

DIGIHEAT TITANIUM IN LINE SPA HEATERS

Installation and operation manual for Single & Three Phase Models

DigiHeat 2.4kW - 10A

DigiHeat 3.6kW - 15A

DigiHeat 4.8kW - 20A

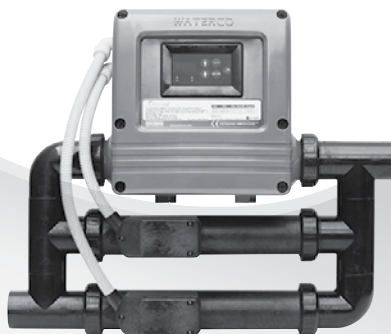
DigiHeat 6.0kW - 25A

DigiHeat 10.8kW - 15A/Phase

DigiHeat 14.4kW - 20A/Phase

DigiHeat 18.0kW - 25A/Phase

DigiHeat 24.0kW - 35A/Phase



WARNING

This equipment must be installed and serviced by a qualified technician. Improper installation may result in property damage, serious injury or death. Improper installation and/or operation will void the warranty.



Notice to Installer

This manual contains important information about the installation, operation and safe use of this product. Once the product has been installed **this manual must be given to the owner/operator of this equipment.**

Table of Contents

IMPORTANT SAFETY INSTRUCTIONS ----- 01

INSTALLATION ----- 02

ELECTRICAL & WIRING ----- 03

SPECIFICATIONS ----- 03

HYDRAULICS & REQUIRED FLOW RATES ----- 04

REQUIRED FLOW RATES TABLE ----- 04

IMPORTANCE OF WATER CHEMISTRY ----- 05

ADJUSTING THE PRESSURE SWITCH ----- 06-07

OPERATING DIGIHEAT TITANIUM ----- 08

THE TOUCH PAD ----- 09

TEMPERATURE CALIBRATION (bias) ----- 10

LOSS OF POWER ----- 11

EMPTYING THE SPA ----- 11

BACKWASHING THE FILTER ----- 11

TROUBLESHOOTING ----- 12

WARRANTY ----- 13

IMPORTANT SAFETY INSTRUCTIONS

When using this electrical equipment, basic safety precautions should always be followed, including the following:

READ AND FOLLOW ALL INSTRUCTIONS

! WARNING: Disconnect all AC power during installation and servicing.

! WARNING: In order to avoid the possibility of hyperthermia (heat stress) occurring it is recommended the average temperature of the spa - pool water does not exceed 40°C.

! WARNING: The Digiheat Titanium Spa Heater is not intended for use by persons (including children) with reduced physical sensory or mental capabilities, or lack of experience and knowledge, unless they have been provided supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure they do not play with the appliance.

- In certain situations unexpected start up may occur when the appliance is in automatic mode.
- The installer should assess the risk with unexpected start-up of this device which, in any circumstance should have no hazardous effect.
- The Digiheat Titanium Spa Heater is not meant to provide safety protection for connected devices. All connected devices should have their own protection for safe operation.
- The heater should be deactivated if the pool or spa has been drained.
- Waterco electric heaters must be installed by a suitably qualified person in accordance with current Regulatory Standards, the applicable Wiring Rules (AS3000) and local statutory authority regulations.
- Parts containing live parts, except parts supplied with safety extra-low voltage not exceeding 12V, must be inaccessible to a person in the spa - pool.
- Parts incorporating electrical components, except remote control devices, must be located or fixed so that they cannot fall into the spa - pool.
- The appliance should be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30mA.
- An Earth terminal is located inside the wiring enclosure. To reduce the risk of electric shock, this terminal must be connected to the grounding means provided in the electric supply service panel with a continuous copper wire as sized to comply with current Standards and local statutory authorities in relation to the circuit conductors supplying the equipment.
- A cable connector is provided on this unit to connect a suitably sized copper conductor between this unit and any metal equipment, metal enclosures of electrical equipment, metal water pipe, or conduit within 1.5m of the unit via equipotential bonding.

