



# Swimming Pool Heater



## Installation Instructions & Operating Manual

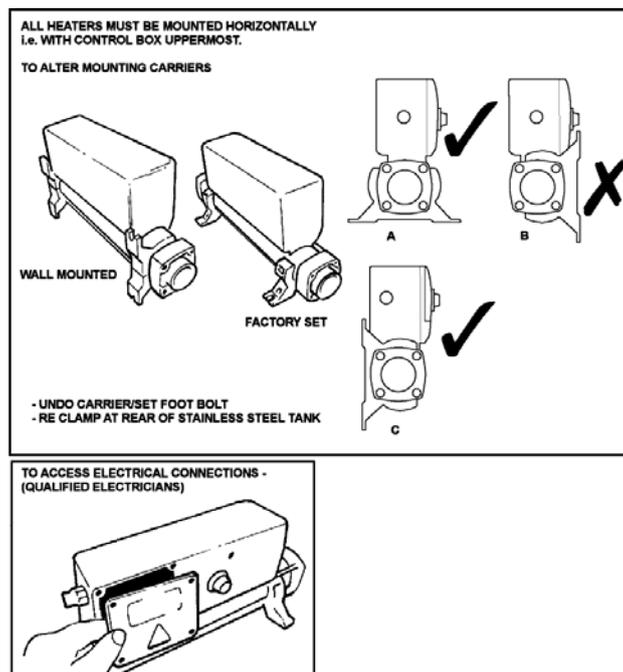
**PLEASE READ CAREFULLY BEFORE INSTALLING**

**Incorrect Installation Will Affect Your Warranty**

**Do Not Discard, Keep For Future Reference**

## POSITIONING

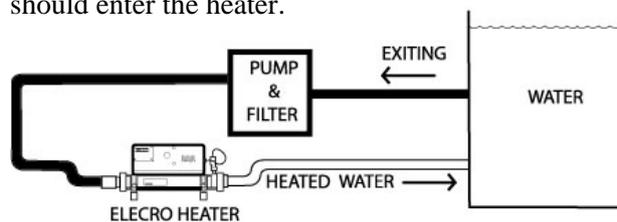
Your heater must be screw fixed to a firm base or wall. The heater **MUST** be horizontal and upright i.e. with the control enclosure located above the flow tube (see diagram below). Under no circumstances should the heater be operated in any other orientation.



The heater should be installed at a low point in the filtration system. It should be positioned after (i.e. downstream) of the filter but before (i.e. upstream) of any dosing or other water treatment plant.

NOTE If the flow direction is reversed (explained later in this booklet) the heater **MUST** remain sited after the filter.

Only clean filtered water should enter the heater.



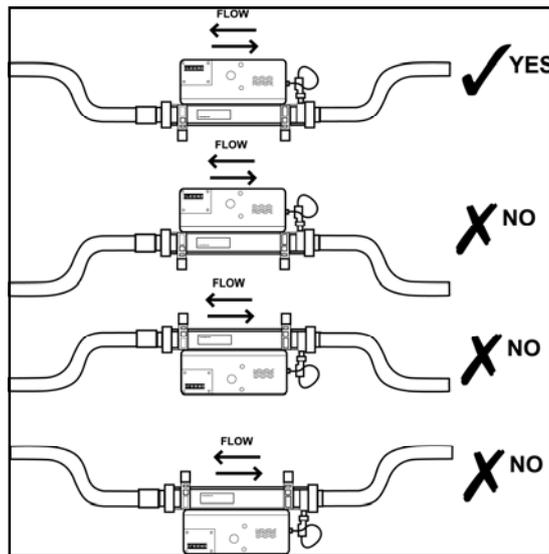
## PIPE WORK

It is essential that the pipe work connecting to and from the heater has a minimum bore (internal diameter) of 1¼" (32-mm).

To assist correct air purging and to ensure the heater remains completely full of water during operation, the return pipe which carries the water back to the pool must incorporate a safety loop or kick up in the pipe, installed as close as possible to the heater (see diagram below).

