



# Large Capacity Drying Oven

## *User Manual & Setup Guide*

**TD-78T-2-D**

**STAR X**

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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.



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.

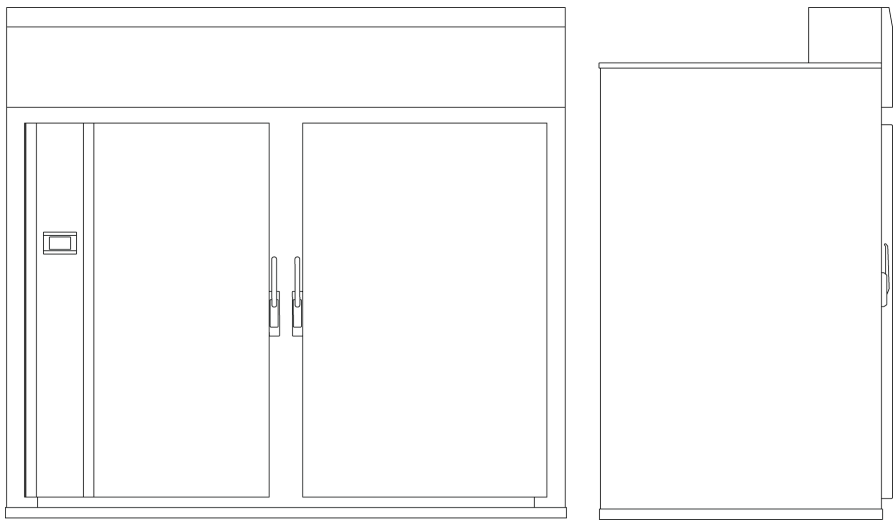
**This user manual is intended for Thermoline's large capacity drying oven range. We recommend that you read this user manual the whole way through before you start using the cabinet. Consider this manual as a part of the cabinet and an integral part of its function. We recommend keeping it close and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

The Thermoline large capacity drying oven TD-78T-2-D is designed and manufactured to remove large quantities of moisture from products and samples. Designed to operate between ambient +10°C and 150°C, the TD-78T-2-D offers an industry standard in moisture removal.

The Thermoline range of ovens is set to function with specific operating ranges. The optimum operating conditions will be explained further in this manual.

- Operating Temperature of ambient +10°C to 150°C





**Dimensions**

**External**

TD-78T-2-D

WxDxH (mm)	1780x1230x2360
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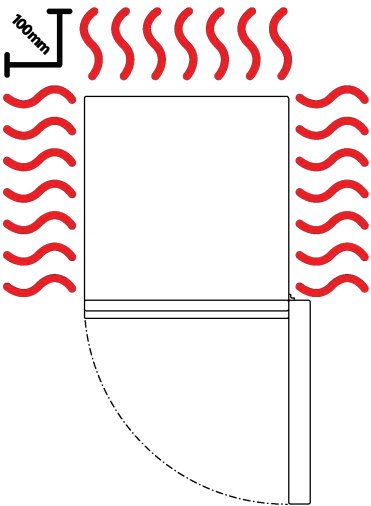
**Internal**

WxDxH (mm)	1650x1070x1620
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**Clearance**

TD-78T-2-D

Front (mm)	890
Back (mm)	100
Sides (mm)	100



## Product Specifications

### Technical Specifications

#### TD-78T-2-D

Temperature Range	Ambient +10°C to 150°C
Temperature Uniformity	+/-2°C to 100°C
Doors	2
Shelf Positions	100mm spacing between levels
Electrical	15A / 3 Phase + N + E / 415V (20A 5 pin 3 phase outlet required)
Nominal Capacity	2500L
Weight	480kg

### Features

Lockable Castors	✓
Internal Fans	✓
Star X Touch Screen	✓
Ethernet Port	✓
Download data to USB	✓
Solid Doors	✓
BMS	✓
Fibreglass Insulation	✓

### Safety

Over Temperature Safety	✓
Over Current Protection	✓

### Options

Open Wire Shelves	Stainless steel shelves are 900x750mm. Two shelves per level
Perforated Trays	Stainless steel trays are 300x750mm with 50mm depth. Standard perforations are 20mm diameter at 80mm centres but can be customised to suit. Six trays per level
Solid Trays	Stainless steel trays are 300x750mm with 50mm depth. Six trays per level
Door Locks	Door latches can be replaced with key lockable versions

## Large Capacity Drying Oven Operating Environment

Ensure the large capacity drying oven 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 large capacity drying oven 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 (+/-2.0°C)
- **Humidity:** Up to 85%RH

### Optimal Environment:

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

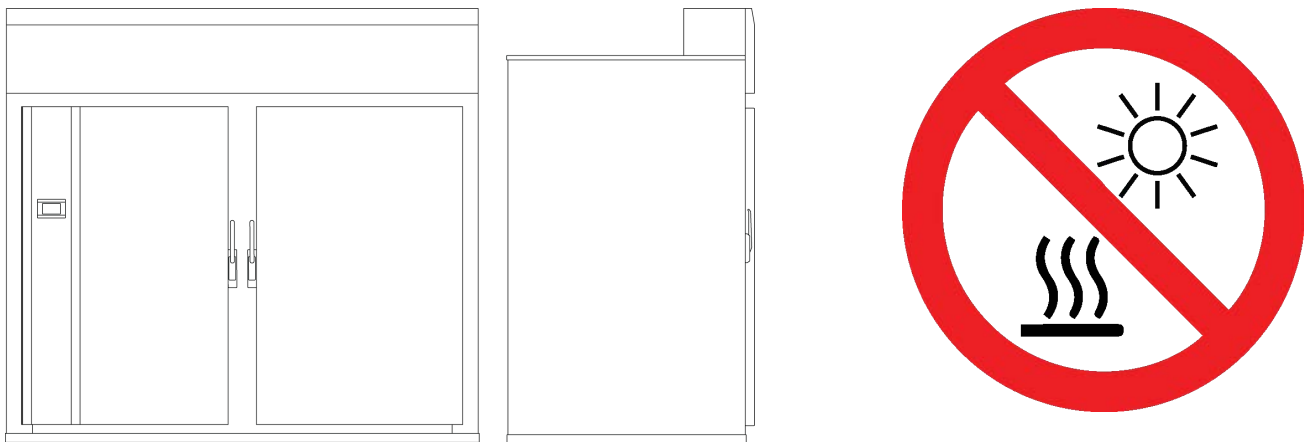


Fig 1. Suitable Environment

## Operating Environment

### Electrical Connections

You will need a dedicated outlet with a 20 amp, 415 volt, three-phase power supply to operate the large capacity drying oven. The oven comes with a power lead and a five-pin, three-phase plug, which you can use to connect to the power source. It's essential to ensure you use the correct outlet and plug to avoid any safety hazards.

A Certificate of Electrical Safety should be obtained from your electrical contractor for any new or additional electrical installations carried out.

The TD-78T-2-D includes an approximately 3-metre mains power lead with a five pin three-phase plug (**Fig 1**).

You will require a power outlet such as the one shown (**Fig 2**).

#### Electrical requirements

TD-78T-2-D

20A / 3 Phase + N + E / 415V



Fig 1. Five pin three-phase plug

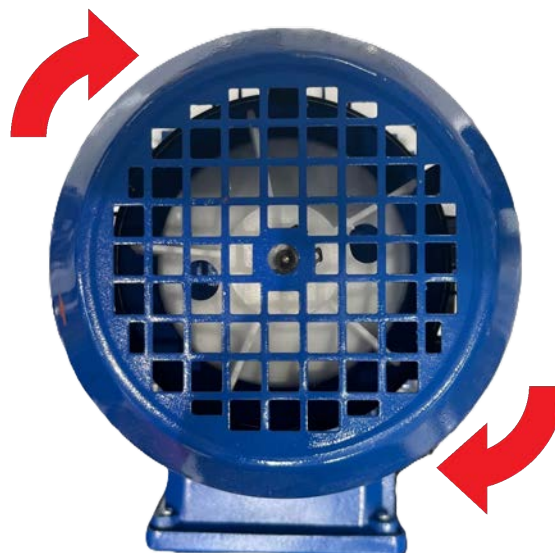


Fig 2. 20Amp 5 pin 3 Phase wall socket

### Check Fan Rotation

On first start up please check the fan rotation direction. Having the fans going in the wrong direction will cause zero air flow and the oven elements will overheat. The correct direction is clockwise (looking down) and can be view from the top of the oven.

If the fans are turning anticlockwise turn the oven off immediately and you will require a qualified electrician to change around the appropriate wires in the plug.



## Operating Environment Warnings

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

Drying ovens 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.



Drying ovens are not suitable for use with flammable solvents. They are fitted with components that may be a source of ignition.



The drying ovens are designed for high-capacity drying and will exhaust hot, moist air.

