Heater Circulator

User Manual & Setup Guide

TU RANGE

Omron E5CC

Thermoline Scientific Equipment Pty. Ltd.
ABN 80 000 859 129
10-12 Ross Place
Wetherill Park, NSW 2164. Australia.
Phone: +61 2 9604 3911
email: hello@thermoline.com.au
www.thermoline.com.au

Thermoline SCIENTIFIC

Contents

Symbol

General Warning Sign

Warning sign: signifies a general warning, and indicates a risk to people specified by the supplementary sign that if not avoided, may result in death or serious injury.

Warning; Flammable

Warning; Flammable: signifies a flammable warning, and indicates a risk of flammable content as specified by the supplementary sign that if not avoided, may result in a fire by igniting flammable material.

Warning; Electricity

Warning; Electricity: signifies a electricity warning, and indicates a risk of contact with electricity as specified by the supplementary sign that if not avoided, could result in injury.

Warning; Hot Surface

Warning; Hot Surface: signifies hot surface warning, and indicates a risk to people specified by the supplementary sign that if not avoided, will result in contact with hot surface.

General Prohibition Sign

General Prohibition: signifies a prohibited action, indicates a risk to people specified by the supplementary sign that if not avoided, will result in death or serious injury.

Do Not Expose Outside

Do Not Expose Outside: signifies prohibiting the exposure to direct sunlight, and indicates a raised temperature due to sunlight or placement on hot surface can cause harmful damage to bath.

General Information

This user manual is intended for Thermoline's range of TU3 heater circulators. We recommend that you read this user manual the whole way through before you start using the bath. Consider this manual as a part of the water bath and an integral part to its function. We recommend keeping it close and within easy access.

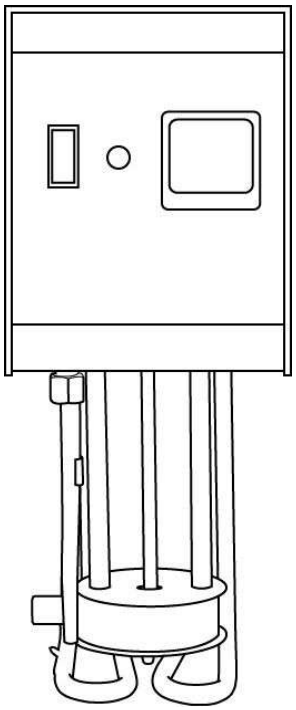
Intended Use

The Thermoline TU3 heater circulators are designed and manufactured in Australia. Designed to operate between ambient +5°C and 100°C. The Thermoline TU3 heater circulator offers an industry standard in temperature controlled in uncirculated baths.

- Control Accuracy: +/- 0.1°C
- Operating Temperature up to 100°C

The Thermoline range of TU3 heater circulators are set to function with specific operating ranges. The optimum operating conditions will be explained further in this manual.

Product Specifications



Dimensions	**TU3**
Overall WxDxH (mm)	**130x160x340**
Bottom Heating Section Only WxDxH (mm)	**90x110x150**

Clearance	**TU3**
Front (mm)	**100**
Back (mm)	**100**
Top (mm)	**100**

Product Specifications

Technical Specifications	TU3	TU3-2000W
Temperature Range	Ambient +5°C to 100°C (max temp with bath lid on)	
Bath Capacity	Up to 24L (Up to 48L max temperature dependant)	24L to 80L (Up to 80L max temperature dependant)
Temperature Stability	+/- 0.1°C	
Display Accuracy	+/- 0.1°C	
Electrical	1020W/230V	2020W/230V
Heating Power	1000 watts	2000 watts
Min. Filling Height Below Bath Top	85mm	
Min. Bath Depth Below Bath Top	130mm	
Weight	4kg	
Features		
Omron E5CC Controller	✔	✔
Air Cooled Motor	✔	✔
Whisper Quiet Operation	✔	✔
Incoloy Heating Element	✔	✔
Safety		
Over Current Protection	✔	✔
Over Temperature Safety	✔	✔
Options		
Mounting Bracket	Universal Mounting Bracket to fix TU3 to the wall of an existing bath/tank	
Programmable Controller (MSP)	(E5CC-MSP) Upgraded Omron Controller features 256 ramp and/or dwell segments	

Warranty:

Thermoline offers a comprehensive two years parts and labour warranty on all Australian Made products.

