Vulcan

V100 Pool Heater

Installation & Operating Manual

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Introduction

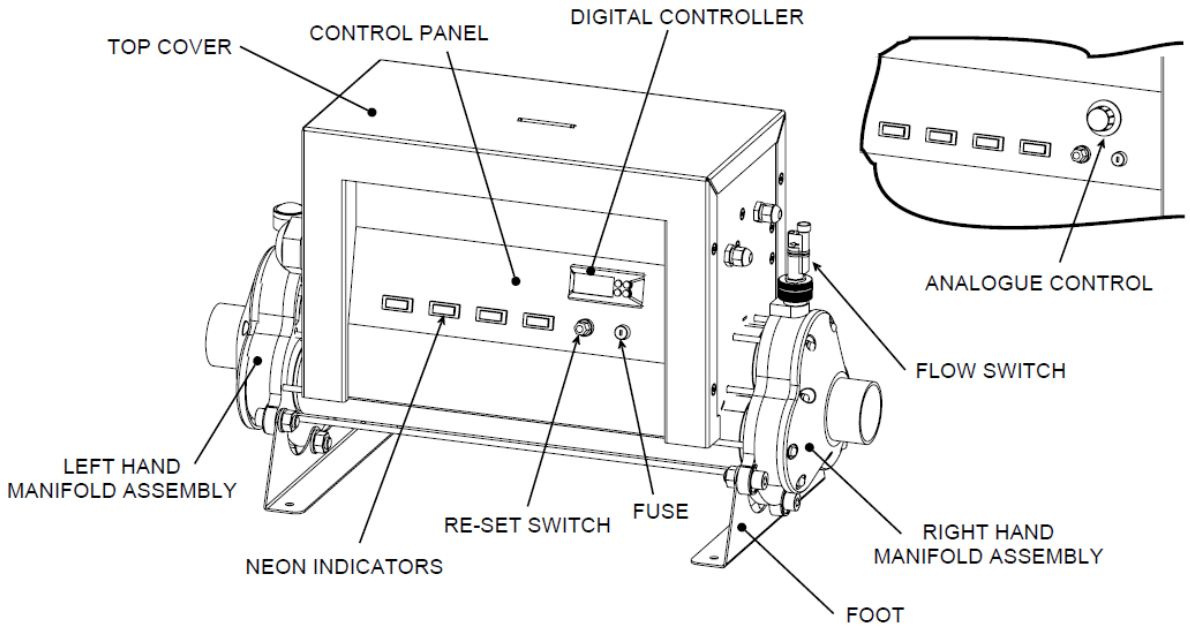
Thank you for purchasing a V100 electric swimming pool heater manufactured to the highest standards in England.

To ensure years of trouble-free service, please read and follow these instructions for proper installation, maintenance, and use.

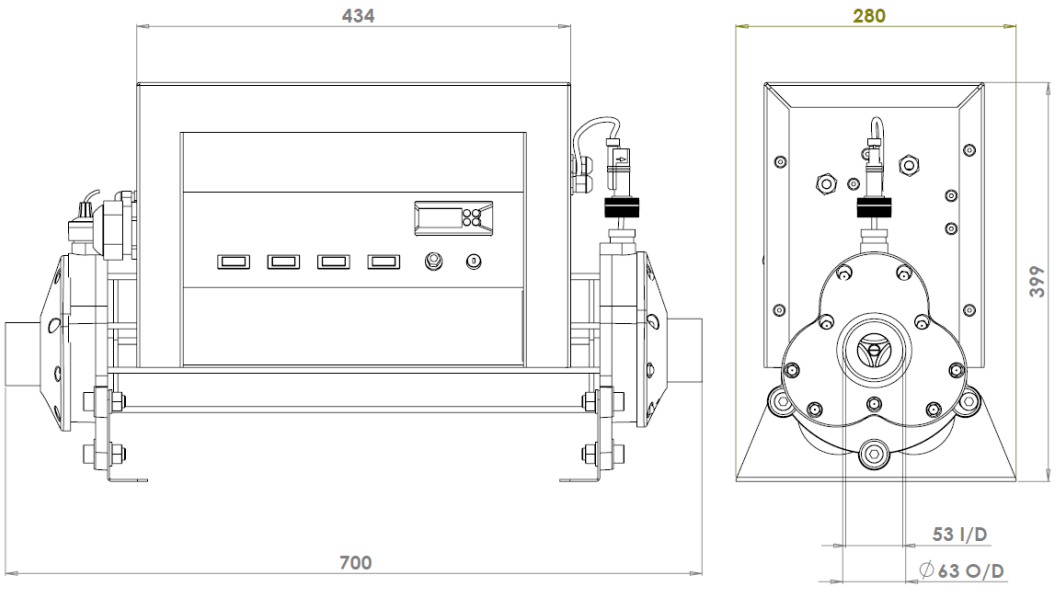
WARNING: Failure to install the unit correctly may result in the warranty being void.

