Vulcan

800 Evolution Pool Heater

Installation & Operating Manual

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INTRODUCTION

Thank you for purchasing the Vulcan Evo

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. Incorrect installation will affect the warranty.

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

Please retain this manual for future reference.

1. PRODUCT OVERVIEW

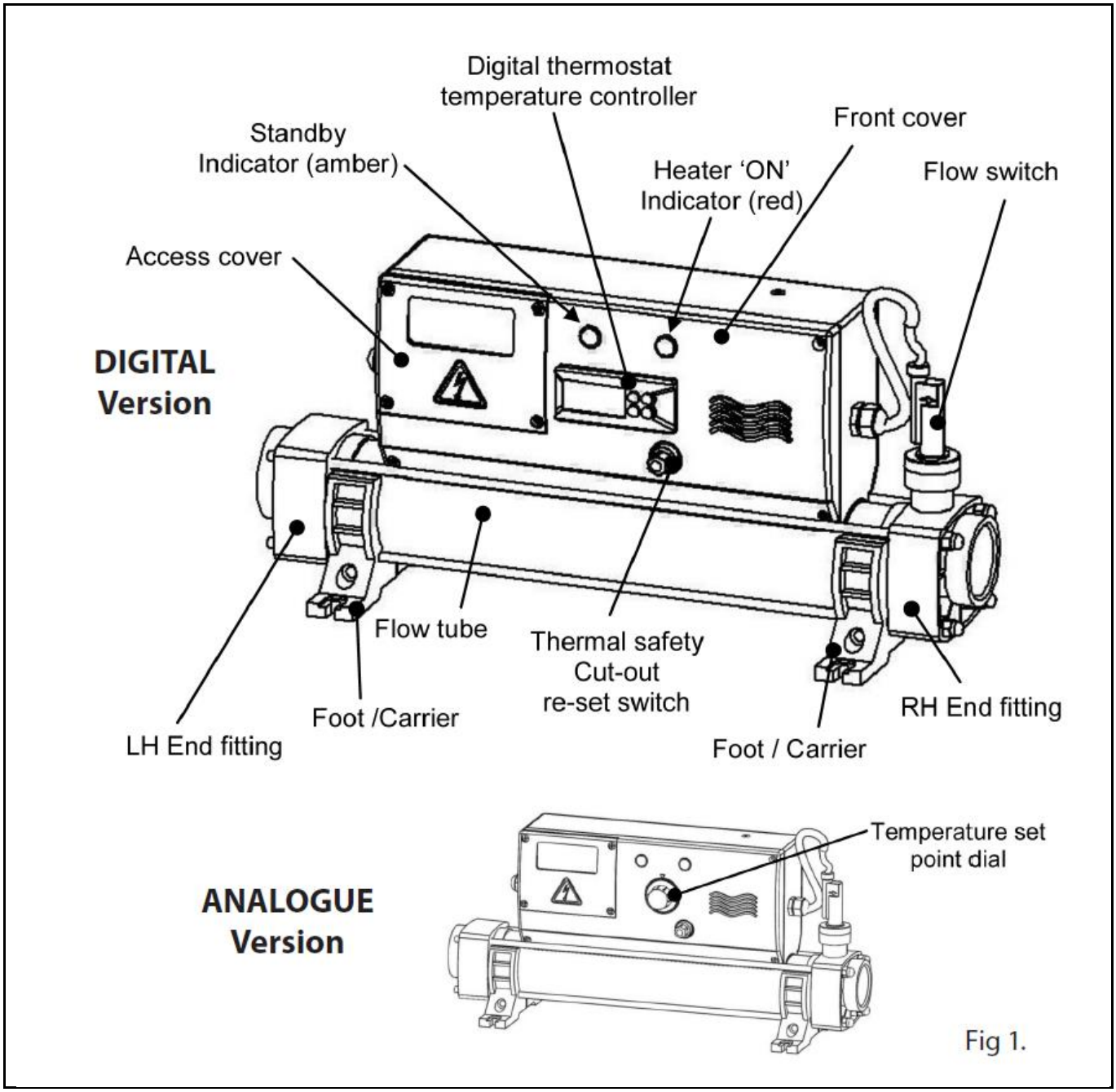


Fig 1.

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.

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.

