

HEATER CONTROLLER

Installation and Operation Manual



Rainbow Pool Products

PO Box 2388, Mansfield Qld 4122

Telephone STD 61-7-3849 5385

Facsimile STD 61-7-3849 5384

Email: info@rainbowpoolproducts.com.au

Web: www.rainbowpoolproducts.com.au



For operating a conventional swimming pool heater on a separately plumbed hydraulic circuit.

WARNING

This equipment must be installed and serviced by a qualified technician. Improper installation can create electrical hazards which could result in property damage, serious injury or death. Improper installation 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.**



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WATERCO

Waterco Limited ABN 62 002 070 733

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WATERCO

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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.
- ⇒ ! WARNING: In order to avoid the possibility of hyperthermia (heat stress) occurring it is recommended that the average temperature of the spa - pool water does not exceed 40°C.
- ⇒ ! WARNING: Waterco Heater Controller 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 associated with unexpected start up of any connected device which, in any circumstance should have no hazardous effect.
- ⇒ The equipment mentioned in this manual is specially designed to control heating of water in swimming pools.
- ⇒ The installation should be carried out in accordance with the safety instructions of swimming pools especially Standard HD 384.7.702 and the specific instructions for each facility. This appliance is intended to be installed in accordance with the wiring rules (AS/NZS3000) and outside the pool zone.
- ⇒ This product must be mounted vertically, with the socket outlets facing down.
- ⇒ The rules enforced on accident prevention should be carefully followed.
- ⇒ During operation, some parts of the Waterco Heater Controller are subject to dangerous electric voltage. Ensure the Heater Controller is disconnected from the supply mains and attached equipment before performing work on any auxiliary equipment.
- ⇒ The user should ensure assembly and maintenance tasks are carried out by qualified authorized persons and that these persons have first carefully read the Service and Installation Instructions.
- ⇒ The operating safety of the Heater Controller is only guaranteed if the Installation and Operation instructions are correctly followed.
- ⇒ The limit values stated in the Technical Specifications should not be exceeded under any circumstance.
- ⇒ In the event of defective operation or fault, contact the manufacturer's Technical Support Department or nearest Authorized Agent.

- ⇒ The controller is a complete appliance and should not be modified. If the product or supply cord is damaged, it must be repaired by the manufacturer, its service agent or similarly qualified persons, with original replacement parts and accessories authorized by the manufacturer in order to avoid a hazard. The manufacturer accepts no liability for the damage and injuries caused by unauthorized replacement parts and accessories.
- ⇒ The Waterco Heater Controller conforms to the Australian Electromagnetic Compatibility Standard marked by the C-tick.

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INTRODUCTION

Congratulations on choosing the Waterco Heater Controller to operate your conventional swimming pool heater on a separately plumbed hydraulic circuit.

This manual contains information pertaining to the installation, operation and maintenance of your Waterco Heater Controller. Please read the instructions in this manual carefully. Waterco equipment is designed and manufactured to provide safe, reliable operation. We hope that you obtain the maximum pleasure and benefit from your heated pool!

FEATURES AND BENEFITS

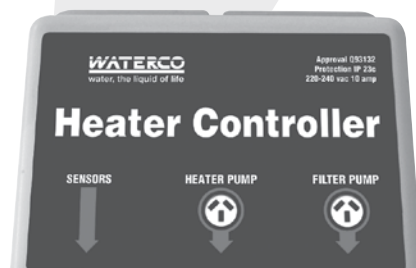
- Combined filter pump and heater pump control unit.
- Thermostatically controls conventional heaters on independently plumbed heating circuits.
- Heater pump off overnight timer
- Two filter pump timers
- Safe, low voltage control panel separate from high voltage power module.
- Digital temperature display.
- System status, operation and fault display.
- Raised buttons to allow easier operation.
- Backup battery to keep time and set program.
- Optional flow check valve connection to safeguard against pump running dry.

SECTION 1 - Installation Instructions

POWER MODULE

The power module should be mounted on a vertical surface in a sheltered position where it is protected from direct exposure of sunlight or entry of water from rain, garden hoses, etc., e.g.: on a wall protected by the house eaves.

Secure to vertical surfaces by screws; through the two top mounting holes (190mm apart) so the open side is facing down to prevent water entry.

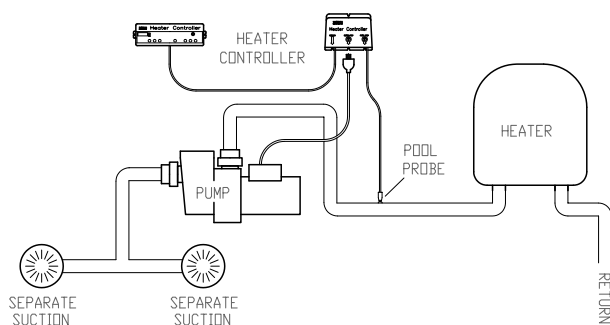


CONTROL MODULE

Measure out and drill two holes into the vertical mounting surface so they are in line with the Controller mounting brackets. Mount by driving two #5 pan head screws onto the mounting bracket of the Controller into the vertical mounting surface.



