Service Manual

Active Smart®
Refrigerator/Freezer

Models:
RF195A
RF175W

321037

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

Note: A service summary may be found within a plastic bag wedged into the right hand side of the condenser located behind the front toe kick panel of the refrigerator.

CA NUMBER	MODEL NUMBER AS OF INTRODUCTION 2010
22601	RF195ADUX1 FP US
22605	RF175WCRW1 FP US
22606	RF175WCLW1 FP US
22607	RF175WCRX1 FP US
22608	RF175WCLX1 FP US
22609	RF175WCRUX1 FP US
22610	RF175WCLUX1 FP US
22611	RF175WDLX1 FP US
22612	RF175WDLUX1 FP US
22613	RF175WDLUX1 FP US
22614	RF175WDRUX1 FP US

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1 SPECIFICATIONS

1.1 Cabinet Specifications

DIMENSIONS	RF195A	mm	RF175 (I&W)	mm	RF 175 Non I&W	mm
Height	69⅞" - 70⅝"	1775 - 1794	69⅞" - 70⅝"	1775 - 1794	69⅞" - 70⅝"	1775 - 1794
Depth	28½"	725	28½"	725	28½"	725
Width	35⅝"	905	32⅝"	829	32⅝"	829

CAPACITY GROSS VOLUME

	RF195A		RF175 (I&W)		RF 175 Non I&W	
Provision Compartment	13.8 cu.ft.	391 litres	12.4 cu.ft.	353 litres	12.6 cu.ft.	357.4 litres
Freezer Compartment	5.7 cu.ft.	161 litres	5.1 cu.ft.	143 litres	5.1 cu.ft.	143 litres
TOTAL	19.5 cu.ft.	522 litres	17.5 cu.ft.	496 litres	17.7 cu.ft.	500.4 litres

ELECTRONICS

Display Module (Ice & Water)	Part No. 819415P
Display Module (Non Ice & Water)	Part No. 881219P
Power/Control Module	Part No. 860524P

SUCTION LINE ASSEMBLY

Part Number	817864

DEFROST ELEMENT

Part Number	884125P
Ice maker fill tube heater element non replaceable	1.2 watts @ 120 Ohms
Provision compartment duct heater	Xx watts @ xxx Ohms

CONDENSER FAN

Part Number	12825101P

1.2 Compressor Specifications

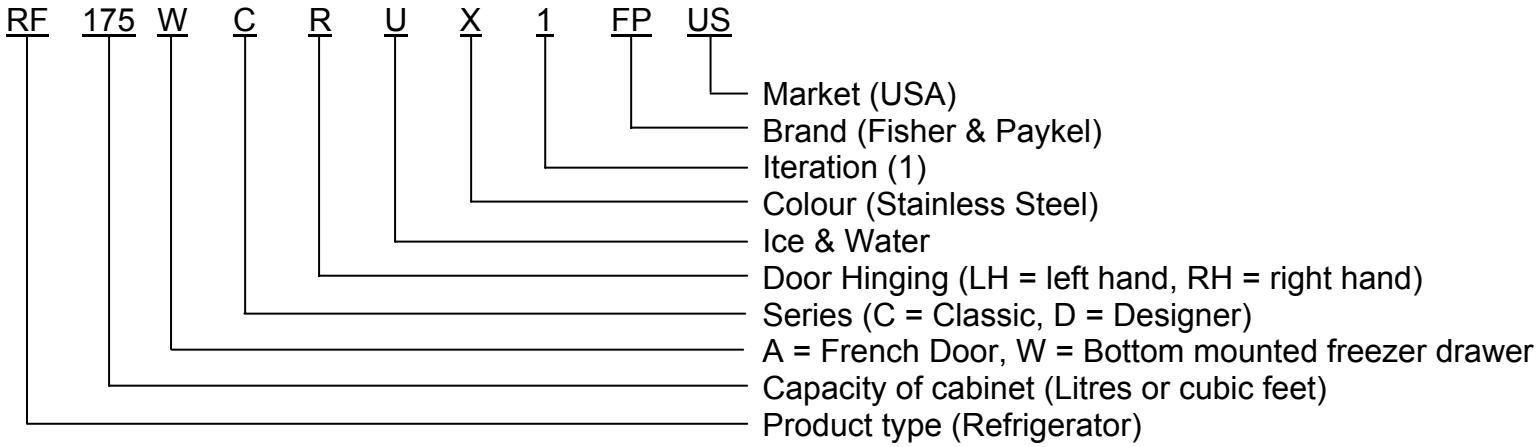
Make	Embraco
Model	EGX70HLC
Part Number	207247P
Volts	110
Hertz	60
Motor Protection Overload	4TM319NFBYY-53
Run Capacitor	12uF
Start Resistance (Ohms)	6.25Ω @25^{O}C (77^{O}F) ±8%
Run Resistance (Ohms)	4.4Ω @25^{O}C (77^{O}F) ±8%
Run Current (Amps)	0.99
Starting Device Type	TSD
Oil Charge (ml)	280
Refrigerant Type	R134a
Gas Charge	155 Grams of R134a

1.3 Electrical Specifications

Rated Voltage	110 volts
Rated Current	1.75 amps
Frequency	60 Hz
Flapper Heater	12 volt 10 watt 15 ohms
Duct Heater	12 volt 3 watt 48 ohms
Low Ambient Heater	12 volt 7 watt 22 ohms
Ice Tube Heater	12 volt 1.2 watt 120 ohms
Defrost Element	110 volts 355 watts
Light Bulbs	12 volt 10 watts
Condenser Fan motor	110 volts 3.4 watts
	1120 RPM @ 115 volts

2 MODEL NUMBER IDENTIFICATION

1	2	3	4	5	6	7	8	9	10
RF	**175**	**W**	**C**	**R**	**U**	**X**	**1**	**FP**	**US**
Product Type	Capacity of cabinet in Litres 175 = 175 litres	Bottom Freezer Drawer	Classic	Right Hand Door Hinging	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.

3.1.1 Static Strap

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

3.1.2 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

3.2.1 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).

3.2.2 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.

3.2.3 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 Air Space Requirements

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

- 50mm (2”) clearance at the top.
- 20mm (0.8”) clearance each side.
- 30mm (1.2”) clearance at the back.

4.2 Levelling Components

Front and rear rollers are fitted ex factory.
Cabinet levelling can be done by adjustment of the front roller-levelling screw. See diagram 4.2.
Weight should be lifted off the cabinet for ease of adjustment.
If it is necessary to place packing material under the rollers to achieve the required height, use only hardboard or plastic, **NOT** metal.

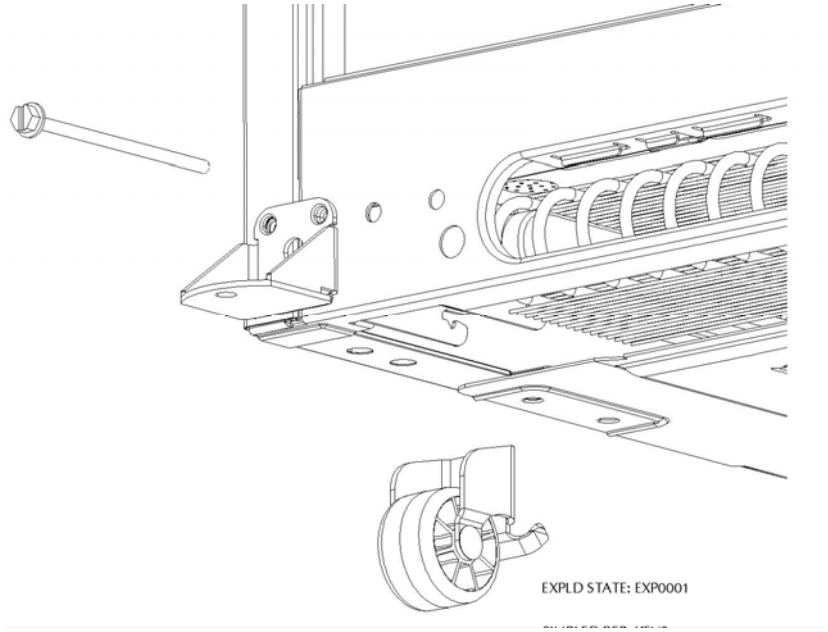


Diagram 4.1 (Front Leveller & Roller)

Diagram 4.2 (Front Levelling Screws)

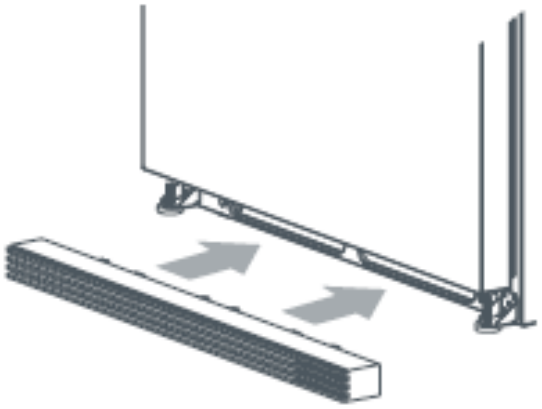


Diagram 4.3 (Toe Grill Installation)

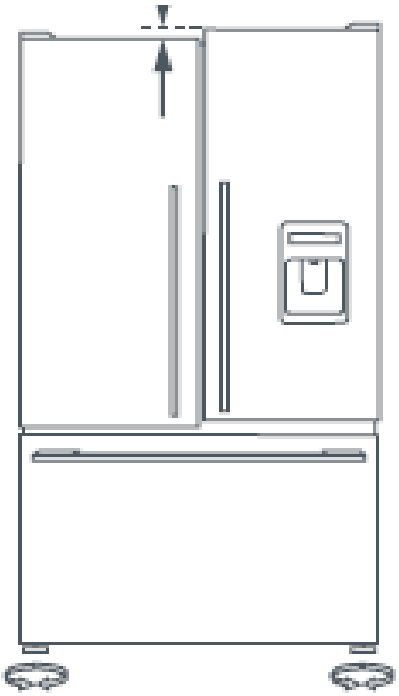


Diagram 4.4 (Uneven Door Alignment)

RF195A only. Adjust levelling foot to adjust door alignment.

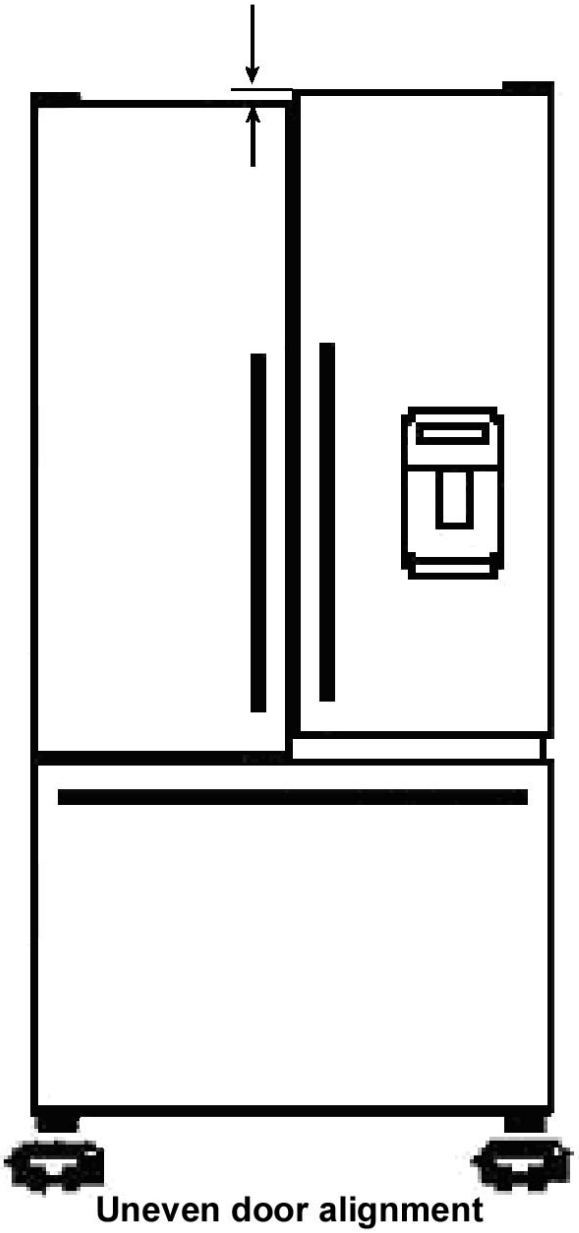
4.3 Levelling the Cabinet

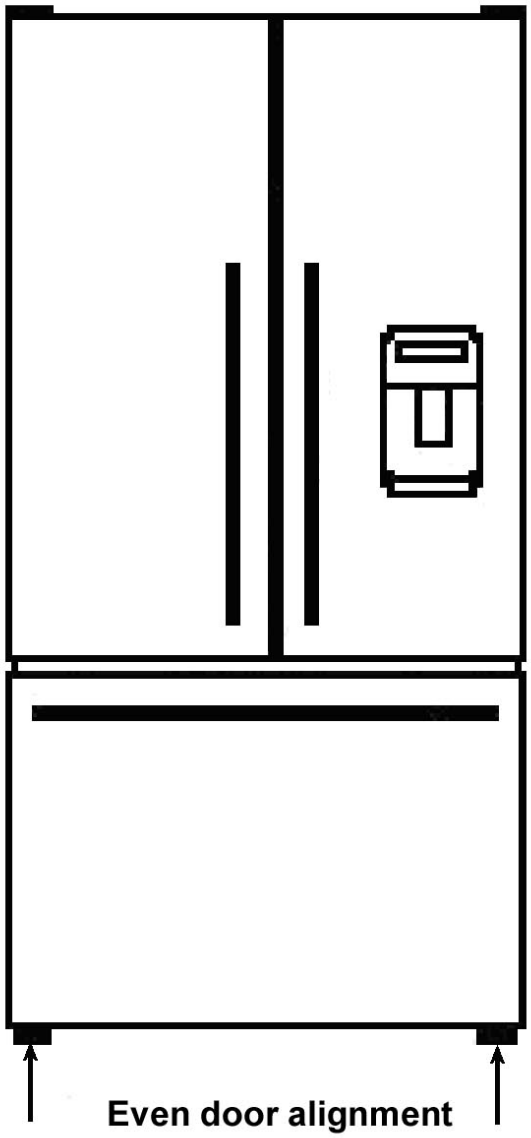
The word 'level' is somewhat of a misnomer, as a 'spirit level' need not be used to set the appliance level. It is preferable to have the appliance level in appearance where both doors will close with the aid of the door closing components. It is also important that the appliance sits solidly on the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

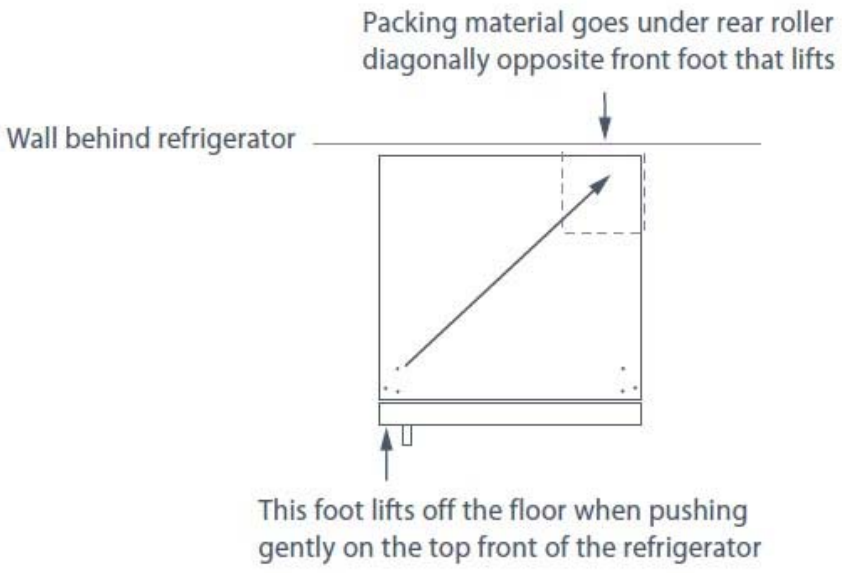


Fig.14 Stabilizing your refrigerator

Unlevelled floors:

Gently push the top of the refrigerator back until the rear rollers contact the floor.

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

Obtain some solid packing material (hardwood, plastic etc, **NOT** metal), which fits firmly into the gap under the foot.

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

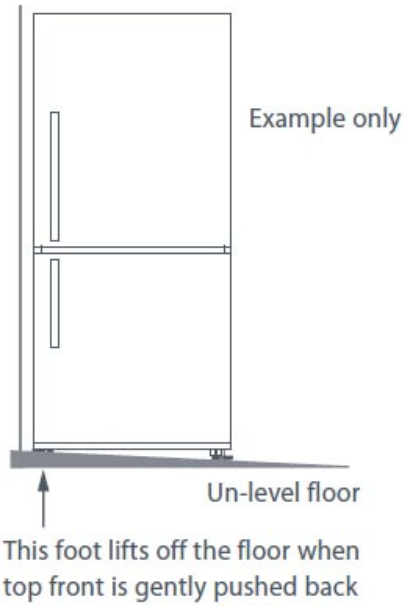


Fig. Unstable refrigerator

5 THEORY OF OPERATION

5.1 Terms

CABINET WRAPPER
Pre-painted steel.

LINER
A two-piece vacuum formed HIPS liner.

DIVIDER
Is formed by the two-piece vacuum formed liners.

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

CONDENSER
All wire on tube located in base tray.

CONDENSER FAN
The condenser fan is 110 volt and is connected in parallel with the compressor circuit.

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

SUCTION & CAPILLARY LINE
Foamed into the back of the cabinet with all joints to the evaporator 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
Reed switches encapsulated within plastic housings are mounted on the cross and base rails behind plastic covers. A magnet housed just under the lower end cap of each door activates these reed switches when the doors are closed.

COMPARTMENTS
In this manual we refer to the refrigerator compartments as follows:

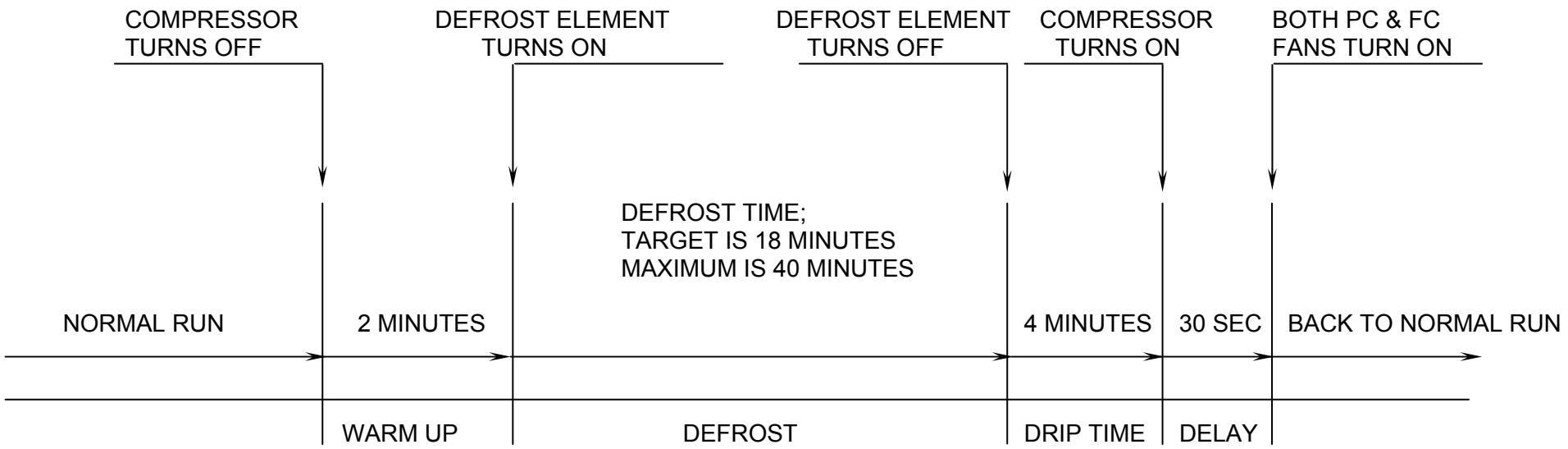
- PC = Provision or fresh food compartment.
- FC = Freezer compartment.

LOW AMBIENT HEATER
Blanket wire type attached to the base of the PC liner.

5.2 Defrost Cycle

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

Defrost Cycle of the Active Smart® Refrigerator (With Showa Evaporator)



If 40 minutes has elapsed, defrost would be aborted if the defrost sensor has not reached 8°C (46.4°F). If 2 defrosts are aborted, Fault Code 2 is displayed.

Diagram 5.2

5.3 The Refrigeration Cycle

The compressor discharges high pressure, high temperature gas into the condenser circuit. A loop from this condenser coil forms the mullion heater around the front edge of the freezer compartment of the cabinets to then enter the filter drier, which is mounted vertically in the unit compartment.

Now that the high-pressure gas has been condensed, the liquid refrigerant flows through the capillary tube, which is soldered to the suction line as a heat exchanger, entering the evaporator mounted in the freezer compartment. The liquid refrigerant then boils off due to the low suction pressure applied to it within the evaporator from the compressor, causing the evaporator to get very cold. (Note: A warm body moves to a colder body). This heat-laden vapour is drawn back to the compressor by way of the suction line to start the cycle all over again.

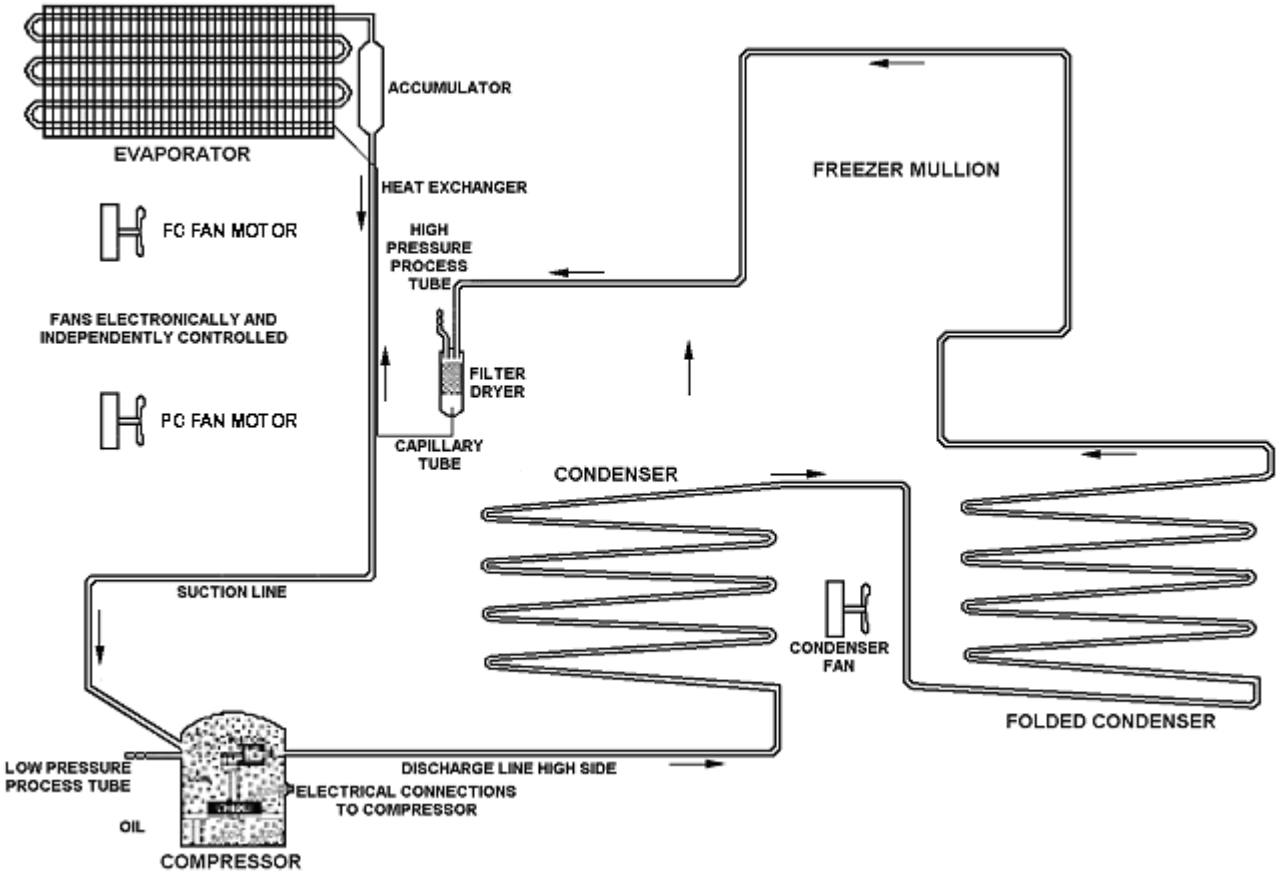


Diagram 5.3

5.4 Servicing Features

5.4.1 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 heater 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 that is located directly below the Condenser fan. Water is evaporated by warm air from the condenser drawn across the tray by the condenser fan.

