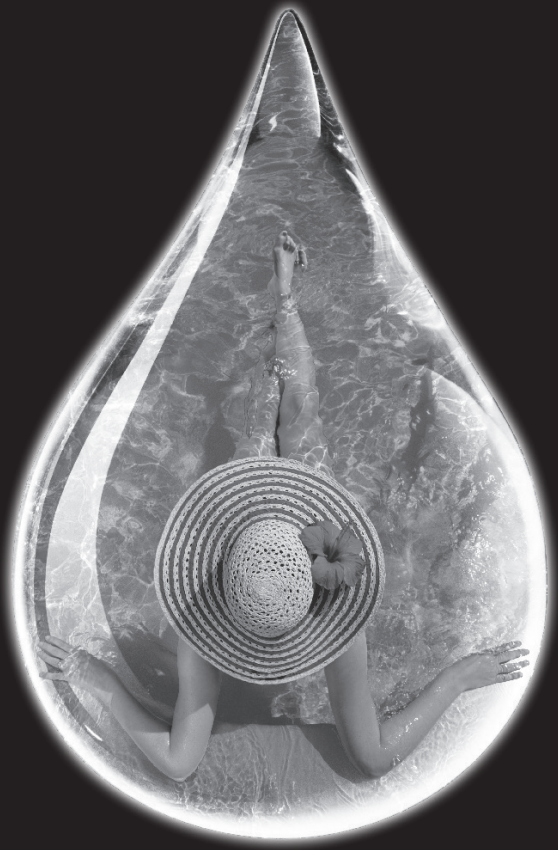
Touchscreen Optima Compact Pool Heater

Installation & Operating Manual



HeatPumps 4Pools

ELECRO ENGINEERING

Important Notes!

Thank you for purchasing the Optima Compact direct electric swimming pool heater manufactured in England to the highest standards.

To ensure your new heater will give years of trouble free service **please carefully read the following instructions. Incorrect installation will affect your warranty.**

Do not discard this manual, please retain for future reference.

The appliance is not to be used by children or persons with reduced physical , sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction. Children should be supervised to ensure they do not play with the appliance.

Product Overview

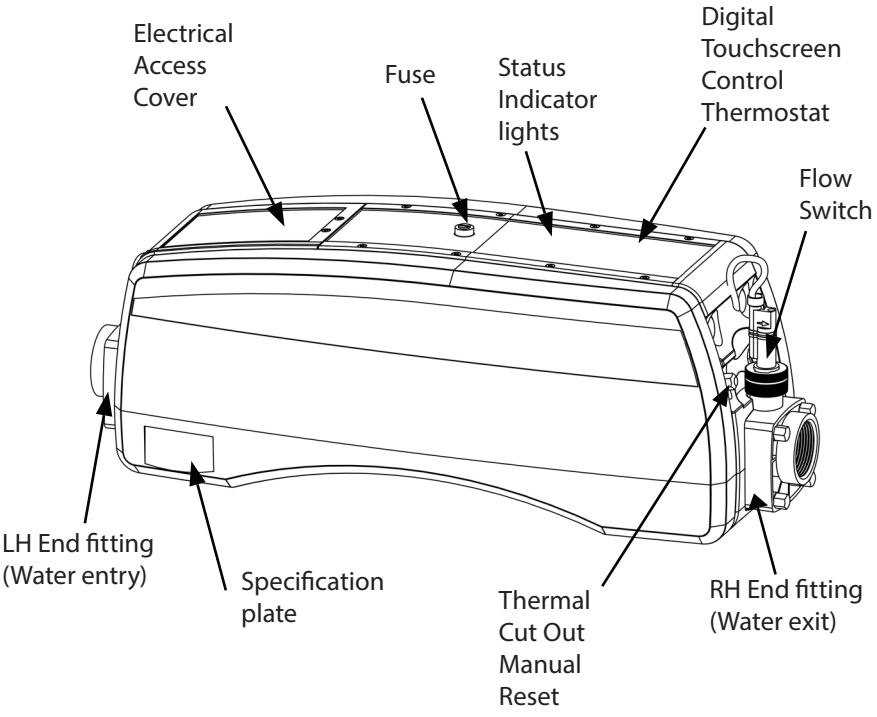


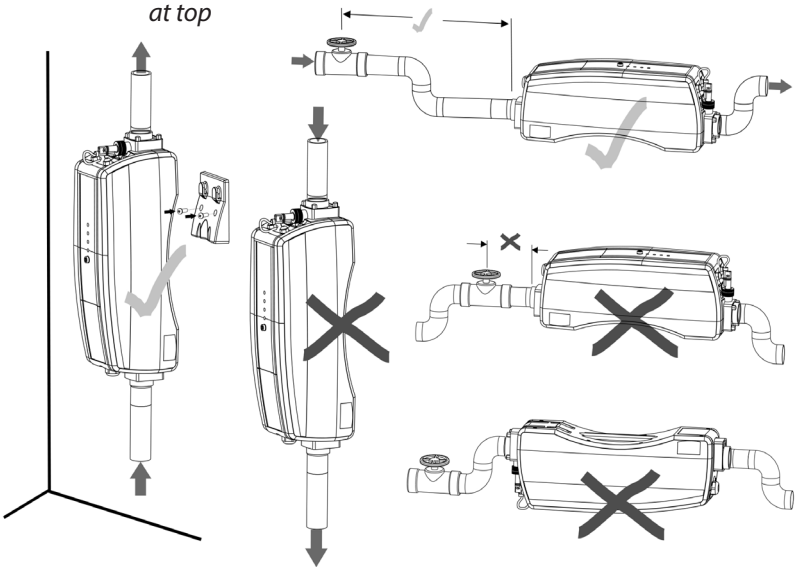
Fig 1.

Positioning

Your heater should be horizontally or vertically sited allowing sufficient space for pipe connections and wiring.

Wall mount

Flow switch at top



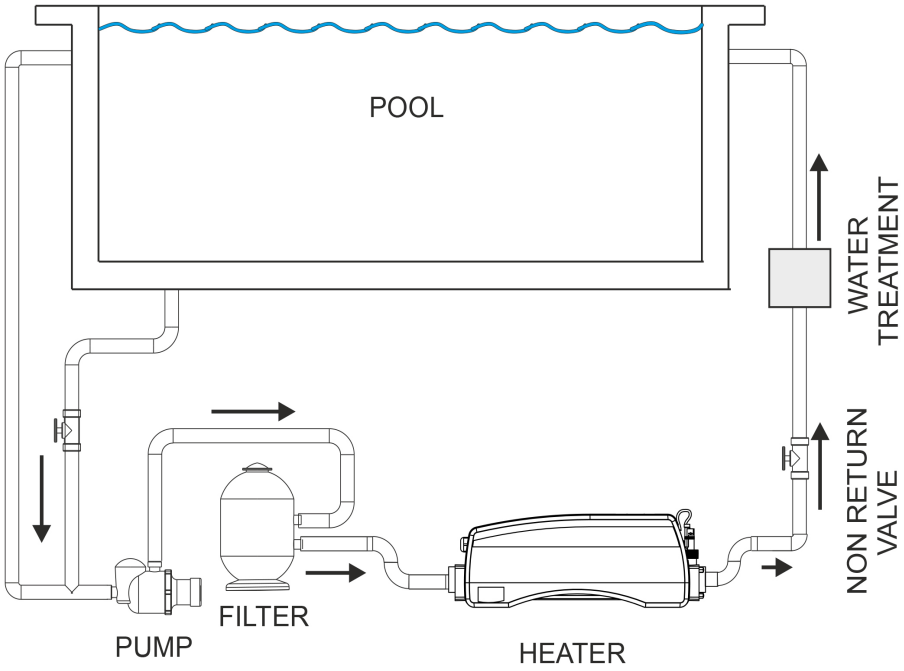
For vertical wall mounting water must always enter at the bottom

Floor mount

Fig 2.