INDEPENDENT HYDRAULIC HEATING CIRCUIT



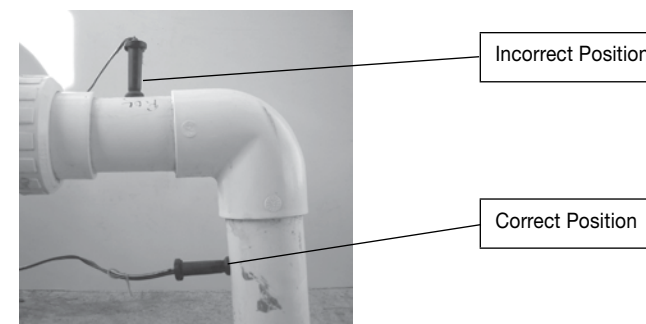
PROBE SENSOR & HARNESSES

Consist of the pool probe and flow link.

Pool Probe:

This must be installed in the heater pump return prior to the heater so that it can sense the pool water temperature at all times.

- I. Carefully drill a 9.5mm hole in the side of the line as shown in the image below with a suitable drill bit designed for use on PVC pipe.
- II. Insert the special plug into the hole and rotate home.
- III. Insert the probe holder by pushing into the plug fully up to the head. This is a tight fit to ensure sealing. Lubricate with soap if necessary but do not use mineral oil or grease.
- IV. Strap lead firmly to pipe to prevent any strain on the probe holder or lead entry.
- V. The probe should not be installed on top of any pipe work coming from the pump as it is exposed to sunlight and accidental physical damage. It should be installed on an inside elbow of the pipe work (as shown). This will eliminate heating of the probe by sunlight – giving inaccurate readings, and also minimise the risk of damaging the probe by pool users.



CONNECTING THE CONTROLLER TO POWER

- I. The heater circuit circulating pump is to be plugged into the heater pump GPO.
- II. Plug in power lead to standard 3 pin 240 VAC 10-amp power supply outlet and switch on.
- III. The heater pump will now operate in accordance with prescribed conditions.

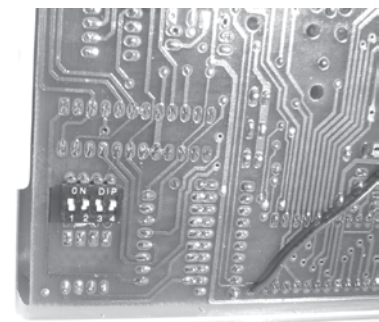
Note: - Waterco recommends the installation of a flow check valve to conventional heaters mounted more than one metre above or below the pool surface level.

DIP SWITCH SETTINGS

Four DIP switches located in rear of Control Module are factory set in the following positions:-

	SWITCH ON	SWITCH OFF	SETTING
L1	Auto Heat/ Cool	Heat Only	Off
L2	Pool/ Spa Model	Hot Water Model	On
L3	Heating 24Hrs. S/C sensor test	Disable Heating between 9pm and 7am. No S/ C test	Off
L4	SOF' Model	'In S' Model	Off

Normally the top out temperature can be set from 15.0 - 40.0°C in 1°C increments.



SPECIFICATIONS

Approval No.	SAA-170044-EA
Power Supply	240 VAC 50/60Hz combined load 10 amps maximum,
	1.5m lead length
Probe Length	Factory fitted 3m Pool
Outlet GPOs	3 pins standard 10 amp maximum load
Dimensions	254 X 81 X 25mm Control Module
	175 X 135 X 85mm Power Module
Top-Out Adjustment	Digital control to 40°C (conforms to AUST STD)
Installation	Sheltered position out of direct sunlight on vertical surface
Indicator LED	All functions except "OFF"
Top-Out setting	0.5°C about set Top-out temperature
Operation	ON/ OFF +5°C / +1°C nominal differential
Flow Protection	Optional with special Flow check Valve protection
Sensor Probe	Pool for positive quick connection and easy installation.

SECTION 2 - User Instructions

FUNCTIONS OF CONTROLLER

Functions

Filter Pump / Heater Pump Operation:

The Waterco Heater Controller should be set to INS. The heater pump runs independently to the filter pump with the filter pump set at timer mode.

Automatic Operation of Heater Pump:

"AUTO" selection will allow the heater pump to circulate pool water through the conventional heater whenever the top out temperature is above pool water temperature until set Top Out temperature is reached.

Manual Operation:

Selection of "MAN" operation overrides the automatic function to operate the heater pump for servicing the system or extending the conventional heater run time.

