SERVICE MANUAL

ActiveSmart™ Refrigerator

Version 4, 5 & 6 models

RF402 - RF442 - RF610 - RF540 - RF522 - RF135 - RF170 - RF201
Recessed Handle
Black Glass , Black Stainless, Stainless, White

CONNECTED - WIFI

NZ AU GB HK/SG US

FEATURED PRODUCT

CA	MODEL	MARKET	COLOUR
26320	RF402BLGW6	NZ	WHITE
26321	RF402BLGX6	NZ	STAINLESS
26322	RF402BLPW6	AA	WHITE
26323	RF402BLPX6	AA	STAINLESS
26332	RF402BLYW6	AA	WHITE
26333	RF402BLYX6	AA	STAINLESS
26334	RF402BRGW6	NZ	WHITE
26335	RF402BRGX6	NZ	STAINLESS
26339	RF402BRPW6	AA	WHITE
26341	RF402BRPX6	AA	STAINLESS
26344	E402BRXFD5	AU	STAINLESS
26360	RF402BRYW6	AA	WHITE
26361	RF402BRYX6	AA	STAINLESS
26364	RF442BLPW6	AA	WHITE
26365	RF442BLPX6	AA	STAINLESS
26368	E442BLXFD5	AA	STAINLESS
26377	RF442BRPW6	AA	WHITE
26380	RF442BRPX6	AA	STAINLESS
26385	E442BRXFD5	AA	STAINLESS
26392	E442BRXFDU5	AU	STAINLESS
26404	RF522ADUB5	AU	BLACK
26409	RF522ADUX5	AU	STAINLESS
26411	RF522ADW5	AA	WHITE
26413	RF522ADX5	AA	STAINLESS
26427	E522BLXFD5	AA	STAINLESS
26436	RF522BRDB5	AA	BLACK
26439	RF522BRPB6	AA	BLACK
26452	E522BRXFD5	AA	STAINLESS
26459	E552BRXFDU5	AU	STAINLESS
26493	RF610ADUB5	AU	BLACK
26500	RF610ADUX5	AU	STAINLESS
26502	RF610ADW5	AA	WHITE
26504	RF610ADX5	AA	STAINLESS
26509	RF610ANUB5	AU	BLACK
26511	RF610ANUX5	AU	STAINLESS
26513	RF610AZUB5	AU	BLACK
26546	E522BLXFDU5	AU	STAINLESS
26169	RF522ADX4	HK	STAINLESS

CA	MODEL	MARKET	COLOUR
26170	RF522WDLX4	HK/SG	STAINLESS
26171	RF522WDRX4	HK/SG	STAINLESS
26172	RF522ADUSX4	HK	STAINLESS
26173	RF522WDRUX4	HK/SG	STAINLESS
26175	RF522BLPX6	HK/SG	STAINLESS
26179	RF402BLPX7	HK/SG	STAINLESS
26180	RF610ADUSX5	HK/SG	STAINLESS
26181	RF610ADX5	HK/SG	STAINLESS
26182	E522BLXFD5	HK/SG	STAINLESS
26183	E522BRXFD5	HK/SG	STAINLESS
26184	E522BRXFDU5	HK/SG	STAINLESS
26185	RF402BLXFD5	HK/SG	STAINLESS
26186	RF402BRXFD5	HK/SG	STAINLESS
26187	RF402BRXFDU5	HK/SG	STAINLESS
26188	RF522BRPX6	HK/SG	STAINLESS
26189	RF522BRPW6	HK/SG	WHITE
26190	RF610ADUSB6	HK/SG	BLACK
26191	RF402BRPX7	HK/SG	STAINLESS
26192	RF402BRPW7	HK/SG	WHITE
26193	RF442BRPW7	HK/SG	WHITE
26194	RF442BLPX7	HK/SG	STAINLESS
26195	RF442BRPX7	HK/SG	STAINLESS
26269	RF135BDLIX4	US	STAINLESS
26270	RF135BDLUX4	US	STAINLESS
26271	RF135BDLX4	US	STAINLESS
26272	RF135BDRJX4	US	STAINLESS
26273	RF135BDRUX4	US	STAINLESS
26274	RF135BDRX4	US	STAINLESS
26275	RF135BLPJX6	US	STAINLESS
26276	RF135BLPX6	US	STAINLESS
26277	RF135BRPJX6	US	STAINLESS
26278	RF135BRPX6	US	STAINLESS
26279	RF170ADJX4	US	STAINLESS
26280	RF170ADUSB5	US	BLACK
26281	RF170ADUSX4	US	STAINLESS
26282	RF170ADW5	US	WHITE
26283	RF170ADX4	US	STAINLESS
26284	RF170BLPUX6	US	STAINLESS

