Refrigerated Incubators

User Manual & Setup Guide

TRI RANGE

Omron E5CC-T

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Symbols

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 an 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.

General Information

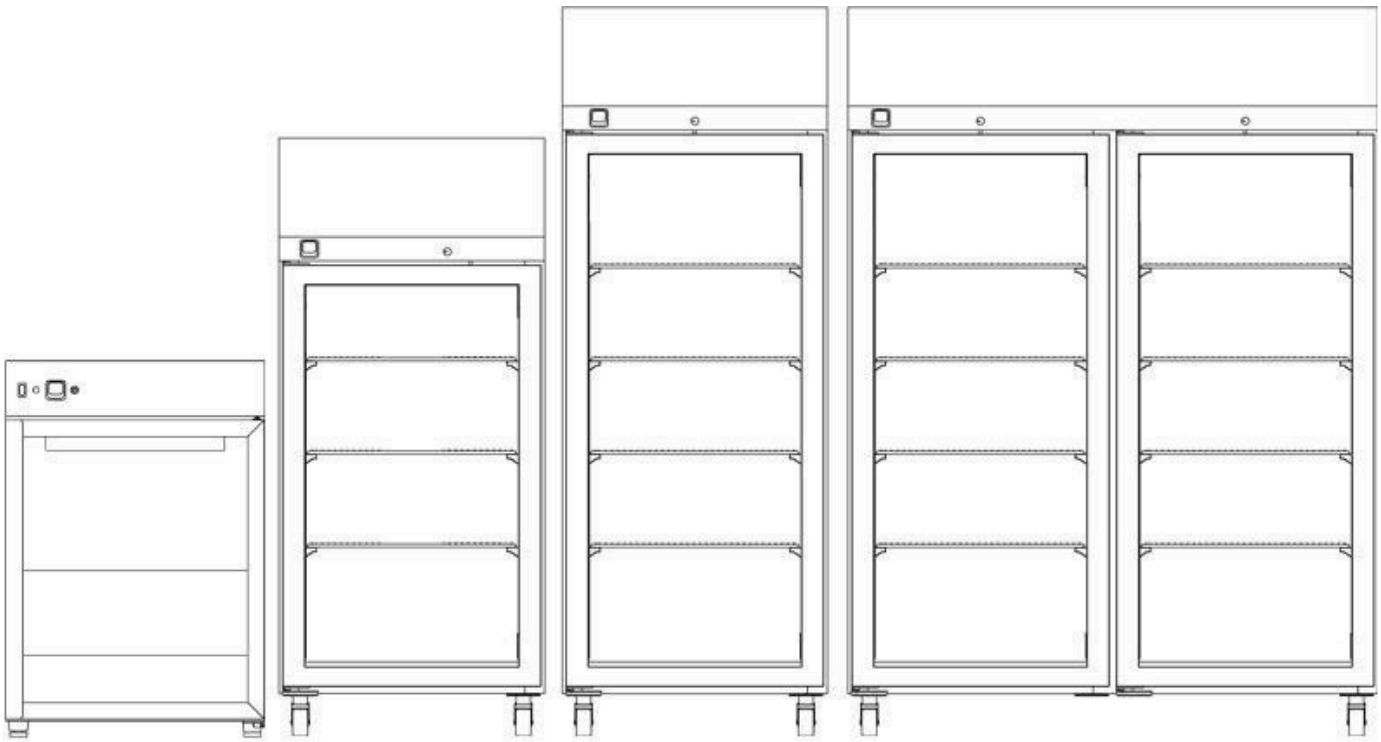
This user manual is intended for Thermoline's range of refrigerated incubators. We recommend that you read this user manual the whole way through before you start using the cabinet. Consider this manual as a part of the cabinet and an integral part to its function. We recommend keeping it close and within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

The Thermoline Refrigerated Incubator 145, 360, 520, and 1100 models are designed and manufactured to provide safe and precise temperature conditions for sample storage. Designed to operate between +5°C and +45°C (+10°C and +45°C for the TRI-145-1-GD/SD) with alarms set at 5°C above and below the setpoint, the Thermoline Refrigerated Incubators offer an industry standard in forced draught refrigeration.

- Operating temperature from +5°C to +45°C (+10°C to +45°C for the TRI-145-1-GD/SD)
- Ecofoam Insulation
- Electronically controlled heating element
- Monitoring port hole
- Removeable and adjustable plastic coated shelves
- Optional glass or solid doors

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

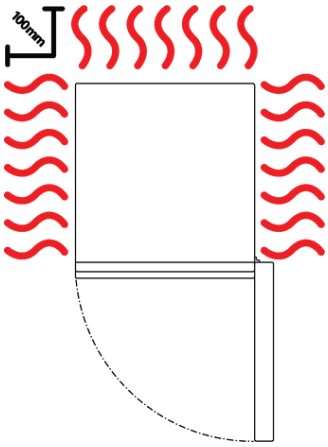
Product Specifications



Dimensions

External WxDxH (mm)	TRI-145-1-(GD/SD)	TRI-360-1-(GD/SD)	TRI-520-1-(GD/SD)	TRI-1100-2-(GD/SD)
	600x600x900	740x840x1560	740x840x2010	1470x840x2010
Internal Width (mm)				
	510x430x610	590x530x1000	590x530x1430	1320x530x1430

Clearance	TRI-200-1-(GD/SD)	TRI-360-1-(GD/SD)	TRI-520-1-(GD/SD)	TRI-1100-2-(GD/SD)
Front (mm)	600	740		
Back (mm)	100			
Sides (mm)	100			