SAVE THESE INSTRUCTIONS.

INSTALLATION

DigiHeat Titanium single phase models can be mounted directly onto the pipework, fixed to a wall or base mounted. Wall and base fittings are supplied. Single phase units should be plumbed using minimum 40mm pipe.

Digiheat Titanium three phase units should be mounted securely and directly to a wall due to the wet weight. Wall fittings are supplied with the unit. Three phase units should be plumbed using minimum 50mm pipe.

NOTE: All units are to be mounted with a 5 degree incline to the water outlet to assist with purging air from the unit during operation.

Direct mounting onto pipework

- simply connect the Digiheat to the pipework. Ensure the pipework is rigid and secure.



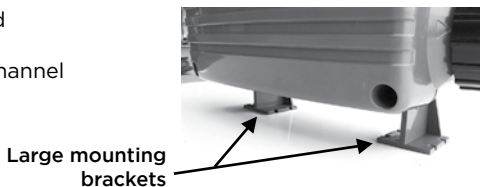
Wall mounting

- use the 4 small mounting brackets supplied. Slide two small mounting brackets into the channel located on the top of the Digiheat and the same on the bottom.



Base mounting

- use the 2 large mounting brackets supplied (single phase model only). Slide two large mounting brackets into the channel located on the bottom of the DigiHeat



ELECTRICAL & WIRING

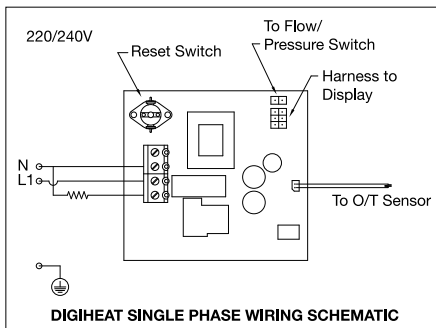
- The electrical wiring must be permanently hardwired by qualified electrician in accordance with all the local wiring rules.
- A properly rated isolating switch must be connected from the supply to the DigiHeat with a minimum rated power circuit as specified on the table below.
- To access and carry out the electrical connections, the front cover with the digital controller needs to be removed. The front cover of the DigiHeat is hinged from the bottom to make it easier to remove and replace.

To remove the front cover :

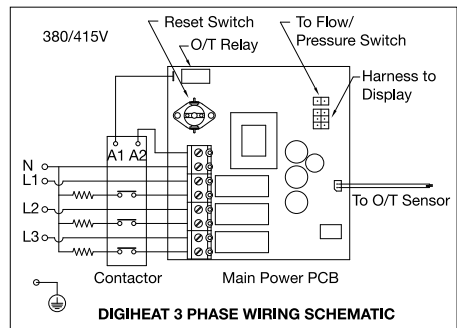
- remove the 6 spring loaded quarter turn locking pins first
- pull the cover gently from the top
- now slide the cover across to the left to disconnect the hinges.

⚠ WARNING

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DigiHeat Titanium Single Phase



DigiHeat Titanium Three Phase

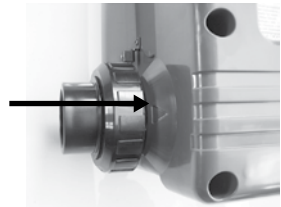
SPECIFICATIONS

Model	Weight (kg)	Supply Voltage (volts)	Frequency (Hz)	Amps	Minimum Circuit Size (Amps)	IP Rating	Max Pressure (kPa) @ 31m head
2.4 kW	3.5	240	50	10	15	IP23	300
3.6 kW	3.5	240	50	15	20	IP23	300
4.8 kW	3.5	240	50	20	25	IP23	300
6.0 kW	3.5	240	50	25	30	IP23	300
10.8 kW	9.4	415	50	15 /phase	20	IP23	300
14.4 kW	9.4	415	50	20 /phase	25	IP23	300
18.0 kW	9.5	415	50	25 /phase	30	IP23	300
24.0 kW	9.5	415	50	35 /phase	40	IP23	300

HYDRAULICS & REQUIRED FLOW RATES

⚠ WARNING This equipment must be installed and serviced by a qualified technician. Improper installation may result in property damage, serious injury or death. Improper installation and/or operation will void the warranty.

