Pool-Smart

Installation Instructions & Operating Manual

QUICK SET-UP GUIDE

Screw mount the Pool-Smart to a wall in a dry weather proof location, ensuring that it is sited no more than 3 metres from the swimming pool filtration pipe work and upstream i.e. before the heating appliance.

Solvent cement the PVC "T" piece into the pipe work ensuring the direction arrow (moulded into the "T") is pointing in the direction of flow.

Electrical connection: -

To access the internal terminal connection block

Remove the 4 cover screws in the lower section of the controller housing & connect as follows:

Terminal 1 and 2 Power supply 100-230 volt ac mains

Terminal 3 and 4 connect to the filtration pump **(volt free switched output 1.5 HP Pump maximum)**

Terminal 5 and 6 connect to the heating appliance (volt free switched output)

Terminal 7 and 8 connect to the flow switch in the "T" Piece

Terminal 9 and 10 connect to the temperature sensor in the "T" piece

for programming and functionality refer to the digital controller key section

FULL INSTALLATION INSTRUCTIONS

POSITIONING

The Pool-Smart should be installed in a dry weather proof location that will allow access to the control buttons. Consideration must be given to the positioning of the "T" piece to ensure both the controller and "T" piece are no more than 3 metres apart.

The "T" Piece incorporates a flow switch and temperature sensor must be sited up stream (i.e. before) the pool heating appliance.

WALL MOUNTING

The rear face of the Pool-Smart has an upper key hole screw hook, located at the rear of the enclosure, and 2 lower screw holes which are accessed after removing the 4 screws retaining the lower access cover.

"T" PIECE INSTALLATION

The "T" piece should be cut into the swimming pool filtration pipe work up stream of the heating appliance using a suitable PVC cement. The "T" piece has slip fit female 63-mm and is supplied with 50-mm reducers or 1½ inch reducers for UK , USA and Canada.

Note:- correct orientation of the "T" is essential in order to facilitate the correct operation of the flow switch, and temperature detecting probe i.e. the arrow moulded on the "T" must point in the direction of flow.

ELECTRICAL CONNECTION

Terminals 1 and 2: Connect to a permanent power supply of 100-230 volts AC (Mains) fused at 3-Amp.

Terminals 3 and 4: Connect to the filtration pump i.e. route the + from the live supply to the pump through position 3 and 4. **WARNING:** If a circulation pump is larger than 1.5 HP an auxiliary contactor **must** be installed.