Operating Environment

Heater Circulator Location

Ensure the heater circulator is placed in a suitable environment, away from direct sunlight or direct heat sources **(Fig 1)**. The product shouldn't be placed in a room where the ambient temperature exceeds that of which it was designed to operate.

Heater circulators should be stored inside at all times. Failure to adhere to this could cause significant drops in water bath performance and damage to items stored inside. when not in use they should be powered down stored out of the water.

Extreme Operating Conditions:

- **Temperature:** *10°C to 32°C*
- **Humidity:** *Up to 85%RH*

Ideal Conditions:

- **Temperature:** 23°C (+/- 5°C)
- **Humidity:** 50%RH (+/- 25%RH)

Ensure the heater circulator is placed in the bath being used **(Fig 2)**.

While the heater circulator doesn't necessarily require ventilation, Thermoline still suggests 100mm on the sides and back of the bath that the heater circulator is located in to aid with accessibility.

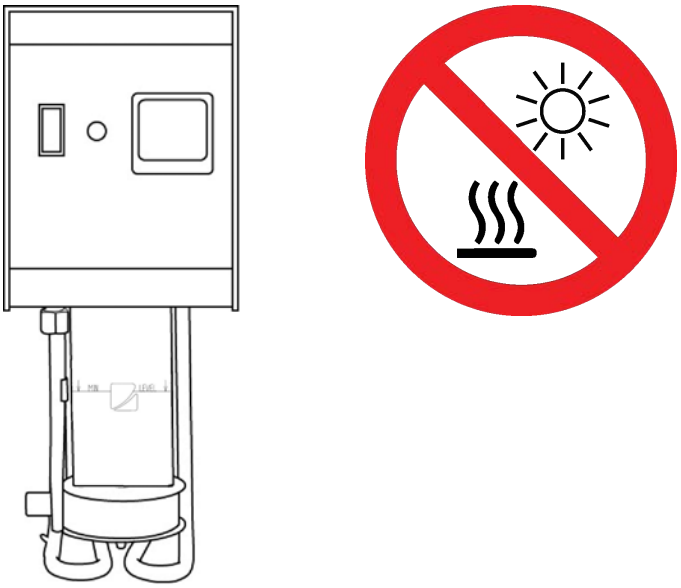


Fig 1. Suitable operating environment.

Ensure the bath is placed on a level surface.

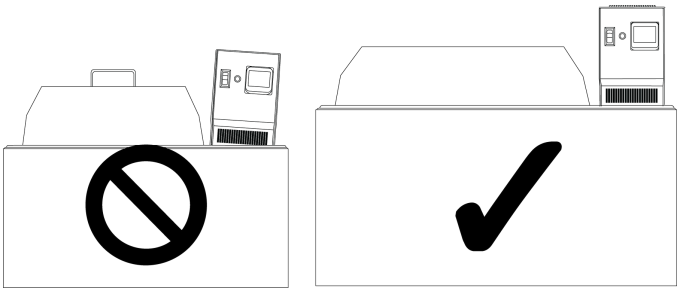


Fig 2. Level heater circulator.

Electrical Connections

The TU3 heater circulator require a 10amp 230V 50hz power supply.

A dedicated outlet should be used for all heater circulators. Do not use power boards or the like. A 3-pin moulded plug is supplied as standard.

Electrical:

- Included with the heater circulator is a 2.5m removable mains power lead with a three pin plug and right angle female IEC plug. Ensure the product is reasonably
  distanced from the power supply. **(Fig 1)**
- On the heater circulator itself is a 10 amp male IEC socket. **(Fig 2)**

