INSTRUCTION MANUAL

for

LABORATORY REFRIGERATOR

MODEL – TLR 520 – 1 – SD/GD
750/950 – 2 – SD/GD
1150 – 3 – SD/GD
520, 750, 950, 1150 Ltr CAPACITY

REVISION 10/11/09
Introduction:
Thank you for selecting this equipment from the large range of products manufactured in Australia by Thermoline Scientific.
This manual covers the operation, cleaning, & maintenance instructions for this equipment. Incorrect operation or use can cause harm or damage to the equipment, therefore it is very important that you read, understand, and implement the instructions, to ensure reliable operation. Please keep this manual in a safe place for future reference.

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UNPACKING:
Remove the equipment from the packing material and check for damage. Notify the detail of any damage to your supplier or to Thermoline Scientific without delay.

Retain the packing materials until the equipment has been thoroughly tested.

Inventory:
• Shelves and shelf support clips.
• 1 x 3-pin plug for connection of alarms to remote Building Management System.
• Door key/s.
• Chart recorder keys and paper. (Only if optional chart recorder is fitted).
USE & FUNCTION:

The TLR range of Laboratory refrigerators are designed to maintain the temperature of laboratory products at around 4ºC, with a temperature range from +4ºC to 10ºC. Temperature control is by means of a digital control with display and temperature logging facilities incorporated.

The digital temperature control monitors product temperature, and includes a temperature logging feature that allows the operator to determine the maximum and minimum temperature reached during daily operation.

The display also incorporates the HI/LO temperature alarms emitting both visual and audible signals, which can also activate a building monitoring system (BMS), via a connection socket at the rear of the cabinet.

High temperature alarm set at +3ºC.

Low temperature alarm set at -3ºC.

Operating temperature set at 4ºC.

These cabinets will operate from a standard 10 amp, 240 volt, 50Hz, general purpose outlet (power point). Cooling is by means of a hermetically sealed refrigeration unit using environmentally friendly refrigerant.

Fan forced air circulation internally ensures that even temperature conditions are obtained on all shelf levels. Shelves are adjustable, and castors are fitted to the base for ease of movement.

Cabinets in this series can be supplied with either double glazed or solid doors with heated fascias to minimize condensation.

LOCATION & INSTALLATION:

Location:
All refrigerated equipment generates heat as part of the normal operation. It is vital for correct performance and reliability that adequate ventilation is provided to allow this heat to dissipate.

Any refrigerated equipment that is operated in a small unventilated area, especially in warm weather, can cause the compressor to overheat and may result in premature failure.
NOTE: Failure to observe ventilation guidelines will void the manufacturer’s warranty!

A minimum of 300mm above the refrigerator and 100mm at the back and sides must be maintained at all times to ensure adequate air flow to dissipate heat generated by the refrigeration unit.
Do not store items on top of the fridge as this will also affect ventilation!

**Level:**
The cabinet should be standing on level ground to ensure correct operation of the self-closing door, and proper draining of condensate from the evaporator.

**Castors:**
The cabinet is fitted with castors for ease of movement to allow for cleaning under the cabinet. Where lockable castors are fitted they must be locked to prevent accidental cabinet movement. This can be achieved by pressing the lock-down tab with your foot. Ensure that both castors are locked.

**Mains connection:**
This cabinet is suitable for connection to a standard 240 volt, 50Hz, 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 mains lead.

**OPERATION:**

1: Locate the cabinet as previously described, and plug the mains lead into the power supply but do not turn the power on just yet.

2: The cabinet is supplied with the shelves fixed in place. Adjust the shelf positions to suit your storage needs by moving the support clips provided.

3: Turn on the power and the circulating fan inside the cabinet will start immediately. You should also be able to turn on the internal light using the “light” switch on the front panel.

4: After a short warm-up period the temperature control will display the temperature inside the refrigerator. The refrigeration compressor will start after a few minutes.
Temperature control:

- **Information/set point button.**
- **Decrease button.**
- **Increase button.**
- **Exit/Mute button.**

5: The temperature control has been factory set to operate @ 4°C. This is the minimum recommended temperature to limit the risk of the refrigerator “icing-up”. You can adjust the temperature from +4°C to +10°C as follows:

- Press and hold the **i */* button, the instrument will then display the current set temperature.
- With the **i */* still held, use the **▲ ▲** or the **▼ ▼** button to increase or decrease the set temperature.
- Release the **i */* button to enter the new set temperature and return to the original display. The temperature control will adjust the output to achieve the new set temperature.