Parts Guide

Technical Specification	TRI-145-1-(GD/SD)	TRI-360-1-(GD/SD)	TRI-520-1-(GD/SD)	TRI-1100-2-(GD/SD)
Temperature Range	+10°C to +45°C	+5°C to +45°C		
Temperature Control Stability	+/- 0.1°C			
Temperature Uniformity	+/- 1.0°C			+/- 2.0°C
Nominal Capacity	145L	360L	520L	1100L
Porthole Diameter	13mm			
Weight	80kg	130kg	160kg	280kg
Electrical	450W/230V			900W/230V
Features				
Shelves (max @100mm spacing)	4 (max 4)	3 (max 7)	4 (max 11)	4 levels (max 11)
Castors	X	✔	✔	✔
Fan Forced Air Circulation	✔	✔	✔	✔
Omron E5CC-T Controller	✔	✔	✔	✔
Door Locks	X	✔	✔	✔
BMS Plug	✔	✔	✔	✔
Ecofoam Insulation	✔	✔	✔	✔
Safety				
Over Current Protection	✔	✔	✔	✔
Over Temperature Safety	✔	✔	✔	✔
Options				
Glass or Solid Doors	Nomenclature designations: Glass Door (GD), Solid Door (SD)			
Additional Shelves	Additional shelves to suit			
Customisable Port Hole	Add additional 13mm port holes or choose 50mm port holes			

Operating Environment

Cabinet Location

Ensure the Incubator 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.

The Incubator 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 Conditions:**

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

Ideal Conditions:

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

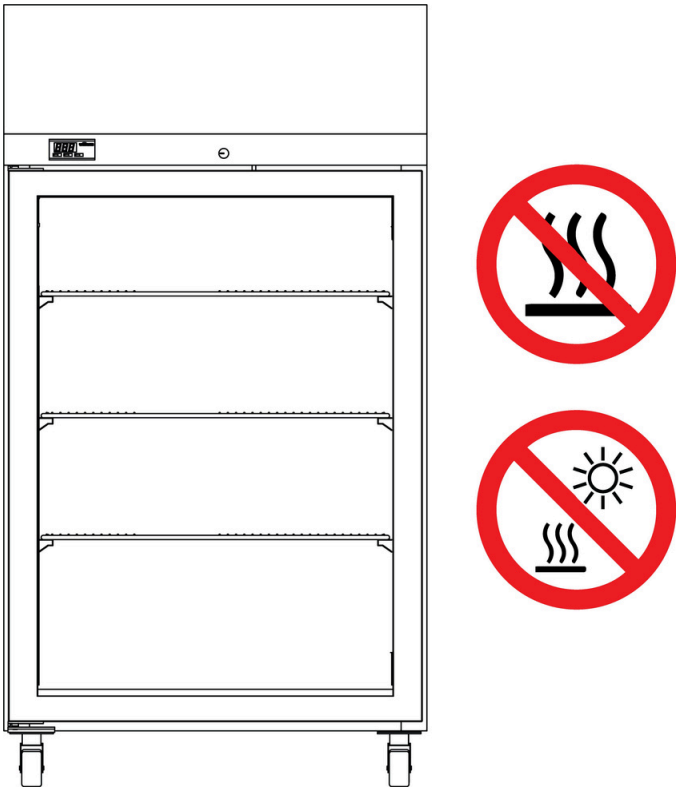


Fig 1. Suitable Environment

Bench Top Location

Only the TRI-145-1-GD/SD can be placed on a bench or plinth due to the size of the other models.

Installation Requirements:

- Under no circumstances should any Incubators be stacked on top of each other **(Fig 2)**.
- 145 Cabinets come with adjustable feet in case of uneven surfaces **(Fig 3)**.

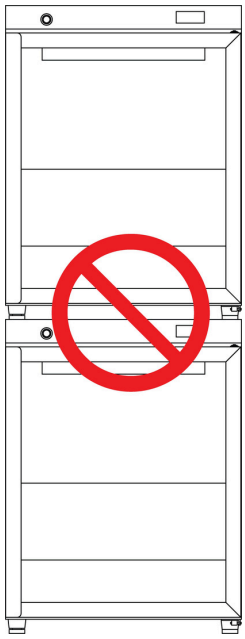


Fig 2.

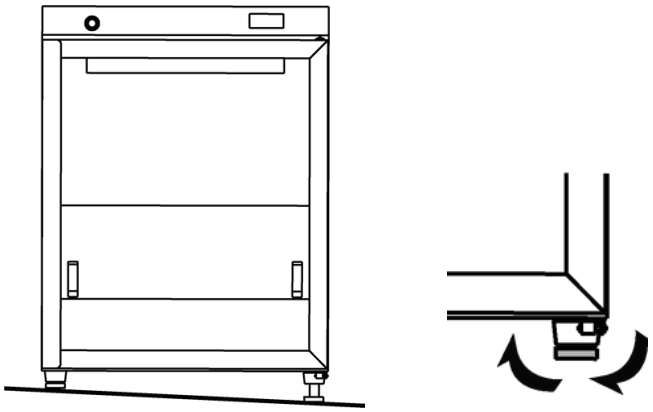


Fig 3.

Operating Environment

Electrical Connections

The incubator 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:

- The incubator includes 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 incubator itself is a 10 amp male IEC socket. **(Fig 2)**

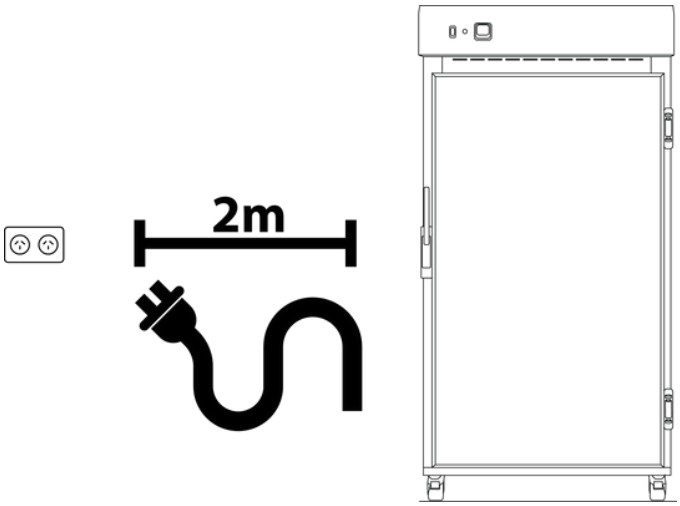


Fig 1. Suitable distance from power supply (2m)