Heater Pump Off:

Select "OFF" to turn the heater pump off. Mains power supplying the power module will still be on.

Top-Out Temperature Control:

Your controller can be set to stop the heater pump when the pool water reaches your pre-set comfort level. We call this the "TOP-OUT" temperature. Select top-out temperature and alter with "+" or "-" button until the desired top-out temperature is displayed. After 10 seconds, the display will revert to display the pool temperature. Maximum temperature under normal conditions is limited to 40°C in accordance with Australian Standards. If the pool temperature exceeds the top-out temperature, the controller will cool the pool automatically.

The Waterco Heater Controller manages the pool water temperature. The conventional heater top out temperature should be set to maximum.

No Flow:

"FLO" will be displayed whenever there is insufficient filtered water flow detected by a Flocheck valve. This is a unique feature, which, when used in conjunction with a special FLOCHECK valve, protects pumps against expensive seal or other damage, due to running dry. If the FLOCHECK valve is not connected, the link wire must be, or FO4 will be displayed. (Refer to Fault Diagnostic section).

Controller Settings Menu Selection:

Depressing the “OFF” button on the Control Module and pressing “SELECT” will scroll through the following options:-

- Option 1. - Setting the bias of the pool and roof probe between +/- 5°C by 0.1°C increments allowing variance adjustment between displayed temperature and on-site temperature measurements.
- Option 2. - Not applicable on this model
- Option 3. - Not applicable on this model
- Option 4. - Display selected operating option set as INS.
- Option 5. - Display set as “norF” for Standard operation.
- Option 6. - To ensure the heater pump does not run the pump through the night, heating may be disabled between the hours of ‘LATE’ and ‘EARLY’. The default for the LATE time is 7pm. Use the “+” and “-” arrows to alter the displayed time.
- Option 7. - The default for the EARLY time is 8am. Use the “+” and “-” arrows to alter the displayed time. The filter timer must be set to TIMER for Options 6 and 7 to be active.

OPERATION GUIDE

General Description

The Control unit has a number of controls operated by button presses as follows:-

“SELECT” The display can be scrolled through the following selections by pressing the “SELECT” key.

The appropriate LED will light to indicate the current selection.

POOL TEMPERATURE	TIMER 1 ON	TIMER 2 ON
TOPOUT TEMPERATURE	TIMER 1 OFF	TIMER 2 OFF
TIME (24 HOUR CLOCK)		

All displays other than Pool Temperature or Time will revert to Pool Temperature or Time depending on whether the last display was Pool Temperature or Time before activating of other display after 10 seconds with no button presses.

Other keys are provided to select or alter functions.

“+” or “-” are used to alter the value of any selected display except pool temperature.

“TIMER” is used to cycle filter through three states of operation:

1. **TIMER** - To automatically access the two set timer periods indicated by **LED**.
2. **MANUAL** - To override set time period and switch the filter on.
3. **OFF** - To switch off the filter pump as indicated by displayed “**OFF**”.

Heater Pump Controller Keys

1. **AUTO** - Automatic operation of heater pump.
2. **MAN** - Manual override, heater pump **ON**.
3. **OFF** - Heater pump **OFF**.

FACTORY DEFAULT PROGRAM SETTINGS

The Factory default program settings are:-

TOPOUT TEMP -	30.0°C	P/R OFFSET -	0.0°C
TIMER 1 START -	12:00	RF ONLY OFFSET -	0.0°C
TIMER 1 STOP -	12:00	P/R DIFFERENCE -	1.0°C
TIMER 2 START -	12:00	TIMER - DISABLED i.e. FILTER ON	
TIMER 2 STOP -	12:00	HEATER PUMP CONTROL -	AUTO.

Start Up

Press SELECT to toggle through and alter the desired top-out temperature, time and timer periods using the “+” and “-” keys; the figure will be locked if not altered for 7 seconds. Select **TIMER** so LED is illuminated.

Timer periods will operate once time passes through the “TIMER ON” setting and stop through “TIMER OFF”.

For Heating; Select “AUTO” mode. Once set, the controller will operate the heater pump which enables heat input. Water flow protection of heater pump operates continuously with optional flow check valve.

Memory

The controller has long life battery to retain all settings and time of day when powered down. A time delay is built into the software to prevent the frequent starting and stopping of the heater pump due to pool sensor location.

ADDITIONAL SETTINGS/ DETAILS

Any of the displays other than the pool temperatures and the types can be adjusted using the ‘+’ or ‘-’ keys providing the keyboard is unlocked. The keyboard can be unlocked by using the ‘SELECT’ key. Once a display is selected the keyboard will remain unlocked until 7 seconds have elapsed without pressing any keys. Caution should be used to avoid inadvertently altering any set values.