6: The alarms are set to operate @ set temperature minus 3°C for low alarm, and set temperature plus 3°C for high alarm with a 10 minute time delay to allow for normal loading of the refrigerator. For example, with a set temperature of +4°C, the low alarm is +1°C, and the high alarm is +7°C.

Since the temperature inside the refrigerator will be a lot higher than 4°C when first turned on, the high temperature alarm will obviously be actuated after the time delay. The display will indicate “Hi” and the buzzer will “beep”. To silence the button until the refrigerator temperature falls below the high alarm temperature, simply press the **X □ □ □** button.

**Note:** If at any time during normal operation the alarm goes off, for example after the door has been opened for an extended time during loading, the alarm will be activated until it is acknowledged by pressing the **X □ □ □** button, (even if the temperature inside the refrigerator has returned to normal).
7: Allow the cabinet to operate for at least 8 hours before loading your product.

**CONNECTION OF ALARMS:**

As previously mentioned, this cabinet is fitted with a 3-pin socket at the rear to allow for connection to a building management system (BMS), or to a phone dialer. A plug is also supplied separately to connect the socket to your wiring. The alarm contacts have no voltage present, but we recommend that the wiring is connected by a suitably qualified technician (electrician or similar).

An alarm can be triggered by one of the following conditions:

- Loss of power.
- High temperature inside the refrigerator (3°C high for more than 10 minutes).
- Low temperature inside the refrigerator (3°C low for more than 10 minutes).

**LOADING:**

All forced draught refrigerators such as this one require constant air flow throughout the cabinet to maintain the desired temperature. Correct loading of the shelves must be considered for efficient refrigeration performance.

- Never block off air vents in the rear panel.
- Allow air space around the product on each shelf.
- Distribute the load evenly over all of the shelves rather than stacking everything on one shelf.
- Whenever possible the load should be chilled prior to loading to reduce the effect on the temperature inside the refrigerator. If this is not possible then load the product a little at a time.
TEMPERATURE LOGGING:

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

The button is the “information” button that allows the operator to view a series of operating information in the following order:

a) “t1” = current temperature.
b) “thi” = maximum logged temperature, (can be reset).
c) “tlo” = minimum logged temperature, (can be reset).
d) “cnd” = compressor working weeks, (do not alter).
e) “loc” = keypad locked state, (do not alter).

i) Press and release , ‘t1’ appears, this is the parameter for the actual refrigerator temperature.
ii) Press and release again, ‘thi’ appears. This is ‘MAX’ temp logged.
iii) Press and hold to view the maximum logged temperature, then whilst holding press to reset the maximum logged temperature to the current temperature. Release both and then ‘tLo’ will be displayed which is ‘MIN’ temp. logged.
iv) Press and hold to view the minimum logged temperature, then whilst holding press to reset to the current temperature.
v) Press and release to return to normal display.

vi) Note that there are 2 other parameters “cnd” and “Loc” which are not associated with the logging and should not be altered.

CLEANING & MAINTENANCE:

General 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, internal light, refrigeration condensing unit. These items should not be subjected to any levels of moisture. For example do not use a hose to wash down the refrigerator. Evidence of moisture entry into any electrical device will void the manufacturer’s warranty!
Maintenance:

Apart from normal levels of cleanliness, it is important that the refrigeration condenser is kept clean and free from dust.

Failure to keep the condenser clean could lead to higher temperatures inside the cabinet, higher running costs, and often a failure of the compressor. A clean condenser is a critical factor in keeping the refrigerator operating correctly. The condenser should be cleaned at least 6 monthly, in some dusty locations this may need to be more frequent. By monitoring the amount “clogging” due to dust, the frequency of cleaning can be adjusted to keep it clean.

Manufacturer's warranty does not cover the failure of the compressor due to a blocked condenser.

