

GUARANTEE

Your Elecro heater is guaranteed for one year from the date of purchase against faulty workmanship and materials.

ELECRO ENGINEERING LTD 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.

ELECRO ENGINEERING LTD will not be liable in cases of incorrect installation of the heater, or inappropriate use, or neglect of the heater.

CE Declaration Of Conformity

Elecro declares that the herewith products or ranges

ELECTRIC AQUATIC 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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ELECRO

ENGINEERING

Aquatic Heater



Installation Instructions & Operating Manual

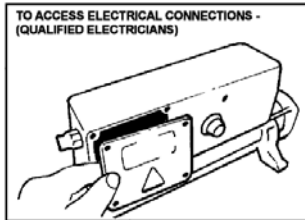
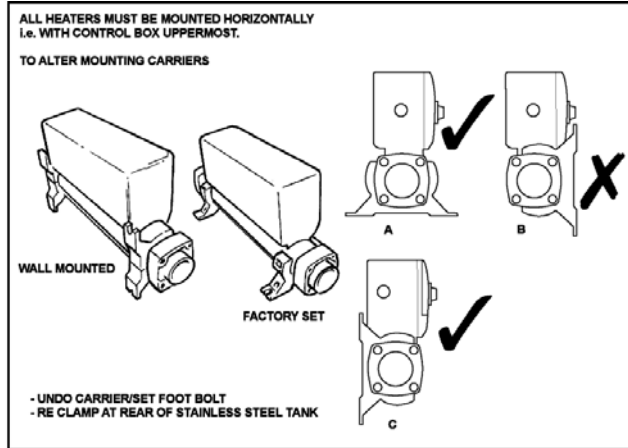
PLEASE READ CAREFULLY BEFORE INSTALLING

Incorrect Installation Will Effect Your Warranty

Do Not Discard, Keep For Future Reference

POSITIONING

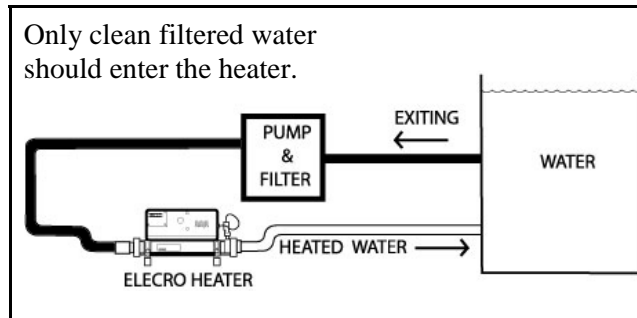
Your Elecro heater must be screw fixed to a firm base or wall. The heater **MUST** be horizontal and upright i.e. with the control enclosure located above the flow tube of the heater (see diagram below). Under no circumstances should the heater be operated in any other orientation.



NB Diagrams do not show
the digital thermostat

The heater can be installed on both pump and gravity fed systems. It should be installed at a low point in the filtration system. To limit weed and debris build up inside the heater it **must** be sited after, i.e. downstream, of the filter.

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



If it becomes necessary to confirm that your Elecro heater is delivering the specified heat output, an electricity meter reading will be required (taken from the property's main electricity meter). Two readings will need to be taken with an exact one hour interval (i.e. take one meter reading 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 Elecro heater is also rated in kW hours. 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 etc). The pond pump and heater will need to be running (i.e. red light on) continuously during the test. A large pond 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 Elecro heater to waste energy. All the power drawn by the heater will be turned into heat and transferred to the water.

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

NOTES

[Blank For Your Notes]

TROUBLE SHOOTING CONTINUED

Possible Cause 2.) Insufficient Flow

If the warning exclamation mark is flashing and the temperature display and 1A are both flashing intermittently on the display the flow rate has dropped below 1,000-litres per hour or flow has stopped completely. The cause of the reduced / static flow rate should be investigated and resolved.

Possible Cause 3.) The high limiting thermostat has tripped.

If the heater is displaying the current water temperature and indicating that the water temperature has fallen below the set point; this is shown by LED 6 being continuously illuminated (shown on previous page).

