



Humiditherm Cabinet

User Manual & Setup Guide

TRH RANGE

STAR X Touchscreen

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**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.

This user manual is intended for Thermoline's Humiditherm range. 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 Temperature & Humidity cabinet 300, 460, 850 and XL models are designed and manufactured to provide an accurate temperature and humidity-controlled environment for laboratory evaluation and long-term storage of products. Designed to operate within +5°C and +80°C with adjustable alarms, the Thermoline temperature and humidity cabinets offer an industry standard in temperature and humidity control.

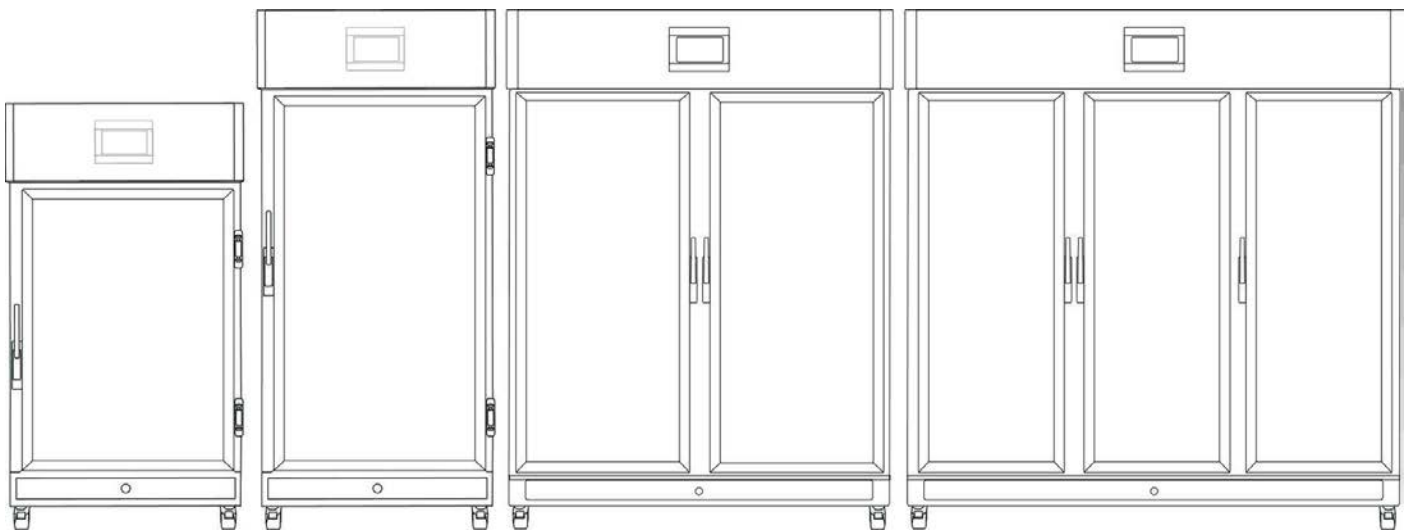
Thermoline temperature and Humidity Cabinets come in either a Glass Door or a Solid Door option.

- Glass Door Models operate at a range of +5°C to +80°C with a maximum humidity of 90%.
- Solid Door Models operate at a range of +5°C to +80°C with a maximum humidity of 95%.



The Thermoline Humiditherm cabinet is set to function with specific Operating Ranges. The optimum operating conditions will be explained further in this manual.





Note: Cabinets positioned side-by-side require at least 500mm between or fitment of ventilation deflectors on exhaust side.

Dimensions

External

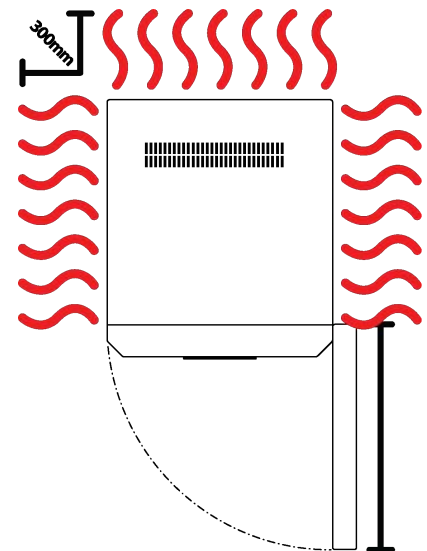
	TRH-300-(GD/SD)	TRH-460-(GD/SD)	TRH-850-(GD/SD)	TRH-XL-(GD/SD)
WxDxH (mm)	810x950x1640	810x950x1950	1330x950x1950	1940x950x1950

Internal

WxDxH (mm)	650x650x840	650x650x1140	1170x650x1140	1780x650x1140
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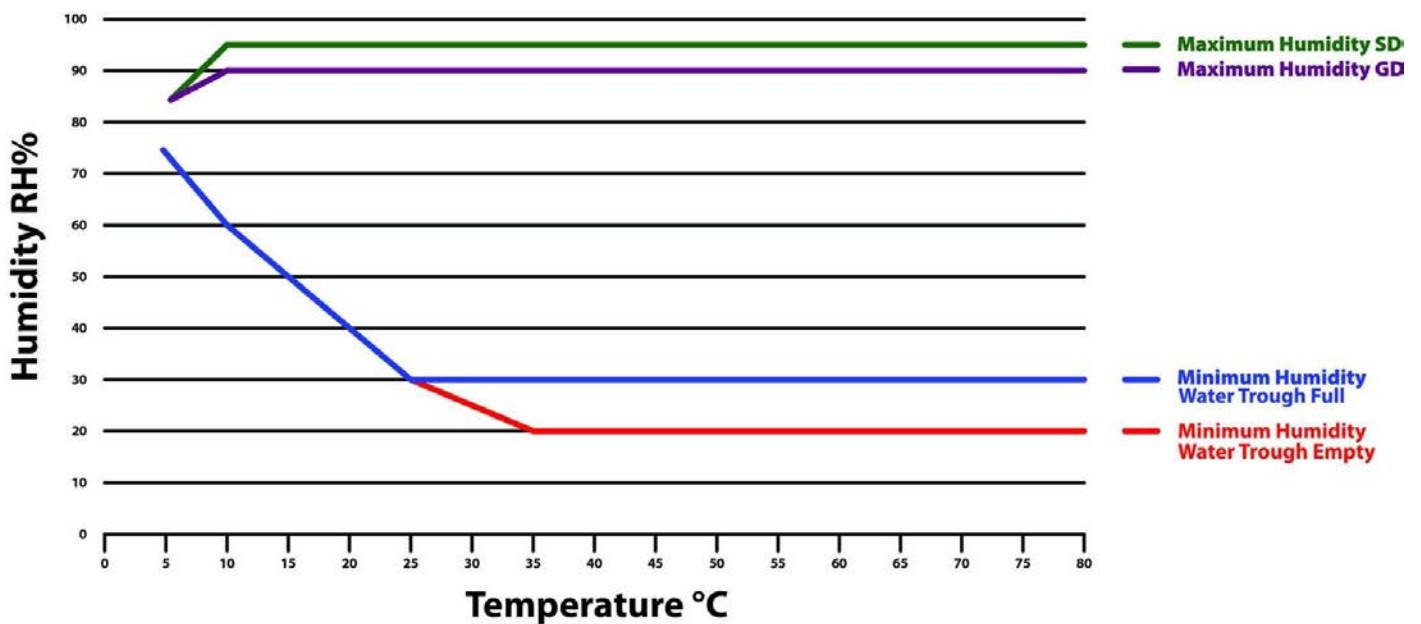
Clearance

	TRH-300	TRH-460	TRH-850	TRH-XL
Front (mm)	810		650	
Back (mm)		300		
Sides (mm)		300		



Product Specification

Technical Specifications	TRH-300	TRH-460	TRH-850	TRH-XL
Temperature Range	+5°C to +80°C			
Temperature Control Stability	+/- 0.2°C			
Temperature Uniformity	+/- 2.0°C			
Humidity Range	20% to 90%RH (95% with solid door) as per Control Envelope			
Humidity Uniformity	+/- 5%RH			
Heat Removal Capacity @ 10°C	600 watts		800 watts	
CO2 Range (Optional)	Ambient to 3000 PPM			
Porthole Diameter	50mm			
Electrical	15A/230V			
Nominal Capacity	300L	460L	850L	1350L
Weight	180kgs	240kgs	350kgs	440kgs
Heat Output	700 watts to 2700 watts (dependant on operating conditions)			
Noise Level @ 1 metre (dbA)	59			
Refrigerant Type	R507			



Control Envelope for TRH Glass Door (GD) and Solid Door (SD) Models.

The temperature and humidity data depicted in the above control envelope is based using an empty cabinet and ambient conditions of between 22-24°C and 50- 70% RH. Ambient conditions outside this range can affect the cabinet's ability to reach the above temperature and humidity values.

Parts Guide

Features

	TRH-300	TRH-460	TRH-850	TRH-XL
Power Cord	✓	✓	✓	✓
Shelves (max @100mm spacing)	3 (max 6)	4 (max 8)	4 levels (max 8)	4 levels (max 8)
Lockable Castors	✓	✓	✓	✓
STAR X Touchscreen	✓	✓	✓	✓
Ethernet Port	✓	✓	✓	✓
Download data to USB	✓	✓	✓	✓
Battery Backed-up Alarms	✓	✓	✓	✓
Trough Humidification	✓	✓	✓	✓
BMS	✓	✓	✓	✓
Supply Line Water Filters 1x Carbon, 1x Sediment	✓	✓	✓	✓

Safety

Over Current Protection	✓	✓	✓	✓
Over Temperature Safety	✓	✓	✓	✓
Element Safety Cut Out	✓	✓	✓	✓

Options

Glass or Solid Doors	Nomenclature designations: Glass Door (GD), Solid Door (SD)
Additional Shelves	Additional stainless steel shelves and clips can be supplied
Door Locks	Door latches can be replaced with key lockable versions
55L Pump Water Feed Tank	Pump feed water supply where mains water is unavailable
Drain Pump	Drain Pump for when a suitable drain is unavailable
CO2 Control	Set Point Control of CO2 Between Ambient and 3000ppm
Additional Portholes	Additional 50mm port holes can be added to the side walls
LED Lighting	See TRHDL (door lighting) / TRHSL (shelf lighting) models

Cabinet Location

Ensure the Humiditherm cabinet 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 Humiditherm cabinet 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:

- **Temperature:** 23°C (+/-2.0°C)
- **Humidity:** 50%RH (+/-5%RH)

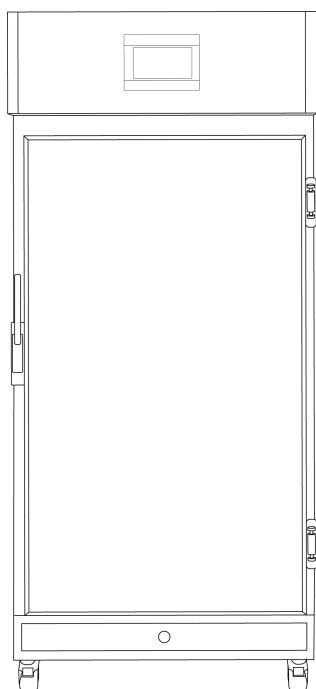


Fig 1. Suitable Environment

If there are multiple cabinets nearby, heat issues can occur because of the air flow direction. Essentially, one cabinet can heat the next, which then affects performance. Thermoline can supply deflectors to alleviate this issue if unavoidable (Fig 2 and 3).

- (Fig 2). If this is unavoidable please contact Thermoline as Air Deflectors can be supplied (Fig 3).

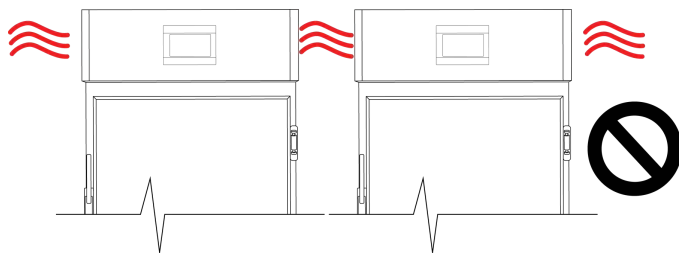


Fig 2. TRH cabinets without Deflectors

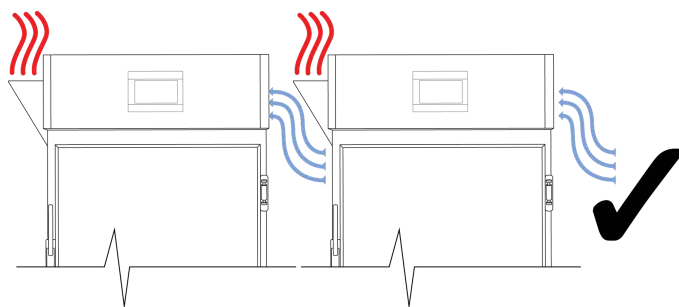


Fig 3. TRH Cabinets with deflectors

Operating Environment

Electrical

All Humiditherm cabinets require a 15amp, 230V, 50hz power supply. A dedicated outlet should be used for the supply, do not use power boards or the like. A 3-pin moulded plug is supplied as standard to the mains.

Electrical Conditions:

- All Humiditherm cabinets include a 2.5m removable mains power lead with a three pin plug and female IEC plug. Ensure the product is reasonably distanced from the power supply. **(Fig 1)**
- On the cabinet itself is a male IEC socket **(Fig 2)** and **(Fig 3)**.

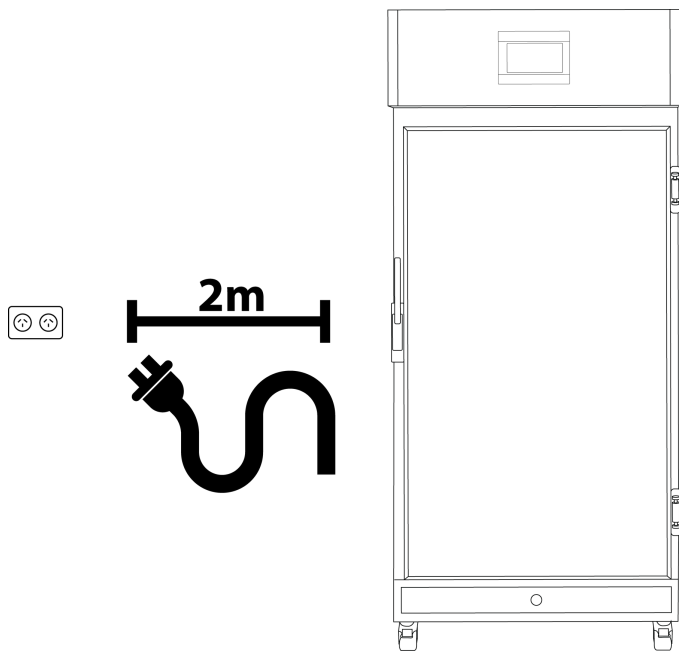


Fig 1. Suitable cord distance (2m)

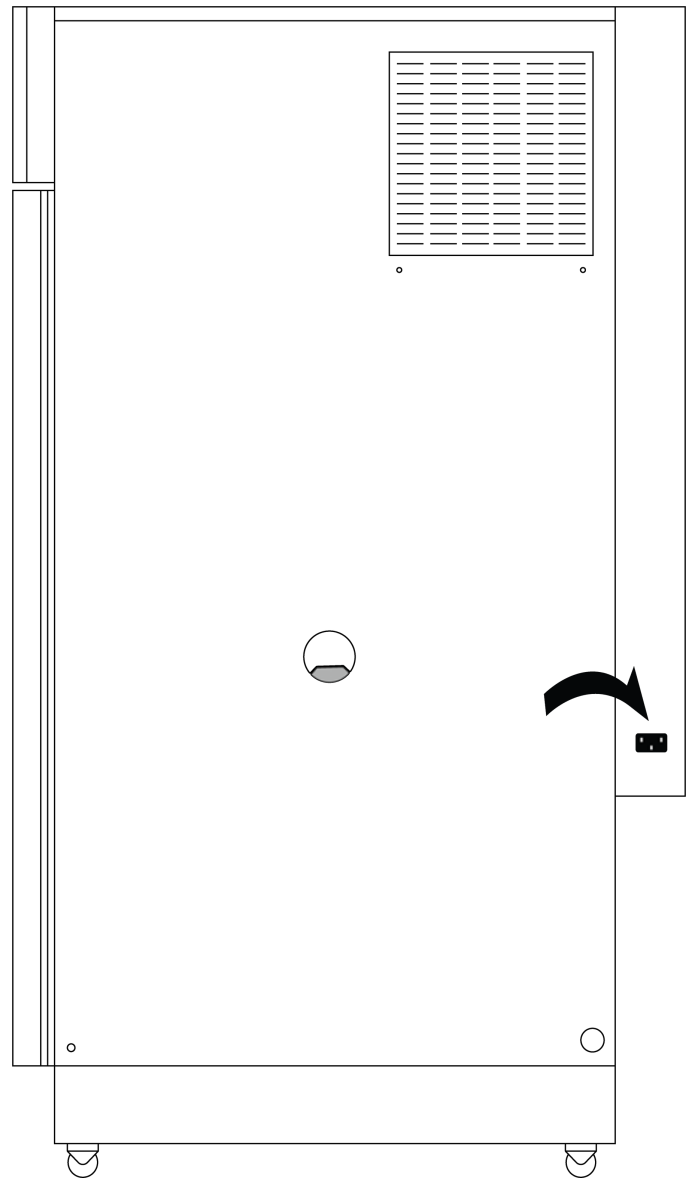


Fig 3. 15A/230V IEC socket location.