The heater should be installed downstream of (after) the filter and upstream of (before) any dosing or other water treatment plant. It is essential that a non-return valve is positional between the heater and any water treatment/dosing product (see fig.3).

Fig 3.



Pipe Work

It is essential that the pipe work connecting to and from the heater has a minimum bore (internal diameter) of 1¼" (32mm). The heater **must** be installed within a dry weather proof enclosure.

Caution! *If the heater is not used during winter months it must be drained to prevent frost damage.*

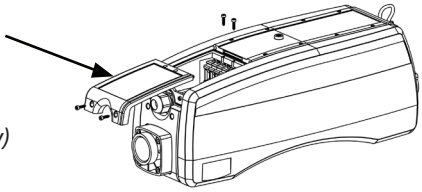
Electrical Connection

The heater must be installed in accordance with the country / regional requirements and regulations. In any event the work must be carried out by a qualified electrician, who will provide a certificate of conformity upon completion of the work. The power supply **must** be fitted with a RCD.

Cable section: This should be calculated at 5-amp / mm² for distances up to 20 metres (these sections are indicative and should be checked and adapted if necessary for cable lengths over 20 metres).

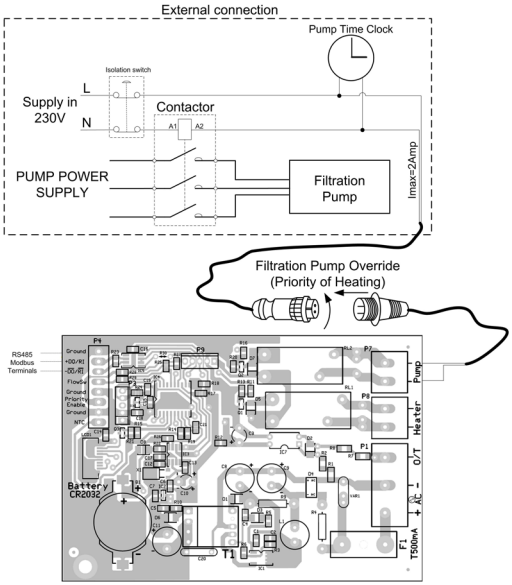
Fig 4.

Remove Access Cover to make the electrical connections (Qualified electricians only)



Wiring Diagram

The below wiring diagram shows how to connect the Priority of Heating and MODBUS (BMS) connections (explained later in this manual)



Power Requirements

All Optima Compact heaters are fitted with their own specification plaque that details the power requirements for the heater. Below is a table of power requirements for standard 230/400V models - if your voltage is not listed please refer to the specification plaque on the product.

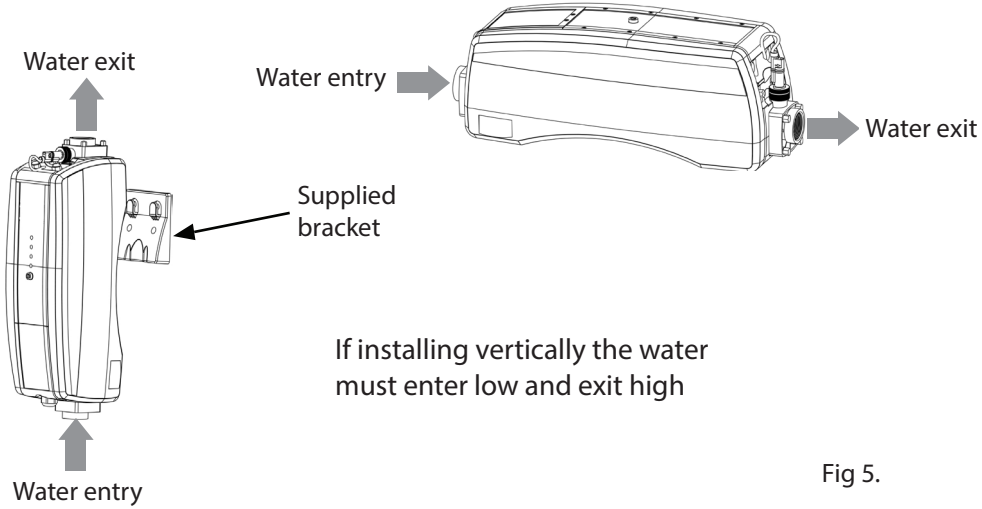
Single Phase Power Output	Voltage (V)	Load (Amp)
3-kW	230	13
6-kW	230	27
9-kW	230	40

3 Phase Power Output	Voltage (V)	Load (Amp)
15-kW	400	22
18-kW	400	26
24-kW	400	35

Versatile Power Output (1/3 Phase Models)	Voltage (V)	Load (Amp)
6-kW	230/400	27 / 9
9-kW	230/400	40 / 13
12-kW	230/400	53 / 18

3 Phase Power Output	Voltage (V)	Load (Amp)
6-kW	230	15
9-kW	230	23
12-kW	230	31
15-kW	230	38
18-kW	230	46

Flow Requirements



If installing vertically the water must enter low and exit high

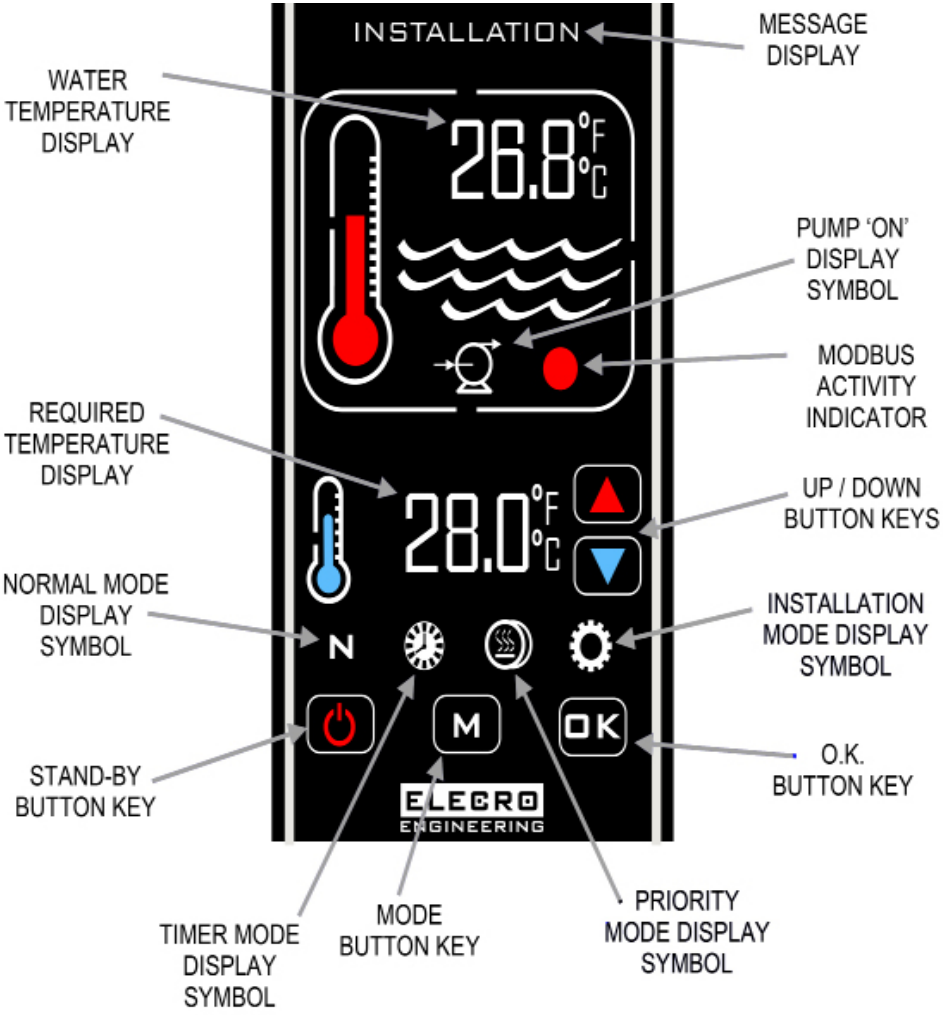
Fig 5.