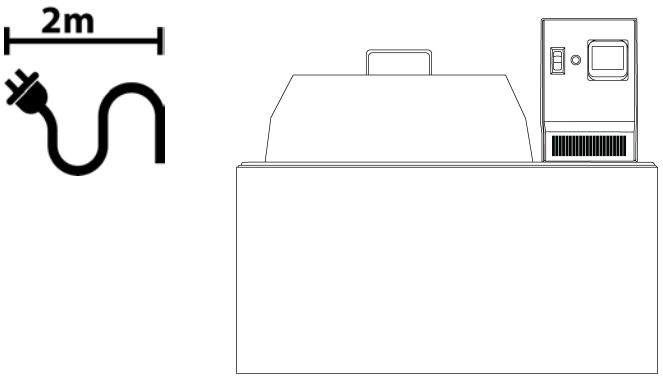


Fig 1. Suitable distance from power supply (2m)

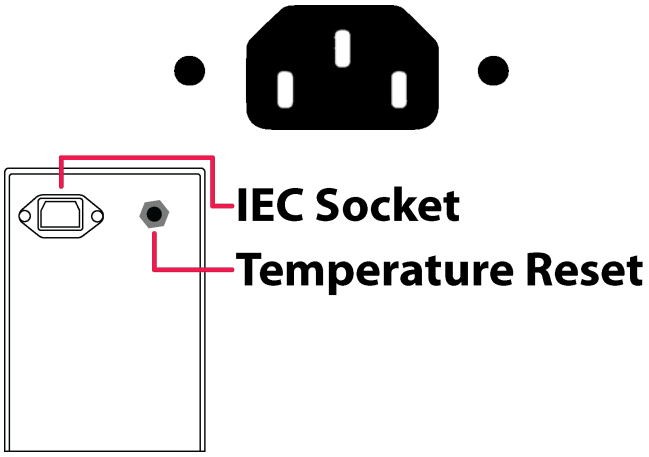


Fig 2. 10 amp male IEC socket

Operating Environment Warnings

Water baths should be stored inside at all times. Failure to adhere to this could cause significant drops in bath performance and damage to items stored inside.

Water Baths are not suitable for use with flammable solvents! They are fitted with components that may be the source of ignition.

Water baths heat water up to 100^{0}C and can become hot. This includes the optional lids.

Unpacking

Unpacking Process for carton:

- The TU3 heater circulator will be delivered in a carton.
- Removing the box requires the cling wrap and straps to be cut, then expose the bath by carefully sliding the box upwards. **(Fig 1)**