Terminals 5 and 6: Connect to the heating device - **under no circumstances** should terminals 5 and 6 be connected to a load greater than 8-Amp.
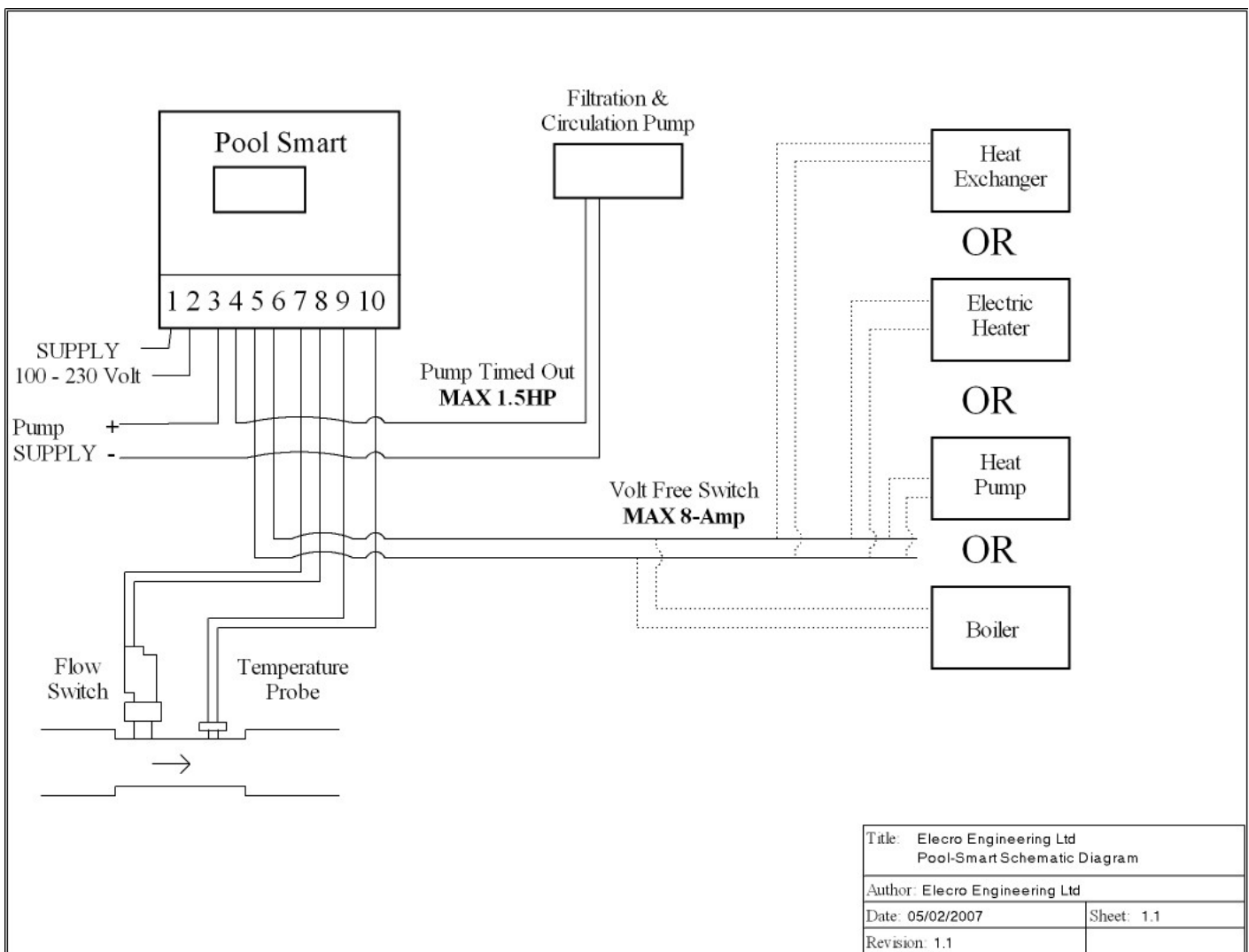Recommended connection method.
Using a suitable 2 core wire connect the 2 cores from one end of the wire to terminals 5 and 6. Then connect the free end of the wire to the heating appliance by disconnecting one of the connections from the thermostat of the heating device and re connecting (join) it to one of the cores of the 2 core wire. The remaining free core of the 2 core wire should then be connected to the terminal on the thermostat.

Terminal 7 and 8 , connect to the flow switch installed in the "T" piece.
Terminal 9 and 10 connect to the temperature-detecting probe installed in the "T" piece.
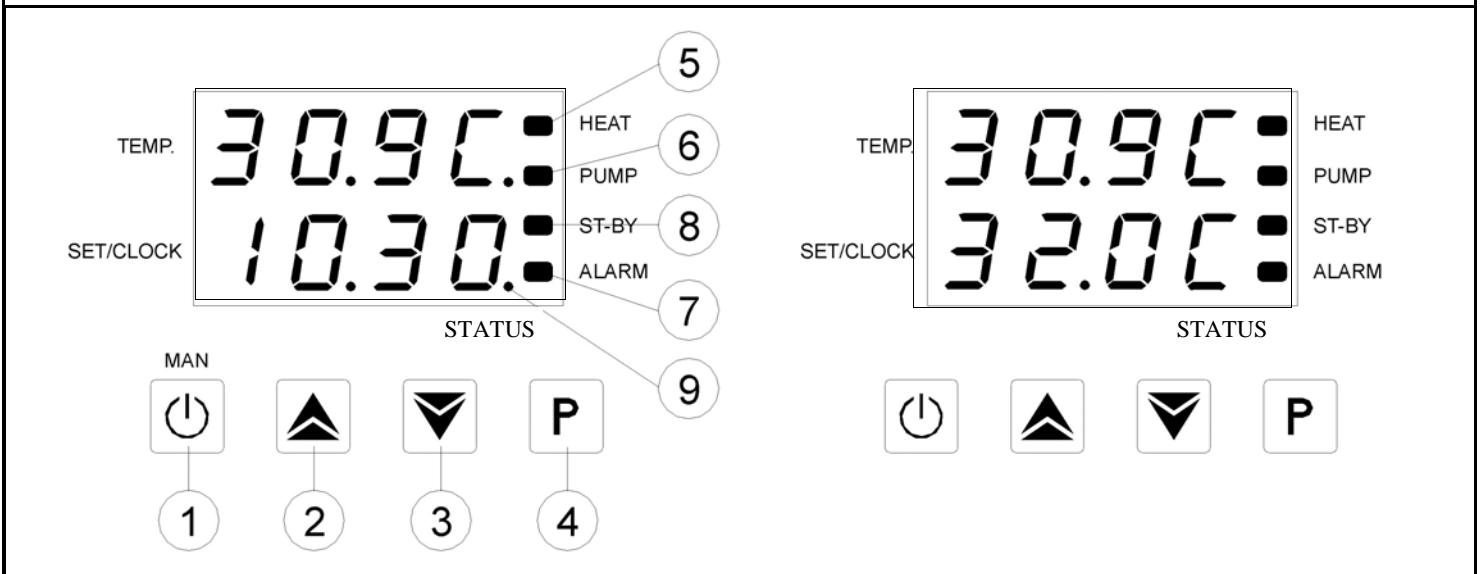
FLOW REQUIREMENTS

