



INSTRUCTION MANUAL

**CAT 6150CP – 6400CP
COOLED INCUBATORS**

**CONTHERM SCIENTIFIC LIMITED
P O BOX 30-605 LOWER HUTT 5040**

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WARRANTY STATEMENT

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CONTHERM Scientific Company will guarantee CONTHERM equipment for a period of twelve months from the date of installation against faulty workmanship and fabricated materials. This guarantee covers the replacement of component parts found to be defective and authorised labour charges during this period.

Should a malfunction occur or condition develop beyond reasonable acceptance the company will accept responsibility for returning the unit to its factory specification at no cost to the Purchaser providing that the operating instructions have been observed and the defect is due solely to faulty design, material and workmanship. That the defective part be returned, freight paid to the nearest sales service office. Units outside the warranty period will be accepted and repairs will be covered under an extension of the above for 90 days.

In remote installations where it is not possible for the company's or agents' engineers to attend, authority may be given to allow the Purchaser to arrange such service.

The Purchaser is required to remit the purchase price of the unit to the supplier within the terms of that supplier's condition of sale. CONTHERM Scientific Company will accept no liability or shall its agents for consequent damage of any kind due to a malfunction or component failure.

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STATEMENT of CONFORMITY

This **CONTHERM** cabinet conforms to the following standards:

- **Electrical Safety:** Complies with AS/NZS3350:1:1994
- **EMC:** Complies with EN 61326-1:1997



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IMPORTANT

All electrical servicing **must** be carried out by suitably qualified personnel only.

SECTION 1 DEFINITION OF TERMS

For the purpose of our standard specifications the following definitions shall apply:

- a) **WORKING SPACE**
That portion of the internal space which is above the lowest shelf and not less than 3cm from any wall (including roof).
 - b) **CABINET TEMPERATURE**
That temperature at the centre of the working space.
 - c) **SPATIAL VARIATION**
The difference between the midrange of all measured temperatures obtained at one site and that at another site for those sites which give the greatest difference.
 - d) **TEMPORAL VARIATION**
The maximum value of the temperature range obtained for the standard site with the greatest range throughout the test interval.
 - e) **TEMPERATURE OVERSHOOT**
Any excess of actual over desired cabinet temperature during a heating up period.
 - f) **TEMPERATURE REPRODUCIBILITY**
Temperature regained without alteration to controls.
 - g) **TEST INTERVAL**
Interval of time to which the steady state characteristics apply (Max 1 hour).
- NB:** All the above apply with an **empty** chamber.
For definitions and test methods refer: **AS2853 : 1986** (and Appendices)

SECTION 2 INTRODUCTION AND SPECIFICATIONS

The CONTHERM 6000CP series PROGRAMMABLE COOLED range of cabinets have been expressly designed to give the widest choice of operating conditions consistent with high reliability and low cost.

All specifications are quoted for a cabinet temperature of 20°C with an ambient temperature of 20°C.

- **Construction** - High quality stainless steel interior, full fibreglass insulation, with non-jar magnetic door catch and corrosive resistant epoxy powder coated exterior.
- **Safety** - Fitted with an independent user adjustable Hi-Limit completely separate from normal controls.
- **Convection** - All units come with mechanical convection fan systems.
- **Electrical** - All quoted at 20°C - ZP21 Micro-Controller mechanical Convection.
 - Designed to AS/NZS 3350.1.1994 220-250V AC M.E.N
- **EMC** - Designed to EN/IEC 61326

PERFORMANCE:

- a) **Temperature:**
- | | |
|----------------------------|-----------------|
| Nominal Range (Lights OFF) | +5°C - 50.0°C |
| (Lights ON) | +10°C - 50.0°C |
| Temporal Variation | ± 0.5°C |
| Spatial Variation | ± 1.5°C |
| Initial Overshoot | +2.0°C |
| Reproducibility | ±0.4°C |
| Dial resolution | 0.1°C |
| Operating Ambient | 10°C - 35°C |
| Mains Voltage Range | 220-250 AC 50Hz |
- b) **Timer:**
- | | |
|-------------------|--------------------------------|
| Timing range | 1 minute - 99 hours 59 minutes |
| Timing Resolution | 1 minute |

NB: Timer does not start timing down **UNTIL** within 2.5°C of the temperature **SET POINT**.