Fig 2. 15amp IEC socket

Operating Environment

Water Quality

The water quality parameters in the table below should be adhered to to get the best out of your Thermoline equipment. Due to the extensive use of stainless steel in Thermoline products, deionised water should not be used. It can cause corrosion (due to leaching over time) that may not be covered under warranty.

Thermoline suggests avoiding using tap water if possible. Using tap water may significantly increase the required frequency of cleaning and maintenance of the equipment. Unacceptable water can cause excess scale build-up and mineral deposits, particularly in humidity systems. This, in turn, can cause heater failure and issues with float switches. In water baths, corrosion due to insufficient cleaning is the primary concern, with heater circulators and circulation pumps being the most significant issue.

Note: All Thermoline equipment using water requires regular maintenance, inspection and cleaning. Six monthly for Humiditherm, Envirotherm and Climatron cabinets. Water baths will require much more frequent cleaning due to the ease of contamination in the water. The water in baths should be changed at the first signs of contamination.

Parameter	Range
Resistivity	0.1 - 0.5 MΩ
Conductivity	2-10 µs/cm
Total Dissolved Solids	<10 mg/L
Acidity	6-7 pH

Operating Environment Warnings



Humiditherm cabinets require ventilation around them. 300mm on either side and the back is required.

Humiditherm cabinets 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.

Ensure that the feed water is suitable for the cabinet.



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

Uncrating/Unpacking

Unpacking process for foam wrapped and crated:

- In most cases, the Humiditherm cabinet will be delivered foam wrapped and on its castors via sensitive freight. (Fig 1)
- The Humiditherm cabinet 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. (Fig 2) A forklift is needed to remove the incubator from the crate.
- Please don't dispose of the packaging until the Humiditherm cabinet is inspected. If damage is present upon opening your package, notify your supplier or Thermoline Scientific without delay on +61 2 9604 3911 or email at service@thermoline.com.au.



Fig 1. Unpacking Process (foam wrapped)

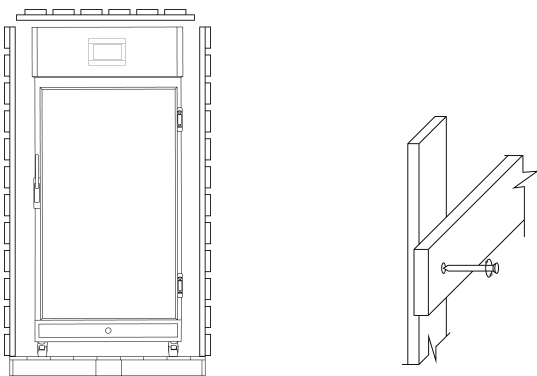


Fig 2 . Unpacking Process (Crate)

Moving

Moving the Humiditherm cabinet:

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

NOTE: Humiditherm cabinets are 'Top Heavy'. Do not move the cabinet too quickly. (Fig 3 & 4)



Fig 3 . Safe moving of cabinet.

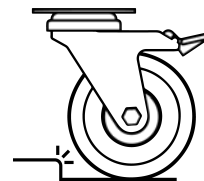


Fig 4.

Setup

Castors

The Humiditherm cabinets are equipped with lockable castors to prevent cabinet movement.

Castor Setup:

- Ensure the Humiditherm cabinet is placed on an even 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 cabinet. (**Fig 1**)
- When placing the Humiditherm cabinet into place, ensure that the castors can be accessed so they can be locked (**Fig 2**) and unlocked (**Fig 3**). Please contact your supplier or Thermoline should there be any damage to the castors.

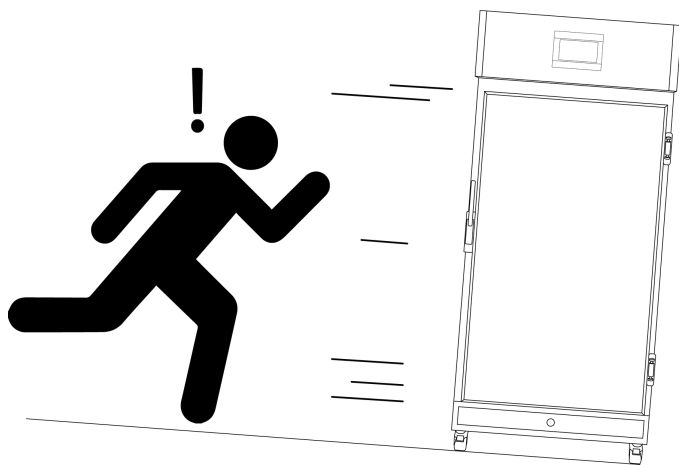


Fig 1.

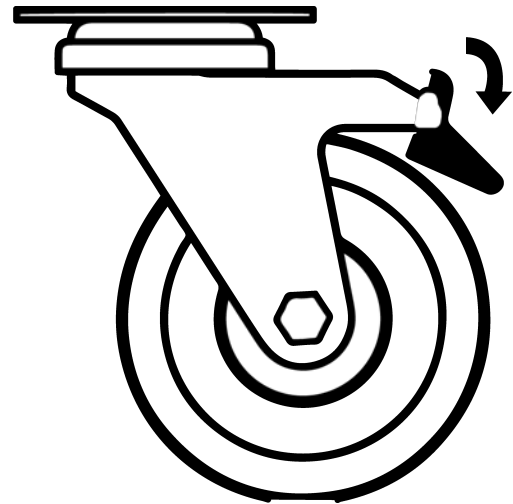


Fig 2. Castor Locked

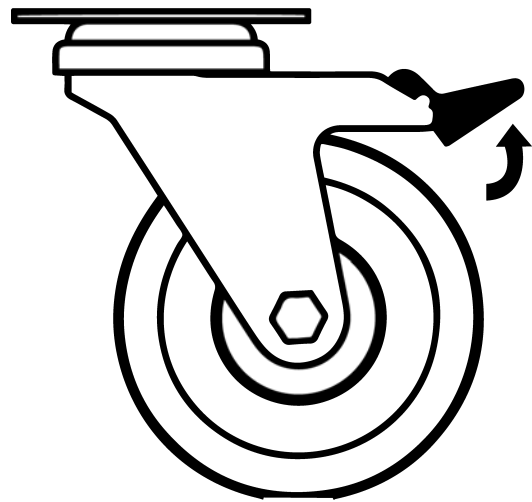


Fig 3. Castor Unlocked

Setup

Cabinet Location

Location Requirements:

- Humiditherm cabinets require a level surface to operate correctly. (Fig 1)
- The Humiditherm cabinet requires ventilation. Thermoline suggests 300mm on the sides and back, which also aids with accessibility (Fig 2). The optional deflectors may be required. 300mm at the top to also ensure good ventilation (Fig 3).
- The cabinet doors should also be allowed to open and close at full range (Fig 4).

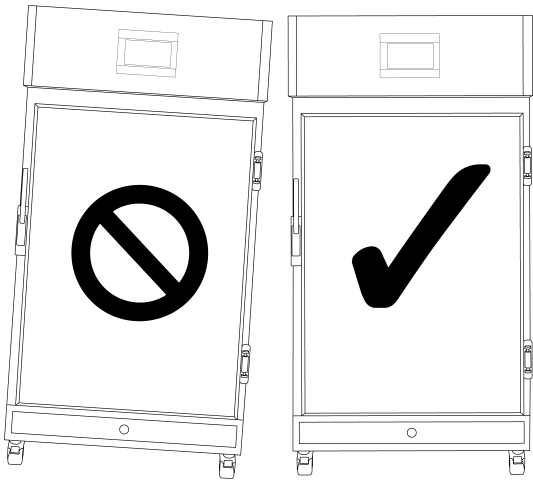


Fig 1 . Correct Levelling

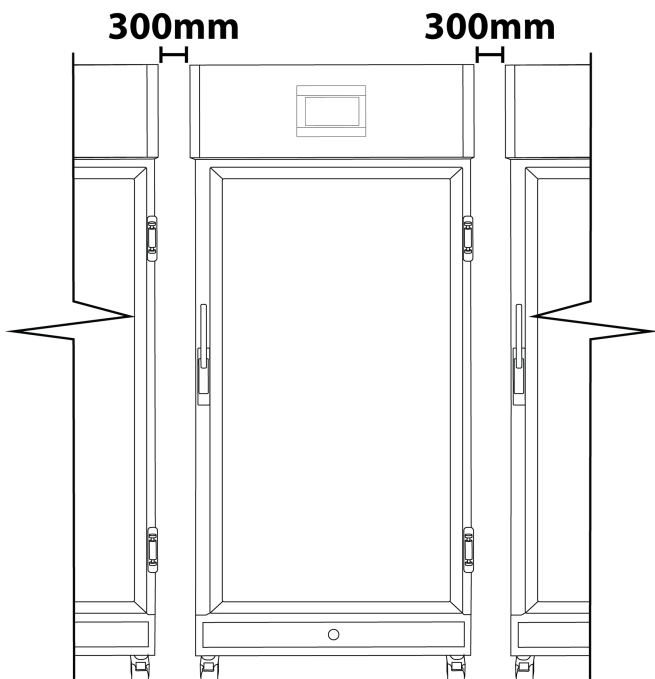


Fig 2.

300mm

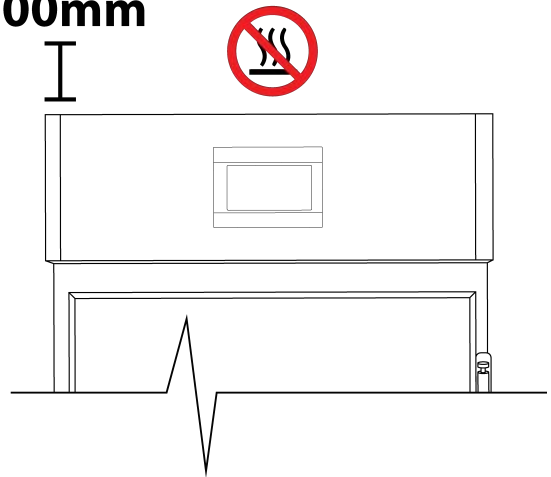


Fig 3.

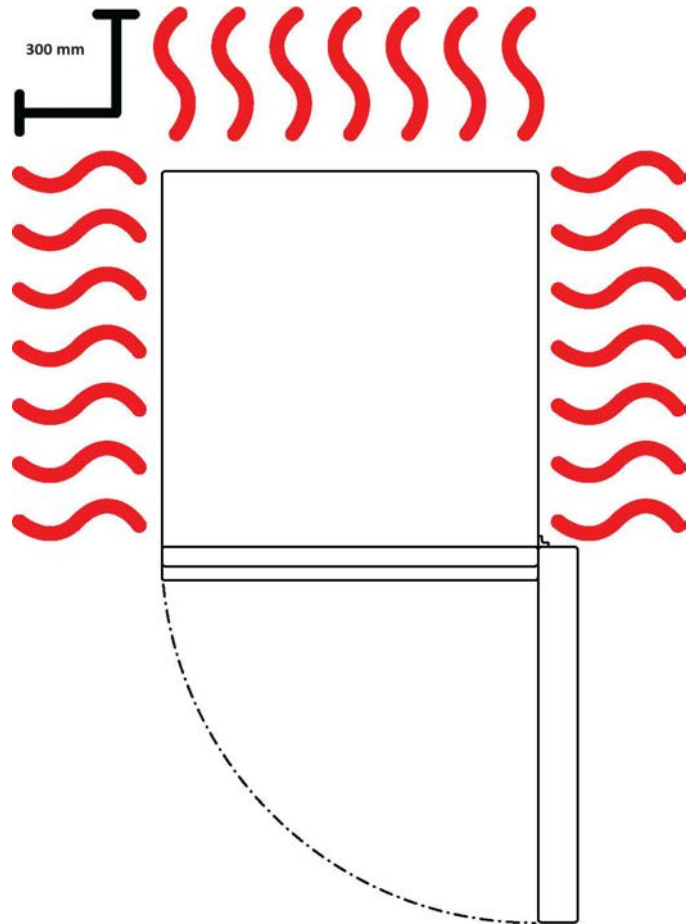


Fig 4.

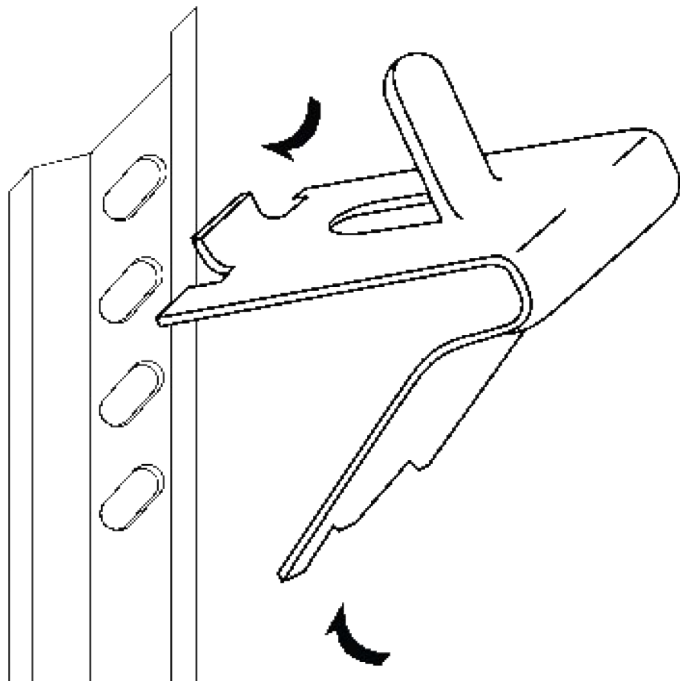
Setup

Shelves

All Humiditherm cabinets come equipped with shelves used for holding items while the cabinet is 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 above.
- Pinch and squeeze the base of the clip
- Push base of clip into slot and release.



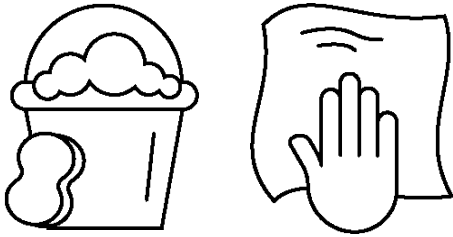
SAFETY NOTE:

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

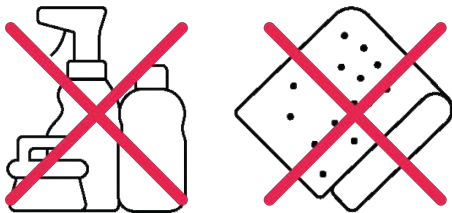
Setup

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.



The water trough inside the cabinet provides the humidity for the cabinet. Since water constantly evaporates from this trough, mineral deposits can be left behind (mainly if town water is used). The supplied Water Filter Assembly is included to provide additional protection even if the supply water meets the suggested water quality requirements to keep the residual deposit to a minimum but cannot eliminate them. Even with supply water meeting the requirements, regular maintenance is still required and replacement every six months. Regular draining and cleaning of the humidity trough will help to keep these deposits to a minimum. This can be viewed directly on the cabinet floor and should be cleaned at the first sign of contamination. Please check for any corrosion during the cleaning process. You can use the drain at the front of the cabinet to remove the water from the trough.