The flow rate of water into the heater must not exceed 17,000 litres per hour (17m³/h) / 3,740 UK gallons/hour. A higher flow rate will require the installation of a bypass. The heater will not operate unless the following minimum flow rates are achieved ie:

1,000 litres / hour (1m³/h) / 220 UK gallons/hour for 2 ~ 6-kW heaters and 4,000 litres / hour (4m³/h) / 880 UK gallons/hour for 9 ~ 24-kW heaters.

Digital Touchscreen Controller Overview

The Touchscreen digital controller has been pre-programmed with all the necessary parameters to ensure reliable service & operation. Below is an overview indicating the controller button keys and graphical symbols.



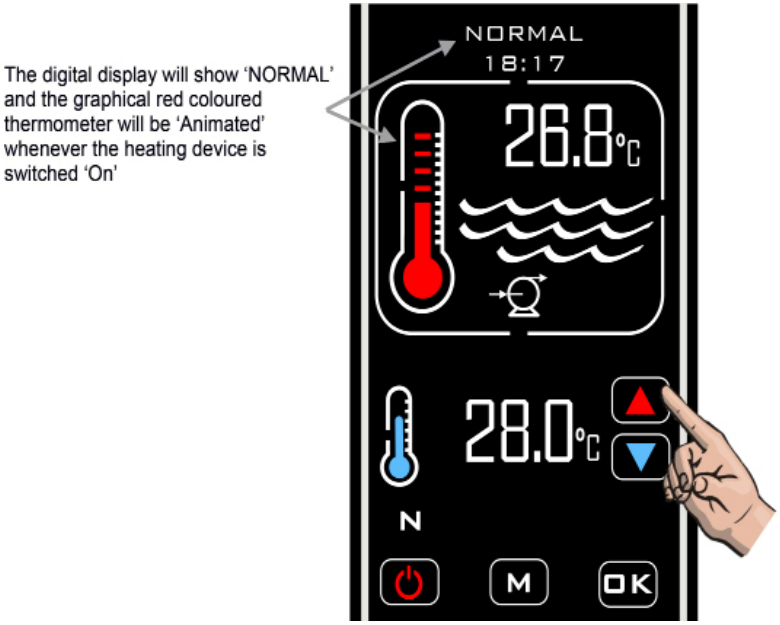
Operating Instructions

On initial power up of the heater the digital display will be illuminated.

The heater will only be switched 'On' when the following criteria are met i.e:

• Water circulating pump is 'On' delivering in excess of the minimum flow requirement (see page 5)

• The required temperature is set to a higher value than the actual water temperature.



The actual pool water temperature is shown in the upper area of the display. The required temperature is shown in the lower area of the display. The required water temperature can be adjusted by touching the 'UP / DOWN' touch button keys until the required temperature is displayed, adjustments are in 0.1°C increments.

Priority of Heating is a function that ensures your pool water is constantly maintained at your required temperature. When Priority of Heating is activated the Symbol will be displayed on the screen.

The controller will then monitor the pool water temperature, and start both the pool circulation pump and heating process when necessary.

Time Switching Delay

To prevent overheating of the switch components within the heater caused by frequent on / off switching (cycling) the controller has been pre-programmed with a time delay function.

When time switching delay is activated the message display will show 'HEATER DELAY' for 2 minutes.

Differential

When the pool water has reached the required temperature the heater will switch off and will not switch back on until the water temperature has fallen 0.6°C below the required temperature.

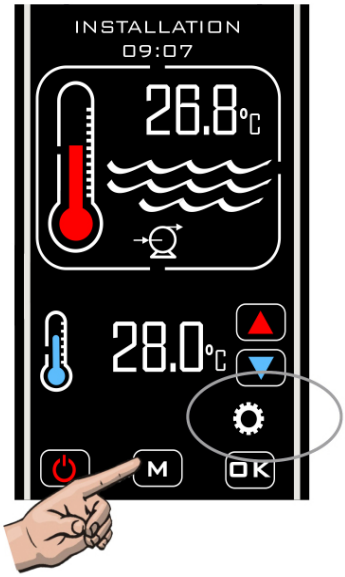
Operating Modes

There are five operating modes:

Normal Timer Priority Installation Standby

The required Modes are selected by touching the 'M' button key, each touch causes the mode to change to the next mode. The display will indicate which mode is currently selected together with the clock time.

(Example illustrated 'INSTALLATION' mode)



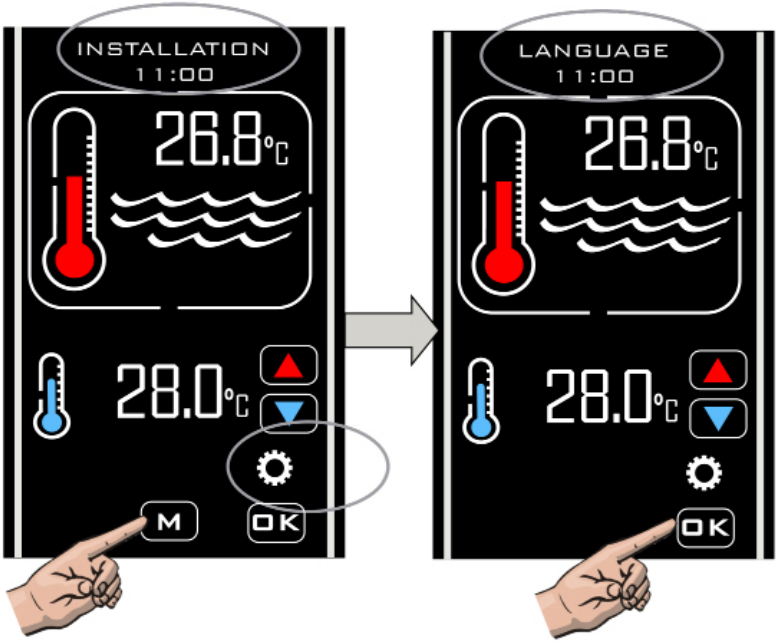
Installation Mode

When entering Installation mode the heater and pump will immediately be turned off (if they are on) and will not be permitted to be turned on while the controller remains in any of the setup menus. On exiting the 'Installation' mode the controller will revert to the 'Normal' mode and follow the same procedure as if first entering that mode, the display will reflect this.