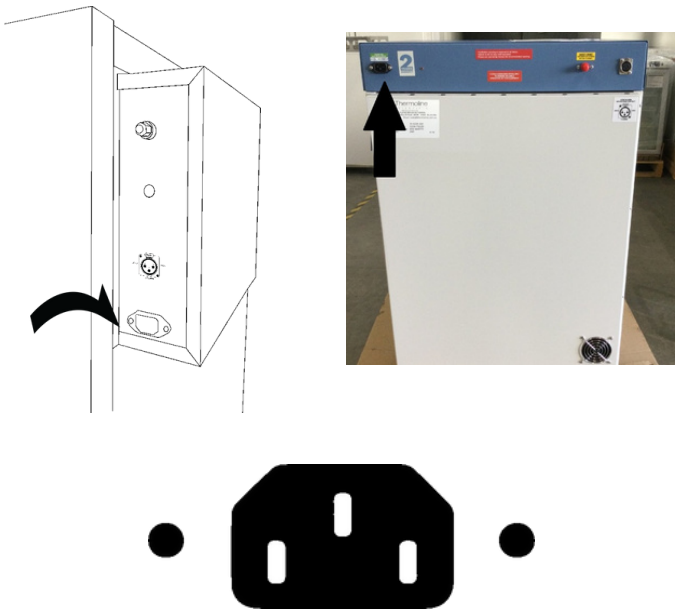


Fig 2. 10 amp male IEC socket

Operating Environment Warnings

Refrigerated incubators require an even surface to ensure consistent performance. Internal contents can also be damaged by the cabinet being on an uneven surface.

Refrigerated incubators require ventilation around them. 100mm on either side and the back is required.

Refrigerated incubators 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.

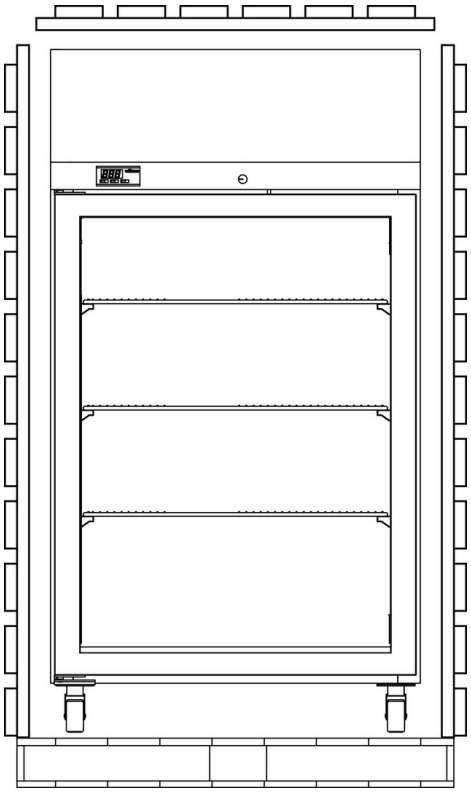
Refrigerated incubators are not suitable for use with flammable solvents! They are fitted with components that may be the source of ignition.

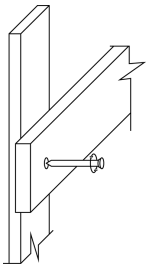
Setup

Uncrating/Unpacking

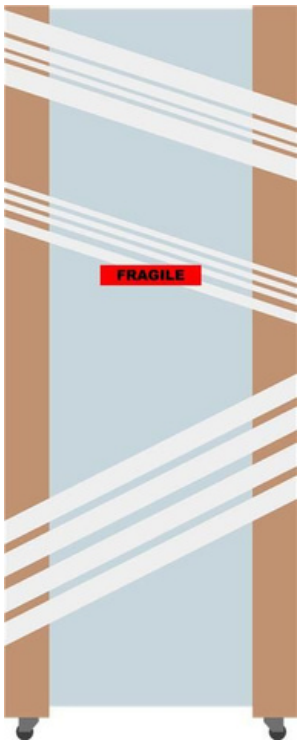
Unpacking process for foam wrapped and crated:

- In most cases, the incubator will be delivered foam wrapped and on its castors via sensitive freight. The 145L incubator will be delivered in a box on a skid.
- The incubator may be delivered to remote areas in a crate. To remove the crate packaging that comes with some cabinets, unscrew both the left and right sides of the packaging. A forklift is needed to remove the refrigerator from the crate.
- Please don't dispose of the packaging until the refrigerator is inspected. If damage is present upon opening your package, notify your supplier or Thermoline without delay on +61 2 9604 3911 or email at service@thermoline.com.au.

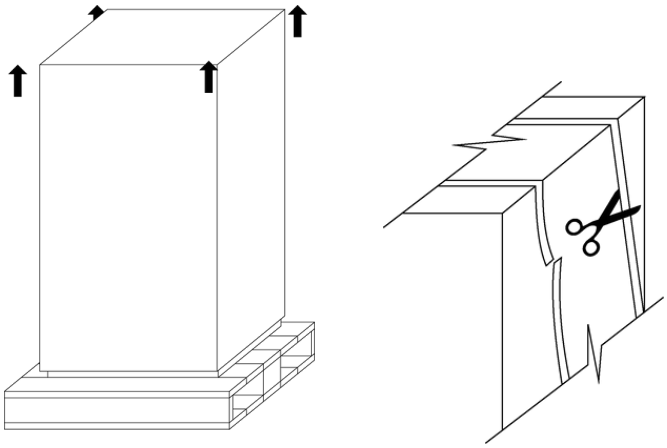




Unpacking Process (crated)



Unpacking Process (foam wrapped)



Unpacking Process (Box and Skid)