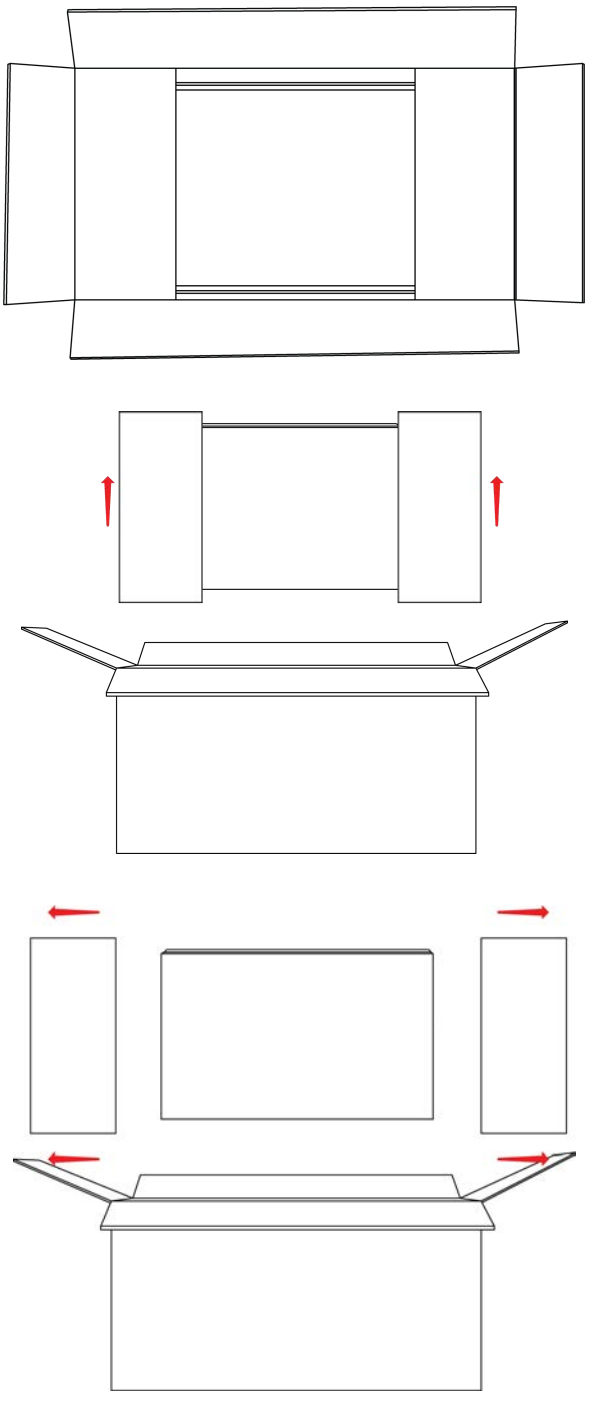


Fig 1 . Unpacking Process (Box)

If upon opening your package damage is present, notify the detail of any damage to your supplier or to Thermoline Scientific without delay at +61 2 9604 3911 or email at service@thermoline.com.au.

Moving

The heater circulator can be removed from the bath. Please note to take caution with lifting and be aware of any residual heat.

Filling

Please ensure that the bath used is sufficiently filled with water to cover the minimum depth required by the TU3 heater circulator. The minimum fill level is etched onto the flat plate as shown in figure 1 below.

The maximum fill will be determined by the maximum fill level on the bath itself (30mm from the edge on Thermoline TWBC baths) **(Fig 2).**

Note: Never use deionised water with the heater circulator. It will corrode the stainless steel and not be covered by warranty.

Note: Never use the heater circulator with oil. The introduction of oil into the bath will result in pyrolysis (chemical decomposition by heat).

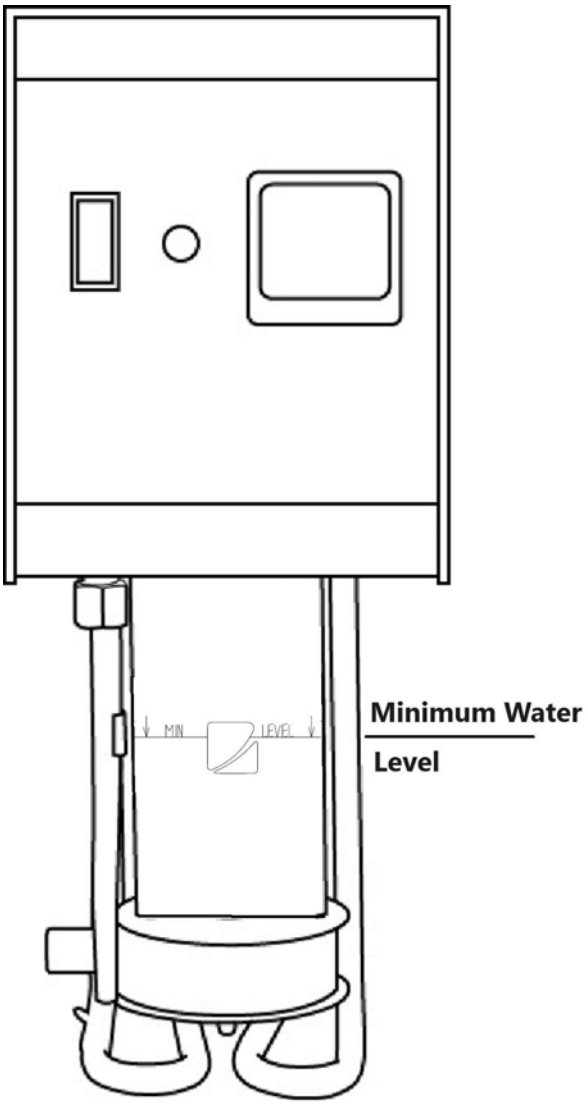


Fig 1. Minimum fill level.

