Fisher&Paykel appliances

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Service Manual

RF201A Active Smart USA Refrigerator Freezer

819091D

The specifications and servicing procedures outlined in this manual are subject to change without notice.

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CONTENTS

1. SPECIFICATIONS

1.1 CABINET SPECIFICATIONS

DIMENSIONS	RF201A
Height	70 inches
Depth	28 ¾ inches
Width	35 ½ inches
CAPACITY GROSS VOLUME	
Provision Compartment	14.1 cu.ft.
Freezer Compartment	4.13 cu.ft.
TOTAL	18.25 cu.ft.
ELECTRONICS	
Display Module	Part No. 814857P
Power/Control Module	Part No. 817859P
Module/Inverter	Part No. 837126
SUCTION LINE ASSEMBLY	
Part Number	817864
DEFROST ELEMENT	
Part Number	884125P

1.2 COMPRESSOR SPECIFICATIONS

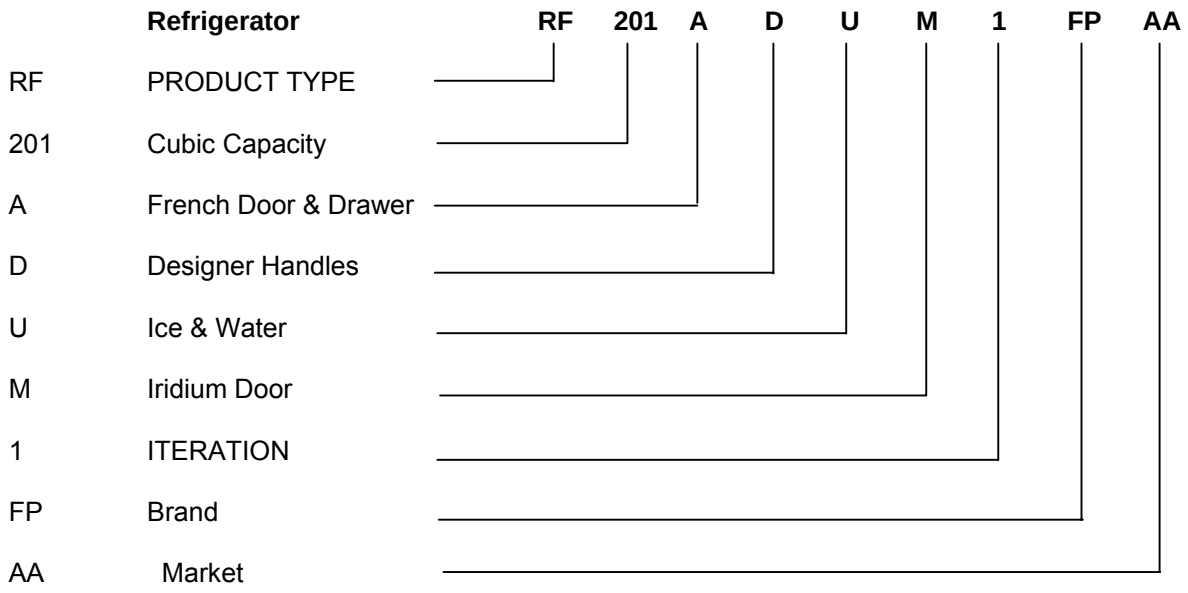
Make	Embraco
Model	VEG Y6H
Part Number	884259
Volts	230
Hertz	53 - 150
Phase	3
Input Watts	55.7 - 205
Output Watts	97 - 468
Nominal BTU	330 - 1596
Start Resistance (Ohms)	6.40
Run Resistance (Ohms)	6.40
Starting Device Type	Inverter
Oil Charge (cm^3)	430
Refrigerant Type	R134a
Gas Charge	6.4ozs (180 Grams) of R134a

1.3 ELECTRICAL SPECIFICATIONS

Rated Voltage	120 Volts
Rated Current	1.75 amps
Frequency	60 Hz
Heater Flapper	12 Volt
	10 Watt
	15 Ohms
Defrost Element	110V
	355 Watts
Light Bulb	12 volt

2 MODEL NUMBER IDENTIFICATION

1	2	3	4	5	6	7	8	9
RF	**201**	**A**	**D**	**U**	**M**	**1**	**FP**	**AA**
Product Type	**Cubic Capacity of cabinet** 201 = 20 cubic feet	**French Doors**	**Designer Handles**	**Ice & Water**	**Colour** M = Iridium X = S/S EZKLEEN	**Iteration**	**Brand**	**Market**



3 SERVICING REQUIREMENTS

3.1 SPECIALISED SERVICE TOOLS

For the servicing of this product, specialised tools are needed.

Static Strap

To be used as ESD protection when replacing the console board.

Interface Pen Mk 2

Used to retrieve and download data from the electronic control module along with the diagnostic programme on a laptop. Part number 425930.

3.2 HEALTH & SAFETY

Good Work Practices

1. Take care while removing all plastic components, especially when cold.
2. Leave the product clean and tidy when service work is completed.
3. Extreme heat in cabinets will cause plastic deterioration or distortion and thermal fuses in the evaporator to go open circuit (be careful with heat guns).

Environmental Health And Safety

When servicing products, consider safety and health issues and requirements, which must be adhered to at all times. Specific safety issues are:

1. Electrical safety.
2. Electrostatic discharge.
3. Mixing of foam insulation.
4. Vapours while brazing.
5. Reclaiming of refrigerant.

Good Practice And Safety

1. Take care when removing or servicing all electrical components to avoid electrical shock or short circuit conditions.
2. Take care when removing plastic components at low temperatures as breakages can occur with these components.
3. Extreme heating of plastic components can cause distortion of those parts being heated.
4. Avoid overheating temperature sensitive devices such as the element thermal fuse and cabinet sensors.
5. Avoid using solvents and citrus based cleaners on all plastic parts. We advise only warm soapy water be used.

4 INSTALLATION INSTRUCTIONS

4.1 LEVELLING COMPONENTS

Front and rear rollers are fitted ex factory.
Cabinet levelling can be done by adjustment of the front roller-levelling wheel fitted ex factory. See diagram 4.1B
Weight should be lifted off cabinet for ease of adjustment.

CURRENT TYPE

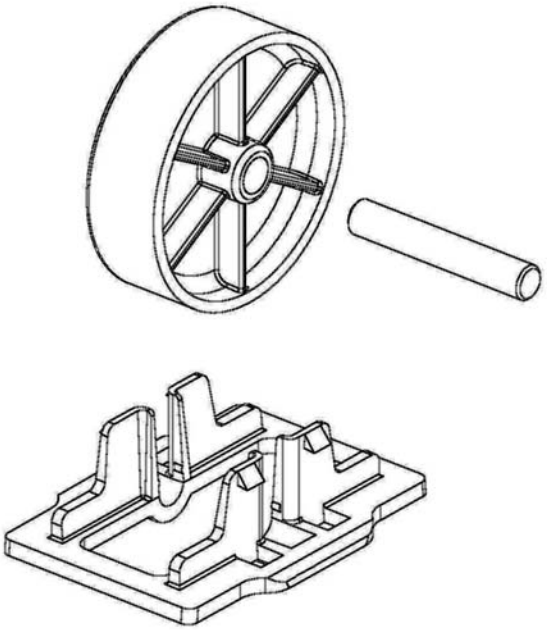


Diagram A (Rear Roller)

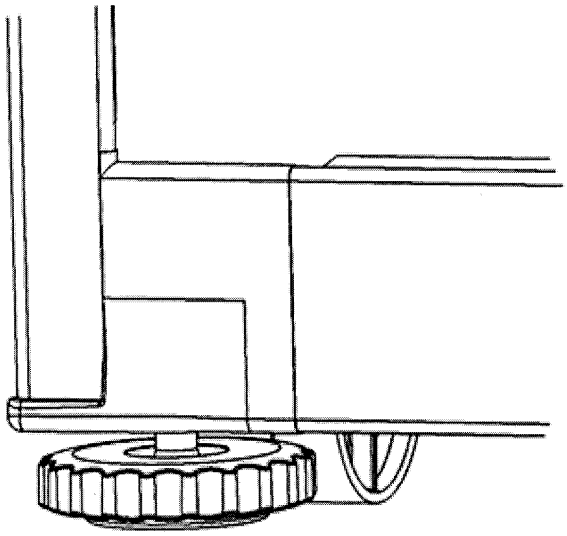


Diagram B (Front Leveller & Roller)

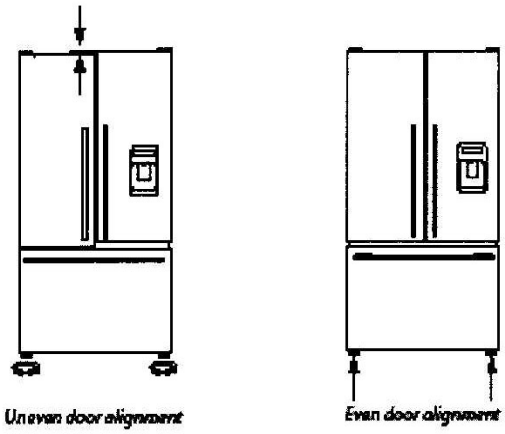
4.2 LEVELLING THE CABINET

The word 'level' is somewhat of a misnomer, as a 'spirit level' need not be used to set the appliance level. It is preferable to have the appliance level in appearance where both doors will close with the aid of the door closing components. It is also important that the appliance sits solidly on the floor.

Cabinet levelling can be done by adjustment of the front roller-levelling wheel fitted ex factory.

Weight should be lifted off the cabinet for ease of adjustment.

The product should be levelled with the majority of the weight on the right hand hinge side front foot.



The opposite side of the front foot should then be adjusted to stabilise the product. Measure the gap between the roller and the floor. This distance should be the depth of the rear packing material.

Cut the solid packing material to the depth and place the material against the wall and push the product on top of material.

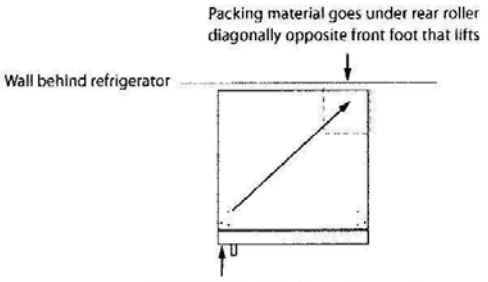


Fig.Stabilizing your refrigerator

Unlevelled floors:
Gently push the refrigerator back until the rear rollers contact floor.

Measure the gap under the front foot, which has come off the floor.

Obtain some solid packing material (hardwood, plastic etc), which fits firmly into the gap under the foot.

Note: do not use metallic materials that may corrode and stain or damage floor coverings.

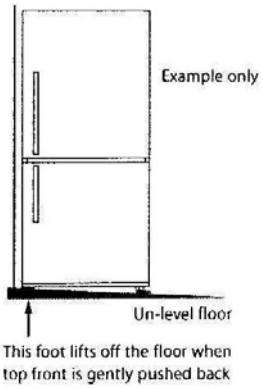


Fig.Unstable refrigerator

4.3 AIR SPACE REQUIREMENTS

On all refrigerators and freezers it is important that an air gap is left around the product:

- 2 inches clearance at the top.
- ¾ inch clearance each side.
- 1 inch clearance at the back.

5 THEORY OF OPERATION

5.1 TERMS

CABINET WRAPPER
Pre-painted steel.

LINER
A one piece vacuum formed ABS liner with a plug-in divider.

DIVIDER PARTITION
Injected moulding of HIPS, with two outer injected moulded housings, and an insulated ducted moulded polystyrene inner core.

FAN MOTORS
DC 12 volt brushless variable speed fan motors for air circulation in both 1 x FC and 1 x PC compartments.

EVAPORATOR
Aluminium Fin on Tube type mounted vertically on the back wall of the FC.

SUCTION & CAPILLARY LINE
Foamed into the back of the cabinet with all joints of the evaporator having been brazed in the FC.

POWER / CONTROL MODULE
Contains the microprocessor that controls all functions of the refrigerator and gathers data from the sensors. This module also contains support circuitry to switch the various outputs.

DISPLAY MODULE
Using signals from the Power Module, this module generates the LED display. The lamp is also switched from this module.

REED SENSORS
A reed switch encapsulated within a plastic housing, mounted on the cross and base rails behind a plastic cover. A magnet housed just under the lower end cap of each door activates this reed switch when the door is closed.

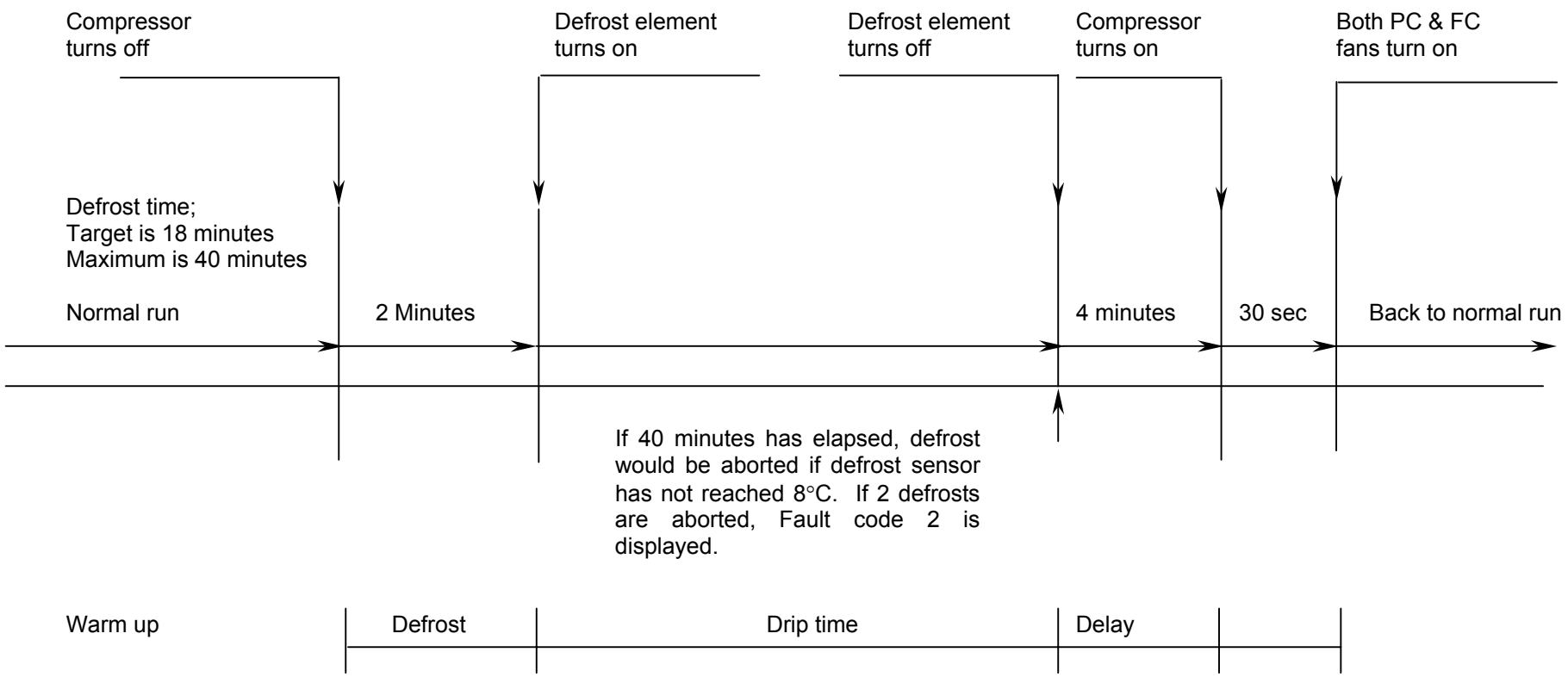
COMPARTMENTS
In this manual we refer to the refrigerator compartments as follows:
PC = Provision or fresh food compartment.
FC = Freezer compartment.

LOW AMBIENT HEATER
Blanket wire type used in divider.

5.2 DEFROST CYCLE

The following table outlines the defrost cycle of an Active Smart refrigerator.

Defrost Cycle of the Active Smart Refrigerator (With Fin On Tube Evaporator)



5.3 THE REFRIGERATION CYCLE

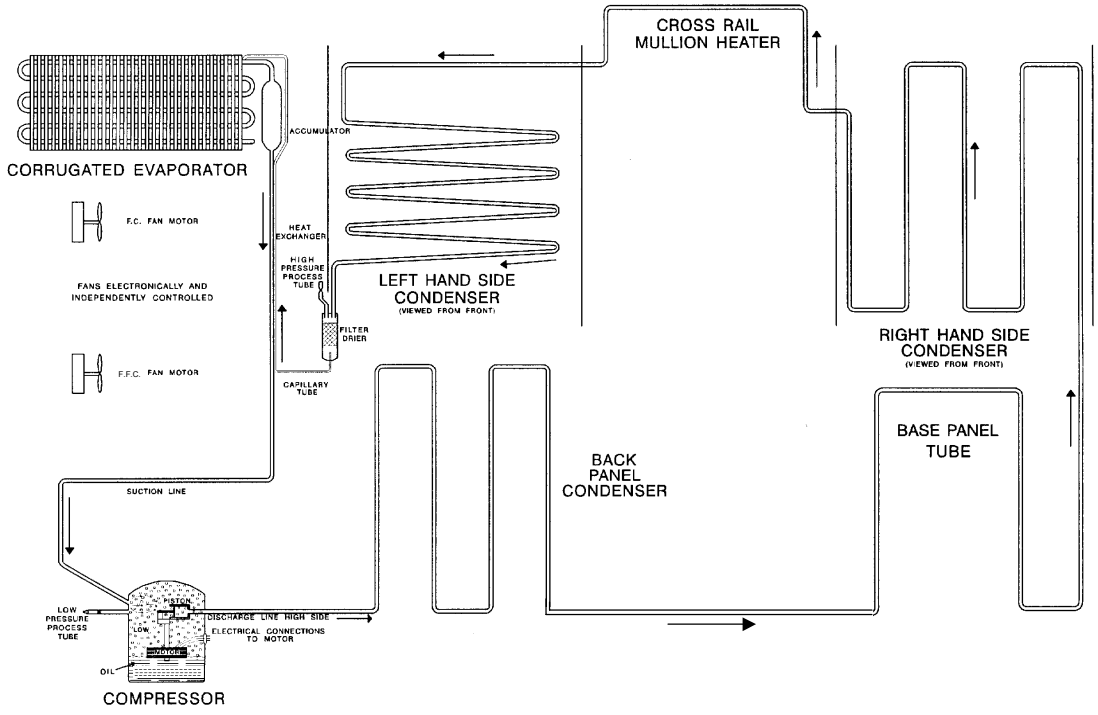
The compressor discharges high pressure, high temperature gas into the back panel condenser circuit first, returning via the oil cooler in the compressor and entering the side condenser in the cabinet by way of the base tube. This tube runs from the compressor compartment forward to the front bottom edge of the cabinet, returning down the left hand side to be connected to the left hand side condenser coil (viewed from the rear of the cabinet).

A loop from this condenser coil forms the cross rail mullion on dual temperature cabinets. The condenser then continues across the top front edge of the cabinet to form the right hand side condenser entering the filter drier, which is mounted vertically in the unit compartment.

Now the high-pressure gas has been condensed, the liquid refrigerant flows through the capillary tube entering the evaporator mounted in the freezer compartment. The liquid refrigerant then boils off due to the low suction pressure applied to within the evaporator from the compressor. The heat-laden vapour is drawn back to the compressor by way of the suction line to start the cycle all over again.

The above information relates to the cabinet, not the drawing below.

SINGLE EVAPORATOR TWIN FAN SYSTEM

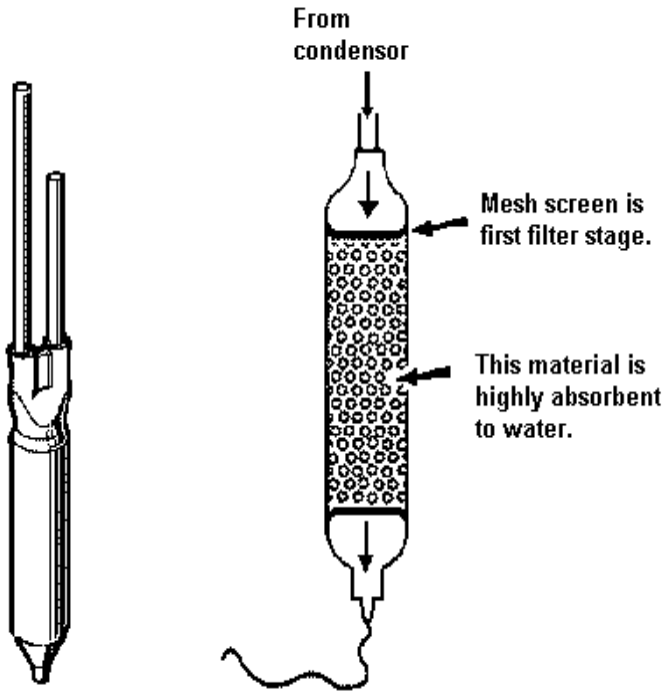


5.4 SERVICING FEATURES

Condensate Disposal

During the defrost cycle, which is electronically timed and controlled, live frost is melted off the evaporator by means of heat from the defrost element. Condensate from the evaporator defrosting drops into a collection trough, which has an outlet hole in the centre of the liner. A tube then allows the condensate to flow into a water evaporation tray above the compressor.

Filter Drier



The filter drier or molecular sieve, as the name suggests, is both a filter and a drier. Whenever a system is opened it is essential that the filter drier is replaced. ALWAYS ensure that replacement filter driers are kept well sealed and airtight prior to being fitted to a system.

PLEASE NOTE: When filter driers are replaced on systems being serviced, it is important that the filter drier is either cut from the system or the desiccant is removed before heat is applied to the old filter drier. Failure to do so will drive any moisture held in the desiccant back into the system.

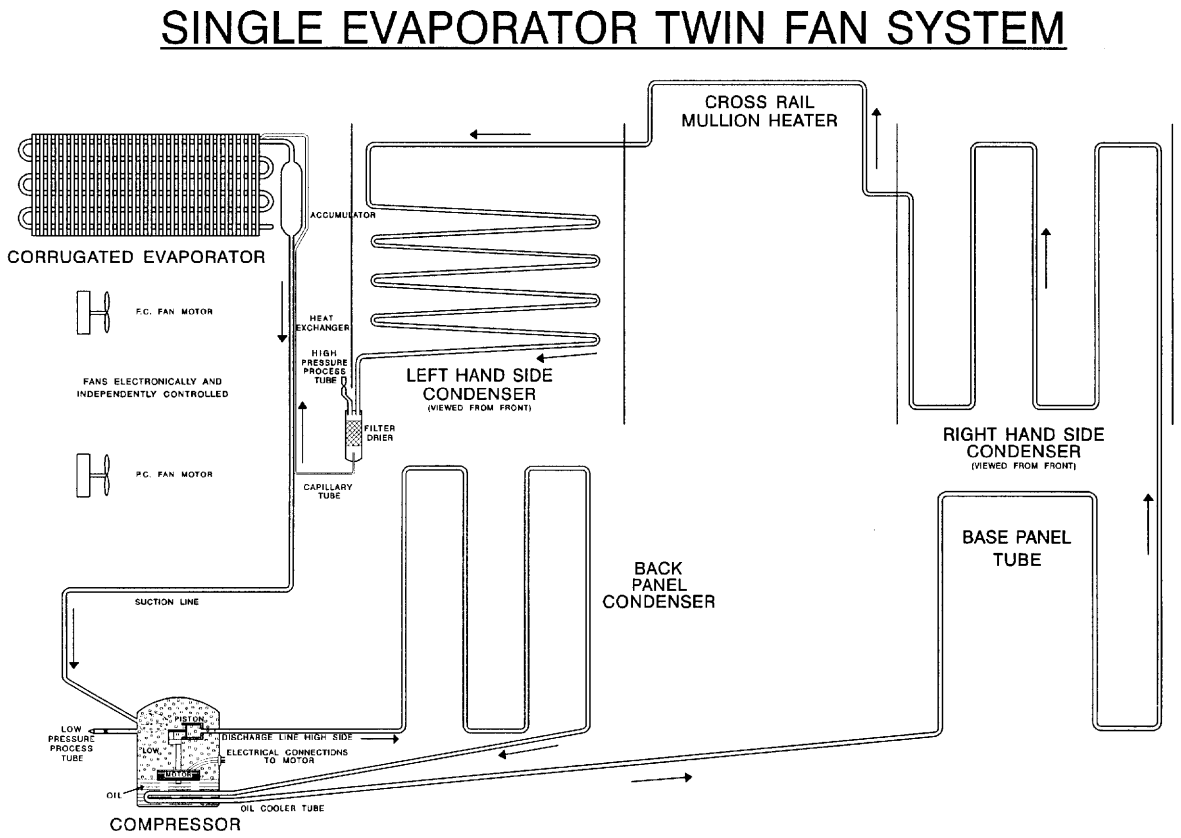
ALWAYS mount vertically or as near to vertical as possible and use the correct desiccant to suit the refrigerant being used.

XH7 or XH9 suits R134a.