SECTION 3 OPERATING INSTRUCTIONS

This appliance is NOT intended for use by young children or infirm persons without supervision.

To set up unit for operation after unpacking and checking for damage proceed as follows:

- 1) Install shelf runners: Fit lug into selected slot at rear of cabinet sidewall and clip down into front slot to lock into place. Check heights of runners are parallel.
- 2) Fit Shelves. Maximum shelf loading is 30Kg/shelf, maximum total for cabinet is 100Kg.
- 3) Fit stainless steel water tray by placing it on cabinet floor, ensuring that the sloping side is pushed fully to the rear of the cabinet so that the tray is hard up against the back wall to catch any water dripping from the fridge evaporator
- 4) Select a location handy to a 10amp electrical outlet.
- 5) Bench Units - Place on solid top with clearance underneath to allow ventilation around entire cabinet.
- 6) Ensure a space of at least 150mm is allowed at the rear of the cabinet for air circulation.

NB: Ensure **ALL** of the distinctly coloured cable ties (If fitted inside cabinet) are **REMOVED BEFORE** operating the incubator.

OPERATING CONTROLLER:

- 1) Plug cabinet into 220-250V Mains outlet.
- 2) Turn on main switch - The LED display should show all 8888s then display the current temperature in the cabinet. Do **NOT** press any buttons until after the 8888's have gone from the display.
- 3) Press and HOLD the temperature button (top) UNTIL the 'SET' LED comes ON then RELEASE. The 'SET' LED above the LED display should now be ON!
- 4) Press the Centre button ("PROG") until the 'SET' LED comes ON then release, the current program number will be displayed. The display will show "P1" for program No1 and "P2 " for program No2. If the LED display does NOT show "P1 " change it to program No1 by using the "UP" or "DOWN" buttons. When finished just leave the keys for 10 seconds and the "SET" led will go out and the controller will return to the normal operating mode.

NB: LIGHTING (if Fitted) WILL COME ON WHEN PROGRAM No2 IS SELECTED!

- 5) While the 'SET' LED is On use the 'UP' & DOWN' buttons to adjust the SET POINT to the desired temperature.
- 6) WAIT for the display to return to normal; the 'SET' LED will then go off.
- 7) The TIMER must now be set to run the cabinet - use the SAME method as for the temperature EXCEPT press the 'TIME' button instead. To obtain the special '[.]' symbol for continuous operation, first adjust the timer down until '0.00' is reached, then press the down button once more to get '99:59' then the 'up' button to go 1 step above '99:59' the special '[.]' symbol should now be shown.
NB: the symbol '[.]' means run **CONTINUOUSLY**.
Setting the TIMER to **0.00** turns the cabinet **OFF**.
If the cabinet has **TURNED OFF** after the completion of a TIMED operating period it is only necessary to PRESS and HOLD the TIMER button until the 'SET' led comes on to **REPEAT** the TIMED run.
- 8) The cabinet will now attempt to obtain the SET POINT and control until the TIMER runs out of time.
- 9) To look at the current TIME press the 'TIME' button for 2 seconds - the amount of time left will now be displayed continuously.
To display the TEMPERATURE continuously - press the 'TEMP' button for 2 seconds.
- 10) To CANCEL any Alarm (ie. 1- - -) PRESS and HOLD the 'TEMP' button until the 'SET' LED comes ON.
- 11) **NB:** When first supplied the mechanical USER HI-LIMIT may be turned OFF (Fully anticlockwise). Ensure it is turned sufficiently clockwise to allow the cabinet to operate correctly. (See next page)

NB: The condensate water from the cooling coil is collected by the internal stainless steel floor Tray. Under some conditions moisture may form on the glass door or cabinet wall/floor. If the cabinet is operated under conditions where the inner glass door is opened frequently, excess moisture may overflow the stainless tray.