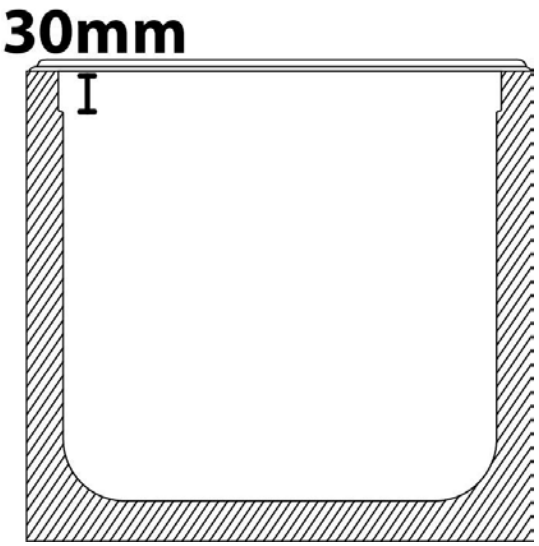


Fig 2. Maximum fill level.

Optional TUSB

The TU3 heater circulator can be used using the bridge on the Thermoline TWBC waters baths which are designed to hold it. The heater circulator can also be used in a plain bath without a bridge by use of the optional TUSB support bracket.

The TUSB support bracket is attached to the back of the heater circulator by removing the screw shown in the below picture and using it to attach the bracket.

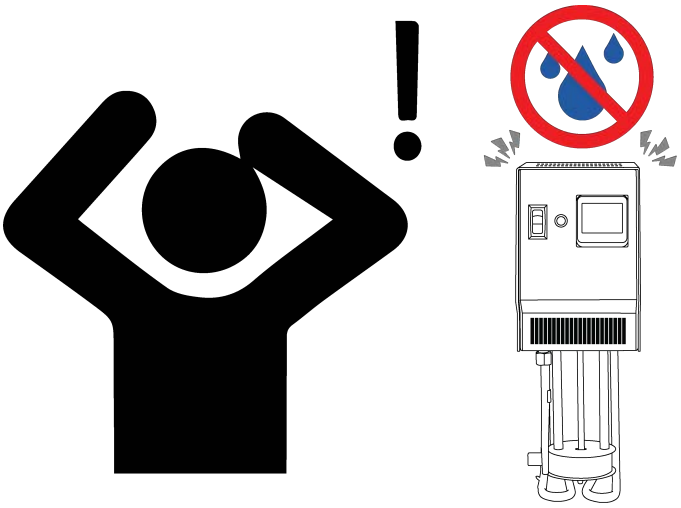
TUSB fitted to TU3 heater circulator

Cleaning

The heater circulator can be cleaned as often as required using a soft cloth and soapy water. Never use abrasive cleaners or scouring pads, as these will scratch the surface and may result in corrosion. Never use caustic-type cleaning agents.

With the element and pump housing you must be mindful of the use of stainless steel in it's construction. If rinsing off does not completely clean this area a very soft brush may be used.

All heater circulators have electrical components such as the temperature control and internal light. These items should not be subjected to any levels of moisture.



Cleaning Stainless

Stainless steel is under most conditions extremely resistant to corrosion. This is in part due to the addition of chromium and nickel to the steel and the formation of a durable chromium oxide at the surface during the manufacturing process. There are several chemicals which will attack the surface of stainless steel, plus the lack of oxygen at the surface will cause rusting, corrosion and pitting. Generally Tap water is suitable. Should this supply prove to be of poor quality, it is recommended that distilled water be used.

Setup Warnings

Ensure that the heater circulator are placed on an even and flat in the bath.

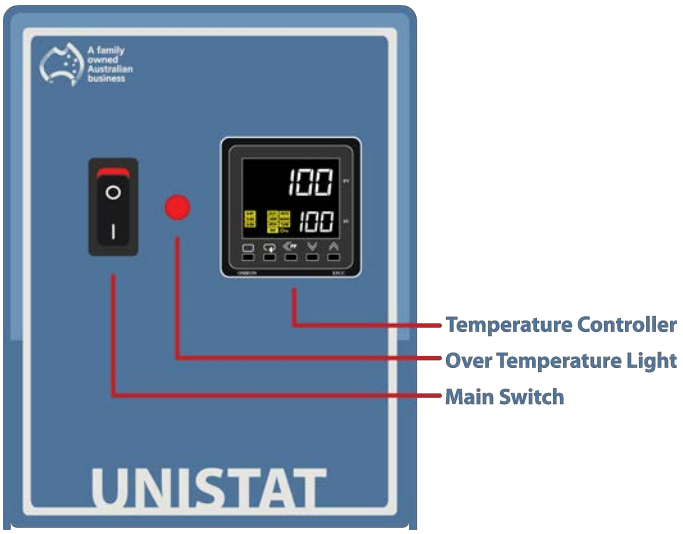
When you remove packaging from the heater circulator you should be careful when using knives to cut tape and cardboard.