Diagram 5.4.1

5.4.2 Filter Drier

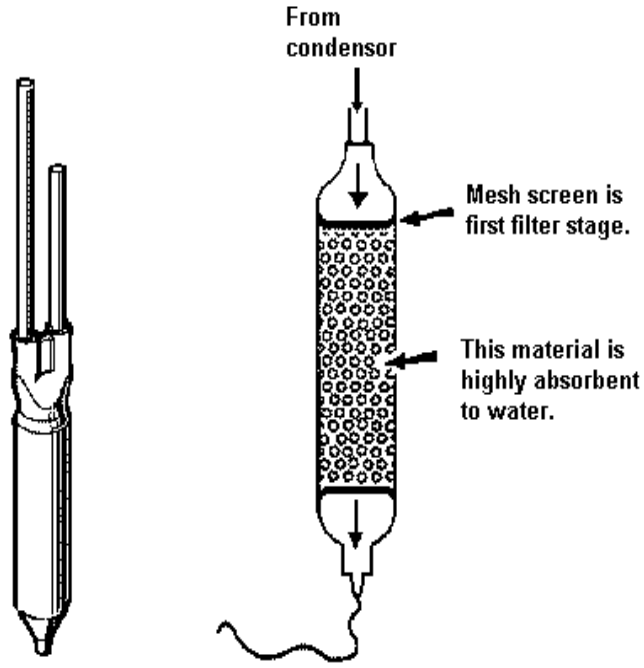


Diagram 5.4.2

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.

5.4.3 Condenser

The condenser is made of tube and wires welded and folded and is located horizontally in the base of the cabinet (see circuit diagram below). Air is drawn across and through this condenser by the condenser fan that is located alongside the compressor in the unit compartment.

It is important that the condenser is cleaned from time to time as any restriction to air flow will affect the overall operating performance of the cabinet.

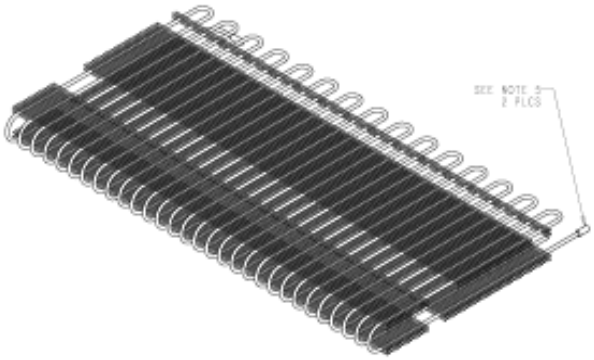


Diagram 5.4.3

5.4.4 Condenser Fan

The condenser fan, located in the unit compartment between the compressor and control module, is of the shaded pole type motor, pulling air through the condenser.

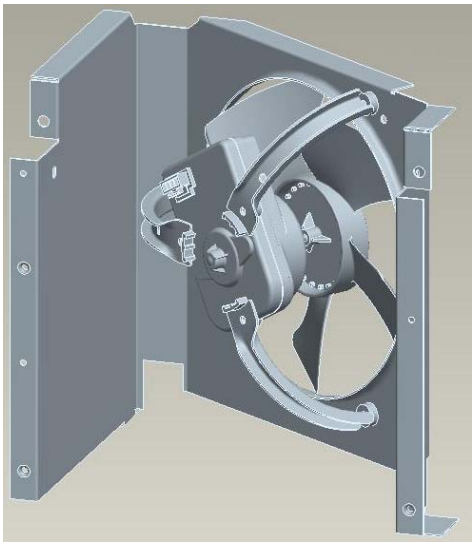


Diagram 5.4.4

5.4.5 Condenser & Mullion Layout

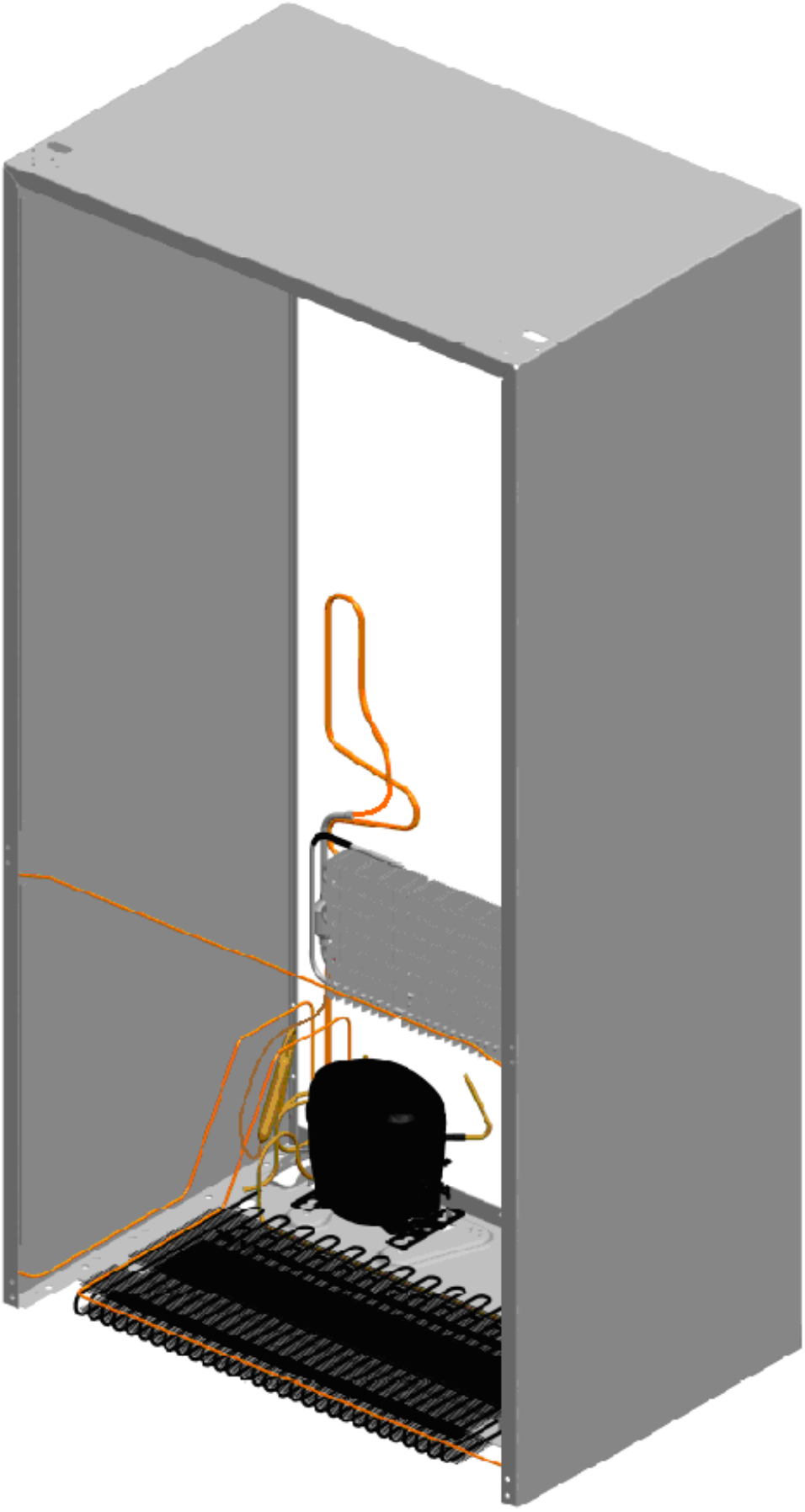


Diagram 5.4.5

5.4.6 Compressor Compartment Layout

The diagram below will assist in identifying the various pipes within the compressor compartment. It should be read in conjunction with the full system diagram (See Diagram 5.3).

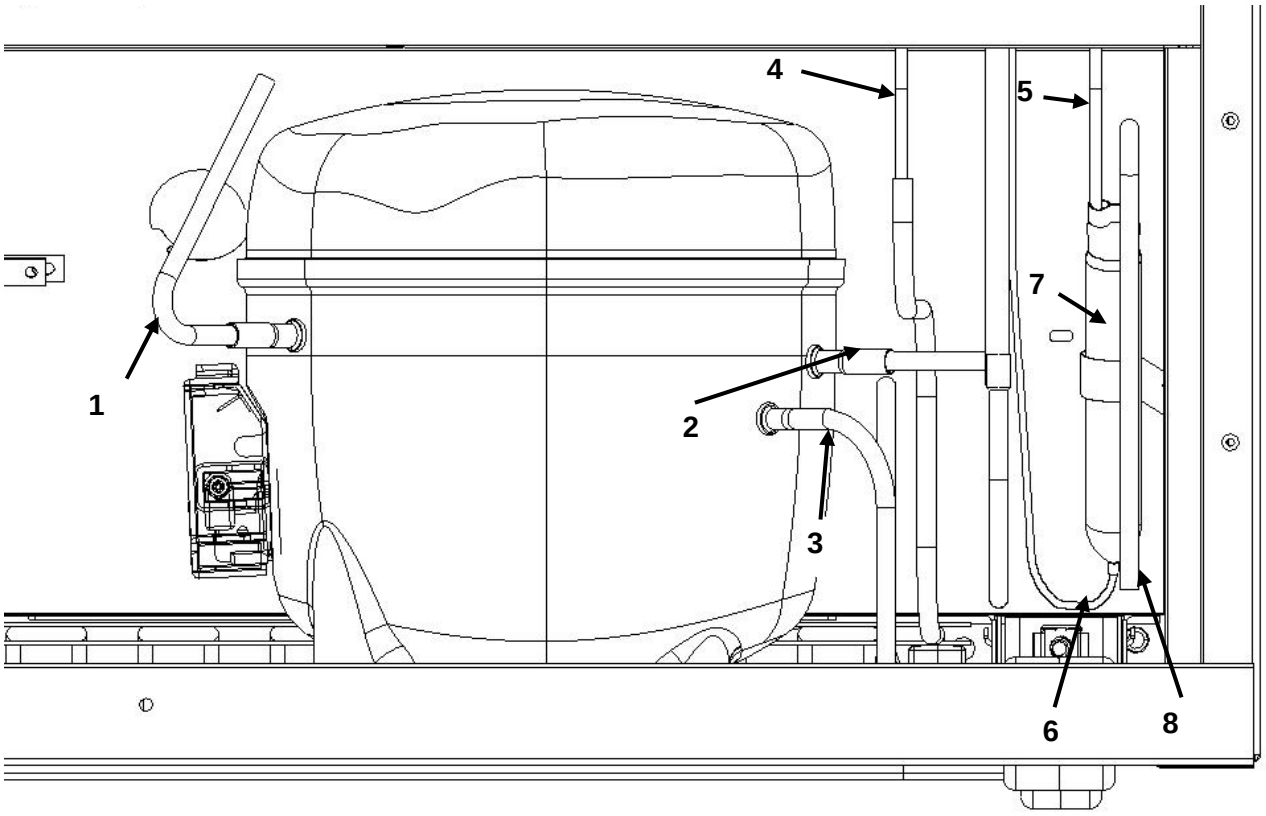


Diagram 5.4.6

1. Service tube (process pipe).
2. Suction line.
3. Discharge line into condenser.
4. Condenser to mullion.
5. Mullion to filter.
6. Capillary tube.
7. Filter dryer.
8. Filter process pipe.

5.5 FC Mullion Heater

The mullion heater is part of the condenser copper tubing (mullion heater) providing heat to the gasket area of the FC compartment, preventing sweating of the gasket around the freezer compartment.

5.6 Provision Compartment Duct

The duct covers provide an air passage up the rear wall of the provision compartment for the cold air drawn from the evaporator by means of the PC fan located at the bottom of the duct in the divider partition (refer to Diagram 5.6).

The duct channel uses moulded polystyrene duct for this purpose

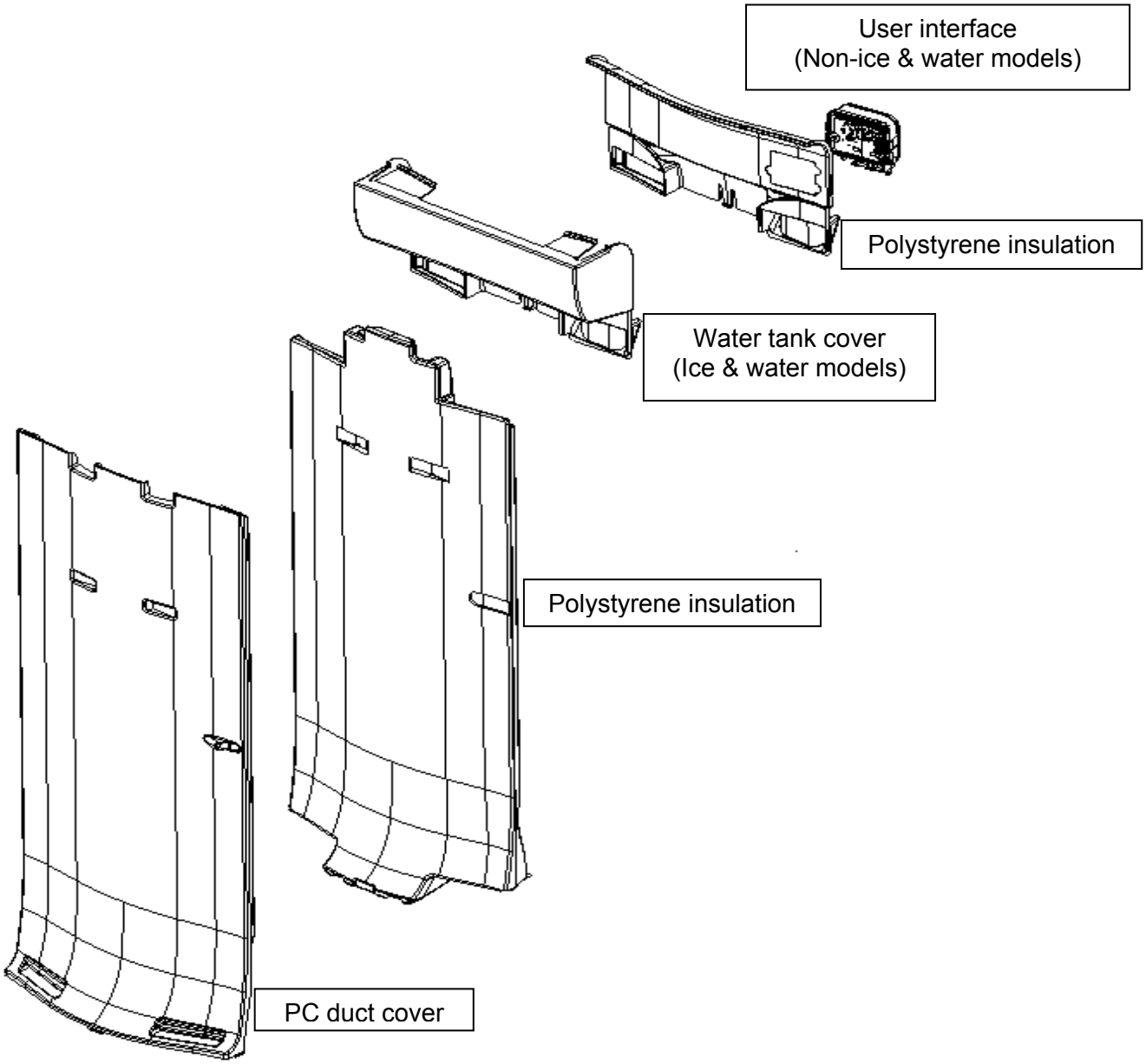

User interface
(Non-ice & water models)
Polystyrene insulation
Water tank cover
(Ice & water models)
Polystyrene insulation
PC duct cover

Diagram 5.6

5.7 Divider Partition

The divider partition provides a barrier between the FC and PC compartments, and also allowing return air from the PC to move back to the FC evaporator. The PC fan motor is housed in the back edge of the divider. The divider partition also houses the low ambient heater and the reed switches located in the front of the cross rail, sensing the opening and closing of the doors.

“B” Divider Duct Partition

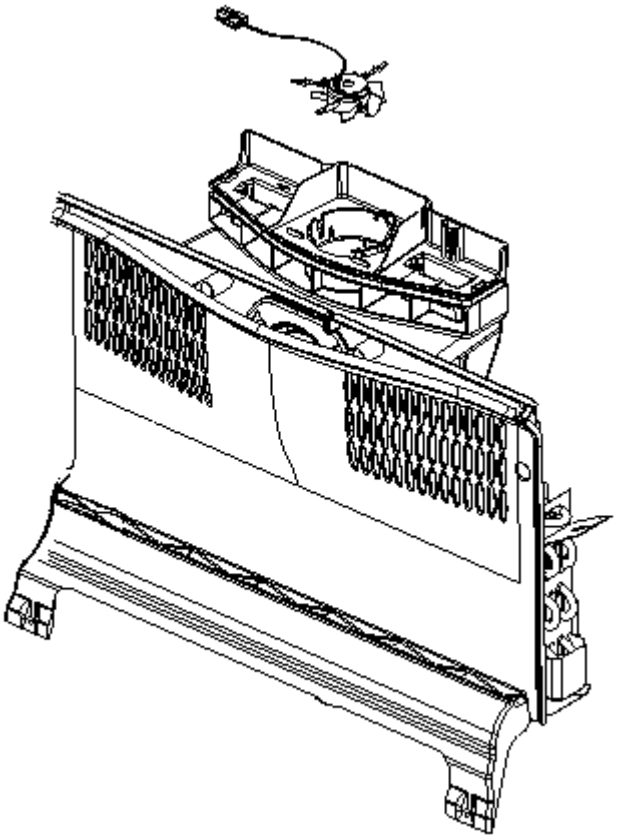


Diagram 5.7

Refer to Diagram 7.8 for details of the air flow in the compartments.

6 ELECTRONICS SECTION

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

6.1 Function Overview

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 provision 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 (refer to Section 7.8).

6.1.1 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 fan motor speeds 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 (E2PROM) 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 E2PROM. The information on the refrigerator 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.

6.1.2 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.

6.1.3 Defrost Heater

A heating element (refer to Diagram 6.1.3) 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 8^{O}C (46.4^{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.

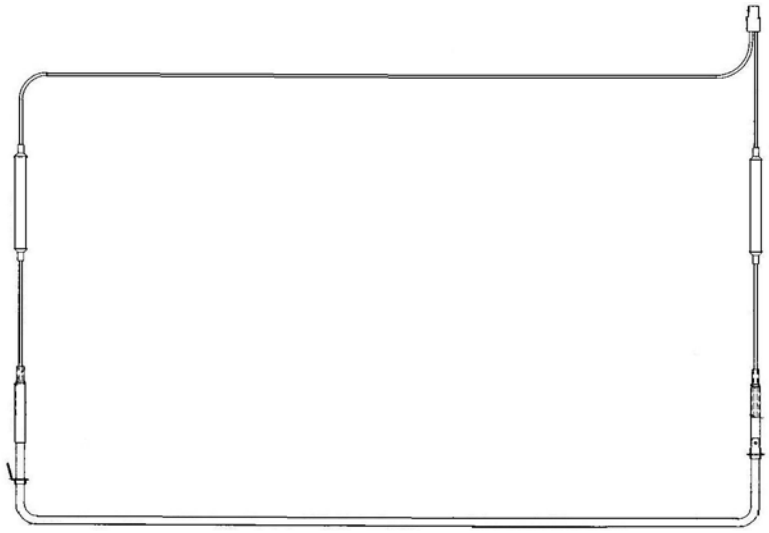


Diagram 6.1.3

6.1.4 Thermal Fuse

There are two thermal fuses mounted in the wiring harness of the defrost element, having a tripping temperature of 72^{O}C (161.6^{O}F). 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 using a heat gun, that the thermal fuses are not over heated.

6.1.5 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 base of the PC 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.

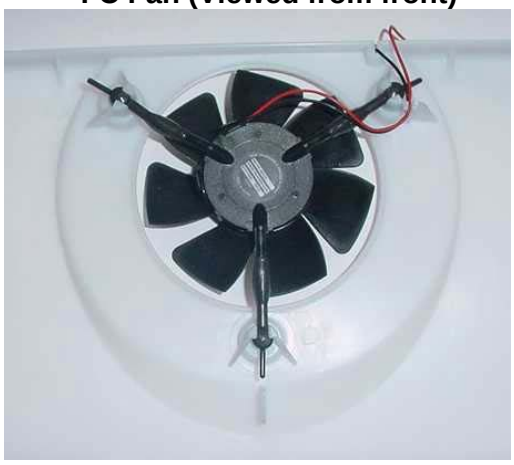
6.1.6 PC/FC Fans

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 fixed, 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, with the PC fan operating at a fan speed of 3 to circulate the air in the PC to ensure foodstuff in the crisper does not 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 of duct)

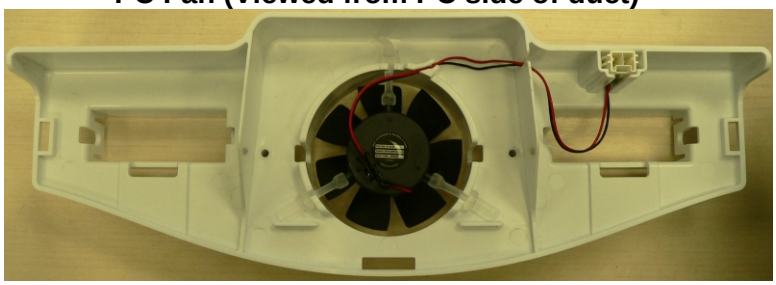


Diagram 6.1.6

6.1.7 Lights (PC & FC)

Two 12 volt, 10 watt halogen lamps 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. If lamps are replaced, they must not exceed 10 watts, or they will overload the power/control module.

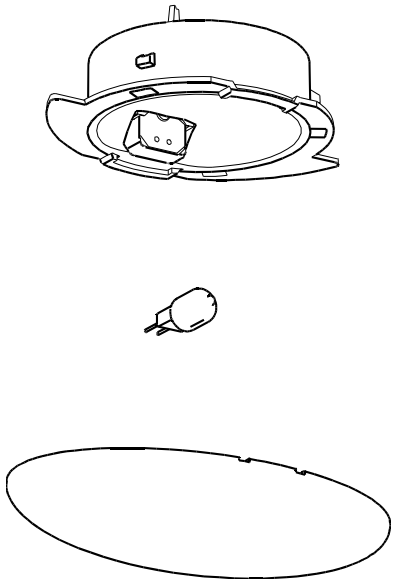


Diagram 6.1.7

Note: It is important that the lamp pins are tight in the lamp socket. The lamp should not be touched with fingers, as this will shorten its life.

6.1.8 Thermistor Temperature Sensors

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

1. Defrost sensor mounted above the evaporator, used to measure the temperature during 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.

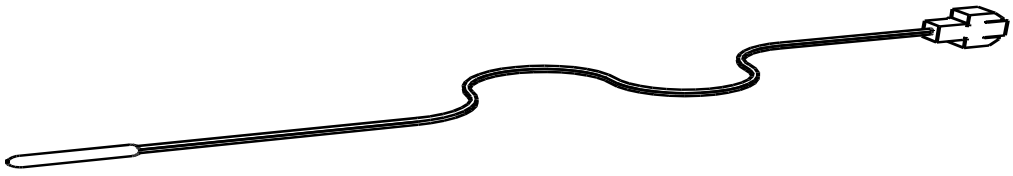


Diagram 6.1.8

THERMISTOR SENSOR RESISTANCE TABLE

TEMPERATURE ° C	RESISTANCE (K Ohms ±5%)
-30.0	25.17
-25.0	19.43
-20.0	15.13
-15.0	11.88
-10.0	9.392
-5.0	7.481
0.0	6.000
5.0	4.844
10.0	3.935
15.0	3.217
20.0	2.644
25.0	2.186
30.0	1.817
35.0	1.518
40.0	1.274
45.0	1.075
50.0	0.9106

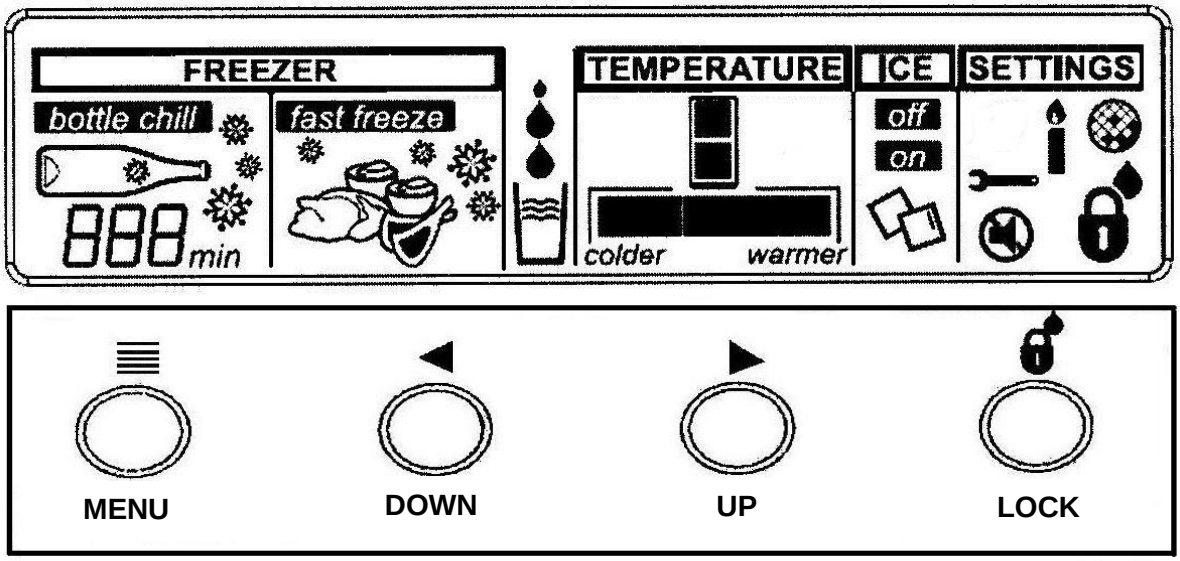
Table 6.1.8

6.1.9 Flapper Door Heater

Used on the French door models to warm the flapper that seals the vertical edges between both doors. It has a total wattage of 10 watts controlled by PWM and is on 100% of the time except when the cabinet is set to the warm set point.