Programming example for CAT 6000 Series Incubators

This example shows how to program a cooled incubator for 12Hrs LIGHT @ 24°C and 12Hrs DARK @ 15°C

NB: The lights are always ON when program No2 (P2) is running and OFF when program No1 (P1) is running – this CANNOT be changed as it is built into the hardware.

To setup for 12Hrs LIGHTS ON and +24°C:

- Press the 'PROG' button until the 'SET' led comes on then press either the 'UP' or 'DOWN' buttons until 'P2' is shown on the LCD display. – WAIT until the 'SET' led goes off – you have now selected program No2
- Press the 'TIME' button until the 'SET' led comes on then press the 'UP' or 'DOWN' buttons to set the time to '12:00'. – WAIT until the 'SET' led goes off – you have now set the time on program No2 to 12:00 (12hrs).

NB: if you take too long to carry out the previous step and the timer happens to be set to '0:00' the controller may automatically advance to the next program step which is program No1 (P1).

- Press the 'TEMP' button until the 'SET' led comes on then press the 'UP' or 'DOWN' buttons to set the TEMPERATURE to '24.0' – WAIT until the 'SET' led goes off – you have now set the desired temperature on program No2 (P2) to +24°C.

To setup for 12Hrs LIGHTS OFF and +15°C:

- Press the 'PROG' button until the 'SET' led comes on then press either the 'UP' or 'DOWN' buttons until 'P1' is shown on the LCD display. – WAIT until the 'SET' led goes off – you have now selected program No1
- Press the 'TIME' button until the 'SET' led comes on then press the 'UP' or 'DOWN' buttons to set the time to '12:00'. – WAIT until the 'SET' led goes off – you have now set the time on program No1 to 12:00 (12hrs).

NB: if you take too long to carry out the previous step and the timer happens to be set to '0:00' the controller may automatically advance to the next program step which is program No2 (P2).

- Press the 'TEMP' button until the 'SET' led comes on then press the 'UP' or 'DOWN' buttons to set the TEMPERATURE to '15.0' – WAIT until the 'SET' led goes off – you have now set the desired temperature on program No1 (P1) to +15°C.

The controller continuously cycles between whichever program it is currently on (say P2) and the other program (P1). IE it will run P2 for 12 hours and then change to P1 for 12hours and then back to P2 for 12 hours. Whenever it changes onto P2 the lights will turn ON.

If power is removed from the cabinet for any reason, it will ALWAYS start with program No1 (P1).

MECHANICAL HI-LIMIT MONITOR

The mechanical hi-limit is provided as a secondary safety device to protect the cabinet from over temperature in the event of electronic controller failure.

To set the Mechanical Hi-Limit

Turn the Hi-Limit control **FULLY CLOCKWISE**.

Allow the cabinet to stabilise at the required operating temperature (for at least 1 hour), then turn the Hi-Limit control anti-clockwise until the **MONITOR** neon comes on (or a slight 'click' is felt). Now turn the Hi-Limit control **SLOWLY CLOCKWISE** until the **MONITOR** neon goes off, then advance the Hi-limit clockwise 1-2 scale markings. This will set the Hi-Limit trip point about 3 - 4°C above the current cabinet temperature.

WARNING: To prevent **FIRE** or **SHOCK** hazard, **DO NOT** expose this product to rain or any type of moisture.

FOR YOUR SAFETY

To ensure safe operation the three-pin plug supplied must be inserted **ONLY** into a standard three-pin power outlet that is effectively earthed through the normal building wiring.

Extension cords are **NOT** recommended.

The fact that the equipment operates satisfactorily does **NOT** imply that the power outlet is earthed and that the installation is completely safe. For your safety, if in any doubt about the effective earthing of the power outlet, consult a qualified electrician.

This appliance should be periodically tested according to the procedures prescribed in **AS/NZS 3760**.