Internal Condenser

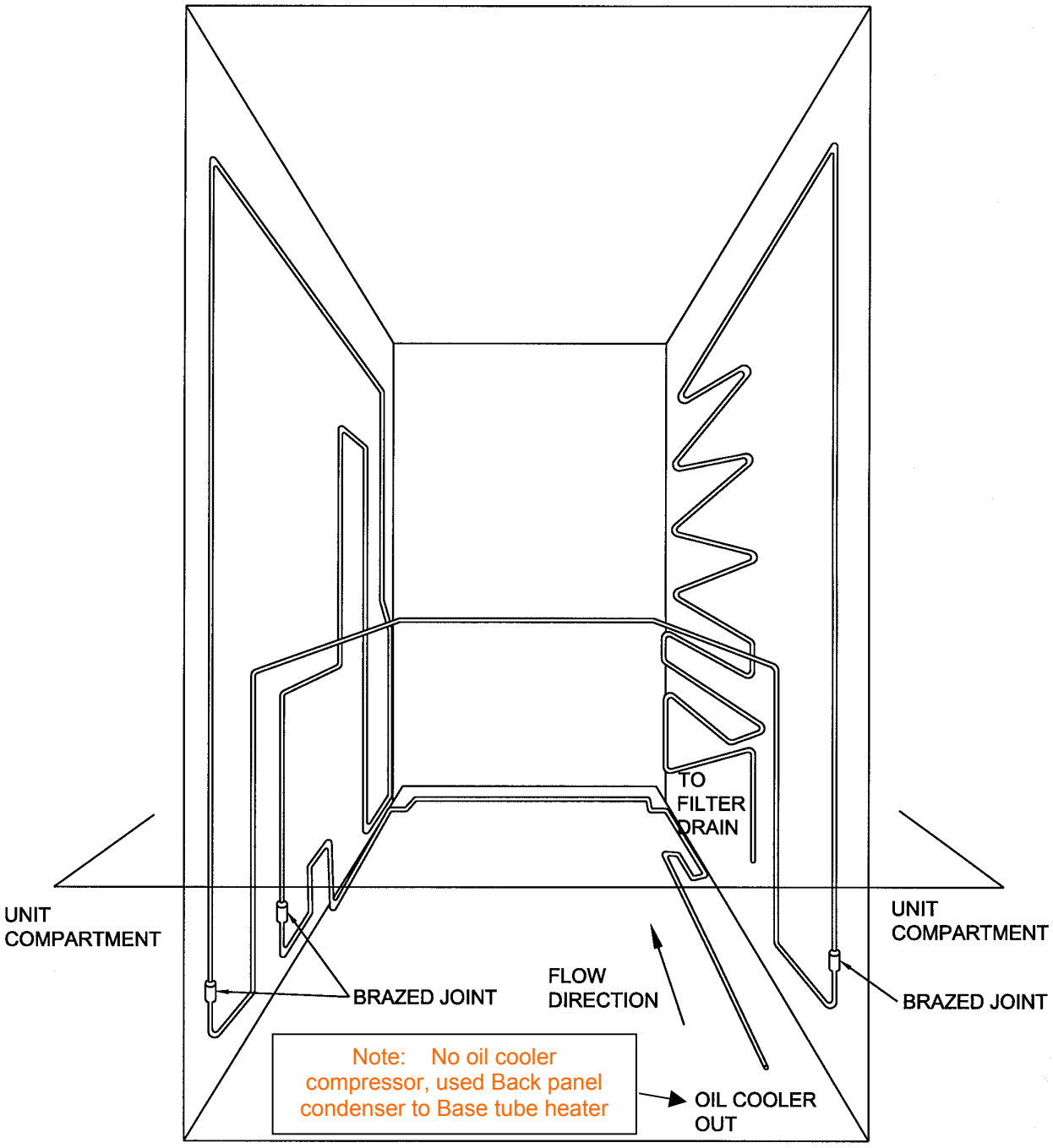
The internal condenser is made in three sections (see circuit diagram below). One third of the condenser is attached to the back panel, and the other parts are attached to the inside of the right and left sides of the cabinet wrapper (as viewed from the back) all being foamed into place. It is very important, if pressure testing the high side circuit, to split the condenser into its 3 sections to locate which section is at fault. Always ease the back panel away from the cabinet slightly before pressure testing the internal pipe work. This will prevent a pressure build-up within the cabinet should any leak be found internally in the foam insulation. Such a leak could pressurise and damage the cabinet liner.

The back panel condenser comes as part of the back panel and should always be replaced as a complete assembly if the back panel is ever removed. On fitting a new back panel assembly always replace the mastic vapour-sealing compound before fitting the back panel into the triple fold of the cabinet.



Condenser Layout RF610A, RF540A, RF201A

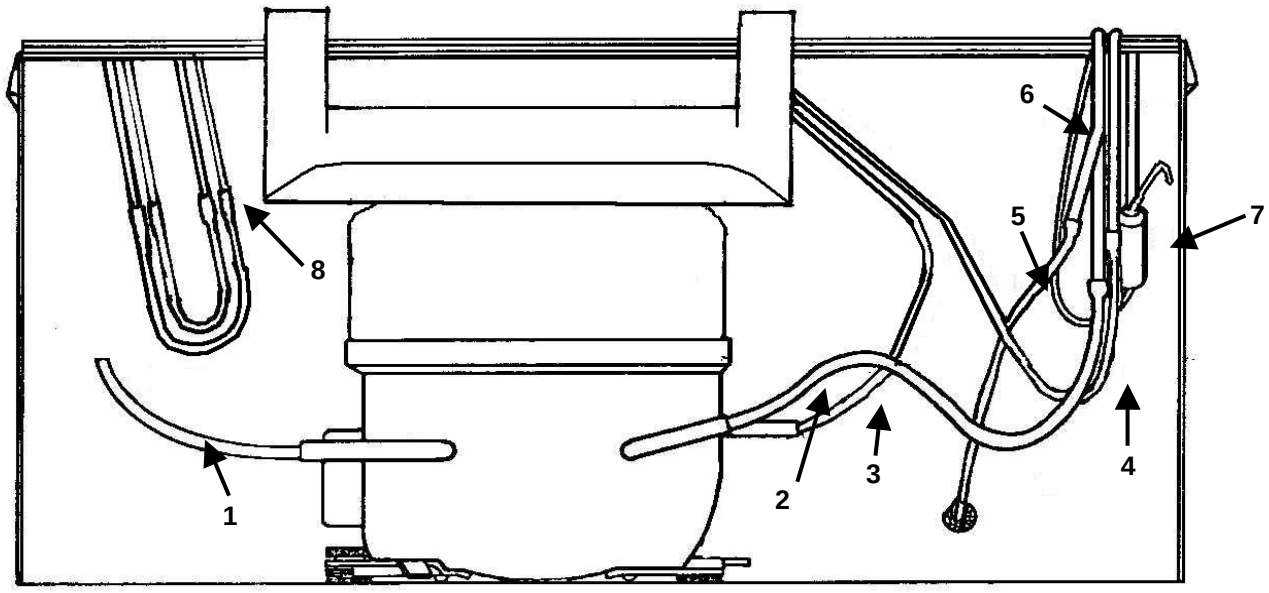
CONDENSER WITH TUBE CROSS RAIL



ALL BRAZED CONDENSER JOINTS ARE EXTERNAL IN UNIT COMPARTMENT

Compressor Compartment Layout

The diagrams below will assist in identifying the various pipes within the compressor compartment. They should be read in conjunction with the full system diagram (See Diagram 0).



1. Service tube (process pipe)
2. Suction line
3. Discharge line into water evaporator tray.
4. Water evaporator to condenser back panel
5. Back panel to base tube
6. Capillary tube
7. Filter dryer
8. External joints from internal condenser circuit.

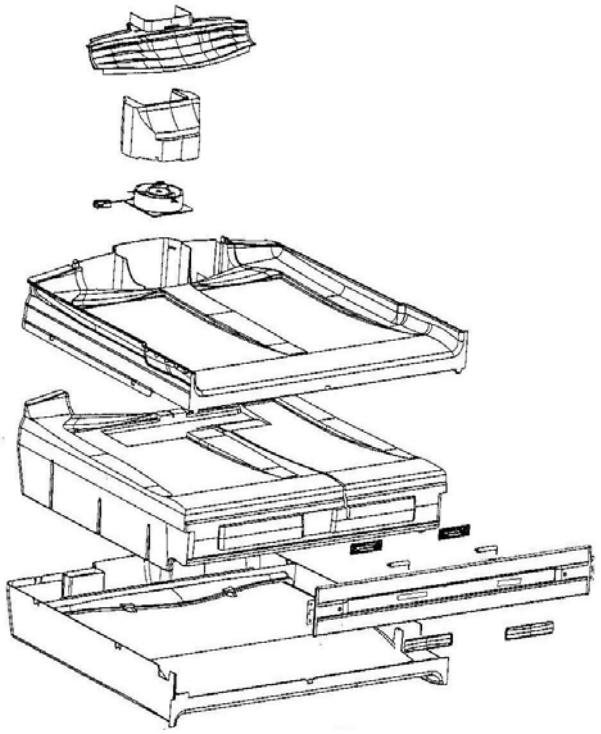
5.5 CROSS RAIL

The cross rail contains part of the condenser copper tubing (mullion heater) providing heat to the gasket area between the PC and FC compartments, preventing sweating of the gasket. Also mounted on the cross rail is the Reed Sensor, under the plastic cover behind each of the French doors and behind the FC drawer.

5.6 DIVIDER PARTITION

This is moulded in two outer pieces and has an inner polystyrene moulded duct assembly that is wax coated. This provides a barrier between the FC and PC compartments, also allowing return air from the PC to move back to the FC evaporator. The PC fan motor is housed in the back of the divider. It also houses the low ambient heater. The divider is fitted into the cabinet as an assembly and cannot be replaced.

“B” DIVIDER PARTITION



6 ELECTRONICS SECTION

6.1 DIAGRAMMATIC OVERVIEW FUNCTION DESCRIPTION

The electronic system consists of several parts:

Power / control module, display module, compressor, defrost heater, ambient heater, produce compartment fan, freezer compartment fan, light, temperature sensors and door sensors.

The purpose of the Power / Control module is to turn on the compressor, which cools the evaporator, then to use the fans to efficiently cool the compartments. Both fans turn on with the compressor. The freezer compartment (FC) fan is kept at a constant speed while the produce compartment (PC) fan is regulated to provide the cooling for the PC compartment, which operates independent of the FC compartment in controlling its temperature. The function of the microprocessor in the Power / Control module is to provide independence of both compartments to their set temperatures, although the environment of one compartment effects the other as they are linked by the ducts as can seen by the diagram of the internal air flow of the cabinet.

6.2 CONTROL & PERIPHERAL FUNCTIONS

The control system consists of the Power / Control module located in the unit compartment of the refrigerator, and various sensors and actuators controlled by the power module. The function and brief description of each of these units is defined below.

Power/Control Module

This module is the electronic brain and control centre of the refrigerator. It contains a microprocessor, support circuitry and switching devices. The Power / Control module controls the Provision Compartment (PC) and Freezer Compartment (FC) temperatures by sensing the temperature and door state and operating the compressor and fans accordingly. This module also houses the alarm beeper.

The speed of the fans is controlled by pulse width modulation (PWM). The power/control module controls the motor speed by driving them with short pulses. These pulses vary in duration to change the speed of the motor. The longer the pulses, the faster the motor turns, and vice versa.

The micro controller in the Power/Control module uses its internal memory for control; its ROM (Read Only Memory), for program and fixed constant storage including tables, the RAM (Random Access Memory) for variable storage and access. It uses an external Electrically Erasable Programmable Read Only Memory (E 2 PROM) for storage of variables and history data, which is retained even when the power is turned off.

The Power/Control module contains a special type of memory device call an E 2 PROM. The information on the fridge operation, faults and diagnostic information is stored in this memory. They include the temperature setting, the history of FC, PC temperatures (approx 18 hours), defrost history (the last 12 defrosts) and fault history. This will help the service person find and remedy the cause of failure. All this memory will be retained even when the fridge is disconnected from mains power supply.

The beeper is used to signal prolonged door opening and other fault conditions:

1. The PC door alarm sounds if either PC door is left open for 90 seconds and the FC drawer alarm sounds if the drawer is left open after 60 seconds. Both PC & FC alarm will sound every 30 seconds until the door is closed.
2. If the doors and drawer are left open longer than 5 minutes, the alarm will sound continuously and the PC and/or the FC light will turn off. The alarm will stop with the closing of the doors and drawer. The light is only reactivated by closing and opening the door and drawer.
3. All electronic faults, when detected, will sound the alarm when the door is opened and the fault will be shown on the display.

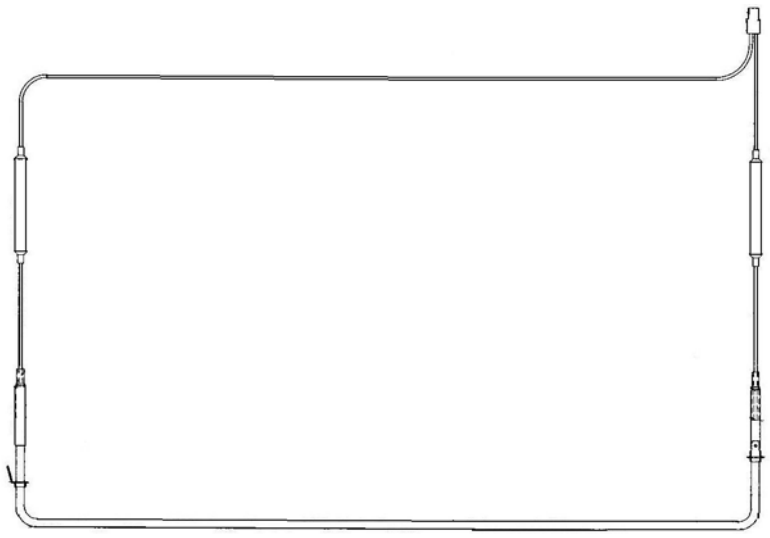
Door Switches

“Reed” switches are used to detect the opening and closing of the doors. Small magnets are built into the PC doors and FC drawer, which activate the reed switches. The reed switches are encapsulated within a plastic housing, which is clipped under the plastic covers on the base and cross rails.

Defrost Heater

A heating element is used to defrost the ice accumulated on the evaporator. The defrosts are adaptive to the usage and environment and are controlled by the power / control module and sensed by the defrost sensor located on the evaporator chassis registering 46^{o}F before terminating the defrost heater element. Previous

defrost history, the number of door openings, and the compressor run time are used to determine the interval between defrosting. The typical time interval for defrosts is between 12 hours and 1 day. However it can be as short as 3 hours or as long as 70.8 hours depending on the usage and environment.



Thermal Fuse

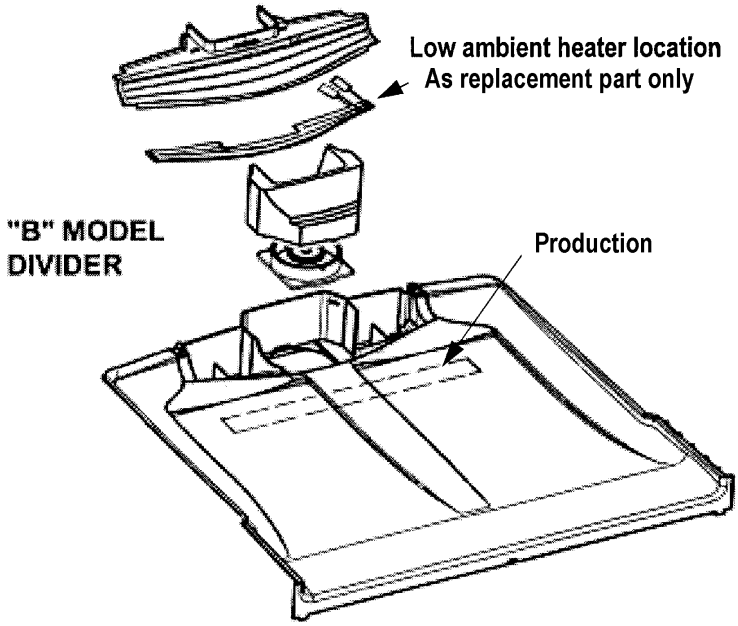
There are two thermal fuses mounted in the wiring harness of the defrost element, having a tripping temperature of 160^0F. Once open circuit they cannot be reset. Replacement is part of the element heater assembly.

These fuses in both leads of the element protect the refrigerator from any over heating through failure of the element itself or a triac failure in the power / control module. Both sides are protected in case phase and neutral are reversed.

NOTE: Care should be taken if manually defrosting the evaporator if using heat guns that the thermal fuses are not over heated.

Low Ambient Heater

In low ambient temperatures, a 12 Volt, 7 Watt low power heater is used to keep the temperature in the Provision compartment above freezing. The ambient heater is controlled by the power / control module which uses pulse width modulation (PWM) to run the heater at 58% to give 4.1 watts of heat. The ambient heater is situated in the divider partition. The element has the purpose of warming the area if the ambient becomes too low, hence in the “B” models, the element is on when the cabinet cycles off as the crispers could freeze. The heater will always be switched off during defrosting. There may be less than 4 cycles in the calculation if a defrost has occurred or there were long cycle times.



PC / FC Fans

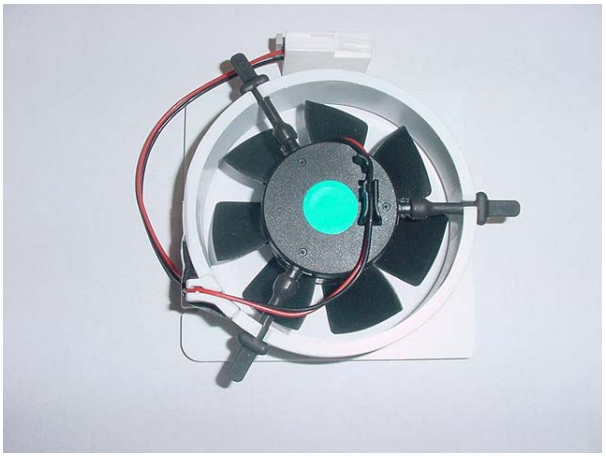
There are two 12 Volt DC electrically commutated motors (ECMs). They provide the required cooling power to both compartments. The motor speeds are controlled using a pulse width modulating (PWM) technique. The power / control module controls the on/off of the compressor, and the fans. The speed of the FC fan is set and the speed of the PC fan is regulated using pulse width modulation.

The freezer compartment fan will always be set at the maximum FC fan speed with the PC fan being adjusted to meet the requirement of that compartment. Off cycle fans (OCF) operate when the product cycles off, the PC fan operates at a fan speed of 3 to circulate the air in the PC to ensure food stuff in the crisper doesn't freeze.

When the compressor is turned on, provided the doors are closed, the fans will also be switched on except immediately following a defrost cycle where there is a delay of 30 seconds after the compressor has started.

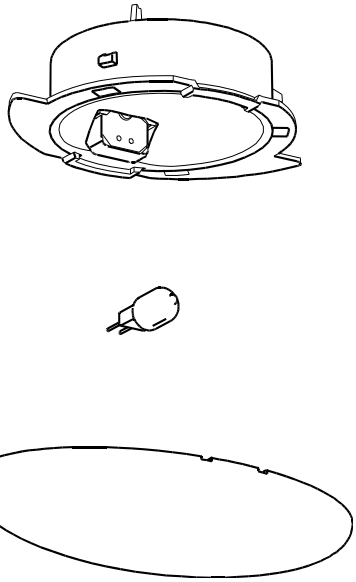
FC FAN (Viewed from front)

PC FAN (Viewed from PC side)



Lights (PC & FC)

Two 12 volt, 10 watt halogen lamp are used in the PC and one in the FC. To prevent overheating, the lamp is turned off after 5 minutes of the door being left open. The power / control module controls this.



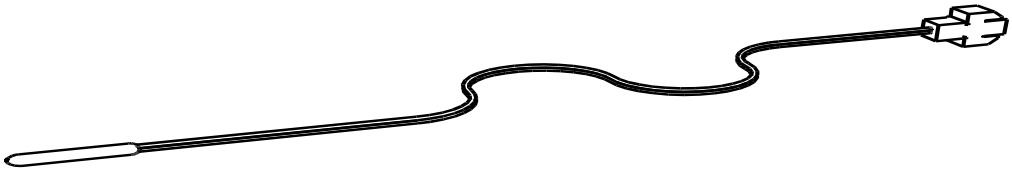
NOTE: It is important that the lamp pins are tight in the lamp socket.

Thermistor Temperature Sensors

These sensors are used to monitor temperatures within the refrigerator. There are 3:

1. Defrost sensor mounted above the evaporator used to measure the temperature when in defrost.
2. FC sensor mounted on the evaporator coil cover used to measure the temperature in FC.
3. PC sensor mounted in the PC on the duct cover and used to sense the PC temperature.

Thermistor sensors are used for temperature measurement. Their electrical resistance changes as the temperature changes. The table below lists some typical resistance values. The temperature can be read on the display once the diagnostic mode is entered into.



THERMISTOR SENSOR RESISTANCE TABLE

TEMPERATURE ° C	°F	RESISTANCE (K Ohms ±5%)
-30.0	-22.0	25.17
-25.0	-13.0	19.43
-20.0	-4.0	15.13
-15.0	5.0	11.88
-10.0	14.0	9.392
-5.0	23.0	7.481
0.0	32.0	6.000
5.0	41.0	4.844
10.0	50.0	3.935
15.0	59.0	3.217
20.0	68.0	2.644
25.0	77.0	2.186
30.0	86.0	1.817
35.0	95.0	1.518
40.0	104.0	1.274
45.0	113.0	1.075
50.0	122.0	0.9106

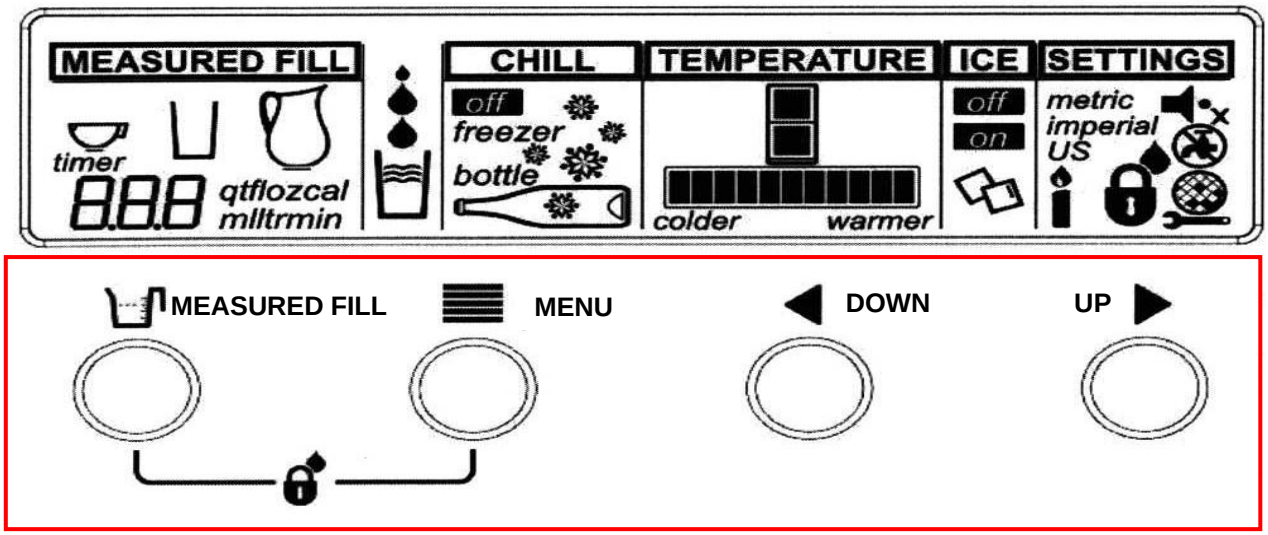
Table

PLEASE NOTE THERE HAVE BEEN SEVERAL CHANGES TO THE DISPLAY INTERFACE, REFER TO "PRODUCTS BEFORE JANUARY 2009" OR "PRODUCTS AFTER JANUARY 2009" FOR CORRECT INFORMATION.

7 DISPLAY INTERFACE

7.1 DISPLAY INTERFACE (BUTTON DESCRIPTIONS)

For Products produced before January 2009



Measured Fill

The **MEASURED FILL** key enables you to select the amount of water to be dispensed.

Menu

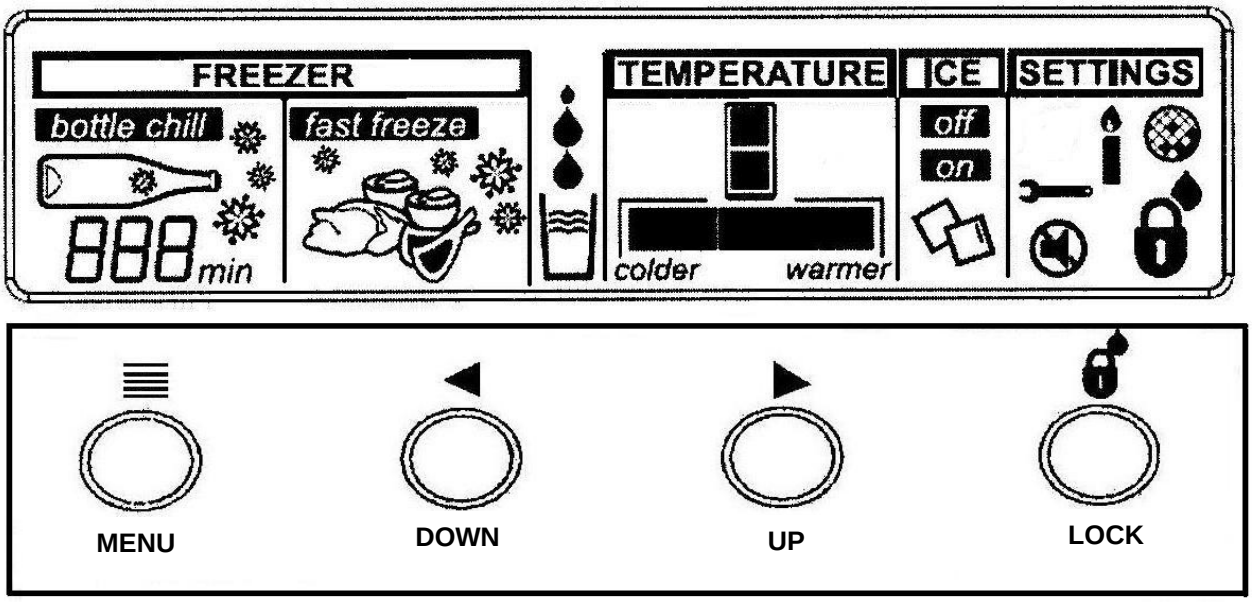
The **MENU** key allows you to scroll through the main menu options (Chill, Temperature, Ice and Settings)

Arrow Keys

The **ARROW** keys are used to scroll through the settings of each function.

7.2 DISPLAY INTERFACE (BUTTON DESCRIPTIONS)

For Products produced after January 2009



Menu

The **MENU** key allows you to scroll through the main menu options (Chill, Temperature, Ice and Settings)

Arrow Keys

The **ARROW** keys are used to scroll through the settings of each function.

Menu

The **LOCK** key enables and disables the water dispenser and all the buttons.

7.3 DISPLAY FUNCTIONAL SCHEMATIC

Inputs		Outputs
Display Harness →	**Display Module**	→Water Solenoid → LEDS → Comms
Tact Switches →		→LCD Display

7.4 DISPLAY INTERFACE FEATURES (Products Before January 2009)

- Icemaker on/off.
- Bottle chill mode – 10, 15, 20, 25, 30 minute timer with alarm.
- Freezer chill mode – nominated freeze time at lower temperature set point.
- Water dispensing.
- Measured fill water dispensing – water dispensing volume selection with 3 set points preset.
- Unit selection – Metric or US units for measured volumes.
- Sabbath mode enable/disable.
- Key silent mode enable/disable.
- Key lock.
- Water dispenser key lock.
- Filter replacement alert.
- No water alert.
- Fault alert.
- Diagnostics.
- Temperature set points.
- Measured fill calibration.

7.5 DISPLAY INTERFACE FEATURES (Products After January 2009)

- Icemaker on/off.
- Bottle chill mode – 10, 15, 20, 25, 30 minute timer with alarm.
- Freezer chill mode – nominated freeze time at lower temperature set point.
- Water dispensing.
- Sabbath mode enable/disable.
- Key silent mode enable/disable.
- Dispenser Key lock.
- Key lock.
- Filter replacement alert.
- Fault alert.
- Diagnostics.
- Temperature set points.