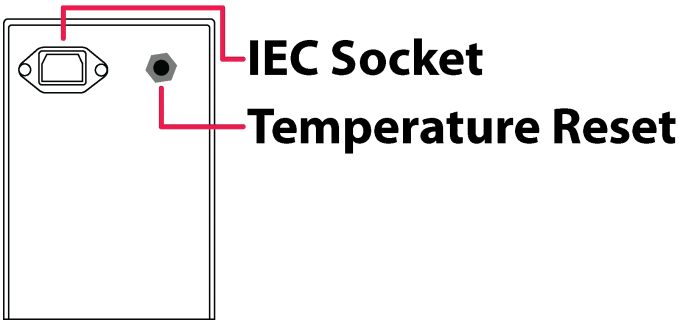
Water baths heat water up to 100^{o}C and can become hot. This includes the optional lids.

Start Up Procedure

Start Up process for the heater circulator:

- Before proceeding, please make sure that all internal and external packaging has been removed from the appliance and that all tape, plastic bags and foam pieces have been removed.
- Ensure that the heater circulator is placed in the bath appropriately and the bath filled.
- Take the supplied lead and plug it into the male IEC socket on the rear of the heater circulator. Next, plug the 3 pin plug into a 10amp General Purpose Outlet.
- Turn the main switch on the front of the heater circulator to 'ON'.
- The controller will go through a warm up period where all segments of the display will be on, before indicating the set temperature (SV) on the lower display and the water bath's actual temperature (PV) on the top display.





Omron User Guide

The controller is an Omron E5CC microprocessor based instrument with digital indication of set temperature and operating temperature. The instrument has been factory configured for range, sensor type, and engineering parameters for optimum control.

Note: Limited access to the controller is available. The operator has access to alter the temperature set point and parameters used for calibration purposes only.

Scroll Button: Used to view the set temperature target and start/reset the ramp/dwell function.

Page Button: Used to view calibration offset parameter and the ramp/dwell control parameters.

Increase/Decrease Button: Used to increase and decrease the parameter settings.

Side Arrow: Used to move the cursor when changing temperature

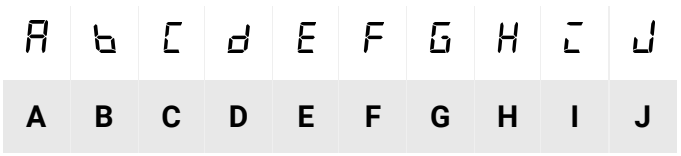
PV ***Process Value:*** Current temperature within the bath.

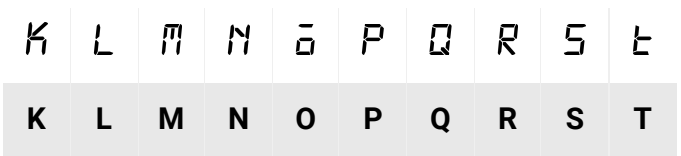
SV ***Set Value:*** Set temperature within the bath.

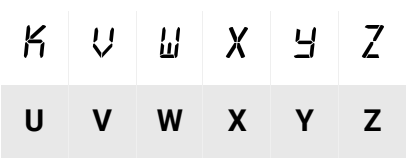
Display Symbols

The Omron E5CC controller comes with an array of functions. The table below is an overview of the LED indicators displayed throughout use. Familiarise yourself with them so you are able to recognise problems or faults easily.