Please retain this manual for future reference.

1. PRODUCT OVERVIEW



Dimensions:



2. GENERAL INSTALLATION INSTRUCTION

2.1 Mounting instruction

The heater should be either installed horizontally or vertically allowing enough space for the pipe connections and wiring. It should be firmly secured using screws to a firm base or wall using the supplied wall bracket.

WARNINGS: If the heater is placed against a combustible material a fireproof barrier must be placed between the unit and the wall, this must cover a minimum of 15cm around the outside of the heater. The unit must not be covered to allow adequate ventilation.
The heater must be installed within a dry, permanent weather-proof area. In any case where water or moisture enters the enclosure the warranty will be void.

Caution: *If the heater is unused during the winter months, it must be drained to prevent frost damage. Water must not be allowed to freeze in the heater, as this will cause severe damage.*

NOTE: *Ensure the correct bracket fixing bolts and wall plugs are used (not supplied).*

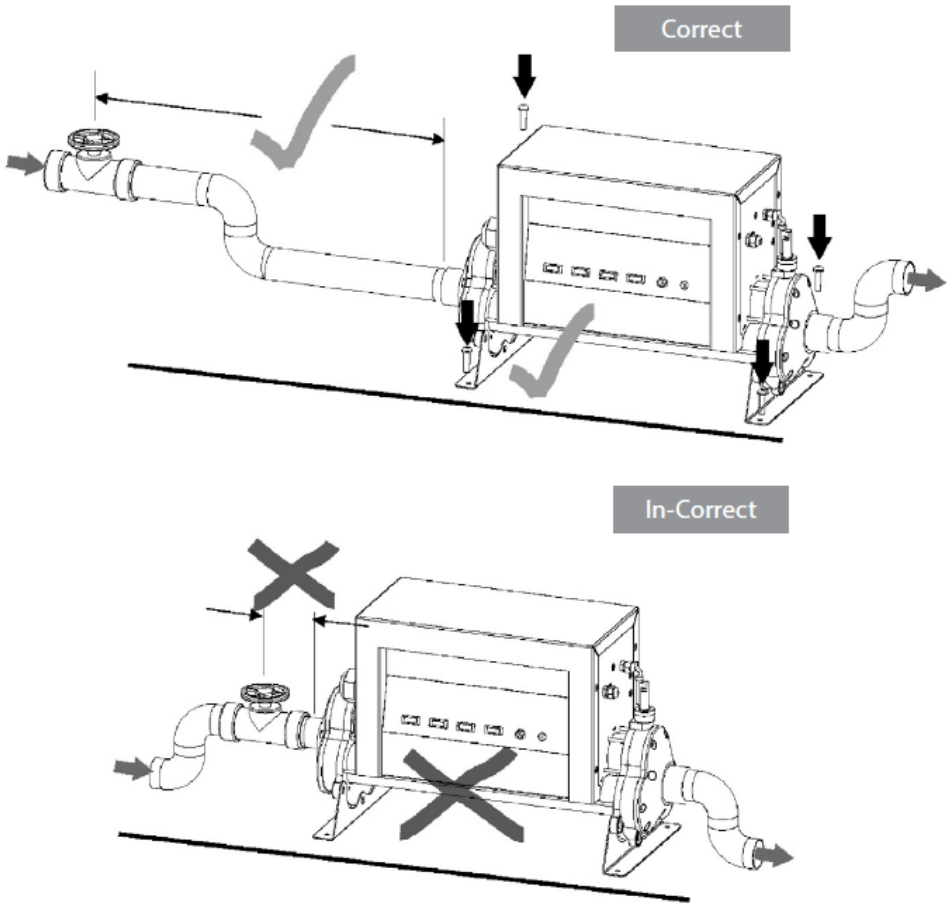


Fig. 2

2.2 Pipe work

The heater should be installed at a low point in the filtration system. It should be positioned downstream of (after) the filter and upstream of (before) any dosing or other water treatment plan. (see Fig 3.).