Note: When coupling to flexible pipe a safety loop can simply be created by routing the pipe up and over an obstacle.

Remember to use pipe clips to securely fasten all hose connections.



## WEATHER PROTECTION

The heater should be installed within a dry weatherproof 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 & 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. If required your electrician may replace the supplied cable entry gland with a larger one to secure the cable powering the heater, this will not affect your warranty if carried out by a qualified electrician.

Cable section: should be calculated at 5-amp / mm<sup>2</sup> for distances up to 20 metres (these sections are indicative and should be checked and adapted if necessary for cable lengths over 20 metres).

## **POWER REQUIREMENTS**

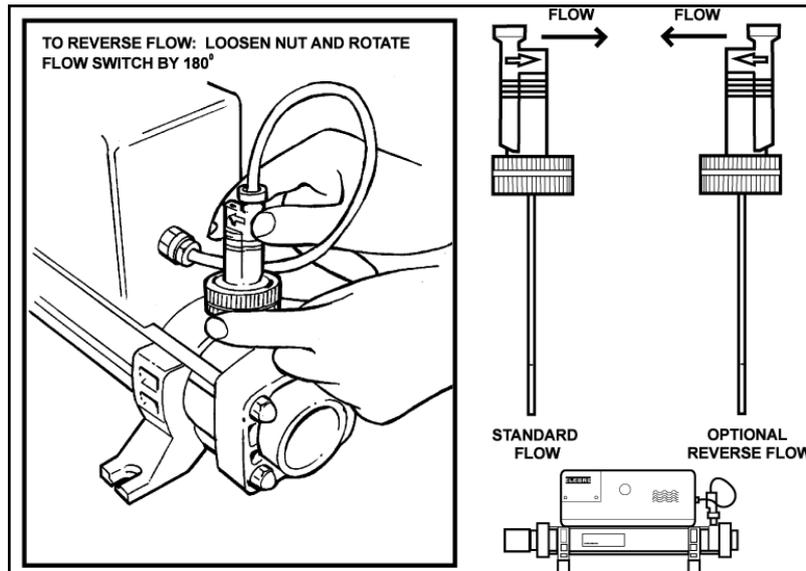
<b>Power Output</b>	<b>Volt (V)</b>	<b>Amp</b>
2-kW	230	9
3-kW	230	13
4.5-kW	230	20
6-kW	230	27
9-kW	230	40
12-kW	230	53
15-kW	230	66
18-kW	230	79
<b>3 Phase</b>	400V Star / 230V Delta	<b>Amp</b>
9-kW	400V / 230V	13 / 23
12-kW	400V / 230V	18 / 31
15-kW	400V / 230V	22 / 38
18-kW	400V / 230V	26 / 46
24-kW	400V	35

## **FLOW REQUIREMENTS**

Your heater is factory set to accept input water flow entering on the left and exiting on the right, this can be reversed by rotating the flow switch 180° (i.e. ½ turn) (see diagram on following page).

### **Warning!**

The flow switch paddle can be damaged when reversing the flow direction if it is lifted by more than 5-mm from its housing and turned with force. If the flow switch has been rotated it is important to ensure that it is finally locked in the correct orientation perpendicular (at right angles) to the flow of water.



The flow rate of water entering the heater **must not** exceed 13,000-litres per hour (2,860 UK gallons per hour). A higher flow rate **will** require the installation of a bypass to prevent damage to the element(s).

The heater will not operate with a flow rate of less than 1,000-litres per hour (220 UK gallons per hour).

## **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 - 1000ppm (parts per million)

Stainless steel heaters are **NOT** Suitable for use on saline (salt) water pools.