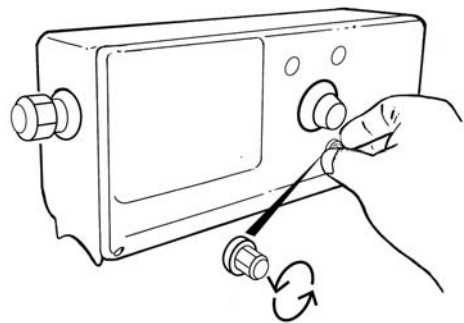
Remedy; remove button cover and press red button to re-set (See diagram below).

If a positive click is felt, the cause of the tripping **must** be investigated, the high limiting thermostat trips at 50°C the only way the top of the heater flow tube can get this hot is;

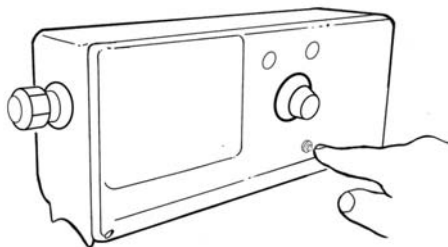
- 1.) Air pocket trapped at the top of the tank.
- 2.) Debris build up around element transmitting heat to the tank.
- 3.) The heater has been positioned in direct sunlight.

If you continually reset the high limiting thermostat you will eventually burn out the element, unless the cause is found and rectified.

Step 1 - Unscrew the black cover



Step 2 - Push the red button



NB Diagram does not show digital thermostat

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.

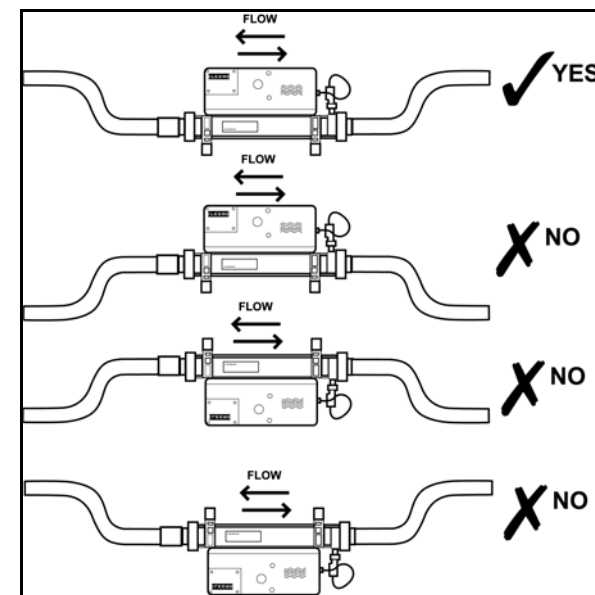
PIPE WORK

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 that carries the water back to the pond 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.

NOTE: To allow ease of periodic internal cleaning - it is recommended that the heater is installed with ball valve unions on both water input and output sides. This will allow the water to be shut off on both sides of the heater to allow removal from the system.



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.

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

POWER REQUIREMENTS

Power Output	VOLT (V)	AMP
1-kW	230	5
2-kW	230	9
3-kW	230	13
4-kW	230	18
6-kW	230	27
8-kW	230	35
3 Phase	Star / Delta	Star / Delta
6-kW	400 / 230	9 / 16
8-kW	400 / 230	13 / 23

FLOW REQUIREMENTS

Your Elecro 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).

Differential:

When the water has reached the set point temperature the heater will switch off and will not switch back on until the water temperature has dropped by 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.

OPERATING YOUR ELECRO HEATER

Upon completion of the installation, run the water-circulating pump to purge the system & heater of air.

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 digital thermostat is set to a value higher than that of the water temperature, will the red indicator light turn on and the amber indicator light turn off. In this mode the heater is on and heating.