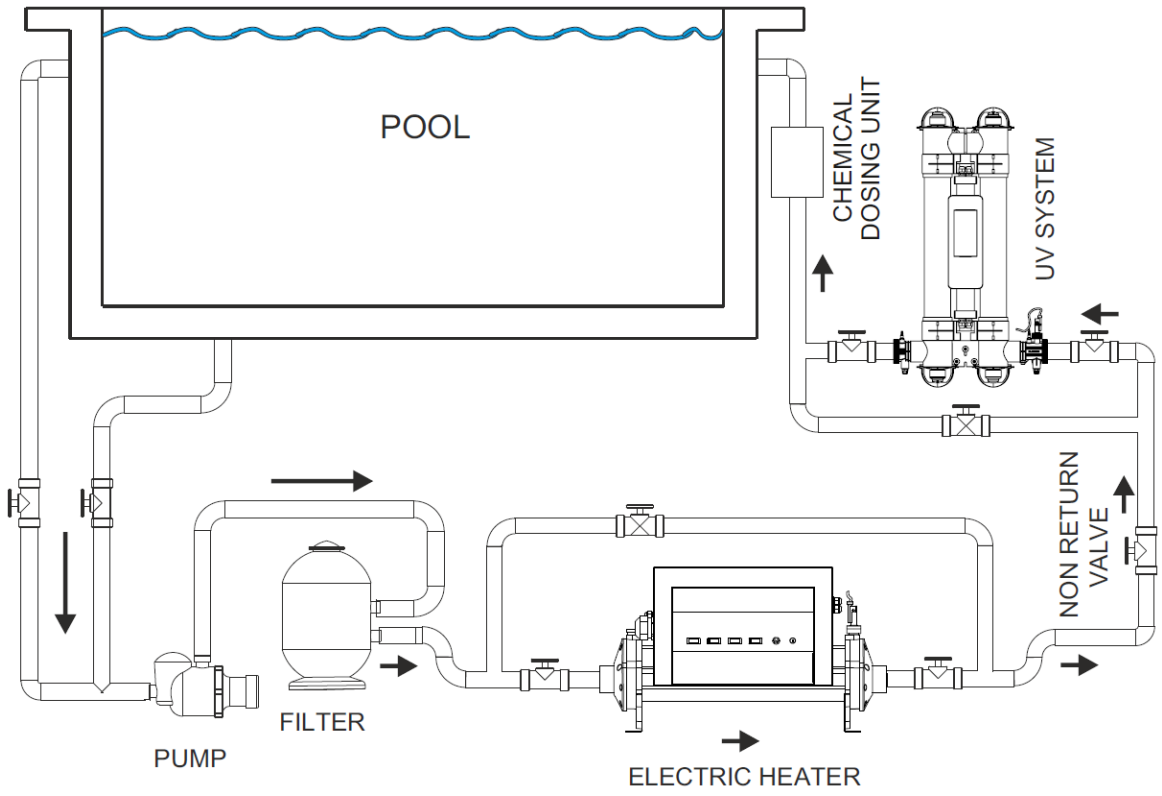


Fig 3.

2.3 Flow direction

The heater can accept flow of water from only one end (please refer to flow direction labels on the products).

DO NOT REVERSE THE FLOW SWITCH

To support 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 as close as possible to the heater (see Fig 2.).

All factory unions are made from ABS plastic, when gluing connections to an ABS pipe, an ABS cement must be used or when using a PVC pipe, a Transition cement must be used.

NOTE: Be sure to apply the glue evenly and to all surfaces that will be in contact to reduce the risk of leakage.

2.4 Electrical connection

WARNINGS:

- This device must be installed by a qualified Electrician following the instructions provided in this manual. The manufacturer will not be liable for any issues caused by poor or improper installation.
- Any alterations made to the unit (unless stated) will affect the warranty. This also applies if components are changed for non-standard components acquired anywhere other than direct from the manufacturer.
- Incorrect installation may result in serious damage to property/persons.

