

# Spark Proof Refrigerators and Freezers

## *User Manual & Setup Guide*

**TF/TR TRF-DUAL RANGE**

**Dixell XR70**

Thermoline Scientific Equipment Pty. Ltd.

ABN 80 000 859 129

10-12 Ross Place

Wetherill Park, NSW 2164. Australia.

Phone: +61 2 9604 3911

email: [hello@thermoline.com.au](mailto:hello@thermoline.com.au)

[www.thermoline.com.au](http://www.thermoline.com.au)



**Thermoline**  
S C I E N T I F I C

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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;  
Crushing of  
Hand**

**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 range of spark proof refrigerators and freezers. We recommend that you read this user manual the whole way through before you start using the refrigerator or freezer. Consider this manual as a component of the fridge or freezer and an integral part to its function. We recommend keeping it close and within easy access.

The interior of the fridge and freezer compartments are classified as 'spark free' as do not have any wiring (such as a thermostat or light) that could potentially ignite any vapours from hazardous materials which may be stored inside. They both offer safe storage of volatiles, compounds, and solvents when a spark-free environment is required.

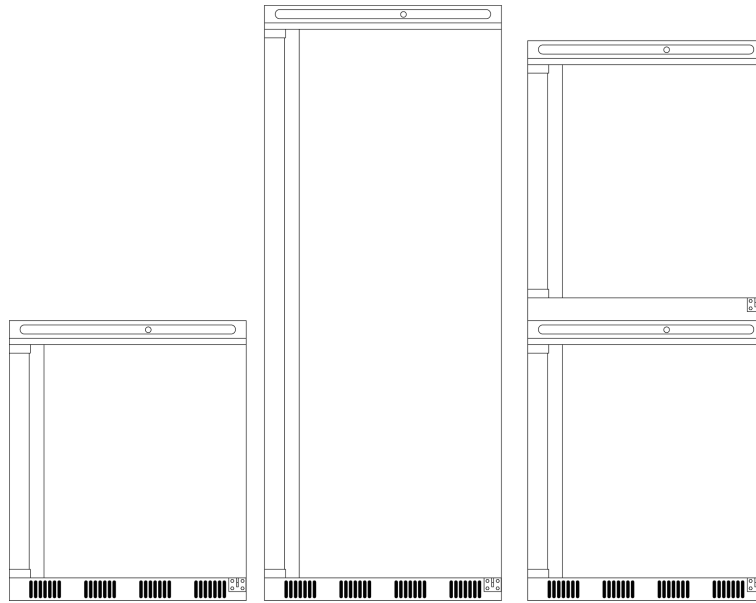
The single door, spark-proof fridge and freezer range is an excellent choice when lab space is limited. For convenient and easy access to your samples and potentially volatile materials, the combination cabinet is the perfect choice.

- Control Accuracy: +/- 0.25°C
- Operating Temperature from +4°C to 10°C in the refrigerators and -20°C to -10°C in the freezers.



# Product Specifications

Spark Proof Refrigerators and Freezers User Manual  
By **Thermoline Scientific**



## Dimensions

### External

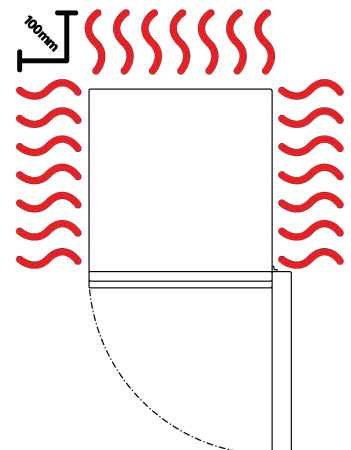
|            | TF/TR-160-SP-1-SD | TF/TR-260-SP-1-SD | TRF-DUAL-SP-1-SD |
|------------|-------------------|-------------------|------------------|
| WxDxH (mm) | 600x600x800       | 600x600x1850      | 600x600x1700     |

### Internal

|                         |             |              |             |
|-------------------------|-------------|--------------|-------------|
| Refrigerator WxDxH (mm) | 510x485x620 | 510x485x1620 | 510x485x620 |
| Freezer WxDxH (mm)      | 480x470x620 | 480x470x1620 | 480x470x620 |

### Spacing

|            | TF/TR-160-SP-1-SD | TF/TR-260-SP-1-SD | TRF-DUAL-SP-1-SD |
|------------|-------------------|-------------------|------------------|
| Front (mm) | 600               |                   |                  |
| Back (mm)  | 100               |                   |                  |
| Sides (mm) | 100               |                   |                  |