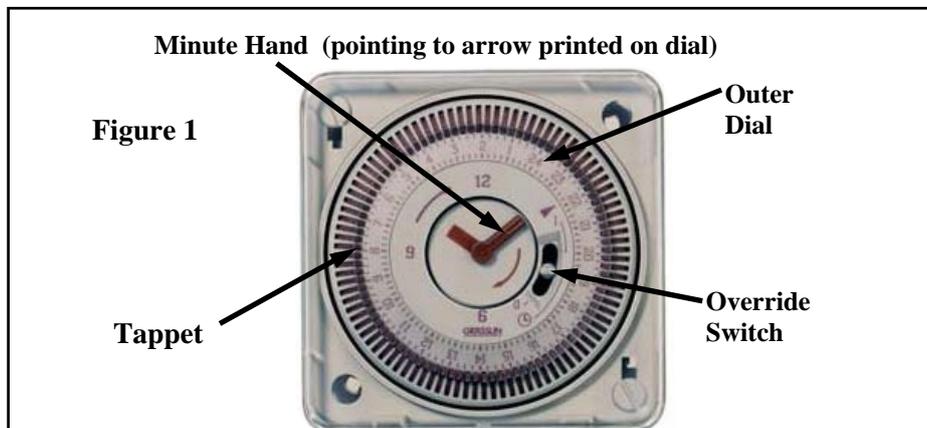
**Water chemistry is complicated if in doubt seek expert advise.**

# 24 HOUR TIMER (If Fitted)

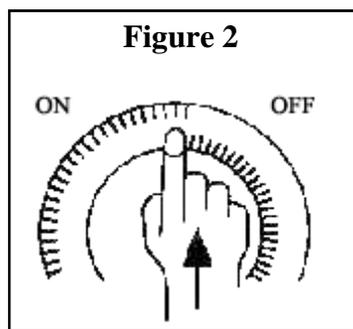
## Programming Guide

**Setting Up** - The Outer dial will need to be set to the current time (when the heater has been installed and has a constant power supply). Rotate the minute hand slowly in a clockwise direction, until the correct hour is located at the tip of the arrow printed on the dial. See Figure 1 below.

Please note that the outer dial is printed with the 24 hour clock i.e. 8:00 am = 8 on the dial. 8:00 pm = 20 on the dial.



**Programming Switching Times** - Once the outer dial has been set to the current time you will need to position the appropriate tappets to your required on and off times. The factory set position of all tappets is in the off position, to change any tappets to the on position they must be switched away from the clock face. See Figure 2 Below.



**Manual Override** - Your 24-hour timer is also fitted with a manual override switch that is built into the face of the dial illustrated in Figure 1 (top of page). This switch has 3 positions which are explained in the table on the following page.

Switch Position	Function
<b>I = Top Position</b>	<b>Manual Override = ON:</b> In this position the time clock is by-passed, and will not affect the operation of the heater.
<b>⊕ = Middle Position</b>	<b>24 Hour Timer = ON:</b> Timed Operation Only.
<b>0 = Bottom Position</b>	<b>Manual Override = OFF:</b> In this position the heater will not operate regardless of any other settings.

**Important** - The manual override positions are a **fixed** selection - i.e. the output of the 24 hour timer will remain ON or OFF (as selected), until the switch is returned back to the ⊕ (middle) position.

## OPERATING YOUR HEATER

Upon completion of the installation, run the water-circulating pump to purge the system & heater of air (i.e. remove any trapped air in the system & heater).

**TIP** You can encourage air out of the heater flow tube by slightly elevating the exit port of the heater when the pump is running.

On initial power up of the heater the amber light should illuminate. Only when the water circulating pump is operational and delivering in excess of 1,000-litres per hour of flow (220 UK gallons) and the temperature set point dial is set to a value higher than that of the water temperature will the red indicator light click on and the amber indicator light off. In this mode the heater is on and heating.

Q = How long will it take to heat my pool?

A = Assuming no heat losses, and a heater sized in the ratio 1.5-kW per 1,000-gallons of water (4,545-litres): it will take 2 days of continuous running to raise the temperature of a pool from tap temperature to swimming temperature.

Heat loss will slow the heating process, particularly during periods of cold weather, hence the higher the water temperature is to be maintained above average ambient air temperature, the slower the heating process will become. The only influencing factors are the level of insulation and the sighting of the pool with regard to wind shelter.

