Cold Plate

User Manual & Setup Guide

TCP-2

TCP-3

Omron E5CC

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Thermoline SCIENTIFIC

Contents

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 cabinet.

2. **General Information**

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

The Thermoline cold plate TCP-2 and TCP-3 models are designed and manufactured to provide a low temperature controlled surface. Designed to operate at between -10°C and -20°C, the Thermoline refrigerated Cold Plate offers an industry standard in plate cooling.

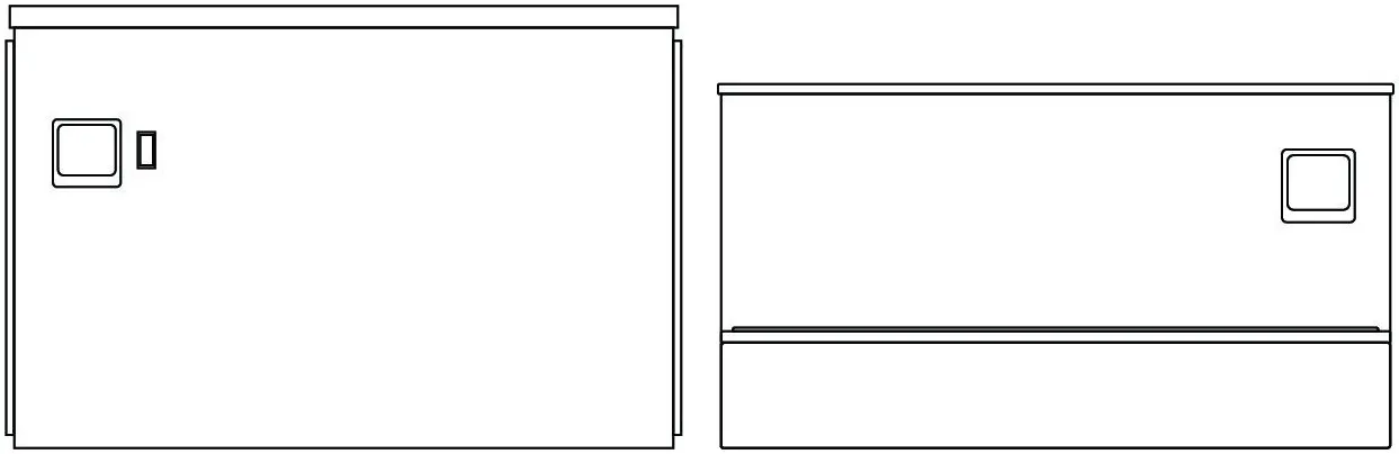
Cold Plates offer:

- Durable exterior case
- Insulation for efficiency
- Meets IEC 61010-1:2010

The Thermoline cold plate is set to function within specific operating ranges. The optimum operating conditions will be explained further in this manual.

- Control Accuracy: +/- 0.1°C
- Operating Temperature between -10°C and -20°C

3. Product Specifications



Dimensions

External	TCP-2	TCP-3
WxDxH (mm)	450x350x300	450x680x260
Plate Area		
WxDxH (mm)	380x300	380x300

Spacing	TCP-2	TCP-3
Back (mm)	100	
Sides (mm)	300	

3. **Product Specifications**

Technical Specification	TCP-2	TCP-3
Configuration	Plate on top	Stepped plate to front
Temperature Range	-10°C to -20°C	
Electrical	3A/230V	
Weight	24kg	28kg
Refrigerant Type	R507	
Heat Output	300 watts	
Noise Level @ 1 metre (dbA)	40	
Fibreglass Insulation	✔	✔
Features		
Over Current Protection	✔	
Power Cord	✔	✔
Condenser	✔	✔
Omron E5CC	✔	✔
Aluminium Work Platform	✔	✔
CFC Free Refrigerant	✔	✔
Over Current Alarm	✔	✔

Cold Plate Operating Environment

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

Ensure that the cold plate is located free from all obstructions to maintain correct operation **(Fig 2)**.

The cold plate should be stored inside at all times. Failure to adhere to this could cause significant drops in cabinet performance and damage to items stored inside.