## Product Specifications

### Technical Specifications

|                                    | TF/TR-160-SP-1-SD                         | TF/TR-260-SP-1-SD | TRF-DUAL-SP-1-SD |
|------------------------------------|---|-------------------|------------------|
| Refrigerator Temperature Range     | +4°C to +10°C                             |                   |                  |
| Refrigerator Temperature Stability | +/- 2.0°C does not include below the step |                   |                  |
| Freezer Temperature Range          | -20°C to -10°C                            |                   |                  |
| Freezer Temperature Stability      | +/- 2.0°C does not include below the step |                   |                  |
| Electrical                         | 1A/230V                                   | 2A/230V           | 2A/230V          |
| Nominal Capacity                   | 160L                                      | 260L              | 2x160L           |
| Weight                             | 50kg                                      | 100kg             | 105kg            |
| Heat Output (Watts)                | 240                                       | 300               | 700              |
| Noise Level @ 1 metre (dbA)        | 40  | 40                | 40               |
| Refrigerant Type                   | R600a (Isobutane)                         |                   |                  |

### Features

|                               |              |                         |   |
|-------------------------------|--------------|-------------------------|---|
| Shelves                       | 3x levels    | Fridge: 4<br>Freezer: 6 | 6 |
| Castors                       | Rear Rollers |                         |   |
| Porthole Diameter             | N/A          |                         |   |
| Internal Fan (Fridge Only)    | ✓            | ✓                       | ✓ |
| Manual Defrost (Freezer Only) | ✓            | ✓                       | ✓ |
| Door Locks                    | ✓            | ✓                       | ✓ |
| BMS Plug                      | ✓            | ✓                       | ✓ |
| Ecofoam Insulation            | ✓            | ✓                       | ✓ |
| 300 mm Base Stand             | Optional     | X                       | X |

### Safety

|                         |   |   |   |
|-------------------------|---|---|---|
| Over Current Protection | ✓ | ✓ | ✓ |
| Over Temperature Safety | ✓ | ✓ | ✓ |

## Cabinet Location

Ensure the spark proof refrigerators and freezers are placed in the correct environment, away from direct sunlight or direct heat sources such as heaters. The product shouldn't be placed in a room where the ambient temperature exceeds that of which it was designed to operate.

The spark proof refrigerators and freezers 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:

- **Temp:** 10°C to 32°C (+/-2.0°C)
- **Humid:** Up to 85%RH (Non Condensing)

### Optimal Environment:

- 23°C (+/-2.0°C)
- 50%RH (+/-5%RH)

### Installation Requirements:

- Under no circumstances should these cabinets be stacked on top of each other. Please see the TRF-DUAL model which is fitted with the appropriate fixings to ensure proper stacking.

## Electrical Connections

The Thermoline spark proof fridges and freezers are suitable for connection to a standard 10Amp, 230 volts, 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 fitted as standard to the 2.5 metre power cord.

**Note: The TRF-DUAL-SP-1-SD has two 2.5 metre electrical cords and requires both to be plugged in (one for the refrigerator and one for the freezer).**

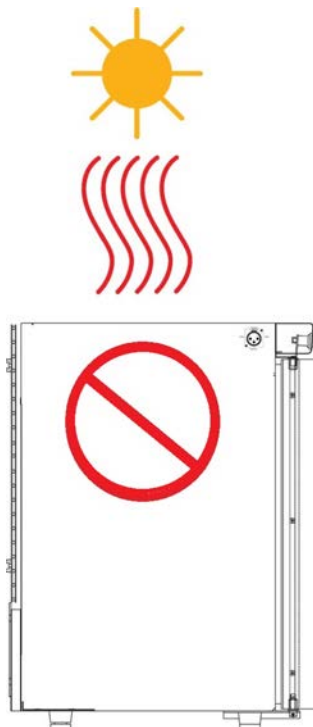


Fig 1. Non-Suitable Environment

## Operating Environment

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### Operating Environment Warnings

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The spark proof refrigerators and freezers 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.



Although the spark proof refrigerators and freezers are suitable for use with flammable solvents, this only applies to the interior.