7 DISPLAY INTERFACE

7.1 Display Interface (Button Descriptions)



Menu

The **MENU** key allows the user 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.

Lock

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

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7.2 Display Functional Schematic

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

7.3 Display Interface Features

- 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 lock.
- Key lock.
- Filter replacement alert.
- Fault alert.
- Diagnostics.
- Temperature set points.

7.4 Features

7.4.1 Icemaker On / Off

This mode 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.

7.4.2 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** button to scroll to **FREEZER**, then use the up or down key to get fast freeze.
To deactivate manually, use the **MENU** button and scroll to **FREEZER.** Press the **DOWN** button until the icon disappears.

7.4.3 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** button to scroll to **FREEZER**, then use the **UP** button until this icon appears. Use the **UP** button to select the time in minutes. Once selected, the alarm countdown will commence.

7.4.4 Water Dispensing

This icon will animate when the water is being dispensed.

7.4.5 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.

7.4.6 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.

When this icon is displayed, it indicates the product is in Key Silent Mode.

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

7.4.7 Dispenser Lock

This mode disables the water dispensing pad & prevents water from being dispensed.
To activate this mode, press the **LOCK** key for 2 seconds.

7.4.8 Key Lock

This mode disables all the buttons.
To activate this mode, press the **LOCK** key for 4 seconds.

7.4.9 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 **LOCK** and **UP** keys simultaneously for 4 seconds.

7.5 Icemaker

7.5.1 Ice Production

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

Press the **UP** or **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 –10^{O}C (14^{O}F) or the ice bin is full, or has been removed, or fitted the wrong way around, the icemaker will not operate.

7.5.2 Information About The Icemaker

- The temperature of the FC needs to reach below -10^{0}C (14^{O}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.

Note: If the temperature is above -10^{0}C (14^{O}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.

To manually force a harvest.

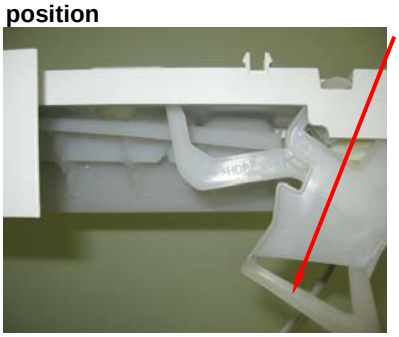
Press the **Down**, **UP** and **Lock** buttons together and hold for 4 seconds. The icemaker will rotate and empty the contents of the ice tray, then return to its normal position. The ice tray will then fill with water.

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.

7.5.3 Ice Bin Full Sequence

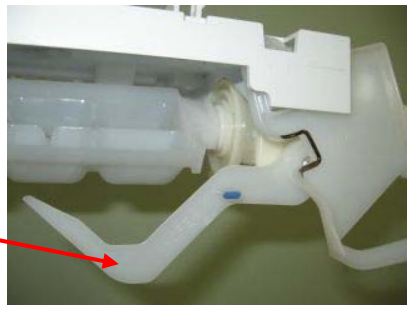
When the ice bin is full, the icemaker starts a sequence of testing to ensure ice harvest can continue. If the icemaker senses the bin is full, the motor resumes its normal position. Twenty minutes later, the testing sequence commences until such time as the ice level is reduced by usage. The testing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

Bin in position

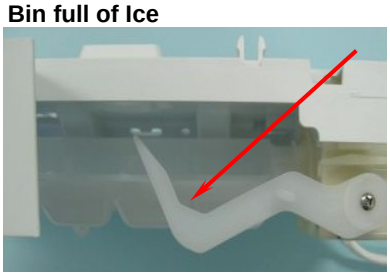


Bin lever – senses if there is a bin in position or not.

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.

7.5.4 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.

7.5.5 Icemaker Fill Tube Heater

There is a heater located under the fill tube nozzle to prevent the fill tube from freezing. It is connected in series with the low ambient heater.

7.6 Key Presses

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.

Version 2 LCD Display			
Function	**Key Presses**	**Action**	**Press Time**
Dispenser Lock	Lock	On/Off	Hold down for 2 seconds
Key & Dispenser Lock	Lock	On/Off	Hold down for 4 seconds
Diagnostic Mode	Menu + Up	On	Hold down for 4 seconds
Manually Forced Defrost	Menu + Down	On	Hold down for 4 seconds
Sabbath Mode	Lock + Menu + Down	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
Manually Force Icemaker Harvest	Down + Up + Lock	Activates once	Hold down for 4 seconds

7.7 Temperature Settings

PC Setting

0.0°C 32°F	0.5°C 32.9°F	1.0°C 33.8°F	1.5°C 34.7°F	2.0°C 35.6°F	3.0°C 37.4°F	4.0°C 39.2°F	5.0°C 41°F	6.0°C 42.8°F	7.0°C 44.6°F	8.0°C 46.4°F

Colder **Warmer**

FC Setting

-21.5°C	-21.0°C	-20°C	-19.5°C	-18.5°C	-18.0°C	-17.0°C	-16.5°C	-15.5°C	-15°C	-14.0°C
-6.7°F	-5.8°F	-4°F	-3.1°F	-1.3°F	-0.4°F	1.4°F	2.3°F	4.1°F	5°F	6.8°F

Colder **Warmer**

Default factory settings are +3°C (37.4°F) for the provision compartment and -18°C (-0.4°F) for the freezer compartment.
Note: Crowbar setting for the PC is -4°C (24.8°F) and for the FC is -26°C (-14.8°F). Temperatures shown are average temperatures.

7.8 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, through the power/control module, 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 FC fan motor to be recirculated again throughout the PC/FC compartments.

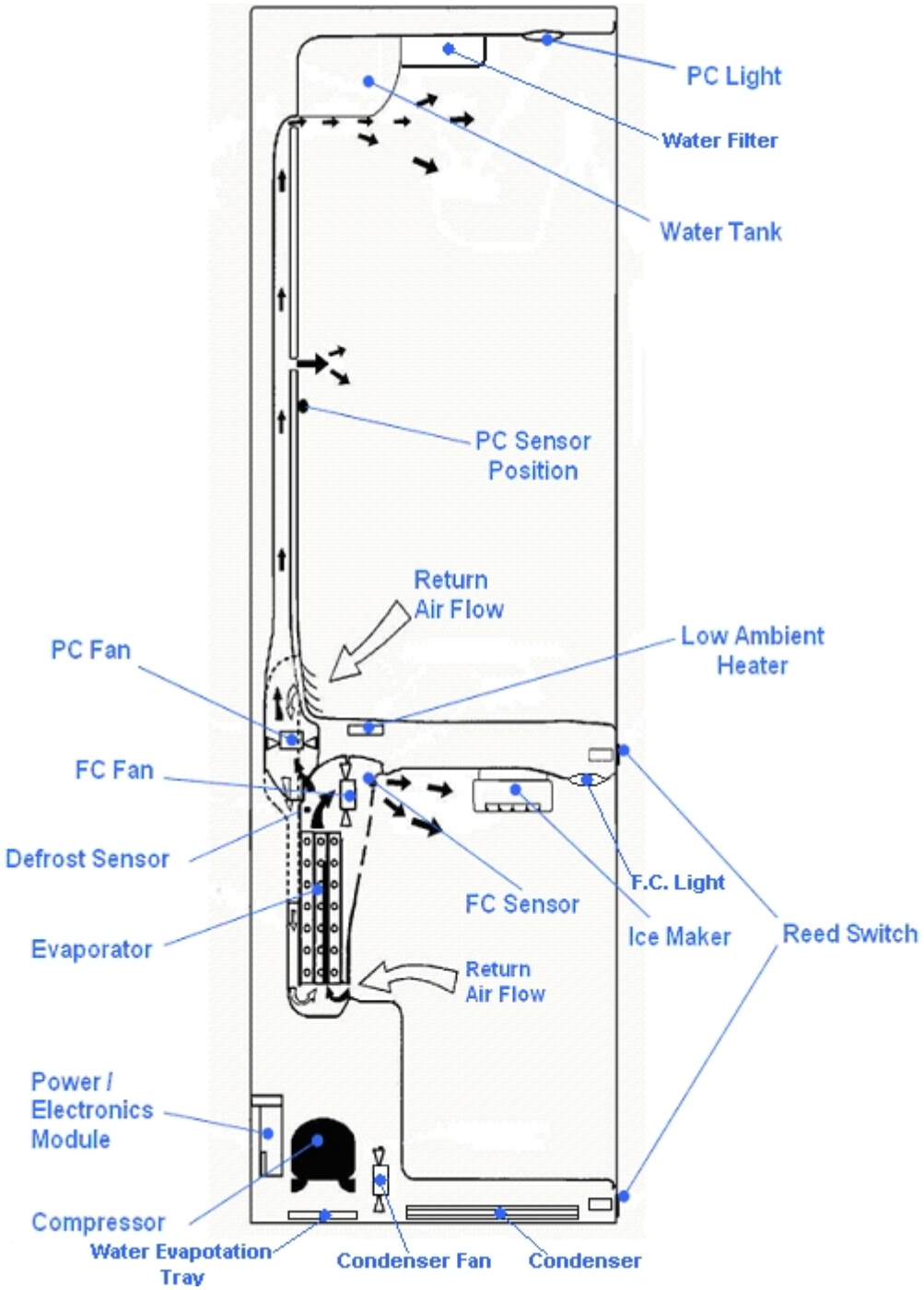
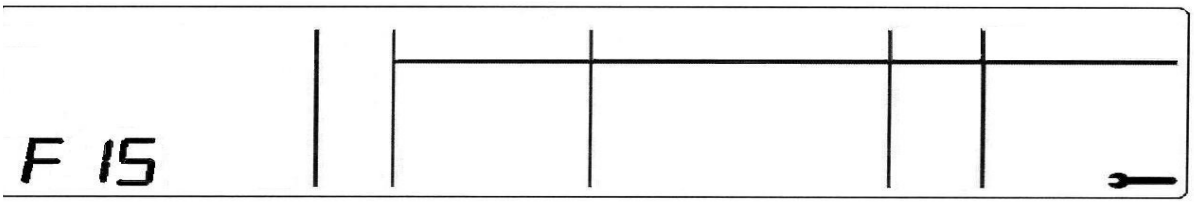


Diagram 7.8

7.9 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 to the 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.

7.10 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: The flapper heater current is 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: The 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: The 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: The icemaker motor current is high.

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

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

Fault Code 28

Reason: the icemaker solenoid current is 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: the icemaker solenoid current is 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 solenoid if open circuit.

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.

Fault Code 42

Note: This fault code will only be seen with a data down load using Smart tool

Reason: The icemaker fill tube nozzle heater current is high.

Primary Action: Check the connections to the controller. Check the resistance of the heater.

Secondary Action: Correct loose connections.

Fault Code 43

Note: This fault code will only be seen with a data down load using Smart tool

Reason: The icemaker fill tube nozzle heater current is low (Element open circuit).
Primary Action: Check the connections to the controller. Check the resistance of the heater (1.2 watts @120 ohms).
Secondary Action: Correct loose connections.

Should the element be open circuit, there is no means available of replacing this element and, unless the ice maker fill tube is frozen, the element being open circuit will have no effect on the operation of the cabinet.

Fault Code 44

Note: This fault code will only be seen with a data down load using Smart tool

Reason: The PC return duct heater current is too high.
Primary Action: Check for short circuit of PC return duct heater. Check the resistance of the heater.
Secondary Action: Replace if faulty.

Fault Code 45

Note: This fault code will only be seen with a data down load using Smart tool

Reason: The PC return duct heater current is too low
Primary Action: Check for open circuit of PC return duct heater. Check the resistance of the heater.
Secondary Action: Replace if faulty

DISPLAY FAULTS
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.

7.11 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 the two white wires marked “0V” and “Ice Sensor” on the controller.
- Testing of the sensor resistance should be in a known stable temperature, such as a glass of water full of ice cubes.

7.12 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.)

If the icemaker sensor needs to be replaced, refer to Section 11.4.16.

7.13 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).

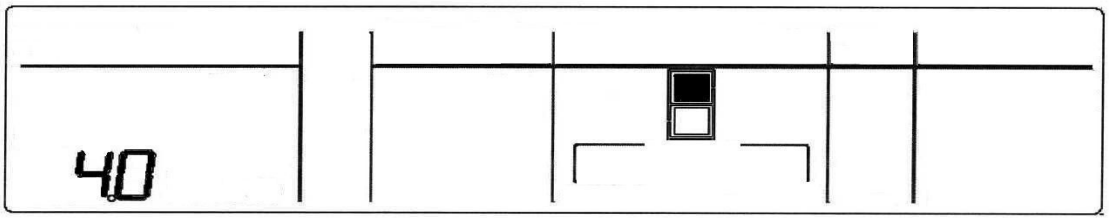
The voltage at the connector (once disconnected from the valve) should be 12 volts DC. Care should be taken not to damage the connector or wiring.

8 DIAGNOSTIC MODES

To enter diagnostic modes, press and hold the **MENU** key, then press the **UP** key for 4 seconds. The PC sensor 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 is 4.0^{O}C (39.2^{O}F).

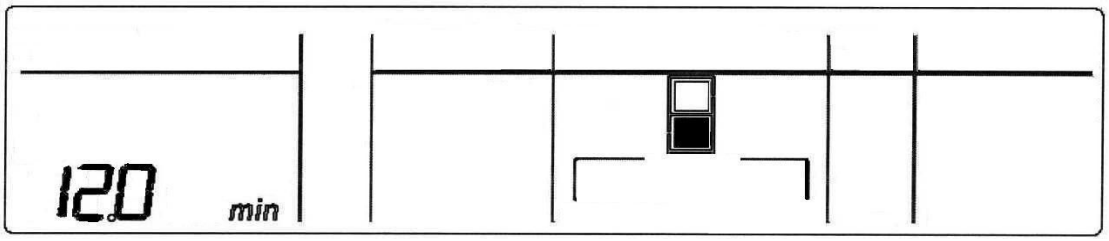
Diagram A



PC Sensor Temperature

FC Sensor Temperature
Press the **UP** key once more – FC sensor temperature.
Note: 12.0 min shown indicates the temperature of the FC sensor is –12^{O}C (10.4^{O}F).

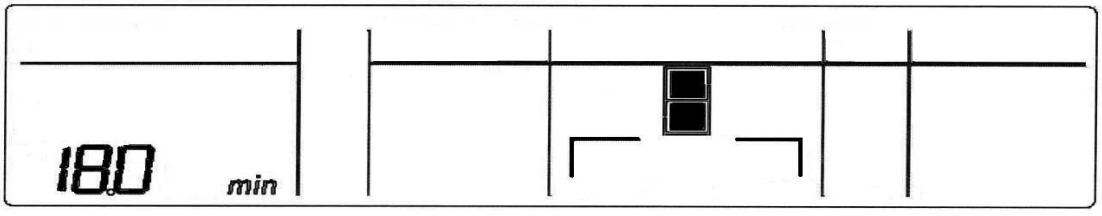
Diagram B



FC Sensor Temperature

Defrost Sensor Temperature
Press the **UP** key once more – Defrost sensor temperature.
Note: 18.0 min shown indicates the temperature of the Defrost sensor is –18^{O}C (0.4^{O}F).

Diagram C



Defrost Sensor Temperature

Input/Output Status

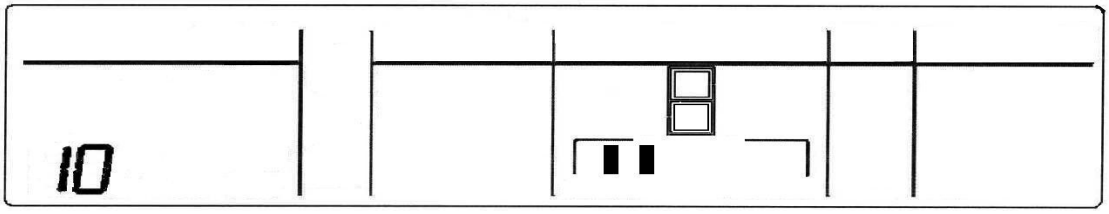
Press the **UP** key once more – Input/Output status.

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



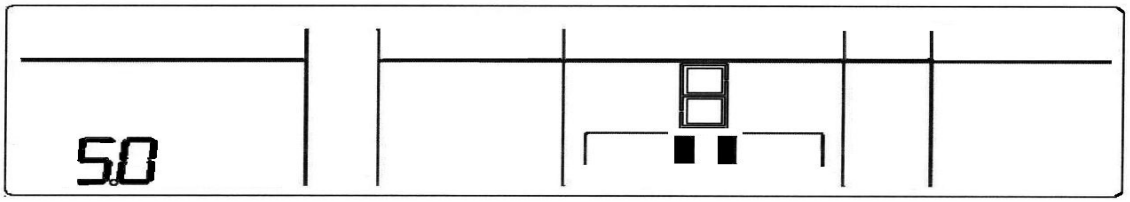
Input/Output Status

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^{O}C (41^{O}F).

Diagram E



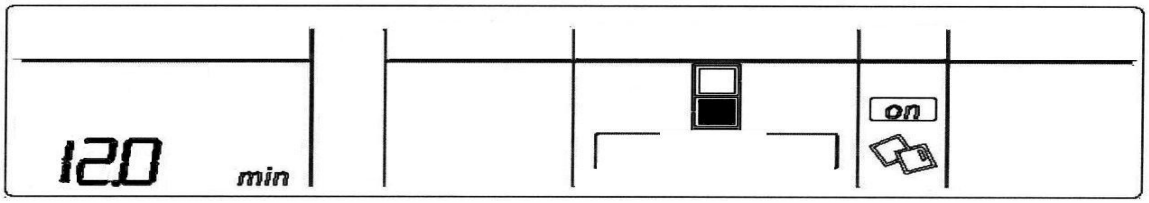
PC Sensor 2

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^{O}C (10.4^{O}F).

Diagram F



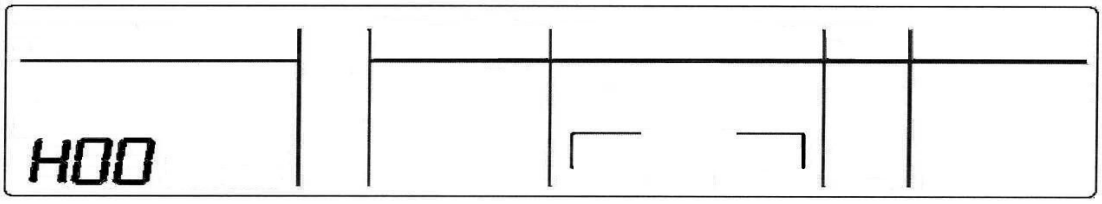
Icemaker Sensor

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.

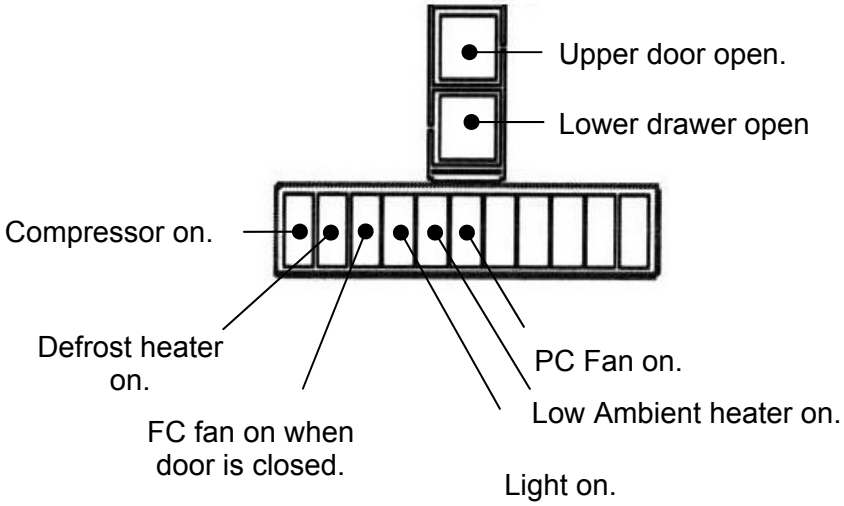
Note: The door alarms do not operate when the appliance is in diagnostic mode.

9 INPUT / OUTPUT STATUS

To enter input / output status:

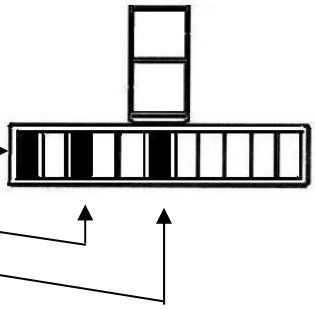
- Press and hold the **MENU** key, then press the **UP** key for 4 seconds. This enters the Diagnostic mode.
- Press the **UP** key three times. The current input /output status will be displayed.
  - If a device is on or a door is open, the respective LCD will be on.
  - Return to normal operation by pressing the **MENU** key.
  - 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** key, press the **DOWN** key 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 (refer to Section 5.2).

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.

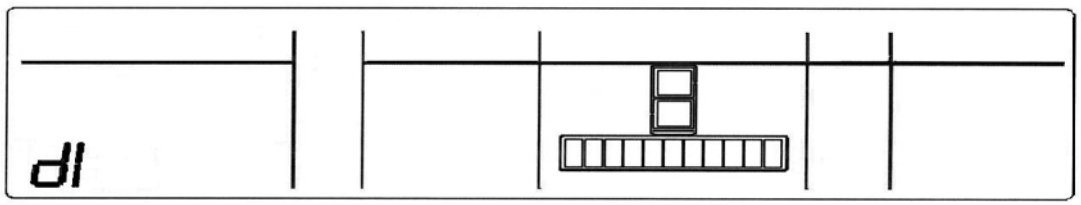
9.4 To Manually Force the Icemaker

Press **LOCK** key first, then press the **DOWN** and **UP** keys and hold all three 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.

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** key, then press the **UP** key for four seconds, then press the **DOWN** key.
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 the product is in a download mode.



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 by pressing the dispenser pad. 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.

Dispense at least 8 – 10 litres (8 – 10 quarts) of water through the system, stopping intermittently to ensure that air in the tank is flushed out. Failure to do so will result in excessive dripping from the dispenser.

10.3 Water Filter and Cartridge

The product is supplied with a water filter and cartridge located in the upper right hand side of the provision compartment. A bypass cap is also supplied should the customer wish to use the water system minus the filter cartridge.

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

10.3.1 Installing the Water Filter

1. Install the water filter into the water filter housing located in the upper right-hand corner of the provision compartment:
   (a) Open the filter housing by pressing the tab at the front end of the housing.
   (b) Remove the blue bypass cap and retain for later use (refer to figure 1).

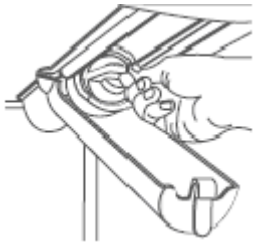


Figure 1

   (c) Remove the sealing label from the end of the filter and insert the filter into the filter head (refer to figure 2).
   (d) Rotate gently clockwise until the filter stops. Snap the filter cover closed.

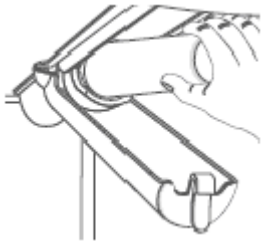


Figure 2

4. Flush the icemaker to ensure good quality ice:
   (a) Press ☰ until the icemaker menu is highlighted, then press ▶ to turn on the icemaker.
   (b) Press 🔓 ◀ ▶ together for 4 seconds to force a cycle. The ice tray will flip.
   (c) When the ice tray has filled with water, force another cycle. The ice tray will flip and spill water into the ice bin.
   (d) Empty the water and replace the bin.
   (e) Discard the first bin of ice made.