- The heater must be installed in accordance with the country/regional requirements and regulations and an Electrical Installation Certificate must be provided on completion of the installation.
- The power supply must be fitted with a 30mA RCD. If required, the Electrician may replace the cable entry gland supplied with a larger size to secure the cable powering the heater.

Minimum cable sectional area

This should be calculated at 5-amp/mm^2 for distances up to 20 metres (these sections are indicative and should be checked and adapted if necessary, for cable lengths over 20 metres).

Connections

- To connect the power supply cable, remove top cover.
- Make sure that all connections to the terminal block are correct as per the label inside the heater and they are tight.
- Make sure not to expose the cable to anything which can cause damage to it i.e. sharp edges, hot surfaces, or crush hazards.
- The cable should be fixed to avoid any trip hazard.

2.5 Power requirements

All V100 heaters are fitted with their own specification plaque that details the power requirements for the heater. Below is a table of the power requirements for the most common voltages - if your voltage is not listed please refer to the specification plaque on the product. The table below also shows the number of heating element banks within your heater, each bank of elements is supplied by two independent contactors.

Power Output	220-240V 3 Phase	380-415V 3 Phase	No of Banks
30 – kW	76-Amp	44-Amp	2
36 – kW	91-Amp	52-Amp	2
45 – kW	113-Amp	66-Amp	3
54 – kW	136-Amp	78-Amp	3
60 – kW	N/A	87-Amp	3
72 – kW	N/A	104-Amp	3

3. OPERATING INSTRUCTIONS

3.1 Flow requirements

The heater should be connected to a filtration system with a minimum flow volume of 12,000-litres per hour (2,640 UK gallons per hour). The maximum flow volume that the heater will operate with is 40,000-litres per hour (8,800 UK gallons per hour). Recommended flow is 30,000 litres per hour (6,660 UK gallons per hour).

If the flow volume is greater, a by-pass must be installed to prevent damage to the heating elements.

NOTE: The flow direction is fixed and must not be reversed.

3.2 Water quality

The water quality MUST be within the following limits:

- PH: 6.8 – 8.0
- Total Alkalinity (TA): 80 – 140 ppm (parts per million)
- Chloride Content MAX: 150 mg/litre
- Free Chlorine: 2.0 mg/litre
- Total Bromine: Max 4.5 mg/litre
- Total Dissolved Solids (TDS)/Calcium hardness: 200 – 1,000 ppm

Stainless Steel heaters are NOT suitable for use on saline (salt) water pools. ONLY heaters with titanium heating elements are suitable for use on saline (salt) water pools.

WARNING: Failure to meet the water quality limits will void the warranty.

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

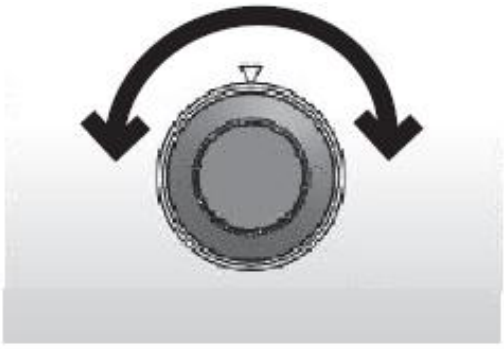
Useful advice:

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.

3.3 THERMOSTAT INSTRUCTIONS

Analogue Heater:

Analogue thermostat temperature can be changed by rotating the dial clockwise (increase temperature), anticlockwise (decrease temperature).



Digital Heater:

The digital thermostat displays the temperature in °C.

Item	Description	Function
1	'P' Button	To display/Modify the required temperature
2	'Down' Button	To decrease the value
3	'Up' Button	To increase the value
4	'U' Button	NOT USED
5	LED-OUT Continuously illuminated If Flashing	Indicates that the water temperature has fallen below the required temperature Indicates that the unit is in 'Time Delay Mode'

The digital thermostat fitted to your pool heater has been pre-programmed with all the necessary parameters to ensure reliable service and operation.

All you need to do is set the temperature you would like your water to be maintained at, this is known as the required temperature.

To display / modify the required temperature, press and release the P button. The pre-programmed required temperature will be displayed.