Cleaning Stainless Steel

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 that will attack the surface of stainless steel, plus the lack of oxygen at the surface will cause rusting, corrosion and pitting. When cleaning tap water is usually suitable but for ordinary running of the cabinet Thermoline suggests water meeting the parameters mentioned in the water quality section manual.

NOTE: DO NOT USE DEIONIZED WATER

Cleaning the Condenser:

- Turn off power at the power point before cleaning the condenser.
- The condenser is located on the right-hand side of the cabinet behind a grill (**Fig 1**).
- To remove the grill, unscrew the four corners and lift the grill off. At this point, you would have full access to the condenser.
- **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.

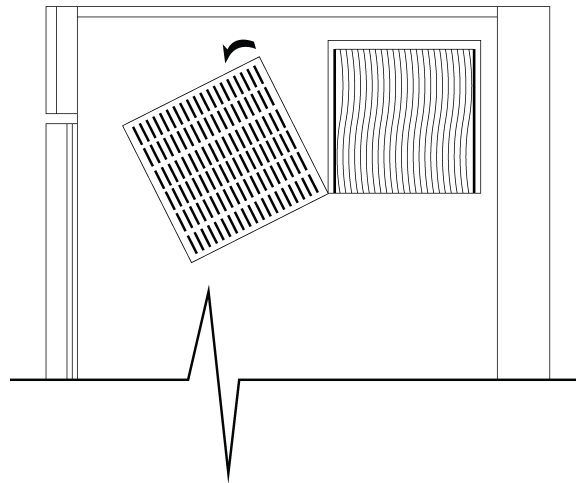


Fig 1. Location of Condenser

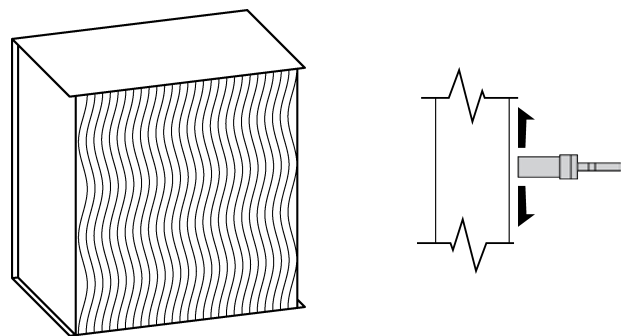
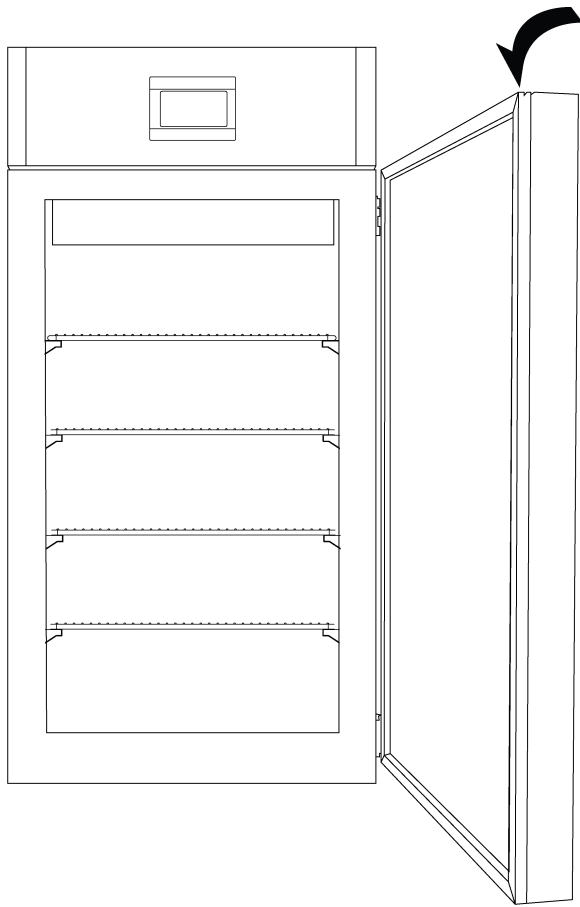


Fig 2.

Setup

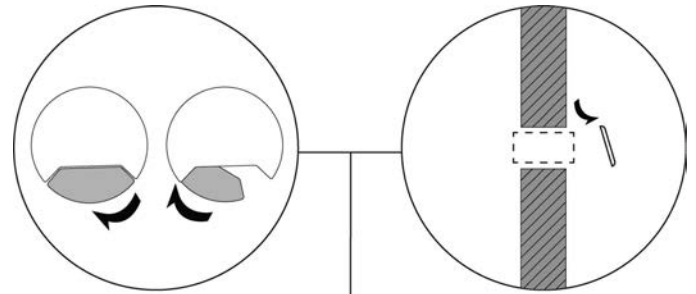
Door Gasket

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.



Port Hole

The cabinet comes equipped with a 54 mm port hole. The plug may be removed by simply pulling it out. Keep the plug safe in case the port hole needs to be closed again.



Push-Fit Pneumatic Fittings

Thermoline uses nickel plated brass push-fit fittings for water inlet connections on the Humiditherm cabinets. These are also on the optional CO₂ inlet. To use the fitting, push the 6mm hose into the push-fit connector. To release, push the outer ring in and pull the hose or fitting out. Below shows a flexible tube, mains water fitting and elbow attached to a push-fit connector.



Setup

Water Filter

A water supply is required for the humidity trough inside the cabinet. The water supply can come from either mains water or from a water reservoir pumping water to the cabinet. In both cases, the water will flow through a pressure regulator to reduce water pressure below 14psi. Pressure higher than this can cause damage to the water control system for the humidifier.

NOTE: DO NOT USE DEIONIZED WATER

Attaching Water Filter

The water filter pack is supplied but not put in place to ensure it does not get damaged during transport.

- On the back of the cabinet are two protruding screws (Fig 1) that match two keyholes on the top of the filter housing (Fig 2). Fit and hang the filter pack from the protruding screws. Do not tighten the screws after fitting.
- Once the filter pack is in place, the water inlet can be connected to the cabinet using the push-fit connector.

Note: Do not connect water directly to the water inlet without passing through the filter/pressure regulator (even if it meets the water quality requirements), as the higher pressure can damage the cabinet.

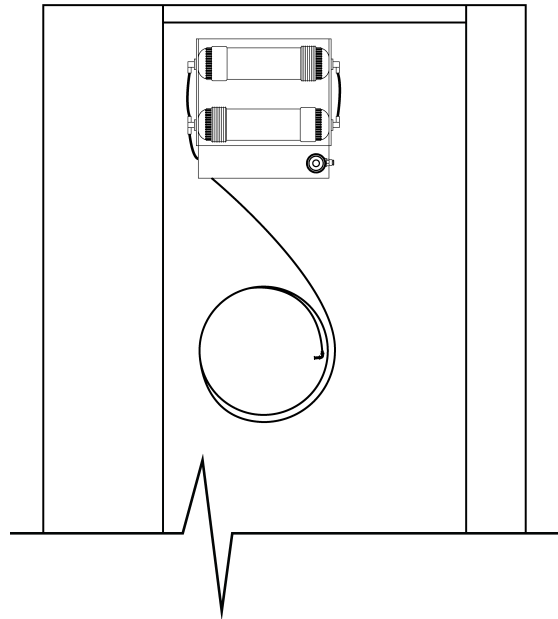


Fig 3. Installed Water Filter

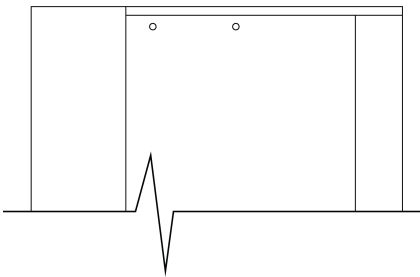


Fig 1. Water Filter Screws

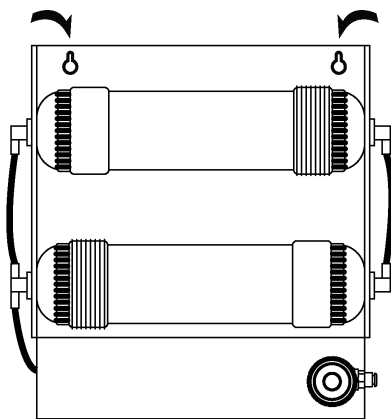


Fig 2. Water Filter Key Holes



Fig 4. Connecting to the cabinet water inlet.

Setup

Water Filter Replacement

Thermoline suggests the particulate filter and carbon filter be replaced every six months. This could be more frequent depending on the feed water quality. Replacement filters are available through the Thermoline online parts store (part no: MFC2000).

Replacing the Water Filter

- Power down the cabinet and isolate the water supply.
- Release the pressure within the line and disconnect the inlet water and outlet from the filter pack.
- Remove the filter pack from the cabinet and lay it on a flat surface.
- Remove the six screws and lift off the front plate.
- Replace the filters taking note to match the orientation and flow.
- Reinstall the cover and put the filter pack back on the cabinet. Reconnect the inlet and outlet and turn the water back on. Check for leaks.
- Turn the cabinet back on.



Water Filter Pack in Place



Water Filter Pack with Cover Off



Water Filter replacement Kit

Setup

Connecting mains water or water with similar pressure:

- Locate the Mains water connector (Fig 5) found inside the cabinet upon delivery. Insert mains water connector into water pressure regulator. (Fig 6 & 7)

Note: Thermoline recommends using water meeting the parameters shown in the water quality section of this manual.

Note: Make sure that the pressure does not exceed 60psi (+/-7psi) (400kpa, +/-50kpa).

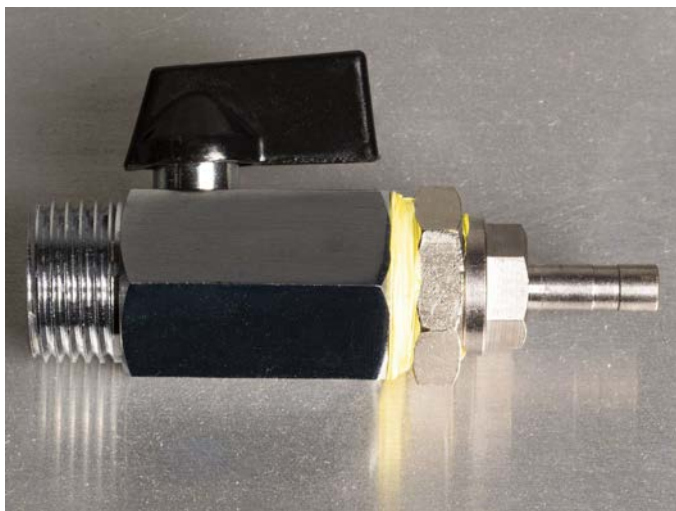
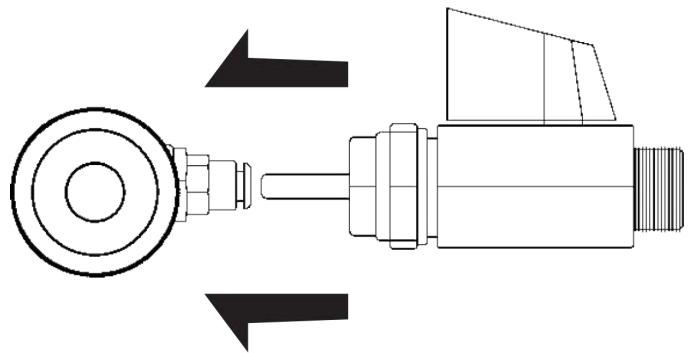


Fig 5: Mains Water Connector



Fig 7: Connection of Mains Water Connector and Water Pressure Regulator.

NOTE: When using a continual mains water supply, the drain outlet must be connected to a suitable waste point. Failure could result in flooding.

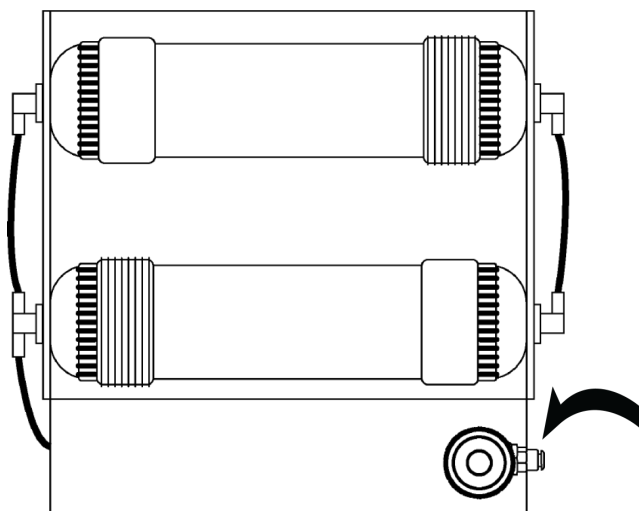


Fig 6: Water Pressure Regulator Connection

Setup

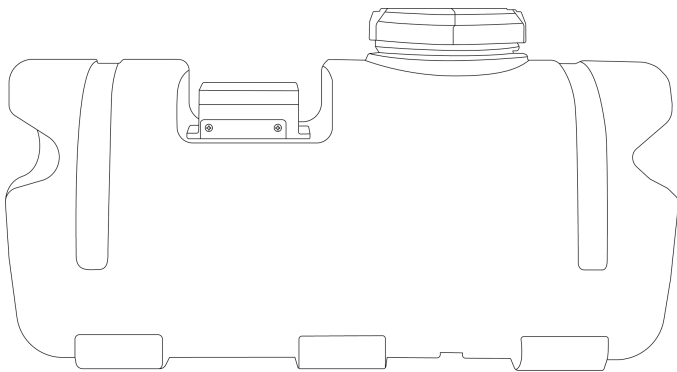
Alternate Water Supplies

55 Litre Water Container:

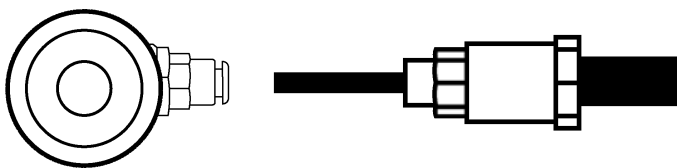
- This is placed at floor level and will pump water to the cabinet as required. Supplies water at 50psi (3.5bar, 350kpa)
- An audible low water alarm is triggered to alert when the container needs to be filled.
- Thermoline suggests that the cabinet drain is connected to a floor drain or pump arrangement when using the 55 litre water container.

NOTE: DO NOT USE DEIONIZED WATER

55 Litre Water Container (shown below). Equipped with a black hose for connection to the Water Filter.



Connect into Water Container hose to Water Filter (shown below)



Setup

Water Pressure Regulator

Located with the Water Filter Assembly. The Water Pressure Regulator can be adjusted to stop the Float Switch 'Bounce' and also shut off the water supply to the cabinet.

Note: The regulator is preset at the factory. Do not adjust the regulator unless there is an issue.

Adjusting the Water Pressure (if required):

- To adjust the water pressure regulator, pull the knob outwards (**Fig 1**). You should feel and hear a click as it comes out. Twist it clockwise (to increase the pressure) or anti-clockwise (to decrease the pressure), depending on what needs to be done (**Fig 2 & 3**).