Extreme Operating Environment:

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

Optimal Environment:

- 23°C (+/-2.0°C)
- 50%RH (+/-5%RH)

Fig 1. Suitable Environment

Fig 2. Cold Plate - Free from obstructions

Multiple units:

- When installing more than one cold plate ensure that there is adequate spacing in between the cold plates.

4. **Operating Environment**

Electrical Connections

The cold plate is suitable for connection to a standard 10 amp, 230 volt, 50Hz, supply. A dedicated outlet should be used for the supply. Do not use power boards or the like.

Electrical:

- Included with the cold plate 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 cold plate itself is a 10 amp male IEC socket. **(Fig 2).**

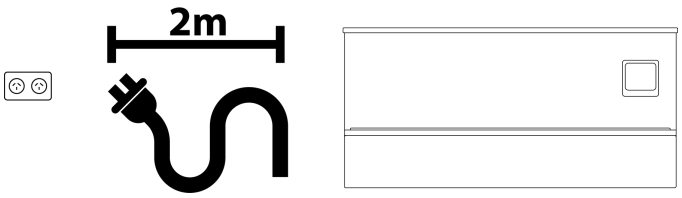


Fig 1. Suitable distance from power supply (2m)

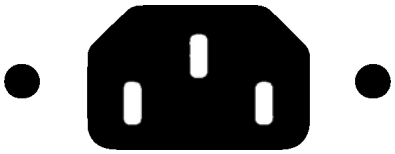


Fig 2. 10 amp male IEC socket

Operating Environment Warnings

Do not store items on top of the cold plate, as this will also affect ventilation.
CAUTION: When installing more than one unit in the same location, ensure that they are positioned in such a way that warm air exhausted from one product is not drawn directly into the other product.

The cold plate is not suitable for use with flammable solvents. They are fitted with components that may be the source of ignition.

Unpacking

Unpacking process for box and skid:

- The cold plate is packed on a timber skid with a lift off carton placed over the top. This is then strapped to the skid prior to skid prior to dispatch.
- Before proceeding make sure that all internal (if present) and external packaging has been removed from the cold plate and that all tape, plastic bags and pieces of foam have been removed.
- To unpack the cold plate firstly cut the straps then the box can be carefully sliding the box upwards. **(Fig 1)**
- If damage is present upon opening your package please 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.

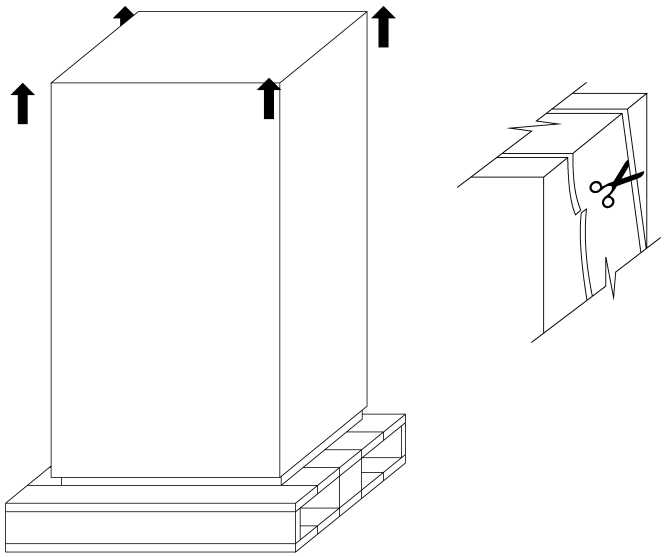


Fig 1 . Unpacking Process

Moving and Lifting

When moving and locating the cold plate please take caution due to the weight of the unit. The TCP-2 and TCP-3 are 24kg and 28kg respectively.