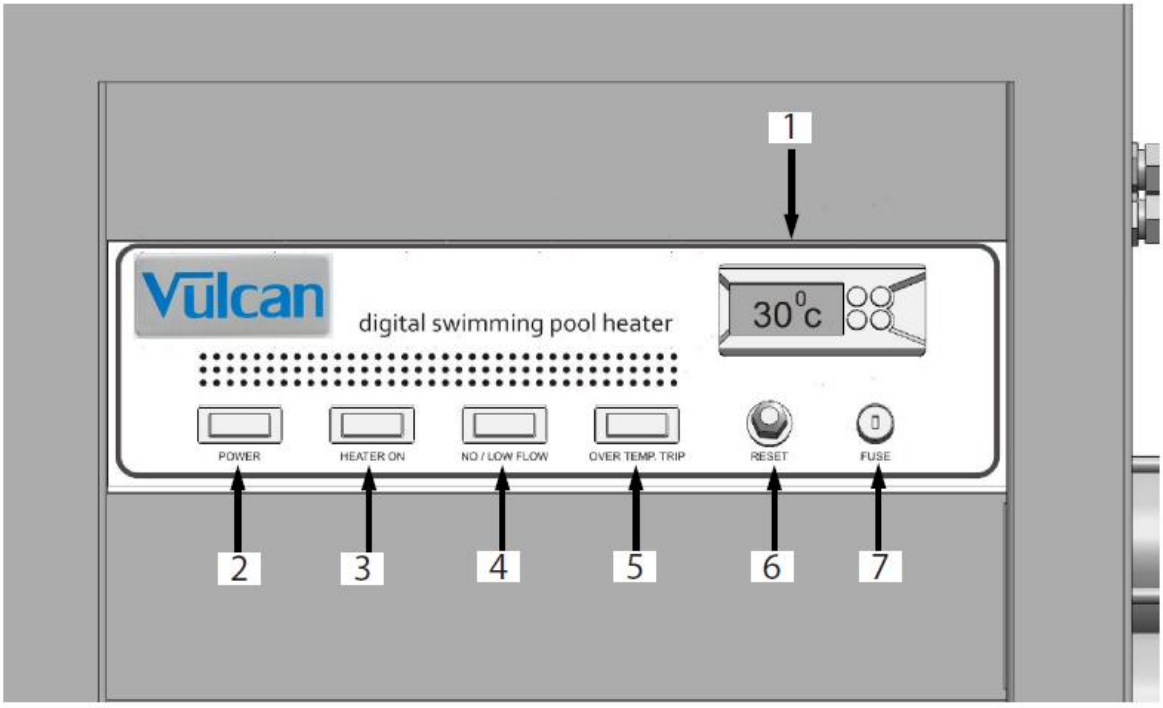
Press ▲ (3) to increase or ▼ (2) to decrease the required temperature.

When the correct required temperature is displayed, press and release the P button. The unit will then revert to displaying the current water temperature, but will now control the water temperature, to a maximum of the required temperature.

Differential:

When the water has reached the required 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 in place to prevent overheating to the switch components caused by cycling.

3.4 OPERATION PANEL



Item Number	Description

1	Digital Thermostat
2	Power Indicator
3	Indicates the heating elements are energised and the unit is heating
4	Indicates the flow volume has fallen below 12,000 – litres per hour, or has stopped completely
5	Indicates that: A = The high limiting thermostat has tripped (requires resetting) B = The temperature within the electrical cabinet is above 60°C (run the filtration pump to reduce temperature)
6	Safety Thermal Cut Out – Manual reset button (under black cover)
7	Panel mounted fuse holder – fitted with 3-Amp glass fuse

3.5 Operating the v100 heater

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

On initial power up of the heater the clear POWER neon indicator should illuminate and will remain illuminated as long as the power supply to the heater is switched on.

If after initial power up either the Clear NO / LOW FLOW or Amber OVER TEMP. TRIP neon indicators are illuminated, please proceed to the troubleshooting section.

Select your required temperature (described earlier in this booklet). The contactors will now click in and the cascade time delay function will begin. In 5-seconds time the first bank of elements will be switched on together with the red HEATER ON neon indicator. Following a further 5-second time delay the second bank of elements will be switched 'ON'. Following a further 5-second delay the third bank of elements will be switched 'ON'. Therefore, the maximum amount of time between the red 'HEATER ON' neon indicator Illuminating, and all element banks being switched on and heating is 10-seconds for a 3-bank heater, and 5-seconds for a 2-bank heater.