- LANGUAGE (English, French, German, Spanish and Russian)
- UNITS (temperature units; centigrade or fahrenheit)
- CLOCK (set current time)
- TIMER (four time settings for switching the heater 'On' and 'Off')
- PROBE CAL (Temperature calibration adjustment)
- MODBUS (Set Baud rate, address and parity for BMS connection)
- FACTORY (Access restricted)
- EXIT

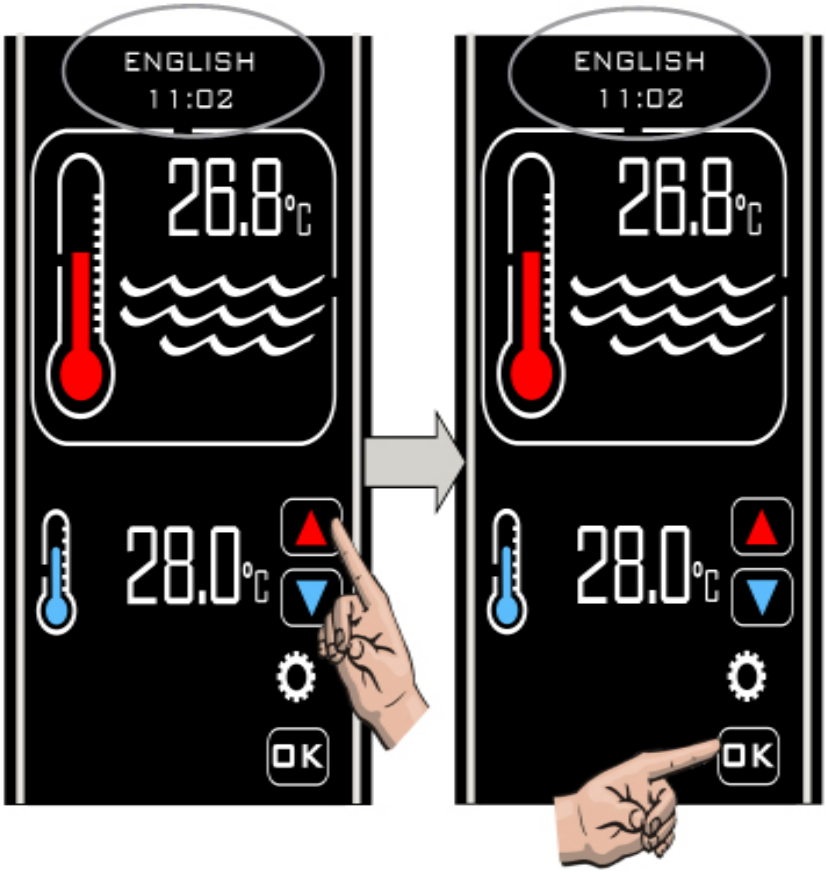
Language Setup

Enter the 'INSTALLATION' mode by touching the 'M' button key repeatedly until 'INSTALLATION' appears at the top of the display then touch the 'O.K'. Button key.



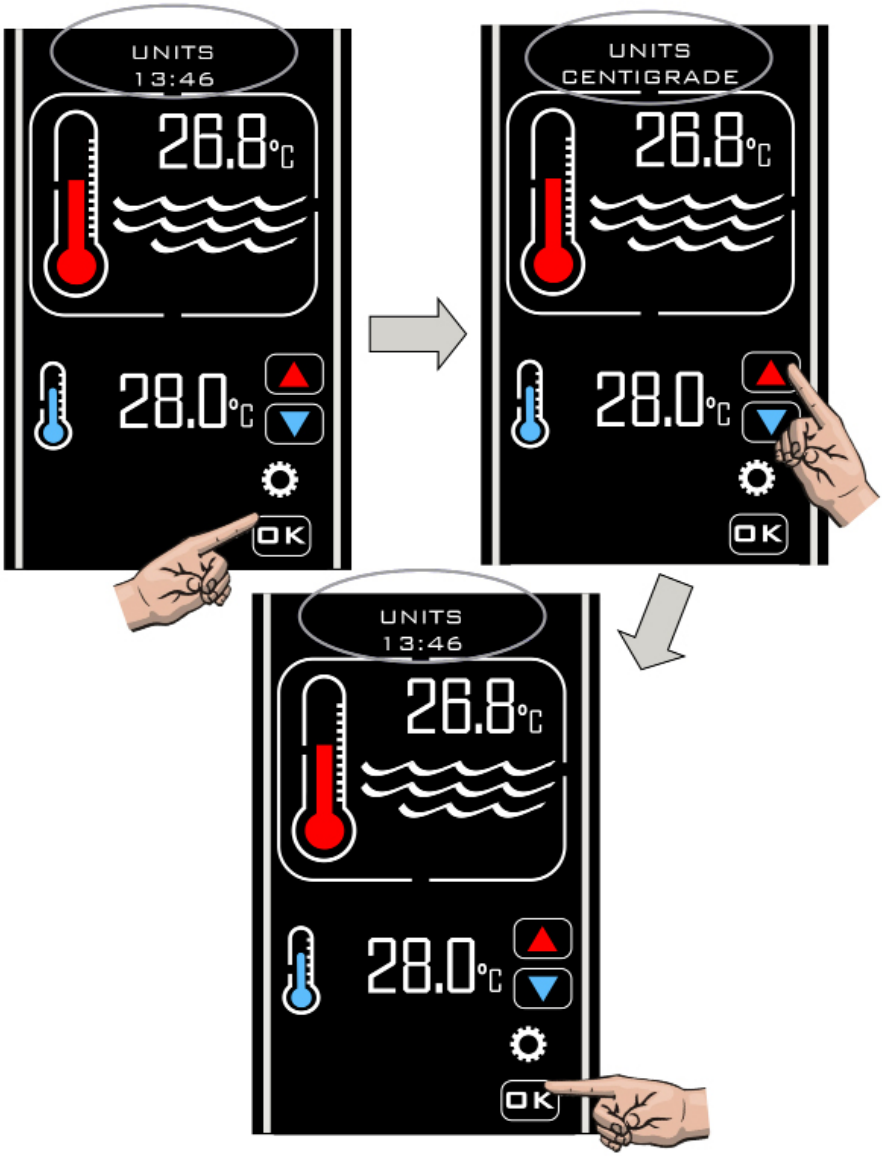
Language Setup continued

Touch the ‘UP’ / ‘DOWN’ button keys until the desired language is displayed then touch the ‘O.K’ button key to select