The basic safety checks and tests on electrical appliances required by **AS/NZS 3760** are:

1. A visual check to ensure that there is no mechanical damage to the supply cord, that controls etc. are in good working order and that no parts are missing.
2. An earth continuity test.
3. An insulation resistance test.

In order to provide evidence of compliance, a label (signed and dated by the person testing the equipment) may be placed on the tested appliance.

ALARMS

All alarms are indicated by a number and three dashes on the LED display and are accompanied by an audible alarm.

To **CANCEL** any Alarm (ie 1---) PRESS and HOLD the `TEMP' button until the 'SET' LED comes ON.

ALARM MEANING

- 1--- This means the cabinet is OVER or UNDER temperature. If UNDER temperature it could be due to the door being opened, otherwise check the cabinet to determine if the Internal fan is still operating and that the MECHANICAL Hi-Limit control is not interfering with normal operation.

- 3--- Preset alarm - The cabinet has lost its control settings due to an internal memory failure. Reset all control settings as desired.

- 4--- This means that the TEMPERATURE sensing probe has failed (1000 Ω RTD). The connections to the probe and the probe condition should be investigated.

- 9--- This is a WATCHDOG alarm - The Electronic PCB has failed - Replace the controller.

CALIBRATION

Calibration should be carried out at 20.0°C or at the temperature of interest, with the thermometer in the centre of the working chamber with the chamber empty and any lighting OFF.

NB: A cooled incubator will typically cool to a minimum temperature of 15°C below the current ambient temperature, the calibration temperature must be within the achievable operating range of the cooled incubator.

- 1) Place the Calibration Thermometer probe in the workspace centre, close the door and set the controller for 20.0°C or the temperature of interest, allow at least 1 hour to stabilise.
- 2) Read the temperature on the Calibration Thermometer.
- 3) To calibrate the cabinet -
 - a) Press and HOLD the `TEMP' button until the 'SET' LED comes ON and then release. The 'SET' led should now be ON.
 - b) WHILE the 'SET' led is ON: Press BOTH `UP' & `DOWN' buttons **TOGETHER** - a beep will be heard and the word `CAL' will appear briefly on the LED display. Adjust the reading on the LED display using the `UP' & `DOWN' buttons until it agrees with the Calibration Thermometer.

NB: If when attempting to press BOTH buttons together, the temperature SET POINT adjusts either up or down - it means you are NOT pressing BOTH buttons at the SAME TIME! - if the 'SET' led is still on you should attempt 3(b) again, if the 'SET' led is OFF you should repeat from 3 (a).
 - c) WAIT for a further beep to occur, the LED display will briefly show `----' and then the **CALIBRATION CONSTANT**, this will be a number in the range 0.0 to 19.9. This figure SHOULD BE NOTED as it may be used to return to this calibration setting. The LED will then briefly show another `---' and the controller will resume its role of normal operation.

NB: If a '[][][]' sign appears on the display the cabinet is OUTSIDE its calibration display range and calibration should be performed at a slightly higher temperature.
- 4) Allow to stabilise again - the temperature should now be correct. If NOT repeat the procedure.

NB: The calibration can only be performed within limits, if the calibration cannot be achieved a further fault exists.

VERIFYING CABINET PERFORMANCE

There are two basic tests that may be carried out to verify cabinet performance.

NB: These tests MUST be carried out with the cabinet EMPTY and at the specified ambient of +20°C.

TEMPORAL PERFORMANCE:

The cabinet should be set to operate at the Contherm specified calibration conditions.

Temporal performance is tested by placing a suitable (calibrated) test probe in the centre of the workspace and recording the readings for up to 1 hour AFTER the cabinet has FULLY STABILISED.

The cabinet has fully stabilised when the average temperature is no longer increasing or decreasing over time.

The result should be within the quoted specification.

This result is a function of the cabinet control system, sensor and airflow.

SPATIAL PERFORMANCE:

The cabinet should be set to operate at the Contherm specified calibration conditions.