7.6 FEATURES (Products Before January 2009)

7.6.1 Icemaker On/Off

This mode simply turns the icemaker on or off.
To access the ice mode, press the **MENU** key until ICE is highlighted. Then use an arrow key to scroll to the icemaker ON or OFF.

7.6.2 Freezer Chill Mode

Freezer chill is a function that rapidly freezes food in the FC by temporarily dropping the freezer to its coldest temperature set point for a 12-hour period.
To access, use the **MENU** key to scroll to CHILL, then use the **UP** key until this icon appears.
To deactivate manually, use the **MENU** key and scroll to CHILL. Press the **DOWN** key until the icon disappears.

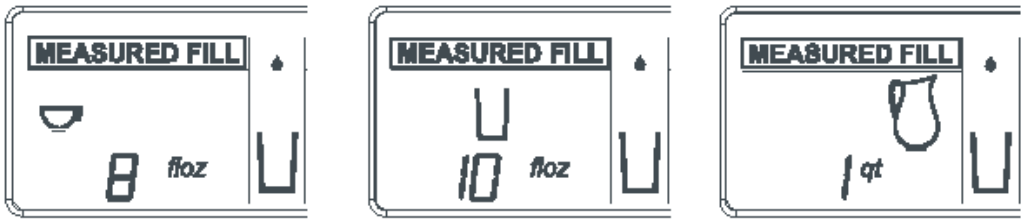
7.6.3 Bottle Chill Mode

Bottle Chill allows the customer to put a bottle in the freezer for a designated amount of time. When that amount of time has elapsed an alarm will sound telling the customer to take the bottle out of the FC. The Freezer automatically changes to its lowest set point.
The times are 10, 15, 20, 25 and 30 minutes.
To activate this mode, use the **MENU** key to scroll to CHILL, then use the **UP** key until this icon appears. Use the **UP** key to select the time in minutes. Once selected, the alarm count down will commence.

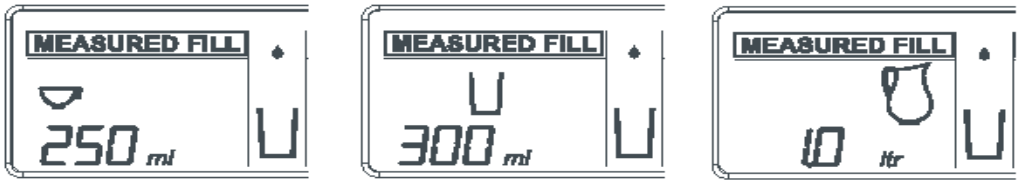
7.6.4 Water Dispensing

This icon will animate when the water is being dispensed.

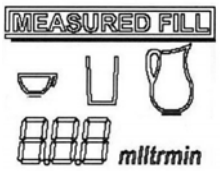
7.6.5 Measured Fill Water Dispensing



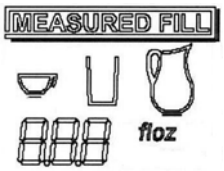
US Display



Metric Display



The amount of water dispensed is pre-selected.
Metric
250ml – cup
300 ml – glass
1000ml – jug
The **UP** and **DOWN** keys can be used to change the units in 25ml increments.



US
8 floz – cup
10 floz – glass
1 Qt – jug
The **UP** and **DOWN** keys can be used to change the units in 1oz increments.

7.6.6 Sabbath Mode

When in this mode, the alarms are deactivated and the interior light and back light on the display will not come on. The interior fan will not turn off when the door is opened.

7.6.7 Key Silent Mode

When in this mode, the beeper does not operate when the buttons on the keypad are pressed.. Note: Faults, Bottle chill, & the door will still alarm when the refrigerator is set on key silent mode.

 Indicates the product is in Key Silent Mode.

To activate or deactivate, hold the **MENU** key for four (4) seconds.

7.6.8 Dispense Lock

This mode disables the water dispensing pad & prevents water from being dispensed.
To activate this mode, press the **MENU** and **MEASURED FILL** keys together for two (2) seconds.

7.6.9 Key Lock

This mode disables all the buttons.
To activate this mode, press the **MENU** and **MEASURED FILL** keys together for four (4) second.

7.6.10 Filter Replacement Alert

This icon will appear when the water filter needs changing. The filter needs replacing every 2800 Litres or 6 months. This will flash when dispensing water.
To deactivate the warning, press the **MEASURED FILL** and **UP** keys for 4 seconds.

7.7 FEATURES (Products After January 2009)

7.7.1 Icemaker On/Off

This mode simply turns the icemaker on or off.
To access the ice mode, press the **MENU** key until ICE is highlighted. Then use an arrow key to scroll to the icemaker ON or OFF.

7.7.2 Freezer Chill Mode

Freezer chill is a function that rapidly freezes food in the FC by temporarily dropping the freezer to its coldest temperature set point for a 12-hour period.
To access, use the **MENU** key to scroll to CHILL, then use the **UP** key until this icon appears.
To deactivate manually, use the **MENU** key and scroll to **FREEZER**. Press the **DOWN** key until the icon disappears.

7.7.3 Bottle Chill Mode

Bottle Chill allows the customer to put a bottle in the freezer for a designated amount of time. When that amount of time has elapsed an alarm will sound telling the customer to take the bottle out of the FC. The Freezer automatically changes to its lowest set point.
The times are 10, 15, 20, 25 and 30 minutes.
To activate this mode, use the **MENU** key to scroll to

FREEZER, then use the **UP** key until this icon appears. Use the **UP** key to select the time in minutes. Once selected, the alarm count down will commence.

7.7.4 Water Dispensing

This icon will animate when the water is being dispensed.

7.7.5 Sabbath Mode

When in this mode, the alarms are deactivated and the interior light and back light on the display will not come on. The interior fan will not turn off when the door is opened.
To activate press and hold **MENU** + **DOWN** + **LOCK** for 4 seconds

7.7.6 Key Silent Mode

When in this mode, the beeper does not operate when the buttons on the keypad are pressed.. Note: Faults, Bottle chill, & the door will still alarm when the refrigerator is set on key silent mode.

 Indicates the product is in Key Silent Mode.

To activate/deactivate, press the **MENU** key and scroll to **SETTINGS**, use the **UP** and **DOWN** key to turn the mode on or off.

7.7.7 Dispenser Lock

Display Water Dispense - To activate this mode press the LOCK button for 2 seconds.

7.7.8 Key Lock

Key Lock - disables all buttons
To activate this mode press and hold the LOCK button for four (4) seconds

7.7.9 Filter Replacement Alert

This icon will appear when the water filter needs changing. The filter needs replacing every 2800 Litres or 6 months. This will flash when dispensing water.
To deactivate the warning, press the **UP + LOCK** keys for 4 seconds.

7.8 ICEMAKER

Ice Production

The icemaker comes out of the factory defaulted to off. To turn the icemaker on, press the **MENU** key and continue pressing the key until the ICE option has been scrolled to.

Press the **UP** and **DOWN** keys to turn the icemaker on or off. When the cubes are frozen, the icemaker motor will turn the ice cube tray and twist the tray causing the ice cubes to dislodge and fall out of the tray. The tray will then return to its normal position and refill with water.

Note: If the FC is above 14^{0}F or the ice bin is full, or has been removed, or fitted the wrong way around, the icemaker will not operate.

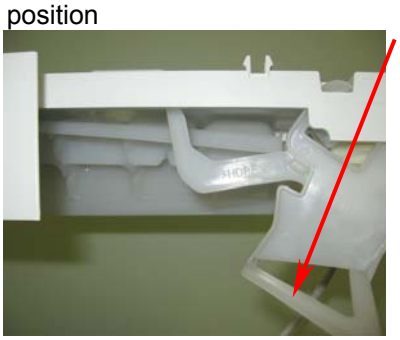
Information About The Icemaker

The temperature of the FC needs to reach 14^{0}F before the icemaker commences to operate.
When first switched on, the icemaker carries out a harvest with no water in the ice tray.
Once the ice tray resumes its normal position, the water will fill the tray. At this stage it will calculate the amount of time taken to do a cycle and then flips. After this point it will run normally calculating the amount of time for each batch. The rate of production will depend on the temperature of the freezer and will not operate if the temperature is above 14^{0}F.
NOTE: If the temperature is above 14^{0}F, the ice/water tray will sit in this position and will not turn to dispense.
The cubes will be ejected from the mould into the ice bin. It is suggested that the ice cubes are levelled with the ice scoop occasionally for maximum storage.
The large and small freezer bins can be rotated if a large amount of ice is required.

Ice Bin Full Sequence

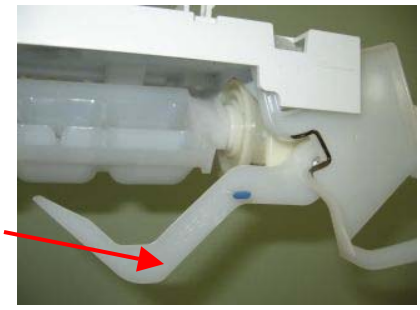
When the ice bin is full, the icemaker starts a sequence of testing to ensure ice harvest can continue. If the icemaker senses the bin is full, the motor resumes its normal position. Twenty minutes later, the testing sequence commences until such time as the ice level is reduced by usage. The testing sequence happens every 20 minutes.

Bin in position

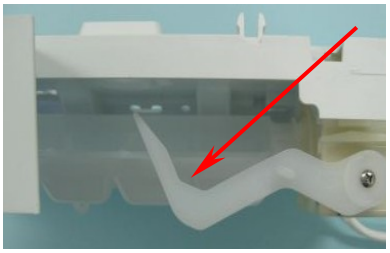


Bin lever – senses if there is a bin in position or not.

If there is no bin, lever will be in the down position as shown.



Bin full of Ice



Lever sensing if ice bin is full.

If bin is not full, icemaker continues rotation to eject ice.

Safety First

When first placed into operation, discard the first bin of ice, as this will remove any impurities that may have been in the water system.
Do the same after vacations or extended periods when ice is not used.
Ice cubes, when not used, will become cloudy, will shrink, and will taste stale. The ice bin will need to be emptied and cleaned periodically.
Avoid contact with moving parts of the ejector mechanism.
Do not place fingers on the automatic ice making mechanism while the refrigerator is turned on.

7.9 KEY PRESSES (Products before JANUARY 2009)

To activate any mode, certain combinations of key presses are required.
The key-presses are as follows. Key presses used by the service technician are those shown shaded.

Function	Key Presses	Action	Press Time
Key Silent Mode	Menu	On/Off	Hold down for 4 seconds
Key & Dispenser Lock	Menu + Measured fill	On/Off	Hold down for 2 seconds
Key Lock	Menu + Measured fill	On/Off	Hold down for 4 seconds
Diagnostic Mode	Menu + Up	On	Hold down for 4 seconds
Forced Defrost	Menu + Down	On	Hold down for 4 seconds
Sabbath Mode	Menu + Measured fill + Down	On/Off	Hold down for 4 seconds
Disable Filter Alarm	Menu + Measured fill + Up	On/Off	Hold down for 4 seconds
Show Off Mode	Menu + Down + Up	On/Off	Hold down for 4 seconds
Flowmeter Calibration	Measured Fill + Down	On	Hold down for 4 seconds
Filter Reset	Measured Fill + Up	Reset	Hold down for 4 seconds
Force Icemaker Manual	Measured Fill + Down + Up	Activates once	Hold down for 4 seconds

7.10 KEY PRESSES (Products After JANUARY 2009)

Function	Key Presses	Action	Press Time
Key Silent Mode	Scroll to **Settings**	On/Off	Press Up or Down keys to turn on or off.
Dispenser Lock	Lock	On/Off	Hold down for 2 seconds
Key Lock	Lock	On/Off	Hold down for 4 seconds
Diagnostic Mode	Menu + Up	On	Hold down for 4 seconds
Forced Defrost	Menu + Down	On	Hold down for 4 seconds
Sabbath Mode	Menu + Down + Lock	On/Off	Hold down for 4 seconds
Disable Filter Alarm	Menu + Up + Lock	On/Off	Hold down for 4 seconds
Show Off Mode	Menu + Down + Up	On/Off	Hold down for 4 seconds
Filter Reset	Up + Lock	Reset	Hold down for 4 seconds
Force Icemaker Manual	Lock (first) Down + Up	Activates once	Press Lock key first then down & up keys and hold all keys for 4 seconds

7.11 TEMPERATURE SETTINGS

PC Setting

32° F	32.9°F	33.8°F	34.7°F	35.6°F	37.4°F	39.2°F	41.0°F	42.8°F	44.6°F	46.4°F

Colder Warmer

FC Setting

-5.8°F	-5.8°F	-4°F	-3.1°F	-1.3°F	0.0°F	1.4°F	2.3°F	4.1°F	5°F	6.8°F

Colder Warmer

Default factory settings are 37.4^{0}F for the provision compartment and 0^{0}F for the freezer compartment.
Note: Crowbar setting for the PC is 28.4^{0}F and for the FC is –14.8^{0}F. Temperatures shown are average temperatures.

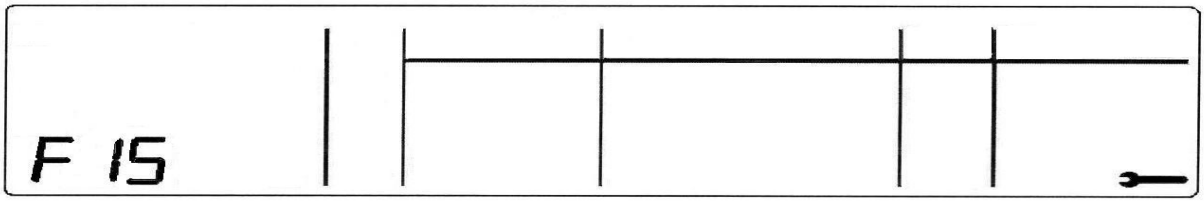
7.12 INTERNAL AIR FLOW

The freezer fan draws air through the evaporator and into a duct in the rear wall of the freezer compartment. This air exits through the fan grill at the top of the freezer compartment. The air behind the freezer coil cover is also diverted through the divider partition to another fan, which supplies the cold air into the PC compartment. The amount of air is controlled electronically by two sensors, which in turn regulate the speed of both PC and FC fans to maintain selected temperatures in each compartment.

Air from the PC returns to the FC evaporator by way of the return air duct, which is built into the divider partition. This air is drawn across the evaporator by the evaporator FC fan motor to be recirculated again throughout the PC / FC compartments.

7.13 DIAGNOSTICS

A spanner symbol and LCD fault code will appear automatically if there is a fault in the temperature measuring system, defrost system, fans or low ambient heater. (Refer diagram below)
When the PC door is opened, an alarm will sound. The number of beeps also indicates the fault code. Pressing any of the control buttons can deactivate these alarms.



Example: When a fault develops, the LCD fault code appears with the spanner.

After rectifying the problem, the fault code and spanner will disappear. Faults are only rectified when that feature is used. So in the case of a defrost fault, the code will remain until a defrost is initiated and it is successful.

7.14 FAULT CODES

Fault Code 1
Reason: On the last power up, the power module failed self-test.
Primary Action: Replace power module.

Fault Code 2

Reason:	The previous 2 defrosts were aborted after 40 minutes.
Primary Action:	Check defrost element assembly in the FC. If faulty, replace.

Fault Code 3

Reason:	The resistance of all the temperature sensors are outside the normal range. (> 45K Ohms)
Primary Action:	Check the 6-way RAST connector at the power module.
Secondary Action:	Re-terminate the 6-way RAST connector.
Tertiary Action:	Replace the power module.

Fault Code 4
Reason: The resistance of all the temperature sensors are outside the normal range. (< 660 Ohms)
Primary Action: Check the 6-way RAST connector at the power module.
Secondary Action: Re-terminate the 6-way RAST connector.
Tertiary Action: Replace the power module.

Fault Code 5
Reason: The resistance of the FC sensor is outside the normal range (> 45K Ohms).
Primary Action: Check the sensor connection at the power module.
Secondary Action: Replace the sensor.

Fault Code 6
Reason: The resistance of the FC sensor is outside the normal range (<660 Ohms).
Primary Action: Check the sensor connection at the power module.
Secondary Action: Replace the sensor.

Fault Code 7
Reason: The resistance of the Evaporator sensor is outside the normal range (> 45K Ohms).
Primary Action: Check the sensor connection at the power module.
Secondary Action: Replace the sensor.

Fault Code 8
Reason: The resistance of the Evaporator sensor is outside the normal range (<660 Ohms)
Primary Action: Check the sensor connection at the power module.
Secondary Action: Replace the sensor.

Fault Code 9
Reason: The resistance of the PC sensor is outside the normal range (> 45K Ohms).
Primary Action: Check the sensor connection at the power module.
Secondary Action: Replace the sensor.

Fault Code 10
Reason: The resistance of the PC sensor is outside the normal range (< 660 Ohms).
Primary Action: Check the sensor connection at the power module.
Secondary Action: Replace the sensor.

Fault Code 11
Reason: The current measured for the ambient heater, PC fan and FC fan is lower than expected.
Primary Action: Check the 6-way fan/LAH RAST connector at the power module.
Secondary Action: Re-terminate the 6-way fan/LAH RAST connector.
Tertiary Action: Replace control module.

Fault Code 12
Reason: The current measured for the ambient heater, PC fan and FC fan is higher than expected.
Primary Action: Check the 6-way fan/LAH RAST connector at the power module.
Secondary Action: Re-terminate the 6-way fan/LAH RAST connector.
Tertiary Action: Replace the control module.

Fault Code 13
Reason: The low ambient heater is drawing less current than expected. Either the heater or wiring is open circuit or the heater is faulty.
Primary Action: Check the wiring and connections at both the heater and the power module.
Secondary Action: Check the low ambient heater resistance. If not within limits, replace.

Fault Code 14
Reason: The low ambient heater is drawing more current than expected. Either there is a short in the heater, or the heater is faulty.
Primary Action: Check the wiring and connections at both the heater and the power module.
Secondary Action: Check the low ambient heater resistance. If not within limits, replace.

Fault Code 15
Reason: The PC fan is drawing less current than is expected. Either the wiring is open circuit or the fan is faulty.
Primary Action: Check the PC fan wiring and connections at both the fan and the power module.
Secondary Action: Check the fan. If faulty, replace.

Fault Code 16
Reason: The PC fan is drawing more current than is expected. Either the wiring is shorted or the fan is faulty.
Primary Action: Check the PC fan wiring and connections at both the fan and the power module.
Secondary Action: Check the fan. If faulty, replace.

Fault Code 17
Reason: The FC fan is drawing less current than is expected. Either the wiring is open circuit or the fan is faulty.
Primary Action: Check the FC fan wiring and connections at both the fan and the power module.
Secondary Action: Check the fan. If faulty, replace.

Fault Code 18
Reason: The FC fan is drawing more current than is expected. Either the wiring is shorted or the fan is faulty.
Primary Action: Check the FC fan wiring and connections at both the fan and the power module.
Secondary Action: Check the fan. If faulty, replace.

Fault Code 19 Reserved.

Fault Code 20
Reason: Flapper heater current low.
Primary Action: Check the Molex connections for the flapper heater.
Secondary Action: Check the resistance of the heater. If open circuit, replace the heater.

Fault Code 21
Reason: Flapper heater current is high.
Primary action: Check for short circuit of the heater. If faulty, replace the heater.

Fault Code 22
Reason**:** The resistance of the PC sensor 2 is outside the normal range (> 45K Ohms). Temperature PC2 sensor cold.
Primary Action: Check the connection at the module. Check the resistance of the sensor.
Secondary Action: Replace the sensor.

Fault Code 23
Reason: The resistance of the PC sensor 2 is outside the normal range (< 660 Ohms). PC 2 sensor hot.
Primary Action: Check the connection of the sensor at the module. Check the resistance of the sensor.
Secondary Action: Replace the sensor.

Fault Code 24
Reason: The resistance of the ice tray sensor is outside the normal range (> 45K Ohms) Sensor cold.
Primary Action: Check the connections of the sensor at the module. Check the resistance of the sensor.
Secondary Action: Replace the sensor.

Fault Code 25
Reason: The resistance of the ice tray sensor is outside normal range. (< 660 Ohms). Sensor hot.
Primary Action: Check the connections of the sensor at the module. Check the resistance of the sensor.
Secondary Action: Replace the sensor.

Fault Code 26

Reason: Icemaker motor timed out

Primary Action: The icemaker gearbox is not returning to the start position and ends signal to controller.

Secondary Action: Check the gearbox, and if faulty, replace.

Fault Code 27

Reason: Icemaker motor current high.

Primary Action: Check motor for obstruction. Check wiring at both the icemaker gearbox and the power module.

Secondary Action: Clear obstruction. Test motor operations. Check the gearbox motor resistance. If not within limits, replace motor.

Fault Code 28

Reason: Icemaker solenoid current high.

Primary Action: Check the connections to the solenoid. Check the resistance of the solenoid.

Secondary Action: Correct loose connections. Replace the solenoid if faulty.

Fault Code 29

Reason: Icemaker solenoid current low.

Primary Action: Check the connection to the solenoid. Check the resistance of the solenoid.

Secondary Action: Correct loose connections at the module or the water valve. Replace the solenoids if open circuit.

Fault Code 32

Reason: Solenoid driver 1 has failed. If this happens the water dispenser will still be operating, however, as Solenoid Driver 1 has failed the product has reverted to Solenoid Driver 2 to dispense water. Fault code 32 will be displayed to make the customer aware of the fault.

Primary Action: Check the solenoid resistance. If not within limits, replace the solenoid. If OK, replace the display module if the problem still present.

Fault Code 33

Reason: Solenoid driver 2 has failed. The module has detected a fault with Solenoid Driver 2; however, Solenoid Driver 1 may still be operational and the water dispenser is still working.

Primary Action: Check the solenoid resistance. If not within limits, replace the solenoid. If OK, replace the display module.

Fault Code 34

Reason: Both Solenoid Drivers 1 and 2 have been detected to have a fault.

Primary Action: Check the solenoid resistance. If not within limits, replace the solenoid. If OK, replace the display module.

Fault Code 40

Reason: Icemaker solenoid Transistor 1 Short Circuit. A transistor on the controller that drives the icemaker solenoid has failed. This could be as a result of a fault in the solenoid.

Primary Action: Check the solenoid resistance. If not within limits, replace the solenoid. Check the wiring and connections at the solenoid and the module. If OK, replace the control module.

Fault Code 41

Reason: Icemaker solenoid transistor 2 Short Circuit.

Primary Action: Check the solenoid resistance. If not within limits, replace the solenoid. Check the wiring and connections at the solenoid and the module. If OK, replace the control module.

7.15 FAULT CODES

If a fault has occurred relating to the display board, the fault code will show on the display just like any other fault.

Note: There will be no alarm/beeping if these faults occur.

Code	Fault
F30	No display signal received (shorted or broken wire)
F31	No display signal received (shorted or broken wire) clock or data line.
	Additional Fault Codes
F32	Solenoid Driver 1&2 (transistor) has failed. Or the solenoid has failed
F33	Solenoid Driver 2 (transistor has failed
F34	Both Solenoid Drivers have failed

Additional fault codes have been added to the display module in order to detect water leaks or continual flow of water from the dispenser should a fault appear. Previous to these changes the software only counted water flow when the solenoid was on. The new version of software (V1.067) now counts water flow when the water valve is on or off.

Fault Code 32, 33 and 34 initial detection.

The first time this fault is detected there are two possible scenarios of how the customer/user will see it happen.

Possibility 1

1. Dispense water
2. Remove glass/cup
3. Water continues to dispense for 5 seconds
4. Fault is detected
5. Water stops
6. After a certain period of time the display will show the customer/user what the fault code is.

Possibility 2

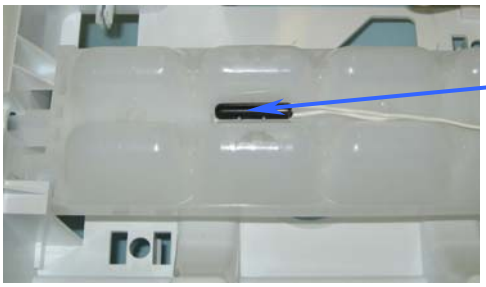
1. Dispense water
2. Remove glass/cup
3. Water stops
4. Fault is detected 5 seconds after the cup is removed
5. Water stops
6. After a period of time the display will show the user what the fault code is.

If both solenoid drivers fail and/or the water valve fails.

1. Dispense water
2. Remove glass/cup
3. Water continues to dispense until water supply is turned off.
4. Fault is detected
5. After a period of time the display will show what the fault code is.

7.16 TESTING ICEMAKER SENSOR

The icemaker sensor is located on the bottom of the ice cube tray. The testing is carried out at the power module.



Icemaker sensor located under insulated pad.

Sensor Insulation.

- Disconnect the refrigerator from the power supply.

Remove the power module from the product.

- Test two white wires marked “0V” and “Ice Sensor” on the controller.

Testing of the sensor should be in a known stable temperature, such as a glass of water full of ice cubes.

7.17 TESTING ICEMAKER MOTOR

Remove the icemaker from the freezer ceiling.
Disconnect the Molex connector.
Check the resistance between the White and Red wire on the connector. (Resistance 37.5Ω.)

7.18 TESTING WATER VALVE

The water valves are located in the unit compartment.
Disconnect the refrigerator from the power supply.
Remove the connector from the valve.
Resistance of the water valves is 14 Ω± 5%.

When testing for voltage at the ice or water valve:
Disconnect the refrigerator from the power supply.
Remove the connector from the water valve.
Place the meter probes into the connector of the valve that is faulty (ice valve or water dispenser valve).
Reconnect the refrigerator to the power supply.
Place a glass into the dispenser to operate the valve (for water dispenser valve only).
Place the product into a forced harvest (for icemaker only).

The voltage at the connector (once disconnected from the valve) should be 12 volts DC. Care should be taken not to damage the connector or wiring.

7.19 TESTING THE FLOW METER (Products before January 2009)

The flow meter cannot be tested electrically. If a fault occurs where the flow meter is suspected to be faulty, the Flow Meter Calibration procedure (refer to Section 0 Flow Meter Calibration) is to be followed, and if after the procedure has been followed the fault still exists, replace the flow meter.

8 DIAGNOSTIC MODES

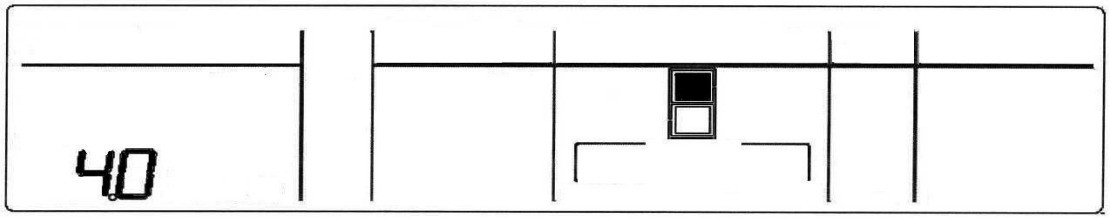
To enter diagnostic modes, press and hold the MENU button, then press the UP button for 4 seconds. The PC temperature will be displayed on the LCD as shown in Diagram A. The actual temperature of the PC is shown.