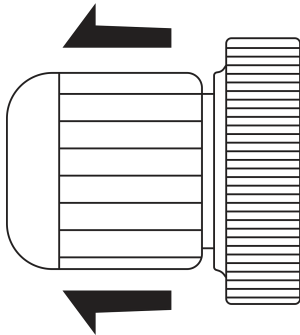


Fig 1. Water Pressure Regulator

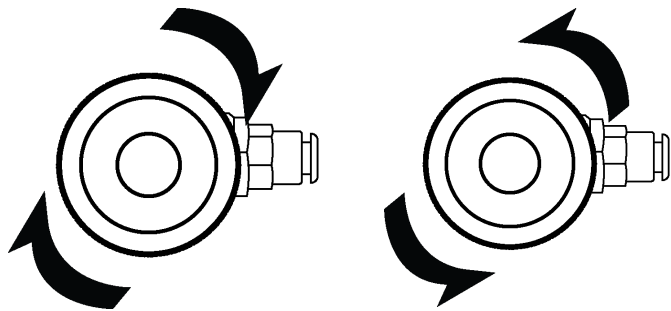
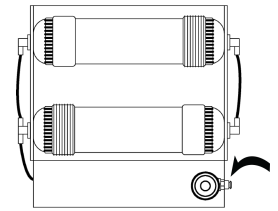
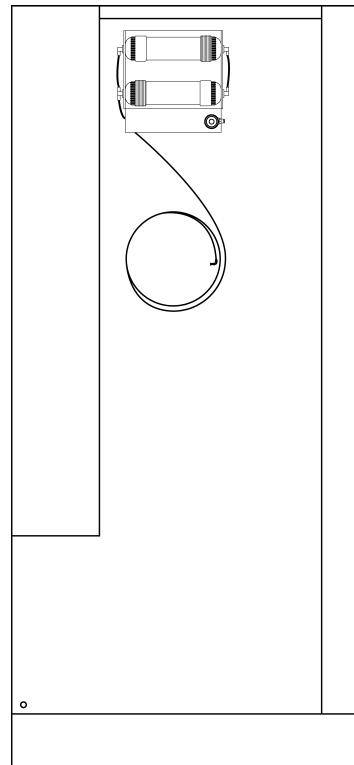


Fig 2. Increase Pressure

Fig 3. Decrease Pressure



Location of Water Pressure Regular

Setup

Draining the Humidifier Trough and Depressurising the Water Feed Line.

Each Humiditherm cabinet has a water supply to be used to control humidity. The water trough fills, and humidity is controlled through a combination of the heating and cooling circuits in the trough. There is an overflow in the trough for excess water and also a manual drain (usually left closed) for draining the cabinet of water. Both of these lead to the 3/4" hose barb fitting at the back of the cabinet. **(Fig 4)**

Drain the water trough:

- Turn off the Humiditherm cabinet using the shutdown procedure. **Note:** If you run the humidifier after turning off the water supply with the drain open, it will depressurize the water inlet lines.
- Lift up the flap at the front of the cabinet to access the tap to drain the cabinet. **(Fig 1)**
- Open the tap to drain the trough. Clean as required and close the tap. **(Fig 2 & 3)**
- The trough will be refilled once the cabinet has been restarted.

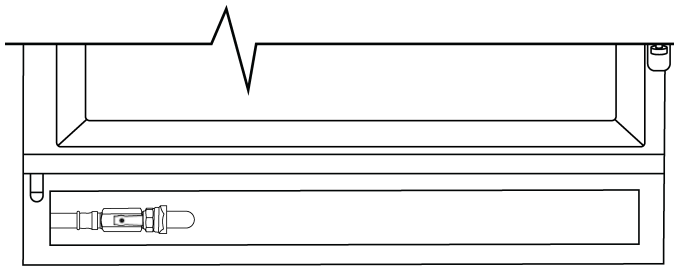


Fig 1. Location of Tap

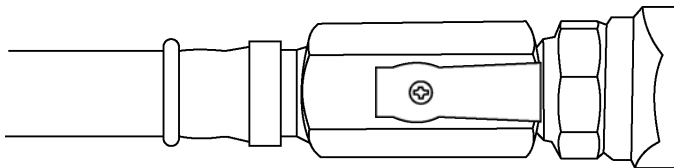


Fig 2. OPEN Drain Tap

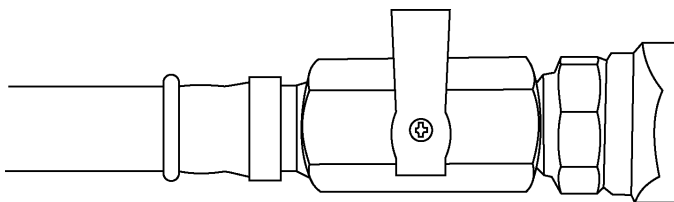


Fig 3. CLOSED Drain Tap



Fig 4. Location of 3/4 inch barbed drain.

Setup

Optional CO₂

When fitted, the CO₂ fitting will be located at the rear of the cabinet in the form shown (**Fig 1**). A hose barb fitting adapter is also supplied (**Fig 2**). Connect a regulated CO₂ supply to this point with set to a maximum pressure of 125kpa. (+/-25kpa). Make sure the CO₂ supply is connected in a manner that will not leak. Use a hose clamp if necessary. See STAR X operating guidelines on how to control the CO₂.

Note: Do not adjust the regulator. It is preset at the factory.

Please note the maximum temperature is +60°C when using the CO₂ sensor within the cabinet. The sensor is not rated to run higher than +60°C. The sensor can be easily unplugged and removed from the cabinet. Once removed, the Humidtherm cabinet will be able to reach its usual 80°C maximum temperature.



Fig 1. CO₂ connection



Fig 2. CO₂ connection adapter

Setup

Loading

All Humiditherm cabinets require constant air flow throughout the cabinet to maintain the desired temperature and humidity.

Loading Requirements:

- Airflow is an essential factor in maintaining a stable and uniform environment for optimal usage. To ensure consistent airflow, keep the sides, top and bottom clear of any obstructions. Take extra care to keep the fan free of blockages. Ensuring the air circulates appropriately around each product on each shelf is important. (Fig 1)
- Distribute the load evenly over all the shelves rather than stacking everything on one shelf.
- Ensure the highlighted area of the cabinet is clear of all obstructions to ensure that proper ventilation is allowed throughout the cabinet. (Fig 2)

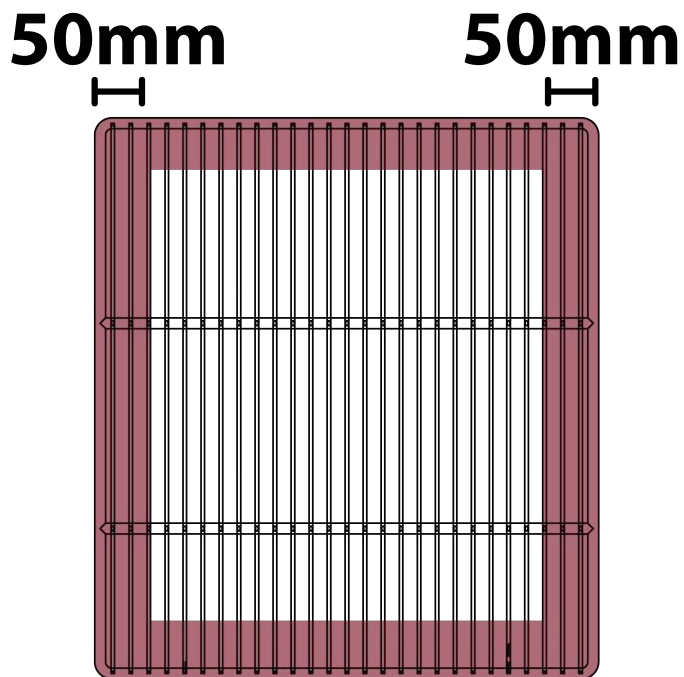


Fig 1.

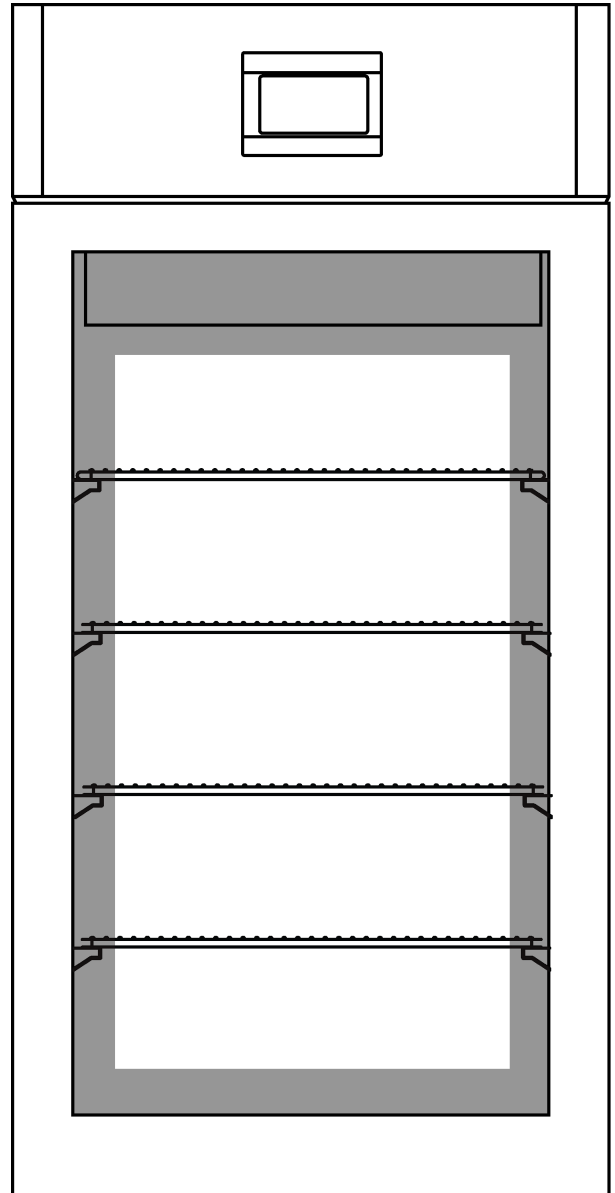


Fig 2.

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

Ensure that the feed water is suitable for the cabinet.

Failure to adhere to the requirements can lead to improper ventilation. Failure to observe these guidelines will void manufacturing warranty.

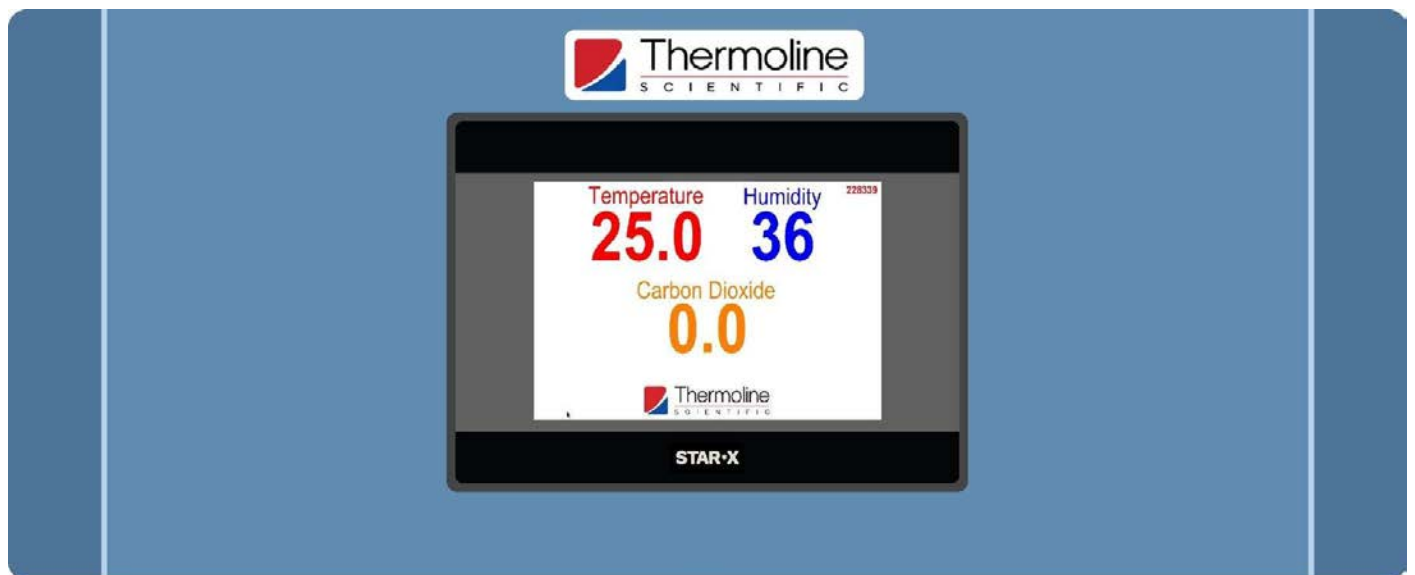
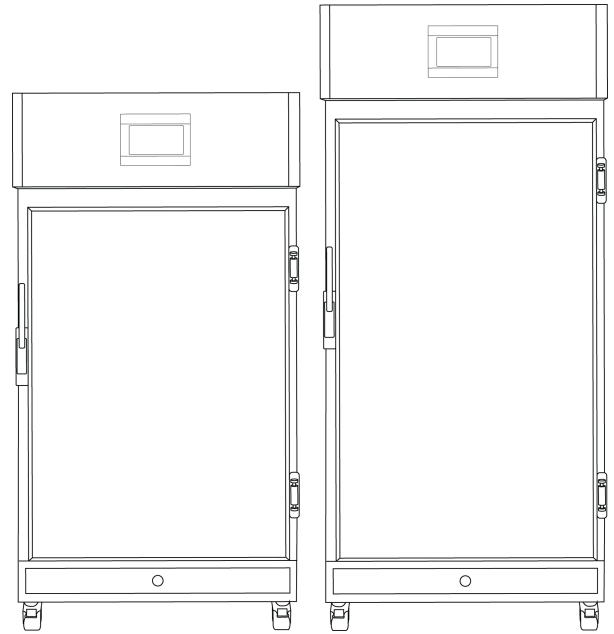


Packaging supplied on cabinets can be sharp and cause injury. Caution must be taken when removing the crate or using knives to cut tape and cardboard.

Start Up Procedure

Start-Up process for Humiditherm cabinet:

- Before proceeding, please ensure that all internal and external packaging has been removed from the cabinet and that all tape, plastic bags and foam pieces have been removed.
- You can now turn on the power when the cabinet is in a suitable location with the water and drain connected.
- 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 15amp General Purpose Outlet.
- The controller will go through a warm-up period and then show the security screensaver (SOV mode).



Temperature Controller

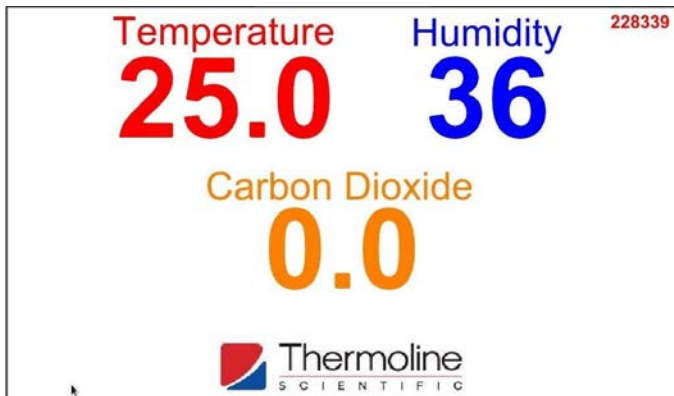
Factory Settings:

- Upon first start-up, the temperature will be set at 25°C and with the humidity function set off.

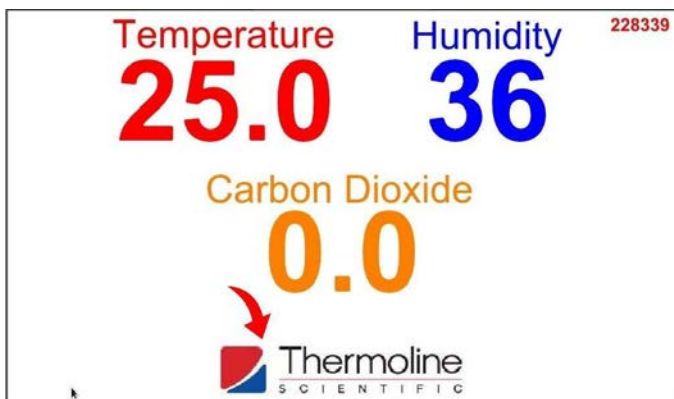
Start Up Procedure

Security Screen Saver

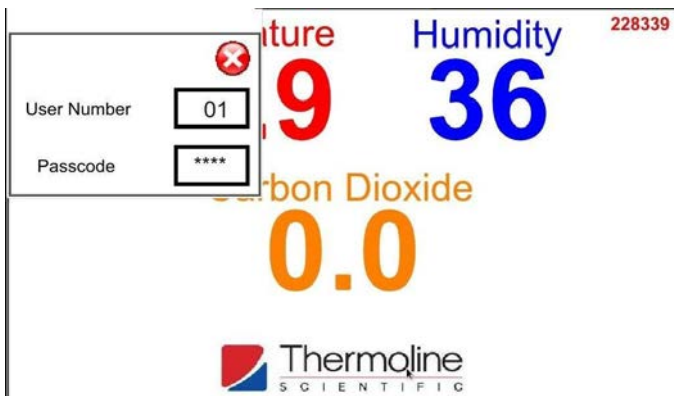
The screensaver is displayed on initial power-up or any time the touchscreen has power cycled to it. Follow the instructions below to navigate this section and get to the Main Screen.