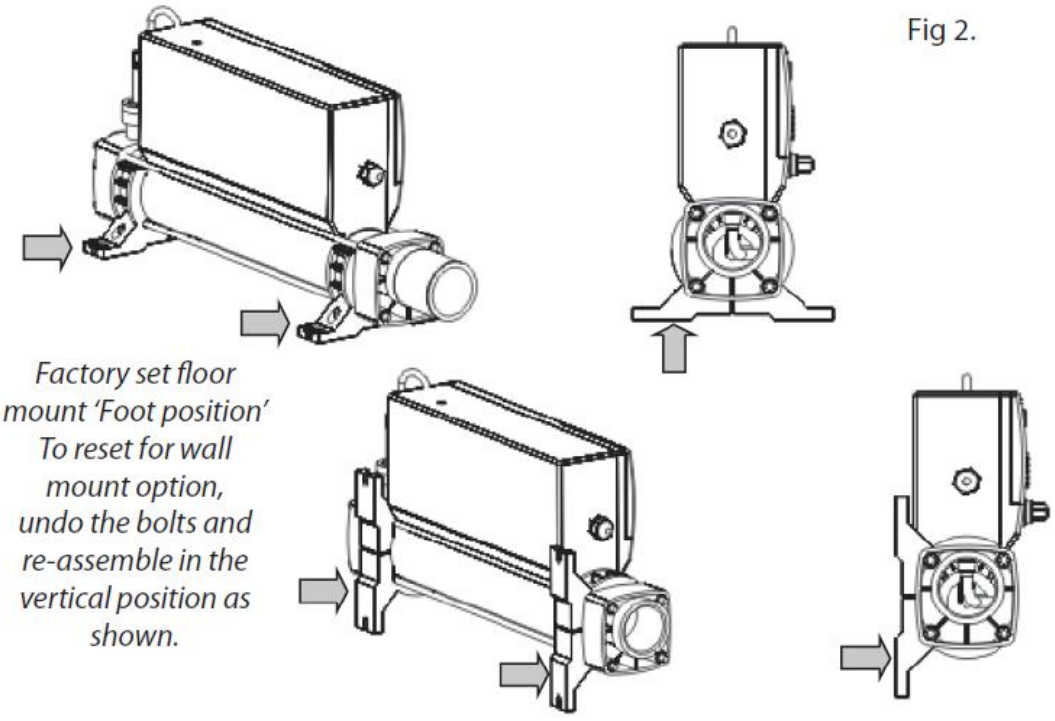
The heater must be installed within a dry, permanent weather-proof area. In any case where water or moisture enters the enclosure the warranty will be void.

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.

See Fig. 2 for mounting instructions when securing to the wall or floor.

FLOOR MOUNT 'FOOT POSITION'

Fig 2.



Factory set floor mount 'Foot position' To reset for wall mount option, undo the bolts and re-assemble in the vertical position as shown.

WALL MOUNT 'FOOT POSITION'

2.2 Pipework

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.).

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

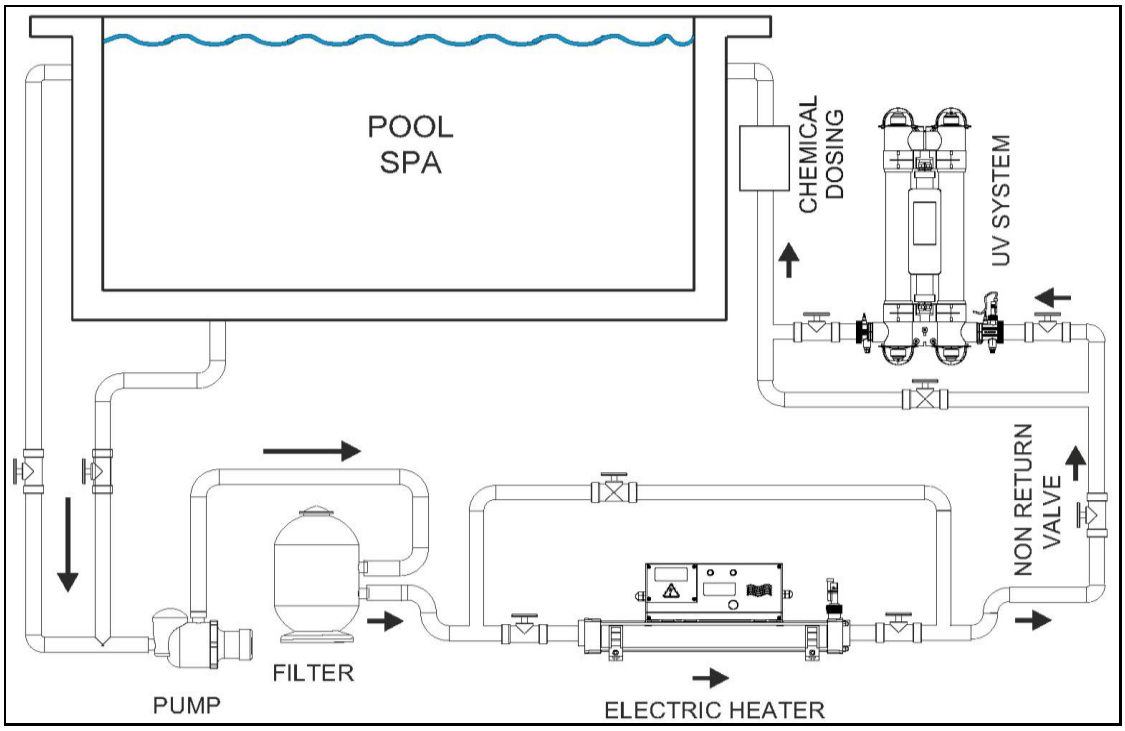


Fig 3.