- Water must flow from left to right (when facing the DigiHeat).
- There are arrows marked on the housing to assist in determining the correct direction.
- The DigiHeat should be positioned upstream from any chemical dosing or chlorinator and a check valve should be installed to prevent corrosive water from flowing back into the DigiHeat.



NOTE: In the event of DigiHeat being installed more than 1.8m below the pool water level the adjustable pressure switch will not work. A flow switch (included on three phase models) must be installed in place of the pressure switch.

REQUIRED FLOW RATES TABLE

- Digiheat products require a constant water flow rate within the minimum and maximum recommended as stated. Any filtration device and media on the hydraulic circuit with the Digiheat unit must be cleaned on a regular basis to prevent restrictions to water flow.
- Failure to observe the recommended water flow rates may void the product warranty.
- Ideally, the optimum flow rate is the midpoint between the minimum and maximum flow rates.

DigiHeat Model	Recommended Minimum Flow Rate (litres / minute)	Recommended Maximum Flow Rate (litres / minute)
2.4 kW	150	350
3.6 kW	150	350
4.8 kW	150	350
6.0 kW	150	350
10.8 kW	200	450
14.4 kW	200	450
18.0 kW	250	450
24.0 kW	250	450

IMPORTANCE OF WATER CHEMISTRY

The DigiHeat has been carefully designed to withstand the harsh environment of a spa system, and non metallic materials are used extensively. Where metals parts are used however such as heater elements it is important the water is chemically balanced to ensure it is not corrosive or scale forming. Waterco will not be responsible for damage caused by corrosion or scaling.

The chemical balance of water is a relationship between its pH, total alkalinity, calcium hardness and temperature. Your professional pool or spa shop can test the water to ensure it is chemically balanced in accordance with the Langelier Saturation Index.

The water must be maintained at all times as per the following:

pH level	: between 7.2 & 7.8.
total alkalinity	: between 80 & 150ppm.
calcium hardness	: between 150 & 300ppm.

And within these tolerances to be balanced to the Langelier Saturation Index within a range of : -0.2 to +0.2

Digiheat Titanium models are fitted with titanium elements and provide high resistance to ozone, iodine, baquacil, salt and chlorinated water.

ADJUSTING THE PRESSURE SWITCH

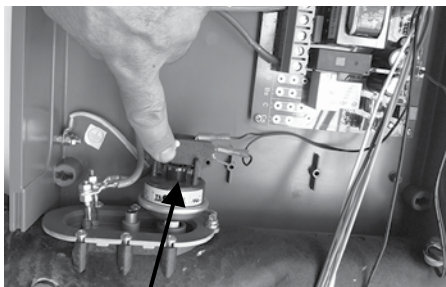
⚠ WARNING

This equipment must be installed and serviced by a qualified technician. Improper installation may result in property damage, serious injury or death. Improper installation and/or operation will void the warranty.

For your safety, refer to the below instruction to ensure the pressure switch is adjusted prior to switching power on to Digiheat. The pressure switch nut is factory set at halfway. Use a multimeter to check switch status.