Please NOTE all temperatures shown on display are in degrees Celsius.

PC Sensor Temperature

Note: 4.0 shown on display, indicates the temperature of the PC sensor 4.0^{0}C (39.2°F).

Diagram A



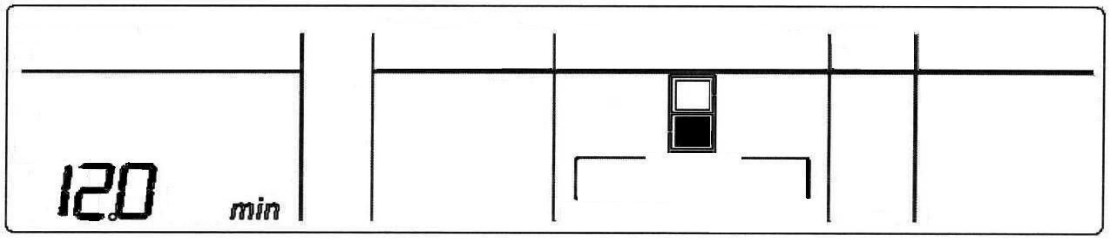
PC Sensor Temperature.

FC Sensor Temperature

Press the UP button once more – FC temperature.

Note: 12.0 min shown indicates the temperature of the FC sensor is -12^{0}C (10.4°F).

Diagram B



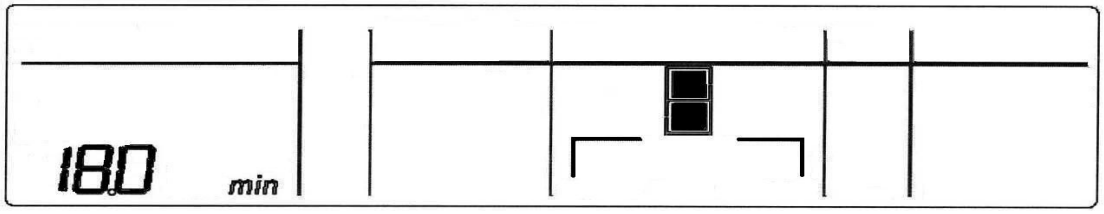
FC Sensor Temperature

Defrost Sensor Temperature

Press the UP button once more – Defrost sensor temperature.

Note: 18.0 min shown indicates the temperature of the Defrost sensor is -18^{0}C (0°F).

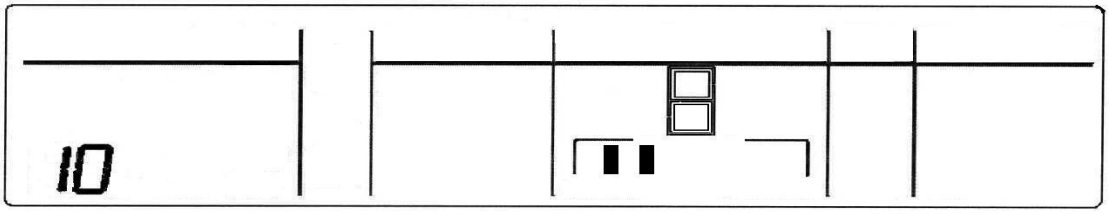
Diagram C



Defrost Sensor Temperature

Input/Output Status
Press the **UP** key once more – Input/Output status.
IO shown indicates the product is in input/output status. The LCDs that are highlighted indicate what components are on.
Note: When the PC door is opened, the backlight will turn off. The LCD for the FC or PC door will come on when either door is opened.
The IO shown stands for Input/Output, not a temperature.

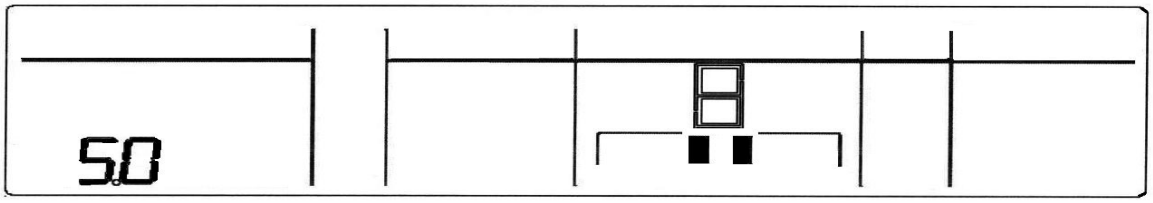
Diagram D



Input/Output Status

PC2 Sensor Temperature
Press the **UP** key once more – PC2 sensor. This sensor is attached to the water tank.
Note: 5.0 shown indicates the temperature of the PC2 sensor is 5^0C (41° F).

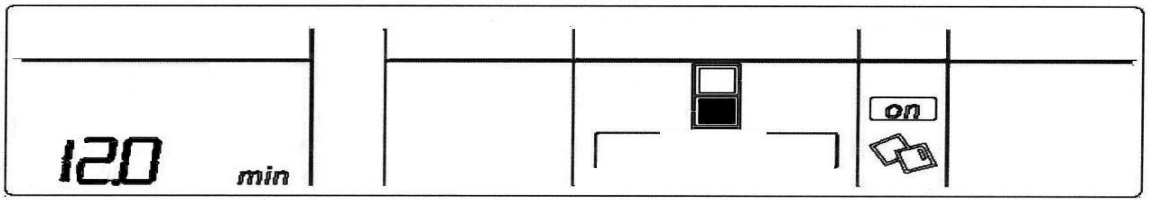
Diagram E



PC Sensor 2

PC2 Sensor Temperature
Press the **UP** key once more – Icemaker sensor.
Note: 12.0 min shown indicates the temperature of the Icemaker sensor is -12^0C (10.4° F).

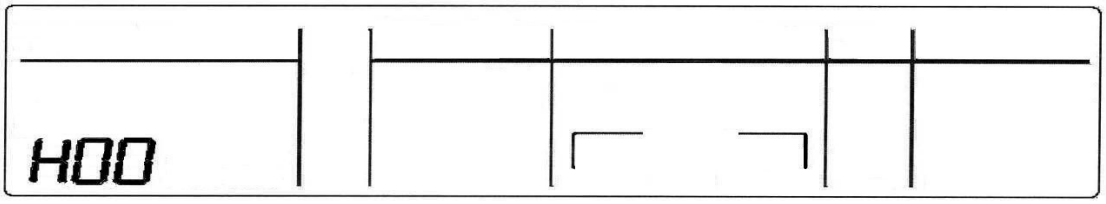
Diagram F



Icemaker Sensor

Fault History
Press the **UP** key once more – Fault History.
HOO will be showing.

Diagram G



Fault History

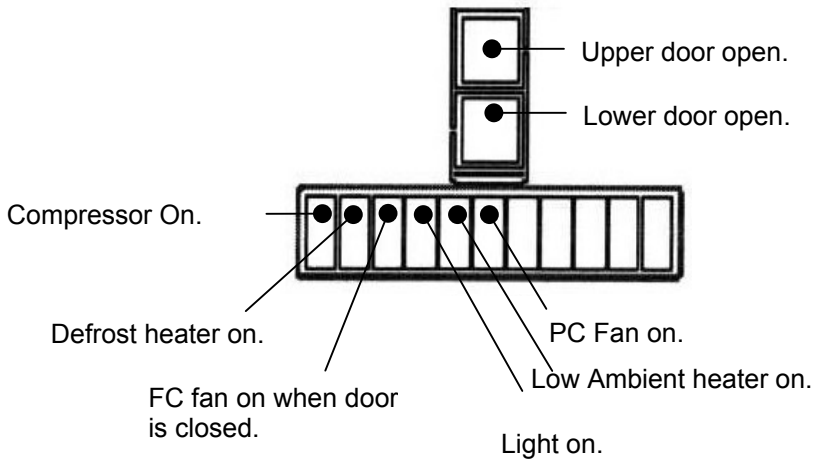
To exit the diagnostic mode, press the **MENU** key. If not terminated manually, the diagnostic mode will time out and go back to default display after 5 minutes.
Note: The door alarms do not operate when the appliance is in diagnostic mode.

9 INPUT / OUTPUT STATUS

To enter input / output status:
Press and hold the MENU button, then press the UP button for 4 seconds. This enters the Diagnostic mode.
Press the UP button three times. The current input /output status will be displayed.

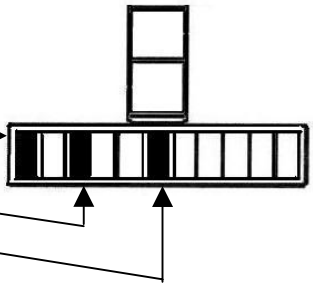
If a device is on or a door is open, the respective LCD will be on.
Return to normal operation by pressing the MENU button.
Note: Only the first 6 LCD's are used. The last 5 are not used.

Input/Output Status



Example.

- The Compressor is on.
- The FC fan is on.
- The PC fan is on.



Note: In I/O mode the illumination of the LCD will turn off if either PC doors are opened.

9.1 FAULT HISTORY

The Fault History will indicate the last fault that occurred with the product. However, this will only be displayed for a periods of 4 days, after which it can only be accessed through a download.
It will also indicate if there are any further faults with the display board. If an icemaker display fault has occurred, these will be indicated by fault codes F40 or F41 on the LCD Display.

Note: This is fault history and may not necessarily be a current fault.

9.2 TO MANUALLY FORCE A DEFROST

While pressing and holding the MENU button, press the DOWN button for 4 seconds. Note that there will be a delay of two (2) minutes before the element starts to heat after going into this mode. This is known as the warm up time.

9.3 LCD DISPLAY

When the PC door is opened, the backlight of the display will turn off and the functions will not operate i.e.: the water dispenser will not work and temperature setting etc. cannot be altered.

However, if the door is left open for 5 minutes, the interior light will turn off and the alarm will sound. At this point the display will start working and all functions will be operative.

9.4 TO MANUALLY FORCE THE ICEMAKER

(Products before January 2009)

Press and hold down the MEASURED FILL + UP + DOWN buttons for 4 seconds. This will activate the icemaker. Note: if the bins are removed to observe the icemaker operation, the icemaker will start to rotate. However, if the bin lever device is in a down position the icemaker will not rotate. The lever-lock needs to be either removed or pushed backwards for the icemaker to complete a full rotation.

(Products after January 2009)

Press **LOCK** key first, then **DOWN** + **UP** keys and hold all three (3) keys for 4 seconds. This will activate the icemaker. Note: if the bins are removed to observe the icemaker operation, the icemaker will start to rotate. However, if the bin lever device is in a down position the icemaker will not rotate. The lever-lock needs to be either removed or pushed backwards for the icemaker to complete a full rotation.

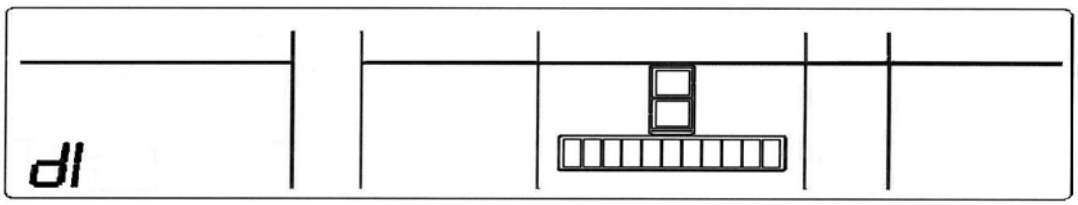
NOTE: A forced harvest will operate without the product being down to temperature. If the harvest does not work the sensor may be not connected or open circuit. The Icemaker sensor must be in circuit for a forced harvest to work.

Bin lever in down position. When in this position, the icemaker will not rotate/harvest.

9.5 DATA DOWNLOAD

To place the product into download mode, press and hold the MENU button, then press the UP button for four seconds, then press the DOWN button.
Once the product is in a download mode, either of the LEDs can be used. Place the download pen towards the LEDs and start the download. The display will have the letters “dl”, signifying product is in a download mode.

Diagram H



10 WATER DISPENSER

10.1 PRESSURE DISPENSING PAD

This pad is located at the rear of the dispensing area, and is used to dispense water. Water can be dispensed using a measured fill option on the display, or free flow. The display will light up and the water fill icon will appear when the water is dispensed.

The dispenser will not operate while the PC door is open.

10.2 INITIAL USE

Press the glass or container into the pressure-dispensing pad.

Note: Pressing very hard against the water dispensing pad will NOT make the water dispenser operate any faster or produce greater quantities of water.

Initially allow approximately a one-minute delay from when the pressure-dispensing pad is pushed until the water is dispensed. While the tank is filling, no water sign will appear.

It is important to flush the tank, discarding around 3 Litres/Quarts of water immediately after the first fill. This may also be necessary after extended periods of non-use.

10.3 MEASURED FILL USE (Products before January 2009)

Select the desired amount to be dispensed.
Activate the pressure-dispensing pad to start dispensing.
Water flow will stop when either the pre-selected amount has been dispensed, or the dispensing pad is released.
During measured fill, the amount of water dispensed will be counted and displayed on the screen.

10.4 TO CHANGE MEASURED FILL (Products before January 2009)

Press the MEASURED FILL button. The default quantity is 250 mls/8flozs.
To change the quantity, press the MEASURED FILL button again. This will change the quantity to 300mls/10flozs.
Pressing the button once more will change to the jug icon 1litre/1quart.
The water-dispensing icon will animate when the water is being dispensed.
Note: After dispensing, the measured fill will return to its default position of 8flozs.

10.5 WATER FILTER AND CARTRIDGE

The product is supplied with a water filter and cartridge. It is recommended that the filter be mounted in a vertical position. Where the filter is positioned is at the discretion of the customer, however, closer to the product is recommended. Water pressure may be reduced if the filter is installed too far from the product.

The replacement icon will appear and blink when the filter needs to be replaced. This is approximately every 2800 litres of water or 6 months.

10.6 CHANGING THE WATER FILTER

Turn the water off. It is also recommended that the pressure be released by dispensing water with the tap off.
Grasp and firmly twist the cartridge in an anticlockwise direction (to the left when installed in the recommended orientation).
Pull the cartridge away from the filter head (down when installed in the recommended orientation).
Discard the old filter.
Remove the protective cap on the spigot on the head of the new cartridge.
Push the cartridge upwards towards the head while rotating it in a clockwise direction (to the right when installed in the recommended orientation).
Reset the filter icon on the display (this will be set to remind the customer the filter is due to be replaced).

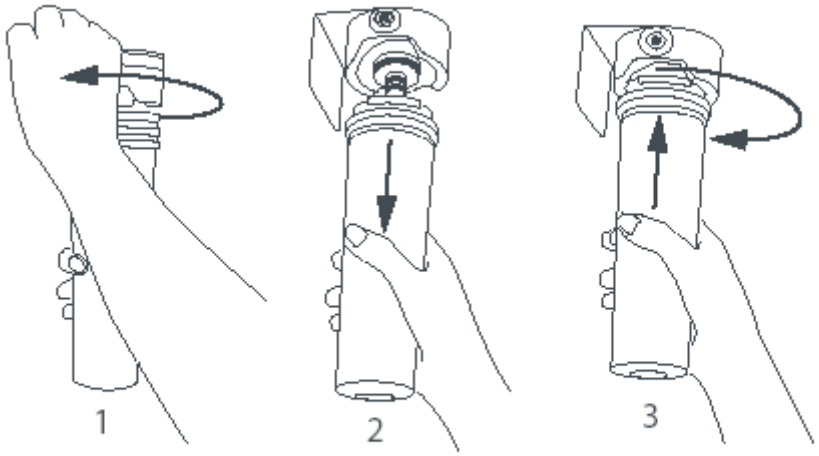


Fig.11 Changing the water filter cartridge

10.7 TO RESET THE FILTER ICON

Press the UP + LOCK button for 4 seconds to reset the “Filter monitor”.

Note: Do not reset the monitor before the filter is changed, or monitoring will be inaccurate.

10.8 TO DISABLE THE FILTER ALARM (Products before January 2009)

Disable the alarm if no filter is to be fitted.
Press and hold the MEASURED FILL button, and press and hold the MENU and UP buttons for 4 seconds to turn this feature on/off.

10.9 FLOWMETER CALIBRATION / MEASURED FILL CALIBRATION (Products before January 2009)

This calibration is to be carried out when the set quantities may be under or over the default settings.
Example: Default setting is 250 mls/8fl ozs, however only 200 mls/7fl ozs is being dispensed.

Press and hold the MEASURED FILL button, then press the DOWN button to enter the calibration mode.
100 CAL will be displayed in the MEASURED FILL window.
The 100 display is a percentage. It can be increased by using the UP button, or decreased by using the DOWN button.

10.10 TO DISABLE THE FILTER ALARM (Products after January 2009)

Disable the alarm if no filter is to be fitted.
Press and hold the **MENU** + **UP** + **LOCK** buttons for 4 seconds to turn this feature on/off.

11 VARIABLE CAPACITY COMPRESSOR

The compressor is turned on when cooling is required. It is switched by the power/control module sending a low voltage frequency signal to the inverter.

The refrigerator is fitted with a variable capacity compressor (VCC). This improves energy efficiency and maintains a more stable temperature in both the provision compartment and the freezer compartment. The compressor windings are wired in a 3 phase star formation with the resistance between any two pins being the same (6.4 ohms).

11.1 VARIABLE CAPACITY COMPRESSOR CONTROL OVERVIEW

The V4.2 power/control module on VCC product is identical to that on non-VCC product. The stage 4.2 power/control module senses if it is connected to a VCC compressor and uses the appropriate algorithm.

The compressor can operate at speeds between 1590 and 4500 rpm inclusive. On the Fisher & Paykel product we operate the compressor at a select number of different speeds between 1590 and 4500 rpm to reduce the variation in sound produced by the compressor. An electronic module/inverter connected between the power/control module and the compressor controls the speed. This it does by supplying a modulated DC 3 phase supply to the compressor. Warning: Permanent damage will occur if the compressor is directly connected to the AC supply line.

The power/control module monitors, amongst other things, the refrigerator compartment temperatures (via thermistors) and the defrost cycle, and from this information sends signals to the electronic module/inverter to determine compressor speeds.

Whenever the compressor starts, it is run at 2200 rpm for 2.5 seconds to establish lubrication, and is then run at 1590 rpm for a further 27 seconds before changing to any other higher speed as requested by the power/control module. This is to provide a softer start before the compressor potentially ramps up to some higher speed.

Whenever the refrigerator is plugged in/turned on, and/or after a defrost, in the first cooling cycle the control will run the compressor, after its initial start procedure, at its maximum speed, which is 4500 rpm. The compressor will stay at its maximum speed until both compartments have reached their cut-out temperature, at which point the compressor will switch off and the refrigerator goes into the warm-up cycle.

In the subsequent cooling cycles, the algorithm will vary the compressor speed according to the amount of cooling required to achieve an average temperature in each compartment (as measured by the thermistors), equal to the compartment set temperatures with a 1 hour run-time.

In low ambient, where the heat load and/or cabinet usage is low, the compressor will be likely to run at its minimum speed (1590rpm), and switch off more frequently than once every hour, similar to most non-VCC product.

When the compressor is running at slow speeds, the evaporator may not be fully flooded, but this is normal.

11.2 BUILT-IN ELECTRONIC PROTECTIONS (WITHIN THE MODULE / INVERTER)

Compressor Start-Up

In case any anomaly occurs during compressor starting, the control will wait 6 seconds before repeating the start-up. If the compressor doesn't start after 12 trials, the control will wait 8 minutes before repeating the start-up procedure (this condition may be when pressures are not equalised between suction and discharge sides in the refrigeration system, eg; after an interruption in the mains supply).

Overload Detection And Protection

The control can detect an overload condition by monitoring the current consumed by the compressor. If overload is detected, the control reduces the current by reducing the speed of the compressor until the overload disappears, when the speed will return to the required value.
If the overload increases, the control will continue to decrease the current until the minimum speed of 1590 rpm may be reached, at which point the compressor may "stall", and the control will return to the start-up procedure.

Power Limitation (Temperature Protection)

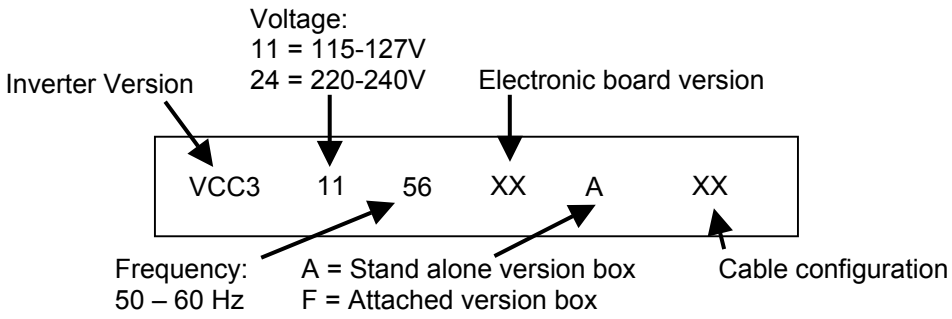
The control limits the power supplied to the compressor to 200 watts to keep all electrical components below a safe operating limit. The power is limited in the same way as the current in the overload protection.

Short Circuit Protection

In a case where a short circuit occurs, (eg; motor winding damage, connection faults etc), the same current limiting control is actuated to reduce further damage. In the case of a major failure, a fuse within the inverter will break the current supplied to the control. This fuse cannot be replaced in servicing.

11.3 VCC MODULE/INVERTER IDENTIFICATION

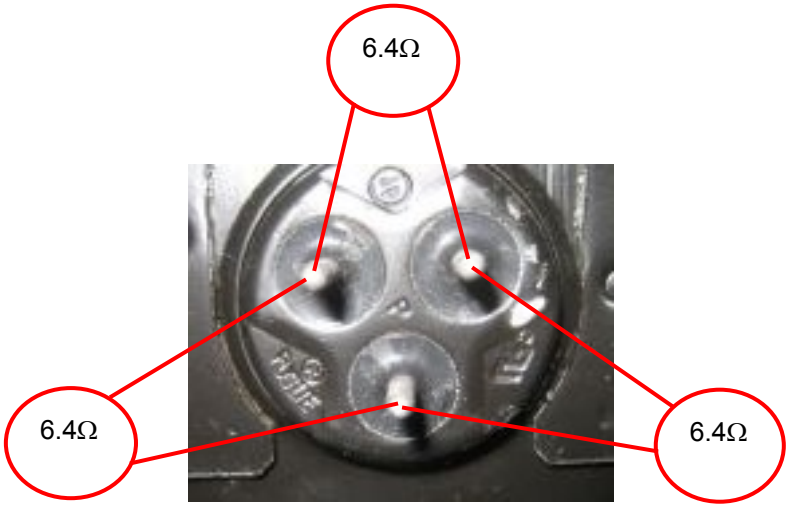
The module/inverter has an identification label giving the following information:



11.4 FAULT FINDING

High Voltage Power Supply Circuit

Whenever power is supplied to the refrigerator, there should always be 240V mains voltage in the high voltage harness between the power/control module and the VCC module/inverter. Live testing of the inverter is **NOT** recommended. Check the resistance of the compressor; check the continuity of the harness from the power/control module and the inverter. If there is continuity through the harness, replace the inverter and check compressor operation. If compressor still does operate replace the power/control module.



VCC Compressor Pins

12 SERVICING PROCEDURES

12.1 SAFETY CONSIDERATIONS

CAUTION

ALL TERMINALS AND INTERNAL PARTS SHOULD BE

TREATED AS ALIVE.

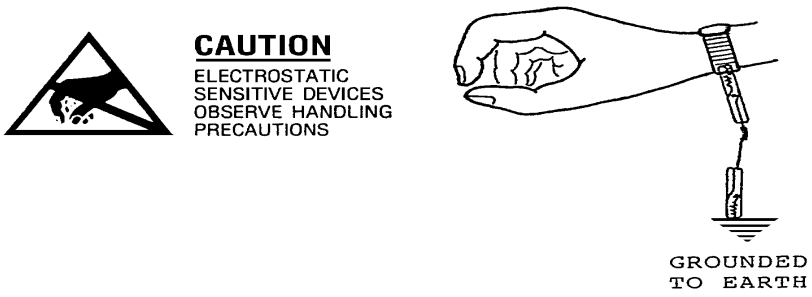
ALL SERVICING SHOULD BE CARRIED OUT WITH THE REFRIGERATOR

DISCONNECTED FROM THE POWER SUPPLY.

Before servicing this appliance, your body should be at the same voltage potential. An antistatic wrist strap must be used when handling electronic components.

Printed circuit boards removed from the refrigerator for return to Fisher & Paykel must be protected from possible electrostatic damage (ESD) while in transit by the use of the specialised packaging in which the replacement was received.

ELECTROSTATIC DISCHARGE SENSITIVE DEVICES



Diagram

12.2 ELECTRICAL SAFETY TEST

Whenever any part of the electrical circuit is serviced or disturbed in the course of carrying out service adjustments or procedures, it is essential that an insulation and earth continuity test be carried out using a two-scale Insulation Tester. This is to be done with the appliance disconnected from power.

Insulation: At least 1 megohm
Earth Continuity: No greater than 0.5 ohm

NOTE: Electronic printed circuit boards can be damaged if tested incorrectly as phase / earth or neutral / earth.

Therefore to carry out an insulation test where the appliance is fitted with a electronic printed circuit board, short out both the phase and neutral conductors together at the 3 pin plug with one test lead of the Insulation Tester. Connect the other lead of the Insulation Tester to the earth pin / cabinet of the refrigerator under test.

Earth continuity can be measured between the earth pin on the 3-pin plug and the cabinet of the refrigerator.

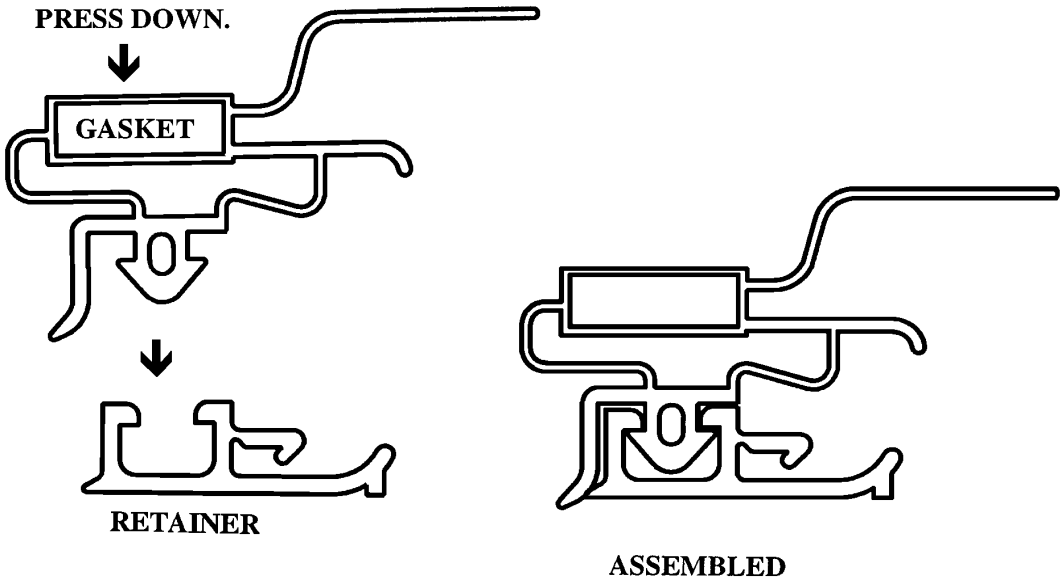
12.3 DOOR AND DOOR GASKET

Door Gasket - (Integral)
Integrally foamed doors with the outer door panel and inner door liner foamed as one unit are becoming more common for manufacturers. This means that only the door gasket can be replaced as a separate part.