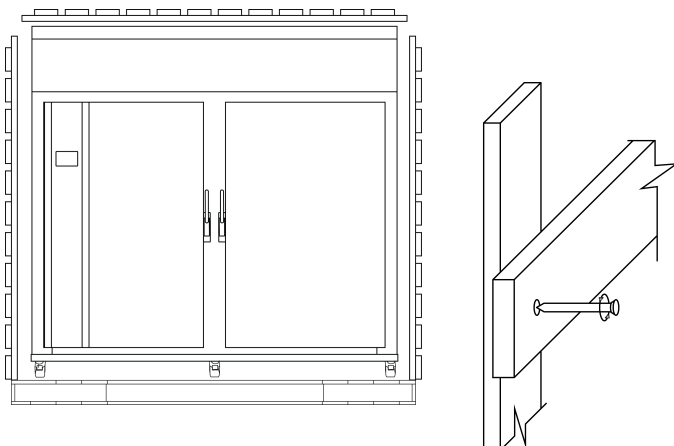
## Unpacking

### Unpacking process for foam-wrapped or crated

- The large capacity drying oven may be delivered foam-wrapped and on its castors via sensitive freight (**Fig 1**) or in a crate (**Fig 2**).
- If the large capacity drying oven is delivered in a crate, a forklift will be required to unload and remove it from the crate.
- Please don't dispose of the packaging until the oven is inspected. If damage is present upon opening your package, notify your supplier or Thermoline Scientific without delay at +61 2 9604 3911 or email [service@thermoline.com.au](mailto:service@thermoline.com.au).



**Fig 1 . Unpacking Process (foam wrapped)**



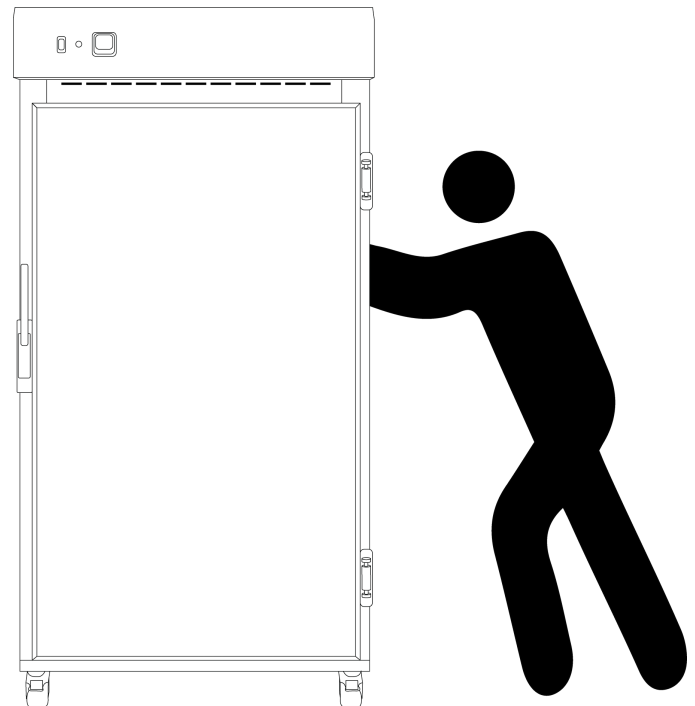
**Fig 2 . Unpacking Process (Crate)**

## Moving

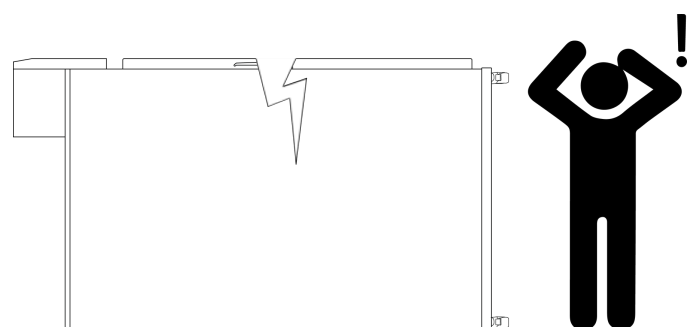
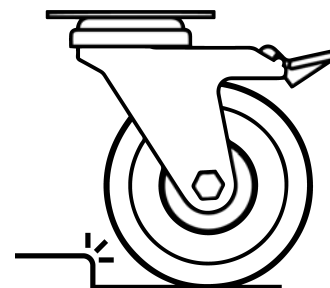
### Moving the large capacity drying oven:

- Ensure that the TD-78T-2-D is rolled on an even and flat surface. Uneven surfaces can cause the incubator to fall over.

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



**Fig 3 . Safe moving of cabinet.**



**Fig 4.**

## Setup

### Castors

The large capacity drying ovens are equipped with lockable castors to prevent cabinet movement.

#### Castor Setup:

- Ensure the large capacity drying oven 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 drying oven (**Fig 1**).
- Ensure when placing the large capacity drying oven into place that the castors can be accessed so they can be locked (**Fig 3**) and unlocked (**Fig 2**). Please contact your supplier or Thermoline should there be any damage to the castors.

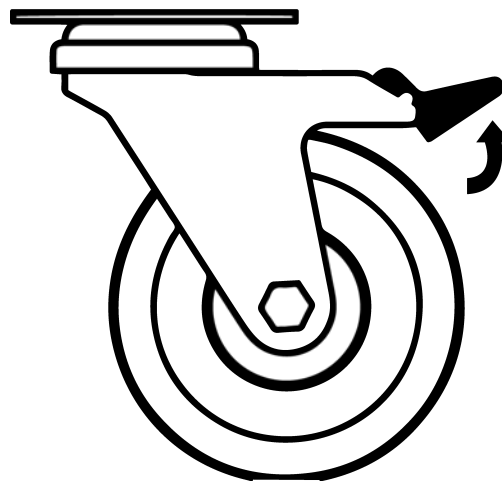


Fig 2. Castor Unlocked

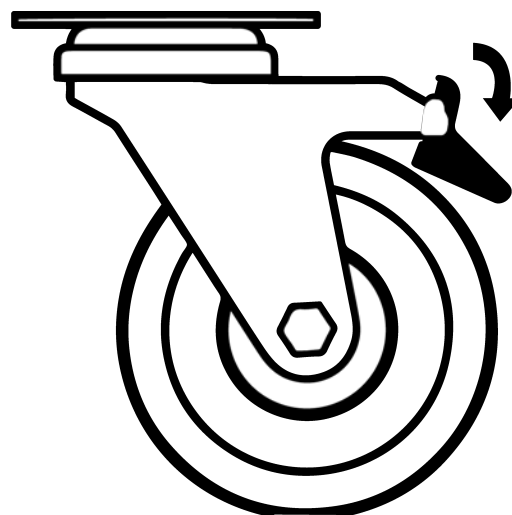


Fig 3. Castor Locked



Fig 1.

## Setup

### Large Capacity Drying Oven Location

#### Location Requirements:

- The large capacity drying oven requires a level surface to operate correctly. (**Fig 1**)
- Do not store items on top of the large capacity drying oven (**Fig 2**). Space is required to accommodate the inlet and outlet vents.
- The large capacity drying oven requires ventilation. Thermoline suggests 100mm on the sides and back, which also aids with accessibility (**Fig 3**). 300mm at the top to ensure the inlet and outlet vents are not obstructed.
- The oven doors should also be allowed to open and close at full range. (**Fig 4**)

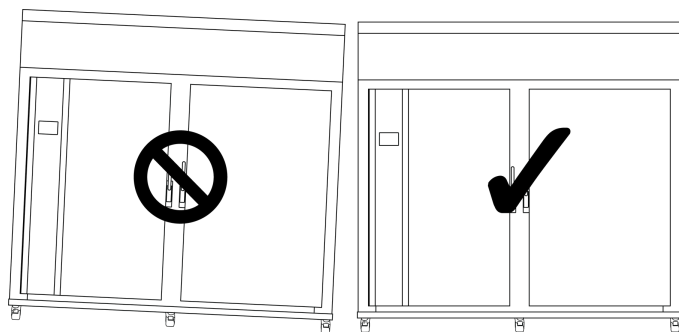


Fig 1. Correct Levelling

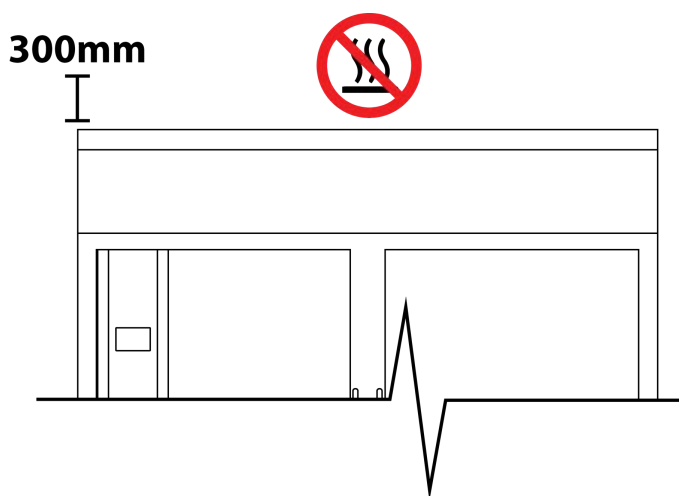


Fig 2.

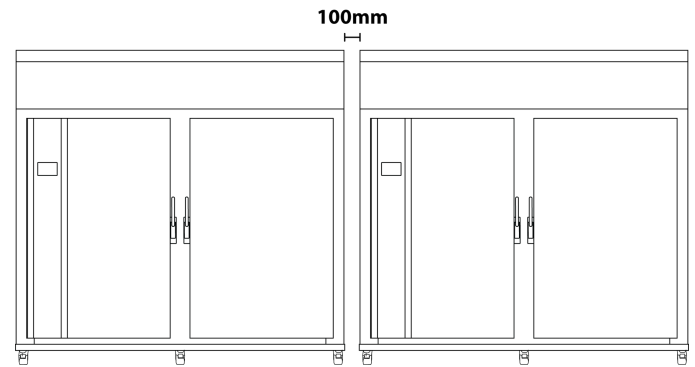


Fig 3.