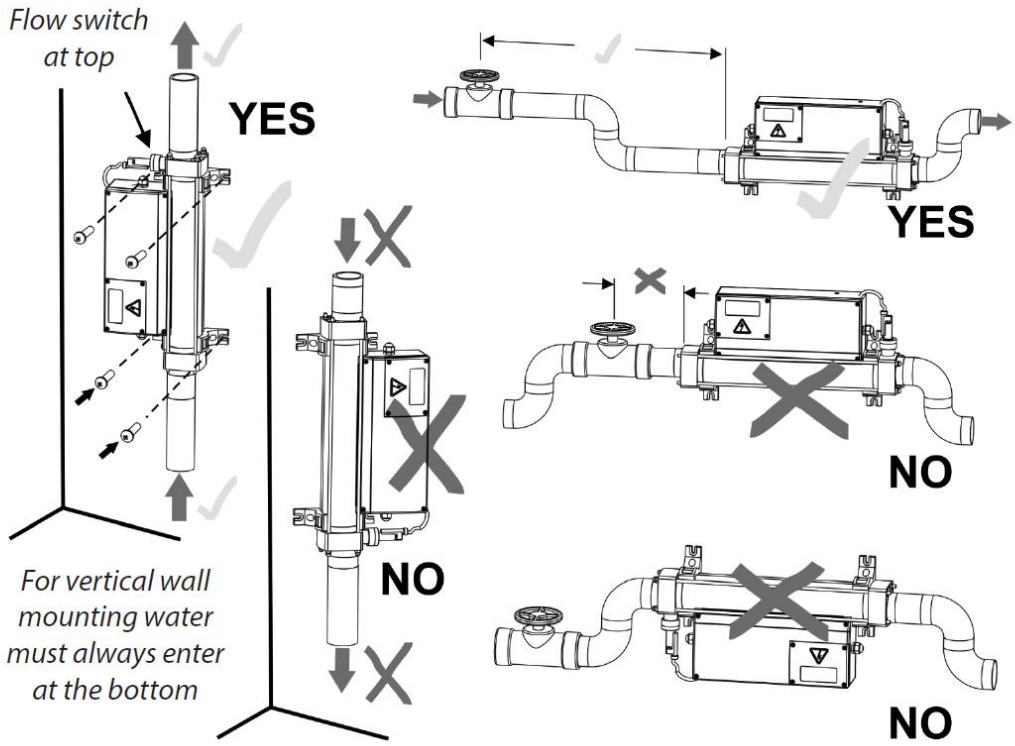


Fig. 4

It is essential that the pipe work connecting to and from the heater has a minimum bore (internal diameter) of 32mm. 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. 3).

NOTE: *When coupling to a flexible pipe, a safety loop can easily be formed by directing the pipe up and over an obstacle. Pipe clips should be used to securely fasten all hose connections.*

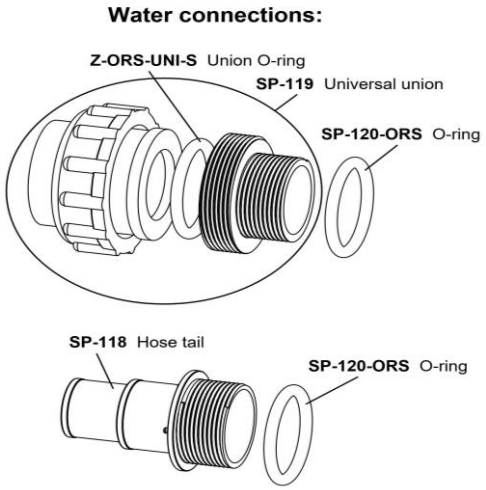


Fig. 5

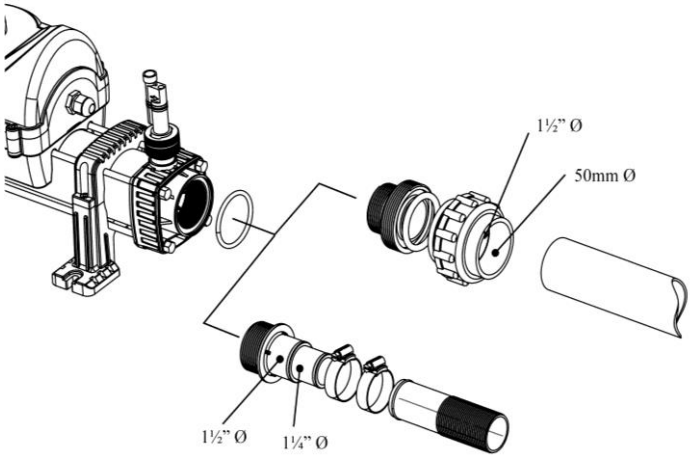


Fig. 6

If rigid pipework is used

There is no need to use mastic or PTFE tape to connect unions or hosetails to the heater, use the O-ring supplied which should be slid over the threaded ends (see Fig. 5).