The flow switch fitted in the T-Piece requires a minimum flow rate of 4,000 Litres-per-hour.

Title:	Elecro Engineering Ltd Pool-Smart Schematic Diagram	
Author: Elecro Engineering Ltd		
Date: 05/02/2007		Sheet: 1.1
Revision: 1.1		

POOL-SMART DIGITAL CONTROLLER KEY

The Elecro Pool-Smart has been pre-programmed with all the necessary parameters to ensure reliable service & operation. Below is a key explaining the controllers buttons & LED signals however these will all be explained in detail later in this booklet.

Item Number	Description
1	On - Off / Man button. When pushed for longer than 1 second switches the controller to standby mode. When pushed momentarily and released overrides the timed ON or OFF position .
2	Up Button - Used to increase the value.
3	Down Button - Used to decrease the value.
4	P Button - Used to access the time clock parameters & the peak rate (day time) set point temperature.
5 Fully Illuminated	When fully illuminated shows the pool water temperature has fallen more than 0.6°C below the current set point temperature.
5 Flashing	When flashing shows the Pool-Smart is in timed delay mode (explained on page 6).
6	Shows the filter pump is on when pump interlock cable is fitted.
7	Shows an Alarm condition.
8	Shows the Pool-Smart is in standby mode.
9	LED STATUS - Shows the heater is in a timed ON period when illuminated.

SET THE CURRENT TIME

When the Pool-Smart has been installed and connected to a constant power supply the first step is to set the current time:
1.) Press and hold the P button for 2 seconds until the upper (red) display shows CLOC.
2.) Press and release the P button so that the lower (green) display shows the existing time setting.
3.) Use the Up or Down arrow buttons as required until the current time is displayed in the lower (green) display.

4.)   Press and release the P button once more so that the upper (red) display reverts to displaying CLOC.

The current time has now been programmed and after 20 seconds the Pool-Smart will permanently store the new time. In the event of a power failure you may need to re-programme the clock settings.

PROGRAMME THE ON & OFF TIME PERIODS

NOTE - To start the swimming season and to bring the swimming pool up to temperature as quickly as possible it is advised that you operate your heating device continuously. Once the set point temperature has been reached, the Pool-Smart can then be programmed to operate utilising off-peak fuel tariffs in the timed mode.

The Pool-Smart digital controller has 4 programmable On & Off time periods (or zones much like your central heating system in your home). You may use as many or as few as you wish by following the below procedure:

1.)   Press and hold the P button for 2 seconds until CLOC is displayed in the upper (red) display.
2.)   Press and release the down button until 1on is displayed in the upper (red) display.
3.)   Press and release the P button, the lower (green) display will now show OFF (the current setting).
4.)   Using the Up button scroll through until the time you would like your heating device to first come on is displayed in the lower (green) display.
5.)   Press and release the P button so the upper (red) display reverts to showing 1on.
6.)   Press and release the down button once so that the upper (red) display is now showing 1of.
7.)   Following the same process as step 4 select the time you would like your heating device to switch off.

Follow steps 3 to 7 for the remaining 3 on and off time periods (labelled 2on, 2of, 3on, 3of, 4on & 4of) if you wish to use all 4 time settings. If you only wish to use 1 or part of the settings simply leave the existing setting as OFF.