## Unpacking

### Unpacking Process for Box and Skid

- The spark proof refrigerator or freezer will be delivered packed in a box on a skid.
- Before proceeding make sure that all internal and external packaging has been removed from the appliance and that all tape, plastic bags and pieces of foam have been removed.
- Removing the box requires the cling wrap and straps to be cut, then expose the cabinet by carefully sliding the box upwards. (Fig 1)
- If upon opening your package damage is present, notify the detail of any damage to your supplier or to Thermoline Scientific without delay at +61 2 9604 3911 or email at [service@thermoline.com.au](mailto:service@thermoline.com.au).

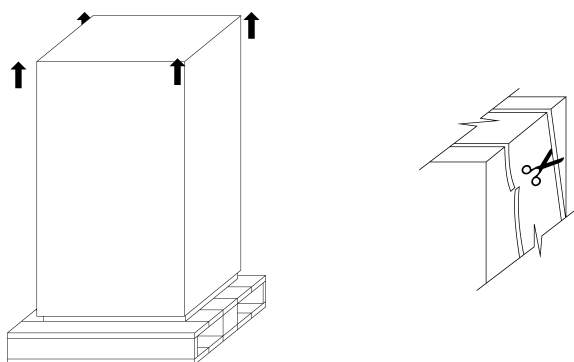


Fig 1 . Unpacking Process (Box)

## Moving

### Moving Cabinet:

- With the spark proof refrigerator or freezer being on a skid it can be moved around using a pallet jack until it is unpacked. (Fig 2)
- Once unpacked the spark proof refrigerator or freezer has single direction rollers at the back to assist with moving.

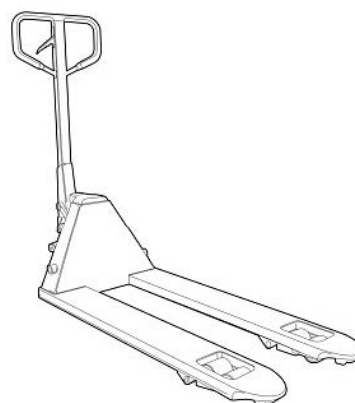


Fig 2 . Pallet Jack

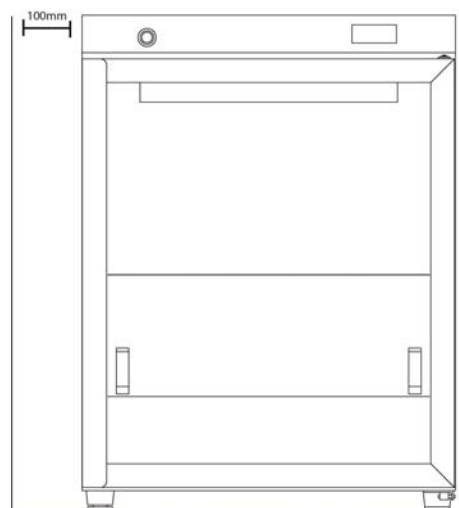
## Cabinet Location

### Location Requirements:

- Spark proof refrigerators and freezers require a level surface to operate correctly. There are adjustable feet at the front to allow for levelling
- Do not store items on top of the spark proof refrigerators or freezer.

### Ventilation:

- All spark proof refrigerators or freezers require ventilation around them. 100mm on either side and 100mm on the back is required.
- The cabinet door should also be allowed to open and close at full range.

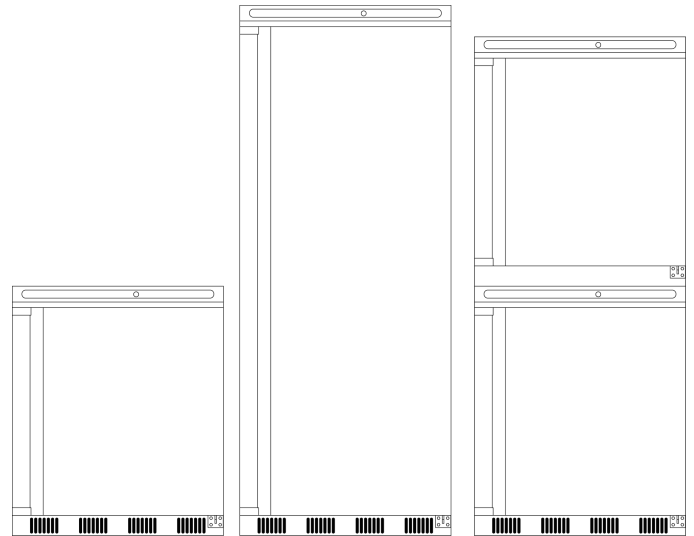


## Setup

### Start Up Process

#### Start up process for the spark proof refrigerators and freezers.

- Locate the cabinet as previously described, and plug the mains lead into the power supply but do not turn the power on just yet.
- Turn on the power at the outlet to spark proof refrigerator or freezer.
- After a short start-up procedure, the temperature control will display the temperature inside the spark proof refrigerator or freezer.
- Allow the spark proof refrigerator or freezer to reach operating temperature and, if possible, operate for at least 8 hours before loading stock.