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

If flexible pipework is used

Connect the pipe to the non-threaded side of the hosetail and secure using two jubilee clips (see Fig. 6).

2.4 Electrical connection

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).

Remove Access Cover to make the electrical connections (Qualified Electricians Only)

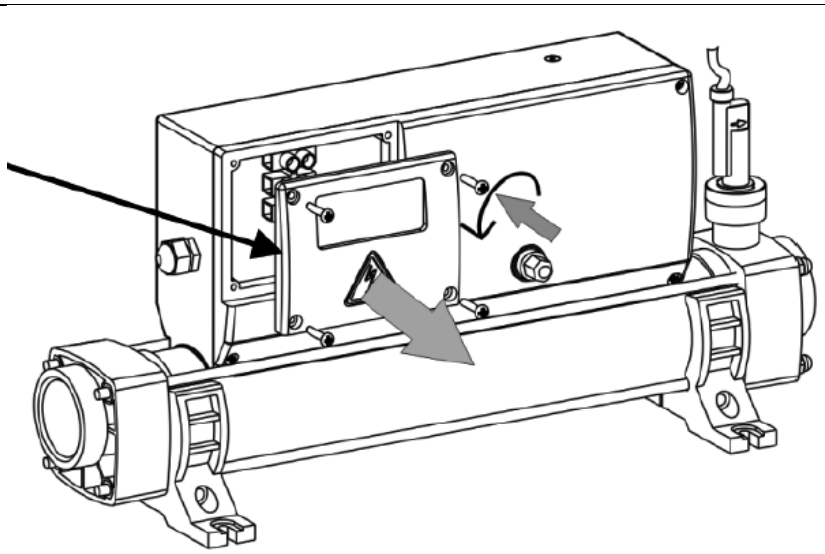


Fig. 7

2.5 Power requirements

Power Output [kW]	Voltage [V]	Current [A]
2	220-240	9
3	220-240	13
4.5	220-240	20
6	220-240	27
9	220-240	40
12	220-240	53
15	220-240	66
18	220-240	79

3 Phase Power Output [kW]	380-415V 3Phase 220-240V Single Phase	Current [A]
6	380-415/220-240	9/27
9	380-415/220-240	13/40
12	380-415/220-240	18/53
15	380-415	22
18	380-415	26
24	380-415	35

3. OPERATING INSTRUCTIONS

3.1 Flow requirements

The flow rate of water into the heater must not exceed 17,000 litres per hour (17m^3/hour/3,740 UK gallons per hour). A higher flow rate will require the installation of a bypass to prevent damage to the heater elements.

NOTE: The heater will not operate unless the following minimum flow rates are achieved:
1,000 litres/hour (1m^3/hour/220 UK gallons/hour) for 2 to 6 – kW heaters
4,000 litres/hour (4m^3/hour/880 UK gallons/hour) for 9 to 24 – kW heaters

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 degrees (ie: ½ turn - see fig. 6)