SET POINTS

The Elecro Pool-Smart has been designed to operate as cost effectively as possible utilising 2 programmable set points:
·   An off-peak set point when fuel is at it's lowest cost (usually at night time).
·   And a peak-rate set point when fuel is most expensive (usually during the day).

The 2 set points enable you to set a higher off-peak set point to take advantage of the cheaper fuel rates, whilst the peak-rate set point can be set at a lower temperature (2 degrees C is recommended).

To access the off-peak set point press the up or down buttons as required – the off-peak set point will then be displayed in the lower (green) display. When the lower (green) display is showing your desired off-peak set point temperature do not touch any buttons for 15 seconds and the heater will then permanently store the new off-peak set point.

During any timed ON position the Pool-Smart will now control the swimming pool to the desired off-peak set point temperature.

To access the day time / peak rate set point:

1.) Press and hold the P button for 2 seconds until CLOC is displayed in the upper (red) display.
2.) Press and release the Up button twice until SPoF is displayed in the upper (red) display.
3.) Press and release the P button. The lower (green) display will now show the existing peak rate (day time) set point.
4.) Using the Up or Down buttons as required until your desired peak-rate set point is shown in the lower (green) display.
5.) Press & release the P button so that SPoF is displayed in the upper (red) display.
6.) Do not touch any buttons for 15 seconds and the heater will then permanently store the new off-peak set point.

Set Point Note - The set point is the maximum temperature that the Pool-Smart will allow the water to be heated to. Upon reaching the set point temperature the Pool-Smart will turn the heating device off. Increasing the set point does not increase the power output of the heating device.

NOTE - If you do not wish to use your timer and would like your heating device to switch on whenever required day or night, simply use the Up & Down arrows to select the set point you require. Then press and release the ON / OFF button so that the status LED illuminates. In this mode the heater will control the pool temperature to the desired set point day or night.

CIRCULATION PUMP INTERLOCK

The Pool-Smart can also control the circulation pump by switching the circulation pump on & off whenever the Pool-Smart is in a timed On position or whenever the swimming pool temperature has fallen below the peak rate (day-time) set point. To connect the pump to the Pool-Smart you will need to connect to terminals numbered 3 & 4 within the Pool-Smart.
NOTE—The largest pump that can be connected directly to the Pool-Smart is 1.5HP (horse power) - any pump larger than 1.5HP **Must** be connected via an external contactor.

PRIORITY HEATING

Now you have set the current time, On & Off time periods & set points your Pool-Smart is now ready to control your heating device as efficiently as possible.
During any timed ON period the Pool-Smart will automatically control the swimming pool temperature to the off-peak (night time) set point that you have selected. When in a timed OFF period the heater will check the swimming pool temperature once every hour by switching on the circulation pump for 5 minutes. If when the temperature measurement is taken and the water temperature has dropped below the day-time set point the Pool-Smart will switch on your heating device and remain on until the day time set point has been achieved. When the day time set point has been achieved the Pool-Smart will switch off your heating device and after 5 minutes the Pool-Smart will then turn off the pump.
The Pool-Smart will continue to monitor the swimming pool temperature throughout any timed OFF period once every hour and if required switch on the heating device & heat the pool to the day time set point as described above.

TIME SWITCHING DELAY

To prevent overheating of the switch components within your heating device caused by frequent on and off switching (cycling), the Pool-Smart digital controller has been pre-programmed with a time delay function. This prevents rapid fluctuations in temperature or velocity from switching the heating device on and off more than once in a two minute period.

The time delay mode is indicated by the flashing LED next to the word HEAT on the digital display. (See diagram on following page).