All replacement doors are supplied minus the door gasket. The door gasket is a replaceable part of the door. It is held in place against the door liner by means of a moulding that locks the gasket in place once pushed into it. There are no screws or retainers to remove or fit.

To Remove the Gasket
Pull on any section of the gasket to pull it away from the moulding.

To Replace the Gasket
Having removed the old gasket, lay the new gasket around the door gasket moulding. First fit all corners, then push the remaining gasket into place around the door.



12.4 COMPONENT REMOVAL & REPLACEMENT

12.4.1 Removal Of Power/Control Module

Located in the unit compartment on the right hand side and held in place by 2 self-tapping screws.

1. Unplug the refrigerator from the outlet socket.
2. Remove the cover mounting screw and remove the cover.
3. Remove the screw holding the module to the unit compartment. It may be necessary to move the power cable and earth wire to the inverter over the inverter to remove the module.
4. Pull the power/control module outwards to disengage the mounting lugs at the back of the module.
5. Remove all connectors along the top and side edges of the power/control module.
6. Remove the defrost connector (brown wires).
7. Remove the inverter connector.
8. Refit in reverse order.

Note: It is important that the power/control module is clipped securely to the side of the unit compartment and the copper earth spring clip is not damaged, as this maintains good earthing and provides a low inductance path to the chassis for RF voltage. Check that the flat pins at the back of the module are properly engaged with the lugs on the unit compartment when refitting.

12.4.2 PC Sensor Replacement

Located in the provision compartment and attached to the PC duct cover.

1. Unplug the refrigerator from the outlet socket.
2. Remove all the PC shelving.
3. Unclip the PC air duct cover but do not remove.
4. Remove the polystyrene duct cover insulation.
5. Turn the PC cover to expose the back of the cover.
6. Remove the PC sensor from the cover and cut off the sensor wires as close to the sensor as possible.
7. Replacement of the new sensor is done by cutting the wire off the new sensor about 50mm from the sensor, stripping the wire back about 10mm, stripping the old sensor wiring back about 10mm, and soldering the new sensor to the old wiring, making sure both connecting wires are not shorting but are insulated with heat shrink sleeving.
8. Refit in reverse order. (Ensure that sensor is protruding at least 12mm.)

12.4.3 PC2 Sensor Replacement

This sensor is located at the rear of the water tank. It is held in place by a piece of aluminium tape.

1. Unplug the refrigerator from the outlet socket.
2. Remove all the PC shelving.
3. Unclip the PC air duct cover but do not remove.
4. Remove the polystyrene duct cover insulation.
5. Turn the PC cover to expose the back of the cover.
6. Remove the PC sensor from the cover.
7. Remove the tank cover to expose the tank.
8. Remove the aluminium tape holding the sensor and cut sensor wires as close to the sensor as possible.
9. Replacement of the new sensor is done by cutting the wire off the new sensor about 60mm from the sensor, stripping the wire back about 10mm, stripping the old sensor wiring back about 10mm, and soldering the new sensor to the old wiring, making sure both connecting wires are not shorting but are insulated with heat shrink sleeving.
10. Ensure the tank is dry, then re-tape the sensor onto the tank using a new piece of aluminium tape.
11. Refit in reverse order.

12.4.4 Removal Of PC Fan Motor

1. Unplug the refrigerator from the outlet socket.
2. Remove all the PC shelving.
3. Unclip the PC air duct cover but do not remove.
4. Remove the polystyrene duct cover insulation.
5. Turn the PC cover to expose the back of the cover.
6. Remove the PC sensor from the cover and remove the cover.
7. Remove the duct grill and polystyrene insulation.
8. Using 2 fingers, withdraw the fan motor upwards. It is mounted horizontally in the divider partition.
9. With the motor out, this will expose a small multi plug and socket connection to the fan motor and wiring harness. Unplug.
10. To refit back together, connect the multi plug, then fit the wiring harness multi plug into the pocket of the divider partition.
11. Using 2 fingers, slip the motor back into the divider partition to fit horizontally.

Note the back of the fan motor faces upwards. Refit duct covers and test.

THE FAN IS FITTED WITH AN OVER MOULDED SUSPENSION. CHECK THE SUSPENSION LEGS TO ENSURE THE LEGS ARE NOT LOOSE OR BROKEN.

12.4.5 Replacing Cross / Base Rail Door Reed Switches

1. Unplug the refrigerator from the outlet socket.
2. Remove the reed switch by placing a small bladed screwdriver into the slot under the reed switch cover and lifting the cover off.
3. Unclip the encapsulated reed switch from the housing.
4. Cut off the wiring to the reed switch as close to the switch as possible.
5. Replacement of the new reed switch is done by cutting the wire off the new reed switch about 60mm from the reed switch, stripping the wire back about 10mm, stripping the old reed switch wiring back about 10mm, and soldering the new reed switch to the old wiring, making sure both connecting wires are not shorting but are insulated with heat shrink sleeving. Take care not to leave too much excess wire as the read switch must be able to be fitted back in to the housing.
6. Refit in reverse order.

12.4.6 Display Module Replacement

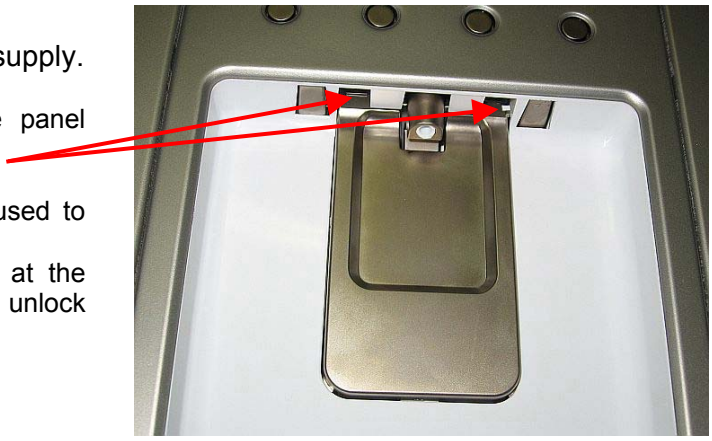
The display module is located on the front of the door.
To remove the module:

Step 1

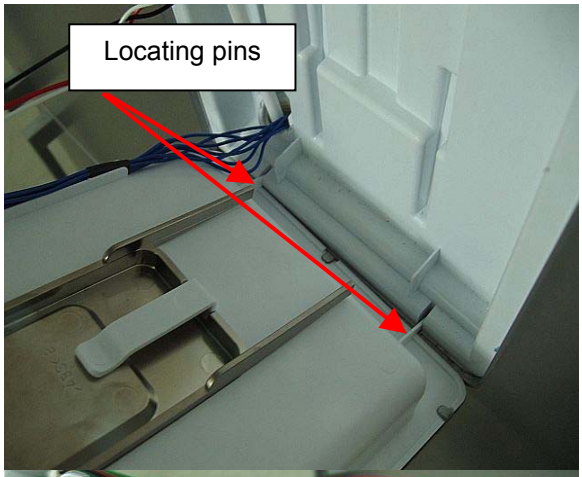
Disconnect the refrigerator from the power supply.

Push the tabs upwards and gently pull the panel forward once the tabs release.

A small screwdriver or key may need to be used to dislodge the tabs from the housing.
By pushing down on dispenser housing and at the same time use key or small screw driver will unlock dispenser



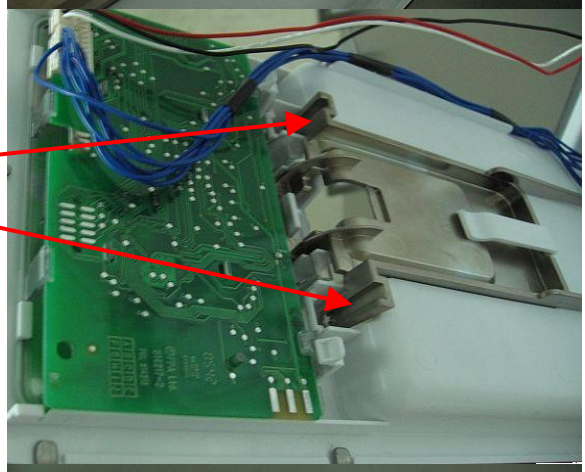
Step 2
Two locating pins on the base of the front panel hold the housing at the bottom.
Note: The housing cannot be removed as wiring looms prevent the housing being removed.



Step 3
Disconnect the RAST connectors from the module.

Pull the two bottom tabs forward.

Remove the module.

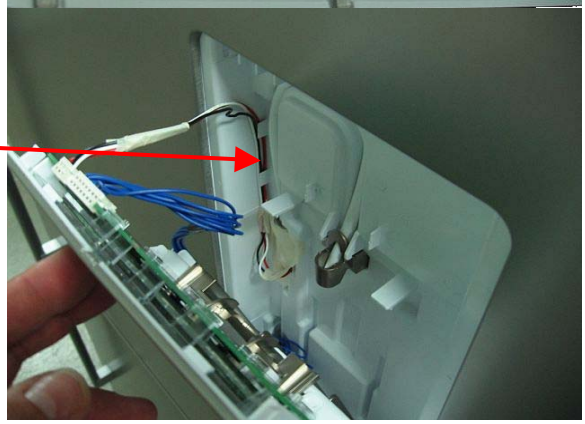


Step 4
Refit in reverse order.

Ensure the wiring is placed and clipped into the correct position.

Ensure the water hose is in the correct position prior to clipping the panel into position.

If necessary, replace the water hose between the top hinge and the dispenser.



12.4.7 Water Dispenser Pad Replacement

- Remove the module (refer to Section 0).

To remove the pad, lift the sensor pad upward.

To refit the sensor pad, ensure the retaining clip is as shown.

Refit in reverse to above procedure.

12.4.8 Removing Water Tank

- Turn the water off at source.
- Remove all shelves.
- Remove the PC duct cover and PC Sensor from duct cover
- Unclip the water reservoir cover from the cabinet liner.
- The reservoir is removed by sliding a flat bladed plastic putty knife or spatula on top of the tank, and with a folding motion of the spatula, lever the tank lip from the LH side to the RH side until clip is lifted from liner and the tank is removed.

Diagram A – tank in position

Diagram A

Diagram B Fit spatula on the RH side of lip and move to RH side until unclipped.

Diagram B

- Remove water tubes from tank.

Hoses are accessible once tank is removed.

12.4.9 Refitting Water Tank

- Place the bottom section of the tank onto protrusion on PC liner (Refer Diagram C and D)

Diagram C

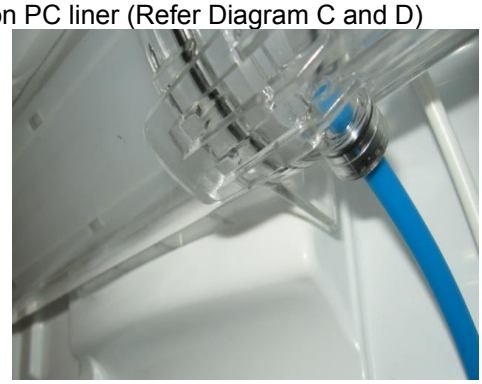


Diagram D

- Push the tank towards the rear of the liner until top lip is clipped into position.
- Refit cover (as per Diagram E).

Diagram E

12.4.10 Defrost Heating Element

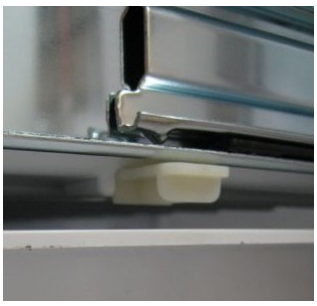
1. Unplug the refrigerator form the outlet socket.
2. Remove all the bins from the freezer and remove the FC drawer.
3. Remove the FC cover by removing two screws. Removal of the icemaker will make removal of the FC cover easier. (Refer Removing Icemaker, Section 0.)
4. Remove the fan grille cover. This unclips with the aid of a small screwdriver.
5. Unplug the fan motor and remove the FC sensor.
6. Lift the evaporator upwards to clear the bottom of the liner drain and pull the bottom edge of the evaporator forward.
7. Remove the cable ties from the thermal fuses.
8. Disconnect the element from the connector.
9. Remove the end deflectors from both ends of the evaporator.
10. Using long nose pliers, bent the aluminium tabs to remove the defrost element.
11. Remove the thermal fuses from the air deflectors.
12. Refit the element in reverse order.

12.4.11 Thermal Fuse

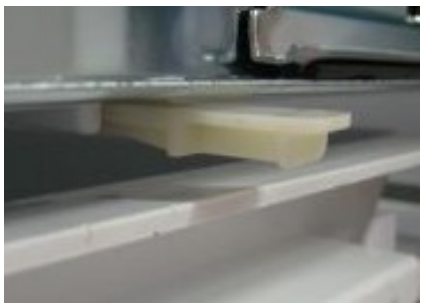
This is part of the element assembly and is to be replaced as part of the defrost heater element assembly. Having a trip temperature of 72^{o} C, they are not re-settable.

12.4.12 Removal Of FC Bins

1. Open the FC drawer and remove all ice and storage bins.
2. Remove the safety clip from the tray. (Refer photo 0)



Remove safety clip from slide to remove tray.



3. Remove the tray.
4. To remove the bin, pull it back towards the freezer.
5. Lift the front of the bin and turn the bin 90° and remove from the FC.
6. Refit the bins in reverse order.

12.4.13 Removal Of The FC Drawer

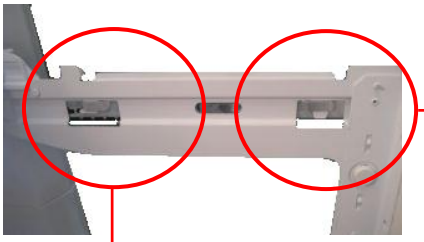
1. Remove all Ice and Storage Bins as in 0.
2. Push the locking tab on each of the FC bracket mount slides as shown in Photo 0
3. Once the tabs have been released, the FC drawer can be lifted up.
4. Locating tabs on the bracket mount slides need to be removed out of the slide to remove the FC drawer.
   NOTE: The anti-wracking device comes out with the drawer.

Push Locking Tab in to release bracket from slide.

Locking Tab

12.4.14 Refitting Of The FC Drawer

1. There are two locating tabs on the drawer that are required to be fitted first. (Refer Photo 0)



Step 1

Step 2

2. Align the rear locating tab into the slot as shown in step 1.
3. Align the front locating tab into the slot as shown in step 2.
4. Fit the anti-wracking bar into the wracking pinion gear ready to fit to the drawer.
5. Both anti-wracking pinion gears need to be fitted simultaneously. (If this is not achieved, damage to the gearing may occur or the drawer will not close correctly.) Refer Photo 12.4.10.1

Photo 12.1.10.1

Photo 12.4.10.2

6. Place the anti-wracking pinion on an angle and slide both pinion gears into position on the slide.
7. Fit the locking tab into position as shown in Photo 12.4.10.2

12.4.15 Removal Of The FC Sensor

1. Unplug the refrigerator from the outlet socket.
2. Remove all bins/trays from the freezer and remove the FC drawer.
3. Remove the FC cover by removing two screws. Removal of the icemaker will make removal of the FC cover easier. (Refer Removing Icemaker, Section 0.)
5. Remove the fan grille cover. This unclips with the aid of a small screwdriver.
6. Move the FC cover to access the FC sensor. (Removal of the FC cover is not necessary.)
7. Cut the FC sensor as close as possible to the sensor.
8. Replacement of the new sensor is done by cutting the wire off the new sensor about 60mm from the sensor, stripping the wire back about 10mm, stripping the old sensor wiring back about 10mm, and soldering the new sensor to the old wiring, making sure both connecting wires are not shorting but are insulated with heat shrink sleeving.
9. Refit in reverse order.

12.4.16 Icemaker Unit Replacement

1. Disconnect the refrigerator from the power supply.
2. Remove all bins/trays from the freezer and remove the FC drawer.
3. Remove the left hand side rail supports.
4. Remove the clip and insulation pad holding the icemaker sensor from the bottom of the icemaker tray.
5. Remove the sensor from under the icemaker tray.
6. Place fingers at the rear of the icemaker, and with a brisk downward motion pull the icemaker from the roof of the freezer.

Note: Both front and rear clips should have dislodged. If only the rear clip has dislodged, place fingers in the front of the icemaker and once again briskly pull the icemaker down.

7. Disconnect the icemaker harness.

12.4.17 Replacing Flapper Element.

1. Disconnect the refrigerator from the power supply.
2. Open the left hand PC door to expose the flapper.
3. Remove the flapper spring. Refer Photo 0.
   a. Using a pair of long nose pliers, remove the top part of the spring from flapper.
   b. Once removed, the spring can be left in position.

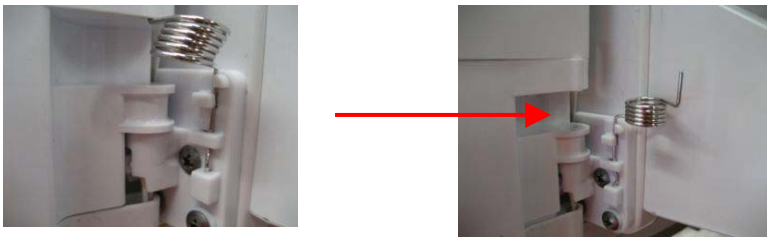


Photo 12.4.13

4. Remove the bottom end cap off the flapper. Refer Photo 12.4.13.1

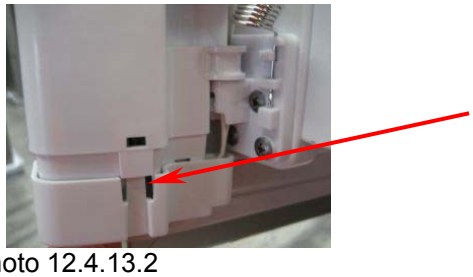


Photo 12.4.13.2

5. Remove the top screws holding the top flapper hinge to the door liner. Refer Photo 12.4.13.3

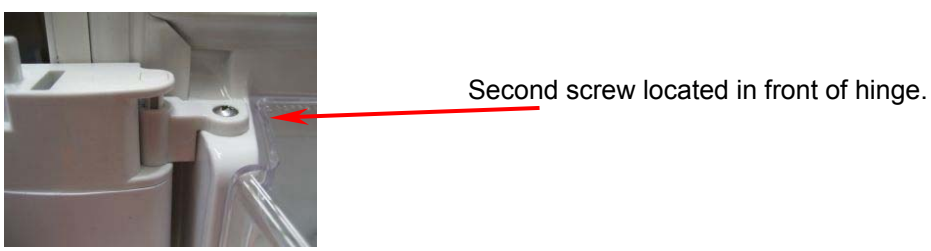
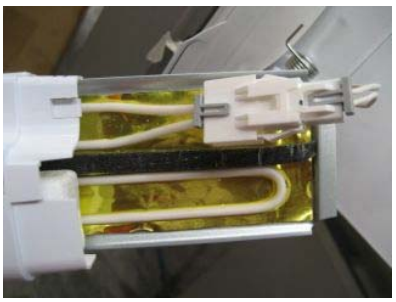


Photo 12.4.13.3

6. Remove the flapper off the bottom hinge and turn over to expose the bottom of the flapper.

7. Slide the element forward. Note: The element is taped onto the steel insert and may offer some resistance. Care should be taken not to damage the insert or the product. Refer Photo 12.4.13.4



Pull element enough to expose Molex connector.

8. Disconnect the Molex connector and remove the entire element.
9. Replacement and re-fitment of the element is in reverse order. Cautionary NOTE: Ensure the element wiring is routed and/or is not under tension as it may cause early failure of the element. Refer Photo 12.4.13.5

Photo 12.4.13.5

12.4.18 Refitting Icemaker

1. Refit the sensor to the underneath of the icemaker tray.
2. Refit the wiring connector.
3. Place the harness into the groove on the edge of the body of the icemaker.
4. Locate the clips and align the icemaker to the clips.
5. With an upward pressure, re-clip the icemaker into position.
   Note: If either front or rear clips do not re-clip, further pressure will need to be exercised to re-clip the icemaker.

12.4.19 Icemaker Temperature Sensor Replacement

1. Remove the icemaker (refer to Section 0).
2. The sensor wires are to be cut as close to the sensor as possible. Strip the wires back (10mm) on the new sensor and on the wiring in the cabinet to allow the wires to be soldered together.
3. Place heat shrink onto both wires of the sensor.
4. Solder the wires, slide the heat shrink over the joints and heat the heat shrink.

12.4.20 Water Valve Replacement

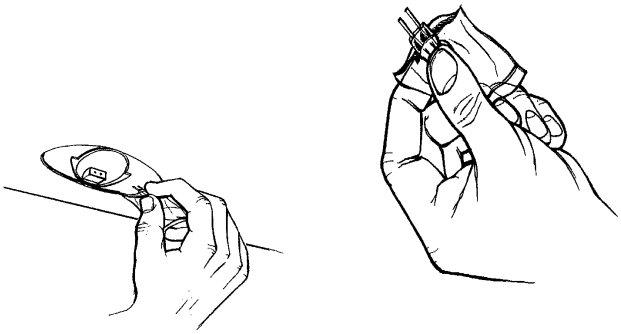
1. Ensure the water is turned off at the supply tap.
2. Disconnect the refrigerator from the power supply.
3. Pull the product away from the wall to access the rear of the product.
4. To remove the water tube from the water valve, push the inner part of the clip inwards and hold down while pulling the tube from the valve. Drain the water (approximately 1½ litres) into a container.
5. Remove the RAST connector from the water valve.
6. Remove the two screws holding the valve to the back wall of the unit compartment.
7. Refit in reverse order.

12.4.21 Replacement Of Low Ambient Heater

This element is mounted in the return grill of the divider and is not replaceable. A replacement element can be fitted onto the rear of the air duct. It is of the blanket wire type on an aluminium tape stuck to the grill itself.

1. Disconnect the refrigerator from the power supply.
2. Remove all the PC shelving and crisper bins.
3. Remove the PC duct cover.
4. Remove the PC air return grill and unplug the element from the harness.
5. Peel the backing off the replacement element and attach the new element to the rear of the return grill.
6. Connect the element to the harness.

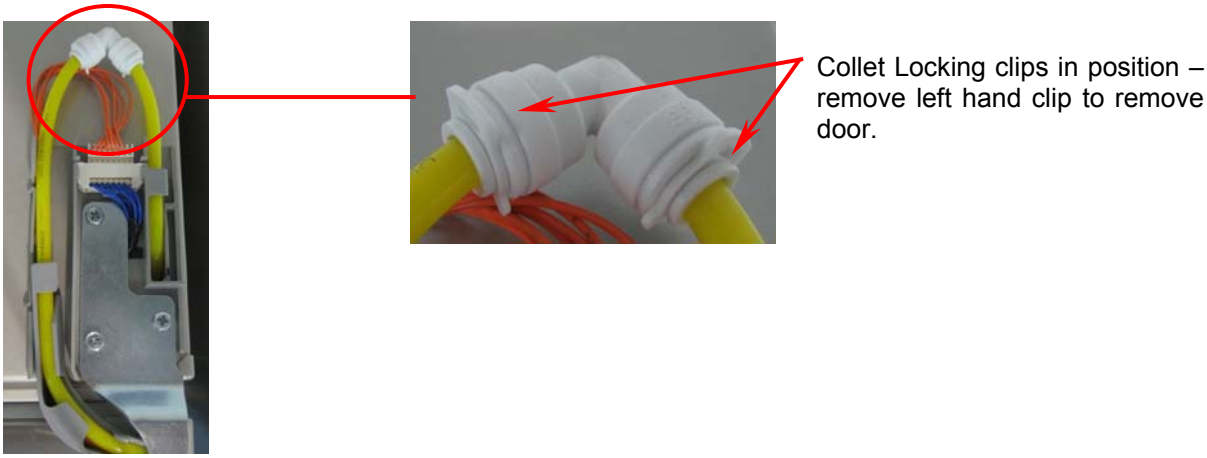
12.4.22 Replacement Of Interior Lamp



1. Disconnect the refrigerator from the power supply.
2. Remove the light cover. (This can be done by using a small screw driver and levering the cover off the front clips.)
3. The faulty light bulb is removed by pulling the bulb out of the light socket.
4. To replace the light bulb, cut the plastic bag but do NOT touch the bulb with your fingers.
5. Push the bulb into position
6. Reconnect the refrigerator to the power supply.
7. Ensure the light operates and refit the light cover.

12.4.23 Replacement of PC Door

1. Disconnect the refrigerator from the power supply.
2. Remove the top hinge cover to expose the wiring and water tubing.
3. Disconnect the edge connector.
4. Remove the left hand collet locking clip from the John Guest Fitting. (Refer Photo 0)



5. Once the clip has been removed, push the collar in to remove the water tube.
6. Remove the top hinge cover and hinge.
7. Remove the water tube and wiring from the guide.
8. Remove the door.
9. Remove the door dispensing pad, wiring and water tube from the old door and refit all components to the new door.
10. Reassemble in reverse order.

12.4.24 Block/Edge Connectors

Should a connector need replacement, it is important that the wiring connections be kept in the correct order to the connector. The wiring harness uses one colour of wire throughout all circuits. The circuit wiring should be traced with the aid of a multimeter before a connection is made.

To make a connection on a female block connector, cut the wire end square and insert it into the correct location on the block connector itself. With the wire fully inserted, apply pressure to the terminal, which will lock the wire and terminal together.

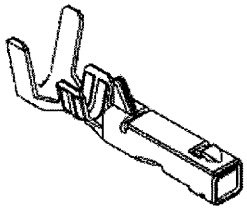
If possible, when replacing a connector the connections should be made one at a time. For example, first cut the wire in pin 1 of the old connector and insert it into pin 1 on of the new connector. Push the pin fully home to lock the wire in place, and then move on to pin 2.