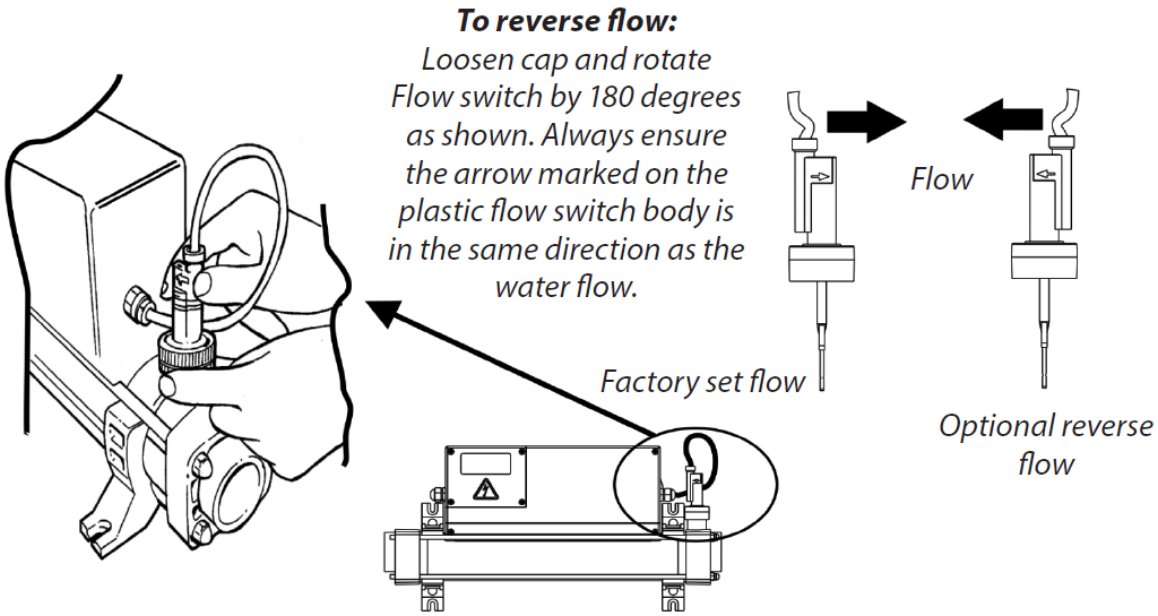


Fig. 6

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 Analogue Thermostat Instructions

Rotate the Temperature 'Set point' dial located on the front of the unit (see fig 1) to the required water temperature.

3.4 Digital thermostat instructions

The digital thermostat displays the temperature in °C.

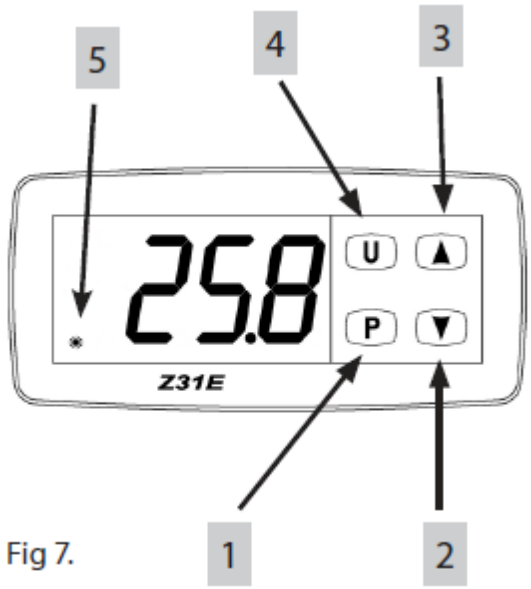


Fig 7.

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	Indicates that the water temperature has fallen below the required temperature
	If flashing	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.

Time switching delay

To prevent overheating of the 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 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 the Red indicator (5) on the digital thermostat (see Fig 7.)

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 0.6ºC. This value is known as the differential and is also in place to prevent over heating to the switch components caused by cycling.

4. TROUBLESHOOTING

4.1 General Troubleshooting

➢ 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.

➢ 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 not fitted with a fuse.*

➢ Heater will not switch from standby to 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 set point 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:	Insufficient flow. Make sure circulation pump is powerful enough to deliver min flow required to operate the heater (see 3.1 flow requirements).
If using a cartridge filter:	Confirm this by running the system with the cartridge removed from your pump and 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.

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

If the heater is faulty it will instantly trip 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 the heater back to the manufacturer. Use the 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.

- **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 relation 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.

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.

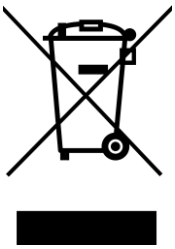
The heater should be drained, the flow tube and heating elements should be cleaned. Removing scale/sludge and any debris or blockages will extend the life expectancy of the heating element(s) and avoid potential failures.

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

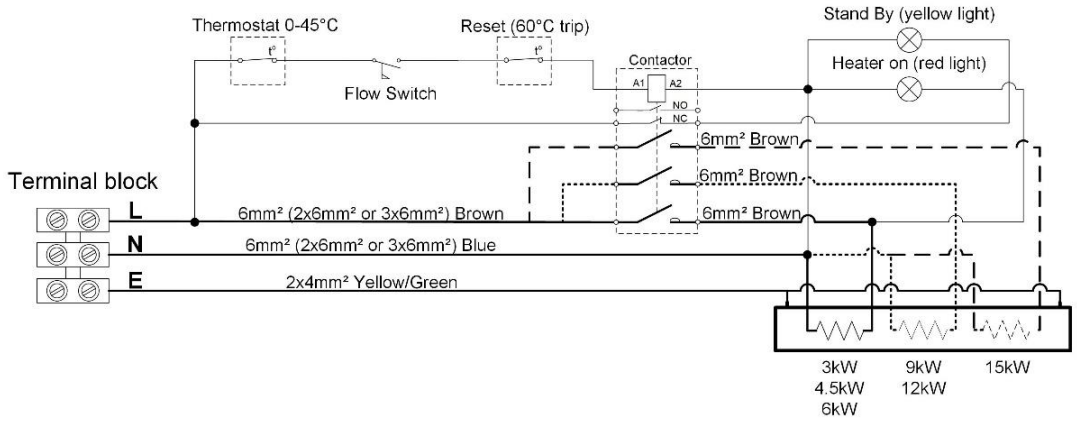
This product is guaranteed from the date of purchase against faulty workmanship and materials for:

- **two years within Europe**
- **one year outside Europe**

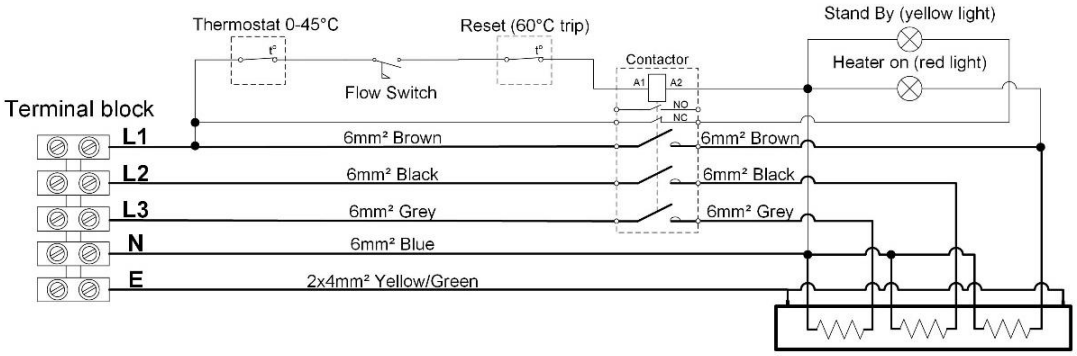
- The manufacturer will replace or repair, at its discretion, any faulty units or components returned to the Company for inspection.
- Proof of purchase may be required.
- The manufacturer will not be liable in cases of incorrect installation of the heater, inappropriate use or neglect of the heater.
- 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.

8. WIRING DIAGRAMS

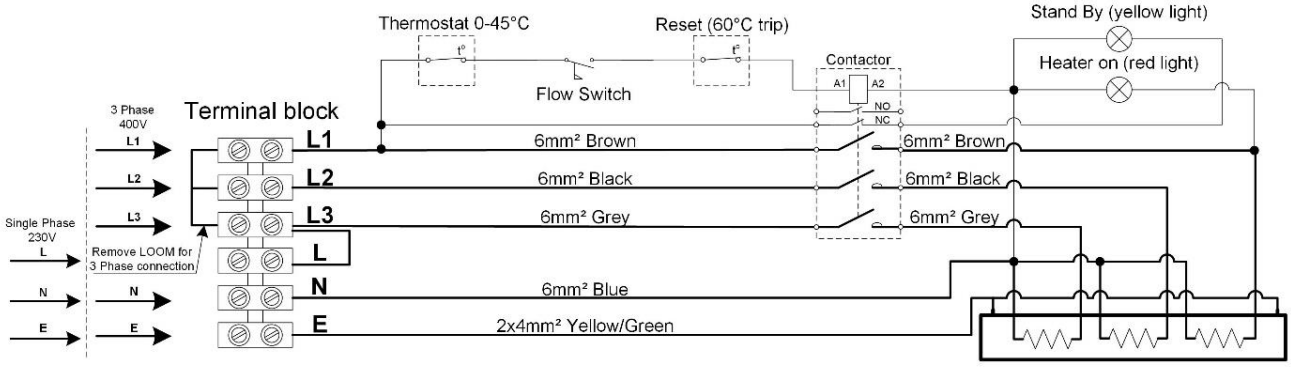
Vulcan Analogue Single Phase 220-240V



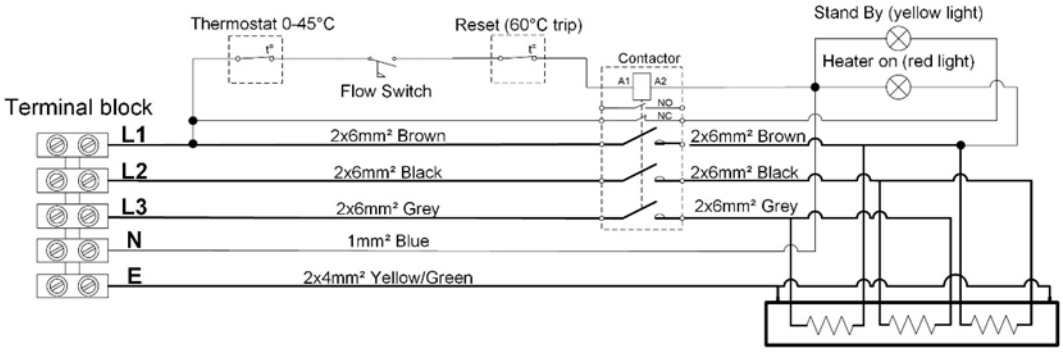
Vulcan Analogue 3 Phase 380-415V (15, 18kW)