CA	MODEL	MARKET	COLOUR
26285	RF170BLPW6	US	WHITE
26287	RF170BLPX6	US	STAINLESS
26288	RF170BRPUX6	US	STAINLESS
26289	RF170BRPW7	TW	WHITE
26290	RF170BRPW6	US	WHITE
26291	RF170BRPX7	TW	STAINLESS
26292	RF170BRPX6	US	STAINLESS
26293	RF170WDLJX5	US	STAINLESS
26294	RF170WDLUX5	US	STAINLESS
26295	RF170WDLX5	US	STAINLESS
26296	RF170WDRJX5	US	STAINLESS
26298	RF170WDRUX5	US	STAINLESS
26299	RF170WDRX5	US	STAINLESS
26300	RF170WLKJX6	US	STAINLESS
26301	RF170WLKUX6	US	STAINLESS
26302	RF170WRKJW6	US	STAINLESS
26303	RF170WRKUX6	US	STAINLESS
26304	RF201ACJSX1	US	STAINLESS
26305	RF201ACUSX1	US	STAINLESS
26306	RF201ADJSX5	US	STAINLESS
26307	RF201ADUSB5	US	BLACK
26308	RF201ADUSX5	US	STAINLESS
26309	RF201ADW5	US	WHITE
26310	RF201ADX5	US	STAINLESS
26324	RF402BLPX7	BI	STAINLESS
26326	E402BLXFD5	AU	STAINLESS
26327	RF402BLXFD5	EU	STAINLESS
26328	RF402BLXFD5	BI	STAINLESS
26337	RF402BRPUX7	BI	STAINLESS
26338	RF402BRPUX6	NZ	STAINLESS
26342	RF402BRPX7	BI	STAINLESS
26345	RF402BRXFD5	EU	STAINLESS
26346	RF402BRXFD5	BI	STAINLESS
26352	RF402BRXFDU5	BI	STAINLESS
26353	RF402BRXFDU5	EU	STAINLESS
26357	E402BRXFDU5	NZ	STAINLESS
26359	E402BRXFDU4	TH	STAINLESS
26366	RF442BLPX7	BI	STAINLESS

CA	MODEL	MARKET	COLOUR
26369	RF442BLXFD5	EU	STAINLESS
26370	RF442BLXFD5	BI	STAINLESS
26371	E442BLXFD4	TH	STAINLESS
26376	RF442BRPUX6	NZ	STAINLESS
26379	RF442BRPW6	TH	WHITE
26381	RF442BRPX7	BI	STAINLESS
26384	RF442BRWFD5	BI	WHITE
26386	RF442BRXFD5	EU	STAINLESS
26388	RF442BRXFD5	BI	STAINLESS
26390	E442BRXFD4	TH	STAINLESS
26393	RF442BRXFDU5	EU	STAINLESS
26394	RF442BRXFDU5	BI	STAINLESS
26395	E442BRXFDU5	NZ	STAINLESS
26396	E442BRXFDU4	TH	STAINLESS
26401	RF522ADB5	EU	BLACK
26402	RF522ADB5	BI	BLACK
26405	RF522ADUB5	NZ	BLACK
26408	RF522ADUSX4	TH	STAINLESS
26410	RF522ADUX5	NZ	STAINLESS
26412	RF522ADW5	BI	WHITE
26414	RF522ADX5	EU	STAINLESS
26415	RF522ADX5	BI	STAINLESS
26418	RF522ADX4	TH	STAINLESS
26421	RF522BLPW6	AU	WHITE
26422	RF522BLPW6	TH	WHITE
26423	RF522BLPX6	AU	STAINLESS
26424	RF522BLPX7	BI	STAINLESS
26426	RF522BLPX6	TH	STAINLESS
26428	RF522BLXFD5	EU	STAINLESS
26429	RF522BLXFD5	BI	STAINLESS
26434	RF522BLXFDU5	EU	STAINLESS
26435	RF522BLXFDU5	BI	STAINLESS
26440	RF522BRPUX7	BI	STAINLESS
26442	RF522BRPW6	AU	WHITE
26444	RF522BRPW6	TH	WHITE
26445	RF522BRPX6	AU	STAINLESS
26446	RF522BRPX7	BI	STAINLESS
26448	RF522BRPX6	TH	STAINLESS