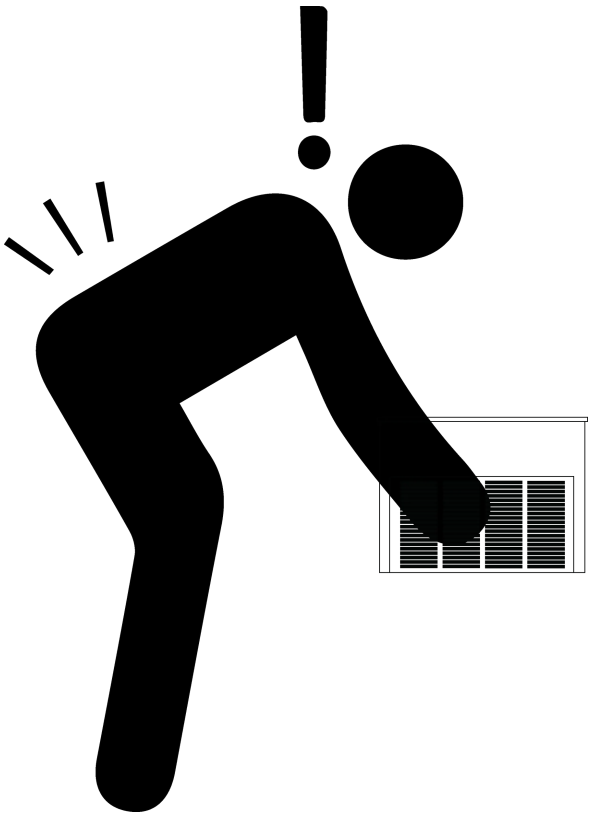


Fig 2 . Safe moving of cold plate.

Cold Plate Location

Location Requirements:

- The cold plate requires a level surface to operate correctly. **(Fig 1)**
- Do not place the cold plate in any amount of water. This will result in premature component damage. **(Fig 2)**

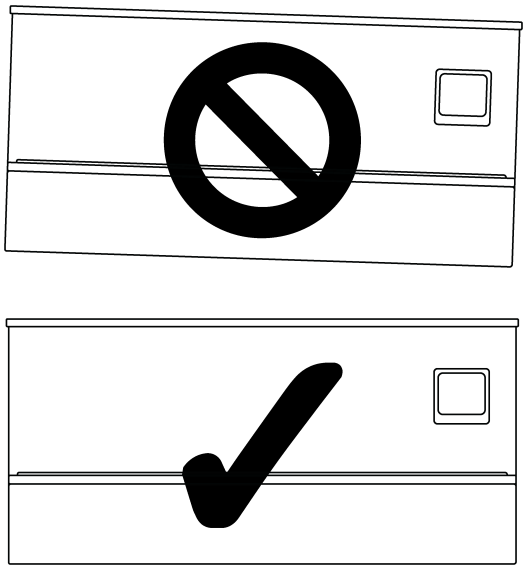


Fig 1. Correct Levelling

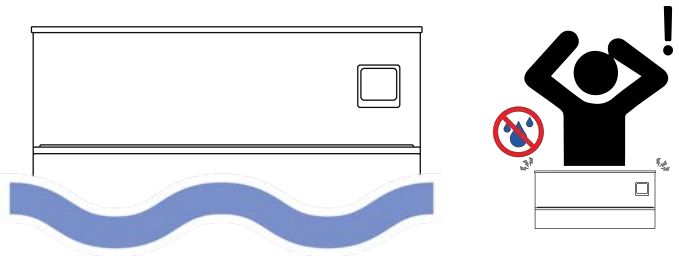


Fig 2. Keep away from water

Ventilation:

- All cold plates require ventilation around them. 300mm on either side and 100mm on the back back is required (can be less than 100mm at the back for the TCP-3). See diagrams above showing correct placement and ventilation distances.