LED	Name	Meaning
SUB1	Auxillary Output 1	N/A
SUB2	Auxiliary Output 2	N/A
SUB3	Auxiliary Output 3	High Alarm
OUT1	Control Output 1	Heat Output ON
OUT2	Control Output 2	N/A
CMW	Communications Wiring	N/A
STOP	Stop	N/A
RSP	Remote SP	N/A
MANU	Manual	N/A
TUNE	AT/ST	N/A
	Setting Change Protection	N/A







Temperature Control

How to
Use the " **<<PF** " button to move the cursor. The digits in **SV** will flash, indicating that it can be changed.

Change the temperature by using the " **UP** " or " **DOWN** " arrows. When the desired temperature is set, leave for a few seconds and the digits will stop flashing to confirm entry.

UP

DOWN

SCROLL

SIDE ARROW

PAGE

Sensor Calibration

There are a number of factors that will affect the accuracy of the temperature displayed in relation to the actual temperature inside the bath. These could include the following:

- Sample load inside the bath (the load should be distributed evenly).
- Product temperature (at higher temperatures the heat loss from the product will be greater).
- Location of the sensor (the temperature sensor can never be placed in the centre of the bath because it could be damaged.

The Omron temperature control has a parameter that can correct the temperature displayed. This sensor correction parameter is displayed as " **iNS** " (Input Shift).

In simple terms, this parameter adds or subtracts a correction value to the displayed temperature to make it read the correct temperature.

The calibration needs to be when the heater circulator is in a bath, with a lid on and allowed to stabalise. The sensor can be placed to the centre of the bath.

Once the bath has stabilised, any difference in the temperature reading can be offset using the sensor correction parameter.

The calibration parameter can be accessed as follows:

How to
Press **PAGE** to display sensor correction parameter.

Use the **UP** or **DOWN** button to adjust the sensor correction.

After this, allow the digit to stop flashing and the screen will display the adjusted value.

Manual Safety Thermostat

This safety thermostat is not operator-adjustable. It will electrically isolate the heating element in the event of an over-temperature situation.

Fixing the Manual Safety Reset:

- Allow the circulator to cool down before resetting the thermostat.
- Also check the water level in the bath as low water may have been the cause.
- Locate the safety reset on the back of the heater circulator. It is either a black or red knob **(Fig 1)**.
- Once the bath has cooled down, twist the red or black knob anti-clockwise.
- Once the knob is off, simply press the internal red button firmly until you feel a “click”, this will restart the circulating fan and turn on the digital display again. **NOTE:** This will allow the heaters to operate again. If this keeps tripping contact a qualified service technician to investigate possible causes of fault.

Fig 1. Remove Screwcap

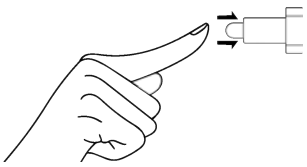
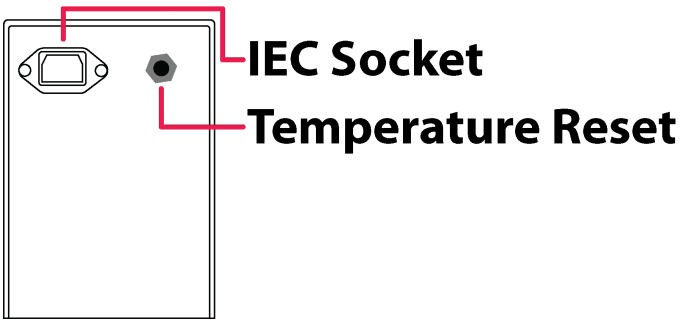


Fig 2.