Please note that once installation is complete, a few drips of water may appear out of the dispenser over the next few days as the remaining trapped air is cleared. This is normal.

10.4 To Reset the Filter Icon

- Press the **UP** and **LOCK** keys for 4 seconds to reset the filter monitor.
  Note: Do not reset the monitor before the filter is changed, or monitoring will be inaccurate.

10.5 To Disable the Filter Alarm

Disable the alarm if no filter is to be fitted.

- Press and hold the **MENU**, **UP** and **LOCK** keys for 4 seconds to turn this feature on/off.

11 SERVICING PROCEDURES

11.1 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

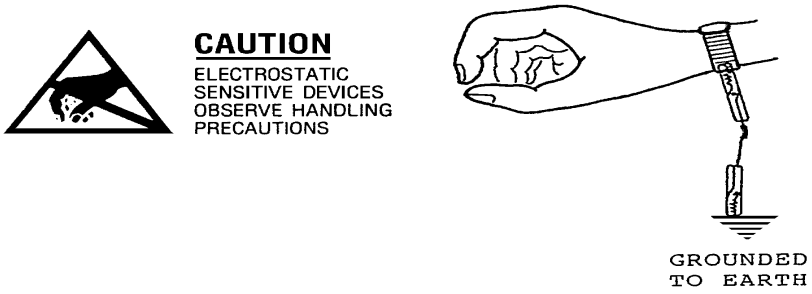


Diagram 11.1

11.2 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, such 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.

11.3 Door and Door Gasket

Doors - (Integral)

The doors are integrally foamed with the outer door panel and inner door liner foamed as one unit . This means that only the door gasket can be replaced as a separate part.

Door Gaskets

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.

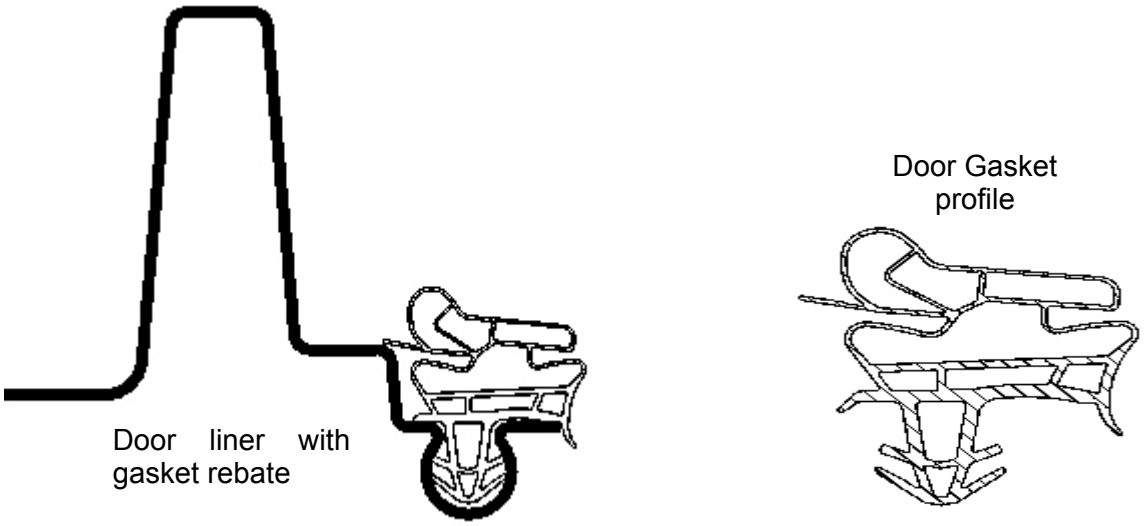


Diagram 11.3

11.4 Component Removal & Replacement

11.4.1 Removal Of Power/Control Module

Location: Behind a metal plate in the unit compartment on the left hand side when viewed from the rear of the refrigerator.

1. Unplug the refrigerator from the outlet socket.
2. Remove the cover mounting screws securing the metal plate and remove the plate.
3. Unclip the plastic locking tab on the underside of the module cover and remove the module. It may be necessary to move the power cable and earth wire 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 rear edges of the power/control module.
6. Remove the connectors (except the transformer) along the bottom edge.
7. 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.

11.4.2 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 and trays.
3. Unclip the PC air duct cover.
4. Remove the polystyrene duct cover insulation.
5. Turn the air duct cover to expose the back.
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 (2”) from the sensor, stripping the wire back about 10mm (0.4”), stripping the old sensor wiring back about 10mm (0.4”), and after sliding heat shrink onto the wires, connecting 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 the sensor is protruding at least 12mm / ½”).

11.4.3 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 and trays.
3. Unclip the PC air duct cover.
4. Remove the polystyrene duct cover insulation.
5. Turn the air duct cover to expose the back.
6. Remove the PC sensor from the cover, then remove the air duct 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 (2.4”) from the sensor, stripping the wire back about 10mm, stripping the old sensor wiring back about 10mm (0.4”), and after sliding heat shrink onto the wires, 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.

11.4.4 Removal of PC Fan Motor

1. Unplug the refrigerator from the outlet socket.
2. Remove all the PC shelving and trays.
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 and locate the lugs into the retainers. The routing of the wiring is important.
    Note: The back of the fan motor faces upwards.
12. Refit the duct covers and test.

The fan is fitted with an over moulded suspension. Before fitting, check the suspension legs to ensure the legs are not loose or broken.

11.4.5 Replacing Cross / Base Rail Reed Switches

1. Unplug the refrigerator from the outlet socket.
2. Remove the reed switch cover by placing a small bladed screwdriver into the slot under the cover and lifting 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 (2.4”) from the reed switch, stripping the wire back about 10mm (0.4”), stripping the old reed switch wiring back about 10mm (0.4”), and after sliding heat shrink onto the wires, 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 into the housing.
6. Refit in reverse order.

11.4.6 Removal of the drawer slide panels

The drawer slide side panels are held in place by the means of a dovetail mould in the cabinet liner. To remove both left and right hand panels.

1. First remove the screw that holds the back edge of the side panel to the liner panel.
2. Flex the top edge of the panel out to release the locking tab and plull the panel forward
3. Disengaging the panel from the dove tail
4. Refit in reverse order.

11.4.7 Defrost Heater Element

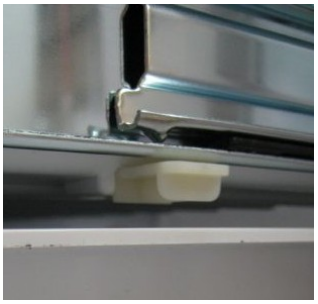
1. Unplug the refrigerator from the outlet socket.
2. Remove all the bins from the freezer and remove the FC drawer.
3. Remove the FC air duct cover by removing two screws. Removal of the icemaker will make removal of the cover easier. (Refer to Removing Icemaker, Section 11.4.13.)
4. Unclip the fan cover. This unclips with the aid of a small screwdriver.
5. Unplug the fan motor and remove the FC sensor. Remove the FC air duct cover.
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, bend the aluminium tabs to remove the defrost element.
11. Remove the thermal fuses from the air deflectors.
12. Refit the element in reverse order.

11.4.8 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 (162^{O}F), they are not resettable.

11.4.9 Removal Of FC Bins

1. Open the FC drawer and remove the ice bin and storage bins.
2. Remove the safety clip from the tray slide. (Refer to photo 11.4.9)



Remove the safety clip from the slide to remove the tray.

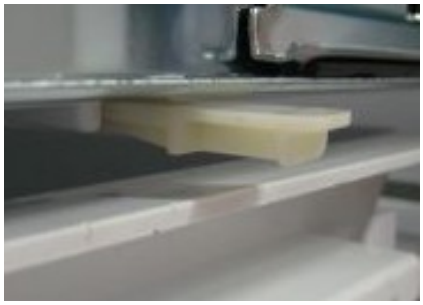
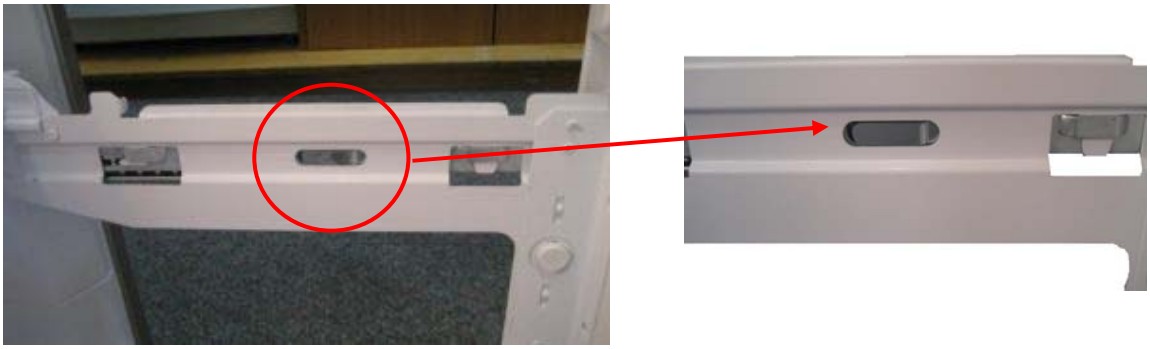


Photo 11.4.9

3. Remove the tray, complete with the hook.
4. To remove the bin, pull it back towards the freezer.
5. Lift the front of the bin and turn the bin 90^{O} and remove from the FC.
6. Refit the bins in reverse order.

11.4.10 Removal of the FC Drawer

1. Remove all ice and storage bins as in Section 11.4.9.
2. Push the locking tab on each of the FC bracket mount slides as shown in photo 11.4.10
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-racking device comes out with the drawer.



Push Locking Tab in to release bracket from slide. Locking Tab

Photo 11.4.10

11.4.11 Refitting of the FC Drawer

1. There are two locating tabs on the drawer that are required to be fitted first. (Refer to photo 11.4.11)

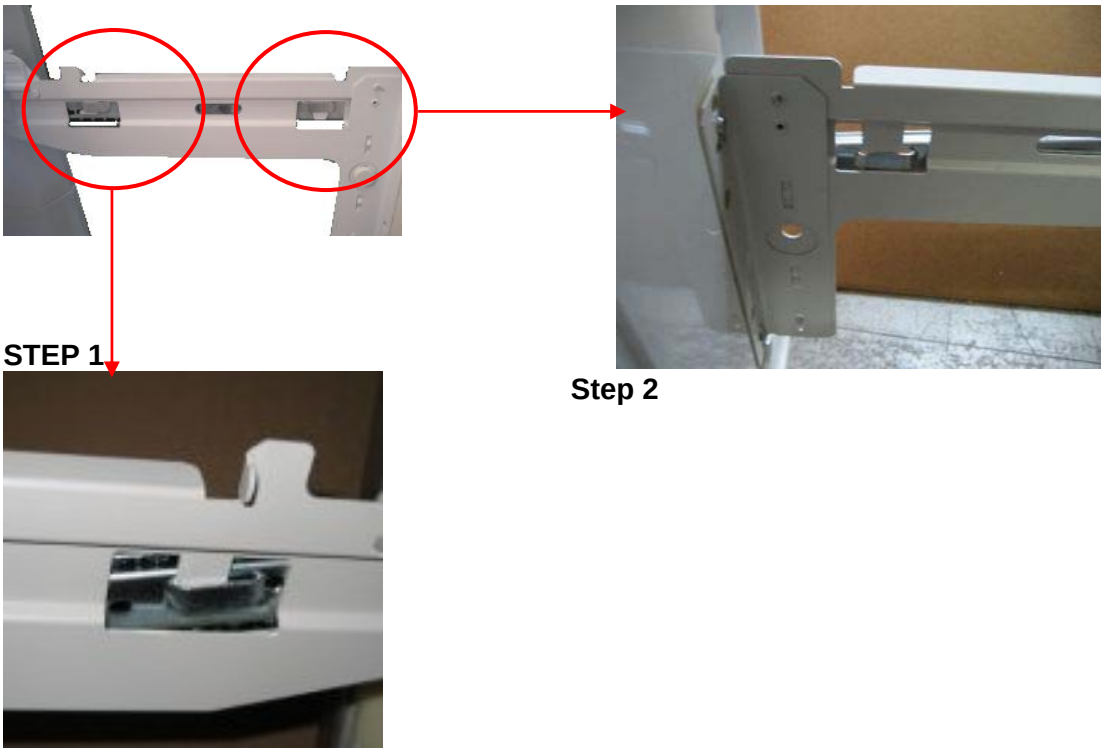


Photo 11.4.11

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-racking bar into the wracking pinion gear ready to fit to the drawer.
5. Both anti-racking 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 to photo 12.4.10.1.

Photo 11.4.11.1

Photo 11.4.11.2

6. Place the anti-racking 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.

11.4.12 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 (refer to Section 11.4.10).
3. Remove the FC air duct cover by removing two screws. Removal of the icemaker will make removal of the FC cover easier. (Refer Removing Icemaker, Section 11.4.13.)
5. Remove the fan cover. This unclips with the aid of a small screwdriver.
6. Move the fan cover to access the FC sensor. (Removal of the fan cover is not necessary.)
7. Cut the FC sensor wire 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 (2.4”) from the sensor, stripping the wire back about 10mm (0.4”), stripping the old sensor wiring back about 10mm (0.4”), and after sliding heat shrink onto the wires, 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.

11.4.13 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. Remove 2 screws securing the body of the icemaker to the roof of the divider.
7. 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.
8. Disconnect the icemaker harness.

11.4.14 Refitting the 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 (refer Note 1).
4. Locate the clips and align the icemaker to the clips.
5. With an upward pressure, re-clip the icemaker into position (refer Note 2).
   Note 1: Allow enough slack in the sensor harness for the ice mould to rotate. The marker tape on the sensor harness fits forward of the clip on the gearbox.
   Note 2: If either front or rear clips do not re-clip, further pressure will need to be exercised to re-clip the icemaker.

11.4.15 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 to photo 11.4.14.
   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.

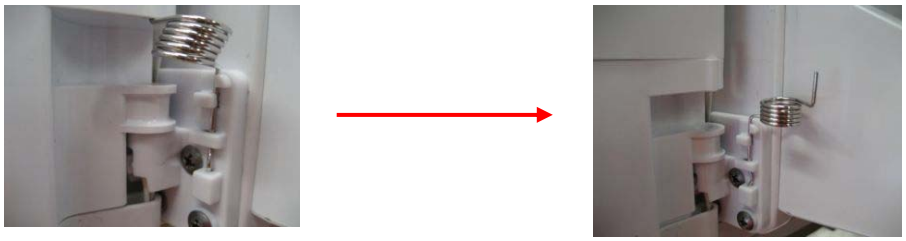


Photo 11.4.14

4. Remove the bottom end cap off the flapper. Refer to photo 11.4.14.1

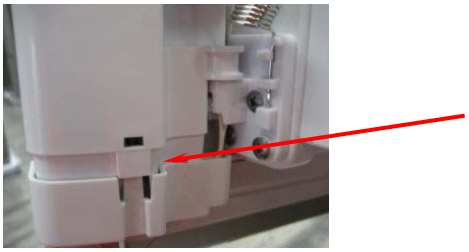


Photo 11.4.14.1

5. Remove the top screws holding the top flapper hinge to the door liner. Refer to photo 11.4.14.2

Photo 11.4.14.2

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 to photo 11.4.14.3

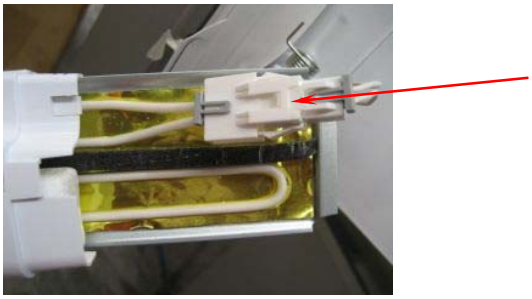


Photo 11.4.14.3

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 to photo 11.4.14.4

Photo 11.4.14.4

11.4.16 Icemaker Temperature Sensor Replacement

1. Remove the icemaker (refer to Section 11.4.13).
2. The sensor wires are to be cut as close to the sensor as possible. Strip the wires back 10mm (0.4”) 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.

Note: When the sensor is replaced, there must be enough slack in the harness to allow the mould tray to rotate. There is a tape marking on the spare part sensor harness. This is fitted in front of the clip on the gearbox.

11.4.17 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/3 pints) 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.

11.4.18 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.

11.4.19 Replacement of Interior Lamp

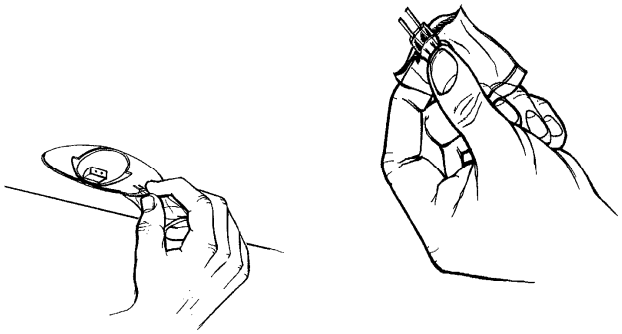


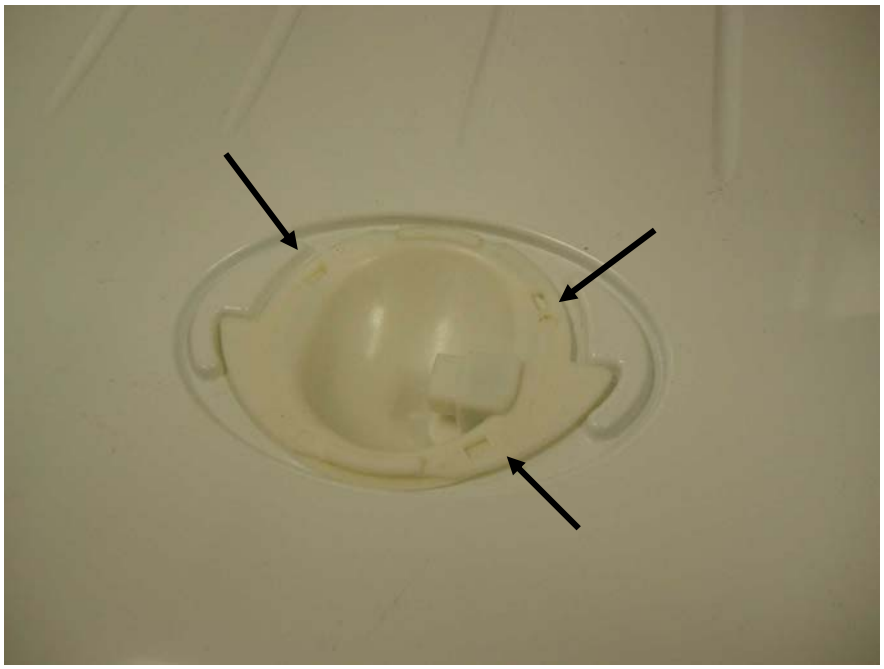
Diagram 11.4.19

1. Disconnect the refrigerator from the power supply.
2. Remove the light cover. (This can be done by using a small screwdriver 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.

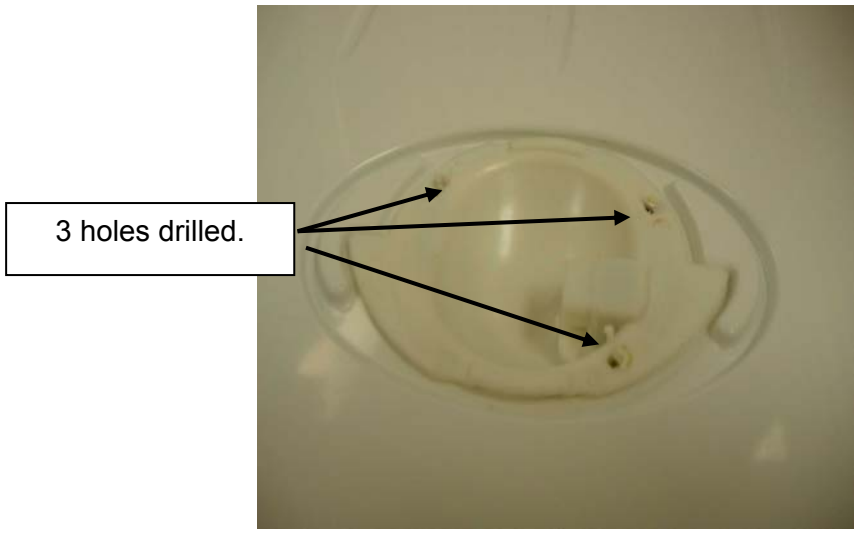
11.4.20 Replacement of the interior light socket

The interior light fitting, while foamed into the roof of the provision compartment, can be replaced by the following steps

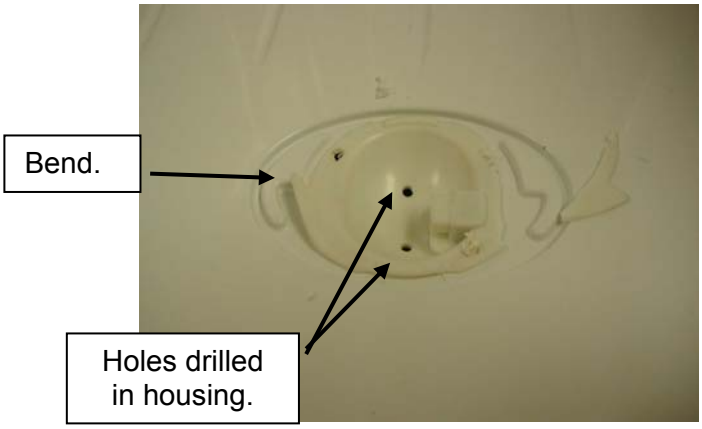
Steps:
1. Remove the lens cover.
2. Remove the lamp.



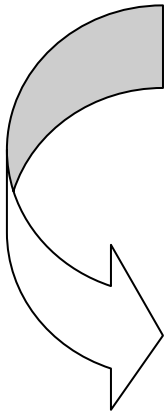
3. Drill three 5mm holes in the lamp housing in the positions shown above. This will cut off the tabs holding the light socket to the liner.



These only need to be drilled to a shallow depth. Cut, bend or break off the 2 lugs on the outer edge of the lamp housing as shown below.



4. Drill two shallow (4mm deep) 5mm holes in the concave of the lamp housing at the 5 & 10 o'clock positions.



5. Using a pair of long noise pliers, insert the pliers into the last two holes drilled, and with the aid of a screwdriver, rotate the lamp housing anti clockwise. This is to break the foam away from the back of the lamp housing.

6. Once the old lamp housing is free of the foam, pull it down gently from the roof and cut the harness from the back of it as close to the housing as possible.

7. Cut and strip the harness, then slide heat shrink over the new lamp harness. Crimp to the existing harness using butt connectors or by soldering each joint. Insulate the joint with the heat shrink.

   Note: It is important that good joint connections are made in terminating these two wires, as failure to do so can produce high temperatures at the joint.

8. Fit the new housing to the liner and test. A small screw may be fitted to each side lug to hold the housing to the liner if needed.

   The freezer compartment lamp housings **don't** need to be drilled to remove them. Just bend the lugs back and rotate the housing, following steps 1,2,5,6,7 and 8 above.

11.4.21 Replacement of PC Door (Where John Guest Fitting Has Been Fitted)

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 to photo 11.4.21)

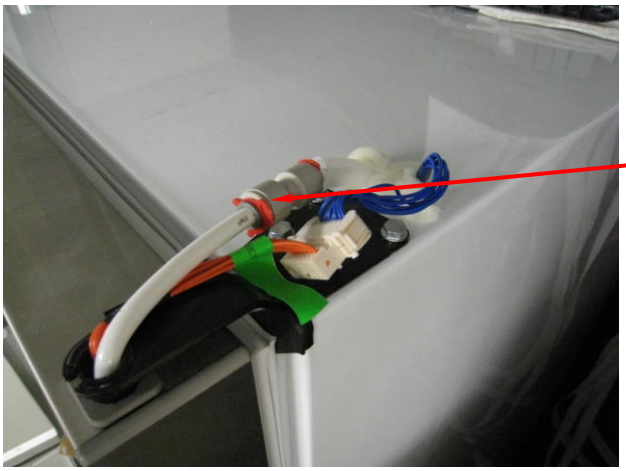


Photo 11.4.21

5. Once the clip has been removed, push the collar in to remove the water tube.
6. Remove the top 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.

11.4.22 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.