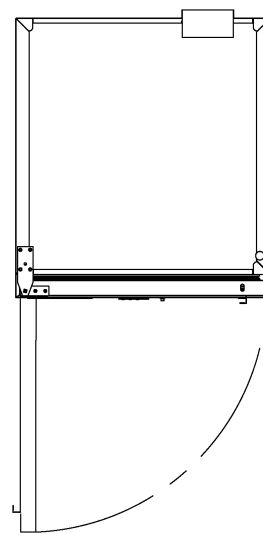


Fig 4.

## Setup

### Shelves

The TD-78T-2-D comes equipped with shelf runners spaced at 100mm centres. There is a total of 13 levels on each side. This allows for a total of 26 open wire shelves or up to 78 trays. Each level can hold three trays per door (**Fig 1**), with one open wire shelf for each level per door (**Fig 2**).



**Fig 1. Trays - 3 per level per side**



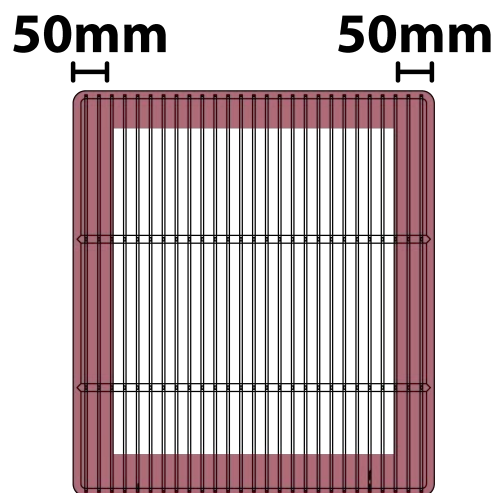
**Fig 2. Open wire shelves**

### Loading

The large capacity drying ovens require constant airflow throughout the cabinet to maintain the desired temperature. Correct loading of the shelves must be considered for efficient 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.
- Never block off air vents in the rear panel.
- Do not load samples on the floor.
- Allow space between the samples and walls when using open wire shelves (**Fig 3**).



**Fig 3.**

## Setup

### Inlet and Exhaust

The large capacity drying ovens feature inlet and exhaust ports on top of the cabinet - three of each in the case of the TD-78T-2-D. The inlet regulates the amount of fresh (dry air) that enters the cabinet, and the outlet regulates the amount of exhaust air that can exit the cabinet. In combination, this governs the rate of drying.

#### Exhaust Requirements:

- The top covers of the inlet and exhaust can be rotated either way to open up the exhaust and allow airflow (**Fig 2**). The air vents are located on the top of the cabinet. (**Fig 1**)
- On top of the drying oven, the exhausts are at the back, and the inlets are at the front, close to each motor. (**Fig 1**). A step ladder or similar will be needed to access the inlet and outlet.
- The large capacity drying oven's vents can also be connected to a ventilation system, whether it is exhaust only or both inlet and exhaust. To do so, you must first remove the vent covers (**Fig 3**).
- To prevent a potential pressure drop, please ensure that the ducting is no smaller than 75mm in diameter for proper ventilation (**Fig 3**).

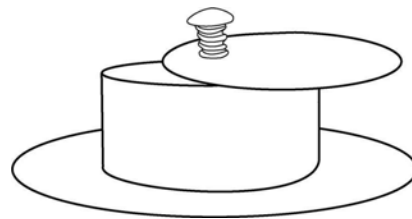


Fig 2.

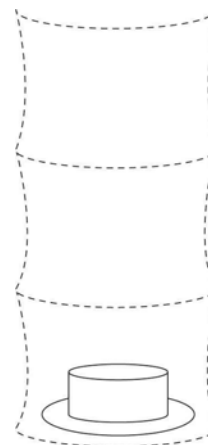


Fig 3. Recommended minimum diameter 75mm

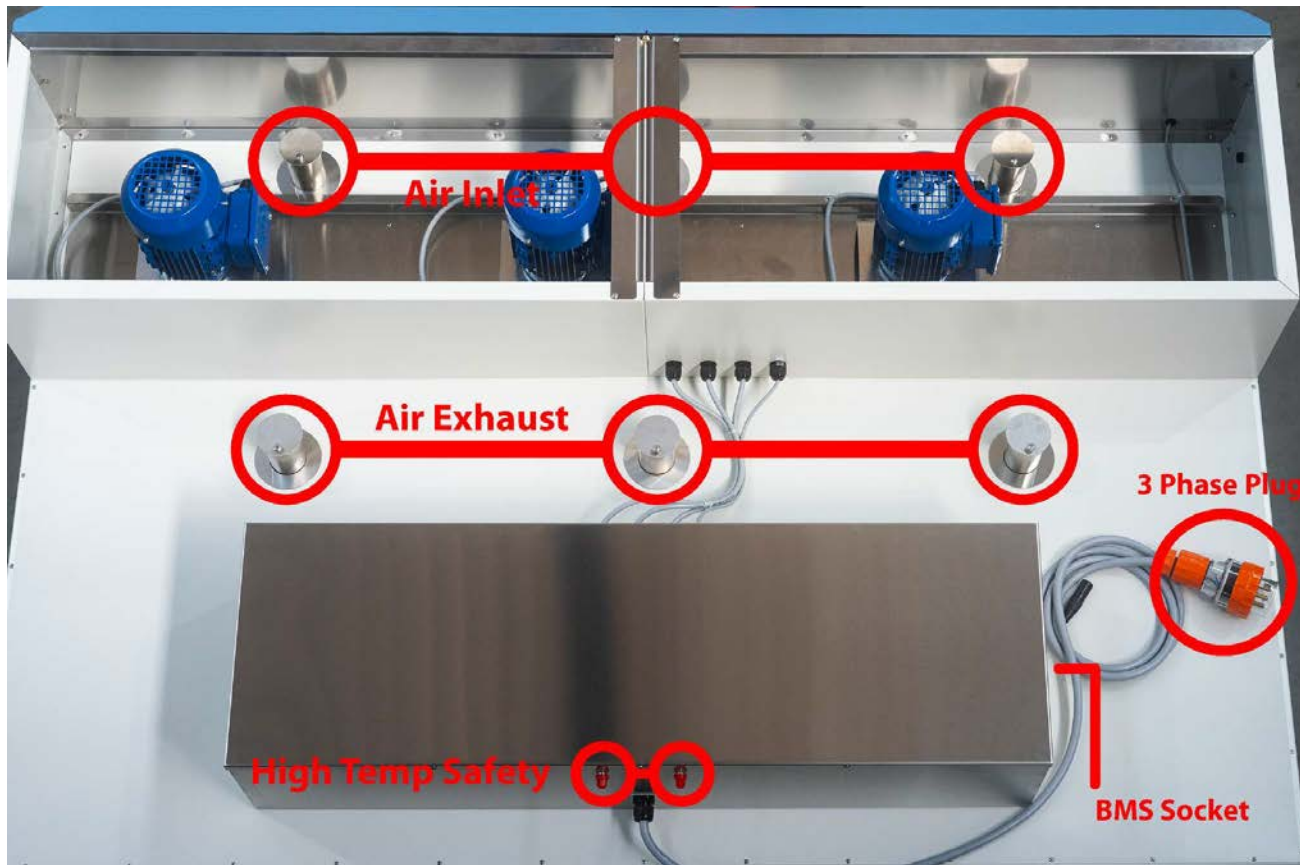


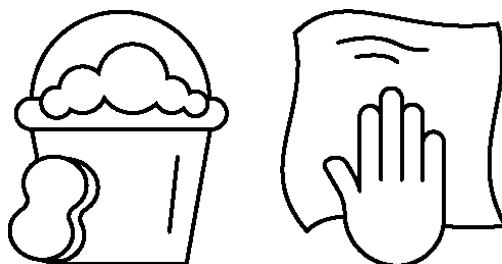
Fig 1. Top view of TD-78T-2-D

## Setup

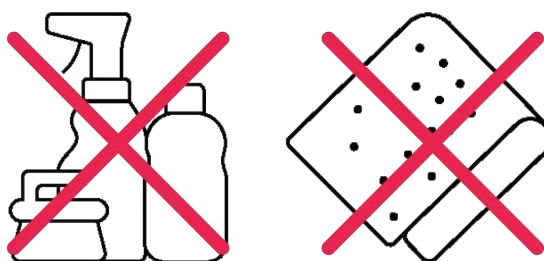
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### Cleaning

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. Power should be turned off prior to cleaning. These items should not be subjected to any levels of moisture.



### Door Gasket

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

### Stainless Steel

Stainless steel is, under most conditions, extremely resistant to corrosion. This is partly due to the addition of chromium and nickel to the steel and the formation of durable chromium oxide at the surface during manufacturing. Several chemicals will attack the surface of stainless steel, and the lack of oxygen at the surface will cause rusting, corrosion and pitting.

## Setup Warnings

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When placing the cabinet into place, ensure that the castors can be accessed so they can be locked and unlocked. Any damage to the castors must be noted to the supplier or manufacturer.