Note: The number of banks the B-100 heater has depends on the power output of the heater, please refer to the power requirement section earlier in this manual to check the number of element banks within the B-100 heater.

4. TROUBLE SHOOTING

- Quick Function Test

Observe the 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. amber 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, at one hourly intervals (i.e. take one-meter reading and then a second reading exactly one hour later). 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 consuming appliances in the property, such as tumble dryers, showers, cookers etc. A large domestic pool pump of one 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 half horsepower pump will draw between 6.3-kW to 6.5-kW in one hour.

- Heater will not switch on (Red light):

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

Possible Cause 1:	The temperature point set has been achieved. To confirm the increase of the temperature set, turn the dial to a value greater than the current water temperature.
Possible Cause 2:	NO FLOW INDICATOR IS ON No Flow indicator or No Flow message (digital heater only) will be illuminated when the heater is not receiving enough flow. This could be due to the circulation pump being switched off. The pump is not powerful enough to meet the flow requirements (See 3.1 Flow requirements). The cartridge filter needs cleaning or replacing. The sand/glass media filter creates too high a back pressure and needs a backwash.

- No display 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.

- 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 the 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 the flow. A popular misconception is that slowing down the flow rate will speed up the heating process.

- Heater is tripping circuit breaker (MCB) after few minutes/ hours of operation:

If the heater is faulty it will instantly trip the circuit breaker (MCB). The most likely causes of tripping the breaker after a period of time are:

Possible Cause 1:	Faulty circuit breaker.
Possible Cause 2:	Incorrect size of the circuit breaker.
Possible Cause 3:	Cross section of the cable is not sufficient.
Possible Cause 4:	Loose connection(s) of the power supply cable. Check both ends of the power supply cable (at the distribution box and at the heater terminal block).
Remedy:	Contact an Electrician to check installation and protection.

- Heater is tripping circuit breaker (MCB) or RCD instantly:

Possible Cause 1:	Short circuit caused by the wiring or faulty components.
Possible Cause 2:	Heating element is going to ground or is damaged.
Possible Cause 3:	Moisture inside the heater.
Remedy:	Send heater back to the manufacturer. Use return form on page 14 or download it from the Elecro website.

- Power supply cable is getting very hot:

Possible Cause 1:	Cross section of the power supply cable is not sufficient.
Possible Cause 2:	Loose connection(s) of the power supply cable. Check both ends of the power supply cable (at the distribution box and at the heater terminal block).
Remedy:	Contact an Electrician to check installation. Inspect for loose connections and upgrade the power supply cable to a bigger size if necessary.

5. MAINTENANCE

We recommend annual maintenance and cleaning of the heater to ensure proper operation.

WARNING: Before performing any maintenance on the unit isolate from the main power supply.

The heater should be drained, the flow tube and heating elements should be cleaned. Removing scale/sludge and any debris or blockages will extend life expectancy of the heating element(s) and avoid potential failures.

Check that electrical cable connections are properly tightened.

6. DISPOSAL OF ELECTRICAL AND ELECTRONIC EQUIPMENT

DO NOT dispose of this product as an unsorted municipal waste.

This symbol on the product or on the 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, household waste disposal service or the retailer where the product was purchased.

7. WARRANTY

This product is guaranteed from the date of purchase against faulty workmanship and materials for:

- two years within Europe
- one year outside Europe

- 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, inappropriate use or neglect of the heater.
- Any damages occurred due to shipping must be reported within 48 hours of receipt of the product. Any claims after this time will be considered as misuse or abuse of the product and will not be covered by the warranty.
- Any glass parts, seals and water connections are considered as consumables and are not covered by the warranty.

Vulcan Pools Ltd
Repairs Department
Unit 11 Gunnels Wood Park
Gunnels Wood Road
Stevenage
Hertfordshire SG1 2BH
United Kingdom

Customer Information: (ATTACH TO HEATER)

Company Name: ……..

Contact Name: ……..

Daytime Telephone Number: ……..

Email Address: ……..

……..

Return Address: ……..

……..

Post/Zip Code: ……..

Country: ……..

Suspect Fault / Description of problem:

11 Gunnels Wood Park, Stevenage, Herts SG1 2BH
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