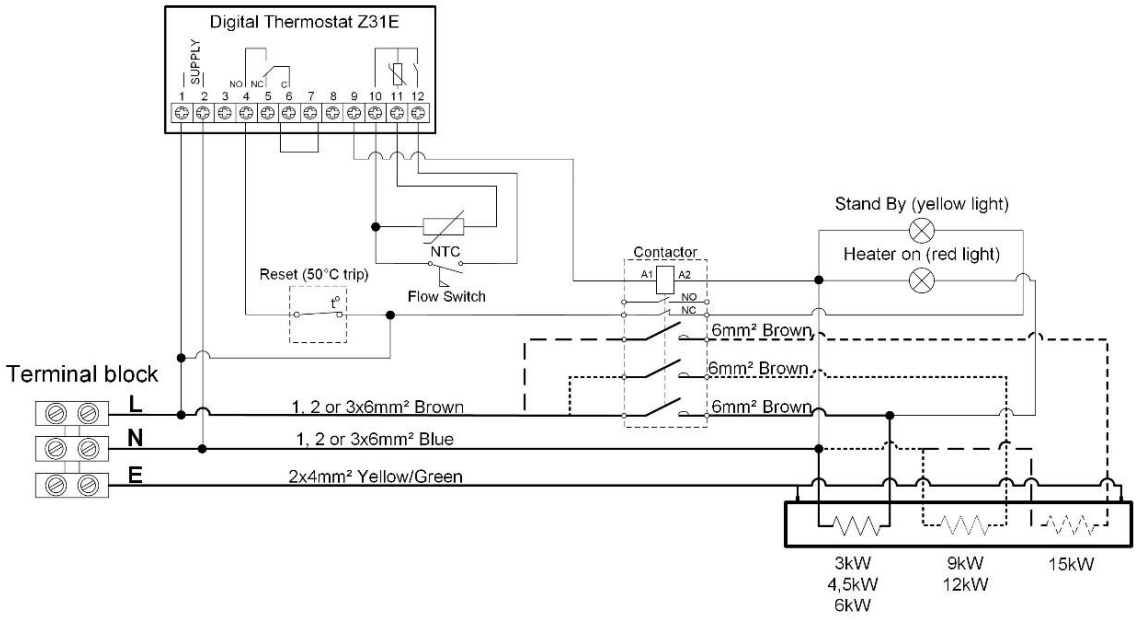
Vulcan Analogue 3 Phase 380-415V or SP 220-240V (6, 9, 12kW)



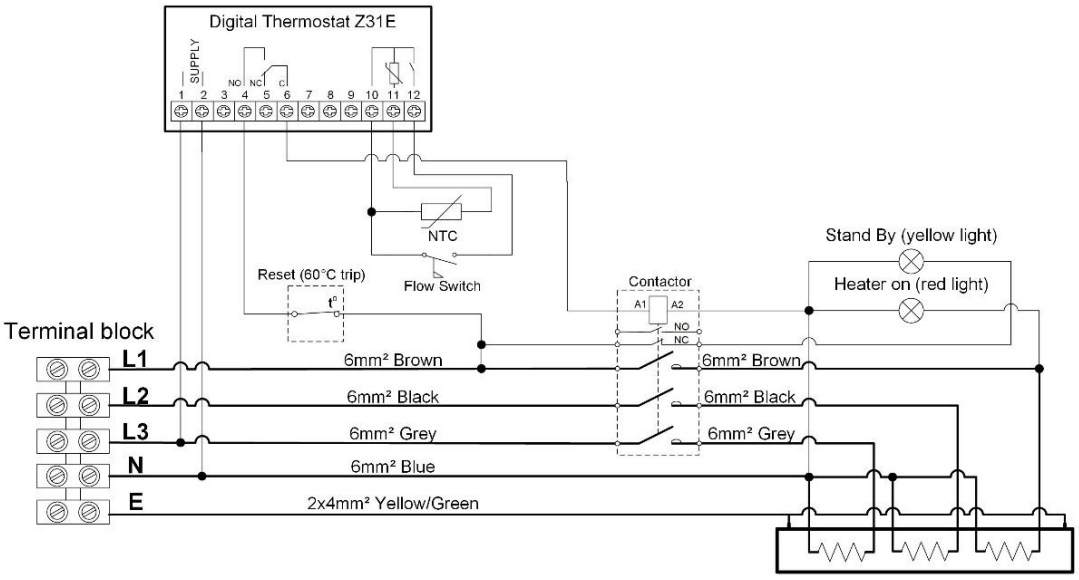
Vulcan Analogue 3 Phase 380-415V (24kW)