### Shelves

The spark proof refrigerators and freezers come equipped with shelves. The refrigerator shelves can be adjusted by removing them completely or moving them to a different molded slot in the wall. The freezers however have fixed shelves which act as part of the refrigeration.



Refrigerator Shelves



Freezer Shelves

## Setup

### Loading

Thermoline suggests no loading below the step (on the floor) of both the refrigerators and the freezers to ensure samples stay within acceptable temperature ranges.

#### Loading Requirements (refrigerators):

- With the spark proof refrigerators being fan forced, good internal airflow is required for optimal performance. To ensure consistent airflow around samples, the sides, top and bottom are clear of any obstructions. Please keep samples approximately 50mm from the walls and spread the load evenly throughout the refrigerator. (Fig 1.)

#### Loading Requirements (freezers):

- With the spark proof freezers not being fan forced, good internal airflow is not as important. Grouping samples very close, or even touching together, will slow the freezing process. Once in a steady state, the sample location (other than below the step) will make little difference to the freezer's performance.

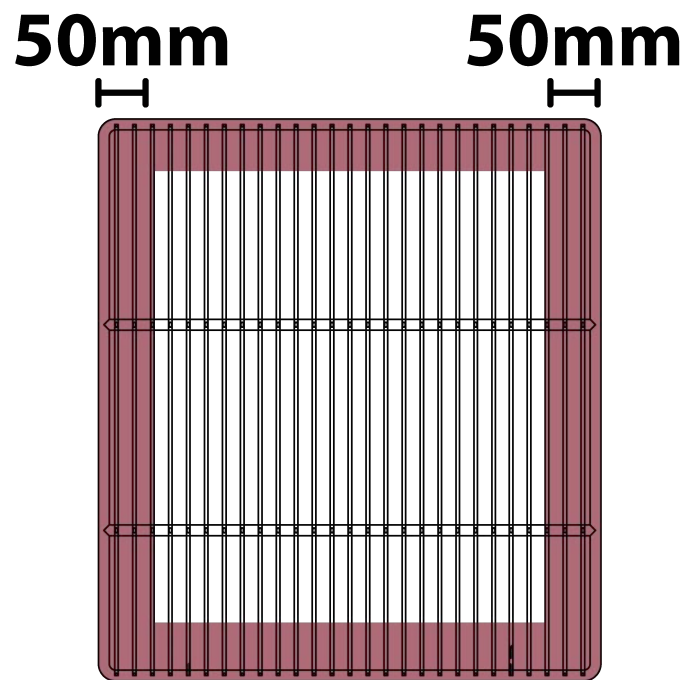
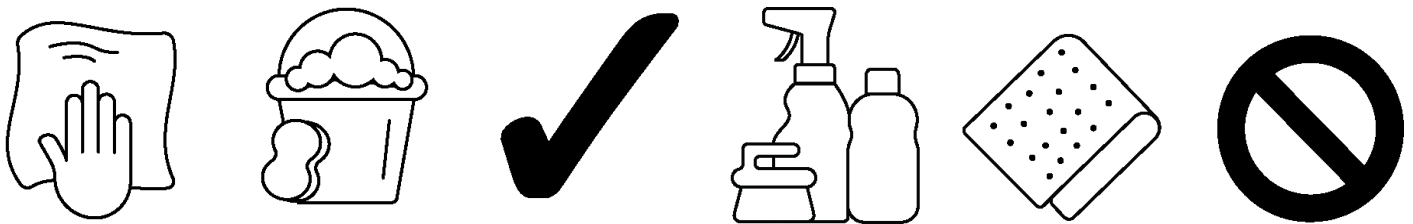


Fig 1.

### 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 such as the temperature control and internal light. These items should not be subjected to any levels of moisture.



General inspection of the refrigerator should be made at regular periodic intervals depending on a range of factors. Generally, every six months, the following tasks should be performed:

- Inspect and clean the refrigerator.
- Check the door gasket for damage, including splits, tears or areas where it isn't sealing to the refrigerator frame when the door is closed. If a gasket is to be replaced, please contact Thermoline Scientific.
- The door self closes when opened to a 90° angle
- The condenser is embedded within the walls of the spark proof fridge and freezer and is not accessible, and therefore, cleaning isn't required.