To adjust the pressure switch:

- Switch OFF the power to the DigiHeat.
- Remove front cover of DigiHeat.
- Ensure the filter is clean & run the pump with the filtration system as normal (FILTER MODE) until all the air has been bled from the system.
- Turn the pump OFF and check the pressure switch turns OFF immediately or after a short delay (1 to 2 secs). If it is not possible to hear the pressure switch operate, connect an Ohmmeter across the Pressure Switch terminals.
- For above water level installation, if the pressure switch contact remains open when the pump is running the adjustment nut should be adjusted up slowly until the switch closes.
- For below water level installation, if the pressure switch contact remains closed after the pump stops the adjustment nut should be adjusted down slowly until the switch opens.
- For installations from 1.8m below water level the pressure switch nut should be adjusted down to maximum pressure.
- If the adjustment required is outside the range of this switch then a different switch or a flow switch will be needed to protect the heater.
- Stop and start the pump several times to check the correct operation. Repeat if necessary.
- Replace front cover on DigiHeat.
- Failure to adjust the pressure switch to suit the installed height may void warranty



Pressure switch adjustment screw

Ensure water flow and all valves open before calibration and operation.

Digiheat Titanium 3 Phase Models 10.8kW (2811030), 14.4kW (2811430), 18kW (2811830) and 24kW (2812430)

A Flowcheck valve (included and pre wired) to be fitted to the Digiheat water outlet.

- a. Looking at the control panel, the water outlet is on the upper right hand side.
- b. The included Flowcheck valve is calibrated to operate with a minimum water flow of 200 litres / minute.



- c. The flowcheck valve is configured to operate in conjunction with the pressure switch.
- d. An upturn on the outlet is required for units mounted above water level to ensure the Digiheat Titanium is completely filled with water prior to it returning to the spa.

OPERATING THE DIGIHEAT

After familiarising yourself with the layout and settings of the touch pad, fill the spa with water and follow the instructions below.

We suggest you instruct all the people who will use the spa or pool fitted with the DigiHeat on how to operate it by either by giving them this manual or by showing them yourself.

Reading, understanding and following this guide should lead to trouble free operation of the DigiHeat spa heater.

1. Fill the spa with water and then switch on the water pump.
2. Switch on the power to the DigiHeat. The controller will then display "OFF" or the water temperature. If the pump is not running or if there is insufficient water flow, "nFL" will be displayed.

(Please refer to troubleshooting section of this manual for "nFL")

3. If the display reads "OFF" press the on/off button to switch on the Digiheat, the temperature will then be displayed.
4. Press and release the Up or Down button and the set temperature will be displayed with either the °C or °F indicator LED flashing.
 - To increase the desired set temperature press and hold the Up button which will allow the set temperature to be raised up to a maximum of 40°C (104°F). Release the button when the desired temperature is displayed on the screen.
 - To decrease the desired water temperature press and hold the Down button. Release the button when the desired temperature is displayed on the screen.

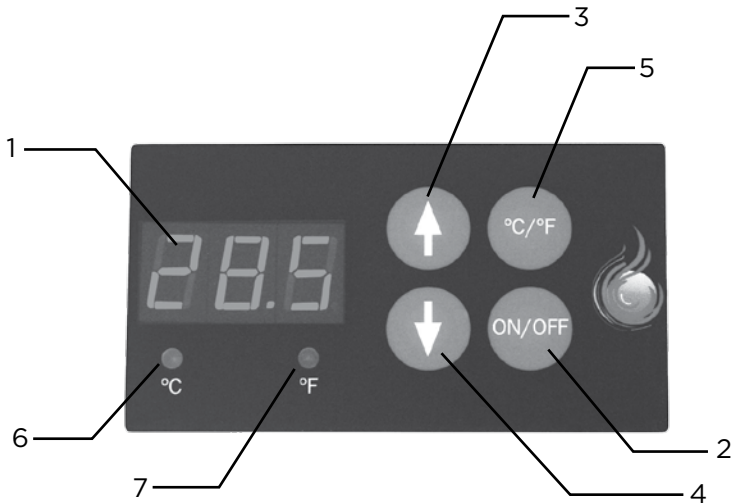
5. With an accurate thermometer, check the actual water temperature in the spa is the same as the temperature displayed on the Digiheat.