Indication for these conditions is provided by the red LED above the ‘**TIMER**’ key. When the timer is off, the LED will be off.

This is equivalent to manual selection for the filter. When the timer is on, the LED will be on outside the time zones and will flash inside the zones. This indicates that the timer is enabled. A third selection turns the filter off and results in the ‘**TIMER**’ LED turning off, as in filter manual selection.

The 4 digit display will display ‘OFF’. ‘OFF’ selection will have no effect on heater pump operation. The three modes above can be selected by consecutive presses of the ‘**TIMER**’ key.

Indication is also given of which zone it is in at any particular time. The ‘**TIMER 1 ON**’ LED will light when the time falls within zone 1 and the ‘**TIMER 2 ON**’ LED will light when it falls within zone 2. Both the zones are functionally identical. When ‘TIMER’ is selected the ‘TIMER’ LED will flash whenever either of the above two LEDs is on.

The filter will also be activated outside the time zones if the pump needs to turn on. The ‘TOPOUT’ LED will light whenever the pool temperature is 0.1°C or more above the top-out temperature and will turn off if it drops to 1.0°C or more below the set temperature.

The zone and top-out indications are blanked when the ‘SELECT’ key is pressed to ensure there is no confusion as to what is being displayed on the 4 digit display. After 10 seconds have elapsed without any buttons pressed the indicators will resume their normal functions.

The Heater Pump can be activated at any time subject to some conditions:-**Flow:**

If there is a no flow condition the pump will not operate. Flow is detected by means of a switch closure by a Flocheck Valve flow switch. An open circuit here will be recognised as a fault, and F04 is displayed and heater pump will not operate.

Manual/ Off/ Auto Selection:**Manual:**

If the above condition is met and 'MANUAL' is selected, the pump will turn on. The exception to this is if the pool temperature rises to 40°C or more.

Off:

Heater Pump will turn off.

Auto:

If the above condition is met and 'AUTO' is selected the pump will operate subject to temperatures and set up values – Top-out, offsets etc,. The pump will not operate in AUTO if a fault is found when reading the pool sensor.

The conditions required to enable the pump in Auto are as follows:-

HEATING - the pool temperature must be less than the Top-out temperature. A 5 second delay timer has been added to the pump. The pump will switch off whenever required but will only ever turn back on if the necessary conditions exist for a continuous 5 second period.

WINTER MODE

Winter mode can be set by setting the Top-out temperature to below 15°C. During Winter mode, the display will read 'SL33' and the pump will operate for 5 minutes between 12:00 & 12:05pm once/ week. Winter mode overrides Standard operation.

All of the set up parameters including the time of day will be stored in battery-backed programmable memory to avoid having to re-set them after power failures. If the time is lost either due to a flat battery or problems reading from the battery backed device, indication will be given by the display flashing '12:00' until it is set.

SECTION 3 - Service Instructions

FAULT DIAGNOSTICS

Various faults can be self diagnosed by the controller. If "F" with a number is displayed indicates a fault condition may exist.

These include:-

- C. Pool Sensor Open Circuit D. Pool Sensor Short Circuit
- E. Flow Switch Open Circuit or missing F. Flow Switch Read Error
- (E & F - Flow switch models only)

If "F" followed by a number is displayed indicates a fault condition may exist.

The fault condition number is a code for the fault or combination of faults. This display will flash until the faults are rectified. The select key may be used to display time or temperature while a fault exists but the display will revert to the fault after 10 seconds has expired without having pressed a key.

The various fault codes have the following meanings:-

Fault Code	Meaning (using A-F - as described above)	Pump Disabled?
01	A	IN AUTO ONLY
02	B	IN AUTO ONLY
04	F	YES
05	A & F	YES
06	C & F	YES
10	C	IN AUTO ONLY
11	A & C	IN AUTO ONLY
12	B & C	IN AUTO ONLY
14	C & F	YES
15	A & C & F	YES
16	B & C & F	YES
20	D	IN AUTO ONLY
21	A & D	IN AUTO ONLY
22	B & D	IN AUTO ONLY
24	D & F	YES
25	A & D & F	YES
26	B & D & F	YES
40	E	YES
41	A & E	YES
42	B & E	YES
50	C & E	YES
51	A & C & E	YES
52	B & C & E	YES
60	D & E	YES
61	A & D & E	YES
62	B & D & E	YES

SECTION 4 - Warranty and Service

WARRANTY AND SERVICE

This unit comes with a one year warranty against faulty materials and workmanship from the date of purchase. Should damage occur arising from water entry, overheating from direct sunlight or other means, unauthorised tampering or repair, fusion caused by storm and tempest or violent power fluctuations, or overloading due to pump malfunctions, a repair service is available. Such repairs are not covered by the unit's warranty. The unit has been factory sealed for your protection and must be serviced only by an Authorised Dealer.