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

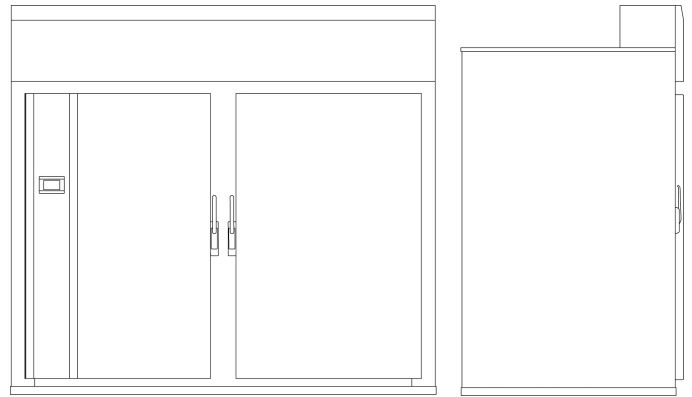


Caution must be taken when removing the packaging, particularly when using knives to cut tape and cardboard.

## Start Up Procedure

### Start-Up process for Oven:

- 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.
- Take the supplied lead and plug it into the 20Amp 5 pin 3 Phase wall socket.
- The controller will go through a warm-up period and then show the security screensaver (SOV mode).



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# Temperature

# 28.2

 Thermoline

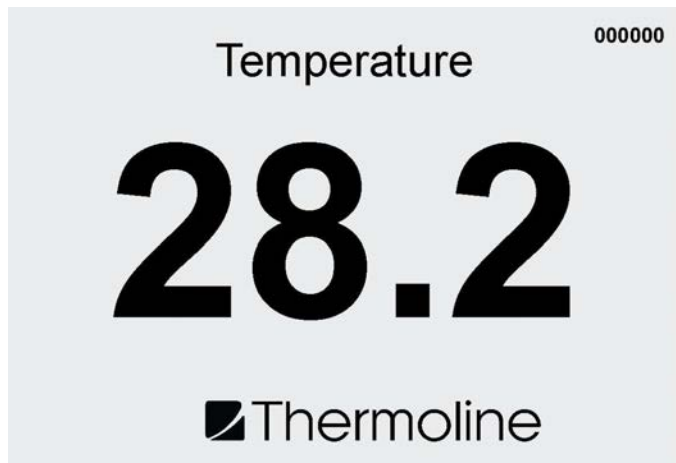
### Factory Settings:

- Upon first start-up, the temperature will be set at 0.0°C and heaters and fans set off via the Oven Start/Stop setting.

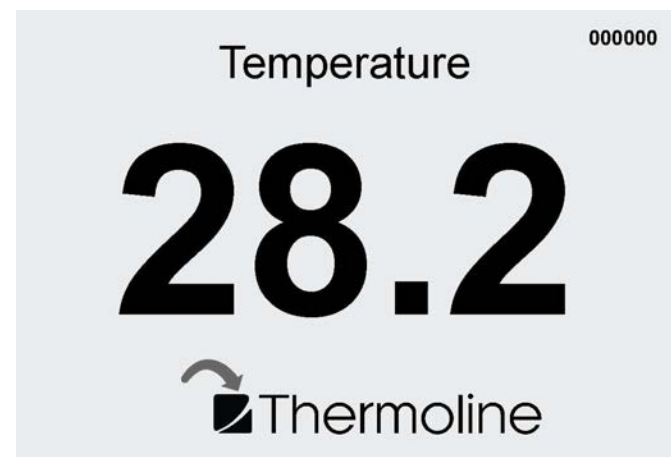
## Start Up Procedure

### Security Screen Saver

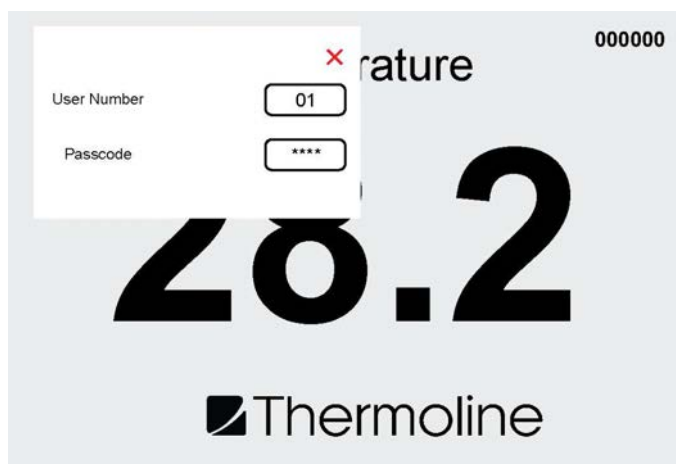
On initial power-up or any time the touchscreen has power cycled to it, the screensaver is displayed. Follow the instructions below to navigate this section and get to the Main Screen.



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

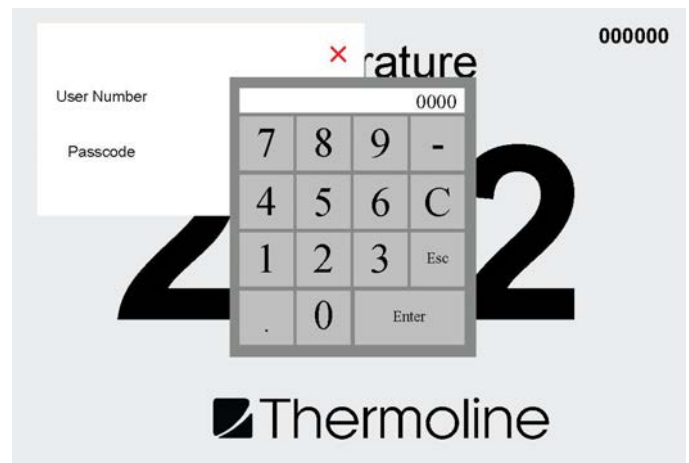


At this point, you should be seeing the User Access window shown below.



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'.

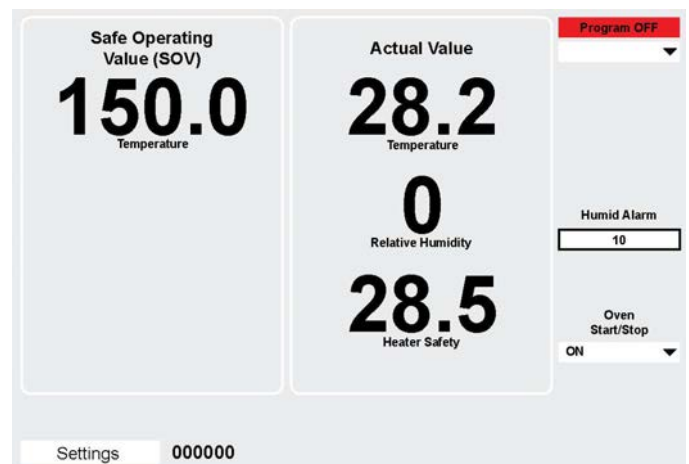


After entering the passcode, press anywhere above the Thermoline logo to continue to the main screen and then close the User Access window.

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



The Oven Start/Stop drop-down will activate the heaters and fans.



# STAR X User Guide

Large Capacity Drying Oven User Manual  
By **Thermoline**

The temperature controller on the Large Capacity Drying Oven 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

Safe Operating Value (SOV)  
**150.0**  
Temperature

Actual Value  
**28.2**  
Temperature  
**0**  
Relative Humidity  
**28.5**  
Heater Safety

Program OFF

Humid Alarm  
10

Oven Start/Stop  
ON

Settings 000000

This mode is simply setting a single temperature setpoint and having the oven 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, the cabinet returns to this mode.

**Actual Value:** This is the current measured temperature 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.

**Oven Start/Stop:** The drop-down menu in the bottom right-hand corner allows the operator to activate and de-activate the heaters and fans.

## PSV Mode

Program Set Value (PSV)  
**150.0**  
Temperature

Actual Value  
**28.2**  
Temperature  
**0**  
Relative Humidity  
**28.5**  
Heater Safety

Program ON

Current Program  
001

Current Step  
002

Step Time Remain  
01:54:04

Humid Alarm  
10

Oven Start/Stop  
ON

Settings 000000

**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: Relative Humidity:** This is the current measured humidity of the workspace and is only used if the optional humidity control feature is fitted to the oven.

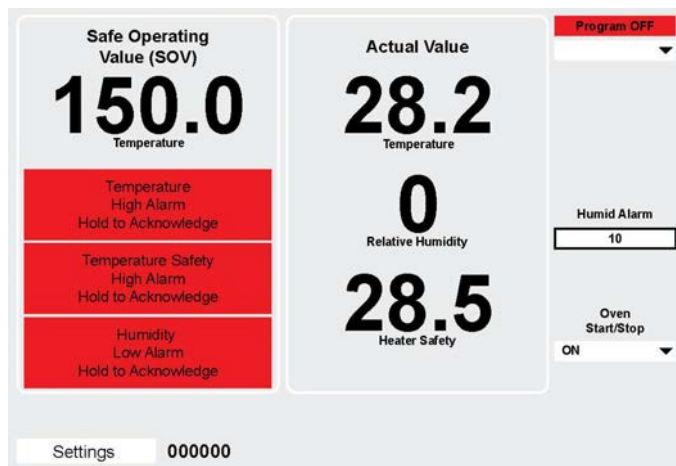
**NOTE: Heater Safety:** This is a secondary safety sensor. This does not control and is only an indication of the temperature at the heating elements. This can be 5-10°C higher than the Actual Value, especially when the oven is in a heating-up phase.

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



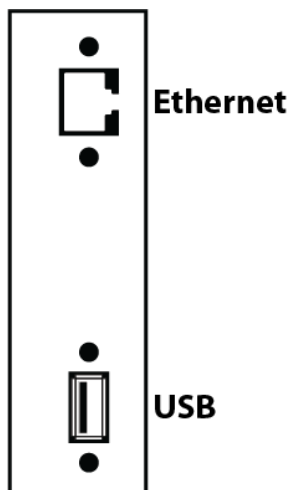
### Alarms

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



### USB and Ethernet

The oven 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.