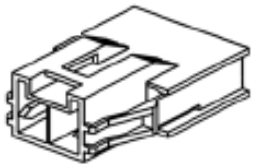
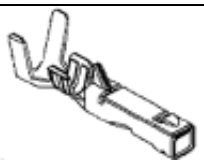
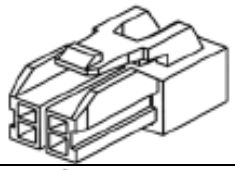
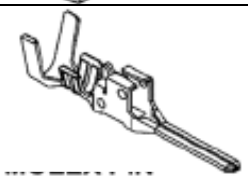
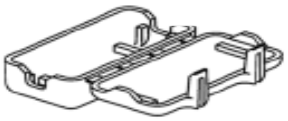
To make a connection on a female block connector, cut the wire end square and insert it into the correct location on the block connector itself. With the wire fully inserted, apply pressure to the terminal, which will lock the wire and terminal together.

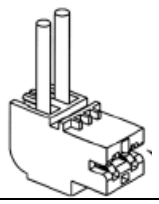
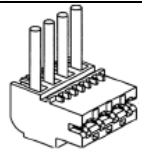
If possible, when replacing a connector the connections should be made one at a time. For example, first cut the wire in pin 1 of the old connector and insert it into pin 1 on of the new connector. Push the pin fully home to lock the wire in place, and then move on to pin 2.

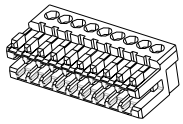
Note that the stage 4 cabinets introduce a new series of block connectors. These connectors contain a wall between the cavities to ‘code’ or polarize the connector. This is especially important in the case of the 4 and 6 way connectors in the power/control module. Also note that the replacement connectors 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.

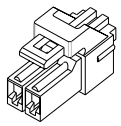
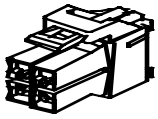
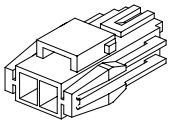
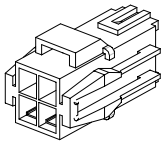
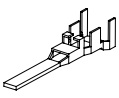
Also used are a new series of in-line connectors, replacing the Molex connectors. These new JST plugs and sockets are available as spare parts.

MOLEX Plugs, Sockets & Terminals			
	Type	**Description**	**Part Number**
	**Socket** 4 way 6 way	Female 51139-02000MLX 51139-0600MLX	 881592 855409
	**Socket Terminal**	16-22AWG 50597-8100 MLX 20-26AWG 50598-8100 MLX There are two sizes of terminals to suit the wire Gauges	881595 881596
	**Plug** 4 way 6 way	Male 51138-0200 MLX 51138-0600 MLX	 881593 855411
	**Plug Pin**	16-22AWG 50599-8100 MLX 20-26AWG 50600-8100 MLX There are two sizes of terminals to suit the wire Gauges	881597 881598
	**Retainer**	51140-0205 MLX	881594
	**Cover**	Coffin insulator Fits over the Molex Plug & socket	884412

Stocko Edge Connectors			
	Used On	**Description**	**Part Number**
	**Mains Cord** **Defrost Heater Element** **Run Capacitor**	9290-02-AB01-000-960 9290-02-BA01-000-960 9290-02-EE01-000-960	881588 881589 881590
	**Compressor cable**	9290-04-EF02-000-960	881591

RAST Edge Connectors		
	**Number of Ways** (Not coded or indexed)	**Part Number**
	2 way	
	3 way	873251
	4 way	873250
	5 way	Not currently used
	6 way	873247
	7 way	Not currently used
	8 way	873279
	9 way	819301
	10 way	873248
	11 way	819300
	12 way	873243
	13 way	Not currently used
	14 way	881136
	17 way	881137

JST Plugs, Sockets & Terminals

	Type	Description	Part Number
 	**Plug** 2 pin 4 pin 6 pin 8 pin	 YLP-02V YLP-04V YLP-06V YLP-08V	 819611 819612 819613 819614
	**Socket terminal** (fits the plug above)	SYF-01T-PO.5A 26/20 AWG SYF-041T-PO.5A 20/16 AWG There are two sizes of terminals to suit the wire Gauges	819607 819608
	**Retainers** Common to both plugs & sockets 2 way 3 way 4 way	 YLS-02V YLS-03V YLS-04V	 819620 819621 819622
 	**Socket** 2 pin 3 pin 4 pin 6 pin 8 pin	 YLR-02V YLR-03V YLR-04V YLR-06VF YLR-08V	 819615 819616 819617 819618 819619
	**Pin terminal** (fits the socket above)	SYM-01T-P0.5A 26/20 AWG SYM-41T-P0.5A 20/16 AWG There are two sizes of terminals to suit the wire Gauges	819609 819610

11.5 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.

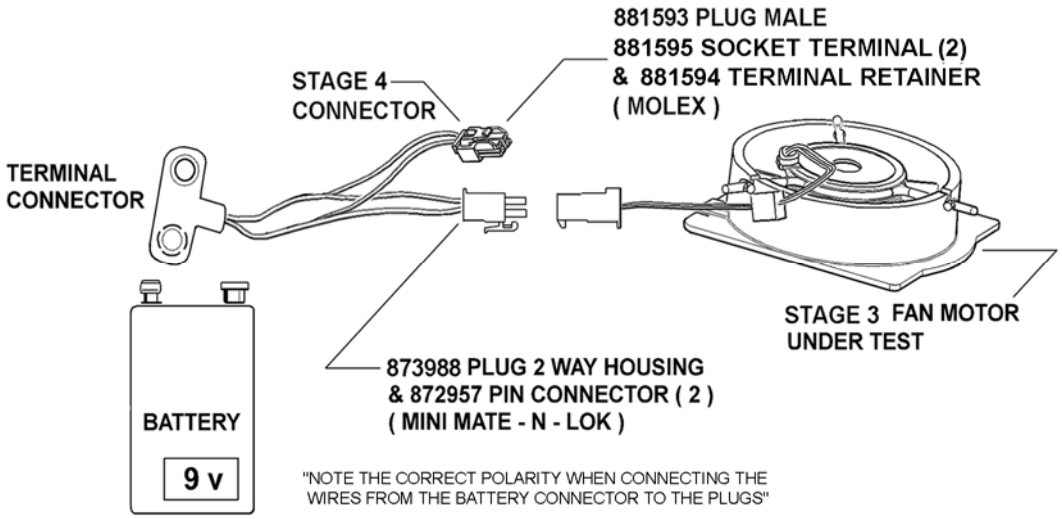


Diagram 11.5

12 FAULT FINDING THE ICEMAKER

1. Is the Icemaker switched on? See Note 1.
2. Open the FC door or drawer.
3. Check, is the ice bin in place?
4. Does the ice bin position lever unlock the bale arm? See Note 2.
5. Is there ice or water in the ice mould tray?
6. Is there a fault code being display on the LCD display or PCB board? See Note 3.
7. Can you manually force a harvest?
8. With the FC door open, do you see the bale arm lower and rise up with the ice mould tray rotation? See Note 4.
9. If the icemaker does a manual harvest, do you hear or see water entering the ice mould tray? See Note 5.
10. Failure to produce ice can be related to the fact that the FC compartment is not cold enough.

    The FC compartment should be low -10 deg C (14 deg F).

Notes:

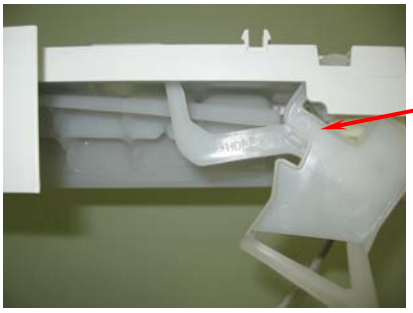
Note 1.

To switch the icemaker on, scroll through the LCD menu and switch the icemaker on/off with the temperature up and down buttons.

Note 2.

The bale arm is unlocked when the ice bin is in place and the bin lever is back.

No Bin fitted

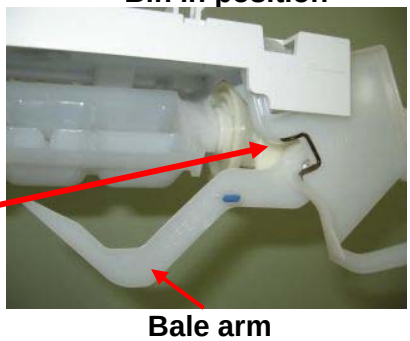


Bale arm locked

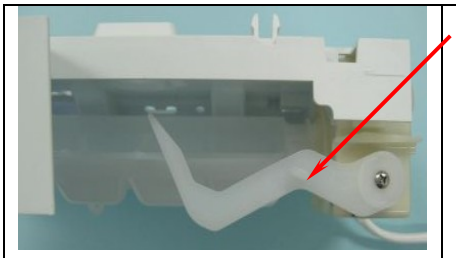
Bin lever – senses if there is a bin in position or not. Bale arm locked.

When a bin is in place the bale arm is free to move down as shown as it is unlocked.

Bin in position



Bale arm

	Bale arm lever sensing if ice bin is full. If the arm cannot move down, the icemaker will not harvest. If bin is not full, icemaker continues rotation to eject ice.	

Note 3.
With the RF175 model, the fault code for the icemaker is displayed not on the LCD display, but on the icemaker PCB board as LED flashes. The PCB board is located in the power control module, which is in turn located in the unit compartment. If the LED is flashing, this is the fault code. Refer to the table below:

If a fault has occurred relating to the display board, the fault code will show on the display just like any other fault. The fault history is a tool to view intermittent faults.

Code	Fault	Action
0 (No LEDs)	No fault.	No fault with PCB board.
1	Motor timeout.	Check motor resistance. Is the motor running?
2	Motor current high – motor obstructed.	Check has gearbox frozen? Thaw and test.
3	Temperature sensor too hot.	Check resistance of sensor. Refer to table in Section 6.1.8.
4	Temperature sensor too cold (or open circuit).	Replace open circuit sensor.
5	Water solenoid current high.	Check resistance of solenoid. Replace if faulty.

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.
Check Harness wiring under hinge cover	

Note 4.
- Is the icemaker gearbox iced up or frozen, i.e. has ice built up around it? This could be the reason why it doesn't rotate.
- Check that the evaporator is defrosting and the defrost element is working along with the FC fan. If not, thaw and retest.
- Force a manual harvest.

Note 5. If water doesn't enter the tray:
Check - Is the water turned on to the cabinet? Can you dispense water through the door?
Check - Are there any kinks in the water lines?
Check - Is the water filter blocked?
Check - The water solenoid resistance.
Check - The resistance of the icemaker motor (refer to Section 12.1).
Check - That the solenoid is opening and water is leaving the solenoid.
Check - For blockage in the icemaker fill tube/nozzle.

12.1 Testing Icemaker Motor

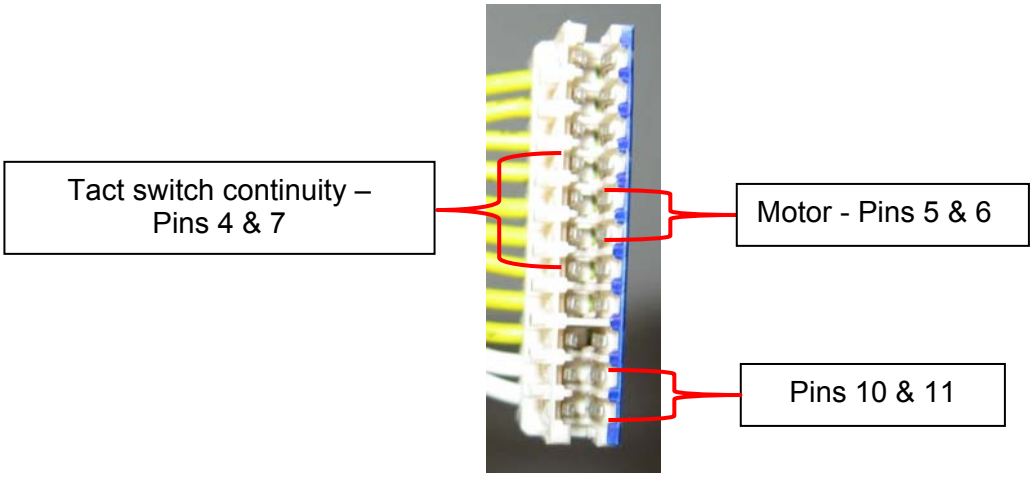
Testing of the icemaker motor is carried out at the power module.

Note: Before any testing is carried out, ensure the product has an ice bin in place and the icemaker arm is in the down position.

Procedure:

- Disconnect the refrigerator from the power supply.
- Remove the power module to expose connectors.
- Remove the connector from the Icemaker PCB.
- Check the resistance of the motor between pins 5 & 6 - resistance should be 35Ω +/- 5%.
- Check the tact switch continuity between pins 4 & 7 - the switch should be closed.

Note: To identify pin numbering, Pin 10 and 11 are white wires



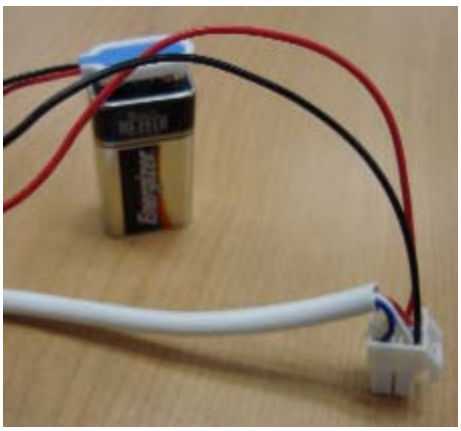
An alternative method of testing the icemaker unit is to use a 9-volt battery plus battery terminal and a multi meter. With the meter probes placed into the back of the icemaker 4 way socket onto the yellow and blue wires, check the continuity of the circuit to the tact switch in the ice mould tray. The switch should be closed.

By applying a 9 volt DC supply across the white and red wires of the plug to the icemaker motor, you can drive the ice mould tray forward to a full twist of the tray and the tact switch will close again.

Note:

- 9-volt battery positive to the red wire to go forward.
- 9-volt battery positive to the white wire to go backwards.

Checking the tact switch



Advancing the motor

12.2 Refitting the Dispenser Panel (RF195A)

When refitting the front dispenser panel, it is important that the wiring harness is placed correctly to avoid it being pinched, otherwise it will prevent the panel from sitting flat when pushed back and clipped into place.

13 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.

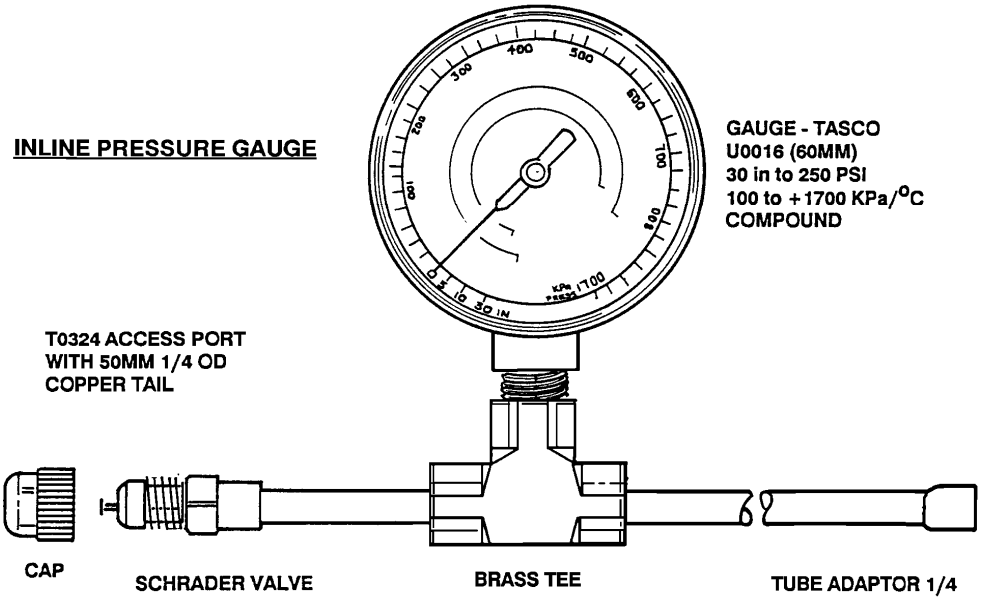


Diagram 13

13.1 Transporting of Refrigerators

It is not recommended that the cabinet be laid on its back or its side. This could lead to problems with oil from the compressor running into the suction line inside the compressor. All cabinets should be transported upright.

It is recommended that:
If a cabinet has 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 13.1.1).

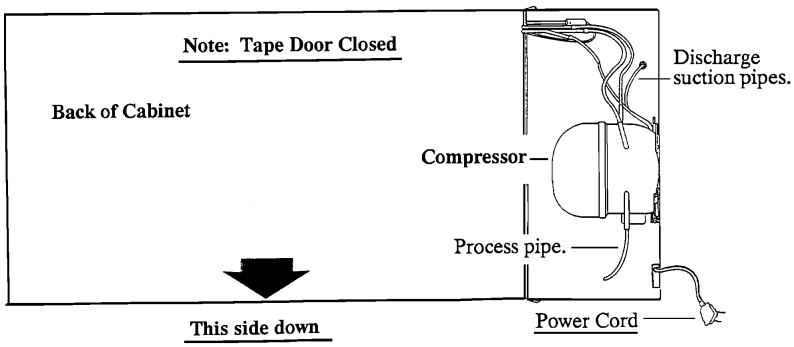


Diagram 13.1.1

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 13.1.2). 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 that is attached to the side of the unit compartment.

On installation, the cabinet should be stood upright for approximately 20 minutes before being switched on. This is to allow the oil to return to the crankcase of the compressor.

Ideally, the product should be transported standing upright.

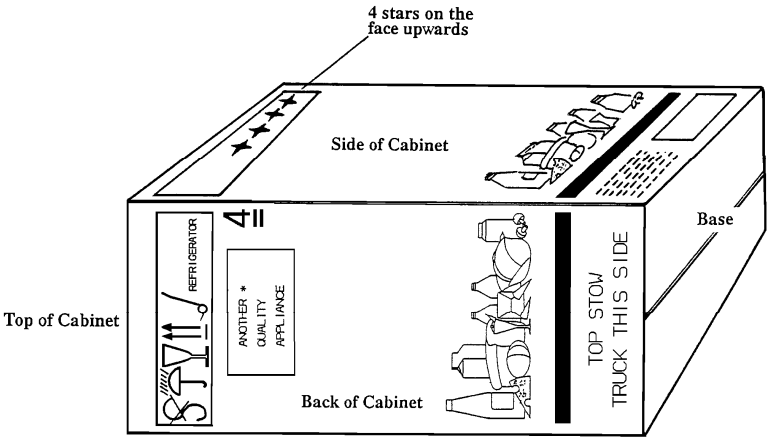


Diagram 13.1.2

13.2 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 11.4.10).
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.

13.3 Refilling a Void In Foam Insulation

When 50ml of each foam component is mixed together, sufficient insulation will be formed to fill a space of approximately 25cm x 25cm x 50mm (10” x 10” x 2”) deep (3 litre volume). "Freefoam" means that the space being filled is not fully enclosed.

The foam is handled as follows:

1. Roughly determine the volume of the void to be foamed and then determine how much activator and resin is required. Do a test run mixing a 1/4-cup of each to estimate your requirement (on waste cardboard).
2. Measure equal quantities of activator and resin into a large wax cup or similar and mix briskly with a wooden spatula for 10-15 seconds. The mixture will start to feel warm, and this indicates that mixing is complete.
3. Pour the mixture into the void and allow to foam. More can be added if necessary.
4. When the foam is firm, remove excess with a sharp knife, apply film of wax and vapour seal to the triple fold, refit the back panel, making sure the panel is perfectly vapour sealed.
5. **DO NOT OPERATE THE APPLIANCE FOR AT LEAST FOUR HOURS AFTER FOAMING.**
6. The foam solvent used for cleaning while the foam is still in a liquid state is methylated spirits.

CAUTION

1. Avoid splashing the mixture onto the cabinet. Once set, foam is almost impossible to remove.
2. When clearing a pocket for foaming, it is recommended to leave a layer of old foam against the ABS plastic liner for support and to prevent the pressure of the foam causing a bulge on the PC inside surface.

13.3.1 Polyurethane Foam

The insulation material being used in refrigerator and home freezer cabinets is polyurethane foam. Polyurethane foam is a two-part mix, consisting of a pre-mix and an isocyanide. The pre-mix contains: polyol, catalyst, silicone surfactant, water and fluorocarbon-II. The isocyanate is 4,4[1]

diphenyl methane di-isocyanate, or M.D.I. for short. In the past, tollene di-isocyanate, or T.D.I. for short, was used. When the cabinet is "foamed" in the factory, the pre-mix and isocyanate are conditioned at a prescribed temperature in advance. When the two ingredients are mixed together they start to expand. Heat is produced by the chemical reaction, which causes the fluorocarbon-II to boil, giving off a gas and creating a froth. It is this froth that produces the cell structure. The size of the cells formed is controlled, to a large degree, by the silicone surfactant, and this is critical in order to provide the required insulation properties.

Precautions necessary when using these Chemicals:
Vapours from the pre-mix and isocyanate can be hazardous to your health, as can be skin contact from both liquids. When using foam, make sure that adequate protective clothing is worn and sufficient ventilation is present to remove the vapours that will be given off by the mixture. Should any of the chemicals come in contact with your skin, rinse off with water. If a gas torch is to be used whilst repairing a refrigerator or freezer, care must be taken not to set the foam alight, as cyanide fumes will be given off, as well as phosgene generated from the burnt fluorocarbon present. Both of these gases can be dangerous if they are allowed to accumulate, and for this reason sufficient ventilation must be present when doing repair work that is liable to cause the generation of gases.

13.3.2 Safe Practices

(a) Do not inhale any vapour from the liquids.
(b) Measure chemicals by weight only and NOT by volume. (Not essential for small quantities used for filling voids after repair).
(c) Avoid contact with skin or clothing.
(d) Use only in accordance with the recommended safety procedures.
(e) Remove, wash and decontaminate clothing before re-use.
(f) You are advised not to smoke near foam operations.
(g) **Isocyanate contact with the eyes:**
Splashes of isocyanate in the eye are an irritant and may cause severe chemical conjunctivitis. If **any** chemical used in the foaming process enters the eyes, they should be washed out as soon as possible with copious amounts of clean water for at least 15 minutes. It has been found that this will require the help of another person to hold the victim's eye open. Foam that is frothing is particularly dangerous if it enters the eyes.
Contact lenses must **NOT** be worn when working with isocyanates, for the chemicals can get in behind these lenses and irreparable damage may occur to the eye while the lens is being removed prior to flushing with water.

DO'S AND DON'TS WHEN USING THESE CHEMICALS

DO wear sufficient protection - overalls, gloves and goggles - as directed by supervision or written instructions.

DO check that first aid facilities are always near you.

DO avoid personal contact with the chemical.

DO wash thoroughly immediately on leaving the work area.

DO seek medical attention at the first sign of breathing or chest troubles.

DO take care when using a gas torch in the repair of a refrigerator and protect the foam from the heat.

DO provide sufficient ventilation so as to avoid breathing any vapours whenever foam materials are handled, mixed or poured. **THIS IS ESSENTIAL**. Cyanide fumes will be given off, together with phosgene from the fluorocarbon present in each foam cell.

DON'T let familiarity with the chemical breed contempt.

DON'T ignore splashes on the skin - wash them off immediately with soap and water.

DON'T take food or drink into an area where isocyanates are used.

DON'T neglect splashes in the eye (see note above).

SUGGESTED METHODS FOR VENTILATION

In a workshop fixed and/or portable ducting, with exhaust fans, can provide good ventilation.

In a customer's house, various alternatives are possible:

(a) A portable ducted fan exhausting to the open air.
(b) Turn on a kitchen X-pelair fan and work near it.
(c) If the clothes dryer exhausts to the outside air, turn the fan on and work near it.
(d) Use the household vacuum cleaner as a vent.
(e) Work outside.

In service applications, the quantities used may be small, but observance of these safe practices is advisable.