Check Spatial Variation @ 20°C

(Refer manual for specification, 8 points as per diagram)

[6R]	[4C]	[3R]	TOP
[8C]	[1C]	[]	CEN
[2F]	[7C]	[6F]	BOT

(Where F=Front, C=Center, R=rear)

Spatial performance is tested by placing suitable (calibrated) test probes (usually thermocouples) in the eight specified positions and recording the readings for up to 1 hour AFTER the cabinet has FULLY STABILISED.

The cabinet has fully stabilised when the average temperature is no longer increasing or decreasing over time.

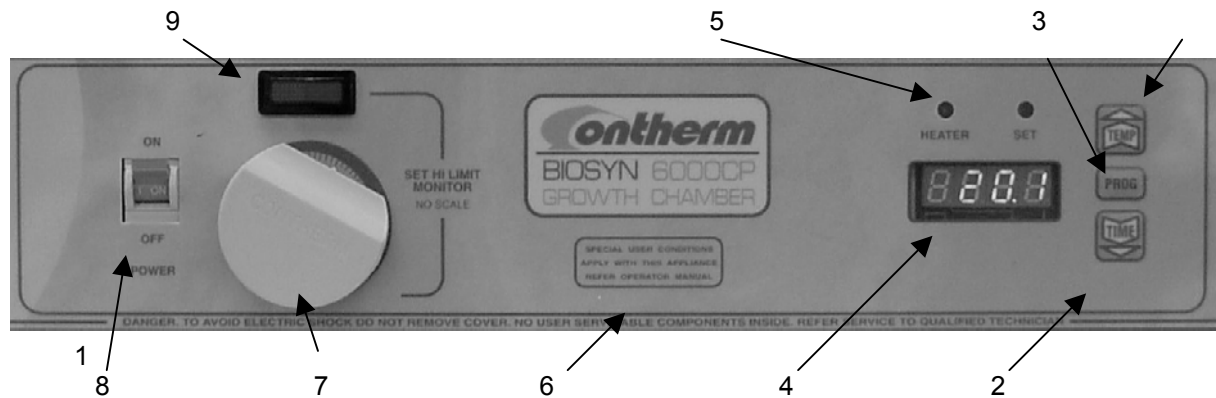
The sensors must be no closer than 30mm to any wall or roof and must be above the lowest shelf position by at least 30mm.

The result should be within the quoted specification.

This result is a function of the cabinet design and air distribution.

The spatial test must be performed with all doors, vents etc CLOSED and the measuring sensors must be very closely matched at the specified temperature.

CONTROL LAYOUT



- 1 Temperature adjustment button. (Also used to adjust set points)
- 2 Time adjustment button.
(Also used to adjust set points)
- 3 Program Button. (Lights are ON when 'P2' is selected).
- 4 LED Display - Gives readout of temperature in degrees centigrade OR elapsed time in hours and minutes.
- 5 LED Indicators - Left LED indicates when the element is ON. Right LED indicates when controller is in SET mode.
- 6 Refer "Caution" Instructions.
- 7 Mechanical Hi-limit set Adjustment Knob (No Scale).
- 8 Mains Switch and Circuit Breaker (10A) combined.
- 9 Hi-Limit Monitor Neon- will come on if power is being applied to heater element while mechanical Hi-Limit is tripped.

SECTION 4 THEORY OF OPERATION

This CONTHERM General Purpose Incubator uses a single chip microprocessor electronic PID controller with a 1000 Ω Resistance RTD probe as the temperature sensing element. The LED display gives a direct readout of the SET POINT or Cabinet temperature in degrees centigrade.

The air inside the incubator is circulated by a small stirring MOTOR which draws air in at the top of the chamber and discharges it down behind a false back to the bottom, resulting in a vertical air flow.

The sheathed HEATING ELEMENT is located adjacent to the air rotor such that the discharged air passes over the active portion of the element.

The chamber temperature is measured by a RTD SENSOR the resistance of which increases with increasing air temperature. This change of resistance is used by the ZP21 CONTROLLER to regulate the cabinet temperature to the desired value.