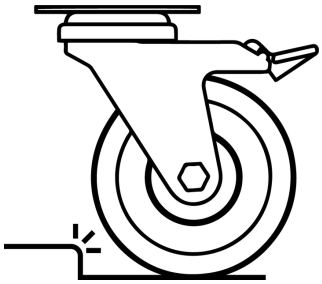
Moving the Incubator

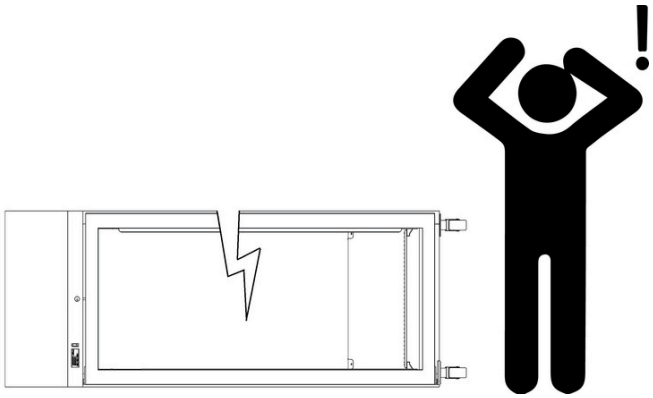
Moving the Incubator:

- Ensure that the incubator is rolled on an even and flat surface. Uneven surfaces can cause the incubator to fall over.

NOTE: Incubators are 'Top Heavy'. Do not move the cabinet too quickly.

Safe moving of cabinet.





Castor catching causing the cabinet to topple.

Castors

The incubators are equipped with lockable castors to prevent cabinet movement.

Castor Setup:

- Please make sure that the incubator is placed on an even and flat surface. Uneven surfaces can cause issues within the cabinet. Uneven surfaces can cause the cabinet to fall over or roll away with unlocked castors.
- Castors can be fixed in place by pushing down on the brake lever. Ensure the castors are locked to prevent unwanted movement from the incubator **(Fig 1)**.
- Please ensure when placing the incubator into place that the castors can be accessed so they can be locked **(Fig 3)** and unlocked **(Fig 2)**. Please get in touch with your supplier or Thermoline should there be any castor damage.

Fig 1.

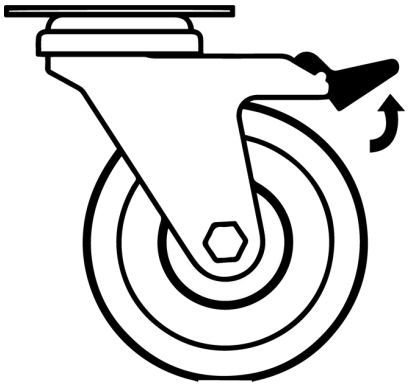


Fig 2. Castor Unlocked

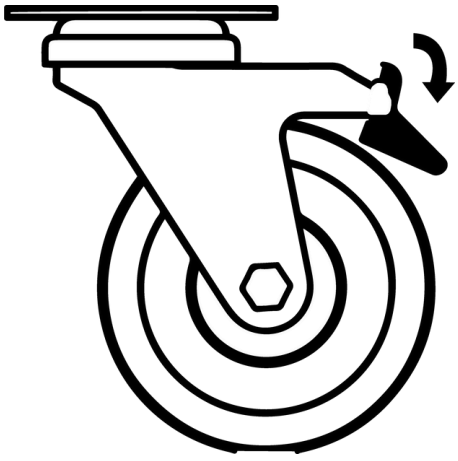


Fig 3. Castor Locked

Refrigerated Incubator Location

Location Requirements:

- The incubator requires a level surface to operate correctly. **(Fig 1)**
- Do not store items on top of the incubator.
- The refrigerated incubator generates heat as part of its normal operation. Thermoline suggests at least 100mm on the sides and back to aid with accessibility and heat dissipation. **(Fig 2)**
- The incubator door should also be allowed to open and close at full range. **(Fig 3)**