13.4 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. Purge 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

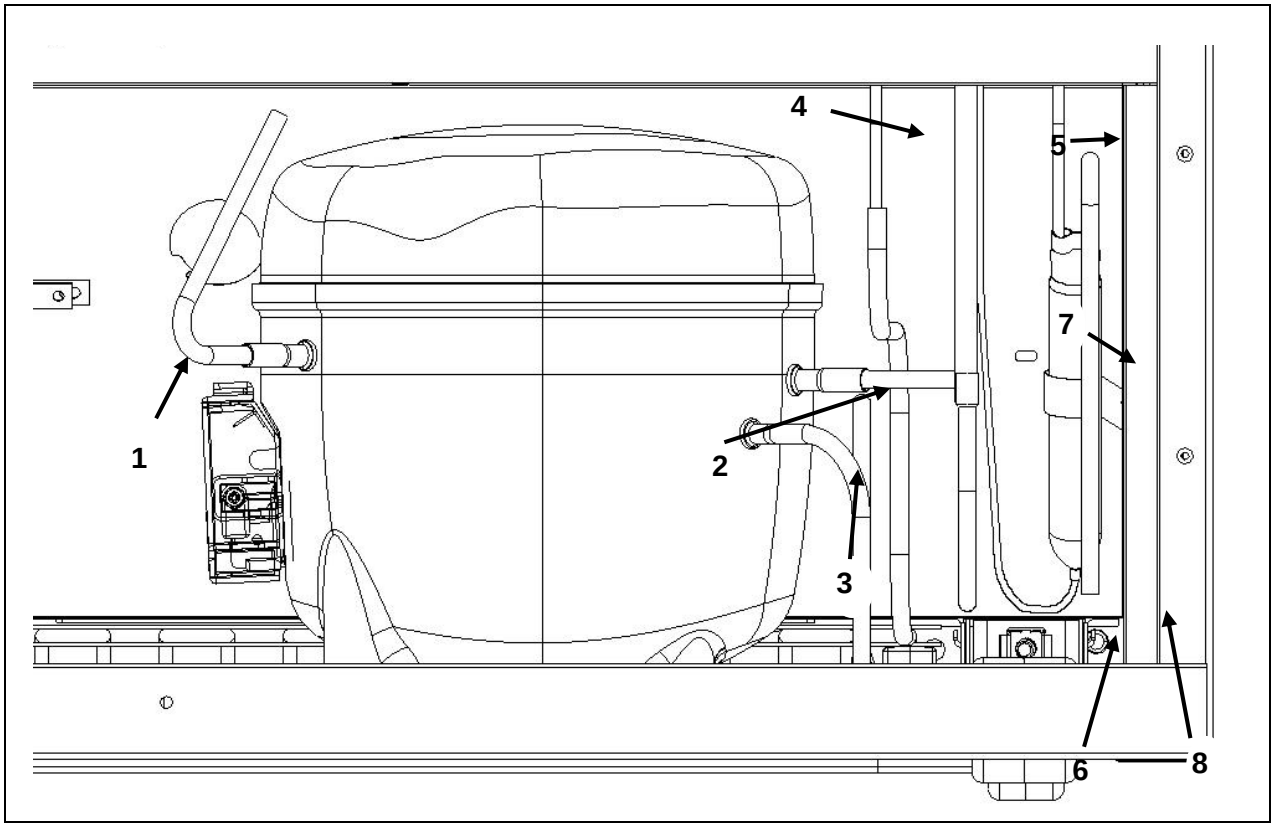


Diagram 13.4

1. Service tube (process pipe).
2. Suction line.
3. Discharge line into condenser.
4. Condenser to mullion.
5. Mullion to filter.
6. Capillary tube.
7. Filter dryer.
8. Filter process pipe.

14 FAULT FINDING

14.1 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.

14.2 Compressor Won't Start - Hums

Possible Causes:

1. The voltage may be low e.g. 10% low. Test the voltage under load.
2. System pressures may not be equalised; too short an off cycle.

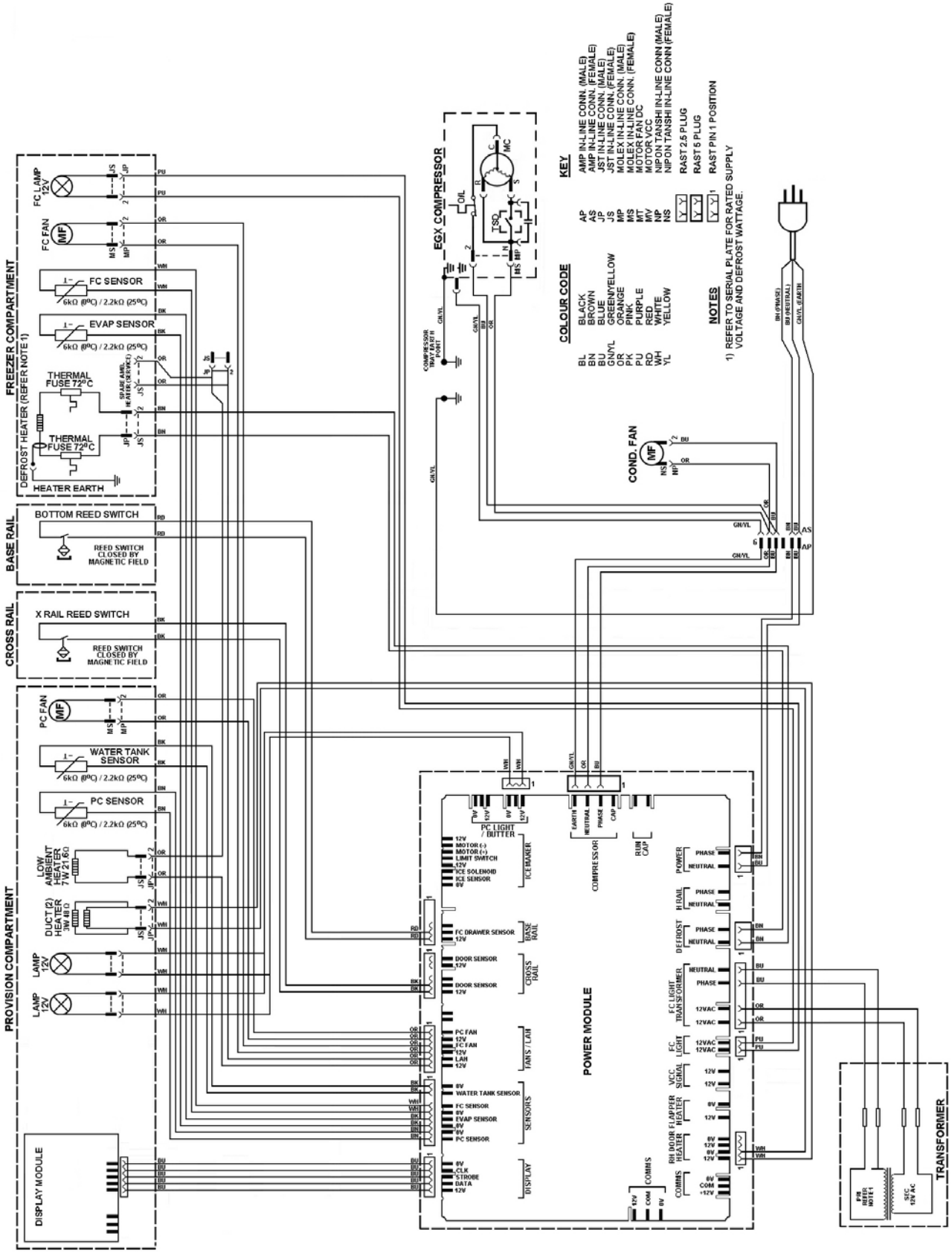
14.3 Compressor starts, runs and then stops

Possible Causes:

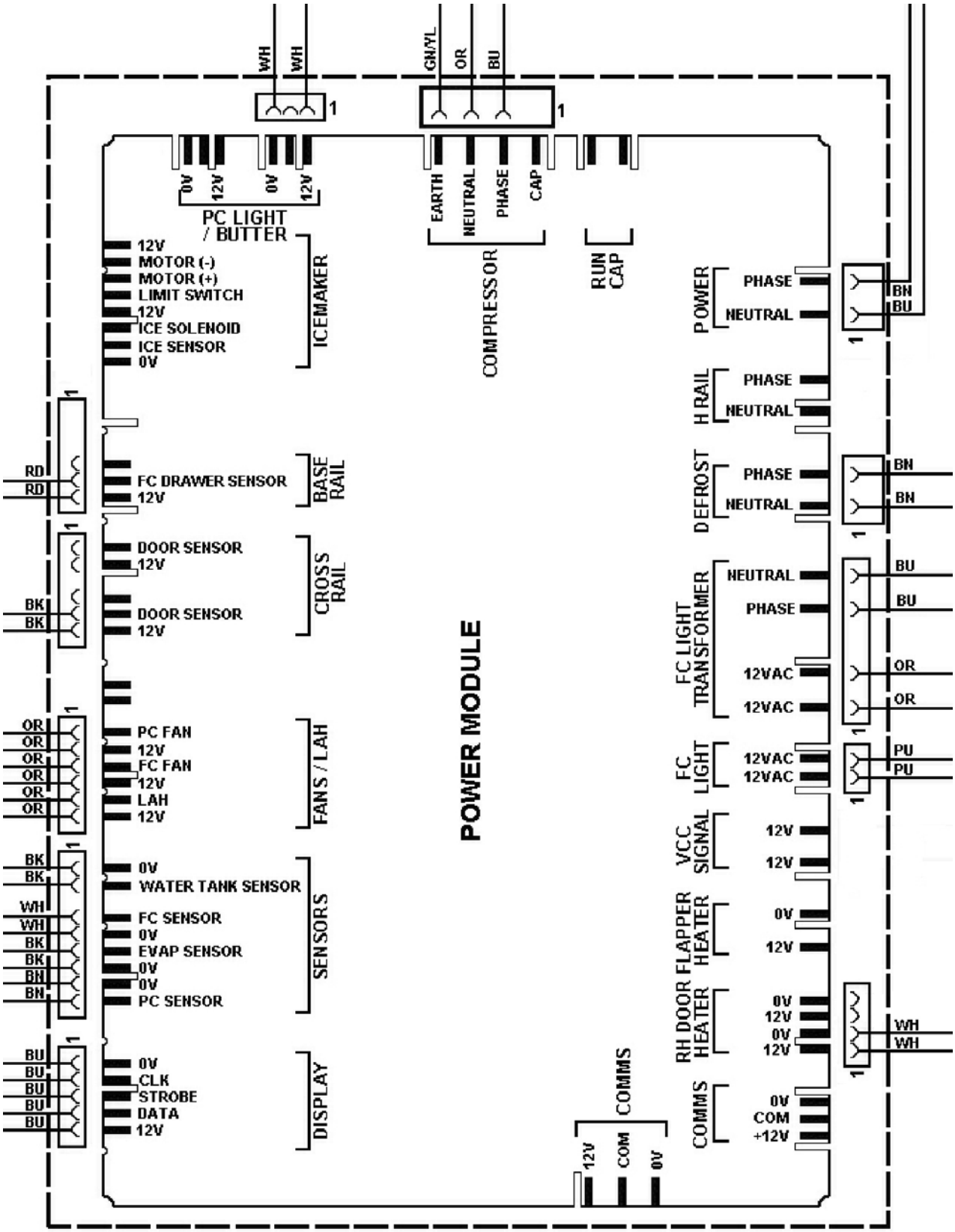
1. Low voltage - high voltage.
2. Check the compressor voltage matches the supply voltage.
3. The system may be grossly overcharged. Liquid refrigerant entering the compressor low side causes slugging of oil.
4. Check the current draw – if an overload is detected, the compressor will try to restart.
5. The high pressure side may be fully or partially blocked. Very high head pressure. This is 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.

15 WIRING DIAGRAM

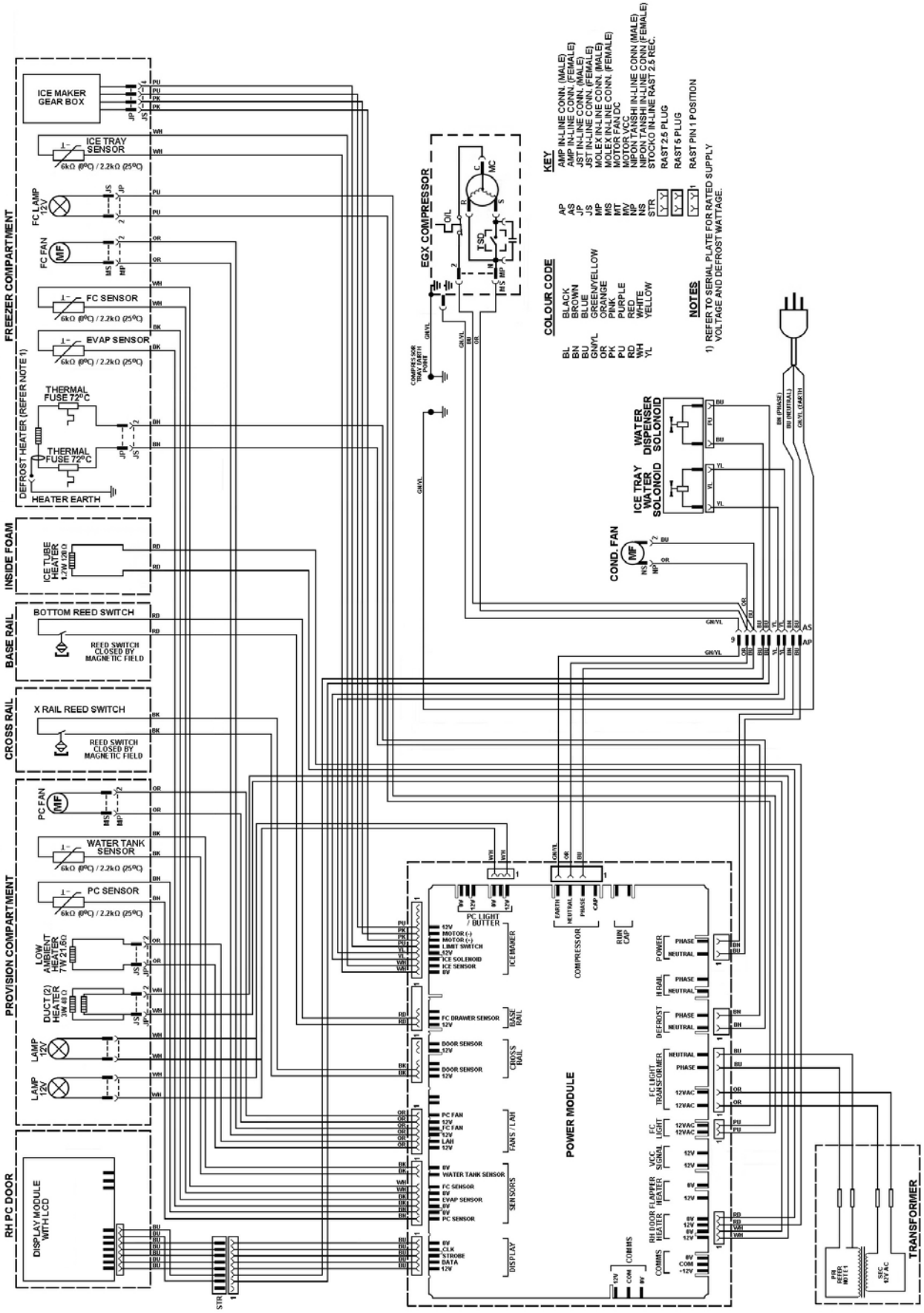
15.1 RF175 Wiring Diagram



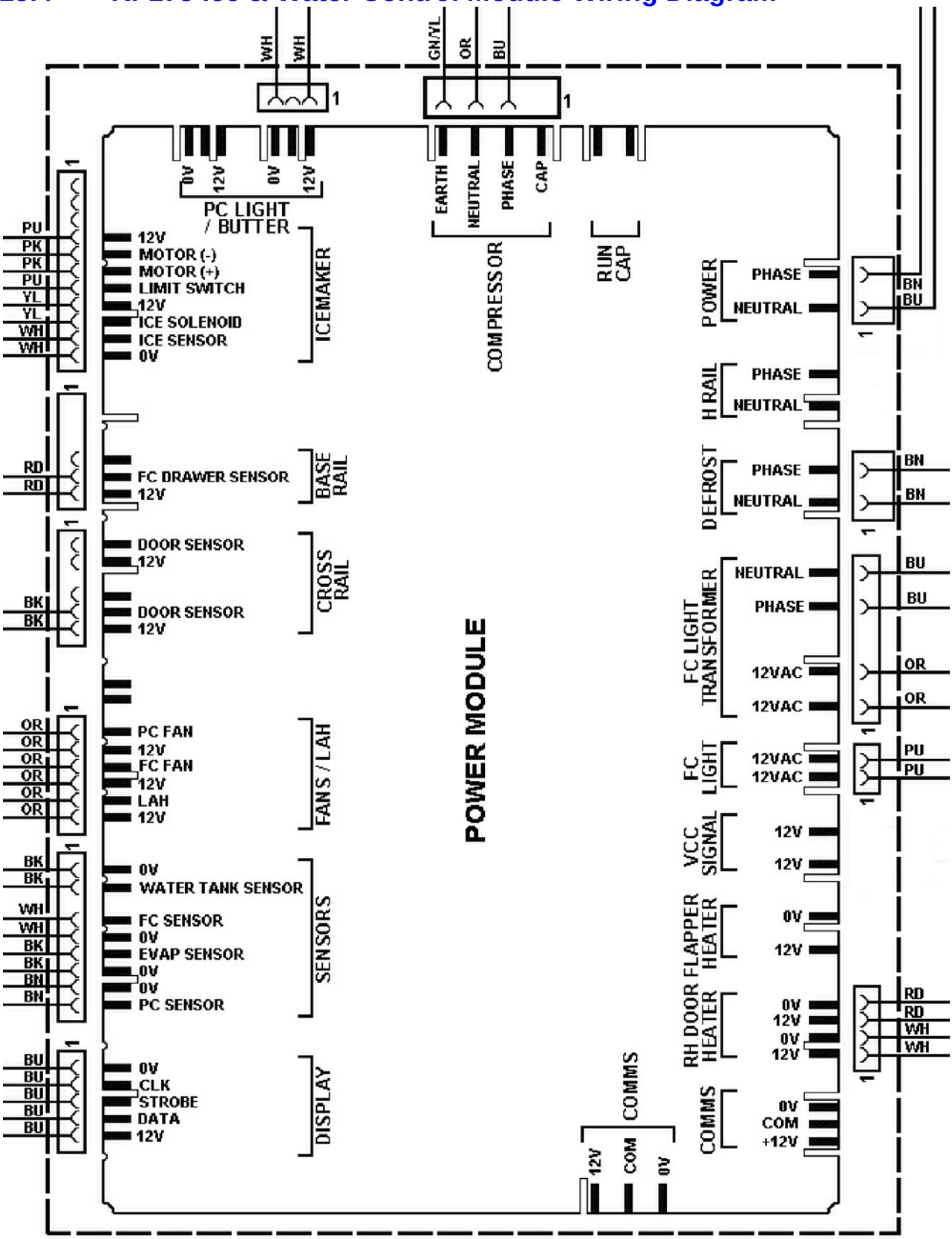
15.2 RF175 Control Module Wiring Diagram



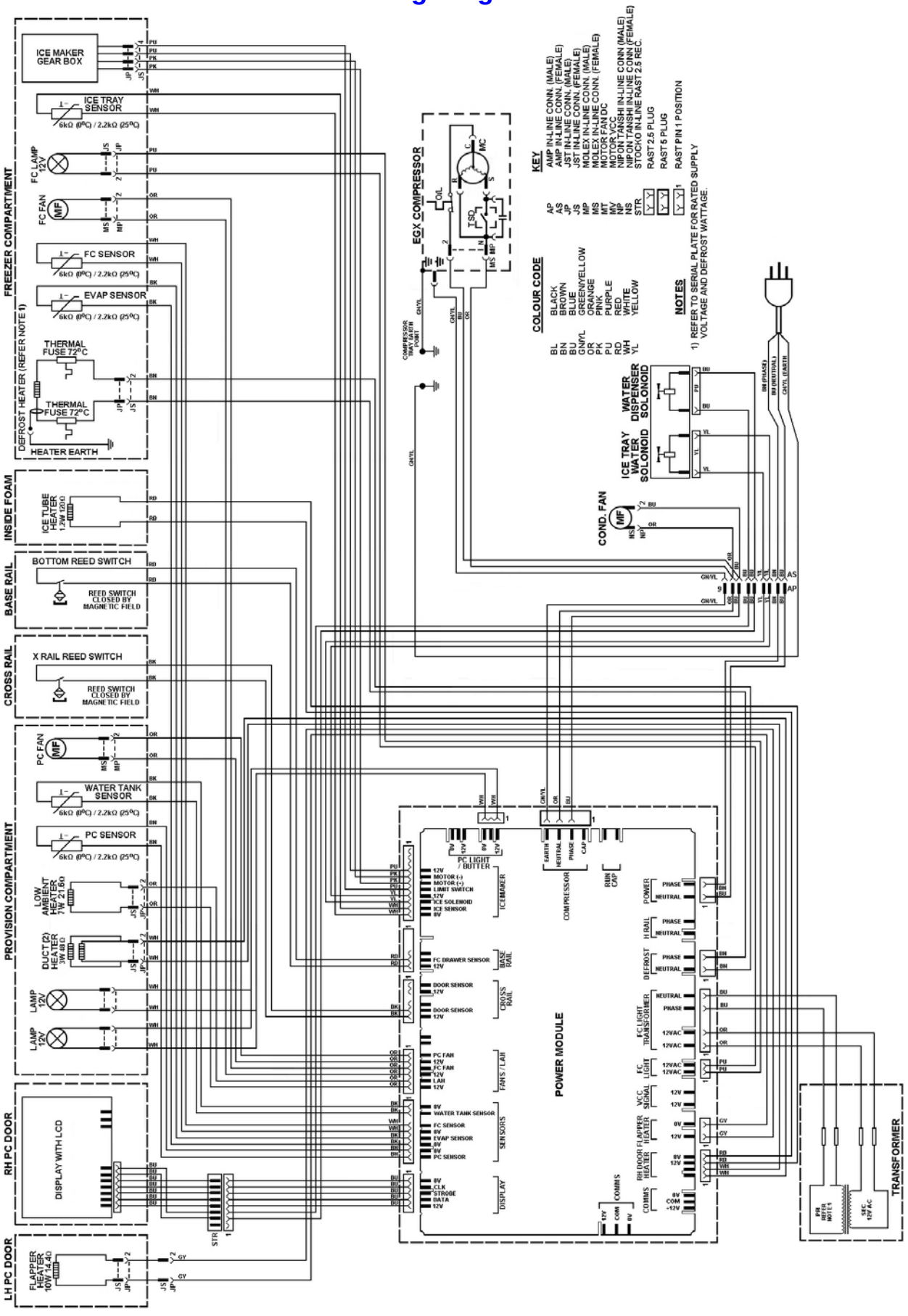
15.3 RF175 Ice & Water Wiring Diagram



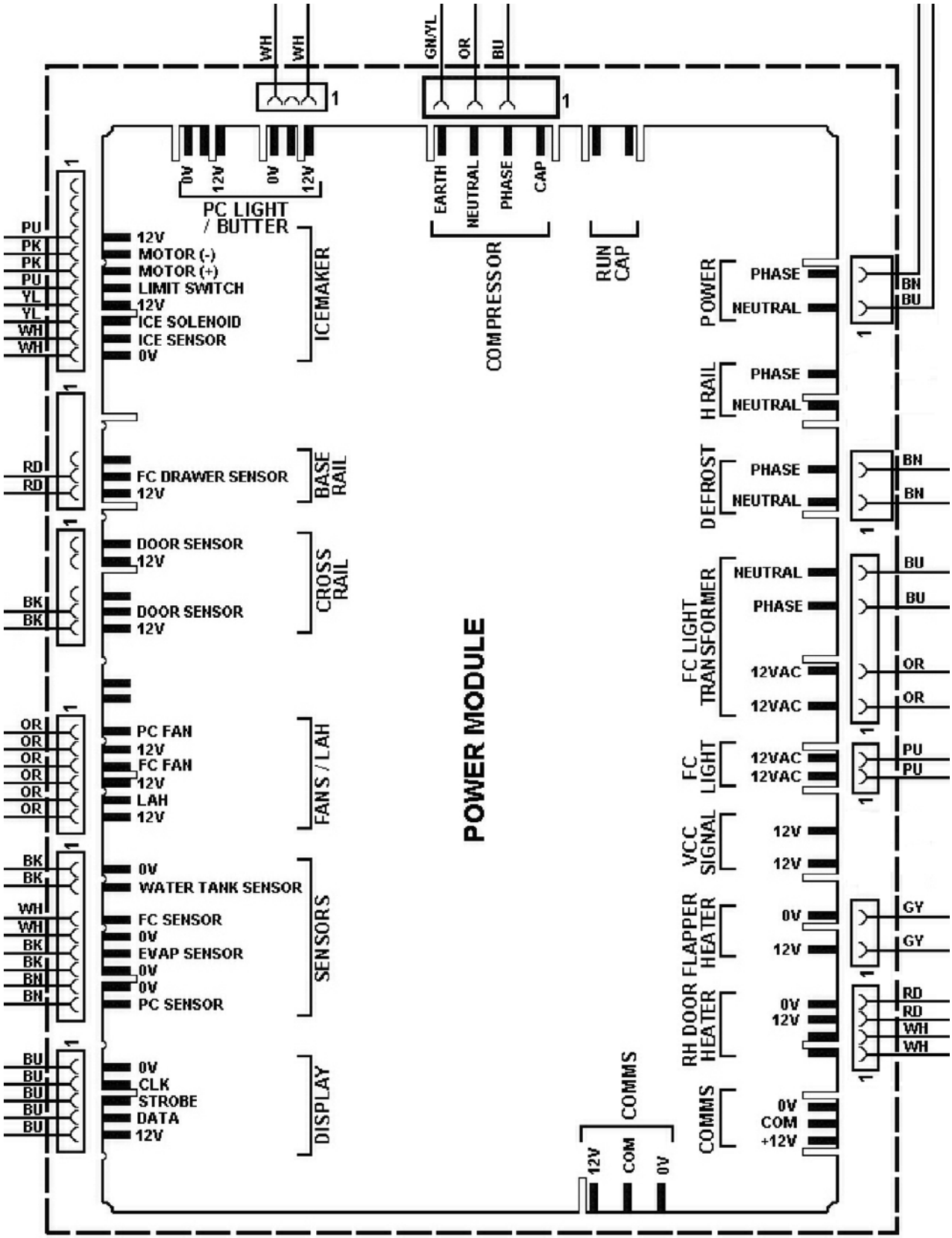
15.4 RF175 Ice & Water Control Module Wiring Diagram



15.5 RF195A Ice & Water Wiring Diagram



15.6 RF195A Ice & Water Control Module Wiring Diagram



16 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.	• 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.