Note that the stage 4 cabinets introduce a new series of block connectors. These connectors contain a wall between the cavities to 'code' or polarize the connector. This is especially important in the case of the 4 and 6 way connectors in the power / control module. Also note that the replacement connectors are un-coded (to reduce the number of spare parts required) and therefore care must be taken that the connector is replaced in the correct socket. Check the wiring diagram and labelling on the power/control module if unsure.

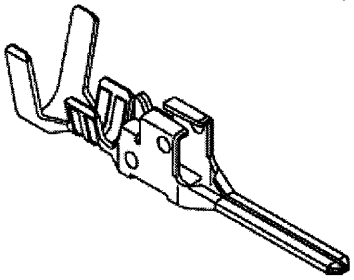
When wiring any DC voltage supply or components it is important that the correct polarity be observed.

Also used are a new series of in-line connectors, replacing the old AMP mini mate-n-lok connectors. These Molex plugs and sockets are available as spare parts.

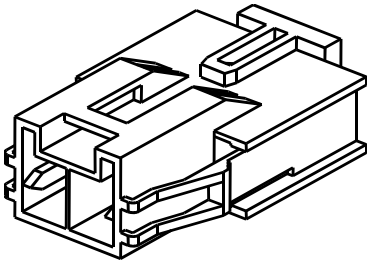
The following diagrams show all these connectors and their Fisher & Paykel part numbers.



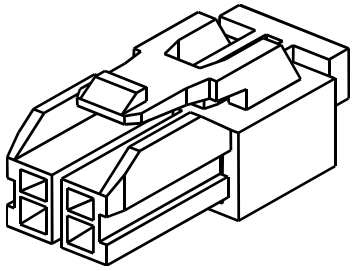
881595 MOLEX SKT 16-22AWG 50597-8100 (16 – 22AWG wire)
881596 MOLEX SKT 20-26AWG 50598-8100 (20 – 26AWG wire)



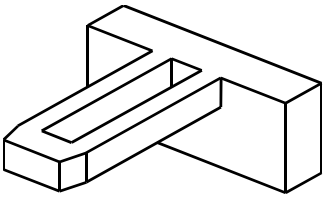
881597 MOLEX PIN 16-22AWG 50599-8100 (16 – 22AWG wire)
881598 MOLEX PIN 20-26AWG 50600-8100 (20 – 26AWG wire)



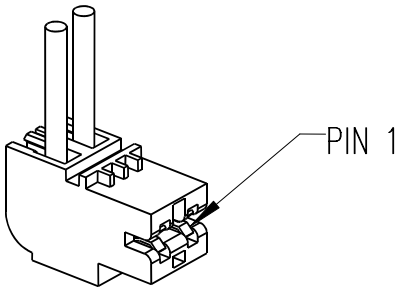
881592 MOLEX CAP FEMALE 51139-0200



881593 MOLEX PLUG MALE 51138-0200

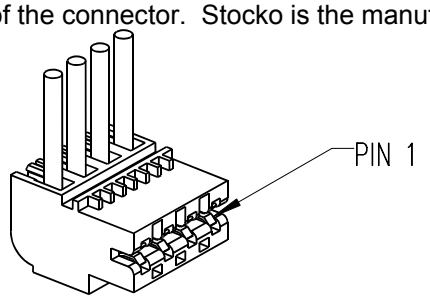


881594 MOLEX RETAINER 51140-0205

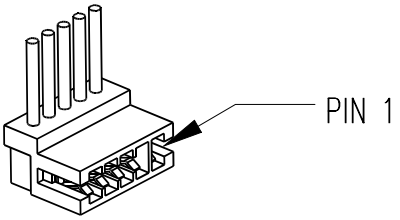


881588 STOCKO 9290-02-AB01-000-960 (Mains cord)
881599 STOCKO 9290-02-BA01-000-960 (Defrost Heater)
881600 STOCKO 9290-02-EE01-000-960 (Run Capacitor)

Note that in the part names of these connectors, the -02- refers to it being a 2 way connector, and the -AB01- (for example) refers to the coding of the connector. Stocko is the manufacturer of these connectors.



881591 STOCKO 9290-04-EF02-000-960 (Compressor cable)



New Edge connector series with internal coding – note the wall.

Note that to minimize the number of spare parts that need to be carried, these coded connectors are to be replaced with their un-coded equivalents. For the 3, 5 and 6 way connectors used on Stage 4 cabinets, these have the following part numbers:

873251 STOCKO 7234-003-500-450 (3 way)
881135 STOCKO 7234-005-500-450 (5 way)
873247 STOCKO 7234-006-500-450 (6 way)

Note that in the part names of these connectors, the -003- refers to it being a 3-way connector (for example). Stocko is the manufacturer of these connectors.

12.5 ACTIVE SMART PC/FC FAN MOTOR TESTER

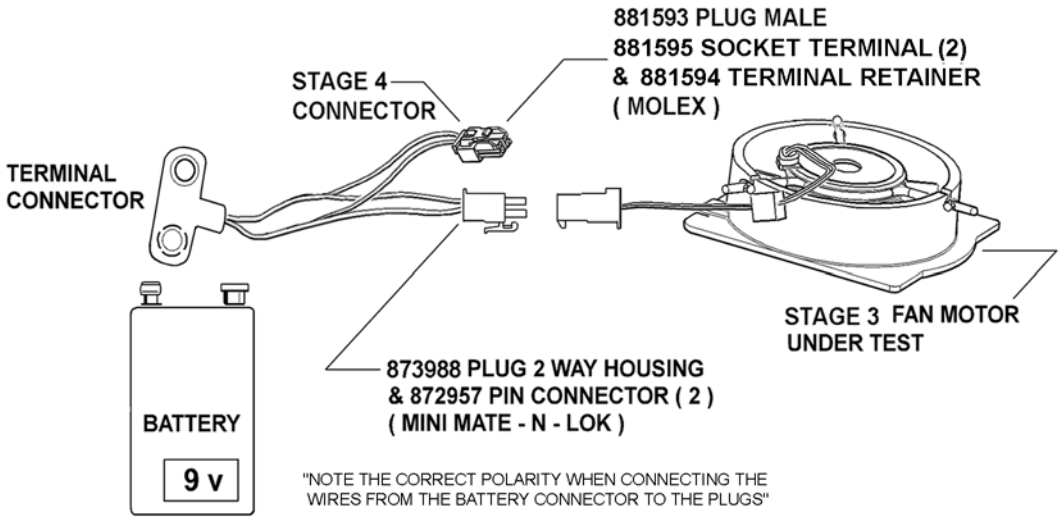
Testing a PC or FC fan motor with a multi meter is not possible, due to the electronics contained within the motor. The simple way to test a fan motor is to apply a DC voltage with a 9 volt battery. A test lead can be made up as shown below that will test motors fitted with either the earlier Mini Mate-N-Lok plug or the later Molex plug.

Parts required are:

Component	Qty	Part Number
Mini Mate-N-Lok 2 way housing plug	1	873988
Pin Connector	2	872957
Molex Plug Male	1	881593
Socket Terminal	2	881595
Retainer Molex	1	881594

A 9 volt battery terminal connector obtainable from any electronic goods supply store.
A 9 volt battery

NOTE: When wiring the plugs, ensure that the polarity is correct, as the motors will not run if the polarity is reversed.



12.6 PRESSURE TESTING OF THE REFRIGERATION SYSTEM

The use of the in-line pressure gauge can speed up and eliminate the incorrect diagnosis of a leak within a refrigeration system. In some cases it has been found to be the services manifold that was being used that was leaking and not the system. There are very few parts on the in-line pressure gauge that can leak.

Rule one:
In pressure testing any cabinet, before disconnecting any joint please be 100% sure that it is not the joint that is at fault, otherwise a lot of time can be lost looking for a joint/leak that doesn't exist.

Rule two:
Only use dry nitrogen to pressure test a system.
NOT REFRIGERANT OR COMPRESSED AIR. NEVER OXYGEN

Rule three:
Don't over pressurise the system. It could be dangerous.

How to use the In-line Pressure Gauge:

Step 1:
Cut and connect the pipe circuit to be tested to the in-line pressure gauge and braze this joint.

Step 2:
At the other end of the pipe circuit being tested, crimp off the pipe with crimp off pliers and braze this end off to totally seal the circuit.

Step 3:
Connect a nitrogen bottle to the in-line pressure gauge by means of a hose with a Schrader valve depressing key in the hose coupling.

Step 4:
Open the nitrogen bottle fully with the regulator backed off.

Step 5:
Increase the regulator pressure in the circuit being tested to 150 psi.

Step 6:
Close the nitrogen bottle valve, back off the pressure regulator.

Step 7:
Disconnect the hose coupling to the Schrader valve fitting.

Step 8:
Seal the Schrader valve with its sealing cap.

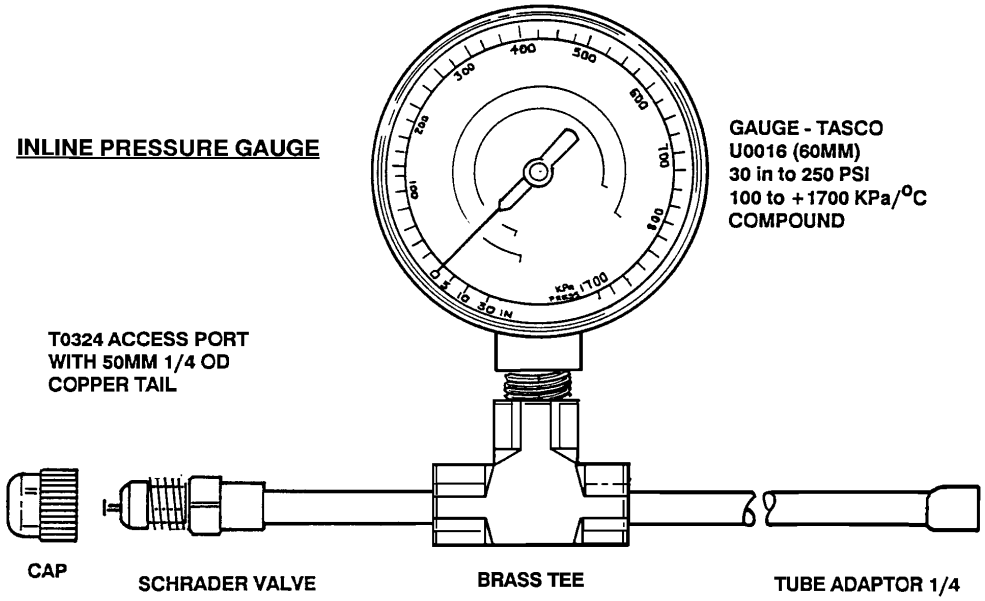
Step 9:
Use a bit of masking tape to mark the face of the pressure gauge at the set pressure. Record the date and time also.

Step 10:
Check all exposed brazed joints with soap bubbles, including the joints on the in-line pressure gauge.

Step 11:
Allow the pipe circuit under test to sit on drop off test. This could take a number of days for a result.

NOTE: In some cases a leak may not be found by pressurising the circuit, whereas a vacuum pulled on the same circuit will show the leak. Keep this in mind, as oil within the circuit can block a hole.

In some cases, if the brazed joint is warmed while under pressure, this can thin the oil and help to expose the leak. A heat gun or hair dryer is useful.



12.7 TRANSPORTING OF REFRIGERATORS

(Internal Condenser models fitted with D series compressors)
Cabinets fitted with D Series compressors have the suction line coupling directly connected to the compressor by means of a spinning type coupling (Harness Direct Coupling D series) within the shell of the compressor. It is not recommended to lay the cabinet on is back or its side. This could lead to problems with oil from the compressor running into the suction line coupling inside the compressor.

Even when the cabinet is stood upright for, say, 20 minutes before being switched on at the time of installation, the problem can still occur. With this type of compressor, large quantities of oil could have run into the suction pipe, leading to problems in the system such as blocked capillary or the compressor not pumping due to oil being slugged.

It is recommended that:
If a cabinet is to be transported lying down, then the cabinet should be placed on one side only. This is the right-hand side when standing facing the front of the refrigerator. If looking at the back of the refrigerator when it is laid down in this manner, you will see the power cord entering the cabinet at the bottom and the discharge and suction pipes on the compressor uppermost. (Refer diagram A).

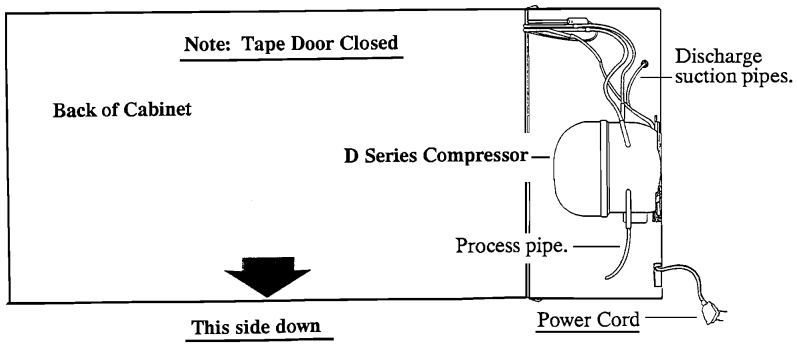


Diagram A

Note: We mark all our refrigerator and freezer cartons with a number of stars on one side of the carton. If the product is to be laid on its side for transporting at any time, the side of the carton with stars on should face upwards (see diagram B). If transporting a cabinet that has been used, be sure to empty the water evaporator tray prior to laying the cabinet down, as water from the water evaporator tray can enter the electronic power module which is attached to the side of the unit compartment.

Ideally, the product should be transported standing upright.

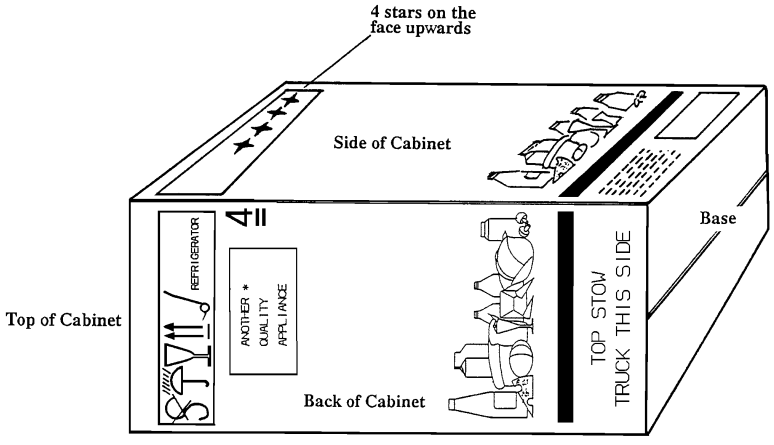


Diagram B

12.8 EVAPORATOR REPLACEMENT

The evaporator is located in the FC compartment mounted on the back wall on its own carrier, with a grill covering a fan motor, which is housed in the front cover.

Having determined that the evaporator needs replacing:

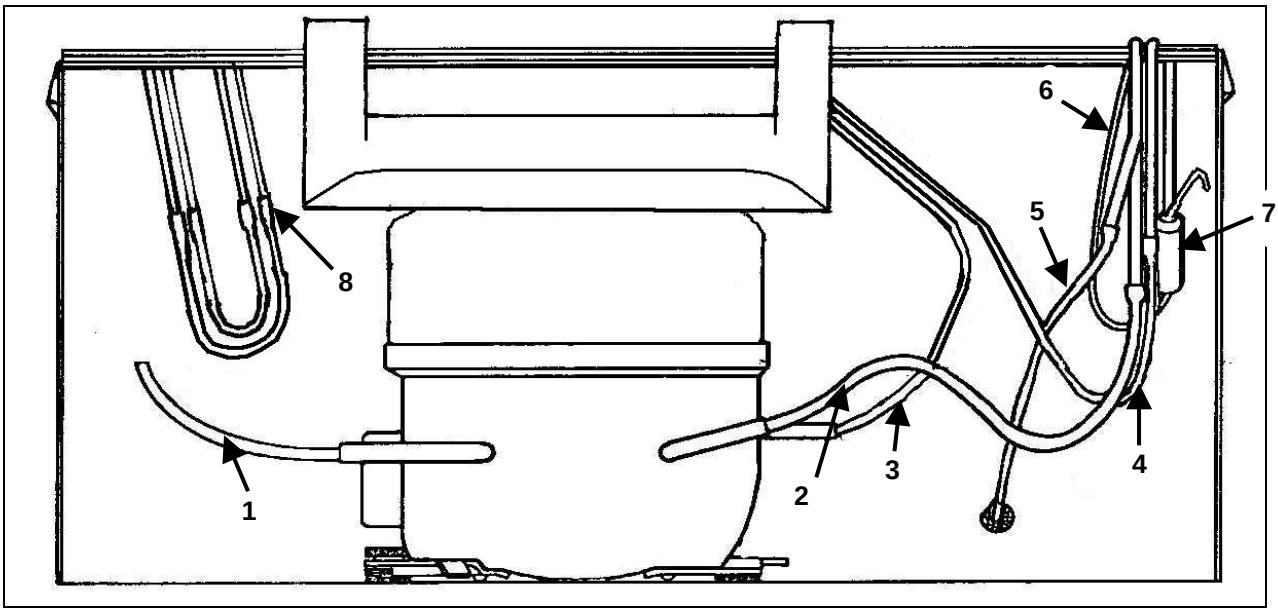
1. Disconnect the refrigerator from the power supply.
2. Recover the refrigerant.
3. Remove the FC drawer (refer to Section 0).
4. Remove the evaporator coil cover.
5. Clean both the suction and capillary pipes with emery cloth.
6. With a tube cutter, cut the suction pipe as close as possible to the induction brazed joint (cutting the suction capillary side of the joint).
7. With a file or knife, cut the capillary where it enters the transition joint on the evaporator.
8. With the element wiring disconnected, the evaporator can be removed.
9. Take the replacement evaporator and fit it to the carrier, fitting the defrost element assembly and the 2 pieces of heat shrink sleeving onto the pipes.
10. Align the evaporator and joints ready to be soldered into position.
11. Lay the product on its back.
12. Place a protective covering over the back of the liner to protect it should solder drop onto it while the joint connections are being made.
13. Fit the suction and capillary lines together, with a protective heat shrink sleeving placed on the pipe first away from the heated area. Care must be taken when brazing near the plastic liner.
14. The same applies for the capillary, applying more heat to the transition joint as it is heavier in material than the capillary.
15. Pressure test both joints.
16. Fit heat shrink sleeving over the joints and heat, having placed damp rags around the area of the ABS liner as heating the heat shrink can cause the liner to be overheated. It is also important to keep the thermal fuse in the element circuit away from the heat gun, as heat from the heat gun can cause the thermal fuse to go open circuit.

12.9 COMPRESSOR REPLACEMENT

COMPRESSOR With No Oil Cooler

1. Disconnect the refrigerator from the power supply. Empty the freezer.
2. Recover refrigerant from the system by fitting a line tap valve to the process pipe on the compressor and connecting to a recovery unit.
3. Remove the relay cover from the compressor and remove the connector from the compressor electrical pins.
4. Unbraze the compressor suction, discharge and defrost water tray heater pipes. Cut if a blockage is suspected.
5. Remove the water tray by removing the two screws.
6. Remove the retaining clips from the compressor mounting pins and lift the compressor clear of the unit compartment. Seal the compressor lines.
7. Fit the new compressor to the mounting pins and refit the retaining clips.
8. Refit the piping such as the suction, discharge and water evaporator heater.
9. FIT A NEW CHARGING TAIL /PROCESS PIPE.
10 REPLACE THE FILTER DRYER. THE FILTER IS TO BE REMOVED BY CUTTING FROM THE SYSTEM, DO NOT HEAT THE FILTER TO UNBRAZE.
11. Pressurise the system with nitrogen. (This is a must before any brazing takes place.)
12. Braze all the pipes.
13. Pressurise the system and test for leaks.

COMPRESSOR PIPING LAYOUT WITHOUT OIL COOLER



1. Service tube (process pipe)
2. Suction line
3. Discharge line into water evaporator tray.
4. Water evaporator to condenser back panel
5. Back panel to base tube
6. Capillary tube
7. Filter dryer
8. External joints from internal condenser circuit.

13 FAULT FINDING

13.1 COMPRESSOR WON'T START - DEAD

Checks to be carried out:

1. Check the fuse and power outlet.
2. Check that there is the correct voltage from the power module to the compressor.
3. Continuity test the 3 pin plug, terminal block and the harness to the compressor.
4. Check the compressor windings (6.40 Ω).
5. Replace the inverter and retest the compressor.

NOTE: A manual starting kit should **NOT** be used on Variable Capacity Compressors (VCC).
Do NOT under any circumstances place line voltage straight onto compressor.

13.2 COMPRESSOR WON'T START - HUMS

Possible Causes:

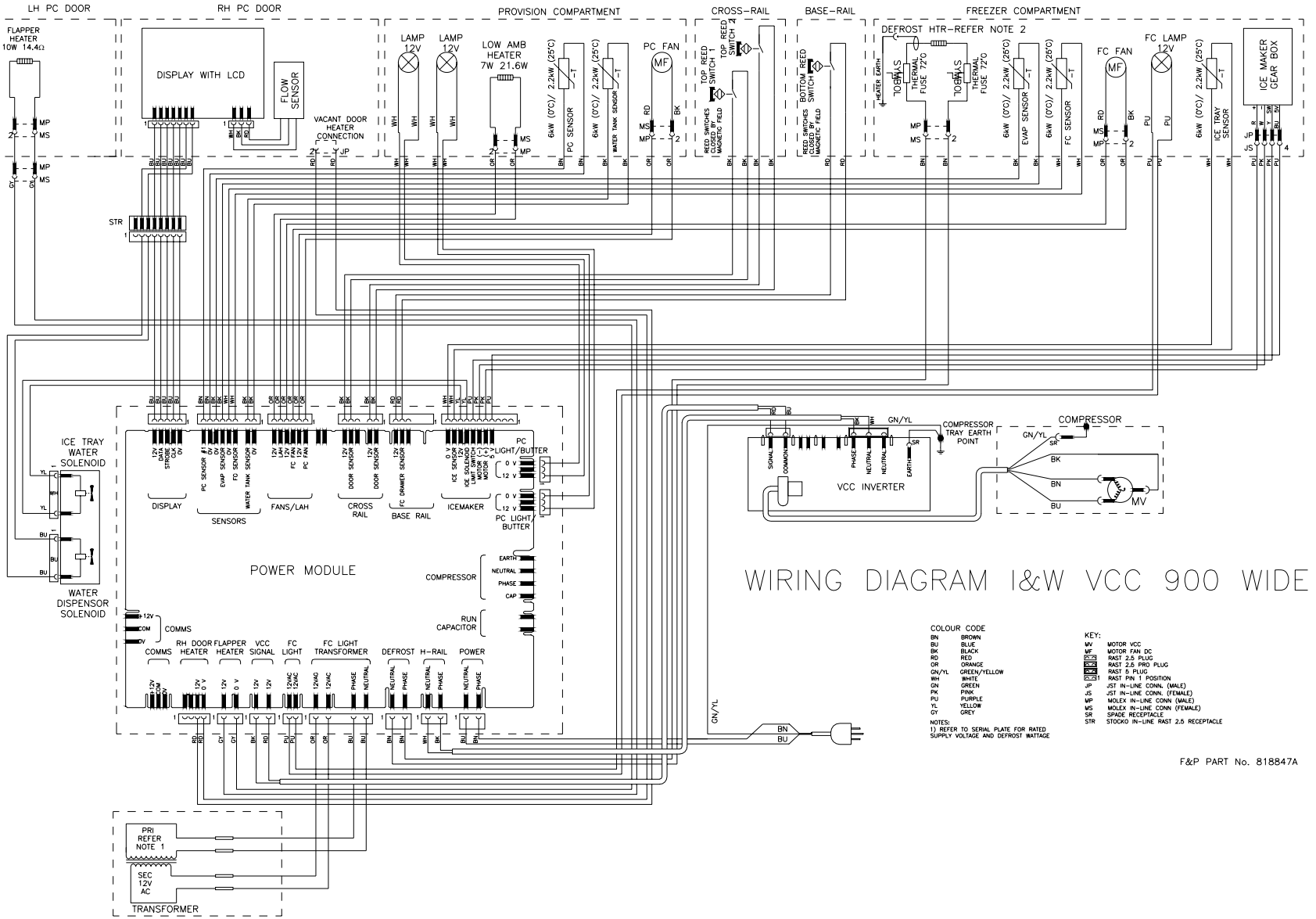
1. The voltage may be low e.g. 10% low. Test the voltage under load.
2. Check the voltage to the inverter from the power module.
3. System pressures may not be equalised; too short an off cycle.
4. Check the start and run windings with an ohm meter.

13.3 COMPRESSOR STARTS, RUNS AND THEN STOPS

Possible Causes:

1. Low voltage - high voltage.
2. Check the compressor voltage matches the supply voltage.
3. The system may be grossly overcharged. Liquid refrigerant entering the compressor low side causing slugging of oil.
4. Check the current draw – if an overload is detected, the compressor will try to restart.
5. The high pressure side may be fully or partially blocked. Very high head pressure. Normally a blockage before the condenser.
6. The condenser may be too hot, e.g. air movement blocked or ambient temperature too high. The refrigerator may be too close to a heating appliance.
7. Check the compressor pipe connections.

14 WIRING DIAGRAM



15 SERVICE REFERENCE

15.1 SERVICE REFERENCE

PROBLEM	Possible Causes	**What To Do**
PC Too Cold		
Cold Crispers	Ambient heater open circuit	Check I/O Fault Log Check continuity of element using multimeter.
Ice In Crispers	PC fan fitted upside down	Fan hub with label on to be facing PC
	PC fan not going	Check I/O Fault Log Check voltage to plug, check wiring polarity
	Air leakage base duct cover	Seal with foam tape on duct divider spigot
	PC sensor location	Remove insulation pad
Cold Compartment Warm Top	PC fan not going	Check I/O Fault Log Check for mechanical obstruction Check power to plug Check polarity Replace fan Check for broken wires.
Total Compartment Too Cold	FC fan not going	Check I/O Fault Log Check power to plug Check for broken wires Check polarity Replace fan
	Short of gas	Check run percentage, if high check evaporator Check fully flooded evaporator, check for leak
	PC sensor inaccurate	Check calibration of sensor ice point using interface binary or refer to thermistor resistance table in service manual
PC Too Warm		
Warm Compartment Cool Bottom	PC fan not going	Check I/O Fault Log Check power to plug Check polarity Check for broken wires Replace fan Check fan is not jammed with ice or anything else
	PC fan upside down	Fan hub with label on to be facing PC refit
	Return duct iced up	De-ice duct area behind chassis Check PC duct insulation for good seal in return duct Check doors are sealing

PROBLEM	Possible Causes	**What To Do**
Total Compartment Warm	PC duct blocked	Defrost evaporator chassis Check for door seal
	Evaporator ice up	Check defrost element, check continuity Check door seal / door left open
	No refrigeration	Does cabinet run? If no check power supplies. If yes check refrigeration system If running, check for live frost/fully flooded evaporator. If not check for leak
	Fans not working	Check I/O Fault Log Is there a 12Volt supply, PC lights working If yes check fan connection(s) at fan end, also at power module end of the harness If no check for power / control module failure.
	Power /control module failure	Is the display lighting up? If not check display module connection If OK is compressor running? If not replace power module
FC Too Cold		
Total compartment too cold	FC sensor location	Check set temperature Sensor clipped and located in correct position
	Faulty sensor	Check calibration of sensor ice point using interface binary or refer to thermistor resistance table in service manual
	PC fan not going.	Check I/O Fault Log Check for mechanical obstruction Check power to plug Check polarity Replace fan Check for broken wires.
FC Too Warm		
Bottom warm top frozen	Iced up evaporator	Check defrost element is working, replace if faulty. Check doors are sealing or have they been left open, adjust and advise customer. FC fan jammed, clear restriction, replace fan if necessary. Check defrost sensor position, reposition onto chassis if not already there.
Total compartment warm	PC fan not going	Check I/O Fault Log Check for mechanical obstruction Check power to plug Check polarity Replace fan Check for broken wires.
	No refrigeration	Is compressor running? If no check power supplies. If yes check refrigeration system. If running check for live frost / fully flooded evaporator, if not check for leak.