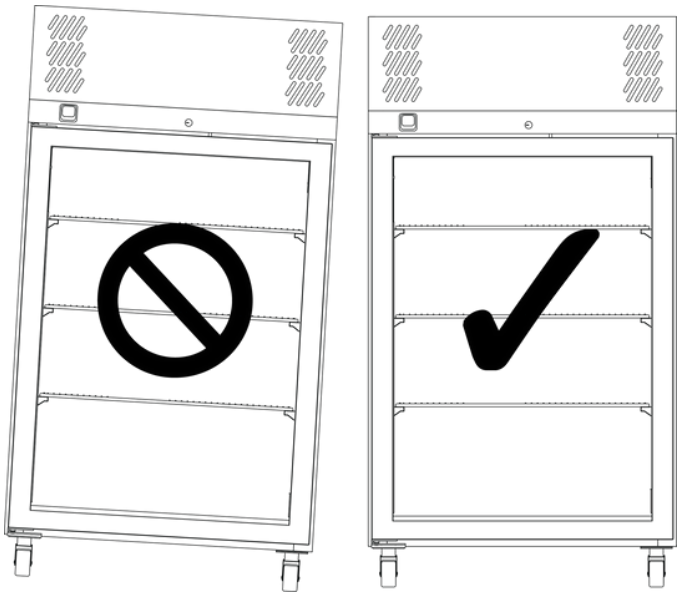


Fig 1. Correct Levelling

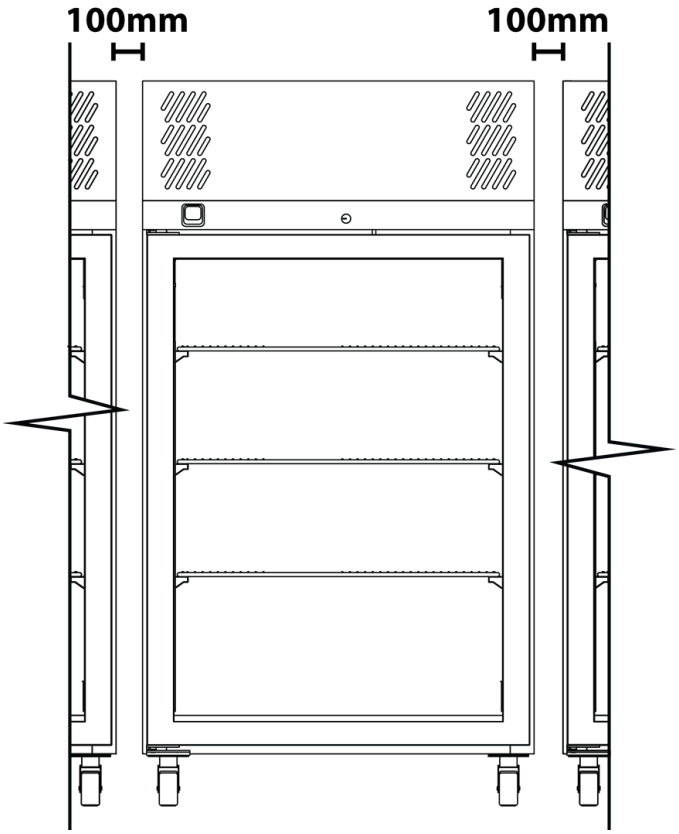


Fig 2.

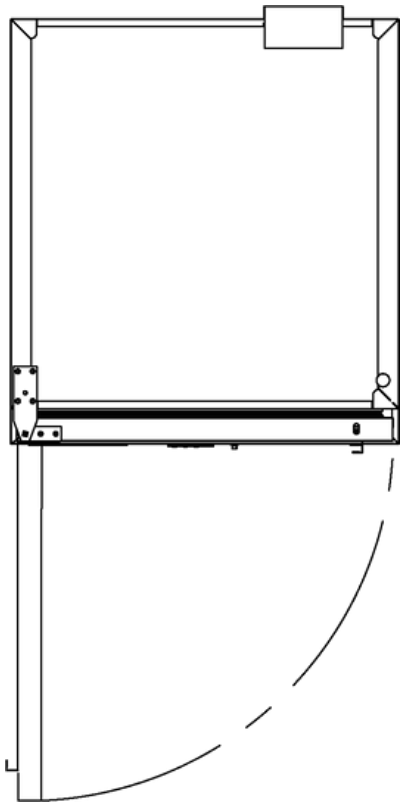


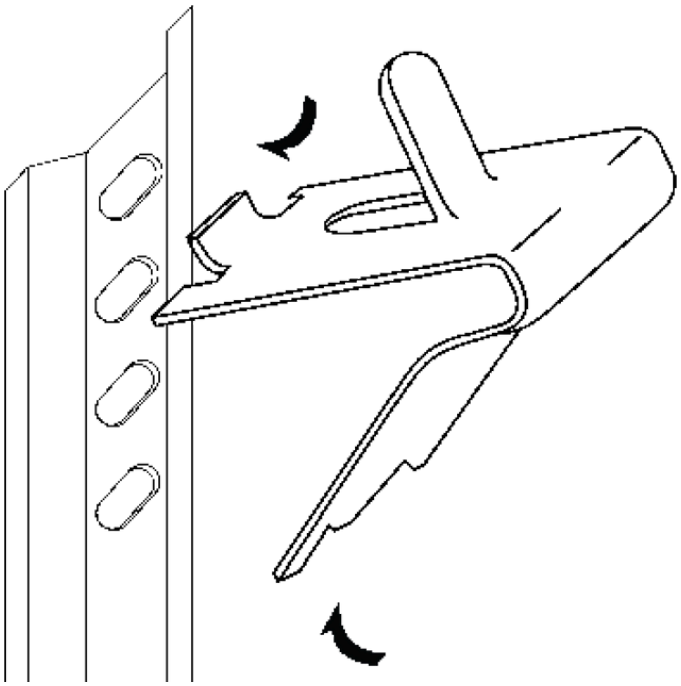
Fig 3.

Shelves

The refrigerated incubator comes equipped with shelves used for holding items while in operation. The shelves can be adjusted to different heights to accommodate different size items.

To adjust the shelf clips you must:

- Hook the top of the clip into the slot seen below.
- Pinch and squeeze the base of the clip
- Push base of clip into slot and release.
- To remove, repeat process.



SAFETY NOTE:

- The edges of the clips can be sharp. Thermoline recommends using protective gloves while adjusting or moving the clips (e.g. leather gloves).

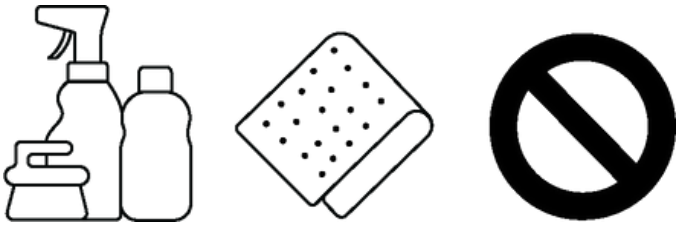
Shelving:

- All refrigerated incubators are supplied with adjustable shelf clips to accommodate different size items within the cabinet, The amount of shelf clips supplied changes depending on the size of the cabinet ordered. Please see the incubator specifications for the number and maximum number of shelves.

Cleaning

The interior, exterior, and door gasket 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 cabinets have electrical components. These items should not be subjected to any levels of moisture.



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 cabinet behind the front panel **(Fig 1)**. To remove the front plate lift the panel up to free it from the locating blocks. Once free pull the panel carefully forward and away from the refrigerated incubator to have full access to the condenser and would be able to clean it.
- **NOTE**: Use a soft brush and/or vacuum with a soft brush attachment to remove any build-up of lint and/or dust **(Fig 2)** taking extreme care not to damage the aluminium fins on the condenser face. Never blow air into the condenser. **NOTE:** The condenser is located
- behind a removable panel on the rear of the incubator for the TRI-145-1- GD/SD model.