UNITS Setup

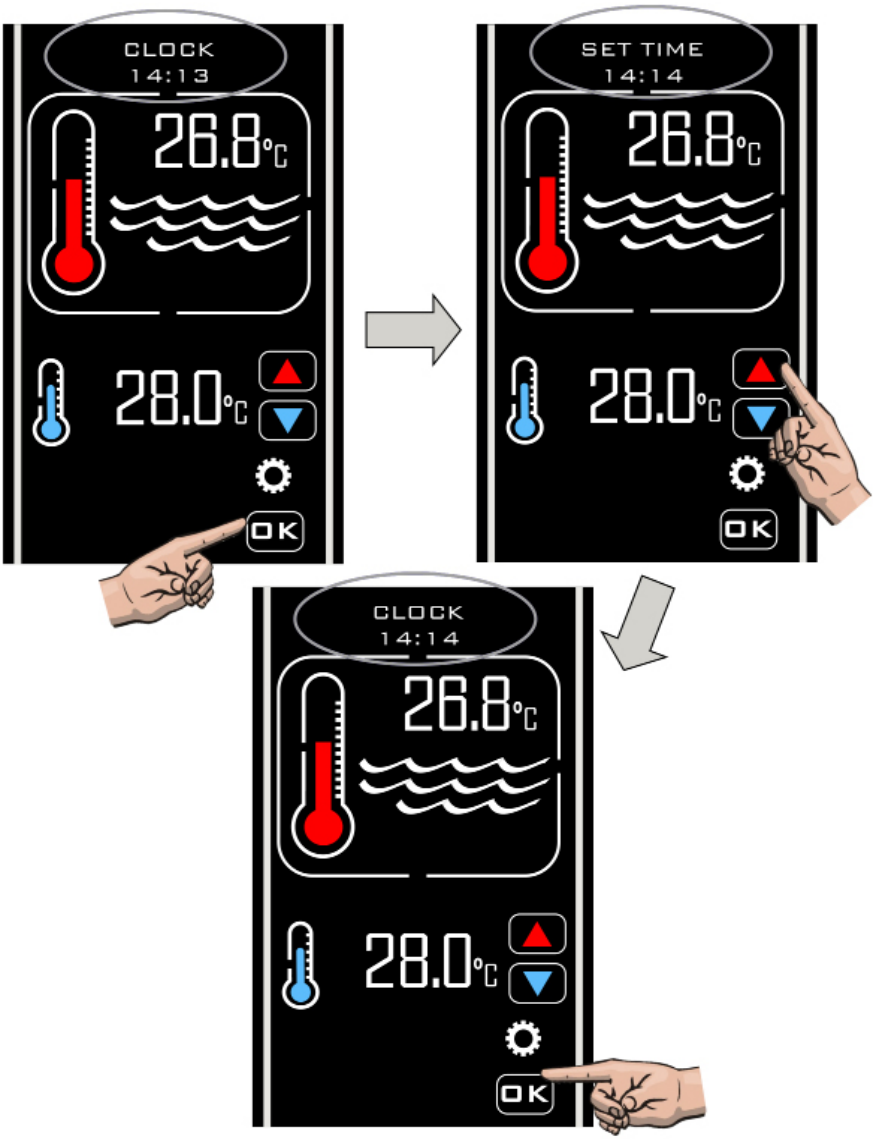
After selecting 'O.K.' For the language setup the display will then revert back to show 'LANGUAGE' touch the 'UP' / 'DOWN' button keys again to display the next option which is 'UNITS' touch the 'O.K.' Button key to select, the display will show 'UNITS' and 'CENTIGRADE' touch the 'UP' / 'DOWN' button keys to change to 'FAHRENHEIT' if required, touch the 'O.K.' Button key to select and save, the display will then revert back to 'UNITS'.



CLOCK Setup

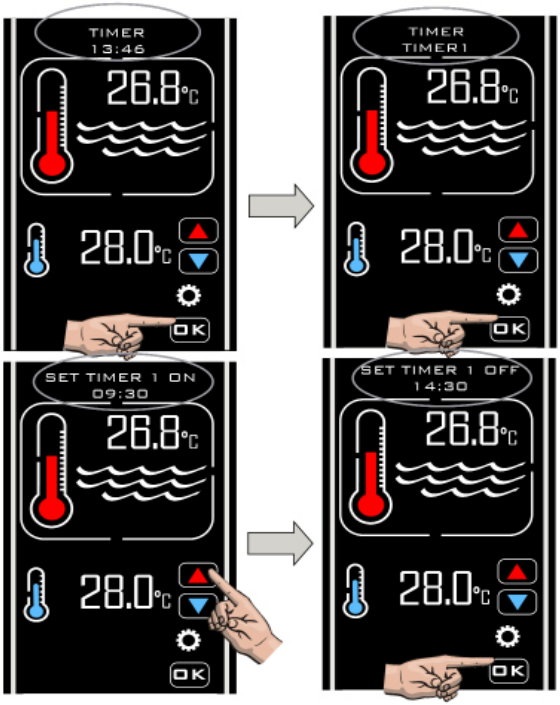
Touch the 'UP' / 'DOWN' button keys to display the next option which is 'CLOCK' touch the 'O.K.' Button key to select, the display will show 'SET TIME' and the current clock time, touch the 'UP' / 'DOWN' button keys to change the clock time, touch the 'O.K.' Button key when the time is correct to save.

Note: The time can only be set in the 24 hour format.



TIMER Setup

After selecting 'O.K.' for the 'CLOCK' setup the display will then revert back to show 'CLOCK', touch the 'UP' / 'DOWN' button keys until 'TIMER' is displayed, touch the O.K. Button key to select, 'TIMER 1' will be displayed, touch the O.K. Button key to select and 'SET TIMER 1 ON' will be displayed, touch the 'UP' / 'DOWN' button keys to set the required time, touch the O.K. Button key to save the setting, 'SET TIMER 1 OFF' will be displayed, touch the 'UP' / 'DOWN' button keys to set the required time, touch the 'O.K.' Button key to save the required time, the display will then show 'TIMER 2' repeat the same procedure for all four 'ON' / 'OFF' timer settings, select 'EXIT' If any Timers are not required set the 'ON / OFF' times the same.