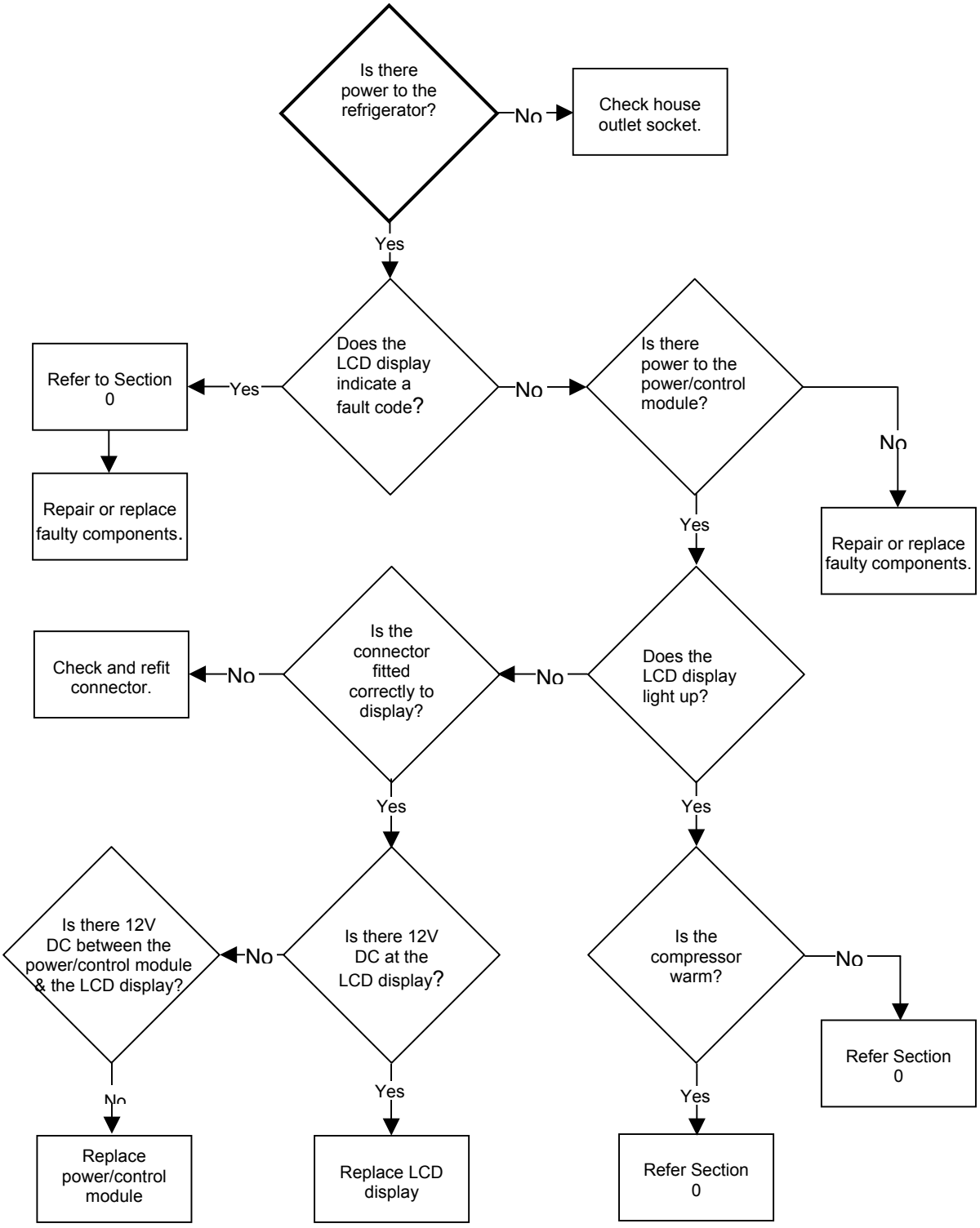
PROBLEM	Possible Causes	**What To Do**
Total Cabinet Too Warm		
	No refrigeration	Is the compressor running? If no check power supplies. If yes check refrigeration system. If running, check for live frost/fully flooded evaporator. If not, check for leak. Compressor is not running, check power / control module voltage outputs. Check compressor. Check reed switches are working OK
FC Cooling PC Warming		
	Iced up evaporator	Check defrost circuit continuity Doors sealing, adjust PC fan is running, if not refer PC too warm
	Iced up return duct	De-ice duct area Check PC duct insulation for good seal in return duct Check doors are sealing
Alarm On		
	Defrost heater	Check display for any fault code Check defrost element continuity Put cabinet into manual defrost, wait for defrost relay to “click” on (2 ½ minutes after pressing buttons) If no “click”, check power / control module If “click” heard, check the defrost heater 230v output at the power / control module
	Sensors	Check display for fault codes 0-5 Sensors above or below limit, refer thermistor service table in service manual
	Door switch fault	Check that no fault code is shown on the display Check that PC/FC doors activate reed switches Check also reed switches with magnet Check wiring harness to power/control module
Fault Displayed - No Alarm		
	Display showing fault code, but no alarm sounding	Alarm has been switched off by user Piezo alarm faulty, replace power/control module
FC Light Not Functioning		
	Blown bulb	Check power supply to socket 7Volts, if nil check plug at display module Check continuity of bulb, if nil replace Check reed switch operations
	Cabinet type	Power / console module not initialised, close FC door and press compartment select button
	Poor connection	Spread halogen bulb legs Lamp holder, replace where possible Connector on display module

PROBLEM	Possible Causes	**What To Do**
No Display Lights		
	Power/control module no power	Check harness and plugs on module harness at both ends Check wiring connections on display board
Refrigerant Noise		
	Popping farting	Capillary may not be fitted into evaporator causing vibration.
	Gurgling whistling	Check alignment of capillary and apply sound dampening tape
PC Light Not Functioning		
	Blown bulb	Check power supply to socket 7Volts, if nil check plug at display module Check continuity of bulb, nil replace
	Reed Switch	Check reed switch is working by using a magnet Place the product in I/O mode can also check reed switch operation.
	Poor connection	Spread halogen bulb legs Lamp holder, replace where possible Connector on display module
Noisy Fan PC		
	Ice around gasket	Replace assy with new fan kit
	Wires touching	Tuck wires away from fan blade
	Faulty fan replace assy with new fan kit	Fit replacement
Noisy Fan FC		
	Ice on cover	Clear ice off cover and check doors are sealing
	Ice on grill	Clear ice off grill and check doors are sealing
	Fan off mountings	Refit
	Wires touching	Tuck wires away from fan blade
	Capillary touching	Shift capillary from fan area make sure it is not touching any part of the cabinet
	Fan motor noisy	Fit replacement
	Wires too tight	Re route wiring
Ice Build Up In Compartment		
	Doors sealing	Check gaskets sealing, adjust gaskets Fit drain valve to drain tube
Not Dispensing Water		
	Dispenser	Check the PC doors are closed Check dispenser connections Check if 12-volt supply is at the dispenser. Check resistance of water valve Check for 12 volt supply at water valve Check water filter and Pressure reducing valve.

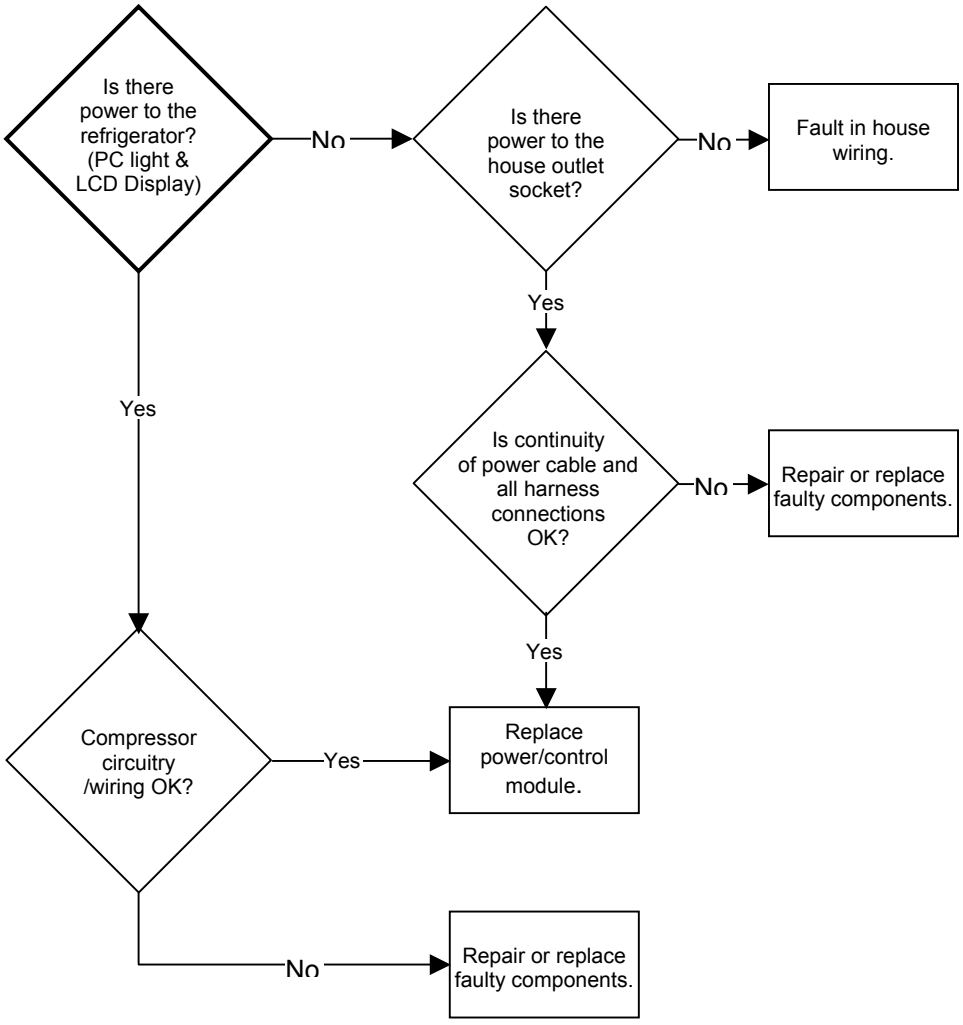
PROBLEM	Possible Causes	**What To Do**
Water Won't Stop Running		
	Dispenser Water Valve Icemaker	Are there any fault codes displayed Is the water valve energised Is the water valve jammed open? Is the water turned on?
Water won't stop running		
Not Producing Any Ice		
	Icemaker Water Valve Sensor	Is the ice bin full Bins are in the wrong way Try forcing a harvest, does it fill Water tape not turned on Icemaker turned off. FC compartment not cold enough FC temperature hasn't reached 14°F Water pressure too low. Water line is kinked/squashed Filter blocked. Check IM sensor for open circuit
Ice Cubes Have Odor		
	Unsealed packages may be transmitting odours/taste	Discard old cubes Ensure foodstuff is sealed correctly.
	Interior of freezer needs cleaning	Ice storage bins needs to be emptied and washed Refrigerator requires cleaning.
	Poor tastes from incoming water	Filter may need changing. If no filter has been installed, filter will need to be installed. Remove tube from exit of filter and test the water for taste after the filter – if taste is present replace filter.
On Installation, No Water Coming In		
	Water supply not turned on	Press dispenser for 2 minutes and allow water to fill the lines and tank.
	Supply line may be blocked	Check supply line for kinks/squashed Run an quart of water through the tank to remove all air bubbles
	Dispenser Lock activated	Check to see if dispenser lock is activated or not.
	Is water Icon on	Check all above
	Water frozen in tank	Check PC and FC setting and increase if necessary. Check download to review excessive usage.
Slow Ice Cube Freezing		
	FC Drawer has been left ajar	Check for obstruction Check Drawer closing mechanism.
	Freezer compartment too warm	Check PC & FC temperature and settings Check temperature of FC and download if required.

16 FAULT FINDING FLOW CHART - SERVICING

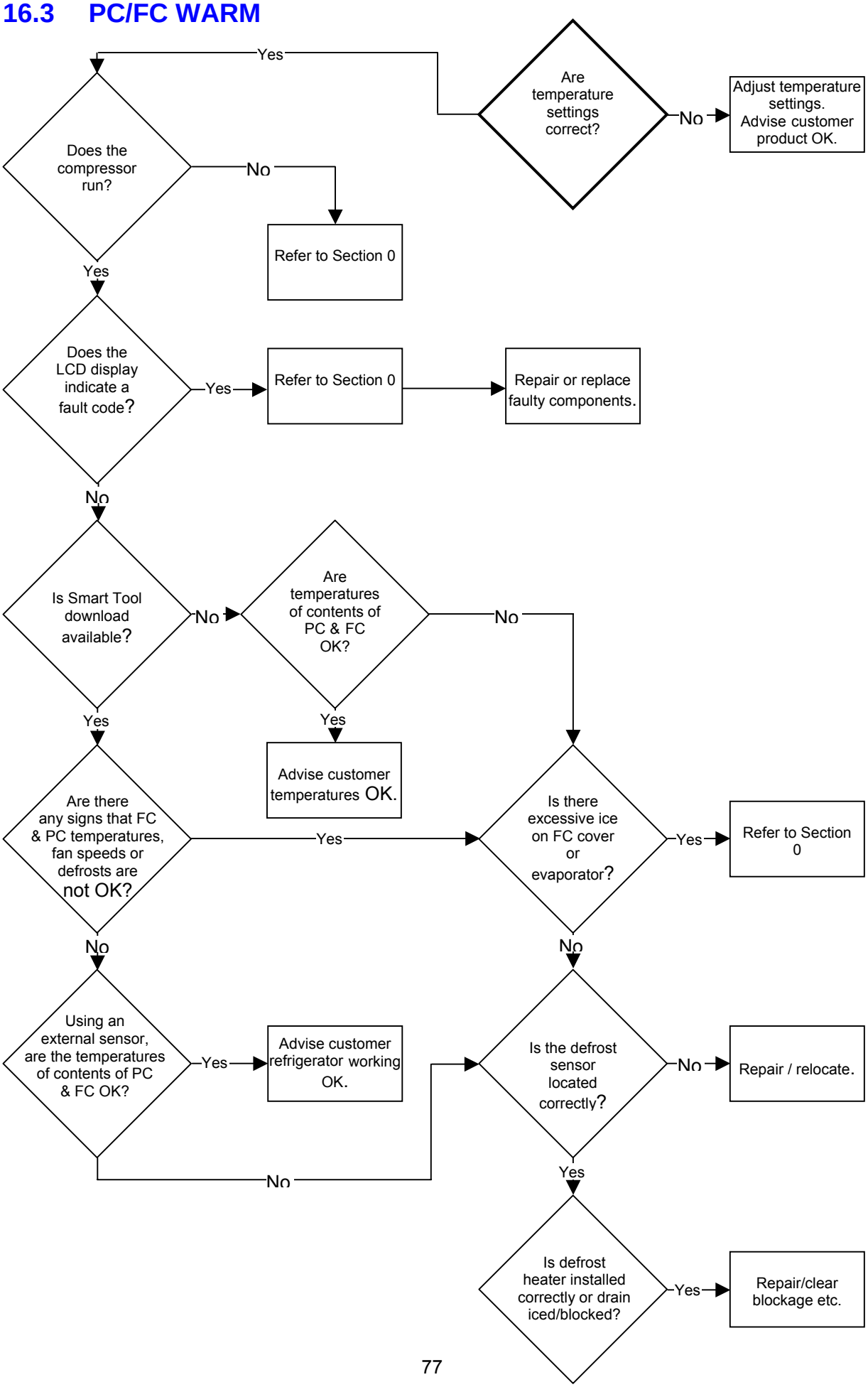
16.1 REFRIGERATOR NOT OPERATING



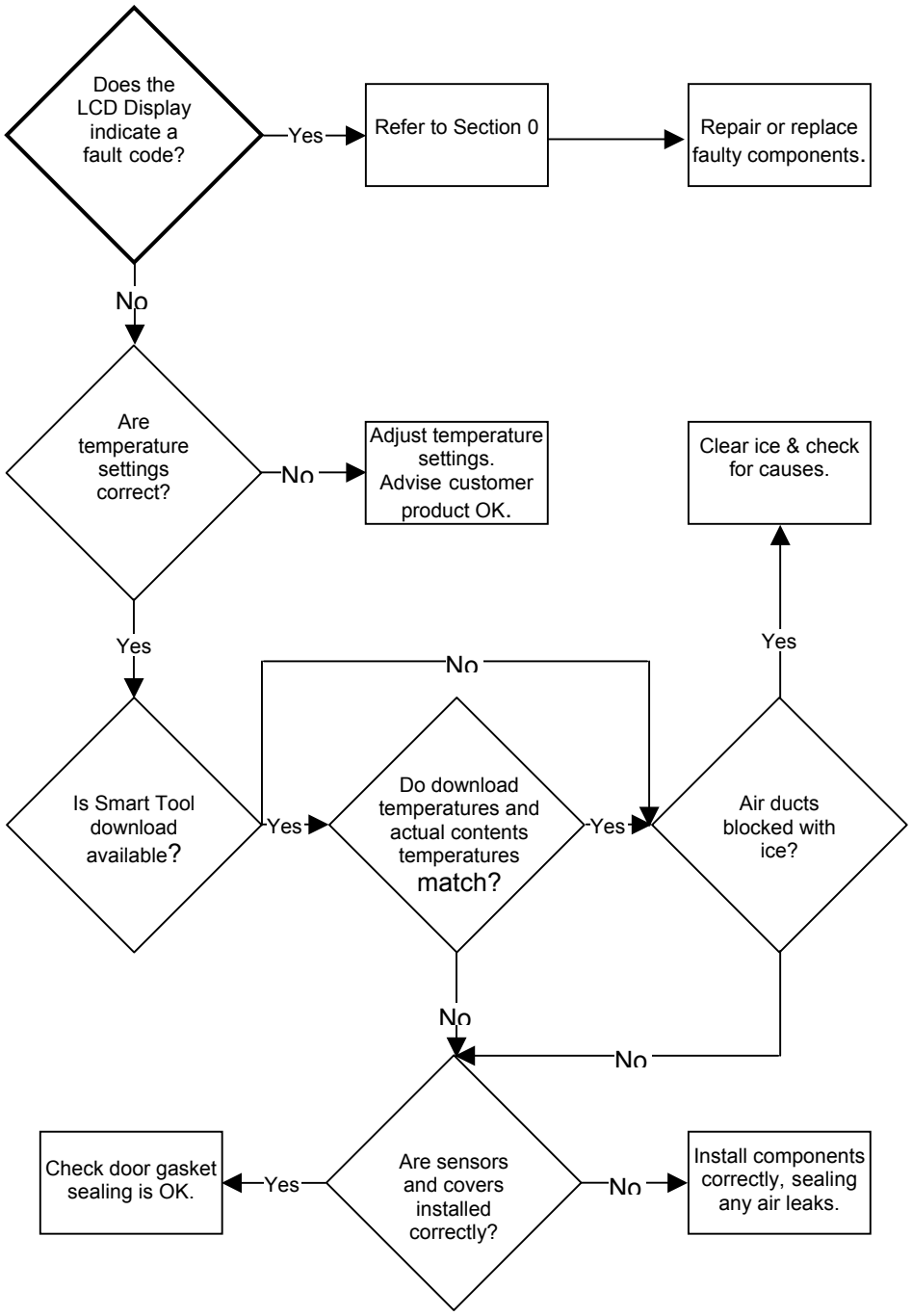
16.2 POWER TO POWER/CONTROL MODULE AND/OR DISPLAY MODULE