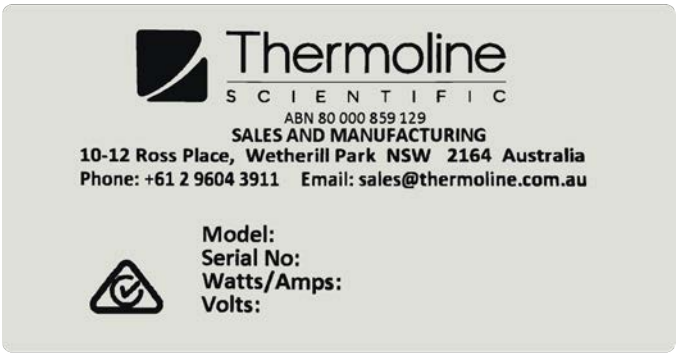
Troubleshooting

Problem	Fix	Part Number
Controller is off, but switch is illuminated	**Safety Thermostat** Please check the safety thermostat. It is the red button on the back of the bath. Unscrew the cap and then push the button in. For further information refer to the Safety Information Chapter. If this does not rectify the issue. You will need to contact your preferred electrician/technician to diagnose the issue.	
The word "Stop" is showing on the Omron Controller	1. Press the 'PAGE' button and the "SCROLL' button simultaneously until 'oAPt' appears on the screen. 2. Press 'SCROLL' button until you see the parameter 'PMSK' on the screen. 3. Press the 'DOWN' button to turn off. 4. Press the 'PAGE' button and the 'SCROLL' button simultaneously to take you back to the main menu. 5. Press 'SCROLL' until you see 'R-S' on the screen. 6. Press the 'DOWN' button to turn 'STOP' to 'RUN' 7. Press the 'PAGE' and the 'SCROLL' button simultaneously until 'oAPt' appears on the screen 8. Press 'SCROLL' until you see the parameter 'PMSK' on the screen 9. Press the 'DOWN' button to turn on 10. Press the 'PAGE' and the 'SCROLL' button simultaneously to take you back to the main menu. **Please note if other parameters are changed by mistake further issues may occur.**	

Technical and Repair Support

When contacting Thermoline regarding information about the product, it is important to have the Serial Number and other related information with you. The serial number is on a silver sticker, usually located near the power IEC socket.

Contact Thermoline service on +61 2 9604 3911 or email at service@thermoline.com.au



Have the following information available when you contact the service department. Model number and serial number. This is generally found on the exterior of the bath in the form of a stick-on label. The company name, address, contact name, contact phone number. A brief description of the problem. All warranty claims must be reported to, and agreed to by a Thermoline representative prior to any work being carried out.

Standard 24 Month Warranty

Thermoline Scientific Equipment Pty Ltd ABN 80 000 859 129 ('Thermoline')

Thermoline warrants to the original purchaser that this product will perform to its product specification for a period of 2 years from date of purchase, provided that the installation of the product has been carried out in accordance with the latest version of the manufacturer's instructions and further provided that the use of the product complies with that specified in the relevant specification. Thermoline is not responsible for any loss or damage arising from incorrect usage, usage outside the suitability of the product as stipulated in the manufacturer's instruction, damage caused by accident, fire, flood, act of God or failure to properly install, operate or maintain the goods in accordance with the printed instructions provided.

The following statement applies only to product sales that fall within the definition of a Consumer Sale set out in the Australian Consumer Law contained within the Competition and Consumer Act (Cth) 2012:

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. Notwithstanding the preceding clause and to the extent permissible by law, the liability of Thermoline is limited, in relation to the warranted product and at the option of Thermoline to:

Replacing the product or the supply of equivalent product;
The repair of the product;
The payment of the cost of replacing the product or of acquiring equivalent product; or
The payment of the cost of having the product repaired.

To the extent permitted by law, all other warranties whether implied or otherwise, not set out in this Warranty are excluded and Thermoline is not liable in contract, tort (including, without limitation, negligence or breach of statutory duty) or otherwise to compensate the Purchaser for:

any increased costs or expenses;
calibration/certification services;
any loss of profit, revenue, business, contracts or anticipated savings;
any loss or expense resulting from a claim by a third party.
Any special, indirect or consequential loss or damage of any nature whatsoever caused by Thermoline's failure in complying with its obligations or the purchaser's failure due to accident damage, impact, misuse or negligence.

The benefits given to the purchaser in this Warranty are in addition to other rights and remedies under a law in relation to the products or services to which this warranty applies. This warranty applies only to products purchased and installed in Australia and does not cover any consumable items e.g. filters, light globes, ultrasonic nebulizers. The warranty does not extend to labour and freight costs where the warranted product is located outside Australia.

To make a warranty claim, contact Thermoline on 02 9604 3911 or service@thermoline.com.au.

We are proudly Australian owned

We will continue to invest in Australian manufacturing.