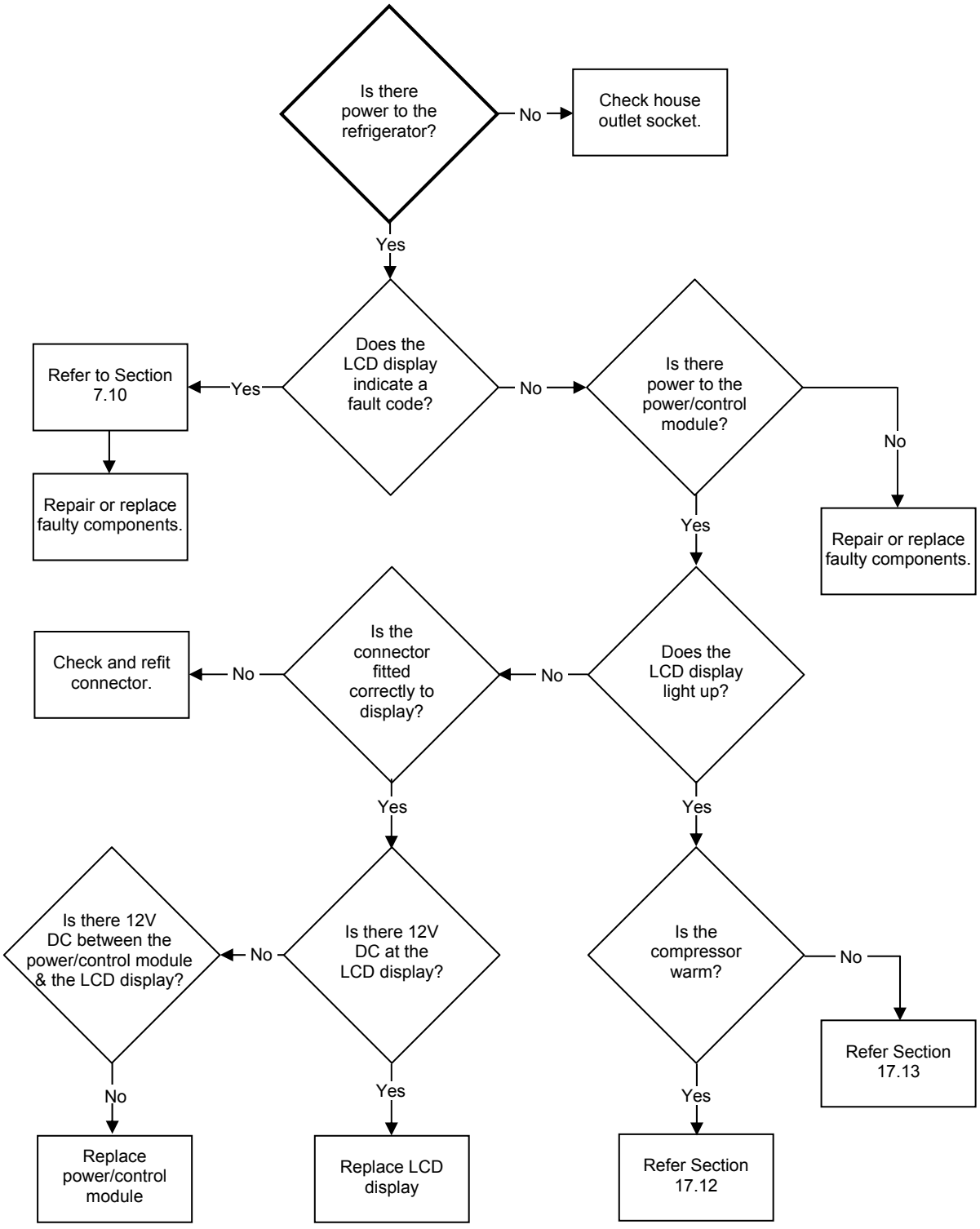
PROBLEM	POSSIBLE CAUSES	WHAT TO DO
Total Cabinet Too Warm.	No refrigeration.	• Does cabinet run? If no, check power supplies. If yes, check refrigeration system. If running, check for live frost/fully flooded evaporator. If not, check for leak. • Compressor is not running? Check power/control module 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 to 5 • Sensors above or below limit? Refer thermistor sensors Section 6.1.8.
	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 assembly 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.

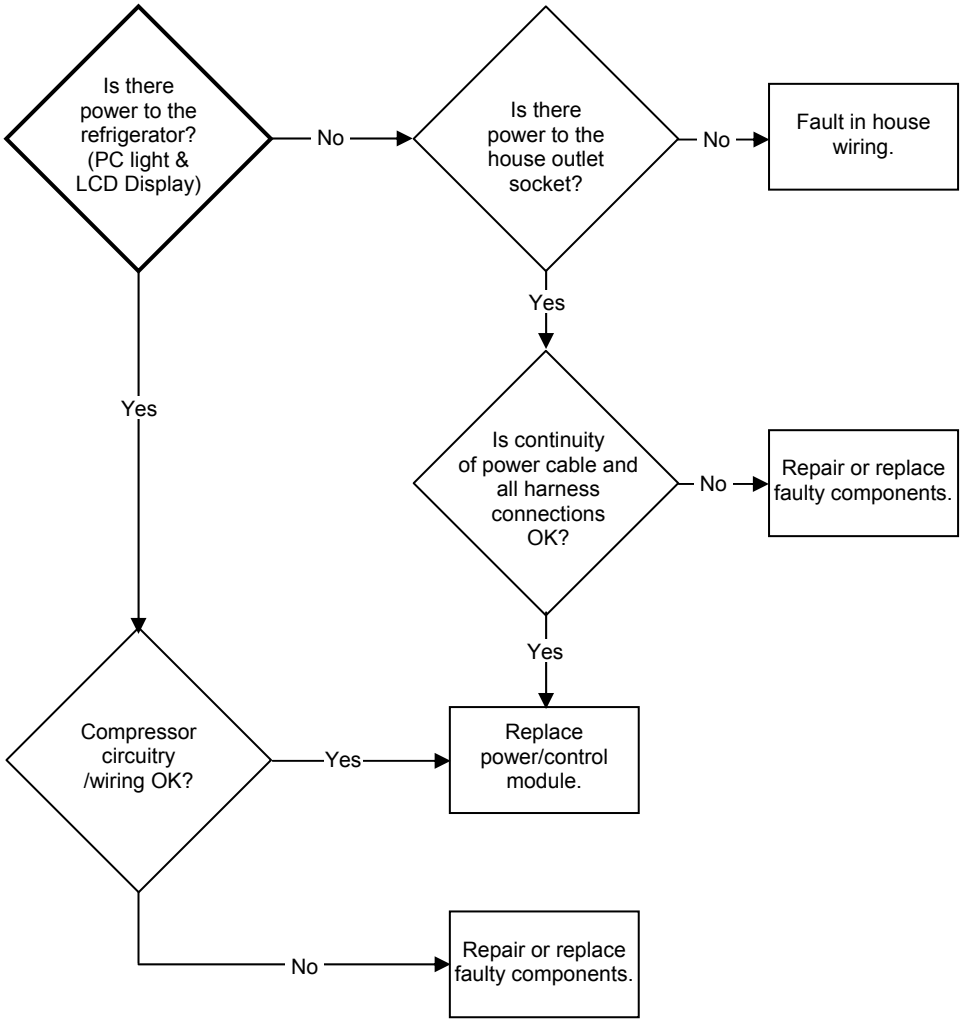
PROBLEM	POSSIBLE CAUSES	WHAT TO DO
Water Won't Stop Running.	Dispenser. Water Valve. Icemaker.	• Are there any fault codes displayed? • Is the water valve energised? • Is the water valve jammed open? • Is the water turned on?
Not Producing Any Ice.	Icemaker. Water Valve. Icemaker sensor.	• Is the ice 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 -10^{O}C (14^{O}F)? • Water pressure too low? • Water line is kinked/squashed? • Filter blocked? • Check sensor (open circuit) poor connection.
Ice Cubes Have Odour.	Unsealed packages may be transmitting odours/taste.	• Discard old cubes. • Ensure foodstuffs are 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 a 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.
Water dripping from dispenser.	Poor fitment of tubing into water tank.	• Tube not pushed far enough into O ring of John Guest fitting? • Oval/concentric tube? • Tube itself not within specification? • Rough/cut tubing around O ring.
	Large O ring in tank leaking air.	• Replacement tank will be required.

17 FAULT FINDING FLOW CHART - SERVICING

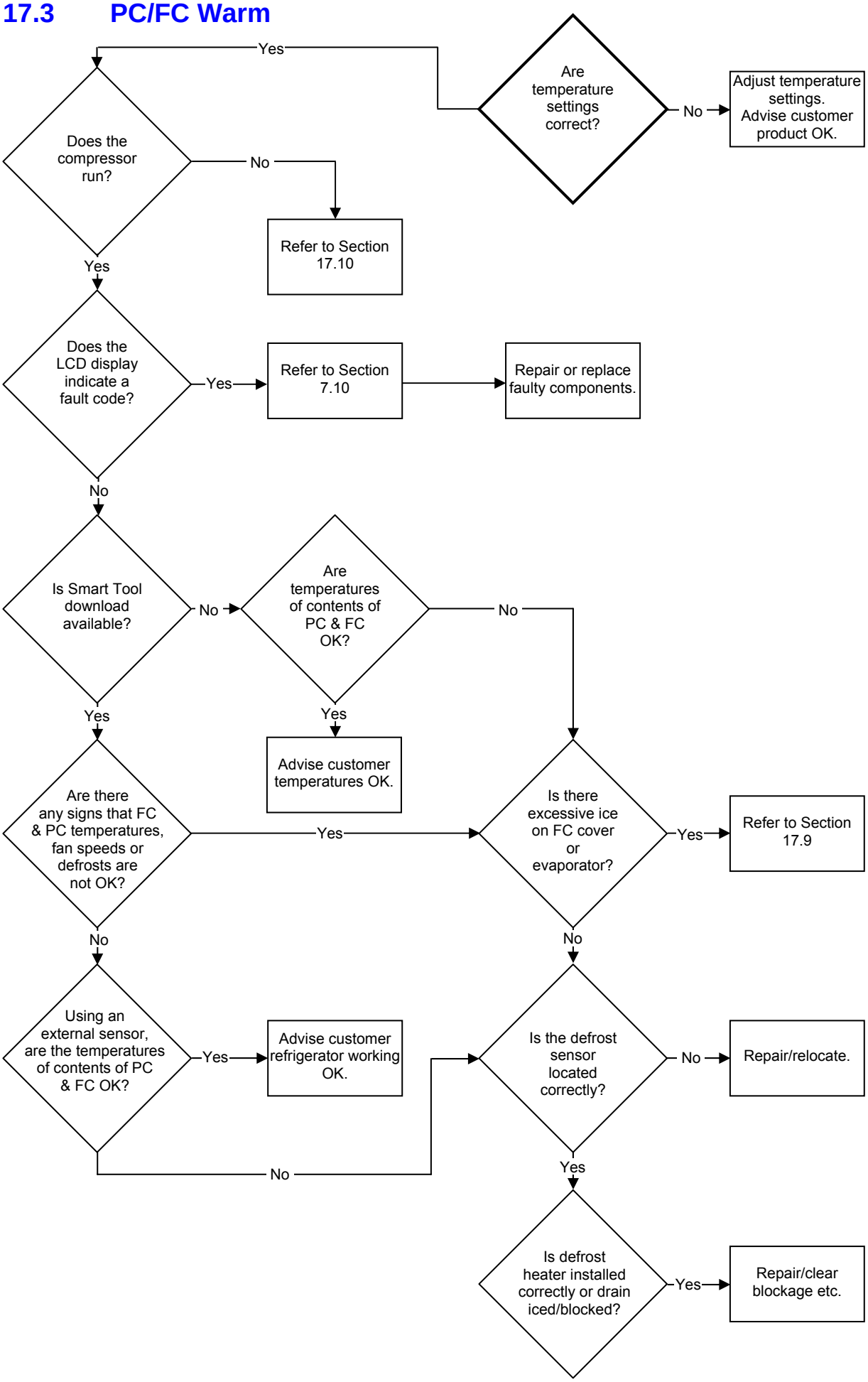
17.1 Refrigerator Not Operating



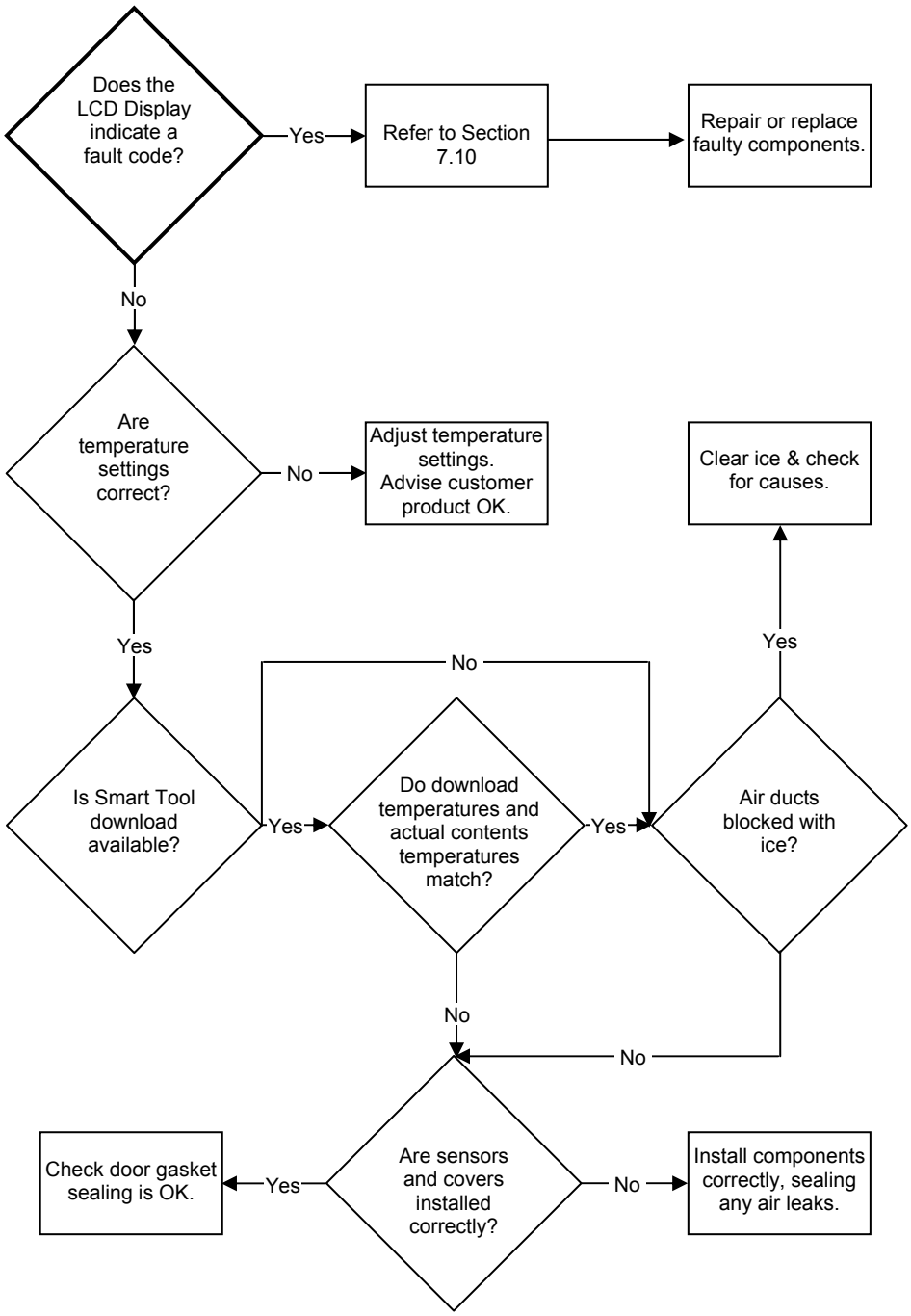
17.2 No Power to Power/Control Module and/or Display Module