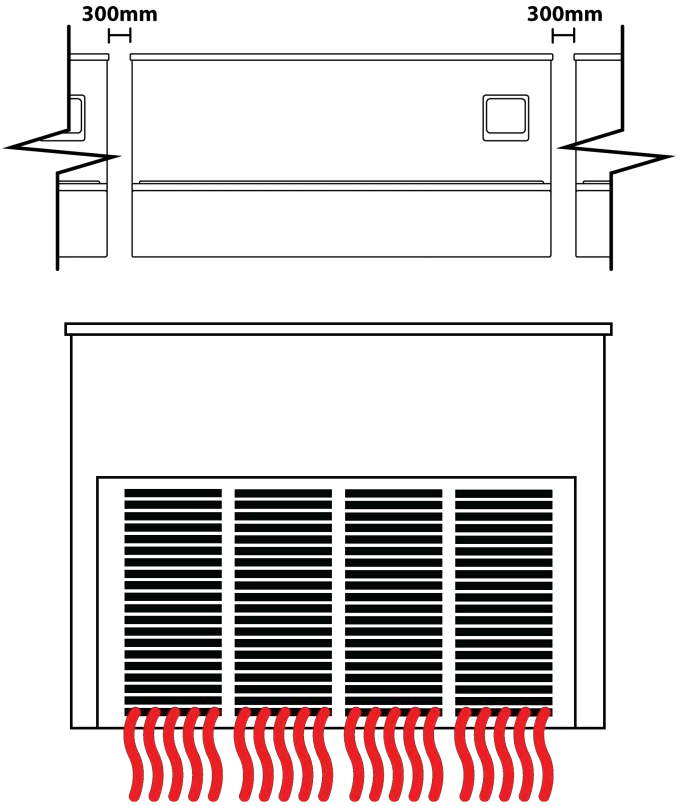
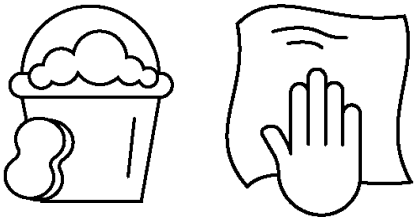


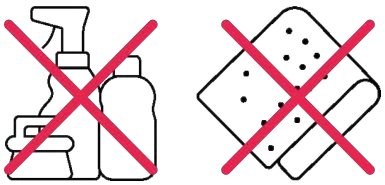
Fig 3.

Cleaning

The external surface and the aluminium cold plate 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.



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



General inspection of the Cold Plate should be made at regular periodic intervals (generally every 6 months).

Apart from normal levels of cleanliness, it is important that the condenser is kept clean and free from dust. A clean condenser is critical to keeping the Cold Plate operating correctly. The interior should be cleaned at least every six months; this may need to be more frequent in some dusty locations. By monitoring the amount of “clogging” due to dust, the frequency of cleaning can be adjusted to keep it clean. The manufacturer’s warranty does not cover the failure of the Cold Plate due to a blocked condenser.

Cleaning the Condenser:

- Turn off power at the power point before cleaning the condenser.
- The condenser is located on the left hand side of the unit behind a grill **(Fig 1)** looking from the back. To remove the grill simply unscrew the screws in the corners and lift the grill off. At this point you would have full access to the condenser and would be able to clean it.
- **NOTE:** Take caution around any sharp edges exposed by removing the vent cover.
- **NOTE**: Use a soft brush and/or vacuum with a soft brush attachment to remove any build up of lint and/or dust. Taking extreme care not to damage the aluminium fins on the condenser face. Don't blow air into the condenser.

Fig 1: Location of removable panel on the left looking from the back.

Setup Warnings

The cold plate requires ventilation for optimal usage. Keep the sides and top clear of any obstructions.

Failure to adhere to the requirements can lead to improper ventilation. Failure to observe these guidelines may void the manufacturer's warranty.

Ensure there are no blockages around the exhaust, as this will affect proper ventilation.

Keeping the exhaust clear of any obstructions will also ensure that the cold plate does not encounter any issues throughout use.

Before proceeding, make sure that all packaging has been removed from the cold plate and that all tape, plastic bags and pieces of foam have been removed.

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

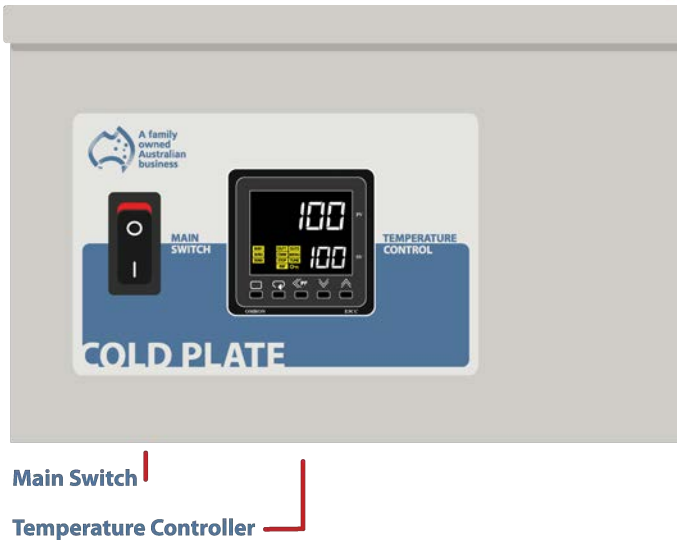
When you remove packaging from the cold plate, you should be careful when using knives to cut tape and cardboard.