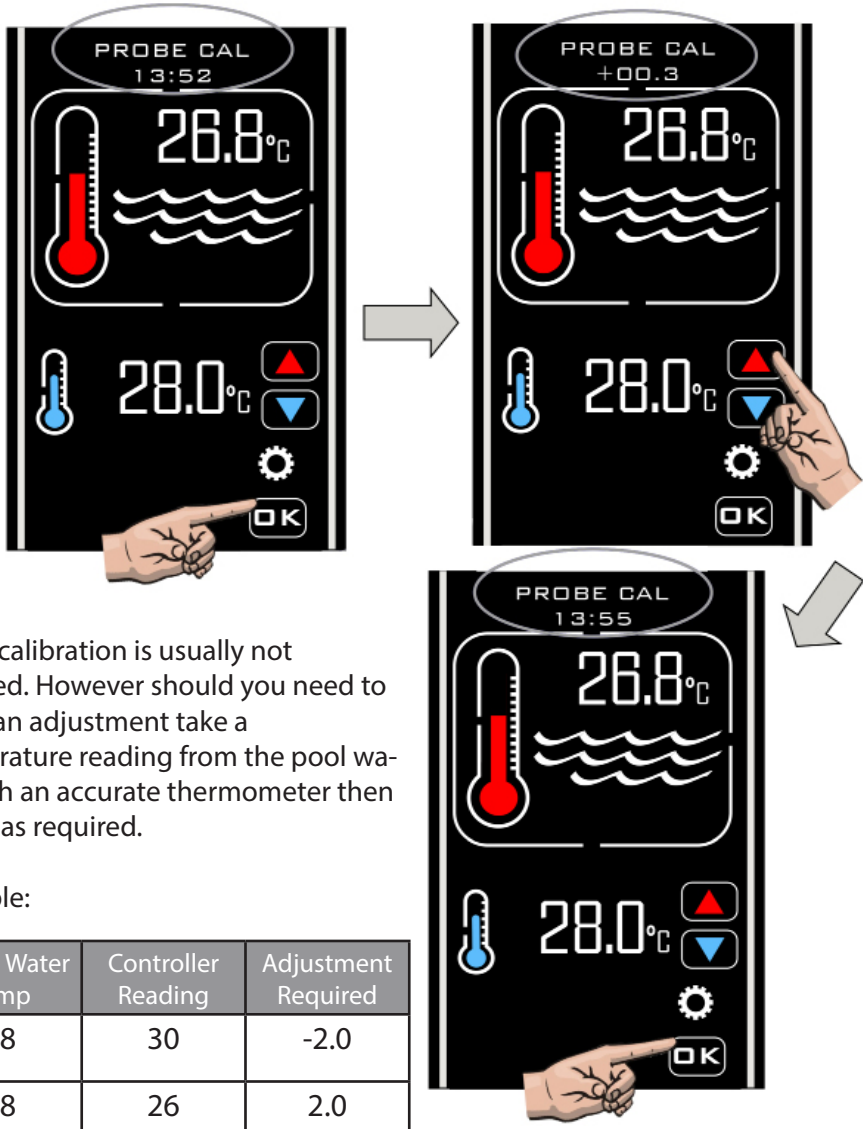
The timer mode allows you to create up to 4 on and off time periods when you would like heating to take place. These can be set to take advantage of
off-peak energy tariffs, or to ensure your pool is at the required temperature during specific time periods.

The controller allows you to override the time clock at any point by activating the Priority of Heating Mode explained on page 19.

Note: The time clock will only control the heating time periods and not

Probe Calibration Setup

After selecting 'EXIT' for the timer setup the display will then show 'PROBE CAL' touch the 'O.K.' Button key to select, touch the 'UP' / 'DOWN' button keys to increase or decrease the temperature calibration adjustment, touch the 'O.K.' Button key to select, the display will then revert back to show 'PROBE CAL'



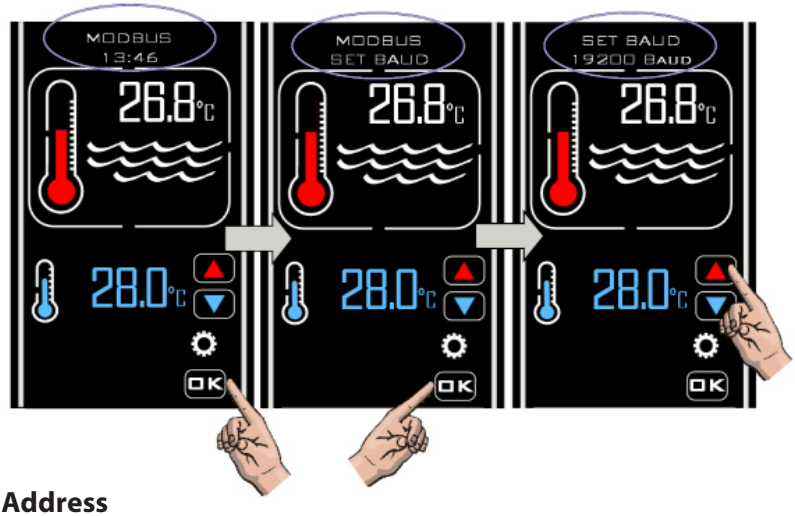
Probe calibration is usually not required. However should you need to make an adjustment take a temperature reading from the pool water with an accurate thermometer then adjust as required.

Example:

Actual Water Temp	Controller Reading	Adjustment Required
28	30	-2.0
28	26	2.0

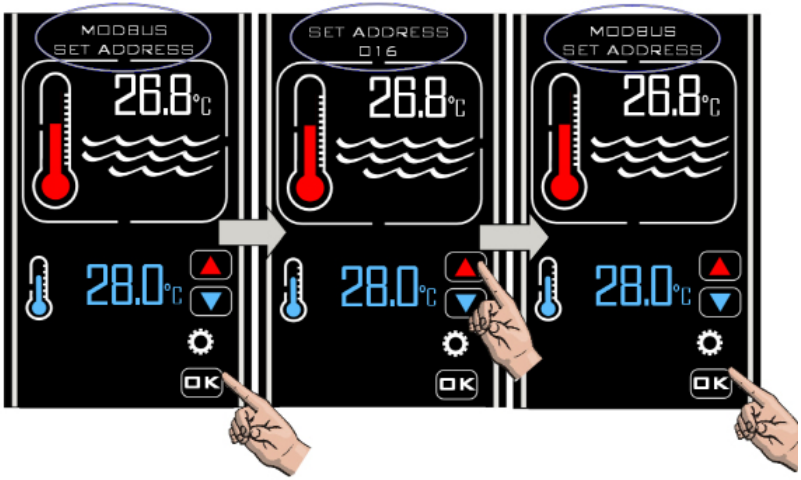
MODBUS Setup

Refer to your BMS Management System manual for the required settings. SET BAUD Touch the 'O.K.' Button key to select, 'MODBUS SET BAUD' will be displayed, touch the 'O.K.' Button key to select and 'SET BAUD 19200 Baud' will be displayed, touch the 'UP' / 'DOWN' button keys for the other option ' SET BAUD 9600 Baud' touch the O.K. Button key to select the required, Baud rate.



Set Address

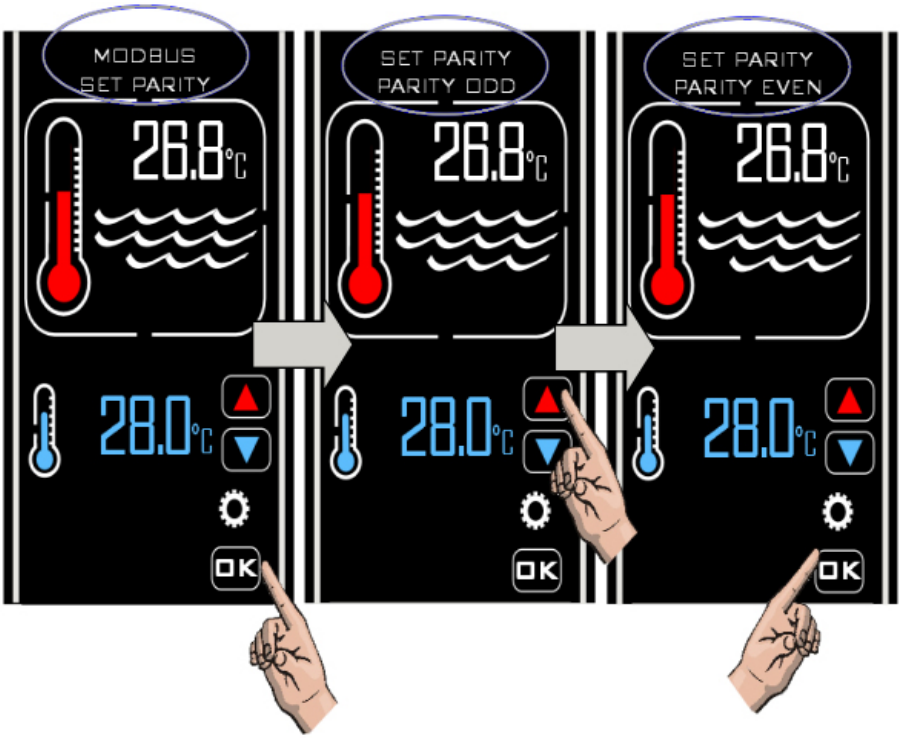
Touch the 'UP' button and 'MODBUS SET ADDRESS' will be displayed, touch the 'UP' / 'DOWN' button keys to set the required address, touch the 'O.K' button key, the display will revert back to show 'MODBUS SET ADDRESS'