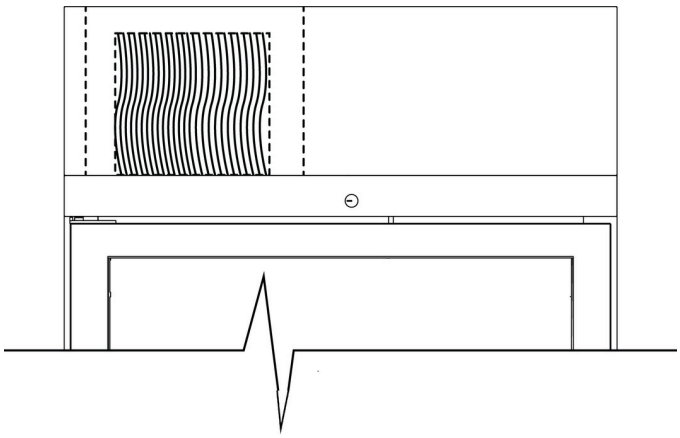


Fig 1: Location of Condenser

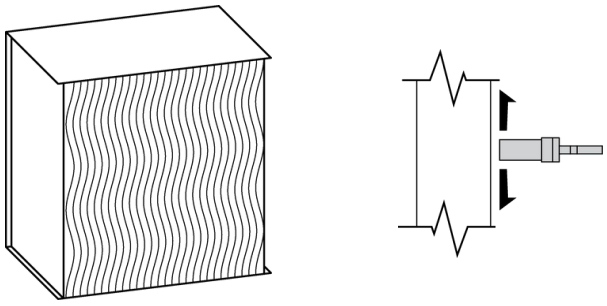
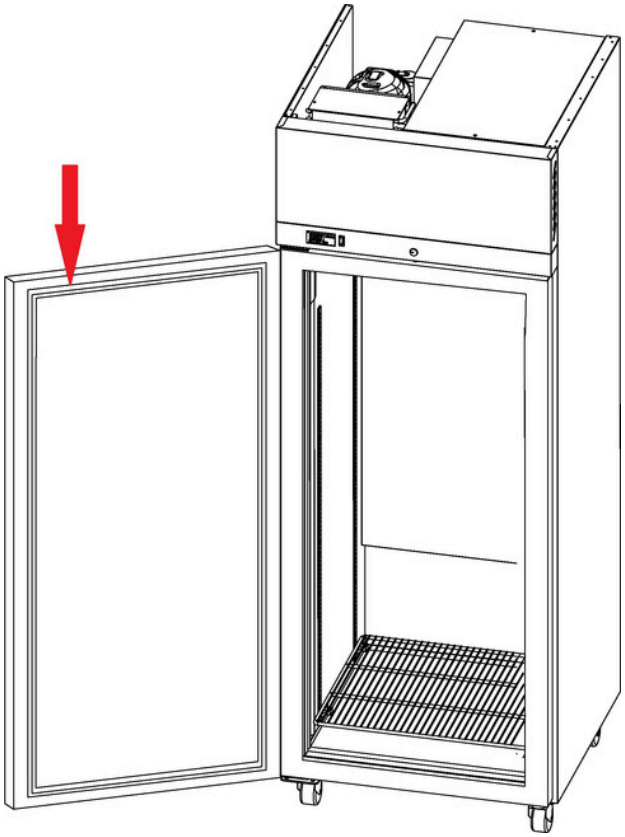


Fig 2.

Setup

Door Gasket

The door gasket should be cleaned regularly with a mild soap solution. If a gasket is to be replaced, please contact Thermoline. Regular inspection is recommended.



Setup Warnings

Castors can be fixed in place by pushing down on the brake lever. Ensure all castors are locked to prevent unwanted movement from the cabinet.

Ensure that the refrigerated incubator is rolled on an even and flat surface. Uneven surfaces can cause the cabinet to fall over and damage the product.

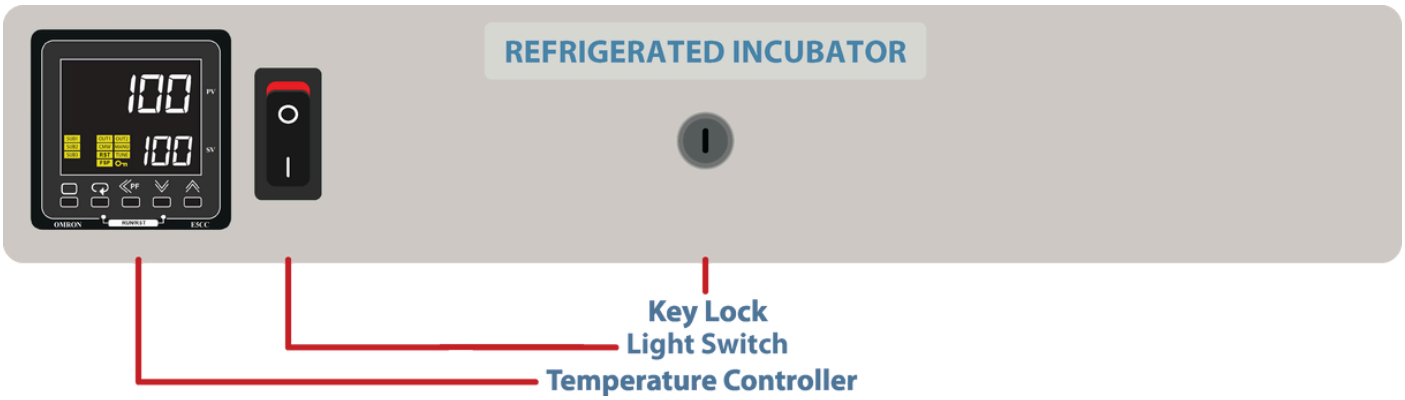
Packaging supplied on cabinets can be sharp and cause injury. Caution must be taken when removing the crate or using knifes to cut tape and cardboard.