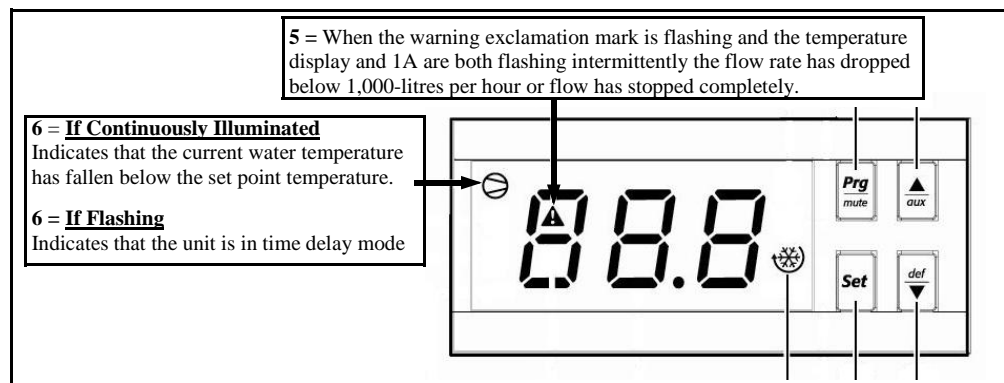
TROUBLE SHOOTING

Heater will not switch from standby 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 that the digital thermostat is requesting the unit to heat, see if there is an illuminated LED on the digital thermostat (6 on diagram below). If illuminated go to step 2, if not illuminated raise the set point temperature to a value higher than the current water temperature. Confirm whether the heater now switches to 'Heat On' mode (red light).





DIGITAL THERMOSTAT INSTRUCTIONS


The digital thermostat fitted to your Electro Aquatic heater has been pre-programmed with all the necessary parameters, to ensure reliable service & operation.

All you need to do is set the temperature you would like to maintain in your pond (This is called the set point*).

To display / modify the set point* temperature, press and hold down the  (1) button for 2 seconds (see illustration & key on previous page).

When you have entered the set point adjustment screen the pre-programmed set point will be displayed with symbol 7  also displayed.

Use the  (3) to increase the set point or  (2) to decrease the set point.

Once the desired set point value has been selected, press and release the  (1) button again.

The unit will then revert to displaying the current water temperature, but will now control the water temperature to a maximum of the selected set point*.

***Set Point (Note)** The set point is the maximum temperature that the digital thermostat will allow the water to be heated to. Upon reaching the set point temperature the digital thermostat will switch the heater off, it does not increase or decrease the power output of the heater.

Warning!

When deciding upon the set point temperature, remember that fish can be traumatised if their environmental temperature is dramatically changed over a short period of time, any changes should be made gradually.

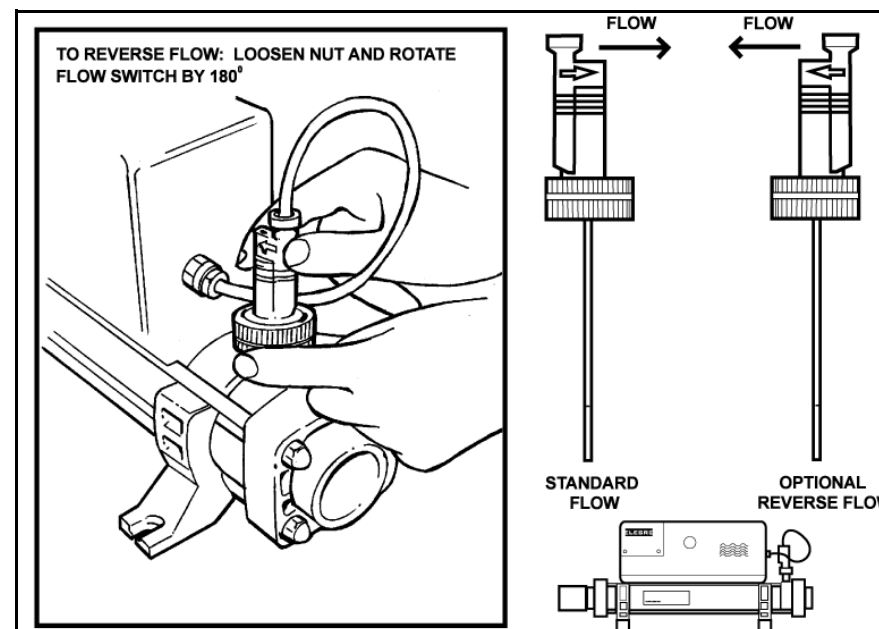
TIME SWITCHING DELAY

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

The time delay mode is indicated by the flashing of amber indicator 6 on the digital thermostat (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 10,000-litres (2,200 UK gallons) per hour. A higher flow rate **will** require the installation of a by-pass to prevent damage to the element(s).