MODBUS Setup continued

Set Parity

Touch the 'OK' button key to select 'MODBUS SET PARITY' and 'PARITY ODD' will be displayed Touch the 'UP' / 'DOWN' button keys to change 'PARITY ODD' to 'PARITY EVEN' or 'PARITY NONE' touch the 'O.K' button key to select the required setting, the display will now revert back to show 'MODBUS SET PARITY' touch the 'UP' button key and 'MODBUS EXIT' will be displayed, touch the 'OK' button key to select 'EXIT' and the display will show 'MODBUS' Touch the 'UP' button key and the display will show 'FACTORY' touch again and 'EXIT' will be displayed, touch 'OK' and the controller will exit the 'INSTALLATION' mode and revert to 'NORMAL' mode.



Once configured the MODBUS connection will enable the controller to be switched 'on' and 'off' (into and out of standby mode) remotely via an external BMS device.

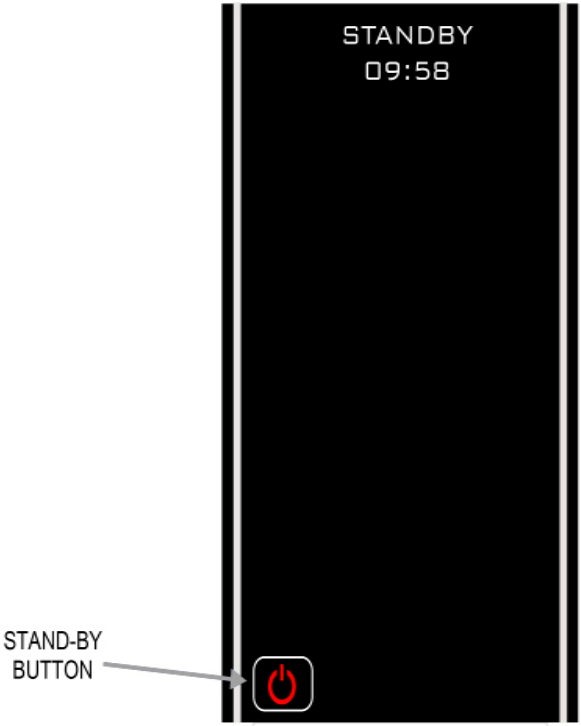
FACTORY Setup

This category has restricted access

Standby Operating Mode

When in Standby mode the controller will display the text 'STANDBY', Clock time and the Standby button key (as below).

When in this mode the internal clock continues to run but there is no other functionality apart from the Standby button key.

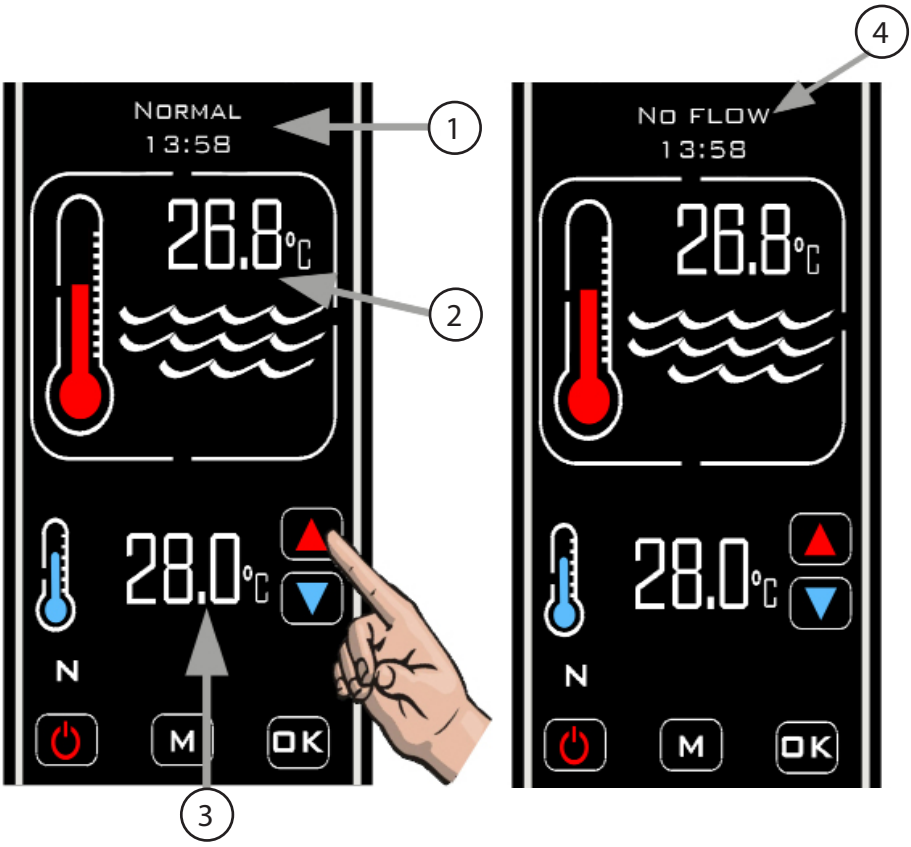


Normal Operating Mode

Under normal conditions when the controller is connected and 'On' and flow has been detected by the flow switch the controller display will be as shown below indicating the following information:

1) 'Normal' and 'Time'
2) Actual water temperature
3) Required temperature

4) If the Flow switch does not detect sufficient flow the message 'NO FLOW' will be shown on the Display.



Timer Mode

To activate the Timer mode, touch the 'M' button key until the 'TIMER' symbol is displayed (see below)

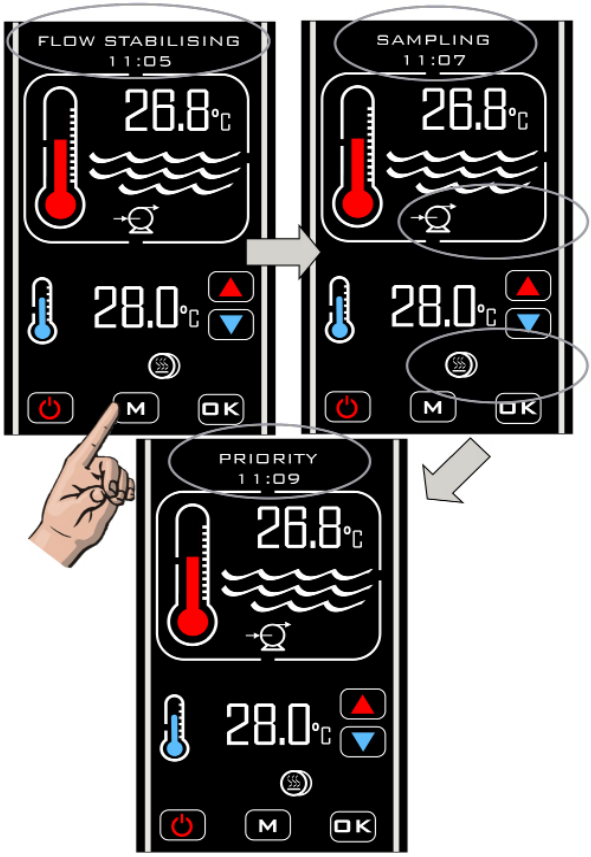
In this mode the controller will only heat during a timed on period and when receiving sufficient flow.

