filtration Only Heating (displayed as Ht.F). In this mode the pump and heater will come on automatically no more than once per hour to filter and heat the water. This mode is provided as an option for those who prefer to limit the natural cycling of the system.

To select the heating mode first press the Pump and Down buttons simultaneously to display the current heating mode, then press and hold the Up or Down buttons to change modes.



3 Pump Operation

There are four possible variations of pump 1 that may have been fitted to your spa, this user guide covers all variations of pump 1 that could have been fitted. Please read sections 3.1 through to 3.4 then follow the section which matches your spa operation.

Note: Even if a 24hr circulation pump is fitted there is no button to control it. The 24hr circulation pump operation is completely automatic. It only turns off in sleep mode (if optional time clock is fitted) or in an error condition.

3.1 Pump 1 (Single speed pump, no 24hr circulation pump fitted)

Pump 1 is controlled by just one touch pad button pushing the pump button three times cycles its operation through three modes Automatic, Manual and Standby. When the spa is running in automatic mode, pressing the pump button will deactivate auto mode and set the pump running in Manual Mode. The auto LED is orange when auto mode is enabled and off when in Manual Mode. When the pump is in standby mode all indicator LED's are off.



Notes:

- 1) If Pump 1 is left in "Manual or "Standby" modes it will automatically revert to "Auto" mode after 90 minutes.
- 2) There is no direct user control over the heater. The heater may come on automatically whenever Pump 1 is on.

3.2 Pump 1 (Single speed pump, 24hr circulation pump fitted)

Pushing the pump button two times turns the pump on and then off. The pump LED is green when the pump is running and off when the pump is off.

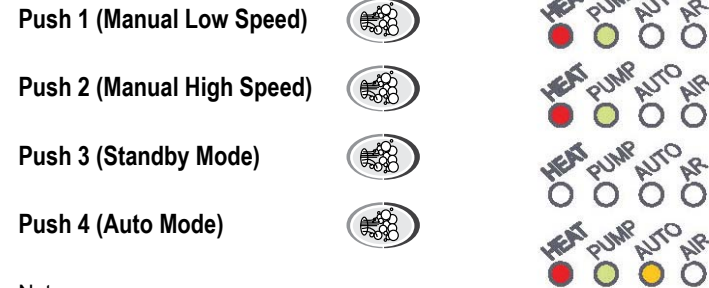


Notes:

- 1) If Pump 1 is left on, it will automatically switch off after 20 minutes.
- 2) There is no direct user control over the heater. The heater may come on automatically whenever the 24hr circulation pump is on.
- 3) If the heater element is on, running the pump may cause the heater to load shed and switch off. If this occurs the heater will come back on approximately 5 seconds after the pump is deselected.

3.3 Pump 1 (Two speed, no 24HR circulation pump fitted)

Pump 1 is controlled by just one touch pad button pushing the pump button 4 times cycles its operation through 4 modes Automatic, Manual Low Speed, Manual High Speed and Standby. When the spa is running in automatic mode, pressing the pump 1 button will deactivate auto mode and set the pump running in Manual low speed. The auto LED is orange when auto mode is enabled and off when in manual low speed or manual high speed. When the pump is in standby mode all indicator LED's are off.

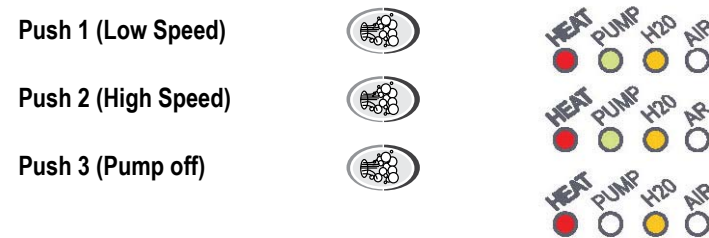


Notes:

- 1) If Pump 1 is left in "Manual or "Standby" modes, it will automatically revert to "Auto" mode after 90 minutes.
- 2) There is no direct user control over the heater. The heater may come on automatically whenever Pump 1 is on.
- 3) If the heater element is on, running the pump in high speed may cause the heater to load shed and switch off.

3.4 Pump 1 (Two speed, 24HR circulation pump fitted)

Pushing the pump button three times cycles the pump through its two speeds then off. The pump LED is green when the pump is running in low or high speed and off when pump is off.



Notes:

- 1) If Pump 1 is left on, it will automatically switch off after 20 minutes.
- 2) There is no direct user control over the heater. The heater may come on automatically whenever the 24hr circulation pump is on.
- 3) If the heater element is on, running the pump in high speed may cause the heater to load shed and switch off. If this occurs the heater will come back on approximately 5 seconds after the pump is deselected.