**Temperature Deviation Alarm:** If the actual temperature goes higher than the SOV or PSV by more than 5°C, the heaters will turn off until the temperature returns to a suitable range. There is no indication on the screen, and does not need to be acknowledged.

**Temperature High Alarm:** If the Actual Temperature reaches 160°C, the heaters will turn off. This alarm is a latching alarm, and the conditions need to be corrected before it can be cleared/acknowledged. This alarm set point cannot be adjusted.

**Temperature Safety Alarm:** This is a sensor close to the location of the heating elements and is set at 200°C. This alarm is a latching alarm, and the conditions need to be corrected before it can be cleared/acknowledged. This alarm cannot be adjusted.

**Humid Alarm:** The low humidity alarm is only active in the case of the optional humidity sensor being used in the oven. This number is determined by the user as the product being "dry" and, once reached, will turn off the heaters. This must be acknowledged by the user before the heaters will turn on again.

**NOTE:** The manual safety reset sensors are also in the same location as those for the temperature safety alarm. Both of these alarms will indicate a fan failure.

**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.

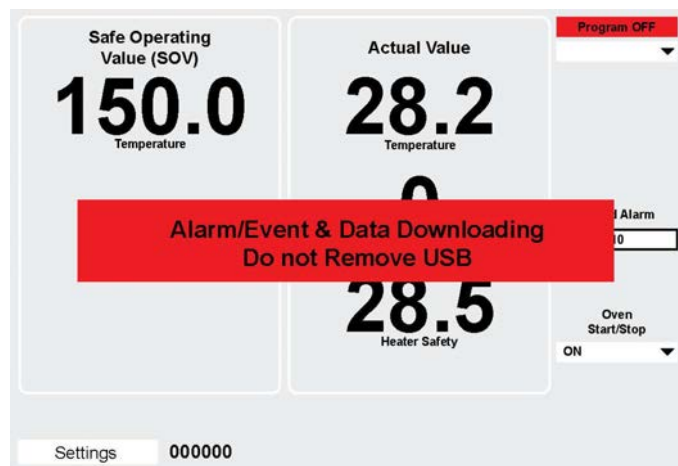
## STAR X User Guide

### 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.

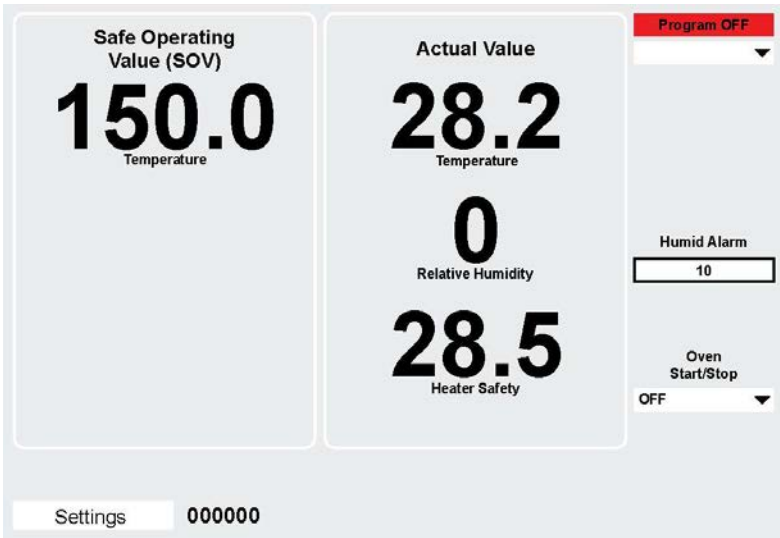
**NOTE:** Downloaded data is formatted in comma-separated format (CSV). This can be easily opened in most spreadsheet programs.

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



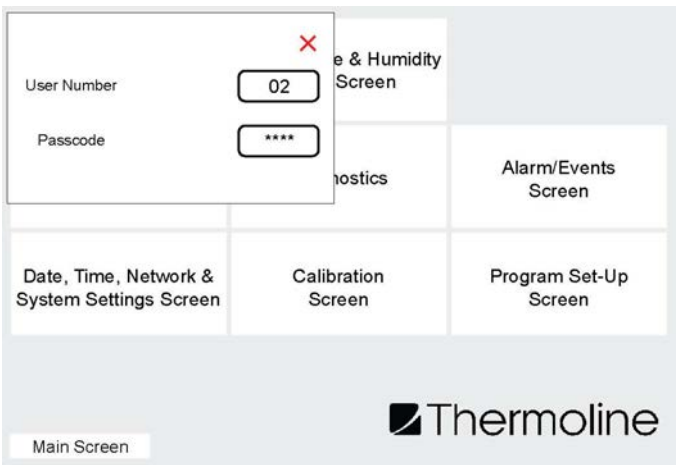
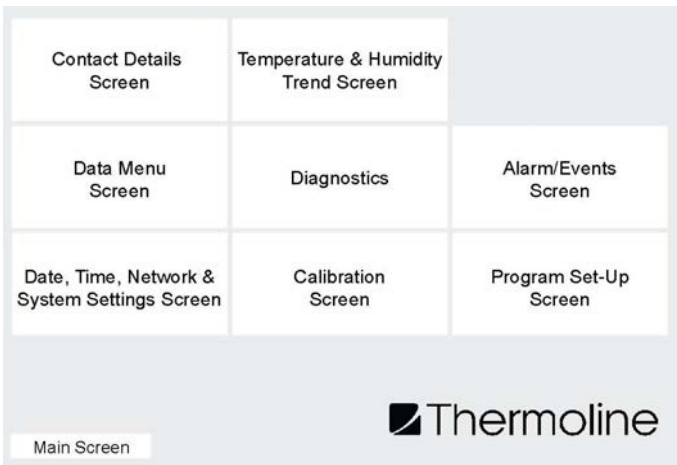
Settings Screen

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



The 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**.



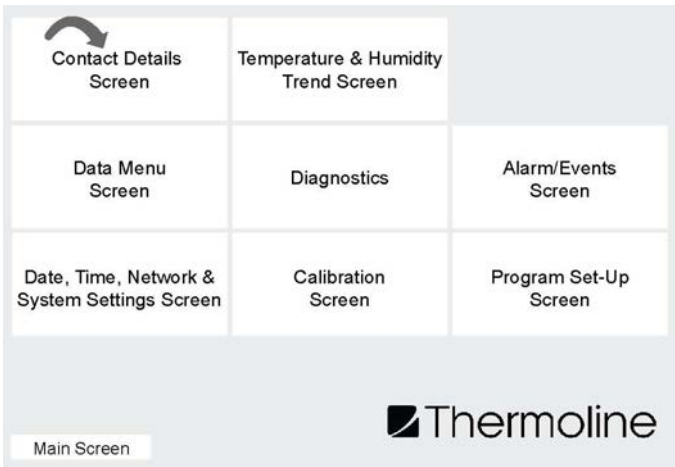
**NOTE:** After exiting, you will need to enter the passcode again to access these sections.

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



Contact Details Screen

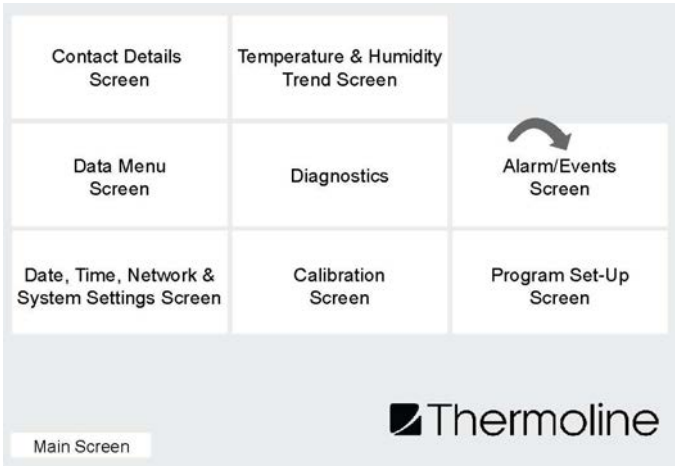
If you need to contact Thermoline for any reason, our contact details are available by pressing the Contact Details Screen button on the settings page.



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.