Start Up Procedure

Start Up process for the refrigerated incubator.

- Take the supplied lead and plug it into the male IEC socket on the rear of the incubator. Next, plug the 3 pin plug into a 10amp General Purpose Outlet.
- Turn the power on at the outlet. The 145L model has a power on/off switch on the front panel which will need to be turned 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 actual temperature (PV) on the top display.

TRI-145 power switch



Loading

The refrigerated incubator requires air movement throughout the chamber to hold temperature and to bring new samples to temperature. Correct loading will ensure the most e cient cabinet performance.

Loading Requirements:

- Distribute the load evenly over all the shelves rather than stacking everything on one shelf. This is to ensure unobstructed airflow throughout the chamber.
- Do not load samples on the floor of the refrigerated incubator.
- The range of refrigerated incubators described here is not to be used in conjunction with large quantities of water (open trays to try and increase humidity). Introducing water and the resultant vapour could result in premature component failure.

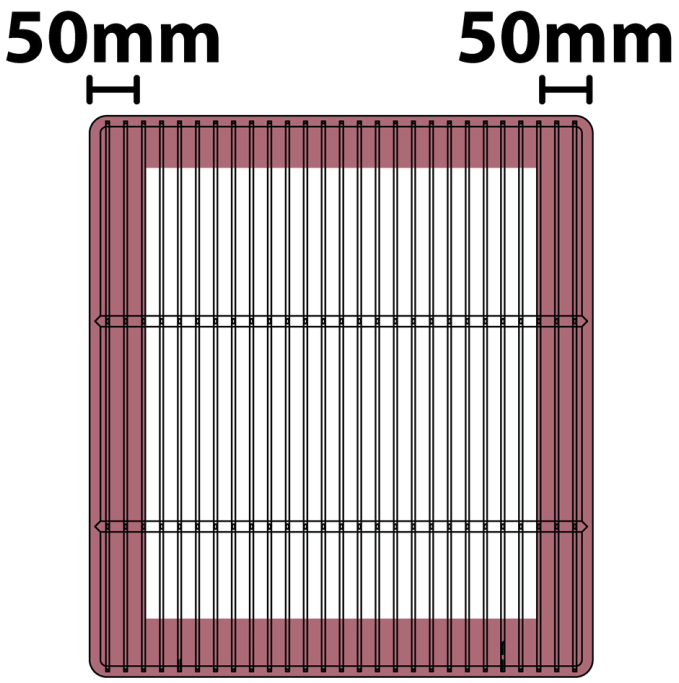
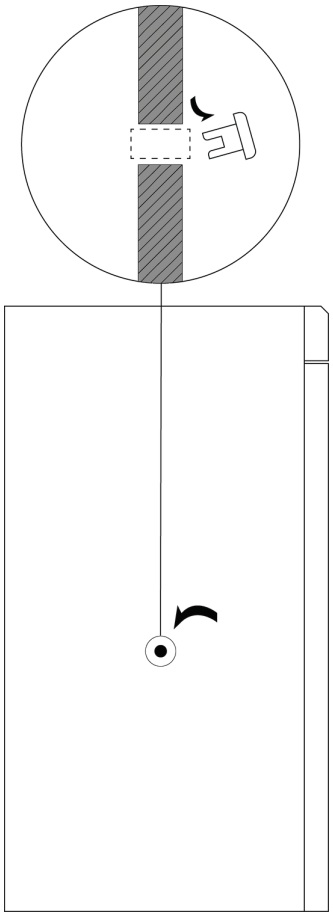


Fig 1.

Port Hole

The port hole can be found on the left side of the refrigerated incubator. The cabinet comes equipped with a plug that may be removed by simply pulling it out. Keep the plug safe in case the port hole needs to be closed again.



Omron Display Guide

The controller is an Omron E5CC-T microprocessor based device with digital indication of set temperature and operating temperature as well as multi step programming as standard.

Note: Limited access to the controller is available. The operator has access to alter the temperature set point, programming 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 cabinet

SV — ***Set Value:*** Set temperature within the cabinet.

Display Symbol

The Omron E5CC-T controller comes with an array of functions depending on the equipment it has been installed in. 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	Alarm BMS
SUB2	Auxiliary Output 2	Hi Alarm
SUB3	Auxiliary Output 3	Low Alarm
OUT1	Control Output 1	Heat output
OUT2	Control Output 2	Cooling output
CMW	Communications Write	Always on
RST	Reset	Program Off
FSP	Fixed Set Point	Program Off
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

Omron Programming Guide

Please use the below link or QR code to access the programming guide.

OMRON-MSP

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 Incubator. These could include the following:

- Sample load inside the cabinet (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 incubator because it could be damage.

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 sensor can be affixed to the centre of the middle shelf.

Once the incubator 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.

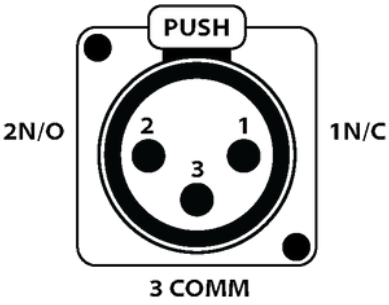
Use the **UP** or **DOWN** button to adjust the sensor correction. After this, allow the digit to stop flashing and the screen will display the adjusted value. Press **PAGE** to exit back to the main screen.