To exit the screen saver, you will need to input the security code. Press the Thermoline logo, as shown below, to access the passcode.

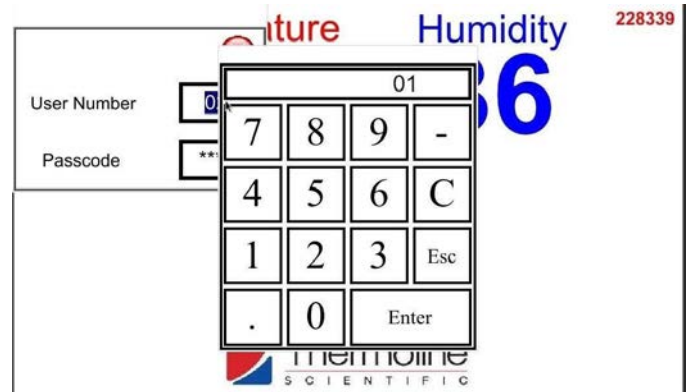


At this point, you should be seeing the User Access window shown below.



Press the passcode section on the right column and enter the passcode using the numeric keypad, as shown below.

NOTE: For this section of the STAR X controller, use the User Number '01' and the Passcode '1111'.

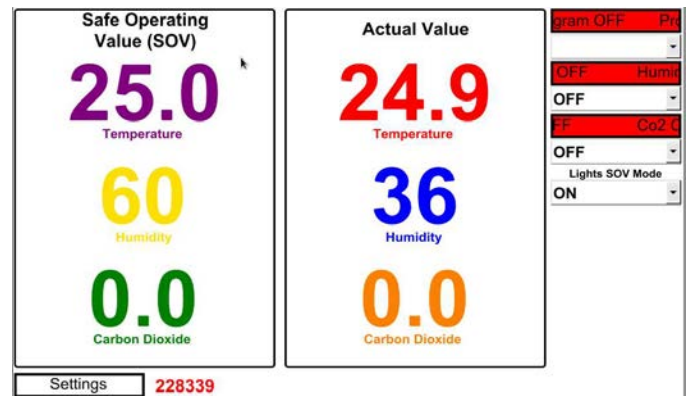


After entering the passcode, press anywhere above the Thermoline logo to continue to the main screen and then close the User Access window.

Scan the QR Code to see the video of this step.



From here, you can set the humidity function (and CO2 if fitted) to on. The SOV values for these can also be set.



Shut Down Procedure

Shutdown process for the Humiditherm cabinet:

- Turning off the power will cause a power fail alarm to show on the screen because of the battery backed up alarm system.
- The power to the controller needs to be interrupted by pressing and holding the red button in while turning off the mains power to the cabinet.



The temperature controller on the Humiditherm cabinet is a STAR X touchscreen. The Thermoline STAR X has been designed and configured to provide ease of use and a suitable level of security. The STAR X has a unique identifier that allows traceability back to the instrument.

SOV Mode

This mode is simply setting a single temperature, humidity and CO₂ (if optioned) setpoint and having the cabinet operate continuously without any ramp, dwell or timer actions.

Safe Operating Value: The values below the heading "Safe Operating Value (SOV)" are the current set values the controller will start controlling on initial power. The purpose of the "SOV" is to have a safe condition that will not cause damage to any research. In the event of a power failure (including alarm battery), the cabinet returns to this mode.

Actual Value: This is the current measured temperature/humidity/ CO₂ of the workspace.

Program ON/OFF/Pause/Resume: The drop-down menu in the top right-hand corner allows the operator to Start, End, Pause or Resume a Program/Diurnal Cycle.

Humid/Co2 ON/OFF: Below the Program drop down menu are the Humidity and CO₂ functions. Use these to turn off the Humidity and/or the CO₂ on or off.

Lights SOV Mode: Not used

PSV Mode

Program Set Value: The "PSV" is shown when a Program is operating. These values cannot be changed by touching the value.

NOTE: The values can only be adjusted within the Program Set-Up accessed via the settings menu.

Current Program: This indicates the Current Program is running and is only visible when a Program/Diurnal Cycle is operational.

Current Step: This indicates the Current Step in a program is running and is only visible when a Program/Diurnal Cycle is operational.

Step Time Remain: This indicates the remaining time of the "Current Step" and is only visible when a Program/Diurnal Cycle is operational.

NOTE: It is important to activate the Humidity and CO₂ before initiating the Program.

Scan the QR Code to see the video of this step.



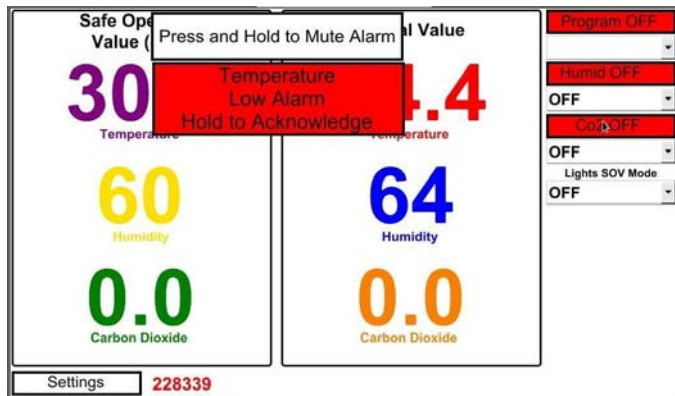
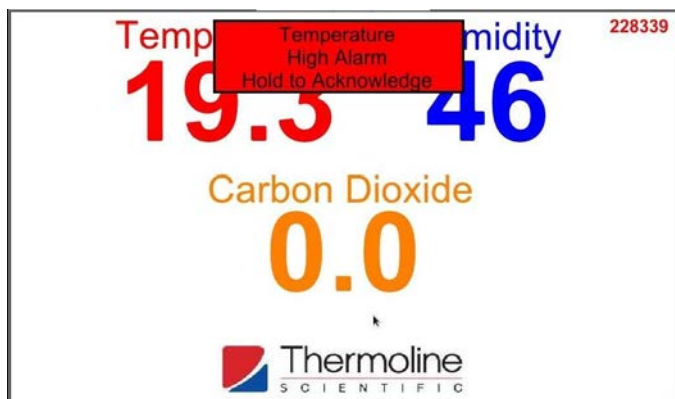
STAR X User Guide

Alarms

The STAR X is equipped with various alarms. The instructions below will run through each alarm and its primary function.

Power Fail: The STAR X has a controller battery backup in the event of a power failure. A fully charged battery will power the Alarms and touchscreen for approximately 24 hours. If the power loss is extended and you wish to turn off the cabinet and alarms, please use the shutdown procedure shown in the manual.

Battery Fail: The STAR X touchscreen checks the Battery Health approximately every 7 days. If during the 5 minute test the battery voltage falls below 22Vdc, a battery alarm will occur. If the alarm occurs, the battery may need replaced.



NOTE: You must log into the main screen to mute and acknowledge alarms.

Latching Alarm: 'Latching alarm' means that if the alarm activates and subsequently the condition returns to normal, the alarm will remain *latched*, or visible, until the Alarm Acknowledge button is pressed. While the alarm can be muted, it will return in 15 minutes unless the condition has been resolved and the alarm is acknowledged.

Temperature Deviation Alarm: If the Actual Temperature deviates the SOV or PSV by more than the set tolerance and for more than the Alarm Delay Time, a Visual and Audible alarm is triggered. This Alarm is a Latching Alarm and needs to be corrected before it can be Cleared/Acknowledged.

Humidity Deviation Alarm: If the Actual Humidity deviates the SOV or PSV by more than the set tolerance and for more than the Alarm Delay Time, a Visual and Audible alarm is triggered. This Alarm is disabled if the Humidity Function is turned Off. This Alarm is a Latching Alarm and needs to be corrected before it can be Cleared/Acknowledged

Carbon Dioxide Deviation Alarm: If the Actual Carbon Dioxide deviates the SOV or PSV by more than the set tolerance and for more than the Alarm Delay Time, a Visual and Audible alarm is triggered. This Alarm is disabled if the Carbon Dioxide Functions is turned Off. This Alarm is a Latching Alarm and needs to be corrected before it can be Cleared/Acknowledged.

NOTE: If alarms and issues persist then immediately call a trained and qualified service technician.

NOTE: There are also temperature high and low safety alarms that will halt all forms of heating for a high alarm and halt all cooling for a low alarm. These are not user adjustable.

USB and Ethernet

The cabinet comes with a built-in USB and Ethernet connection located on the left side of the touchscreen control panel. It can be identified by the diagram below.



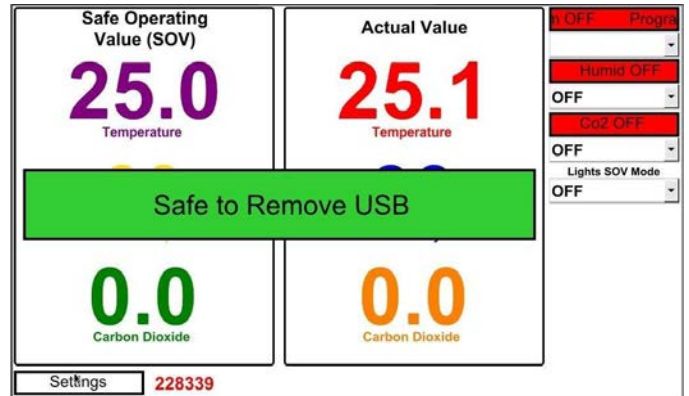
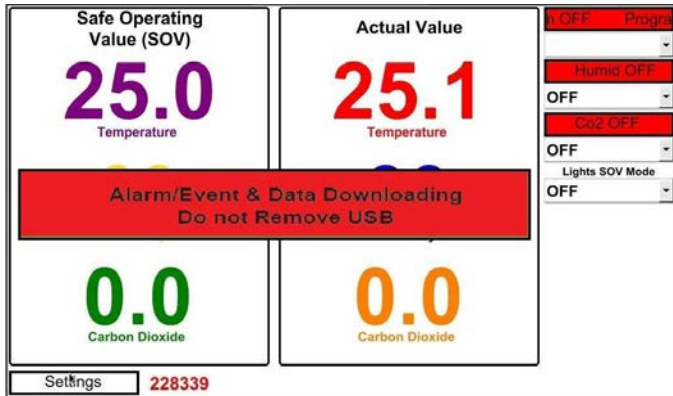
STAR X User Guide

USB Downloading

To download the logged data from the STAR X controller, simply insert a USB memory stick and the data is downloaded automatically. Do not remove the USB stick until all the data has been downloaded. The following messages appear on the screen when data is downloading and when it is safe to remove the USB memory stick. Data is logged every 1 minute. Using the unique identifier number, data can be traced back to the instrument.

Files are in monthly formats. Each file name is the date backwards (YYYY/MM). A maximum of 12 months can be held on the screen and be downloaded.

The below screen is the USB Screen Saver indicating a USB memory stick has been inserted, and the Historical Data and Alarm/Events are being downloaded. This will happen automatically when a USB memory stick is inserted into the cabinet.



Once the data has been downloaded, the STAR X controller will notify you that it is safe to remove the hardware, as shown above.

NOTE: Downloaded data is formatted in comma-separated format (CSV). This can be easily opened in most spreadsheet programs.

Scan the QR Code to see the video of this step.



STAR X User Guide

Settings Screen

Below is the Main Screen. To access the settings from this screen, simply press the settings button located on the bottom left.

The screenshot shows two main panels: 'Safe Operating Value (SOV)' and 'Actual Value'. The SOV panel displays 25.0 Temperature, 60 Humidity, and 0.0 Carbon Dioxide. The Actual Value panel displays 24.9 Temperature, 36 Humidity, and 0.0 Carbon Dioxide. A red arrow points to the 'Settings' button at the bottom left, which is labeled 'Settings' and '228339'. On the right side, there are several dropdown menus for 'Program OFF', 'Humid', 'FF', 'Co2 C', and 'Lights SOV Mode', with 'ON' selected for the last one.

The next screen is the settings screen and is shown below. From here, you can access all other functions present on your STAR X.

No additional passcode is needed to access the functions on the first two rows. Access to the bottom row options is passcode protected. To access, simply touch anywhere on the Thermoline logo in the bottom right corner, and the User Access window will appear. You will require **User Number 02** and **Passcode 2222**.

The settings screen is divided into two main sections. The left section is a grid of menu options: Contact Details Screen, Temperature & Humidity Trend Screen, Carbon Dioxide Trend Screen, Data Menu Screen, Diagnostics, Alarm/Events Screen, Date, Time, Network & System Settings Screen, Calibration Screen, and Program Set-Up Screen. The right section is a user access window with fields for 'User Number' (02) and 'Passcode' (****). Below the user access window is the Thermoline logo and the text 'Main Screen'.

NOTE: After exiting, you will need to enter the passcode again to access these sections.

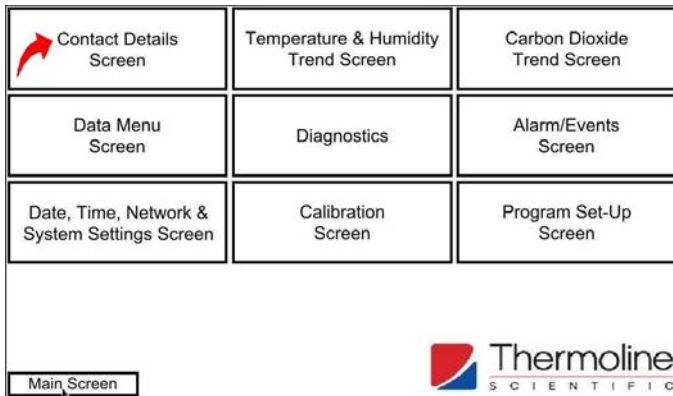
Scan the QR Code to see the video of this step.



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Contact Details Screen

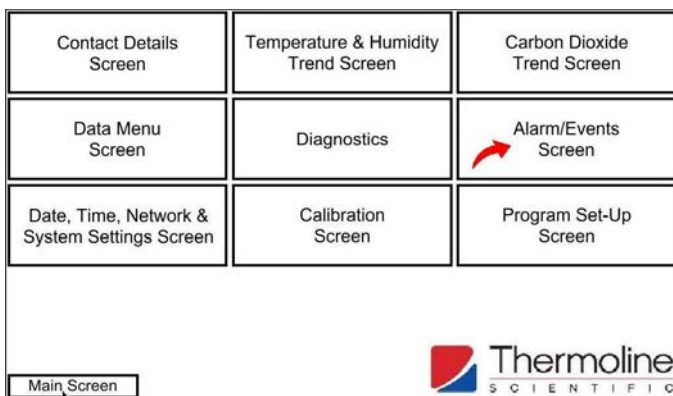
If you need to contact Thermoline for any reason, our contact details are available by pressing the Contact Details Screen button on the settings page.



Alarm/Events Screen

The Alarm/Events Screen is accessed via the settings menu and is protected by the Passcode. This screen records alarms and events that occur within the touchscreen. Things such as logins, operator access to different screens and operator functions being activated and deactivated are all recorded on this screen.

The below screen is the Historical Data and Alarm/Events screen. Entries highlighted in **RED** are when events or alarms occurred and entries in **GREEN** are when the Alarm/Event is normalised.