DIFFERENTIAL

When the pool water has reached the set point temperature (for that time period) the Pool-Smart will switch off the heating device and it will not allow the heating device to switch back on until the water temperature has dropped 0.6˚C. This value is known as the differential and is also in place to prevent overheating of the switch components caused by cycling.
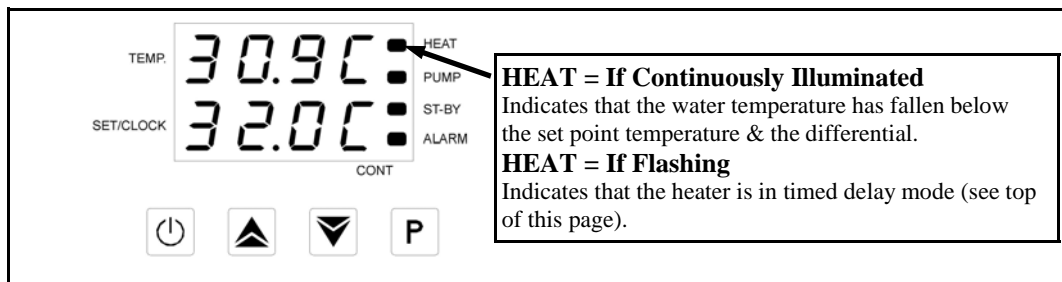
TROUBLE SHOOTING

Heating device will not switch to HEATER ON mode

In most cases this will be the result of one of the following not being met.
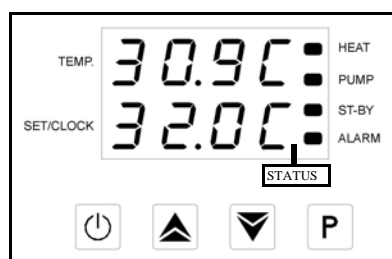
Possible Cause 1.) The set point temperature has been achieved.

To confirm that the digital controller is requesting the heating device to heat check that the window next to the word HEAT is illuminated (see diagram below). If illuminated go to step 2, if not illuminated increase the set point temperature to a value higher than the current water temperature. Confirm whether the heating device now switches on

HEAT = If Continuously Illuminated
Indicates that the water temperature has fallen below
the set point temperature & the differential.
HEAT = If Flashing
Indicates that the heater is in timed delay mode (see top
of this page).

Possible Cause 2.) The heater is in a Timed-OFF period

The time clock ON or OFF status is shown by the LED illuminating above the word STATUS (see diagram below).

TROUBLE SHOOTING CONTINUED

If the Status LED is illuminated, check the set point value (as explained on previous page).
If the status LED is not illuminated you have the following 2 options available:
1.) Increase the off-peak set point (explained on page 6) OR
2.) Press and release the power button to override the time clock (Also explained on page 6).
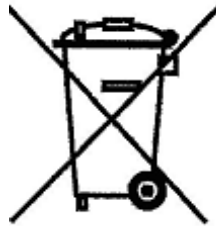
Possible Cause 3.) Insufficient Flow.
The display will display a NoFlo alarm message in the upper (red) display window when the digital controller has detected that the flow rate has dropped below 4,000-litres per hour or has stopped completely.

Useful advice: To reduce running costs and speed up the heating process ;
Insulate the pool wherever possible. A floating solar cover is an essential minimum to retain heat.

WASTE OF ELECTRICAL / ELECTRONIC EQUIPMENT

This product complies with EU directive 2002/96/EC
Do Not dispose of this product as unsorted municipal waste.
This symbol on the product or on it's packaging indicates that this product should not be treated as household waste. Instead it should be handed over to the applicable collection point for the recycling of electrical and electronic equipment.

By ensuring this product is disposed of correctly you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources. For more information please contact your local Civic office, your household waste disposal service or the retailer where you purchased the product.

RoHS COMPLIANCE STATEMENT

Elecro Engineering Limited certify that our Electric Swimming Pool Heater Range complies in accordance with RoHS Directive 2002/95/EC on the restriction of hazardous substances.

GUARANTEE

Your Pool-Smart is guaranteed for 1 year from the date of purchase against faulty workmanship and materials.

The manufacturer will replace or repair, at it's discretion, any faulty units or components returned to the company for inspection. Proof of purchase may be required.

The manufacturer will not be liable in cases of incorrect installation of the controller, or inappropriate use, or neglect of the controller.

CE Declaration Of Conformity
The manufacturer declares that the herewith products or ranges

POOL SMART DIGITAL CONTROLLER RANGE

Are in conformity with the provisions:
of the ELECTROMAGNETIC COMPATIBILITY directive 89/336/EEC, as amended 93/068/EEC. Controlled by AEMC Measures laboratory—technical report no P96045T

The harmonised standards have been applied: EN 55014—EN 55104

EN 55011
EN 55022
CEI 801-4
CEI 801-2
CEI 801-3

of the LOW VOLTAGE directive 73/23/EEC.
The harmonised standards have been applied
EN 60335-2-35

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