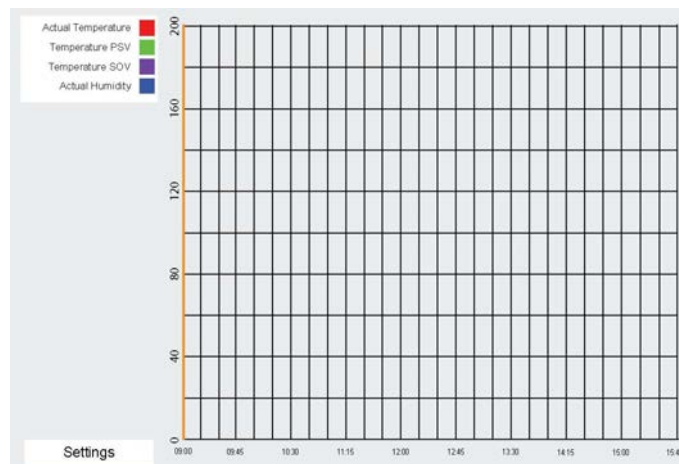
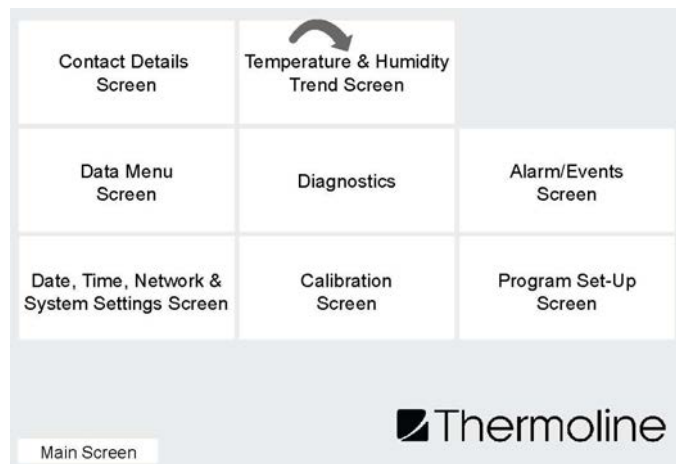
Sequence No.	Trigger Date	Trigger Time	Message	Recovered Time
3	16/02/22	11:21:33	Program Running	11:21:33
2	16/02/22	11:21:33	Program Set-Up Accessed	
1	16/02/22	11:21:33	Calibration Accessed	

Settings

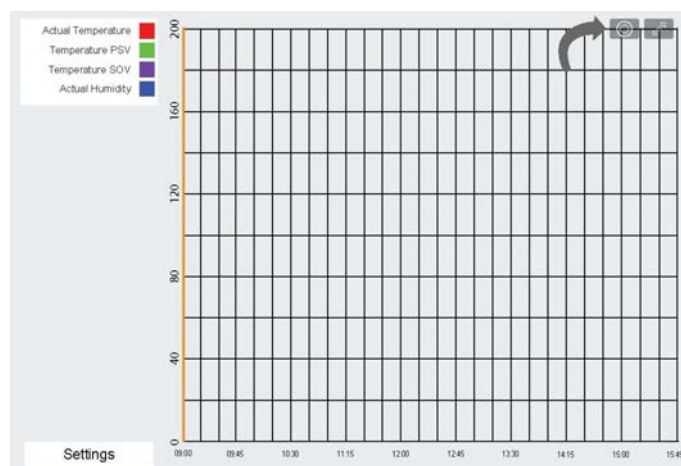
## Trend Screen

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.

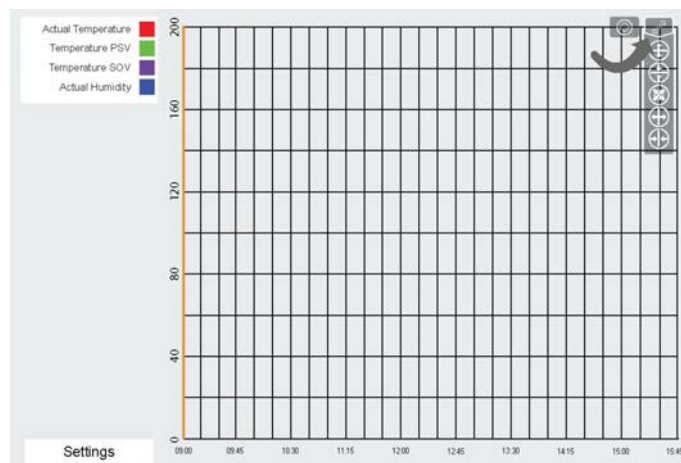
The below screen is the Trend Screen. Use the legend on the left-hand side to identify the lines.



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.

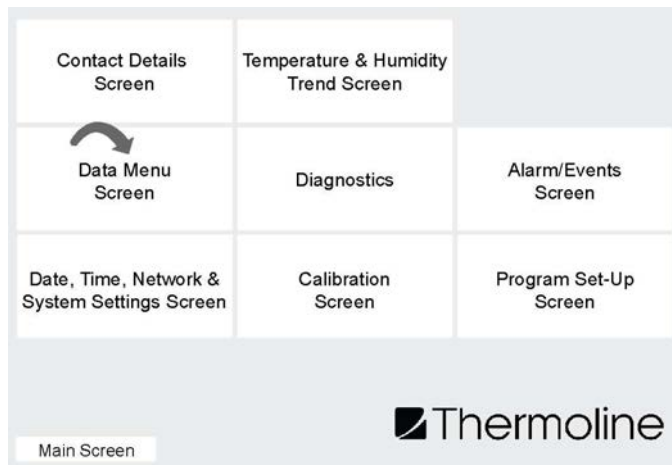


# STAR X User Guide

## Data Menu Screen

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

**NOTE:** Use the User Number '01' and the Passcode '1111' to access this screen.



ID	Time	Date	Temp	Humid	Heater Safe	Temp HCT	Temp PCT	Humid PCT	Serial No.
914	15:13:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
913	15:12:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
912	15:11:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
911	15:10:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
910	15:09:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
909	15:08:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
908	15:07:42	21/02/22	020.0	069.0	020.0	020.0	-17.8	000.0	000000
907	15:06:42	21/02/22	020.0	068.0	020.0	020.0	-17.8	000.0	000000
906	15:05:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
905	15:04:42	21/02/22	020.1	070.0	020.0	020.0	-17.8	000.0	000000
904	15:03:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
903	15:02:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
902	15:01:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
901	15:00:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
900	14:59:42	21/02/22	020.0	070.1	020.0	020.0	-17.8	000.0	000000
899	15:58:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
898	15:57:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
897	15:56:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
896	15:55:42	21/02/22	020.2	070.4	020.0	020.0	-17.8	000.0	000000
895	15:54:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
894	15:53:42	21/02/22	020.1	070.0	020.0	020.0	-17.8	000.0	000000
893	15:52:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
892	15:51:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
891	15:50:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000

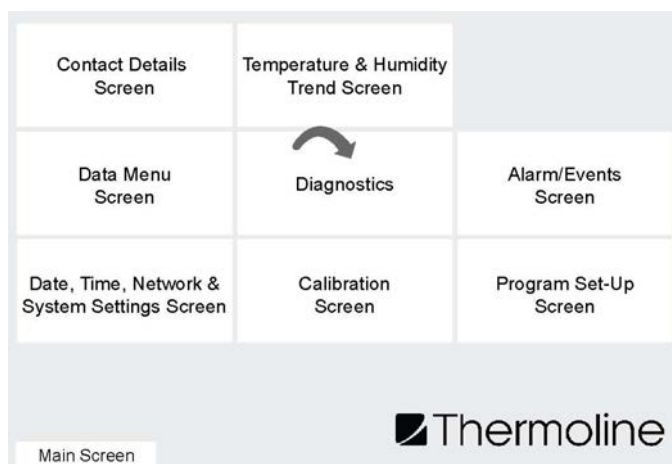
On the data menu screen you can use the settings button (cog) to change the month shown on the table. You can also choose to see all data by selecting (Current).

ID	Time	Date	Temp	Humid	Heater Safe	Temp HCT	Temp PCT	Humid PCT	Serial No.
914	15:13:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
913	15:12:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
912	15:11:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
911	15:10:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
910	15:09:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
909	15:08:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
908	15:07:42	21/02/22	020.0	069.0	020.0	020.0	-17.8	000.0	000000
907	15:06:42	21/02/22	020.0	068.0	020.0	020.0	-17.8	000.0	000000
906	15:05:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
905	15:04:42	21/02/22	020.1	070.0	020.0	020.0	-17.8	000.0	000000
904	15:03:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
903	15:02:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
902	15:01:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
901	15:00:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
900	14:59:42	21/02/22	020.0	070.1	020.0	020.0	-17.8	000.0	000000
899	15:58:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
898	15:57:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
897	15:56:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
896	15:55:42	21/02/22	020.2	070.4	020.0	020.0	-17.8	000.0	000000
895	15:54:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
894	15:53:42	21/02/22	020.1	070.0	020.0	020.0	-17.8	000.0	000000
893	15:52:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
892	15:51:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000
891	15:50:42	21/02/22	020.0	070.0	020.0	020.0	-17.8	000.0	000000

Cancel		Option	Done
FILE SELECTION			
(Current)			
202308			
202307			
202306			
TREND DISPLAY SETTING			
Channel Visibility			
Y Scale			
Disable Y axis scrolling			

## 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.)

Temperature	Humidity	Heater Safety	
30.9	0	31.6	Actual Value
0.0	0.0	0.0	Output Heat
0.0	0.0	0.0	Output Cool

Temp ON  
ON ▼

## 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.

The screenshot displays the 'System Settings' screen with a grid of options. At the top, there are buttons for 'Contact Details Screen', 'Temperature & Humidity Trend Screen', 'Data Menu Screen', 'Diagnostics', 'Alarm/Events Screen', 'Date, Time, Network & System Settings Screen' (highlighted with a curved arrow), 'Calibration Screen', and 'Program Set-Up Screen'. The 'Main Screen' button is at the bottom left, and the 'Thermoline' logo is at the bottom right. Below this grid, there are three main sections: 'Network Communication Settings' (IP Address, Subnet Mask, Gateway), 'Date and Time Settings' (Hour, Minute, Second, Day, Month, Year), 'Passcodes' (Passcode No 1, Passcode No 2), 'Data Information' (Free Drive Space (Mb), Erase Data Memory, Erase Alarm Memory), and 'Screen Timeout' (Screensaver Timeout, Backlight Timeout). A 'Back' button is at the bottom left.