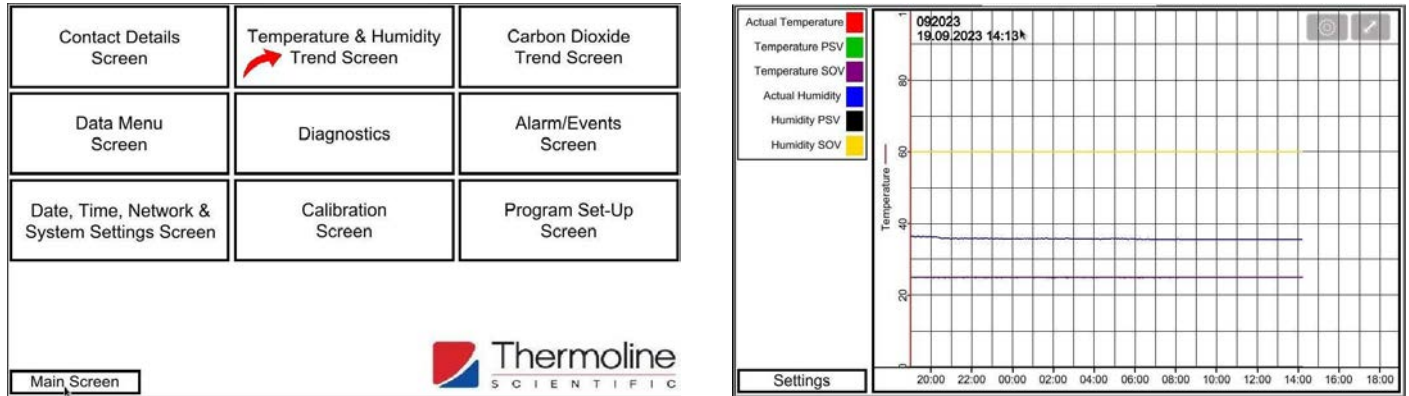
Sequence no.	Trigger date	Trigger time	Message	Recovered (hrs)
57	18/09/2023	18:00:17	Lights (EV1)	18:00:35
56	18/09/2023	18:00:17	Program Running	18:00:35
55	18/09/2023	17:56:35	System Settings Accessed	17:56:36
54	18/09/2023	17:55:45	Program Running	17:56:01
53	18/09/2023	17:52:35	System Settings Accessed	17:52:37
52	18/09/2023	17:20:53	Lights (EV1)	17:56:01
51	18/09/2023	14:02:00	Humid Function	14:29:48
50	18/09/2023	08:03:23	Lights (EV1)	
49	17/09/2023	12:54:47	Lights (EV1)	00:56:00
48	16/09/2023	12:52:19	Lights (EV1)	00:53:32
47	15/09/2023	13:47:27	Program Set-Up Accessed	13:47:29
46	15/09/2023	12:49:49	Lights (EV1)	00:51:02
45	14/09/2023	12:47:18	Lights (EV1)	00:48:32

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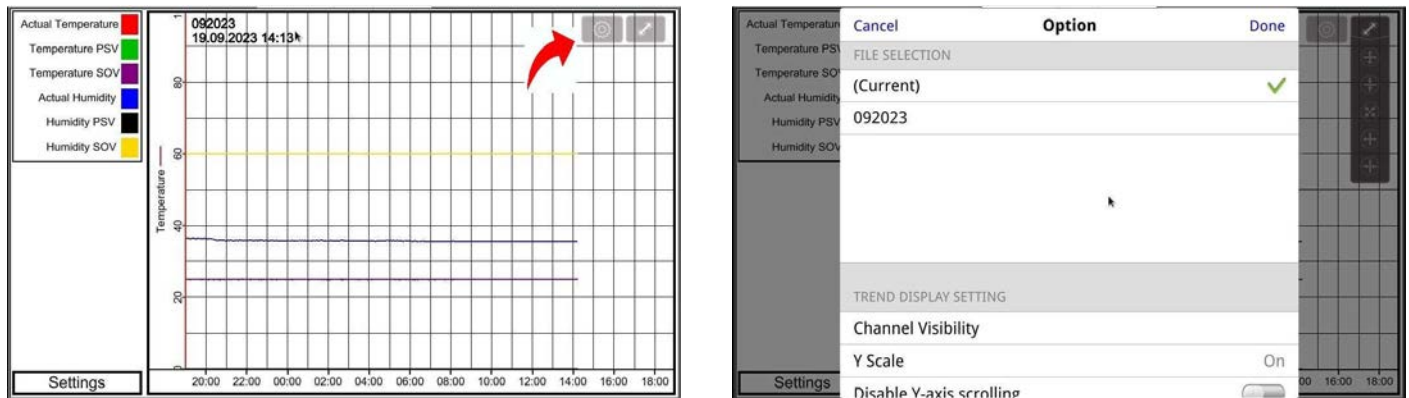
Trend Screen

There are two types of trend screens available. A graph or a data table. They show a daily live trend of the performance of the cabinet. Press the settings button (cog) to select the required date to view historical trends. Use the Chart Time Scale to view the trend in more detail. The STAR X will hold 365 days of logged data.

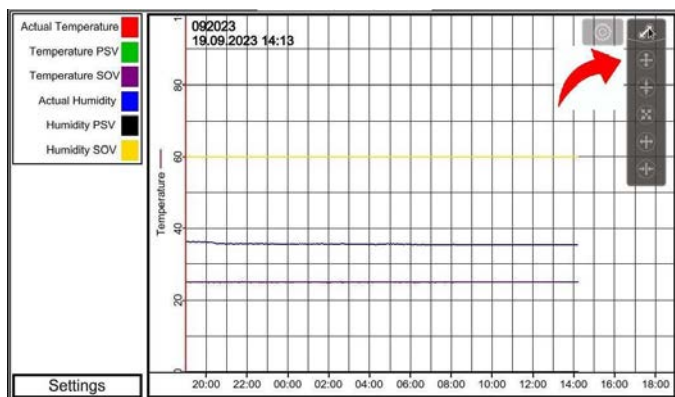
The below screen is the Trend Screen for Temperature and Humidity. Use the legend on the left-hand side to identify the lines.



On the trend screen, you can use the settings button (cog) to change the month shown on the graph.

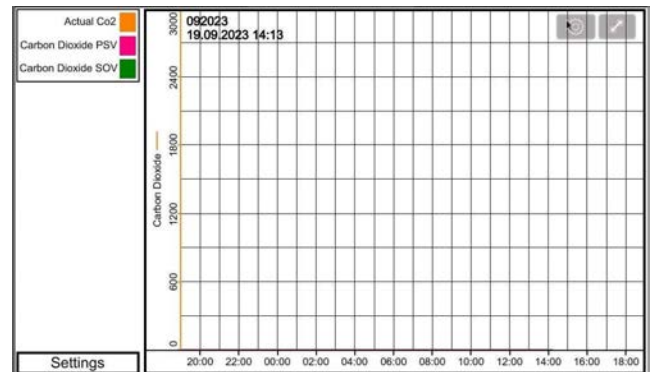
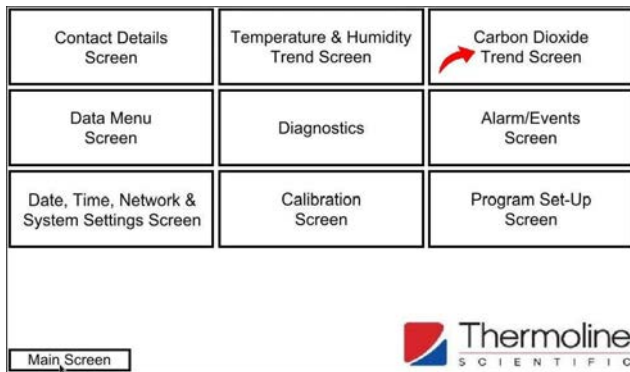


There is also scale adjustment using the button shown below.



Optional CO₂ Trend Screen

The below screen is the Trend Screen for the optional CO₂. Use the legend on the left-hand side to identify the lines.

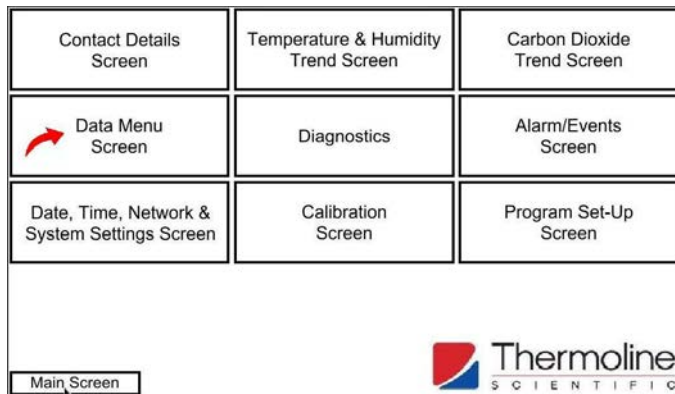


Options and scale adjustments are made the same as the temperature and humidity trend screen.

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Data Menu Screen

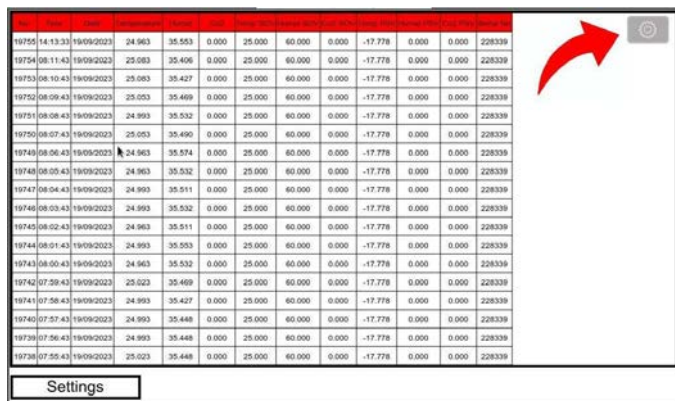
The STAR X also features the Trend Screen in a table format.



19750	14.13.33	19/09/2023	24.963	35.553	0.000	25.000	60.000	0.000	-17.778	0.000	0.000	228339
19754	08.11.43	19/09/2023	25.083	35.406	0.000	25.000	60.000	0.000	-17.778	0.000	0.000	228339
19753	08.10.43	19/09/2023	25.083	35.427	0.000	25.000	60.000	0.000	-17.778	0.000	0.000	228339
19752	08.09.43	19/09/2023	25.053	35.469	0.000	25.000	60.000	0.000	-17.778	0.000	0.000	228339
19751	08.08.43	19/09/2023	24.993	35.532	0.000	25.000	60.000	0.000	-17.778	0.000	0.000	228339
19750	08.07.43	19/09/2023	25.053	35.490	0.000	25.000	60.000	0.000	-17.778	0.000	0.000	228339
19749	08.06.43	19/09/2023	24.963	35.574	0.000	25.000	60.000	0.000	-17.778	0.000	0.000	228339
19748	08.05.43	19/09/2023	24.963	35.532	0.000	25.000	60.000	0.000	-17.778	0.000	0.000	228339
19747	08.04.43	19/09/2023	24.993	35.511	0.000	25.000	60.000	0.000	-17.778	0.000	0.000	228339
19746	08.03.43	19/09/2023	24.993	35.532	0.000	25.000	60.000	0.000	-17.778	0.000	0.000	228339
19745	08.02.43	19/09/2023	24.963	35.511	0.000	25.000	60.000	0.000	-17.778	0.000	0.000	228339
19744	08.01.43	19/09/2023	24.993	35.553	0.000	25.000	60.000	0.000	-17.778	0.000	0.000	228339
19743	08.00.43	19/09/2023	24.963	35.532	0.000	25.000	60.000	0.000	-17.778	0.000	0.000	228339
19742	07.59.43	19/09/2023	25.023	35.469	0.000	25.000	60.000	0.000	-17.778	0.000	0.000	228339
19741	07.58.43	19/09/2023	24.993	35.427	0.000	25.000	60.000	0.000	-17.778	0.000	0.000	228339
19740	07.57.43	19/09/2023	24.993	35.448	0.000	25.000	60.000	0.000	-17.778	0.000	0.000	228339
19739	07.56.43	19/09/2023	24.993	35.448	0.000	25.000	60.000	0.000	-17.778	0.000	0.000	228339
19738	07.55.43	19/09/2023	25.023	35.448	0.000	25.000	60.000	0.000	-17.778	0.000	0.000	228339

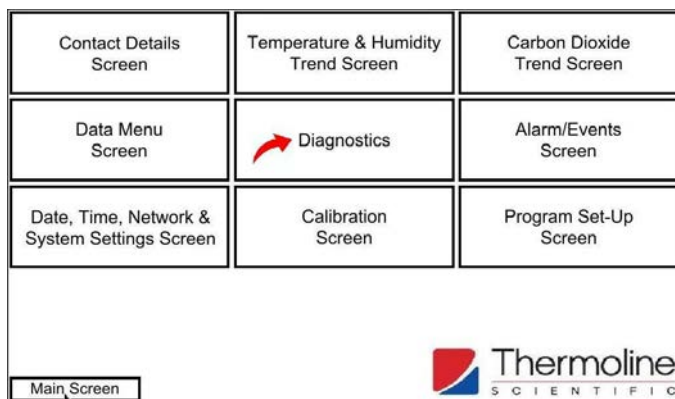
Settings

On the data menu screen you can use the settings button (cog) to change the month shown on the table. You can also choose to see all data by selecting (Current).



Diagnostics Screen

The Diagnostics screen is to help the operator when problems may occur. The Diagnostic screen shows the percentage output of each control function. This is a good diagnostic tool if the cabinet is not operating correctly.



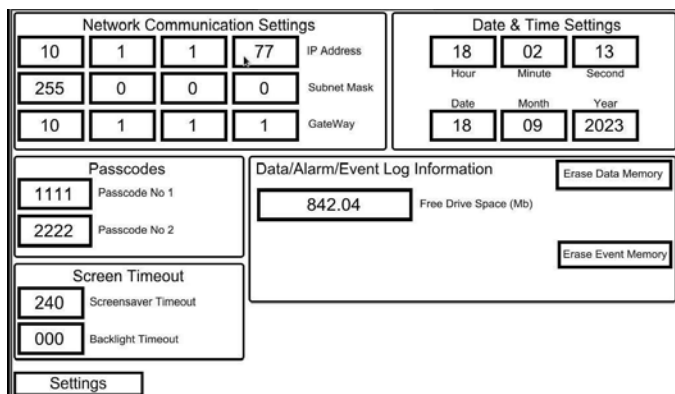
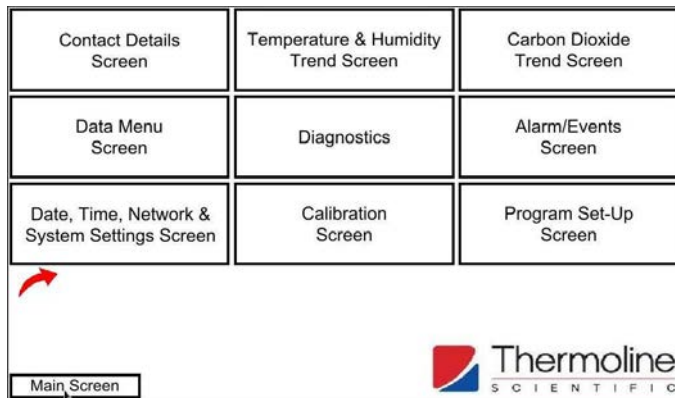
The diagnostics screen shown below can also be used to turn the heaters back on in the event of a service technician adjusting the heater settings in the service menu. (The service menu is not covered in this manual nor accessible by the user.)



System Settings Screen

NOTE: Use the User Number '02' and the Passcode '2222' to access this screen.

To access the system settings screen, simply press on the System Settings button in the Settings menu. From this screen, the user is able to see the Network Communication Parameters, Time, Date, Memory Information and Screen Saver Timeouts. The user is also able to change passcodes from this screen.



System Settings

Network Settings: This shows the network address once the touchscreen is connected to a network.

Time and Date Settings: To change the Time and Date, simply touch the parameter that needs to be changed and enter the current or required time and date.

NOTE: The STAR X does not adjust for daylight savings; this must be done manually.

NOTE: Remember this will be the time and dates stored on the data logging. If it is wrong, so will the time and date on the logged data.

System Settings

Screen Timeout: Screensaver timeout and Backlight timeout can be adjusted. The screen saver timeout can be adjusted from 1 minute to 255 minutes. The backlight timeout can be adjusted from 0 minutes to 255 minutes. 0 minutes will disable the backlight timeout function and keep the screen illuminated.