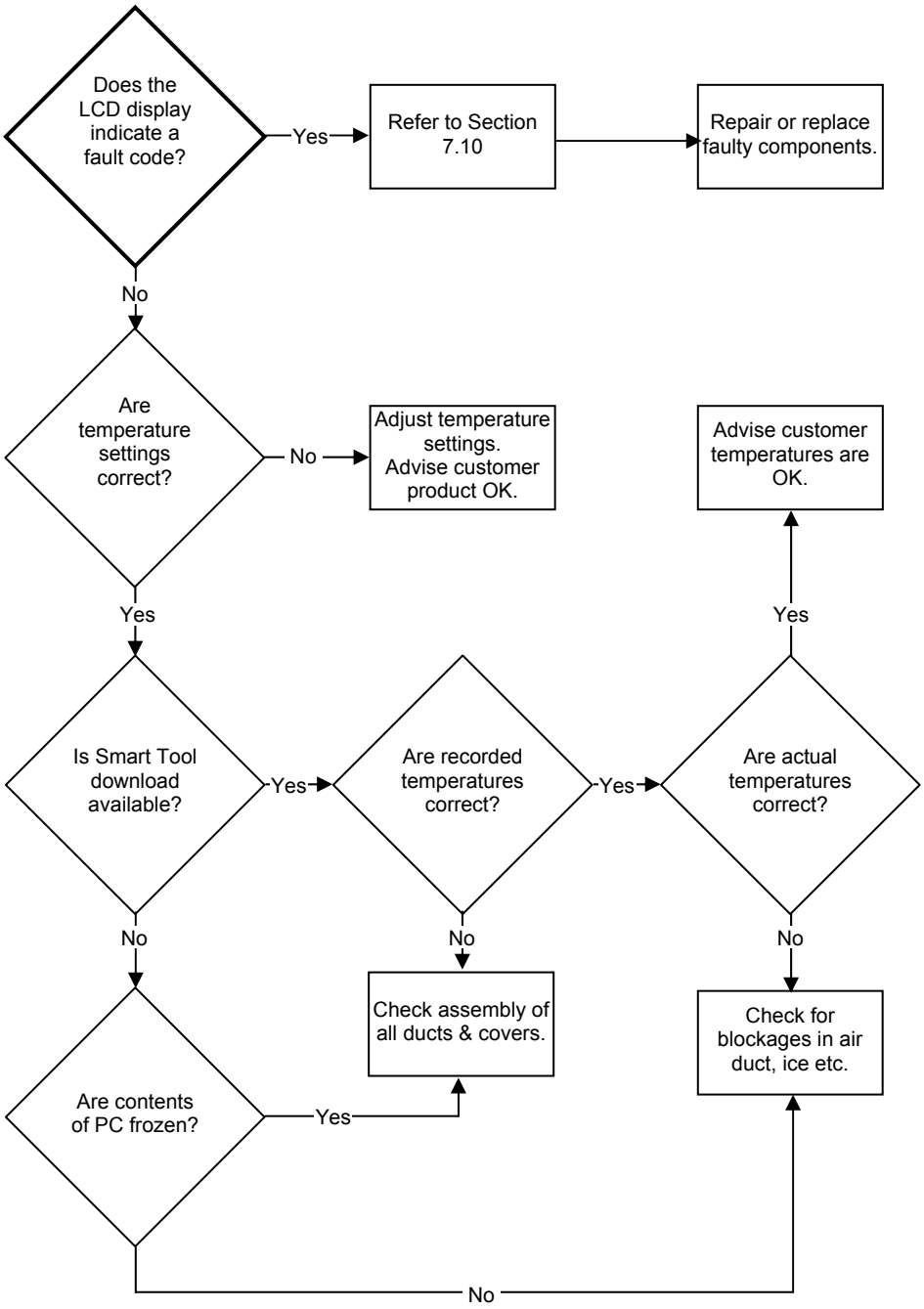
17.3 PC/FC Warm



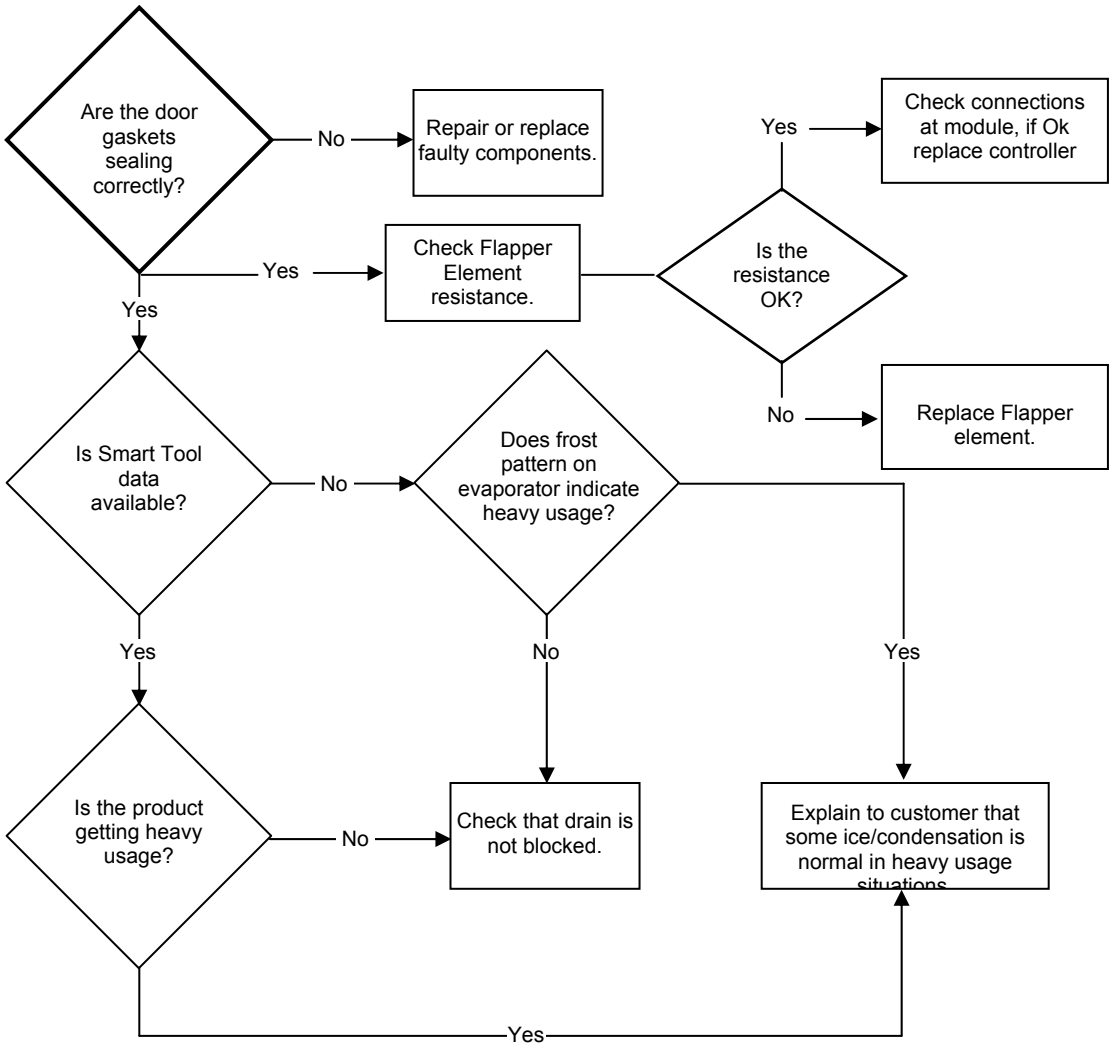
17.4 FC Too Cold – PC Too Warm



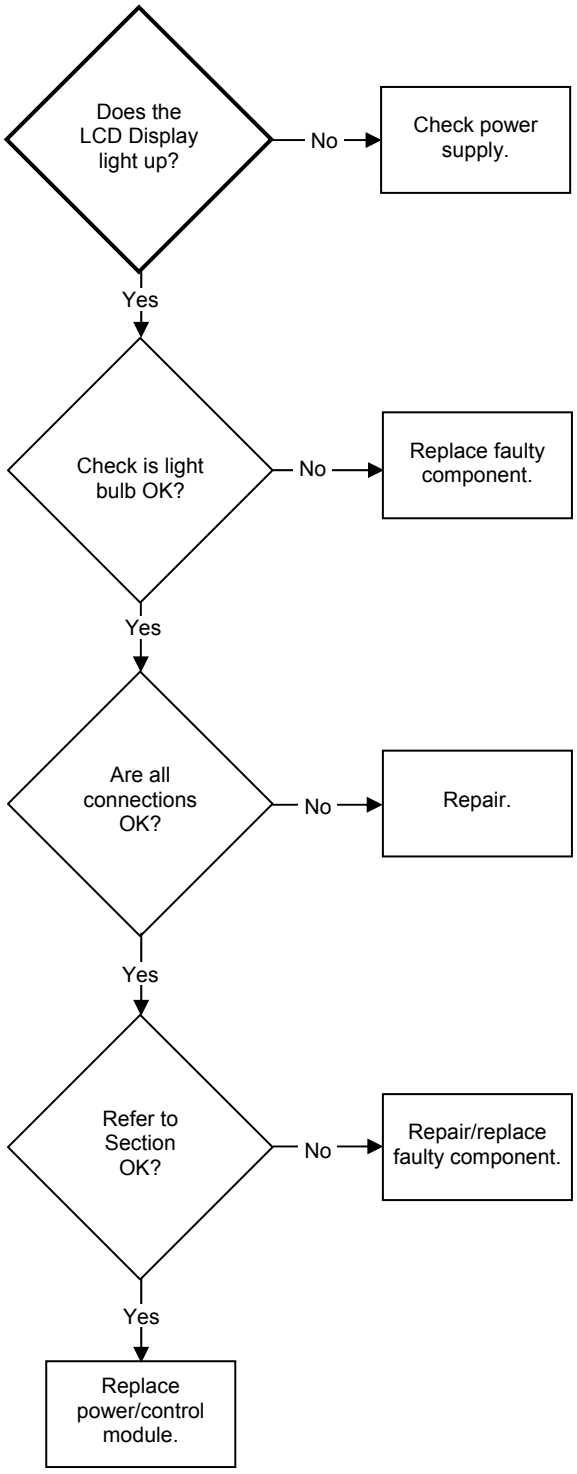
17.5 PC Too Cold



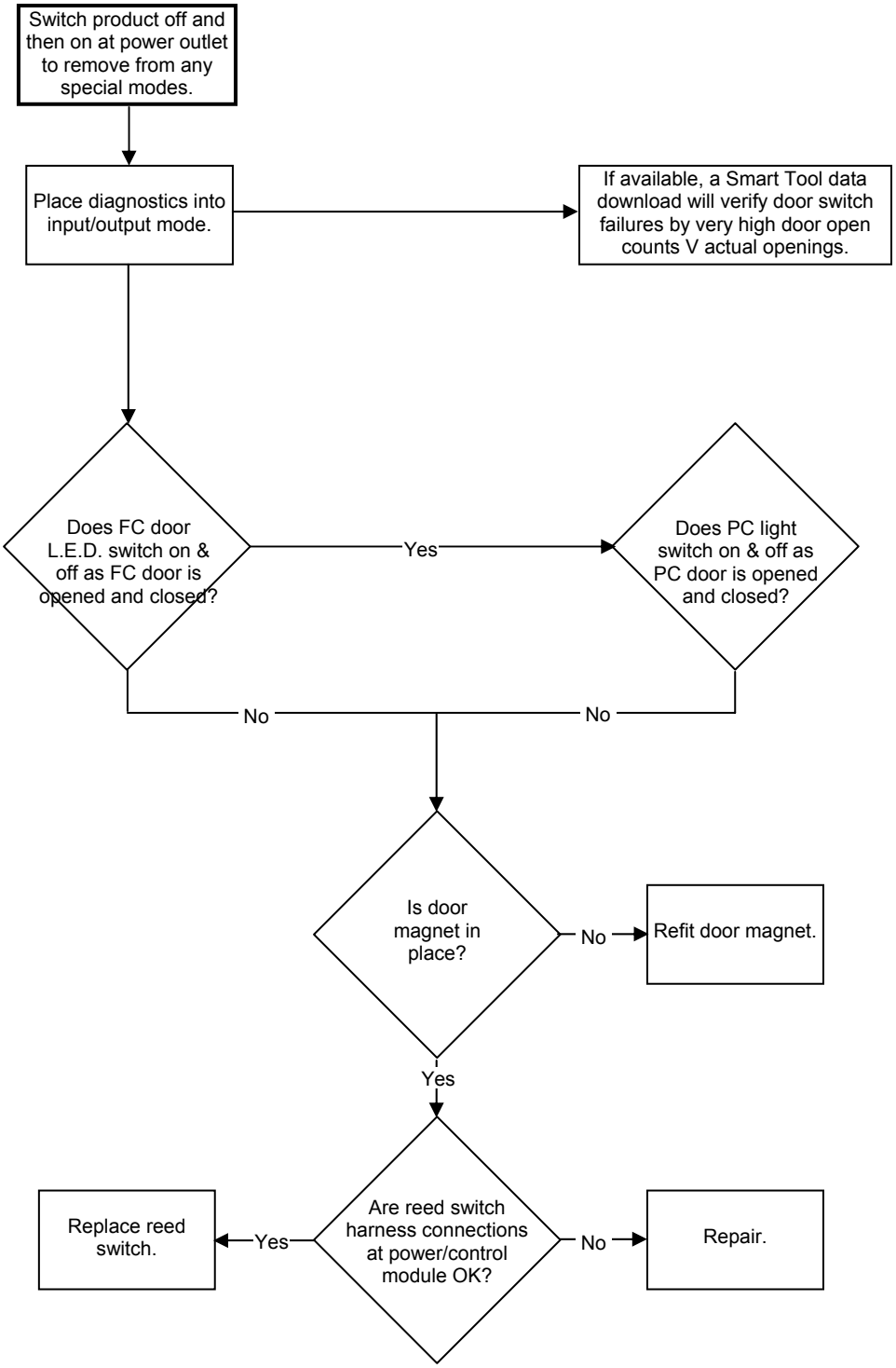
17.6 Ice/Condensation Forming



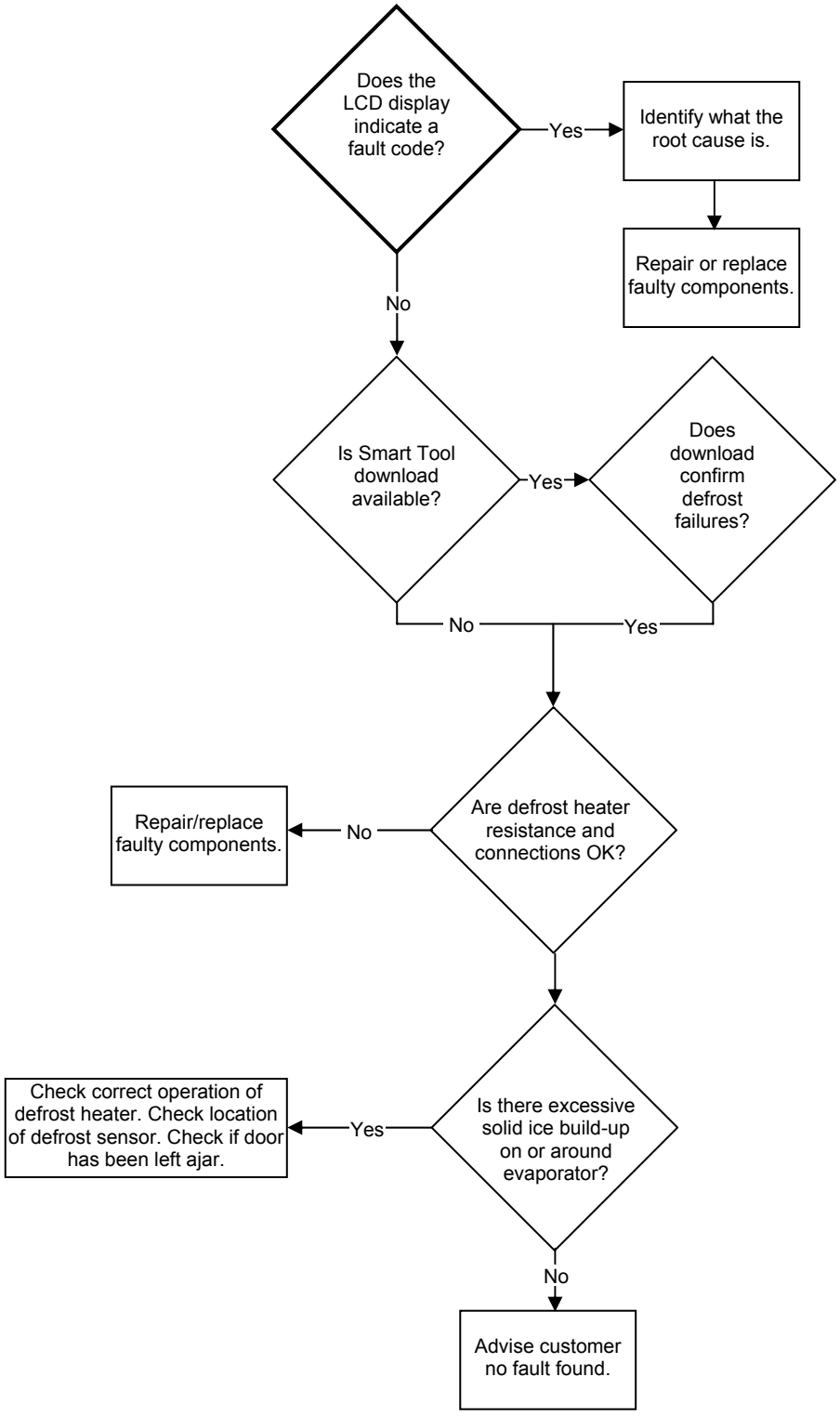
17.7 No Light


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.

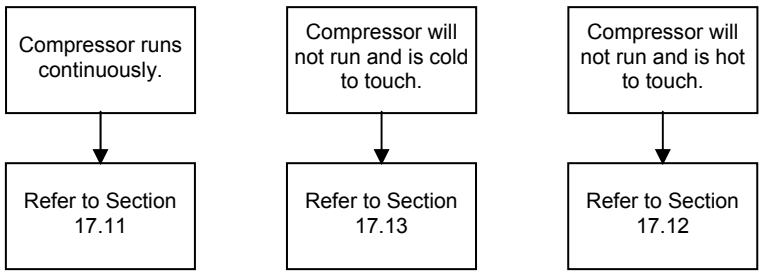
17.8 Door Switch Not Operating



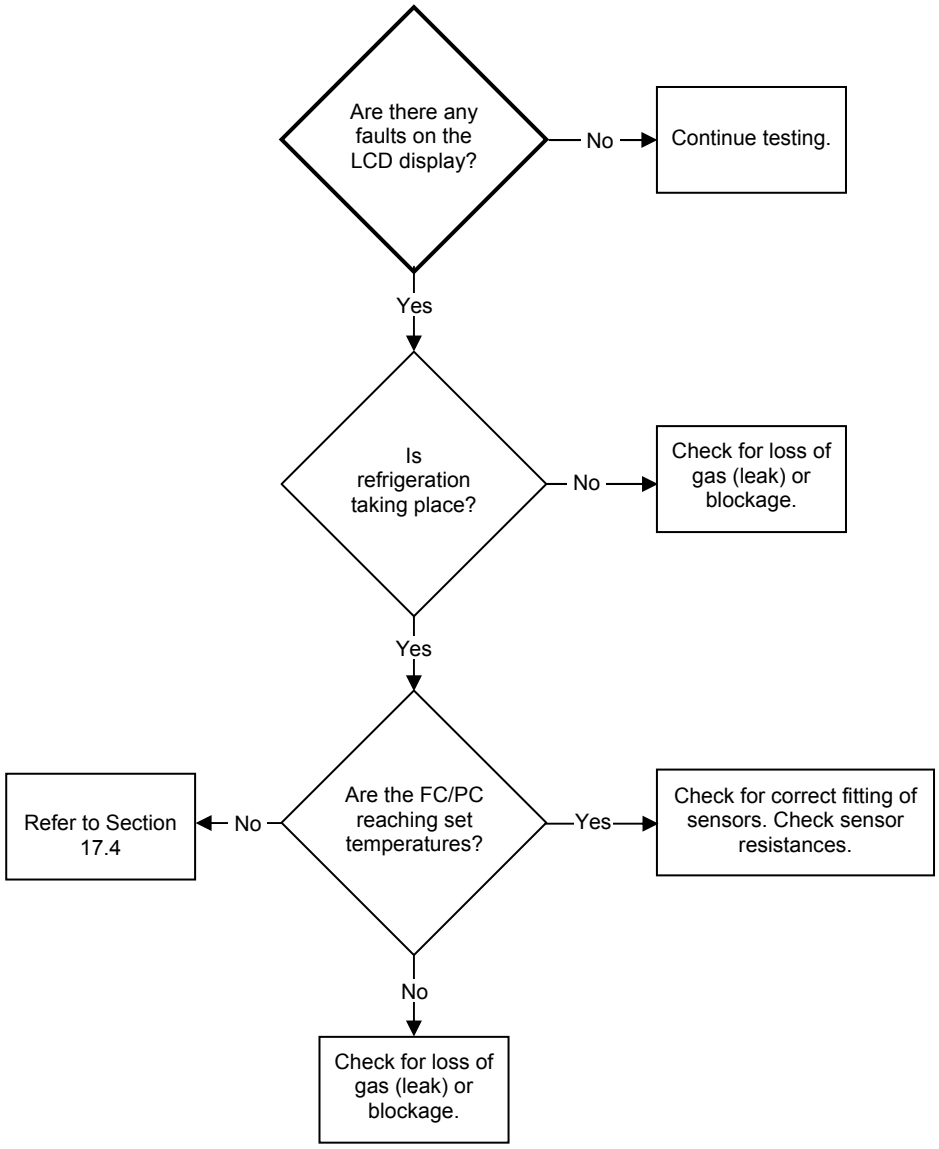
17.9 Defrost Heater Faults



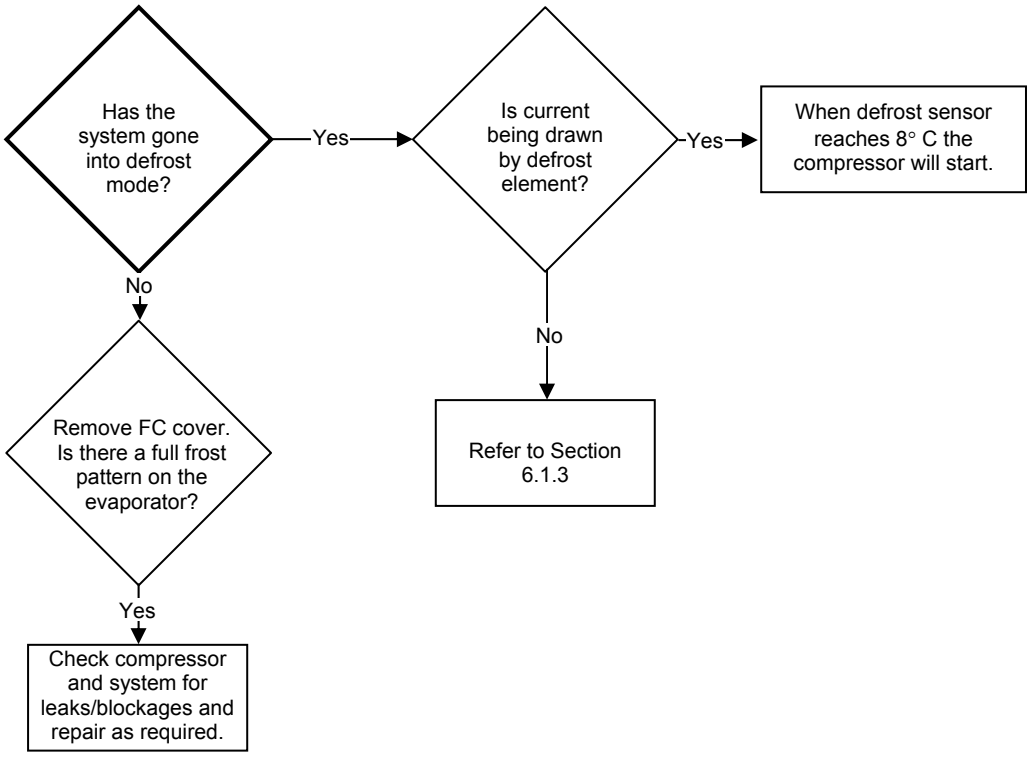
17.10 Compressor Faults



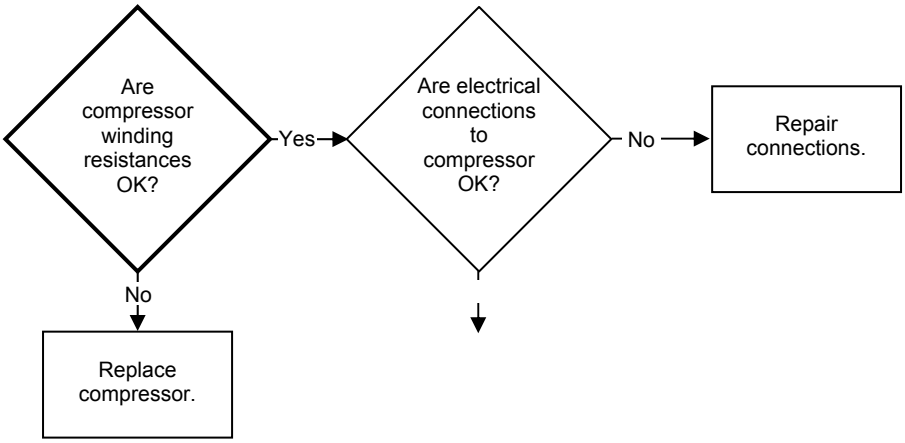
17.11 Compressor Runs Continuously



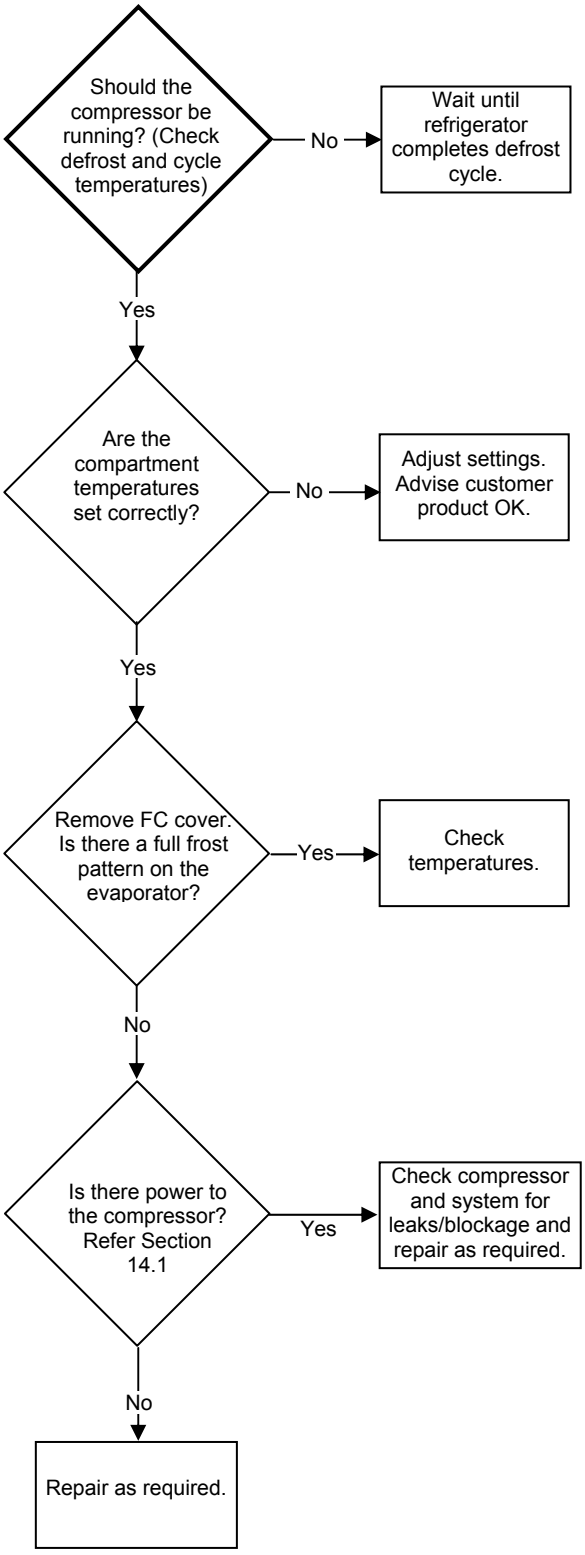
17.12 Compressor Will Not Run and is Hot to Touch



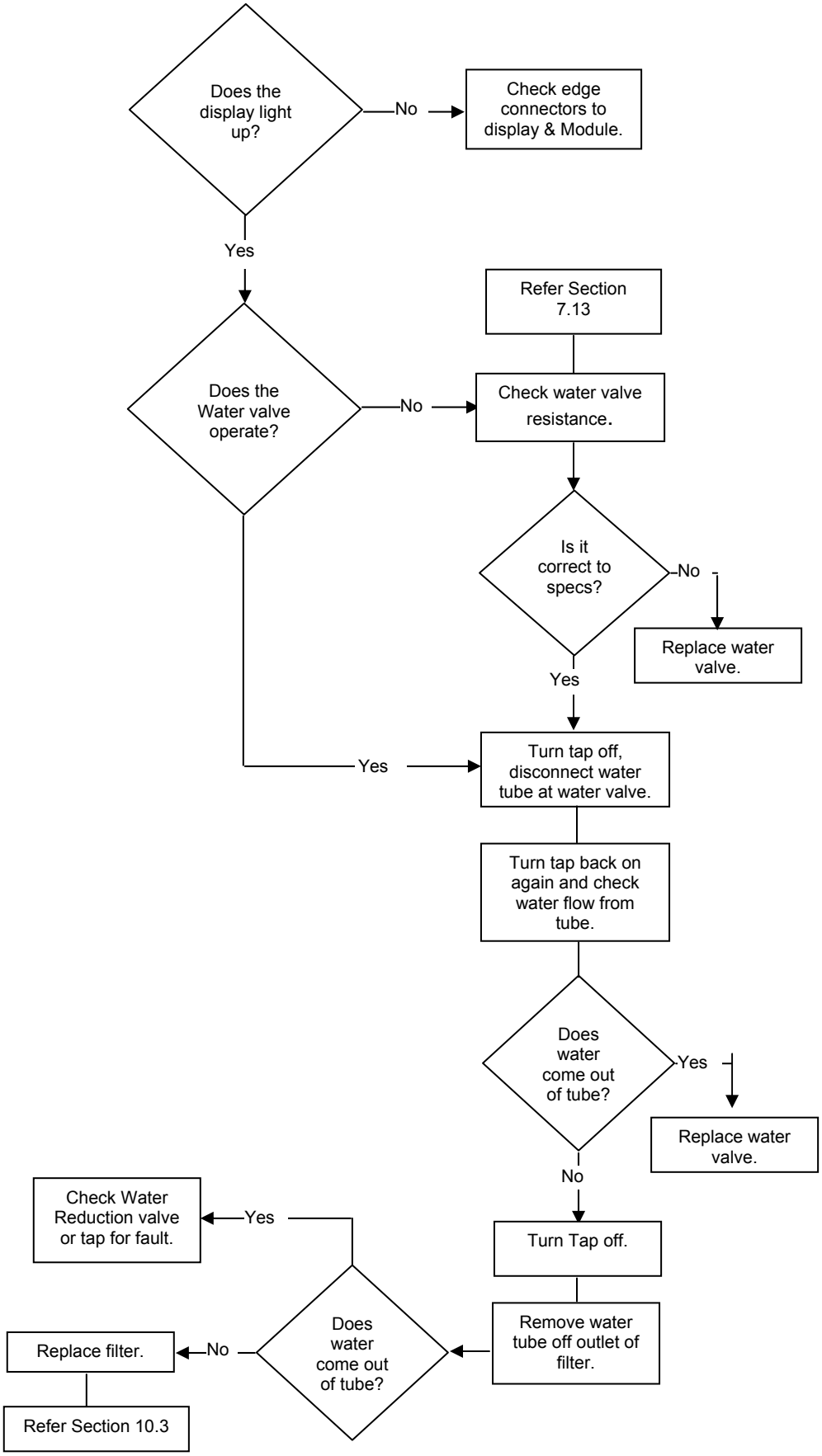
17.13 Compressor Electrical Tests



17.14 Refrigeration System Faults



17.15 Not Dispensing Water



17.16 Not Producing Ice