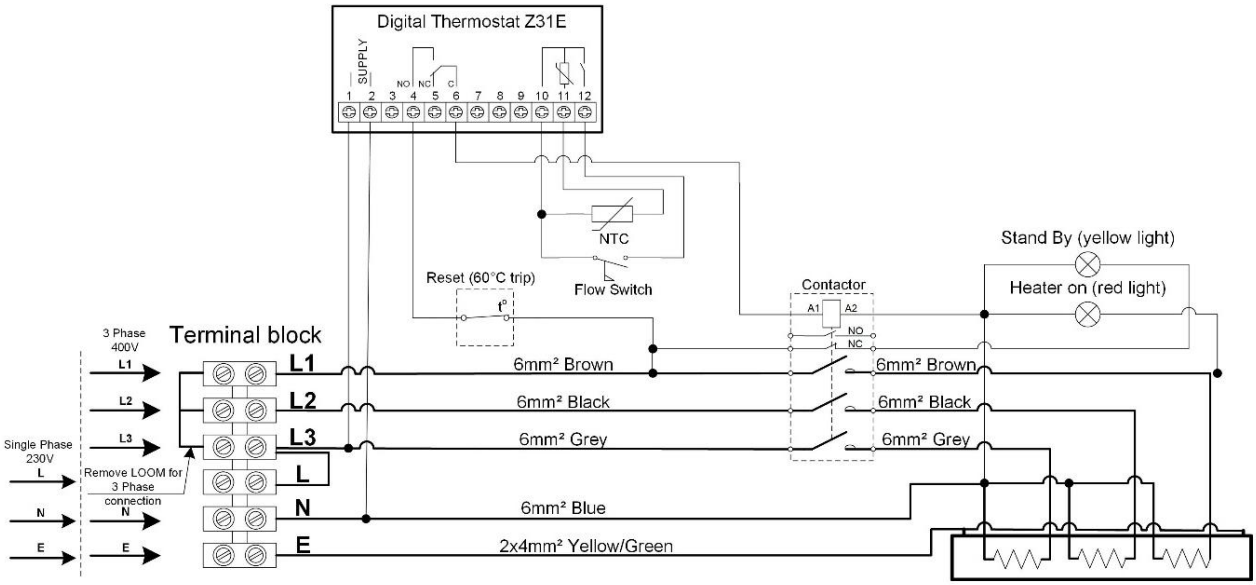
Vulcan Digital Heater Single Phase 220-240V



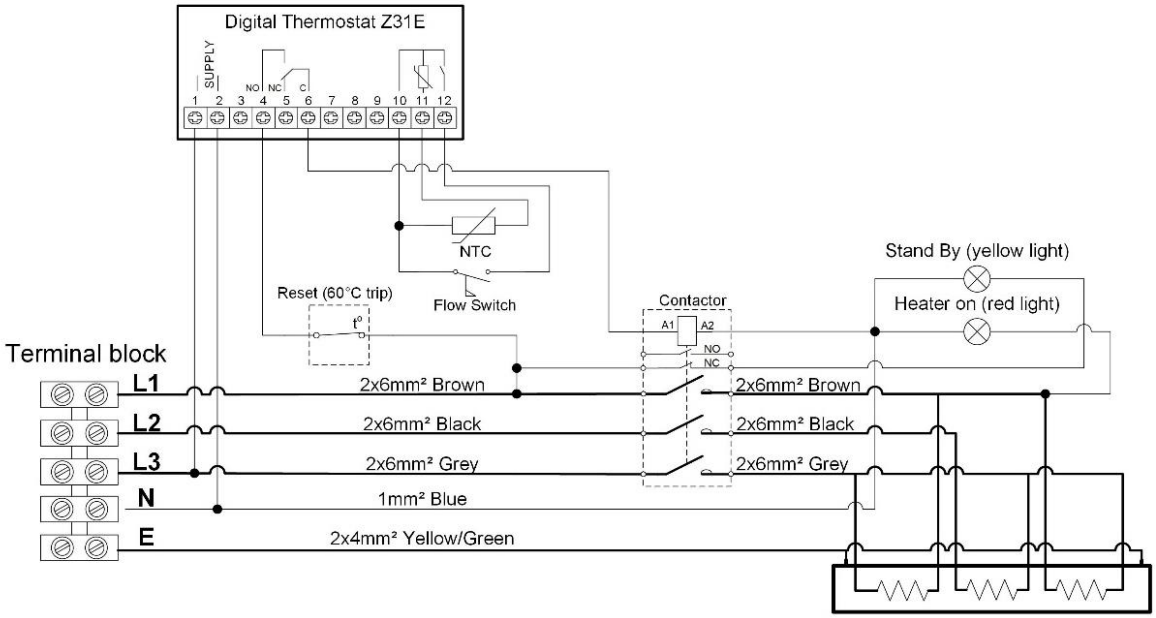
Vulcan Digital Heater 3 Phase 380-415V (15, 18 kW)



Vulcan Digital Heater 3 Phase 380-415V or SP 220-240V (6, 9, 12 kW)



Vulcan Digital Heater 3 Phase 380-415V (24kW)



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
Sales@vulcanpools.co.uk www.vulcanpools.co.uk +44 (0) 1438 759192

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