If the displayed water temperature is different to the actual water temperature, the controller will need to be calibrated. This can only be done whilst the temperature is shown in °C. Refer to the section "temperature calibration".

6. When switching the Digiheat off during a heating cycle, allow the heater to cool down by keeping the water pump operating for two minutes.

THE TOUCH PAD

- 1. Digital display.** Displays the water temperature, bias setting and fault codes.
- 2. On/Off button.** Used to switch the Digiheat On or Off.
- 3. Up arrow button.** Used to increase the desired water temperature and also increase the bias setting. (refer to bias adjustment section.)
- 4. Down arrow button.** Used to decrease the desired water temperature and also decrease the bias setting. (refer to bias adjustment section.)
- 5. °C/°F button.** Use to toggle between Farenheit and Celcius.
- 6. °C indicator light.** temperature displayed in °C
- 7. °F indicator light.** temperature displayed in °F



Digiheat Touch-Pad

TEMPERATURE CALIBRATION (bias)

It is possible to have a temperature variation between the water in the spa and the DigiHeat controller. This is also referred to as the "Bias" adjustment setting. This adjustment can only be carried out whilst the controller is set for "°C" (centigrade).

Example: if the water in the spa is 26°C and the DigiHeat control displays 24°C.

To calibrate the temperature variation, set the bias to +2 with the following procedure:

1. Switch on both the pump and the Digiheat.
2. With the use of an accurate thermometer, read the spa water temperature (e.g.: 26°C).
3. Next read the temperature displayed on the DigiHeat control (eg: 24°C).
4. To determine the bias setting, subtract the spa water temperature from the DigiHeat Temperature.

Eg : $26 - 24 = 2^{\circ}\text{C}$. Therefore we must compensate for the variation by setting the bias to +2.

If the temperatures were reversed eg; the water temperature was 24 and the Digiheat control was 26 we would require a bias setting of -2.

Eg : $24 - 26 = -2$. Therefore we must compensate for the variation by setting the bias to -2.

5. Enter the programming mode by simultaneously pressing on the UP and DOWN arrows.
6. Once the temperature display is flashing press on the ON/OFF button.
7. Using the UP and DOWN arrows, enter the calibration value, (+2). In this case, by pressing the UP arrow twice.(if the down arrow is used, the bias will be a negative figure)
8. Once the bias has been entered, wait until the calibrated temperature appears back on the display.

LOSS OF POWER

If the power supply to the Digiheat is lost, either by disconnecting it from the power supply or from a “blackout”, when power is restored, the DigiHeat will operate as follows,

1. If the Digiheat was “ON” prior to the power interruption, it will continue heating if the pump is running and the set temperature is higher than the displayed temperature when the power is restored. If the pump is not running, the display will show nFL.
2. If the Digiheat was switched “OFF” prior to the power interruption, it will remain “OFF” when power is restored.

EMPTYING THE SPA

If you intend emptying the water from the spa, disconnect the Digiheat and pump from the power supply (isolating switch) to ensure the Digiheat will not be accidentally switched on while the spa is empty. The pump can be damaged if it is run without water. Serious damage or injury may result.

BACKWASHING THE FILTER

If you intend to backwash or clean the filter media ensure the Digiheat power supply is switched OFF during this period.