BMS Output

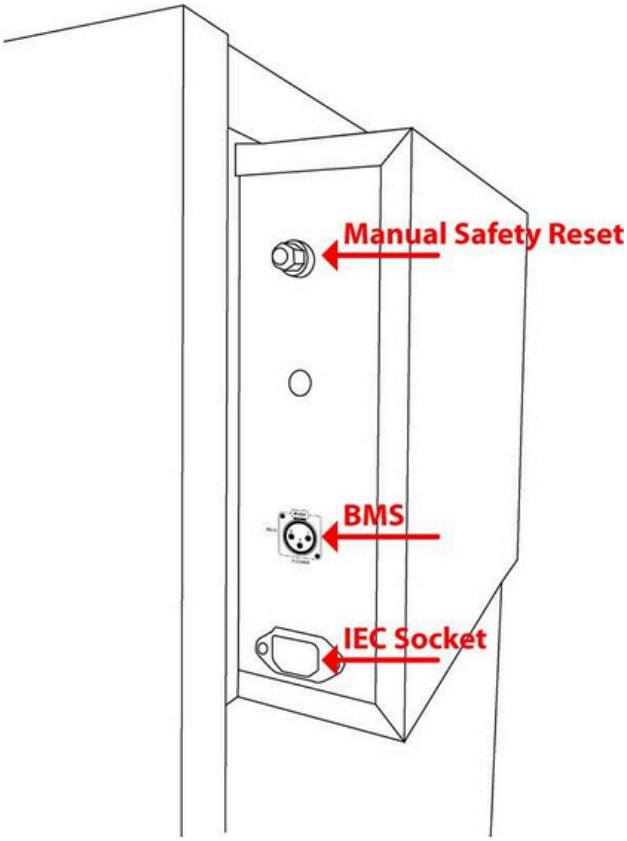
This incubator is fitted with a 3-pin socket to allow for connection to a building monitoring system or phone dialler. A plug is also supplied separately to connect the socket to your system.

The alarm contacts have no voltage present but we recommend that the wiring is connected by a suitably qualified technician. **An alarm can be triggered by the following:**

- Loss of power
- Low temperature inside the cabinet (5°C below setpoint)
- High temperature inside the cabinet (5°C above setpoint)



1N/C: Will open loop upon alarm situation. This is the optimal option as any break in the loop is detected.
2N/O: Will close loop upon alarm situation.
3COMM: At least one wire in connected to this pin.



Location of BMS socket TRI-360, TRI-520, TRI-1100

Location of BMS socket TRI-145

Manual Reset Safety Thermostat

The over-temperature safety thermostat is not operator adjustable. It will electrically isolate the heating elements in the event of an over-temperature situation. The main aim of this safety is to protect from overheating in the event that there is no airflow through the cabinet. This could be a failure of the air circulating fans or the cabinet being overstocked.

Resetting the over-temperature safety thermostat:

- Allow the cabinet to cool down before resetting the thermostat.
- Locate the safety reset at the back of the cabinet. It is displayed as a red or black knob **(Fig 1 & 2)**.
- Once the cabinet has cooled down, turn the black or red knob anti-clockwise. **(Fig 3)**
- Once the knob is off, press the red button firmly until you feel a “click”. This will restart the circulating fan and turn the digital display on 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. Manual Safety Reset 145

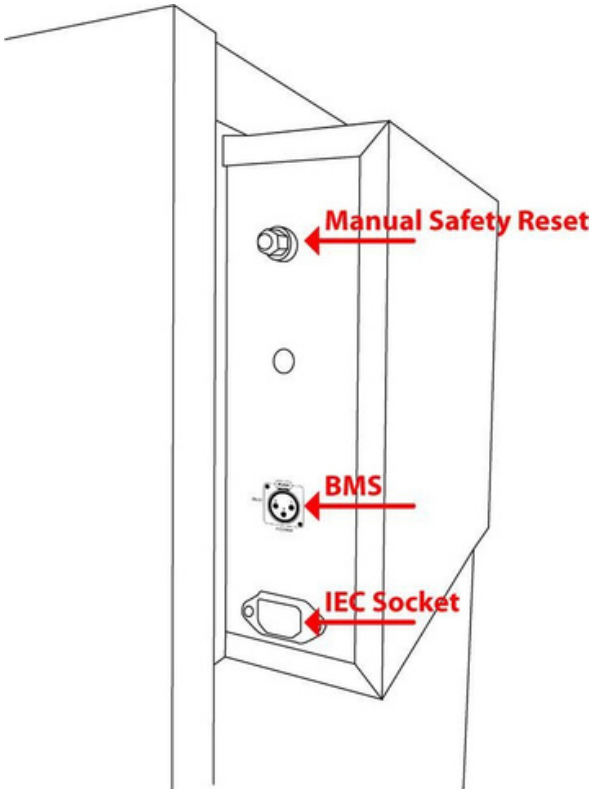


Fig 2. Manual Safety Reset 360, 520, 1100

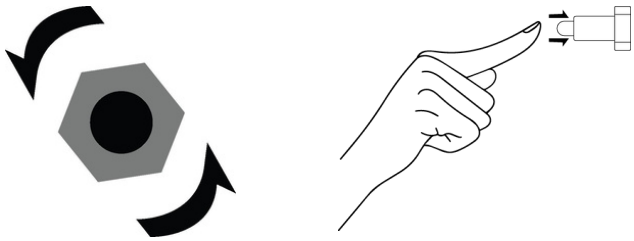


Fig 3.

Troubleshooting

Problem	Fix
Condensation appearing on the glass of Incubator	Condensation on the inside of the glass of the refrigerated incubator would be caused by moisture from the samples. This may occur when the temperature is set above ambient as the glass is fractionally cooler. There is no water source other than the samples or ambient conditions in the location. Water condensing on the outside of the glass door can happen in high-humidity environments when the temperature in the refrigerated incubator is lower than ambient. Thermoline suggests an airconditioned environment where possible.
The "ALM" light is illuminated on the controller, yet the temperature shown is not yet at the set point.	It is likely that the temperature offset has been inadvertently adjusted. Please follow the sensor calibration instructions to bring the " **iNS** " (Input Shift) value back to zero.

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

Thermoline

Model:
Serial No:
Watts/Amps:
Volts:

Phone: +61 2 9604 3911
Email: hello@thermoline.com.au

2 Years Warranty

Warranty

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 cabinet 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.