## 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.

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



## LAN Connection

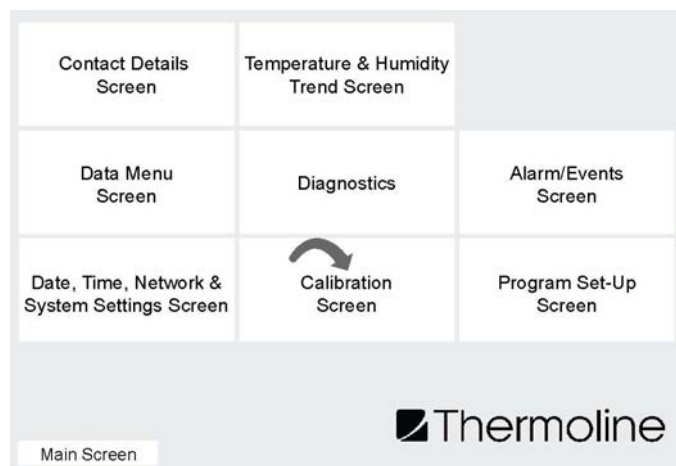
Thermoline cabinets that use the STAR X controller can be connected via a LAN connection to clone the screen so they can be viewed at a remote location. As standard, the STAR X is set to automatically assign an IP address when connected to an active network and is shown on the System Settings page. If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



Calibration screen seen with associated values.

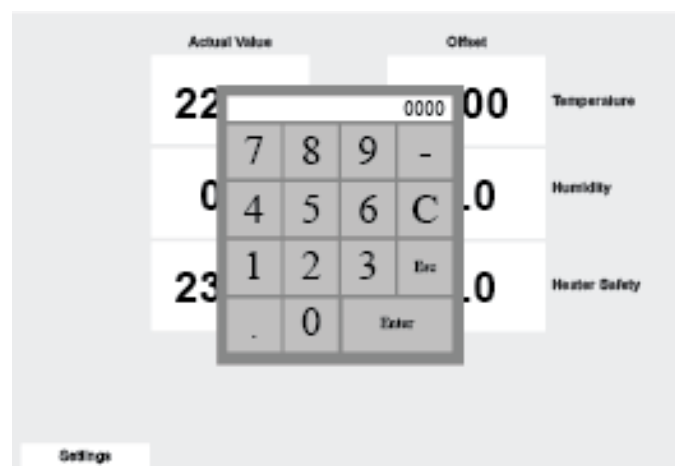


Use the QR Code to see the video of this step.



## How to Calibrate

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



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.

# STAR X Setup

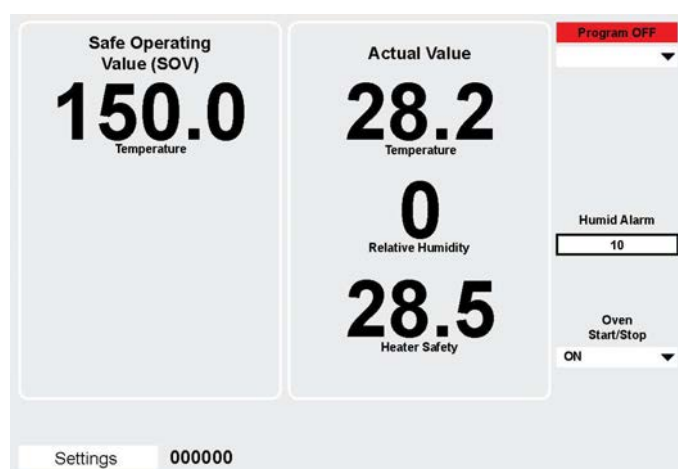
Large Capacity Drying Oven User Manual  
By **Thermoline**

## Temperature Control

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

The Thermoline STAR X touchscreen has been designed for quick and easy adjustments to the cabinet's temperature and humidity alarm values (for models with the optional humidity alarm).

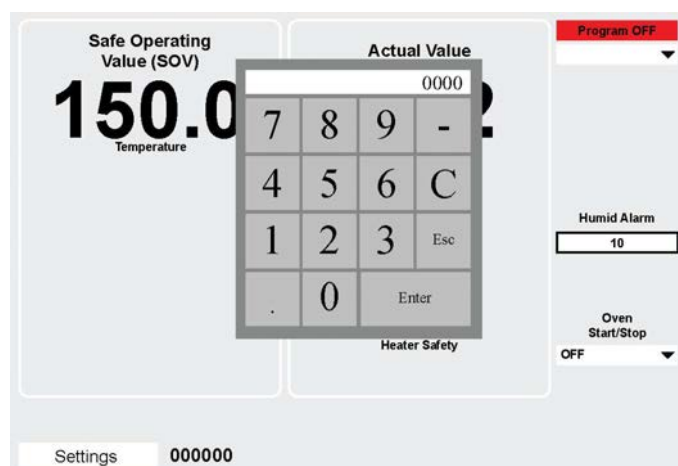
From the main screen of the STAR X, simply press on the value you wish to change. In this example, we will change the temperature.



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.

The maximum temperature the controller can be set at for the oven is +150°C.



## 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.

**Lighting On/Off:** Not used.

Program Setup

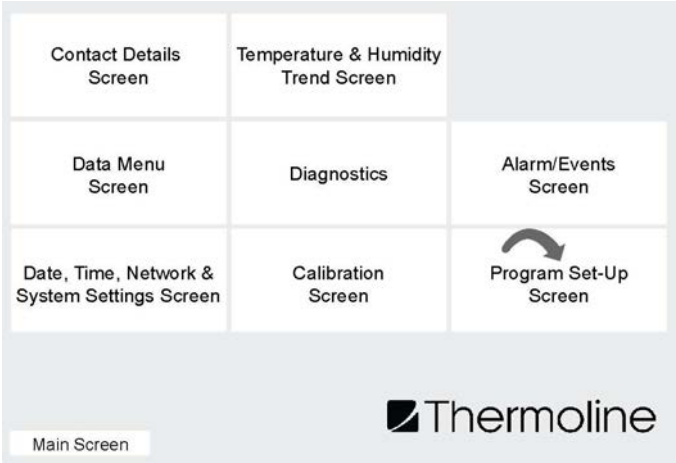
**Hours:** The operator enters the required length of time for the segment in Hours. This value is ignored if the segment either Jump To or End.

**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.

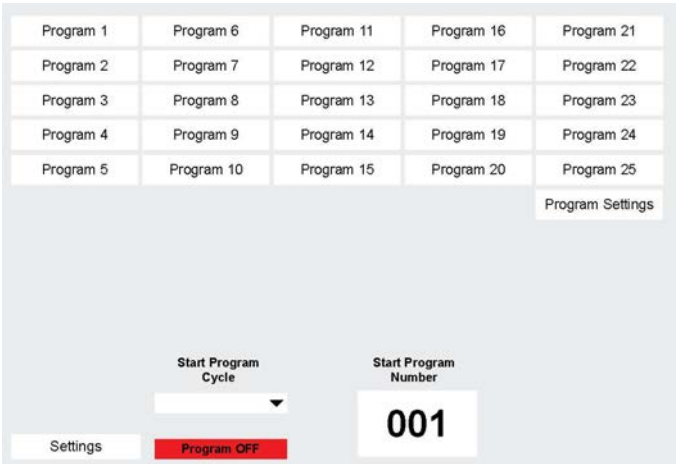
**End Action:** This value determines what will happen when the program ends. It can be set to SOV, which stops the program from operating and controls at the Safe Operating Value. It can be set to Dwell, in which case it will continue to control the Temperature of the last Time segment.

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 oven to heat up or to naturally cool down to keep up with the ramp rate you have entered (time).

By setting the time to, say, 1 second, you will virtually eliminate the ramp rate and have the oven heat up or cool down at its fastest possible rate. In this case, after the 1 second segment, you'll then set the next segment as the 'dwell period' you want the temperature to soak at.

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 50°C that uses segment 1 for one second to set the temperature. It follows on with 50°C for a 2 hour segment and then a 4 hour segment.

Next, it goes to 100°C and will take 2 hours to reach that temperature, and then holds it for 4 hours. Moving on to the second page, it takes a further 2 hours to rise to 150°C and then holds that temperature, at which time the program ends, and the oven will return to the temperature set as SOV.

Time Remaining	Time	Time	Time	Time
Jump To	001	001	001	001
Jump Cycle	0001	0001	0001	0001
Temperature	050.0	050.0	050.0	100.0
Hours	00	02	04	02
Minutes	00	00	00	00
Seconds	01	00	00	00
End Action	SOV	SOV	SOV	SOV
G'Soak Temp				
G'Soak Humid				
G'Soak Co2				

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

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

Time Remaining	Time
Jump To	001
Jump Cycle	0001
Temperature	150.0
Humidity	
Co2	
Hours	02
Minutes	00
Seconds	00
End Action	SOV
G'Soak Temp	
G'Soak Humid	
G'Soak Co2	

Program Set-Up

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.

SOV	SOV	SOV
-----	-----	-----

Lighting On/Off    Segment 6-10

Time Remaining	Time	Time	End	Time	Time
Jump To	001	001	002	001	001
Jump Cycle	0001	0001	0000	0001	0001
Temperature	150.0	150.0	025.0	025.0	005.0
Humidity					
Co2					
Hours	02	04	02	04	02
Minutes	00	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

Linking the Programs

If you find that 10 segments are not enough to complete the temperature 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	End	Time	Time
001	002	001	001
0001	0000	0001	0001
150.0	025.0	025.0	005.0
04	02	04	02
00	00	00	00
00	00	00	00
SOV	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

Program 1	Program 5
Program 2	Program 7
Program 3	Program 8

**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.

Time Remaining	Time
Jump To	001
Jump Cycle	0001
Temperature	010.0
Humidity	080

Time ▼

Time  
Jump To  
End

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.