## Setup

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### Door Gasket

Door gaskets are an essential part of a cabinet. A gasket with impaired functionality can lead to poor performance, excessive ice buildup (in freezers), and decreased lifetime expectancy of the cabinet. It is therefore crucial to be aware of the door gaskets condition. Regular inspection is recommended.



### Freezer Defrost

As the freezer has an auto defrost function, it will periodically need to be defrosted. With the freezer defrosted, you will be able to carry out inspection and cleaning. All samples should be relocated, and the freezer turned off and unplugged. Allow the frost build up to melt while using towels or alike to remove excess water. Clean, inspect and dry the interior of the freezer. Once clean and dry, plug the freezer back in, turn it on and shut the door. When the freezer returns to the working temperature, replace the samples.

### Setup Warnings

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Ensure that the spark proof refrigerators and freezers are placed on an even and flat surface. Uneven surfaces can cause issues within the cabinet. Uneven surfaces can cause the cabinet to fall over and damage the product.

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

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



Be careful when using knives to cut tape and cardboard when removing packaging from the spark proof refrigerator or freezer.

The Dixell XR70 Controller is a microprocessor based controller suitable for applications on medium or low temperature refrigerators, with relay outputs that control the compressor, fan and defrost. The temperature control has been factory set to operate between +4°C and +10°C for the refrigerator, and the freezer operating between -20°C to -10°C. The alarms are set to operate at 1°C below the set point for low alarm and 1°C above the set point for high alarm. Any button can be pressed to mute the alarm. Once muted, the alarm will NOT resound.



**SET**

*Set:* To display the target set point; in programming mode, it selects a parameter or confirms an operation.



*Power Button:* Not Used



*Increase Button:* To see the maximum stored temperature; in programming mode, it browses the parameter codes or increases the displayed value.



*Decrease Button:* To see the minimum stored temperature; in programming mode it browses the parameter codes or decreases the displayed value.



*Defrost:* Not Used



*Light:* Not Used

| LED | Mode     | Function                       |
|-----|----------|--------------------------------|
|     | On       | Compressor Running             |
|     | Flashing | Anti-Short Cycle delay enabled |
|     | On       | Fans Enabled                   |
|     | Flashing | Not Used                       |
|     | On       | Not Used                       |
|     | Flashing | Not Used                       |
|     | On       | An alarm is occurring          |

## On Screen Alarms

| Message | Cause                                    | Explanation / Action                                       |
|---------|--|--|
| P1      | Probe 1 Failure                          | Call Service   |
| P2      | Probe 2 Failure                          | Call Service   |
| HA      | High Alarm - Product Temperature         | Probe in bottle is above alarm point                       |
| LA      | Low Alarm - Product Temperature          | Probe in bottle is lower than alarm point                  |
| DA      | Door Open Alarm                          | Door not closed securely                                   |
| PoF     | UP & DOWN buttons pressed simultaneously | Press UP & DOWN buttons simultaneously until 'PoN' appears |

## General Controls

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### Temperature Logging

The digital temperature control has a feature that allows the operator to log or record the maximum and minimum temperatures attained over a period of time. These logged temperatures can be reset by simply pressing the buttons on the face of the instrument as follows:

**How to:** see the minimum temperature

- Press and release the DOWN key.
- The “Lo” message will be displayed, followed by the minimum temperature recorded.
- By pressing the DOWN key again or by waiting 5 seconds, the normal display will be restored.

**How to:** see the maximum temperature

- Press and release the UP key.
- The “Hi” message will be displayed, followed by the maximum temperature recorded.
- By pressing the UP key again or by waiting 5 seconds, the normal display will be restored.

**How to:** reset the maximum and minimum temperature

- While the max or min temperature is displayed, press and hold the SET key for 3 seconds until “rSt” is displayed.
- To confirm the operation, the “rSt” message will start blinking, and the normal temperature will be displayed.

### Set Point

Press and hold **SET** for 5 seconds. Then press the **UP** or **DOWN** buttons to determine the desired setpoint. Then press **SET** to save the setpoint.

If your wish is to just view the set point. Simply press the **SET** button.

Press **SET** = View Set Point Value.

### Calibration

Calibration of the unit ensures correct product temperature and optimal freezer performance. Calibration should be done by a trained technician.