6. **Start Up Procedure**

Take the supplied lead and plug it into the male IEC socket on the left side of the cold pate. Next, plug the 3 pin plug into a 10 amp General Purpose Outlet.

Turn the main switch adjacent to the temperature control to 'ON' to start the cold plate.

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 current temperature (PV) on the top display.



Refrigeration Safety Pressure Switch

This Pressure Switch is designed to protect the refrigeration compressor in the event of the following:

- **Failed condenser fan.**
- **Ambient temperature is too high.**

The pressure switch will trip if the high side pressure of the refrigeration system exceeds a set value.
Please note: Contact Thermoline's service team if the pressure switch trips more than twice.

How to Reset:

- To reset, simply press the red button (**Fig 1)** at the rear of the cold plate (**Fig 2**). If the Compressor does not start after pressing the red button, wait 30 minutes to allow the pressure in the system to drop to a safe level. Then try again. The pressure in the system needs to drop to 1800kpa before it will reset.

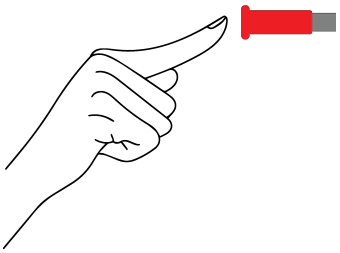


Fig 1. Press the red switch to reset

Fig 2. Refrigeration safety pressure switch location

The controller used in the cold plate is an Omron E5CC microprocessor based instrument with digital indication of set temperature and operating temperature.

Note: There is limited access to the controller's parameters. The operator can alter the temperature set point and has access to parameters used for calibration purposes.

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 Buttons: Used to increase and decrease the parameter settings.

Side Arrow: Used to move the flashing digit.

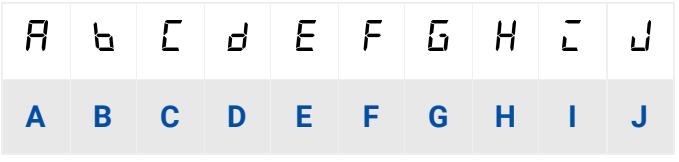
PV ***Process Value:*** Current temperature of the cold plate.

SV ***Set Value:*** Set temperature of the cold plate.

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	Lights when Cool output ON
SUB2	Auxiliary Output 2	N/A
SUB3	Auxiliary Output 3	N/A
OUT1	Control Output 1	N/A
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

The main factor that will affect the accuracy of the temperature displayed in relation to the actual temperature measured on the plate is the location of the control sensor. The sensor is placed on the underside of the aluminium work surface.

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

The calibration sensor can be affixed to the centre of the plate. Before securing the calibration sensor, the user must remove any ice build-up across the aluminium work surface (usually due to prolonged usage) and remove any wax build-up that could affect contact between the calibration sensor and the aluminium work surface. Please ensure that only suitable tools are used to remove excess ice.

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

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

8. **Troubleshooting Information**

Problem	Fix
The cold plate is not cooling on startup	**Pressure Switch** The pressure switch may have tripped. To reset, simply press the red button at the rear of the cold plate. If the compressor does not start after pressing the red button, wait 30 minutes to allow the pressure in the system to drop to a safe level. Then try again. The pressure in the system needs to drop to 1800kpa before it will reset. **Please note:** Contact Thermoline's service team if the pressure switch trips more than twice.
Only the centre of the plate is cooling	**Set Point** Ensure the set point is set at between -10°C and -20°C.
The cold plate is not reaching the set point	**Air Flow** There may not be enough air flow around the cold plate. Please space the cold plate so there is enough air circulation around the product. **Outlet** Please ensure that the outlet of any adjacent product does not face the inlet of the cold plate. **Operation** Make sure you operate the cold plate for only a maximum of 12 hours and clean up any residual ice build up between operation.

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 unit 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.

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We will continue to invest in Australian manufacturing.