Seconds	00
End Action	SOV
G'Soak Temp	

SOV ▼

SOV  
Hold

### 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.

Time Remaining	Time
Jump To	001
Jump Cycle	0001
Temperature	010.0
Humidity	080

Time ▼

Time  
Jump To  
End

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.

Time Remaining	Time
Jump To	001
Jump Cycle	0001
Temperature	010.0
Humidity	080

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.

The screenshot shows a grid of 25 programs arranged in 5 rows and 5 columns. Below the grid is a 'Program Settings' section. At the bottom, there is a 'Start Program Cycle' drop-down menu and a 'Start Program Number' field displaying '001'. There are also 'Settings' and 'Program OFF' buttons.

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.

The image shows a close-up of the 'Start Program Cycle' drop-down menu. The menu is open, displaying four options: END, START, PAUSE, and RESUME. The 'START' option is highlighted with a black arrow pointing to it.

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.

**Program ON**

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

The screenshot shows the 'Start Program Number' field set to '001'. There is a curved arrow pointing from the '001' field to the 'Start Program Number' label. There are also 'Settings' and 'Program OFF' buttons.

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.

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.

The screenshot shows the Main Screen with the 'Program OFF' status. It displays 'Safe Operating Value (SOV)' as 150.0 Temperature, 'Actual Value' as 28.2 Temperature, 0 Relative Humidity, and 28.5 Heater Safety. There are also 'Humid Alarm' and 'Oven Start/Stop' settings. At the bottom, there is a 'Settings' button and a '000000' display.

The screenshot shows the Main Screen with the 'Program ON' status. It displays 'Program Set Value (PSV)' as 150.0 Temperature, 'Actual Value' as 28.2 Temperature, 0 Relative Humidity, and 28.5 Heater Safety. There are also 'Humid Alarm' and 'Oven Start/Stop' settings. At the bottom, there is a 'Settings' button and a '000000' display.

# General Controls

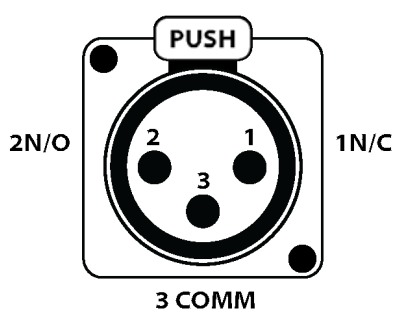
## BMS Output

The large capacity drying oven 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 on top of the oven (looking from the front).

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

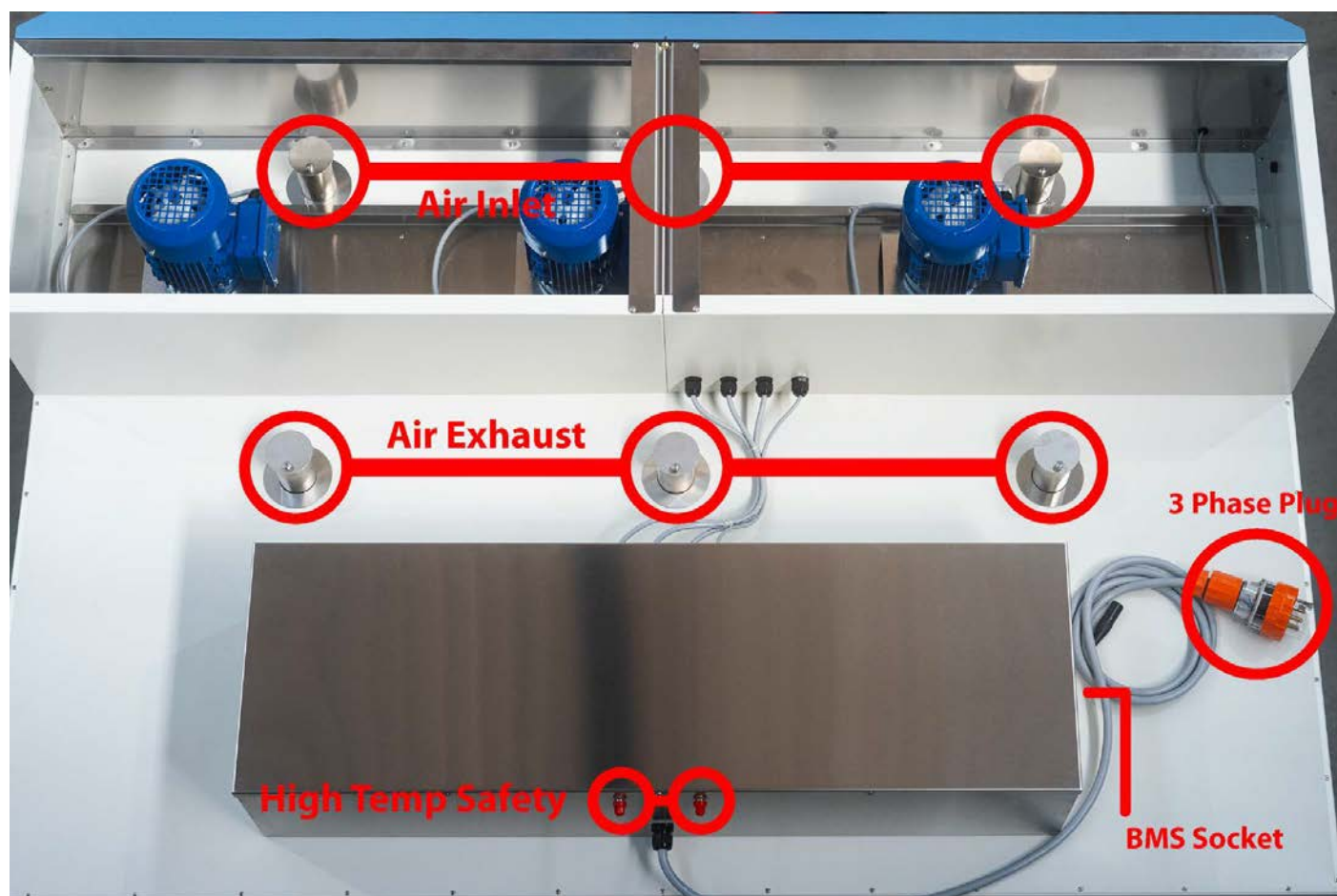
**An alarm can be triggered by the following:**

- Loss of power
- High temperature inside the cabinet (2°C above setpoint)



Location of BMS socket

**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.



Top view showing location of BMS socket

## General Controls

### Manual Reset Safety Thermostat

The over-temperature safety thermostat is not operator-adjustable. It will electrically isolate the heating elements in an over-temperature situation. The main aim of this safety is to protect from overheating if there is no airflow through the cabinet. This could be a failure of the air circulating fans or the cabinet being overstocked. There are two MRST's in the TD-78T-2-D located at the back at the top of the cabinet.

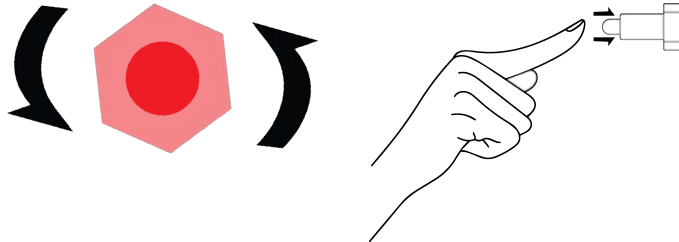


Fig 1.



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



#### Resetting the over-temperature safety thermostat:

- This system is one of several temperature safety's, and it is very likely that there has been a fan or airflow problem that can cause this safety to trip. Thermoline suggests investigating the cause prior to resetting.
- Allow the cabinet to cool down before resetting the thermostat.
- Locate the safety reset at the back of the electrical box on top of the oven. It is displayed as a red or black knob (See previous page).
- Once the oven has cooled down, turn the black or red knob anti-clockwise (**Fig 1**).
- Once the knob is off, press the red button firmly until you feel a "click". This will restart the circulating fans 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.

Problem	Fix
Oven Temperature does not match the controller read out.	<b>Sensor Issue</b> There could be a few reasons why the oven temperature does not match the controller readout. One possibility is that the temperature sensor inside the oven is not properly calibrated or functioning correctly. If the offset is greater than 5°C, then your sensor may need replacing. Replace your oven sensor. To complete this, you will need to contact a technician.
I cannot acknowledge the alarm.	<b>Alarm Condition</b> 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.
There is no air flow in the oven	<b>Fan Failure</b> Limited airflow within the Oven could be related to the failure of one or more internal fans.
Lever latch door will not close (latch too tight) or does not close firmly (latch too loose).	<b>Adjustable strike</b> 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. A grooved surface enables the screw to remain in position once tightened. Thermoline suggests making only very small changes to the strike location (one groove at a time) while making adjustments.
	 

## Troubleshooting

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### Repair and Technical 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](mailto:service@thermoline.com.au)



Model:  
Serial No:  
Watts/Amps:  
Volts:

Phone: +61 2 9604 3911  
Email: [hello@thermoline.com.au](mailto: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.***

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## 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](mailto:service@thermoline.com.au).

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