Procedure for cleaning the condenser:

- The condenser is located at the top of the cabinet. Access is gained by removing the front panel, this can be removed by lifting and pulling it toward yourself. It looks like an assembly of aluminium fins with a fan arranged to blow air through it.

- Turn off the power at the power point before cleaning the condenser!
- Using a stiff paint brush, carefully remove dust and dirt build-up from the condenser, ensuring that dust is not pushed back into the condenser fins. The use of a vacuum cleaner will help in cleaning up the dislodged material.
The condenser fins may be sharp, take care to avoid personal injury by not directly contacting them with your hands!

The fin material is thin and can be easily bent, take care not to flatten the fins as this may affect the efficiency of the condenser.

### TROUBLESHOOTING:

<table>
<thead>
<tr>
<th>PROBLEM:</th>
<th>POSSIBLE CAUSE:</th>
<th>ACTION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cabinet not working: No display. No fans or refrigeration.</td>
<td>Loss of power.</td>
<td>Check that the mains lead is plugged in. Check that the power point is working.</td>
</tr>
<tr>
<td>Cabinet temperature too high.</td>
<td>Condenser blocked.</td>
<td>• Clean condenser.</td>
</tr>
<tr>
<td></td>
<td>Poor ventilation around cabinet.</td>
<td>• Refer to section on location &amp; installation.</td>
</tr>
<tr>
<td></td>
<td>Refrigeration fault.</td>
<td>• Call service engineer.</td>
</tr>
<tr>
<td></td>
<td>Evaporator iced up.</td>
<td>• Door not closed properly.</td>
</tr>
<tr>
<td></td>
<td>Temperature set too high.</td>
<td>• Check for overloading.</td>
</tr>
<tr>
<td>Cabinet temperature too low.</td>
<td>Temperature set too low.</td>
<td>• Set temperature correctly.</td>
</tr>
<tr>
<td></td>
<td>Refrigeration control fault.</td>
<td>• Call service engineer.</td>
</tr>
<tr>
<td>Temperature display indicates “E1” alarm.</td>
<td>Faulty temperature sensor.</td>
<td>Call service engineer.</td>
</tr>
</tbody>
</table>
**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.**
**PRODUCT WARRANTY**

- This warranty is limited to goods purchased and installed in Australia. Twelve (12) months full warranty on parts and labour by Thermoline Scientific through its authorised dealers or service organizations, will repair or at its option replace any part found to contain a manufacturing defect in material or workmanship without charge to the purchaser for parts, service labour or any necessary shipping or cartage costs for parts only. Replacement or repaired parts will be warranted only for the unexpired portion of the original warranty. This warranty does not apply to damage caused by accident, misuse, fire, flood, or acts of God. It does not apply to damage caused from failure to properly install, operate or maintain the goods in accordance with the printed instructions provided. To obtain prompt warranty and service, simply contact Thermoline Scientific.

- If warranty service is required, Thermoline Scientific will endeavour to have an authorised service organisation carry out the work if there is an available agent, however if it is decided to return the equipment to our main workshop then it is the customers responsibility to pay the freight cost of this return, Thermoline Scientific, after the repair, will return the goods at our cost, to the customer. The customer should always contact Thermoline Scientific for approval to return and seek advice as to the best and most cost effective method of return.

- **Export Warranty:** Limited to the replacement of Parts Only. Supplied Ex Factory, Australia.

- **Limitation of Liability:** Except to the extent not permitted by law, Thermoline Scientific excludes all warranties, conditions and terms implied by law. If any implied warranty, condition or term does exist, Thermoline Scientifiс’s liability for breach of that implied term is limited, at the option of Thermoline Scientific, to replacement or repair of goods or part thereof, or payment of the cost of repairing or replacing the goods or any part of the goods. The buyer does not have, under any circumstances, any cause of action or right to claim or recover from Thermoline Scientific for, and in respect of, any loss or damage of any kind whatsoever, caused directly or indirectly by:
  - Any defect in material or workmanship of, or any other defect whatsoever in, or unsuitability for, any purpose of the goods or any part of the goods; or
  - default or negligence on the part of Thermoline Scientific or of any employee, contractor or agent of Thermoline Scientific, or any person for whom Thermoline Scientific had legal responsibility relating to the supply, or otherwise concerning the goods or any legal part of the goods.