If no or insufficient flow is being received no heating will take place.

When in a timed off period no heating will take place.

Priority of Heating Mode

To activate the 'Priority of Heating' mode touch the 'MODE' button key until the 'PRIORITY' symbol is displayed, the message 'FLOW STABILISING' will be displayed, after two minutes the display will change to show 'SAMPLING' and after a further two minutes the display will change back to 'PRIORITY'



Once the 'Priority of Heating' feature has been enabled the controller will take a water temperature sample every hour and the message 'SAMPLING' will be displayed.

If the pool water temperature is below the required temperature, the heater will switch on until the required temperature is reached. When the required temperature is reached the heater will switch off, followed by the filtration pump.

'Pump Delay' will be displayed for one hour, then a new water temperature sample will be taken, if the sampled water is at or above the required temperature no heating will take place and the controller will switch the circulation pump off (pump delay will be displayed) then one hour later take a new temperature sample.

The squence will continue to repeat until 'Priority of Heating' is switched off.

Priority of Heating and Timer Mode

To activate the 'Priority' and 'Timer' modes together touch the 'M' button key until both symbols & are displayed.

In this mode the controller will heat whenever it is receiving flow during a timed on period and 'Priority of Heating' will take place whenever the timer is 'OFF'.

Water Quality

The water quality **MUST** be within the following limits:
PH 6.8 - 8.0
TA (Total alkalinity) 80—140ppm (parts per million)
Chloride Content MAX: 150 mg/litre
Free Chlorine: 2.0 mg/litre
Total Bromine: Max 4.5 mg/litre
TDS (Total Dissolved Solids) / Calcium hardness 200— 1,000ppm
Optima Compact heaters are suitable for use with salt water pools with a salt concentration up to 8000ppm (8g/litre).
For salt water pools with a greater salt content (such as sea water pools) the Optima Compact Plus heater is required.
Water chemistry is complicated if in doubt seek expert advise.

Quick Function Test

Observe the main electricity meter when the heater is on (ie: thermometer on the display is animated) and then observe it again when the heater is in the standby mode. The test should show that the meter is recording more electricity being used by the heater when heating. It is impossible for an electric heater to waste energy, if it is drawing power then that power will be turned into heat that will be transferred to the water.

Accurate Function Test

If a more accurate test is required to confirm that your heater is delivering the specified heat output, two electricity meter readings will need to be taken from the properties main electricity meter, with an exact one hour interval (ie: take one meter reading and then a second reading exactly one hour later) then by subtracting the first reading from the second reading the number of units (kilo watts / kW) consumed can be calculated. Note that your heater is also rated in kW hours.

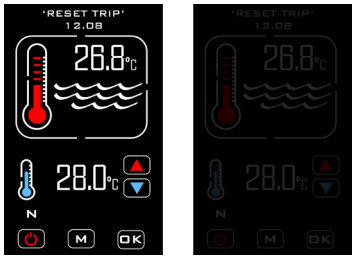
Trouble Shooting

HEATER WILL NOT SWITCH TO 'Heater on'

In most cases this will be the result of one of the following points not being met:

Possible cause 1: *The required water temperature has been achieved.*
Remedy: To confirm increase the required temperature more than 0.6°C above the current water temperature.

Possible cause 2*: The 'thermal safety cut out' has tripped - this is shown by the backlight of the screen switching on and off (flashing) and showing the message 'Reset Trip'.*



Remedy: Remove the black button cover and press red button to re-set (see fig. 7) If a positive click is felt, the cause of the tripping **must** be investigated and could be caused by a debris build-up or air pocket trapped inside the flow tube of the heater.

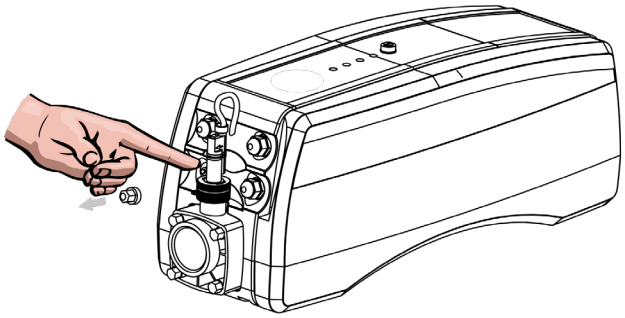


Fig 7.

Possible cause 3: *Insufficient flow. - if this is the cause the display will show 'No Flow'*
If using a cartridge filter: Confirm this by running the system with the cartridge removed from your pump & filter unit, this will supply the heater with the maximum flow rate that your unit is capable of. If the heater then switches 'On' a blocked cartridge can be confirmed to be the cause. The cartridge should be cleaned or replaced.

If using a sand filter: Check the pressure indicator on your sand filter and back wash if necessary.

NOTE: In some cases the thermal safety cut-out tripping and a low flow rate can be linked ie: when a filter becomes choked air can be drawn into the filtration system and become trapped inside the heater so causing the cut-out to trip.

NO LIGHT APPEARS ON THE HEATER WHEN IT IS SWITCHED 'ON'

Possible cause: *Power failure external to the heater*
Remedy : Check any fuses, RCD or other switch components installed in the supply cable. **Note:** The heater is fitted with a 3 Amp glass fuse located on the top control panel assembly (see fig.1).

THE WATER ENTERING MY POOL DOES NOT FEEL MUCH WARMER

The temperature gain of the water after it has passed through the heater will be directly proportional to the volume of water being pumped in relationship to the power output of the heater.

For example: A 6-kW heater, when connected to a 4,000 litre / hour pump, will produce a lift in temperature of approximately 1.2 °C (almost undetectable to the human hand) however, as the water being heated is re-circulated from a single body of water, the time required to heat it remains unaffected by the volume of flow. A popular misconception is that slowing down the flow rate will speed up the heating process.

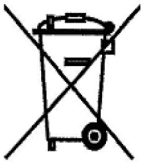
RoHS Compliance Statement

Elecro Engineering Limited certify that our Electric Swimming Pool Heater Range complies in accordance with RoHS Directive 2011/65/EU on the restriction of hazardous substances.

Waste of Electrical / Electronic Equipment

This product complies with EU directive 2012/19/EU
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.

Guarantee

Your heater is guaranteed from the date of purchase against faulty workmanship and materials for a period of 3 years (geographical variations apply)

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 heater, inapropriate use or neglect of the heater.

11 Gunnels Wood Park | Stevenage | Hertfordshire | SG1 2BH | United Kingdom
t: +44 (0) 1438 749 474 | **f:** +44 (0) 1438 361 329 | **e:** info@elecro.co.uk
www.elecro.co.uk

© Copyright 2017