**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.**

### ***Quick Function Test***

Observe the property's main electricity meter when the heater is on (i.e. red light on) and then observe it again when the heater is in the standby mode (i.e. yellow light on). The test should show that the meter is recording more electricity being used by the heater when the red light is on.

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 property's main electricity meter, with an exact one hour interval (i.e. 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. The pool pump and heater will need to be running continuously during the test (i.e. with the heater red light on).

To avoid inaccurate results when performing this test, it is important to refrain from using other high current drawing appliances in the property (such as tumble dryer, showers, cooker etc).

A large domestic pool pump of 1-horsepower will draw less than 1-kW in a one hour period. The conclusion of the test should prove that for example a 6-kW heater and a ½ horsepower pump will draw between 6.3-kW to 6.5-kW in one hour. 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.

## **TROUBLE SHOOTING**

### ***Heater will not switch from standby (yellow light) to on (red light)***

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.

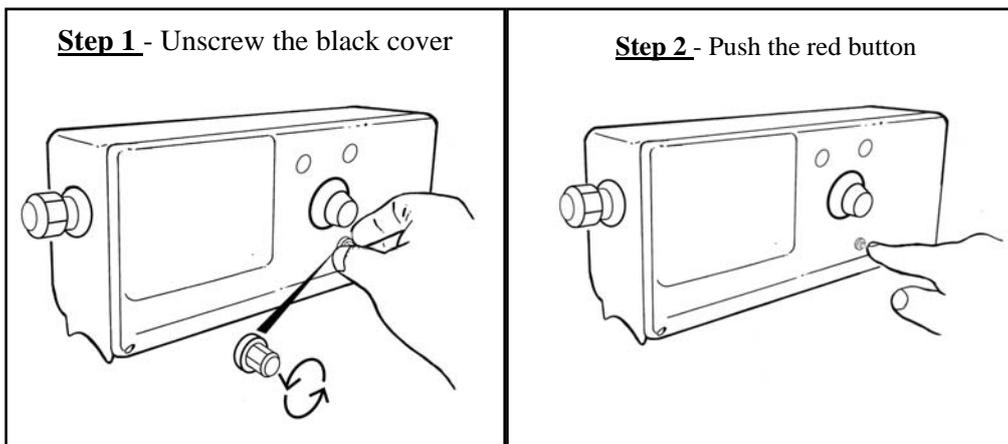
To confirm - increase the set point value by turning the temperature set point dial to a value greater than the current water temperature.

## TROUBLE SHOOTING CONTINUED

Possible Cause 2.) The high limiting thermostat has tripped.

Remedy; remove button cover and press red button to re-set (See diagram below).

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.



Possible Cause 3.) Insufficient 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 your unit is capable of. If the heater then switches on (i.e. red light 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 high limit thermostat tripping and a low flow rate can be linked; When a filter becomes choked air can be drawn into the filtration system and become trapped inside the heater so causing the thermostat to trip.

### ***No lights appear 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 not fitted with a fuse.

### ***The flow tube does not feel warm***

Due to the high efficiency of your electric heater no warmth should be detectable from the flow tube of the heater.

The most likely causes of the flow tube feeling warm are

Possible Cause 1.) The heater has been positioned in direct sunlight.

Possible Cause 2.) An air pocket is trapped inside the heater, particularly if the tank feels warmer at the highest point of the tank (as air rises).

### ***The water entering my pool doesn't feel much warmer***

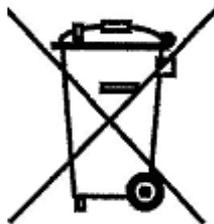
The temperature gain of the water after it has passed through the heater will be directly proportional to the volume of water being pumped in relationship to the power output of the heater.

For example: A 6-kW heater, when connected to a 4000-litre per 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 recirculated 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**

Electro 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.

## **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 its 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 for 2 years from the date of purchase against faulty workmanship and materials.

The manufacturer will replace or repair, at its 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, or inappropriate use, or neglect of the heater.

## **CE Declaration Of Conformity**

The manufacturer declares that the herewith products or ranges

### ***ELECTRIC SWIMMING POOL HEATER 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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