Passcodes: Passcodes can be changed if needed. Passcode Number 1 is the passcode for User 1. This is the passcode required to exit the screen saver mode. Passcode number 2 is the passcode for user 2 and allows access to the calibration, System Settings page and the Program Screen.

NOTE: Thermoline takes no responsibility for lost/forgotten passcodes. If passcodes are forgotten, they cannot be retrieved. It will require a factory reset, which will erase all previously logged data.

Log Information: Memory Information shows the amount of memory left on the touchscreen before old data is lost. The number shown beneath indicates how many days of data storage you have; this can be as high as 365 days. The size of the raw data files is indicative of the amount of memory being used.

NOTE: The data erase button needs to be held for at least 10 seconds. This is a preventative measure to avoid accidental erasure.

Scan the QR Code to see the video of this step.



LAN Connection


Thermoline cabinets that use the STAR X controller can be connected via a LAN connection to clone the screen so they can be viewed at a remote location. As standard, the STAR X is set to automatically assign an IP address when connected to an active network and is shown on the System Settings page. If a manual IP address is required, please contact Thermoline for additional instructions.


Calibration Screen

NOTE: It is advised that all calibrations be made by a trained service technician.

The Thermoline touchscreen has been fitted with a simple one-point calibration adjustment. Access to the Calibration Screen is passcode protected. To access, simply touch the Thermoline logo, and the User Access window will appear.

NOTE: Use the User Code '02' and the passcode '2222' to access this screen.

Contact Details Screen	Temperature & Humidity Trend Screen	Carbon Dioxide Trend Screen
Data Menu Screen	Diagnostics	Alarm/Events Screen
Date, Time, Network & System Settings Screen	 Calibration Screen	Program Set-Up Screen

Main Screen 

Calibration screen seen with associated values.

Actual Value	Offset	
24.48	-0.50	Temperature
37.0	0.0	Humidity
0.0	0.0	Carbon Dioxide

Alarm Values			
	Temperature	Humidity	Carbon Dioxide
Low Dev.	-5.0	-10	-150
High Dev.	5.0	10	150
Time Delay	1800	1800	1800

Settings

Note: The deviation alarm settings are also available on the calibration screen. The maximum time delay is 1800 seconds.

How to Calibrate

To adjust the calibration, simply press the offset window you require to adjust.

Actual Value	Offset	
24.	01 50	Temperature
37	7 8 9 - 0	Humidity
0.	4 5 6 C 0	Carbon Dioxide

Alarm Values

	Temperature	Humidity	Carbon Dioxide
Low Dev.	5.0	10	150
High Dev.	5.0	10	150
Time Delay	1800	1800	1800

Settings

Use a calibrated reference device in the centre of the workspace and then compare that reading to value the screen. Then enter the difference between the PV and your calibrated device.

Scan the QR Code to see the video of this step.

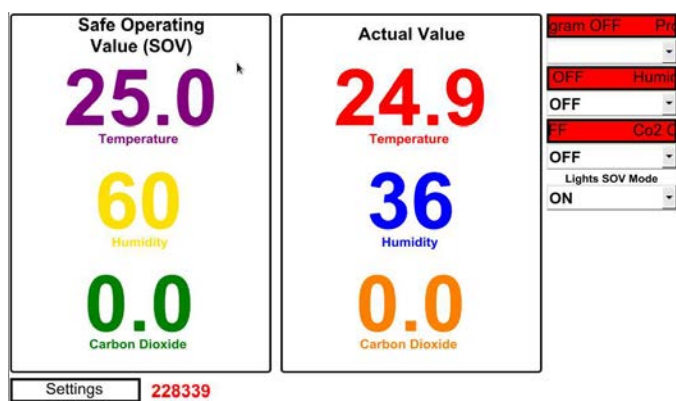


Temperature and Humidity Control

NOTE: Use the User Code '01' and the passcode '1111' to access this screen.

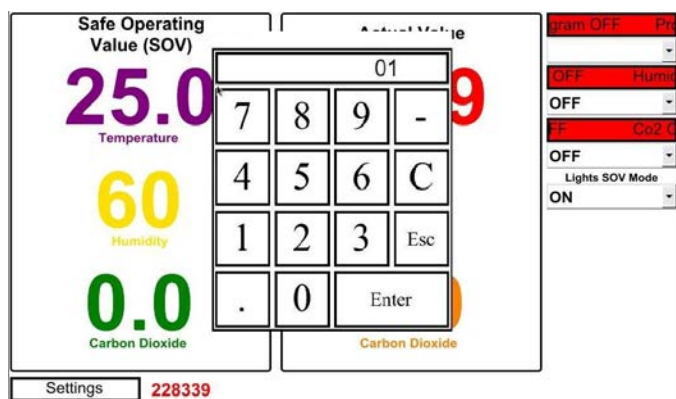
The Thermoline touchscreen has been fitted simple temperature control system, allowing for quick and easy adjustments to the cabinets temperature and humidity levels (plus CO₂ if option fitted).

From the main screen of the STAR X, simply press on the value you wish to change.



This feature only works when the controller is in SOV mode. To change the values in PSV mode, you will have to access the Program Set-up feature.

The next screen will show the numeric keypad over the top of the main screen.



Program Setup

NOTE: Use the User Code '02' and the passcode '2222' to access this screen.

The STAR X has a 250 segment Programmer. The 250 segments are split between 25 Programs (10 segments per program).

Segment Type: The segment can either be a Time, Jump To or End type.

- **Time:** This determines that the segment is a period of time. The time is set in hours, minutes and seconds.
- **Jump To:** This allows the program to repeat a predetermined set of segments. By selecting the 'Jump To' parameter in segment type and then entering a segment value at the 'Jump To' section directly below, the controller will tell the program where to jump back to.
- **End:** This tells the program when to end. There has to be an end segment. Failure to enter an end segment will cause the controller to indefinitely dwell at the last segment.

Jump To: The operator enters the segment number that the program will jump back to. This value is ignored if the segment is set to either a Time or End Segment.

Jump Cycle: The operator would enter a value here as to how many times the 'Jump To' repeats itself. A value of 0 will continually repeat the Jump To segments until the operator ends the Program Cycle manually. This value is ignored if the Segment Type is set to either a Time or End Segment.

Temperature: The operator would enter the Temperature they require the cabinet to achieve. This value is ignored if the segment type is Jump To.

Humidity: The operator would enter the Humidity they require the cabinet to achieve. This value is ignored if the segment's Step Type is Jump To.

CO₂: The operator would enter the Co2 they require the cabinet to achieve. This value is ignored if the segment's Step Type is Jump To.

Lighting On/Off: Not used.

STAR X Setup

Program Setup

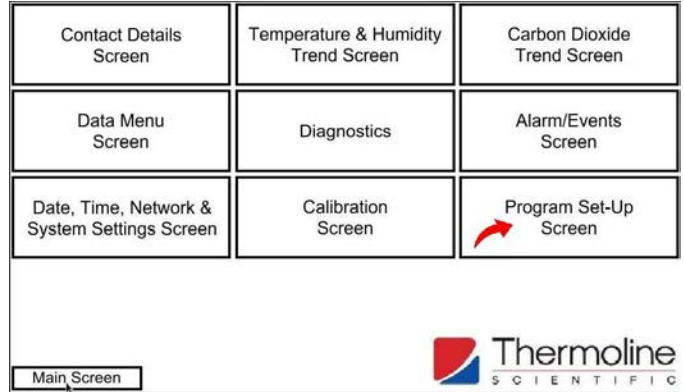
Hours: The operator enters the required length of time for the segment in Hours. This value is ignored if the segment either Jump To or End.

Minutes: The operator enters the required length of time for the segment in Minutes. This value is ignored if the segment either Jump To or End.

Seconds: The operator enters the required length of time for the segment in Seconds. This value is ignored if the segment either Jump To or End.

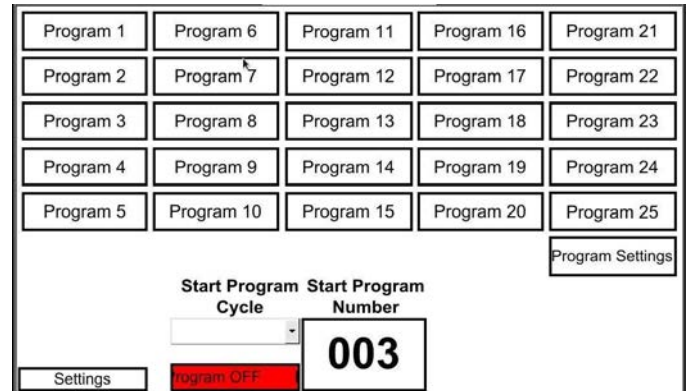
End Action: This value determines what will happen when the program ends. It can be set to SOV, which stops the program from operating and controls at the Safe Operating Value. It can be set to Dwell, in which case it will continue to control the Temperature, Humidity and CO₂ of the last Time segment.

Setting Up the Cycle



The screen below is the Program Set Up Screen. The 25 programs each have 10 segments:

- Program 1: Segments 1-10
- Program 2: Segments 11-20
- Program 3: Segments 21-30
- Program 4: Segments 31-40 etc.



Once in this screen you can select from 25 of the Programs available. In this example we start at program 1.



STAR X Setup

Setting Up the Program

The most important thing to remember is that the segments are always ramping. By that, it means that the time entered in the segment is the time it takes to reach the setpoint. If the temperature in a segment increases or decreases on the previous segment, the setpoint will ramp to the new setpoint at a rate evenly distributed over the time you have entered. It will be up to the cabinet to heat up or cool down to keep up with the ramp rate you have entered (time). This also applies to humidity and CO₂ settings.

By setting the time to, say, 20 minutes, you will virtually eliminate the ramp rate and have the cabinet heat up or cool down at its fastest possible rate. In this case, after the 20 minute segment, you'll then set the next segment as the 'dwell period' you want the temperature to soak at. 20 minutes is chosen as a safeguard to prevent nuisance alarms (It may need to be changed depending on the conditions required).

Please also note that segment 1, or the first segment of a program, will use the SOV as a starting temperature, as will each first segment of the other 25 available programs.

By pressing on Program 1, the following screen is displayed. The below example is a program starting at 22°C and 60% RH that uses segment 1 for 20 minutes to set the conditions. It follows on with the same conditions for a 5-hour segment and then ramps to 40°C and 30%RH over 5-hour segment.

The conditions hold, then ramp and finally hold at 10°C and 80% RH. Segment 8 is a Jump To segment going back to segment 2 with infinite cycles. After this is an End segment, at which time the program ends, and the cabinet will return to the temperature set as SOV. Please note in this example, with infinite repeats, it will not reach the End segment.

	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5
Step Type	Time	Time	Time	Time	Time
Jump To		001	001	001	001
Jump Cycle		0001	0001	0001	0001
Temperature	022.0	022.0	040.0	040.0	022.0
Humidity	060	060	030	030	060
Co2	0000.0	0000.0	0000.0	0000.0	0000.0
Hours	00	05	05	02	05
Minutes	20	00	00	00	00
Seconds	00	00	00	00	00
End Action	SOV	SOV	SOV	SOV	SOV
G'Soak Temp					
G'Soak Humid					
G'Soak Co2					

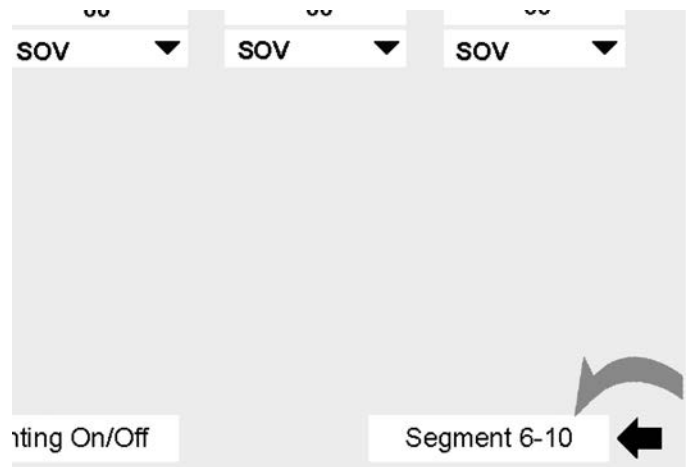
Program Set-Up Lighting On/Off Segment 6-10

Program 1 Segment 1-5

Each of the columns is an editable segment that can have the temperature, humidity and CO₂ adjusted as well as the time that each segment lasts. The diagram on the right shows a column with all the editable features.

Time Remaining	Time
Jump To	001
Jump Cycle	0001
Temperature	010.0
Humidity	080
Co2	0000.0
Hours	05
Minutes	00
Seconds	00
End Action	SOV

When finished editing your requirements, you can move on to the next segment and continue on. Once you are finished editing all segments, move to the next screen by pressing the button shown below.



	Segment 6	Segment 7	Segment 8	Segment 9	Segment 10
Step Type	Time	Time	Jump To	End	Time
Jump To	001	001	002	001	001
Jump Cycle	0001	0001	0000	0001	0001
Temperature	010.0	010.0	-17.8	-17.8	010.0
Humidity	080	080	000	000	060
Co2	0000.0	0000.0	0000.0	0000.0	0000.0
Hours	02	05	02	10	02
Minutes	00	00	00	00	00
Seconds	00	00	00	00	00
End Action	SOV	SOV	Hold	SOV	SOV
G'Soak Temp					
G'Soak Humid					
G'Soak Co2					

Segment 1-5 Lighting On/Off

Program 1 Segment 6-10

STAR X Setup

Linking the Programs

If you find that 10 segments are not enough to complete the program that you require, you can link from one program to the next. As long as you haven't used an end segment and the final segment in the program is a Time segment (it would also work with a Jump To with a finite number of repetitions), the program will automatically transition into the next program.

Once you have finished setting up your program, you can choose from three options. You can end your program, link it to another or repeat the same program.

Time	Time	Time
001	001	001
0001	0001	0001
040.0	040.0	025.0
040	040	060
0000.0	0000.0	0000.0
05	02	05
00	00	00
00	00	00
SOV	SOV	SOV

Time

Time
Jump To
End

For example, if your program requires the use of 15 segments, we can use the 10 segments of Program 1 and the first 5 segments of Program 2 making segment 15 (5th segment of Program 2) an End segment.

If you choose to link programs, you will need to access the program you wish to link with and edit the parameters. Simply do this by returning to the Program Set-Up screen and selecting the next program in this example we select Program 2.

End Action SOV SOV SOV

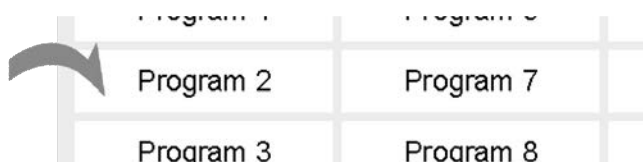
G'Soak Temp

G'Soak Humid

G'Soak Co2

Program Set-Up

Lighting On

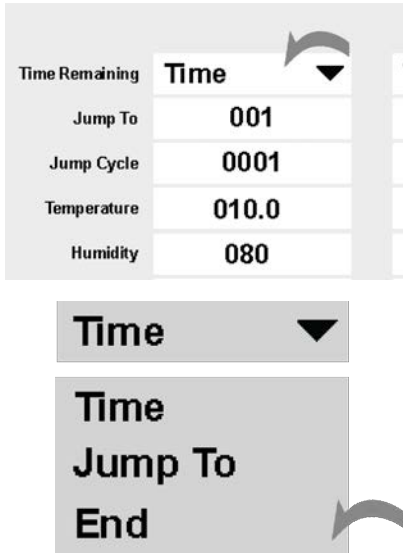


Note: Because of this functionality, it is always important to finish any program with an End segment.

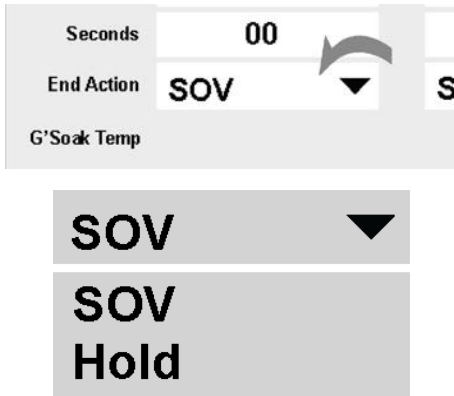
STAR X Setup

Ending the Program

To end the programs, access the drop-down menu and select End. This will allow the program to end the cycle on that segment. The parameters in this segment will be ignored.