Setting and Calibration of the chamber temperature is performed via the adjustment buttons and is stored in non volatile memory. Settings will typically be retained for up to 100 years even in the absence of power.

The type of cabinet (INCUBATOR, OVEN, C or MCP) is selected at the factory by special button sequences during the power on period and stored in the non volatile memory.

An internal glass door allows the contents to be viewed without disturbing the internal temperature.

COOLING is provided by a standard refrigeration unit. The cooling compressor runs continuously. An automatic defrost is provided at temperatures below 25°C.

LIGHTING is provided by standard flourescent tubes, the lighting always comes ON when running Program No2.

REFRIGERATION

REFRIGERATION MAINTENANCE

If the unit is going to be stored for some period after the refrigeration has been used for some length, a drying out period is necessary to remove moisture from the element well. This could be done by setting a temperature of approximately +35°C and have the unit operating with the door slightly ajar to allow for the drying out of the moisture in the interior.

Once the unit is suitably dried it can be closed up and stored without further problems.

REFRIGERATION DATA:

MODEL	6150CP	6200CP	6300CP	6400CP
COMPRESSOR: Electrolux	GL60AA	GL60AA	GL60AA	GL60AA
CONDENSER:	S12/21	S12/21	S16/21	S20/21
COOLING COIL:	G6/18HG	G6/21HG	G8/21HG	G10/21HG
DEFROST VALVE:	IF FITTED: COMMON TO ALLSPORLAN E3S120			
CRANKCASE VALVE:	IF FITTED: COMMON TO ALLSPORLAN CRO			
REFRIGERANT:	COMMON TO ALL.....R134a			
REFRIGERANT CONTROL: Capillary Type	5/044	5/044	5/044	6/044
DRYER:	COMMON TO ALLSweat Type MA256			
COMP COOLING FAN:	COMMON TO ALL.....SUNON 2123 HTB			

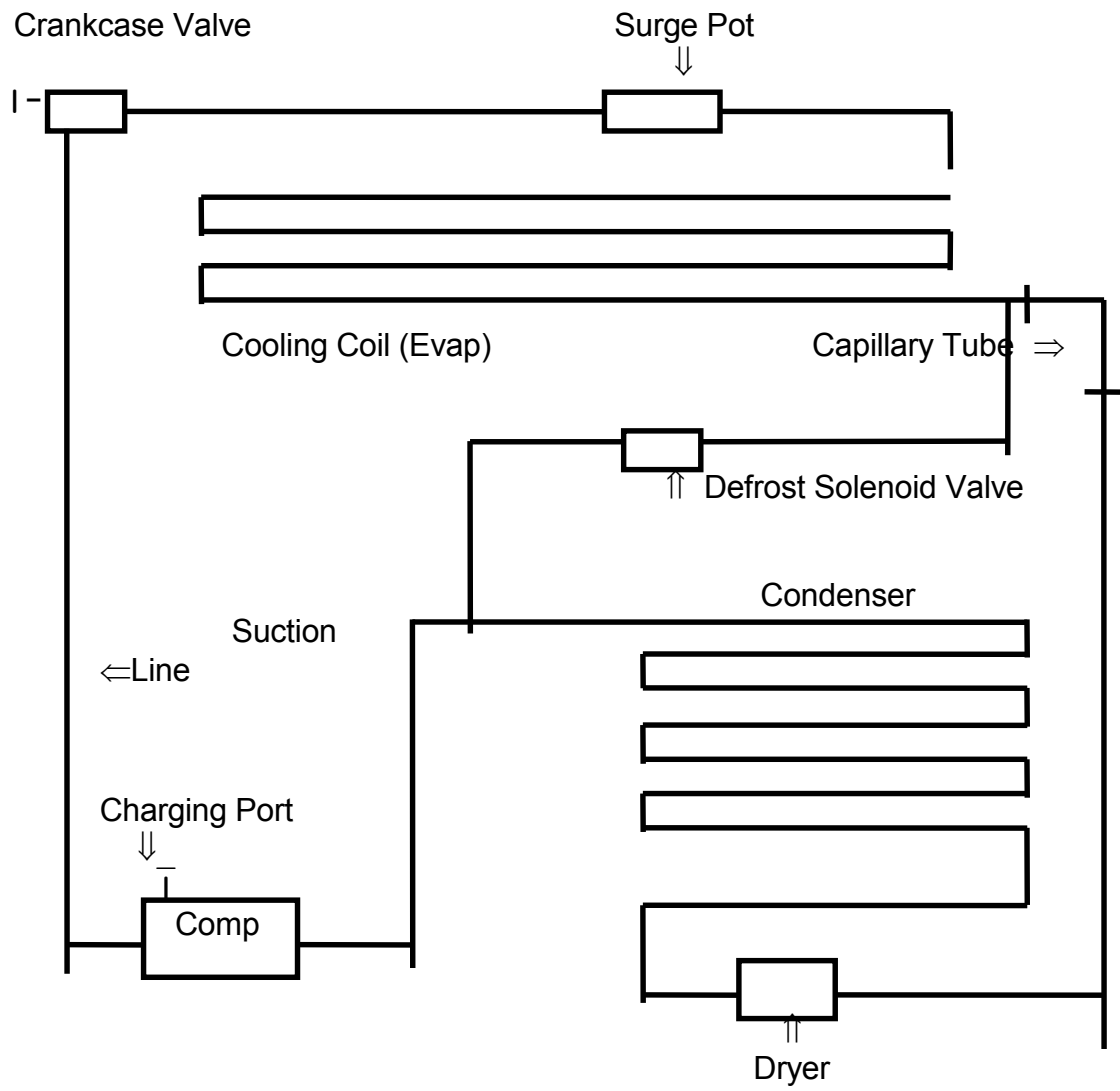
The refrigeration System is designed to maintain the internal cabinet temperature of +5°C - +50°C with ambients of up to +20°C