Press and hold the **SET and DECREASE buttons** simultaneously. The following parameters will be available:

**Ot** - Sensor Offset in Bottle  
**OE** - Return Air Sensor Offset  
**O4** - - Not Used  
**dP1** - Current Temperature of the Bottle Sensor  
**dP2** - Current Return Air Temperature  
**dP4** - Not Used

Calibration is usually performed at 5°C for refrigerators and at -20°C for freezers. This procedure is a standard procedure used by Thermoline Scientific. The aim when calibrating a Thermoline spark proof refrigerator is to have the bottle at 5°C. This is achieved by placing a reference sensor in the bottle, or in a bottle adjacent to the units bottle, and noting the indicated temperature. The **OE** parameter is then adjusted to increase or decrease the air temperature until the reference sensor reads 5°C. Once the reference sensor has an average temperature of 5°C, adjustments to **Ot** are made so that **dP1** (Display Temperature) equals 5°C.

The procedure is the same for the freezer, but at the lower temperature.

#### NOTE:

- High temperature alarm set at 1°C above setpoint.
- Low temperature alarm set at 1°C below setpoint.
- Refrigerator operating temperature set between +4°C & +10°C
- Freezer operating temperature set between -10°C & -20°C

## Alarm Outputs

### BMS Plug

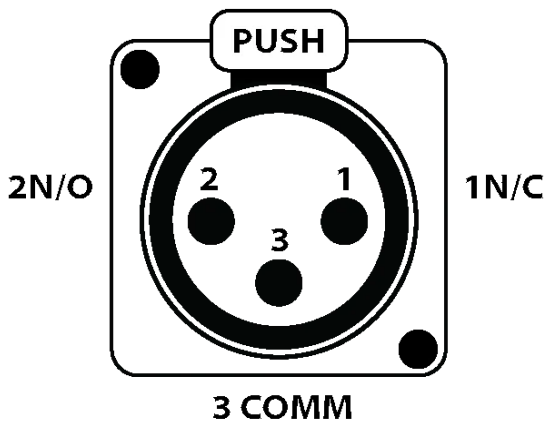
This spark proof refrigerator or freezer is fitted with a 3-pin socket to allow for connection to a building monitoring system or phone dialler. A plug is also supplied separately to connect the socket to your system.

**Note:** The TRF-DUAL-SP-1-SD has two BMS sockets; One for the refrigerator and one for the freezer.

The alarm contacts have no voltage present but we recommend that the wiring is connected by a suitably qualified technician.

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

- Loss of power
- High temperature inside cabinet (1°C above setpoint)
- Low temperature inside the cabinet (1°C below setpoint)



**1N/C:** Will open loop upon alarm situation. This is the optimal option as any break in the loop is detected.


**2N/O:** Will close loop upon alarm situation.

**3COMM:** At least one wire in connected to this pin.



Location of BMS plug

# Troubleshooting

| Problem   | Fix  | Part Number   |
|---|--|---|
| <p><b>Temperature of fridge or freezer is running hotter than expected.</b></p>   | <p><b>Condenser</b><br/>Condenser could be dirty and contain blockages. Clean condenser as described within manual.</p> <p><b>New items in fridge or freezer</b><br/>Have you put new samples in the cabinet?<br/>Allow about an hour to see if the temperature comes down</p> <p><b>Air Flow</b><br/>Is the air flow in the fridge blocked - Ensure the samples are evenly distributed.</p> |   |
| <p><b>PoF is shown on the Dixell Controller.</b></p>  | <p><b>Locked Controller</b><br/>The message PoF means the controller is locked. Please press the <b>UP &amp; DOWN</b> buttons simultaneously until '<b>PoN</b>' appears. This should resolve the issue.</p>  |   |
| <p><b>The buttons on the controller are damaged and the controller does not respond, even though the controller display is working.</b></p> | <p><b>Damaged Faceplate</b><br/>The faceplate is damaged and needs replacing.</p>  | <p>41931 - Dixell XR70 Faceplate</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 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)



ABN 80 000 859 129  
**SALES AND MANUFACTURING**  
10-12 Ross Place, Wetherill Park NSW 2164 Australia  
Phone: +61 2 9604 3911 Email: [sales@thermoline.com.au](mailto:sales@thermoline.com.au)



Model:  
Serial No:  
Watts/Amps:  
Volts:



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

# We are proudly Australian owned

We will continue to invest in Australian manufacturing.