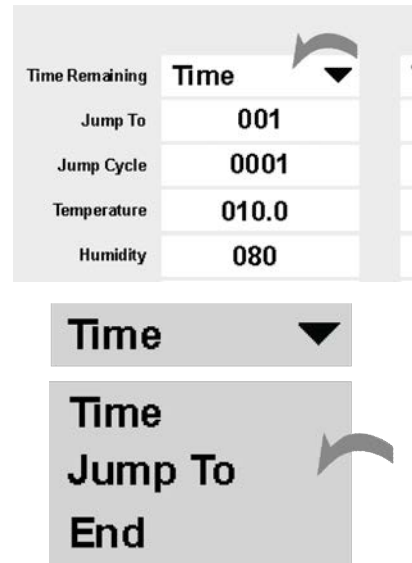


Once you have ended your program, you can choose to return the cabinet to your SOV conditions or you can Hold the parameters from the last segment. To do this, access the drop-down menu with the End Action value and change it to Hold or SOV.



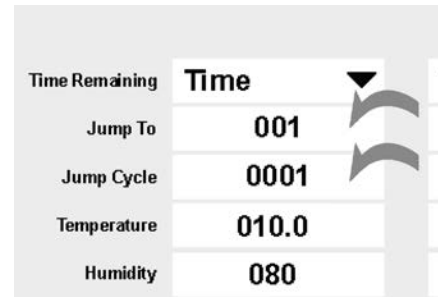
Repeating the Program

If you wish to Repeat the program without going to another, use the Jump To feature in the same drop-down menu.



After selecting the Jump To parameter, you must change the values in the two sections below. The first section, labelled 'Jump To' determines which segment the cycle is repeated from, and the 'Jump Cycle' parameter determines how many times the cycle is repeated.

Note: Choosing a Jump Cycle of 0 gives infinite repeats.



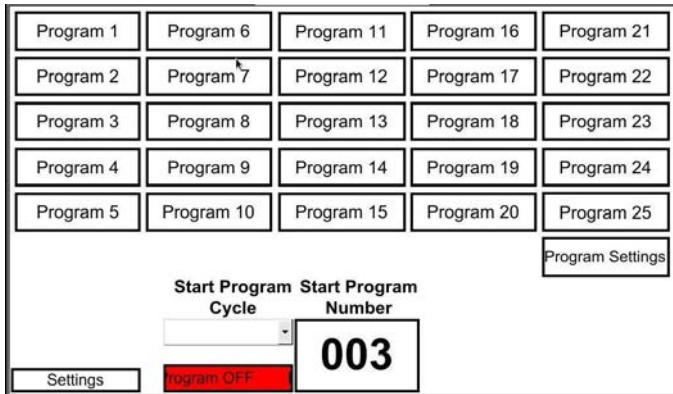
For example, if you wanted to Jump To the 5th segment of the program 6 times, you would input '005' into the Jump To parameter and then '0006' into the Jump Cycle Parameter.

STAR X Setup

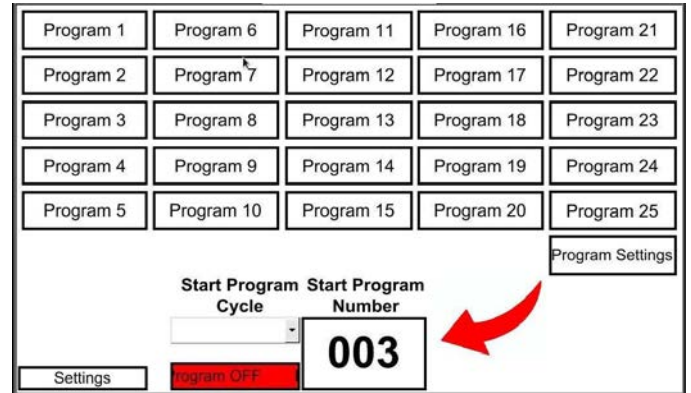
Starting/Stopping the Program

Once you have set the temperature program to your desired parameters and values, you can then activate the program and start it. The STAR X offers two ways to do this. The first way is through the Program Set-Up screen, and the second is from the Main Screen. In the instructions below, we will cover both of these setups.

From the initial Program Set-Up screen, locate the Start Program Cycle drop-down menu at the bottom of the screen.



To start on a specific program, access the Program Set-Up screen and change the number in the Start Program Number box shown below.

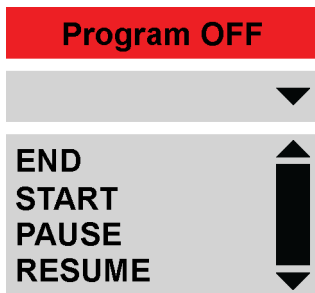


This number can only be changed from the Set-Up screen and not the Main Screen. The number can only be changed between 001 and 025 in line with the number of programs available.

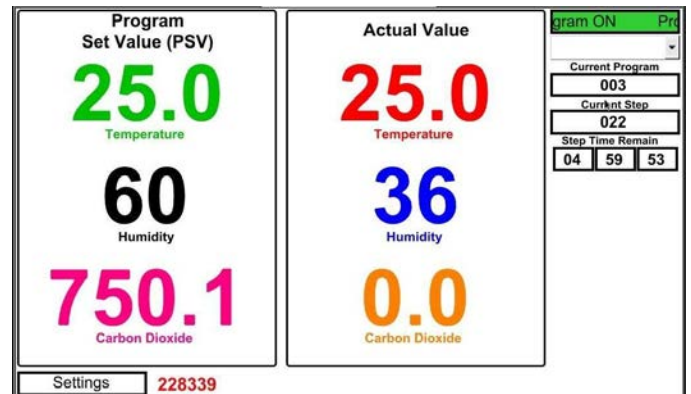
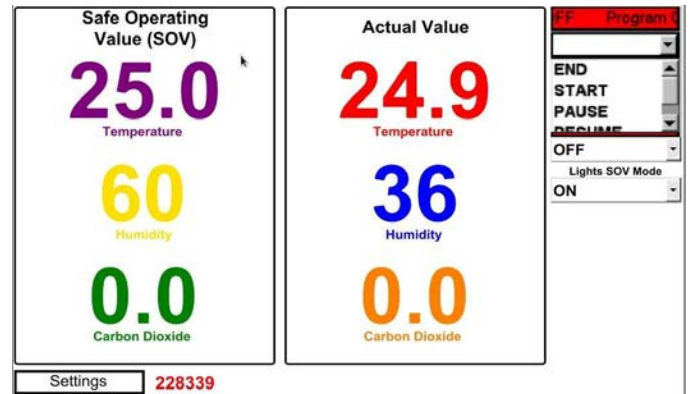
The drop-down menu offers four different types of options. They are:

- **End:** The End parameter is what stops the running program from operating
- **Start:** The Start parameter initiates the program associated with the Start Program Number.
- **Pause:** The Pause parameter will pause the program at its present point. It will hold this point until the resume parameter is selected. If the Start parameter is selected while a program is on Pause, it will restart the program from the beginning.
- **Resume:** The Resume parameter will resume a program after it has been paused.

To start the program from the Main Screen, access the drop-down menu below and select the START option. The main screen will then show the program as ON. Please note If you want the Humidity and CO2 to be active, you will need to turn them both on before you start the program.



To start the program, simply press the START key once it has been selected. The previously RED indicator will become GREEN and display Program ON.



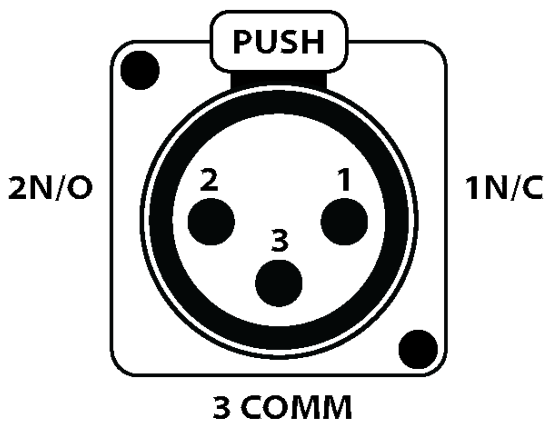
BMS Output

The Humiditherm cabinet 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 BMS socket is located on the left side of the electrical box at the rear of the cabinet (looking from the back).

The alarm contacts have no voltage, but we recommend that a suitably qualified technician connect the wiring.

An alarm can be triggered by the following:

- Loss of power
- High and low temperature alarms
- High and low humidity alarms



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 is connected to this pin.



Location of BMS socket



General Controls

Manual Reset Safety Thermostat

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

Fixing the Manual Safety Reset:

- Allow the cabinet to cool down before resetting the thermostat.
- Locate the safety reset at the back of the cabinet. It is either a black or red knob (**Fig 1**).
- Once the cabinet has cooled down. Twist the knob anti-clockwise until it can be removed.
- Once the knob is off, simply 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. The cause will need to be investigated by a qualified technician

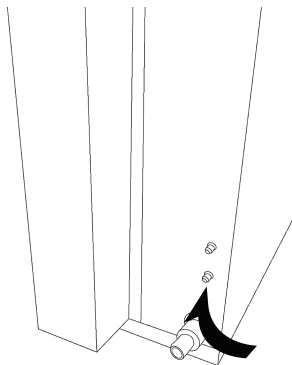


Fig 1.



Fig 2. Remove Screwcap

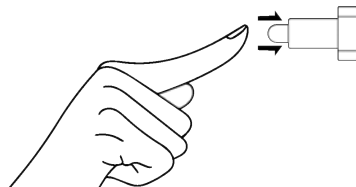
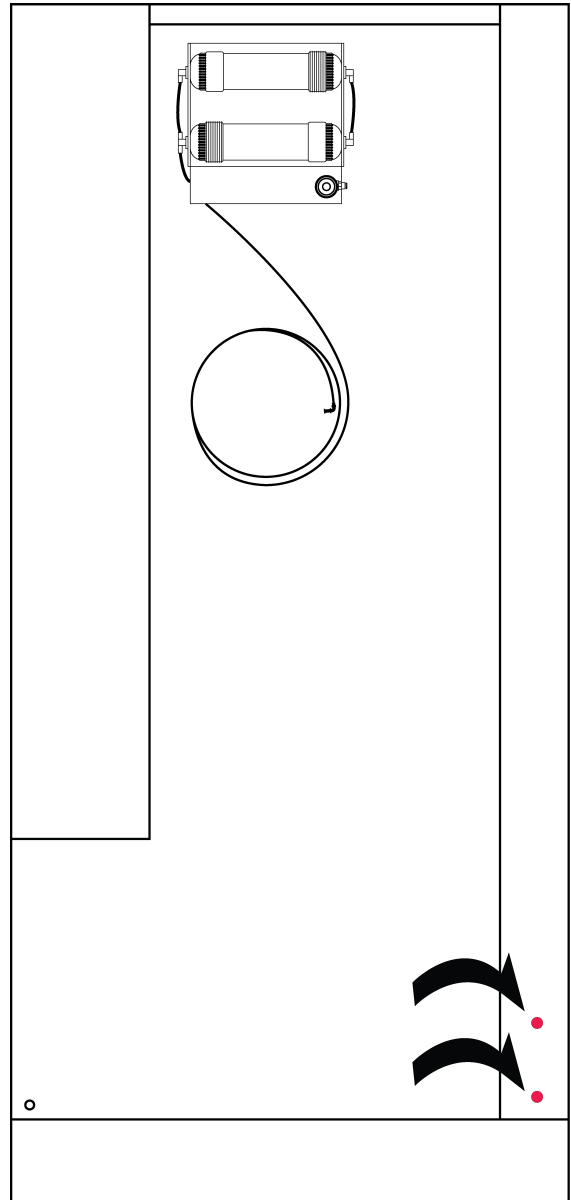


Fig 3. Press the inner button



Location of Manual Safety Reset - Please note there are four MRST's on a TRH-850-GD/SD

General Controls

Refrigeration Safety Pressure Switch

This Pressure Switch is designed to protect the Refrigeration Compressor in the event of the Following:

- **Failed Condenser Fan.**
- **Too High Ambient Temperature.**

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 2**) on the top-left side of the cabinet (**Fig 1**). If the compressor does not start after pressing the Red Button, wait 30minutes 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.

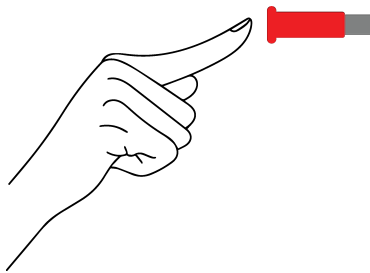


Fig 1. Press the red switch to reset

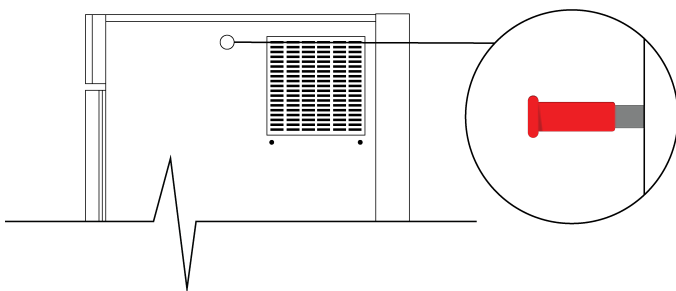






Fig 2. Refrigeration safety pressure switch location

Problem	Fix	Part Number
<p>Battery Alarm still occurs every 7 days, even after being acknowledged and reset.</p>	<p>One of the back up battery's voltage could be low. The battery needs to be replaced</p>	<p>70320 - Sealed Lead Acid Battery Backup (12V 9.5A)</p>
<p>Humidity is not being controlled.</p>	<p>Humidity Function Is the humidity function On? Please follow the instructions in the supplied technical manual to turn the humidity function on</p> <p>Float Switch Float switch could be stuck on. Replace the float switch. This will need to be done by a qualified technician.</p> <p>Solenoid Solenoid could be stuck on. Replace the solenoid. This will need to be done by a qualified technician.</p> <p>Gas Gas could have been lost from the compressor. This will need to be done by a qualified refrigeration technician.</p>	<p>41430 - Stainless Steel Float Switch</p>  <p>10923 - Water Solenoid</p> 
<p>Cabinet is not reaching temperature.</p>	<p>Air Flow There may not be enough air flow around the cabinet. Please space the chamber so there is enough air circulation around the chamber.</p> <p>Adjacent Chamber Please ensure that the outlet of any adjacent chamber does not face the inlet of the condenser. If moving the chambers is not possible, you may need to install a deflector.</p>	<p>Deflector</p>
<p>I cannot acknowledge the alarm.</p>	<p>Alarm Condition Is the chamber still in the alarm condition? This will need to be fixed before the alarm can be properly acknowledged. Muting the alarm will only do so for 15 minutes. Once the issue has been fixed, to acknowledge the alarm, you will need to press and hold the alarm acknowledgement down for 10 seconds.</p>	

Troubleshooting

Problem	Fix	Part Number
<p>Cabinet is not cooling.</p>	<p>Pressure Switch The pressure switch may have tripped.</p> <p>To reset, simply press the red button at the top left of the cabinet. 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.</p> <p>Please note: Contact Thermoline's service team if the pressure switch trips more than twice.</p>	
<p>Lever latch door will not close (latch too tight) or does not close firmly (latch too loose).</p>	<p>Adjustable strike If the latch feels overly tight or will not completely close, the strike will likely need to be brought forward (away from the cabinet). Alternatively, if the latch feels loose when closed and it doesn't hold the door firmly closed, the strike may need to be moved back (towards the cabinet). There is a Philips head screw in the bottom that, once loosened, will allow you to move the strike forwards or backwards. There is a grooved surface that enables the screw to remain in position once tightened. Thermoline suggests making minimal changes to the strike location (one groove at a time) while adjusting.</p>	
		
<p>Sudden loss of Power</p>	<p>Manual Safety Thermostat Tripped Refer to Safety Information Chapter for more information.</p>	

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 white 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

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.

We are proudly Australian owned

We will continue to invest in Australian
manufacturing.