Components of the system are shown on the schematic diagram.

The condensate water from the cooling coil is collected by the internal stainless steel floor Tray. Under some conditions moisture may form on the glass door or cabinet wall/floor. If the cabinet is operated under conditions where the inner glass door is opened frequently, excess moisture may overflow the stainless tray.

The refrigeration system condenser located on the External rear of the cabinet is cooled by natural convection, therefore, it is important to ensure no obstructions are placed to prevent normal ventilation around the cabinet. The condenser will slowly collect a layer of dust, therefore it is recommended that once a year it is brushed clean with a small broom.

REFRIGERATION SCHEMATIC DIAGRAM



COMPONENT LOCATION

Inside Cabinet Behind False Back: Cooling Coil, Surge Pot

Inside cabinet base : Compressor, Condenser, Dryer, Defrost Solenoid Valve, Crankcase Valve

SECTION 5 TROUBLESHOOTING AND MAINTENANCE

MAINTENANCE

The epoxy powder coated mild steel exterior is resistant to corrosion and spillage's and should be wiped with a damp cloth occasionally to maintain its appearance.

The fan motor bearings do not require lubrication under normal conditions.

The stainless steel interior and shelves should be kept clean with a damp cloth. Take care that the temperature probe is not damaged during cleaning of the interior base.

Any spillage or breakage within the cabinet should be cleaned up immediately with the cabinet switched off and unplugged at the mains.

ELECTRICAL SAFETY

This appliance should be tested for insulation and earthing continuity at regular intervals according to **AS/NZS 3760**.

The basic safety checks and tests on electrical appliances required by **AS/NZS 3760** are:

1. A visual check to ensure that there is no mechanical damage to the supply cord, that controls etc. are in good working order and that no parts are missing.
2. An earth continuity test.
3. An insulation resistance test.

In order to provide evidence of compliance, a label (signed and dated by the person testing the equipment) may be placed on the tested appliance.