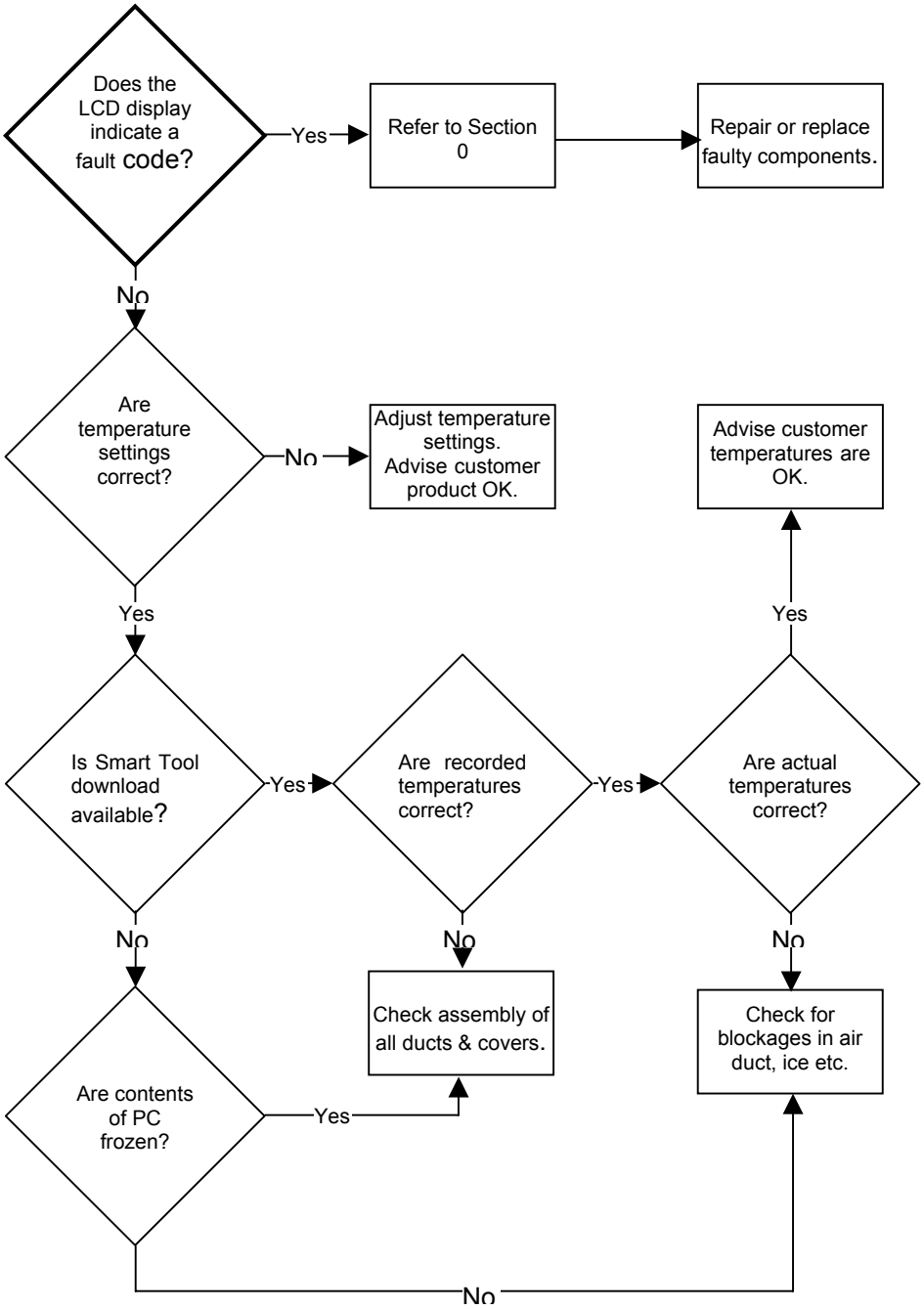
16.3 PC/FC WARM



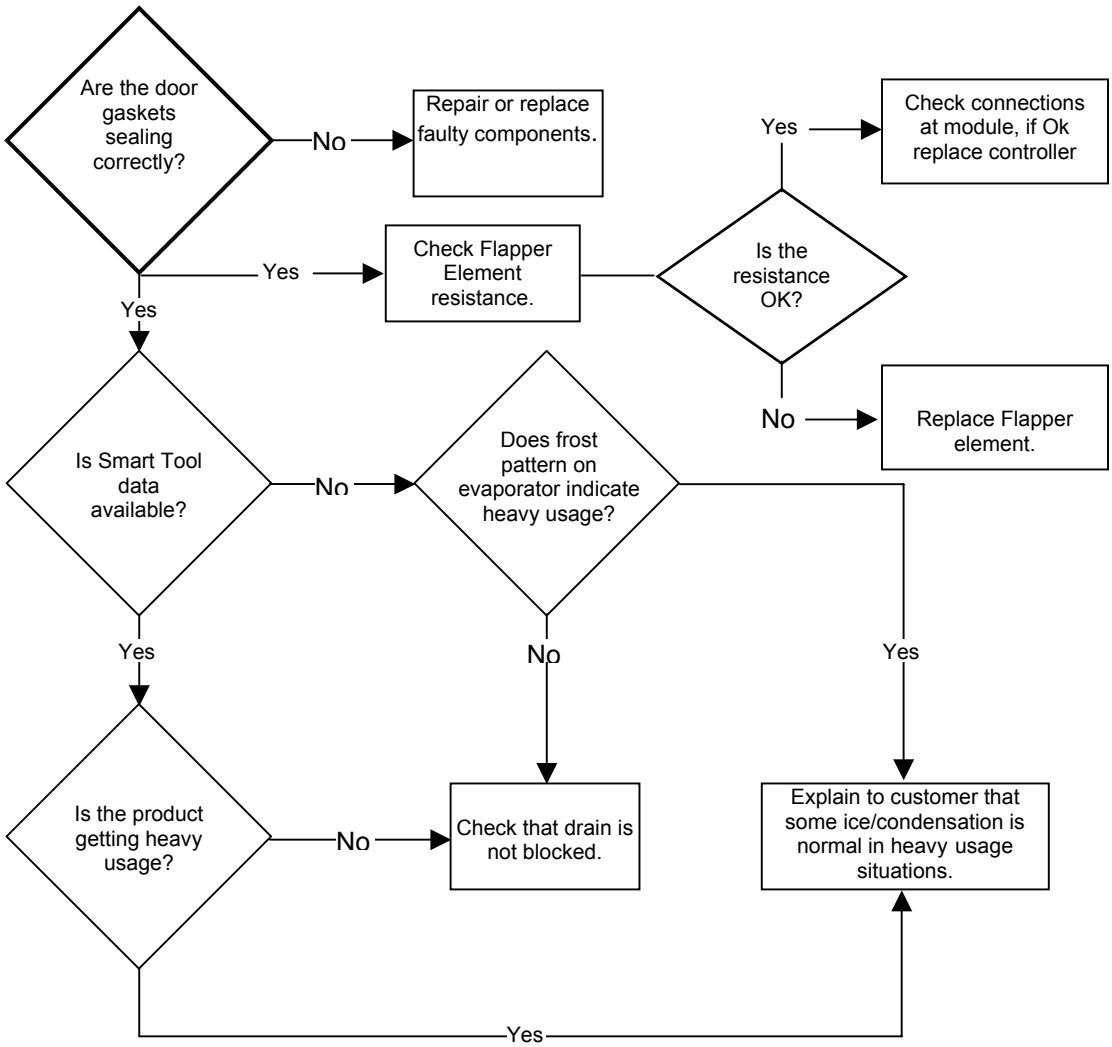
16.4 FC TOO COLD – PC TOO WARM



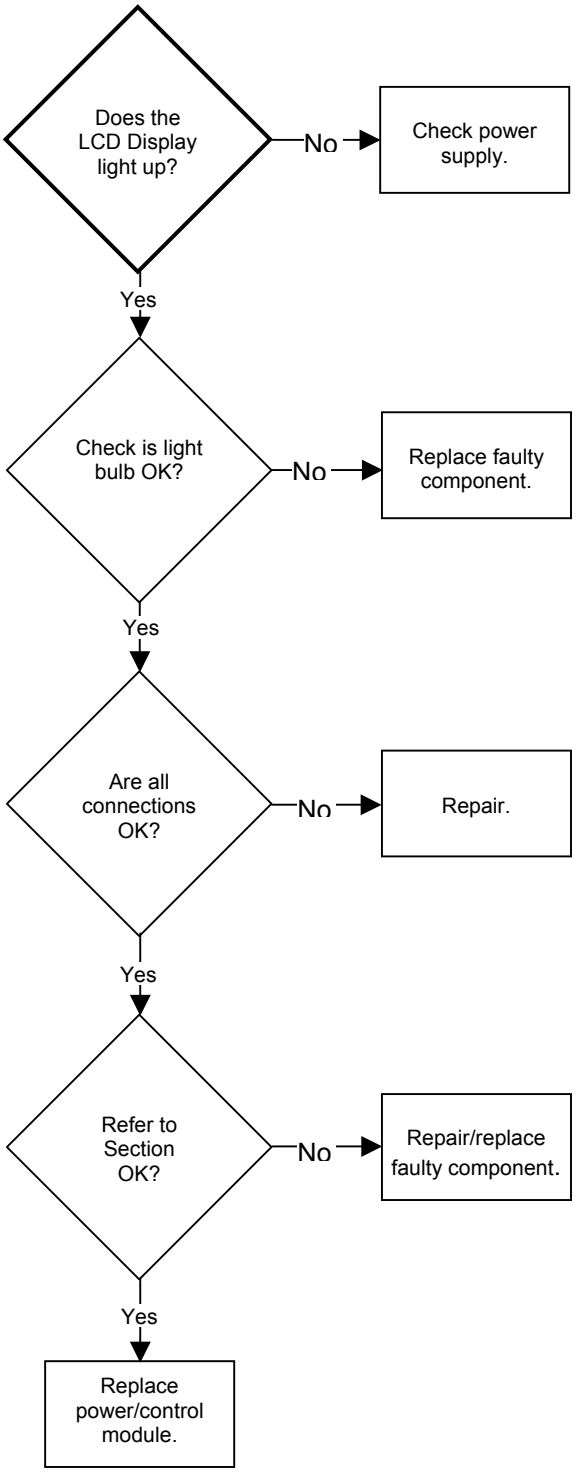
16.5 PC TOO COLD



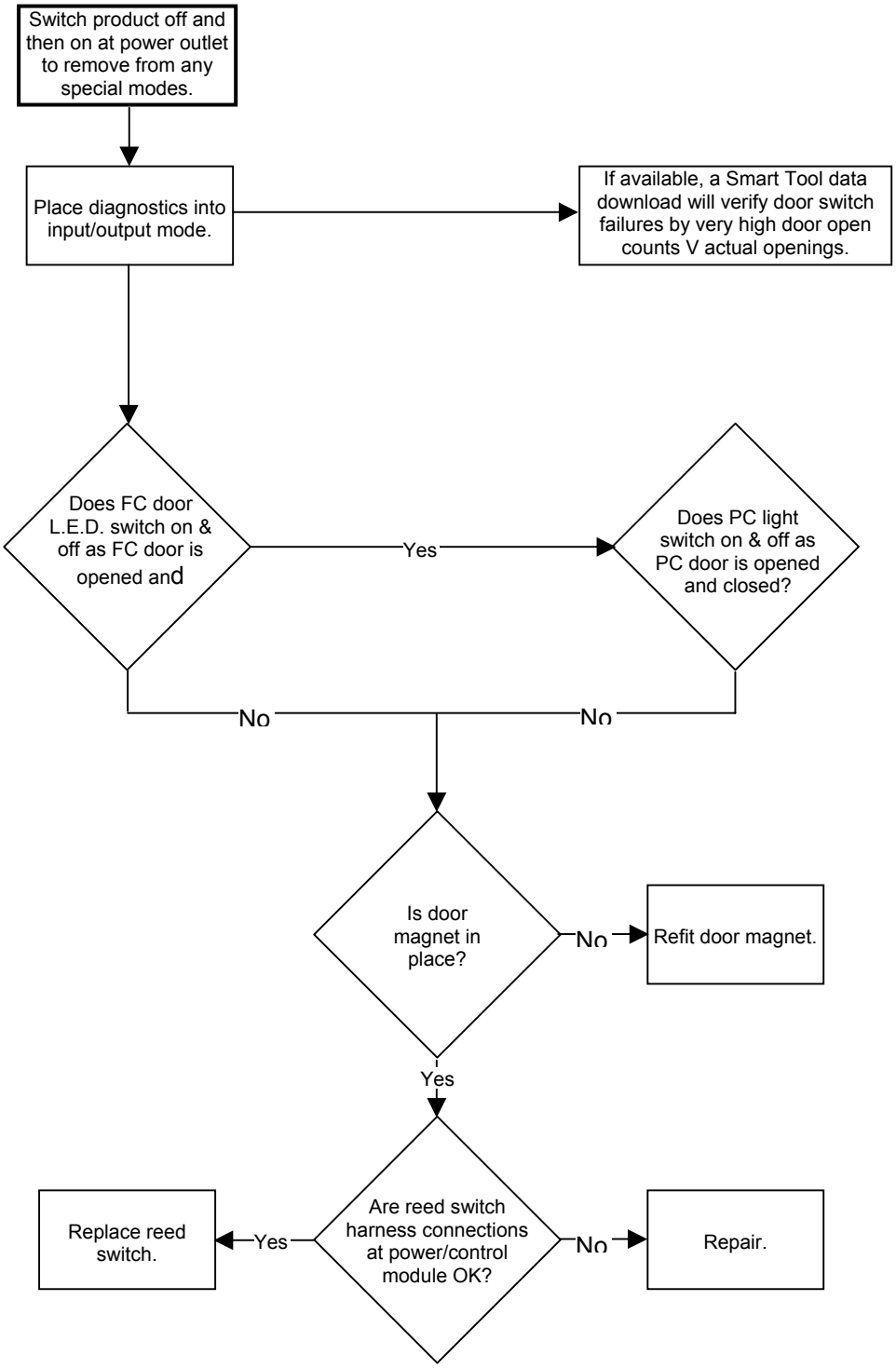
16.6 ICE/CONDENSATION FORMING



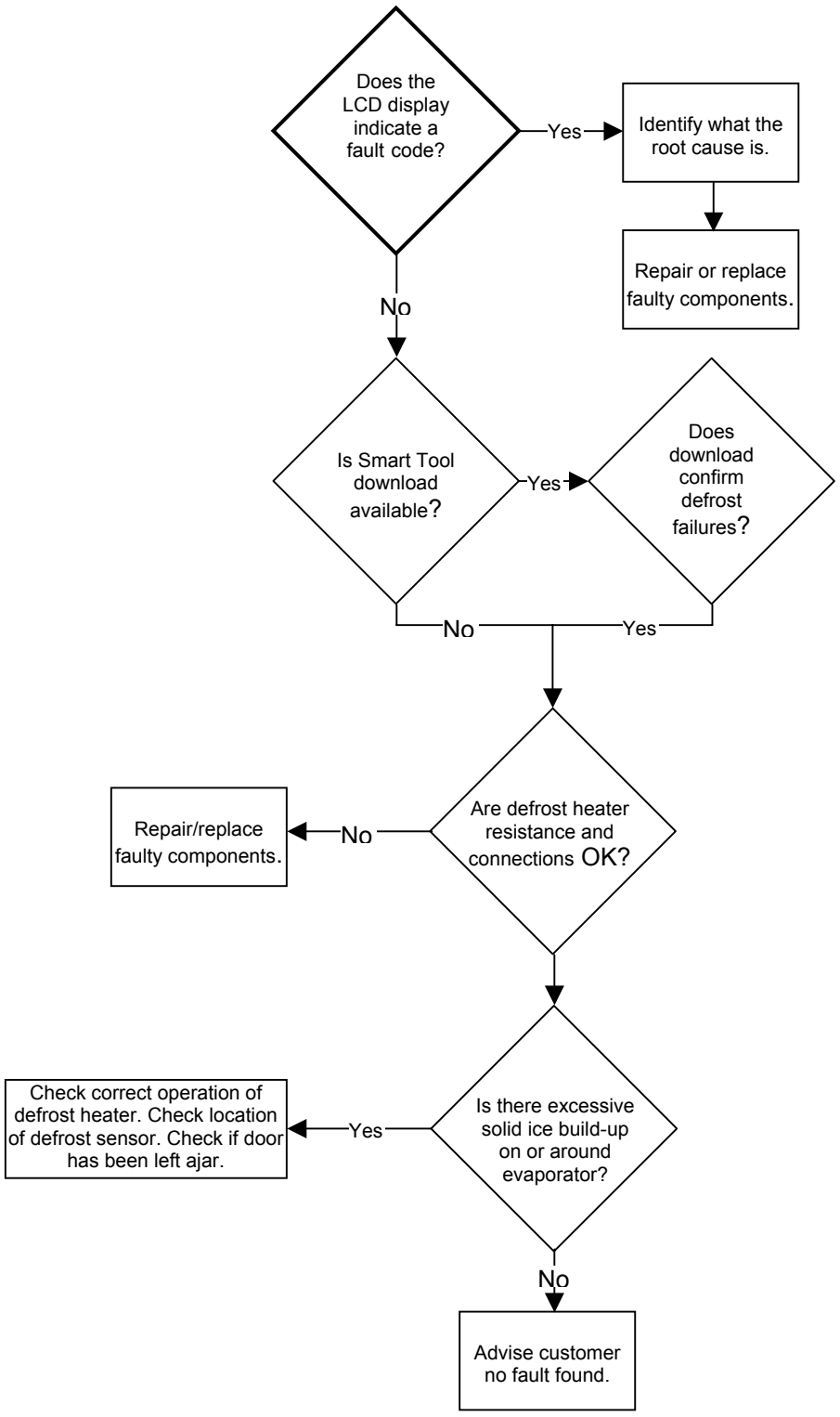
16.7 NO LIGHT


Does the LCD Display light up?
No
Check power supply.
Yes
Check is light bulb OK?
No
Replace faulty component.
Yes
Are all connections OK?
No
Repair.
Yes
Refer to Section OK?
No
Repair/replace faulty component.
Yes
Replace power/control module.

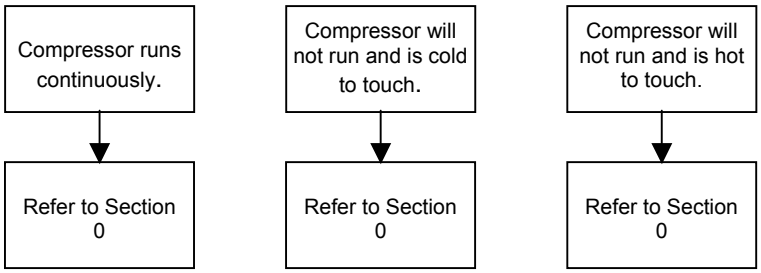
16.8 DOOR SWITCH NOT OPERATING



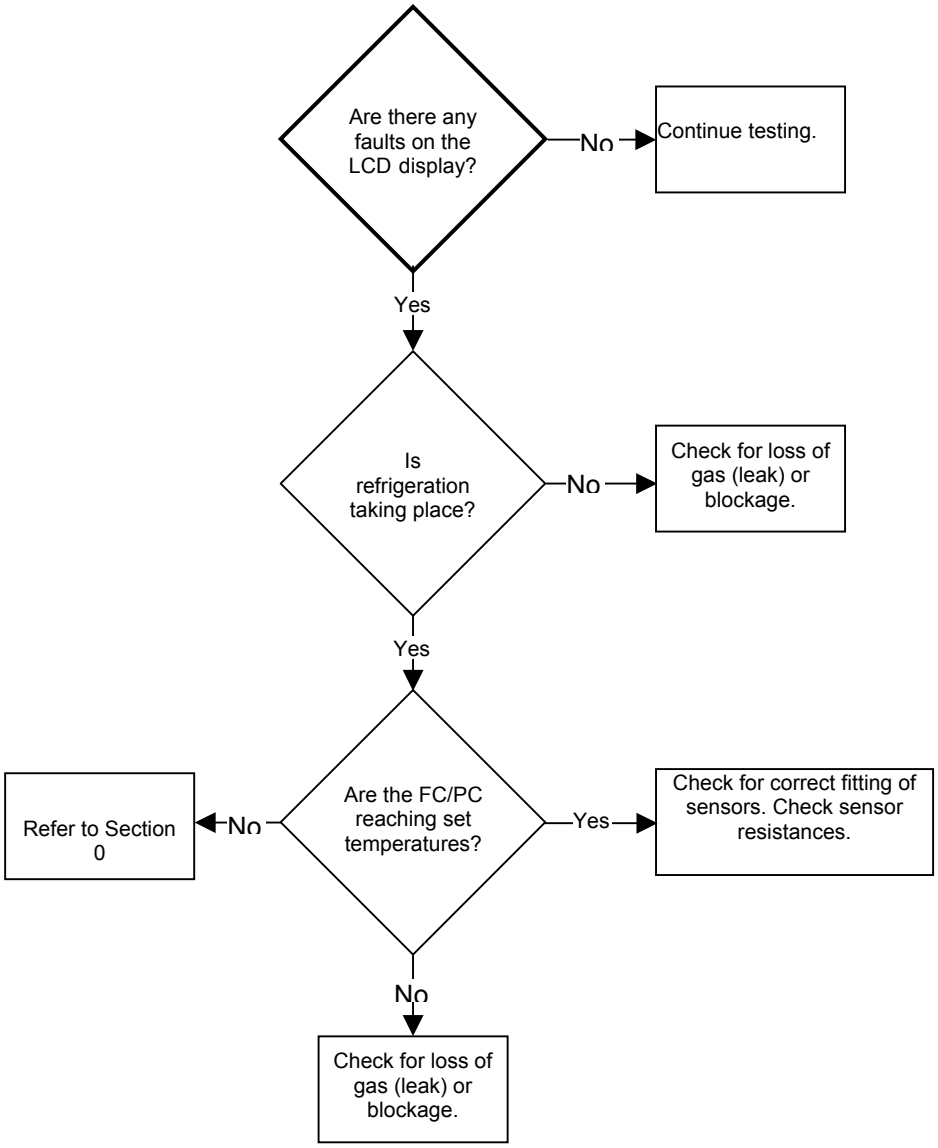
16.9 DEFROST HEATER FAULTS



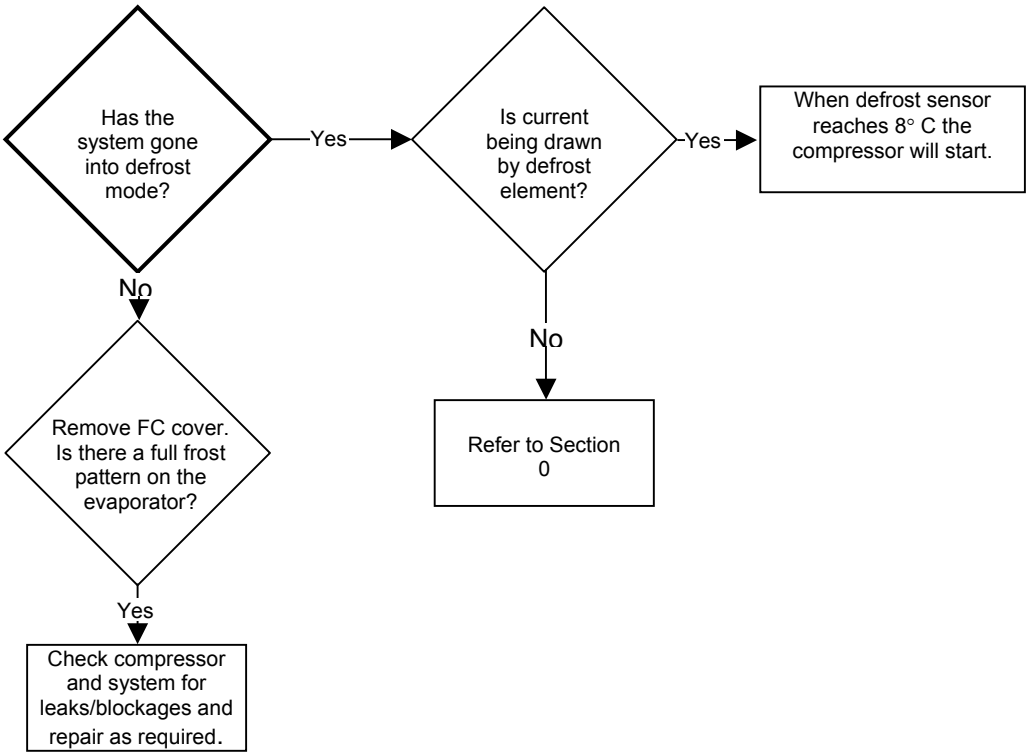
16.10 COMPRESSOR FAULTS



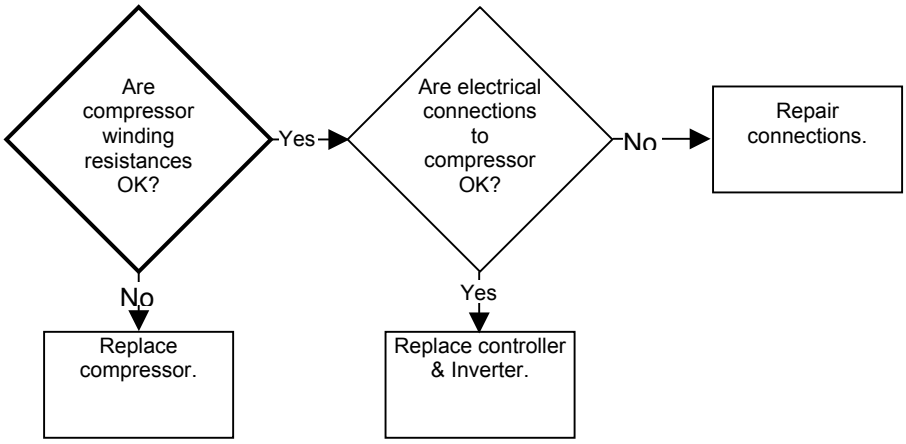
16.11 COMPRESSOR RUNS CONTINUOUSLY



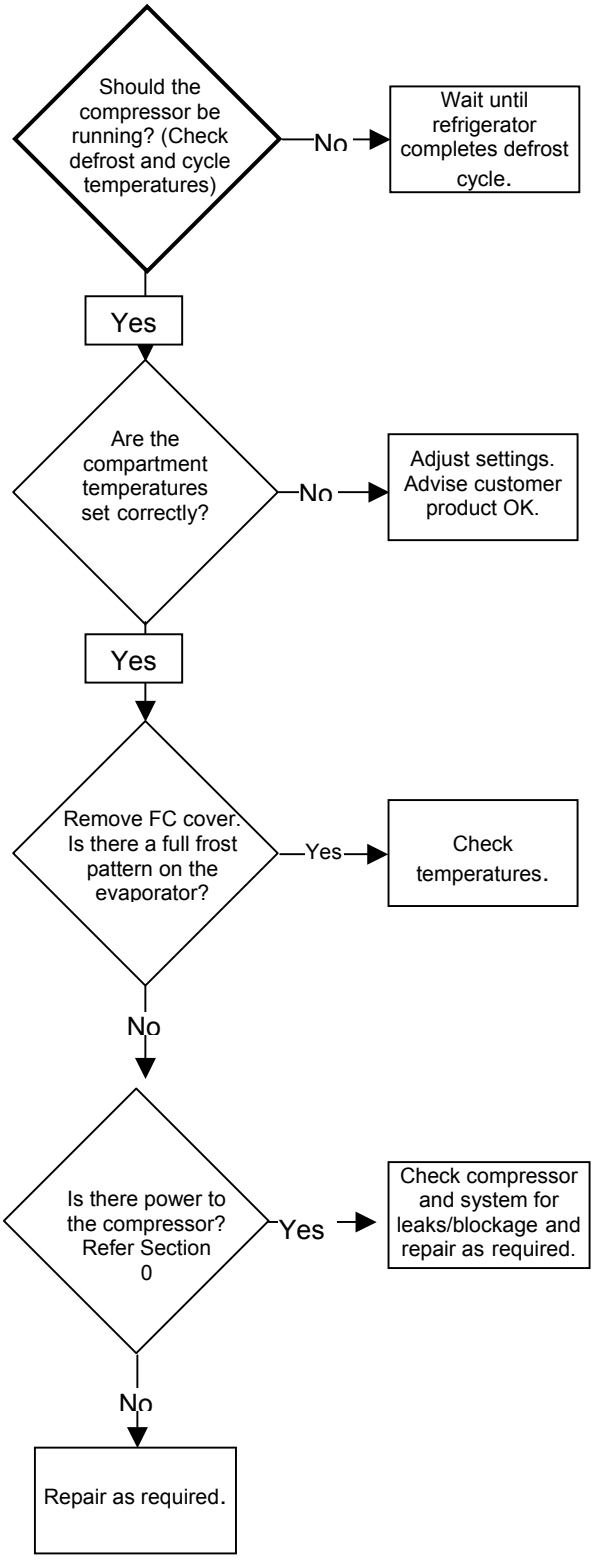
16.12 COMPRESSOR WILL NOT RUN AND IS HOT TO TOUCH



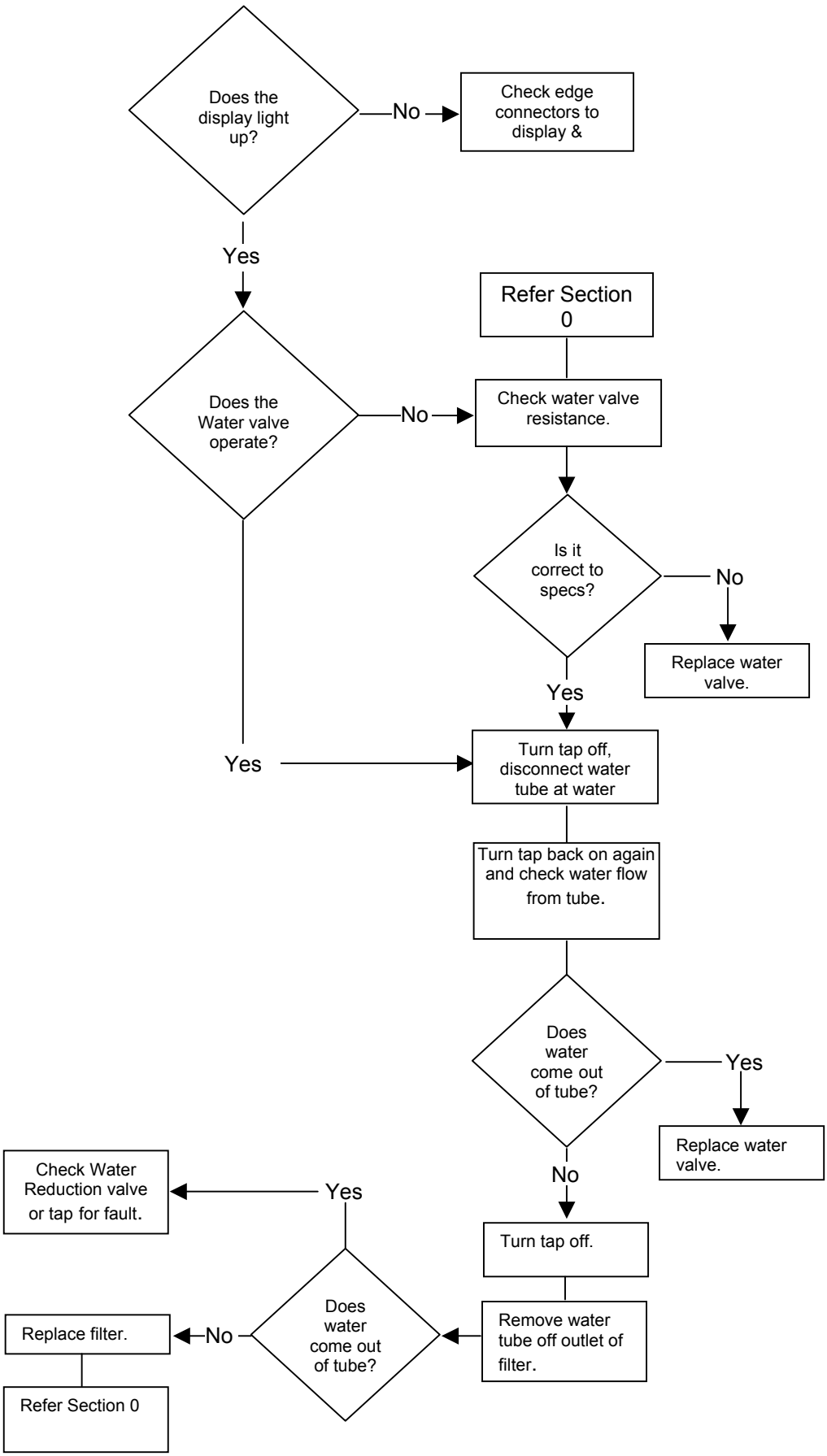
16.13 COMPRESSOR ELECTRICAL TESTS



16.14 REFRIGERATION SYSTEM FAULTS



16.15 NOT DISPENSING WATER



16.16 NOT PRODUCING ICE