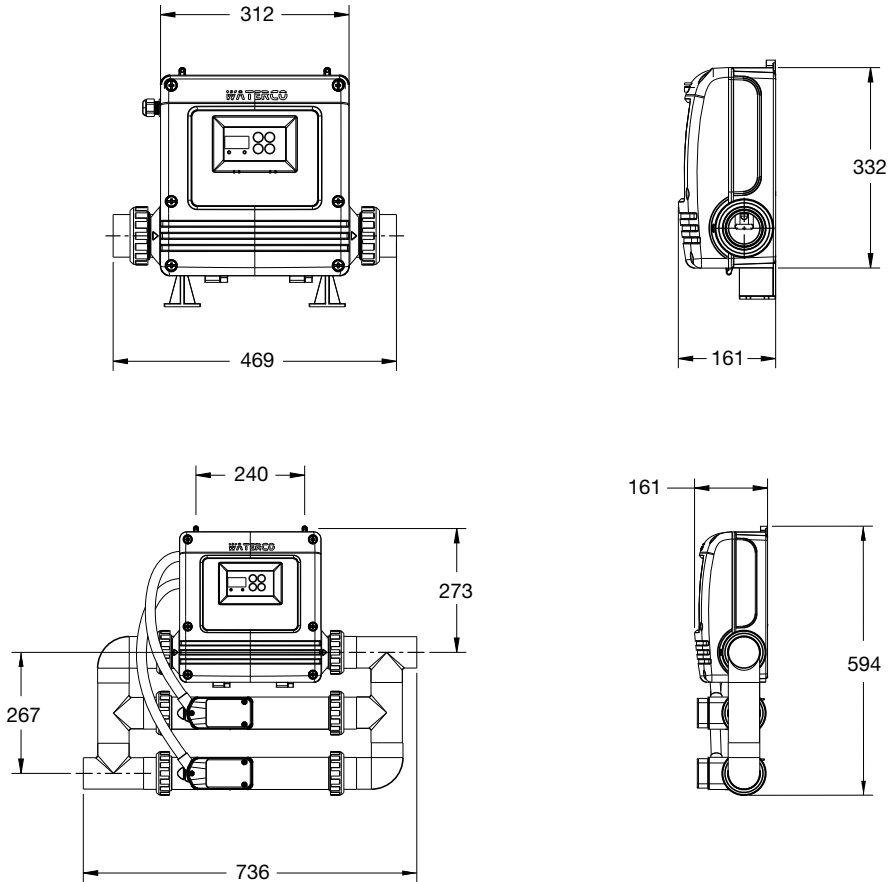
TROUBLESHOOTING

The Digiheat should only be serviced by qualified service technicians. However, some problems can be checked and rectified by the owner before making a service call.

FAULT	POSSIBLE CAUSE	ACTION
Display is blank	No power	Check the isolating switch is on and not damaged.
	Blown fuse	Check the power circuit fuse or circuit breaker has not blown or tripped.
	RCD tripped	Reset RCD.
nFL	Pump not on or pressure switch needs to be adjusted	Switch on pump or adjust pressure switch.
o/t	Over-Temperature Reset Switch tripped	See “Over-Temperature Reset Switch tripped” below.
	Water inside Digiheat reached 45°C /113°F (spa water is still cold)	Check for and remove blockages in the filter and pipe-work. Check for blockages in the impeller and call for service if items are found in the pump/impeller. Press Over-Temperature RESET.
Over-Temperature Reset Switch tripped (touch pad power indicator light blinking)	Water in spa reached 45°C /113°F (touch pad shows lower temperature)	Properly secure sensor in housing (refer to “Installing the Sensor” on page Press Over-Temperature RESET.
	Over-Temperature Sensor not connected or faulty	Re-check Temperature Bias (refer to “temperature calibration”) Press Over-Temperature RESET.
		Call service to connect or replace.
Over-Temperature Reset Switch tripped shortly after power-up	Over-Temperature Sensor not connected.	Check sensor is connected to Control Box. If not, call service to connect the sensor.
Touch pad display shows 00	Temperature Sensor faulty.	Call for service to replace Temperature Sensor.
	Water level too low	Add water to spa or pool to operate pressure switch.
Heater will not operate	Faulty element	Call for service.

Complies with EN60335.2.60, AS/NZS3136:2001, AS/NZS3100:2009

Approval No.: SAA100357EA



WARRANTY

Waterco DigiHeats are covered by a comprehensive 12 months warranty. Please refer to Waterco's warranty terms and conditions.



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