FAN MOTOR

The fan motor on ALL models should be permanently wired so that it is energised whenever power is applied to the cabinet.

The ZP21 PCB is equipped with a green "HEARTBEAT" LED adjacent to the large buzzer. When the cabinet is operating this LED should be PULSING about once per second. There are also TWO small glass fuses to protect the PCB. REMOVE ALL power from the unit (By removing the mains plug) BEFORE attempting to check these fuses.

TROUBLESHOOTING:

- A) **CABINET COMPLETELY DEAD:**
- Check wall socket and wall socket circuit breakers.
- B) **LARGE TEMPERATURE VARIATION IN CABINET, CONTROLLER
'HEATER' LED PULSING :**
- Internal fan not operating (Check for air movement inside cabinet).
- Cabinet OVERLOADED with samples, remove some samples to allow for better air movement.
- Look for HI-LIMIT Monitor neon coming on, if so indicates mechanical Hi-Limit is set too low.
- C) **CABINET NOT CONTROLLING AT TEMPERATURE, 'HEATER' LED
NOT FLASHING :**
- Check that the timer has been correctly set, if the timer is set to '0:00' the cabinet will NOT operate.
- D) **CABINET NOT FUNCTIONING NORMALLY AND CALIBRATION
SHIFTED FROM NORMAL:**
- Confirm controller set type by turning cabinet off at main switch, HOLD down BOTH the 'UP & 'DOWN' buttons TOGETHER, turn power back on and when 8888's are displayed on LED IMMEDIATELY release and then PRESS the 'PROG' & 'TIME' buttons TOGETHER – an answering 'BEEP' 'BEEP' should be heard.
- E) **INSUFFICIENT COOLING :**
Performance is dependent on the ambient temperature. Typical performance is 15°C below ambient (LIGHTS OFF) and 10°C below ambient (LIGHTS ON). If lights are on also check operation of door cooling fan.
- F) **LIGHTS DO NOT WORK and NO AUTO DEFROST :**
NB: lights will ONLY work when cabinet is on P2. ENSURE ALL POWER TO CABINET IS OFF then check 1.0AMP FUSE on ZP21 PCB. This fuse MUST ONLY BE REPLACED BY A 1.0AMP ANTISURGE TYPE FUSE.

REMOVAL AND REPLACEMENT OF ZP21 CONTROLLER PCB

The following should only be carried out by suitably qualified electrical personnel.

NB: ENSURE that power cord has been **REMOVED** from the wall socket **BEFORE** attempting to remove the PCB.

- a) Loosen the two black plastic fasteners holding the cabinet lid down by turning anticlockwise so that the pop up. Lift the lid up at the front and remove from cabinet.
- b) Remove the two self tapping screws at either end of the control panel and rotate the panel up so that it rests on the cabinet top.
- c) **ENSURE POWER CORD is REMOVED** from wall socket then Unplug socket from Controller PC Board. NOTE connections from side 10way socket to sensor probe etc so that they can be correctly reinstalled, then disconnect probe etc from socket.
- d) Using suitable socket undo four 4mm securing nuts. Carefully NOTE position and size of SPACERS
- e) Remove PC Board.
List FULLY all fault details, carefully pack, return to Agent for repair. ALWAYS supply contact details and FULL physical return address.
The refitting of the controller should be done in the reverse order as above, taking care when reconnecting the sensor etc that they are connected to the correct socket holes.
- f) Carry out Insulation (use 500V insulation tester) and earth continuity check BEFORE applying power to cabinet. (as per **AS/NZS 3760** – In-service safety inspection and testing of electrical equipment).
The basic safety checks and tests on electrical appliances required by **AS/NZS 3760** are:
 1. A visual check to ensure that there is no mechanical damage to the supply cord, that controls etc. are in good working order and that no parts are missing.
 2. An earth continuity test.
 3. An insulation resistance test.

In order to provide evidence of compliance, a label (signed and dated by the person testing the equipment) may be placed on the tested appliance.

N.B: Check for loose wires that may have been missed, particularly the earth wires.