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

WATER QUALITY

The water quality must be within the following limits:

Stainless Steel Aquatic Heaters:

PH 6.8-8.0

Stainless Steel Aquatic heaters are **NOT** suitable for use with salt water if the concentration of salt is greater than 0.3% (½ oz per UK gallon).

Titanium Aquatic Heaters:

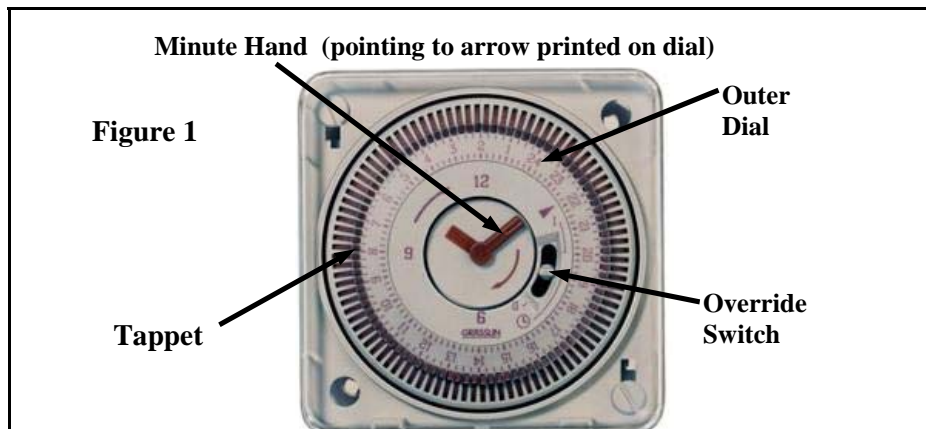
Titanium heaters remain unaffected by water chemistry levels & are suitable for use with salt water systems.

24 HOUR TIMER (If Fitted)

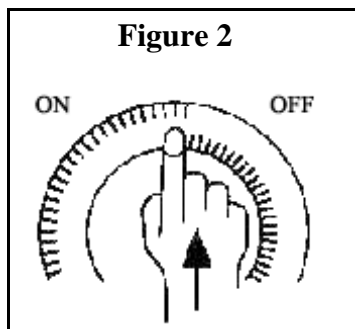
Programming Guide - Tactic Synchronous & Quartz

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.



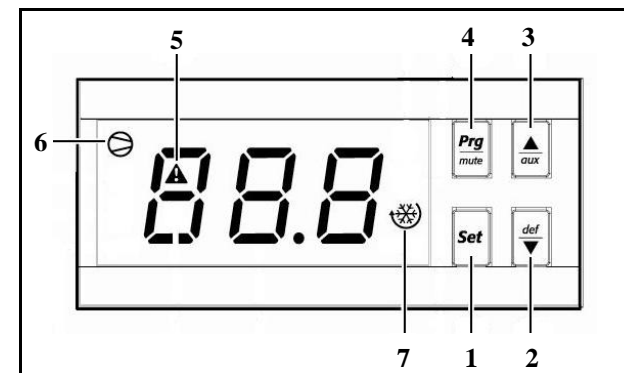
Manual Override - Your 24 hour timer is also fitted with a manual override switch that is built into the face of the dial illustrated in Figure 1 (top of this page). This switch has 3 positions which are explained in the table on the following page.

Switch Position	Function
I = Top Position	Manual Override = ON: In this position the time clock is by-passed, and will not affect the operation of the heater.
⊕ = Middle Position	24 Hour Timer = ON: Timed Operation Only.
0 = Bottom Position	Manual Override = OFF: 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 to the ⊕ (middle) position.

TEMPERATURE DISPLAY

The digital thermostat displays the temperature in °C. A decimal point (1/10°C) is displayed by the thermostat up to 19.9°C. At 20°C & above the decimal point will not be displayed.



1	Set Button	Used to display / modify the set point temperature
2	Down Button	Used to decrease the value
3	Up Button	Used to increase the value
4	Prg	NOT USED
5	Warning Exclamation Mark (Flashing)	Indicates that the flow rate has fallen below 1,000-litres per hour or flow has completely stopped
6	Amber LED (Illuminated)	Indicates that the water temperature has fallen below the set point
6	Amber LED (Flashing)	Indicates that the heater is in 2 minute time delay mode
7	⊗	Indicates you are changing the set point* temperature.