CA	MODEL	MARKET	COLOUR
26449	E522BRWFD5	AU	WHITE
26450	RF522BRWFD5	BI	WHITE
26451	E522BRWFD5	US	WHITE
26453	RF522BRXFD5	EU	STAINLESS
26454	RF522BRXFD5	BI	STAINLESS
26460	RF522BRXFDU5	EU	STAINLESS
26461	RF522BRXFDU5	BI	STAINLESS
26465	RF522WDLUX5	EU	STAINLESS
26466	RF522WDLUX5	BI	STAINLESS
26467	RF522WDLUX5	NZ	STAINLESS
26470	RF522WDLX5	NZ	STAINLESS
26471	RF522WDLX4	TH	STAINLESS
26472	RF522WDRUX5	EU	STAINLESS
26473	RF522WDRUX5	BI	STAINLESS
26476	RF522WDRUX5	NZ	STAINLESS
26477	RF522WDRUX4	TH	STAINLESS
26478	RF522WDRX5	EU	STAINLESS
26479	RF522WDRX5	BI	STAINLESS
26482	RF522WDRX5	NZ	STAINLESS
26483	RF522WDRX4	TH	STAINLESS
26484	RF540ADUB6	BI	BLACK
26485	RF540ADUSB5	EU	BLACK
26486	RF540ADUSX5	EU	STAINLESS
26488	RF540ADUX5	BI	STAINLESS
26489	RF540ANUX5	BI	STAINLESS
26490	RF540AZUB5	BI	BLACK
26492	RF610ADJX6	BI	STAINLESS
26494	RF610ADUB5	NZ	BLACK
26499	RF610ADUSX4	TH	STAINLESS
26501	RF610ADUX5	NZ	STAINLESS
26503	RF610ADW5	BI	WHITE
26505	RF610ADX5	EU	STAINLESS
26506	RF610ADX5	BI	STAINLESS
26508	RF610ADX4	TH	STAINLESS
26510	RF610ANUB5	NZ	BLACK
26512	RF610ANUX5	NZ	STAINLESS
26514	RF610AZUB5	NZ	BLACK

CONTENTS

1 HEALTH & SAFETY

IMPORTANT !
PLEASE RETAIN THIS MANUAL FOR FUTURE REFERENCE.

Note: When servicing the appliance, Health and Safety issues must be considered at all times. Specific safety issues are listed below with their appropriate icon. These are illustrated throughout the service information to remind service people of the Health and Safety issues.

1.1 Electrical Safety

Ensure the mains power has been disconnected before servicing the refrigerator. If the mains supply is required to be on to service the refrigerator, make sure it is turned off when removing any electrical component or connection to avoid electric shock.

1.2 Electrostatic Discharge

An anti-static strap is to be used as electrical static discharge (ESD) protection when replacing or handling electronic components.

1.3 Insulation Test

Use an Insulation tester to check insulation.
Warning: Short together the phase and neutral pins on the plug so as not to damage any electronic circuitry.

1.4 Sheet Metal Edges

When working around cut sheet metal edges use appropriate gloves or protection to eliminate the chance of receiving a laceration.

1.5 Flammable Refrigerant

This product contains flammable refrigerant Isobutane (R600a). Ensure safe work practices are followed when brazing. System components are specifically designed for R600a systems, do not use components that have not been designed for R600a systems.

1.6 Disposal

Extreme care must be taken when disposing of this appliance to avoid hazards
The flammable refrigerant must be removed and disposed safely prior to disposal of the appliance.
Thermal insulation used in this appliance is produced using flammable insulation blowing gases; any exposed foam may be highly flammable and must be treated during disposal.

2 PRODUCT SPECIFICATIONS

2.1 Electrical & Plumbing Specifications

	230V MODELS	120V MODELS
ELECTRICAL SPECIFICATIONS		
Supply	230 VAC, 50 Hz	120 VAC, 60 Hz
Service	10 amp circuit	10 amp circuit
PLUMBING SPECIFICATIONS (WHERE APPLICABLE)		
Supply	¼" John Guest tubing	¼" John Guest tubing
Pressure	Minimum 22 psi (150 kPa) Maximum 120 psi (827 kPa) @ 20°C	Minimum 22 psi (150 kPa) Maximum 120 psi (827 kPa) @ 20°C

2.2 Product Dimensions

This manual covers a range of products, please refer to the installation instructions for the product dimensions.

3 MODEL / SERIAL NUMBER LOCATION & IDENTIFICATION

3.1 Data label and location

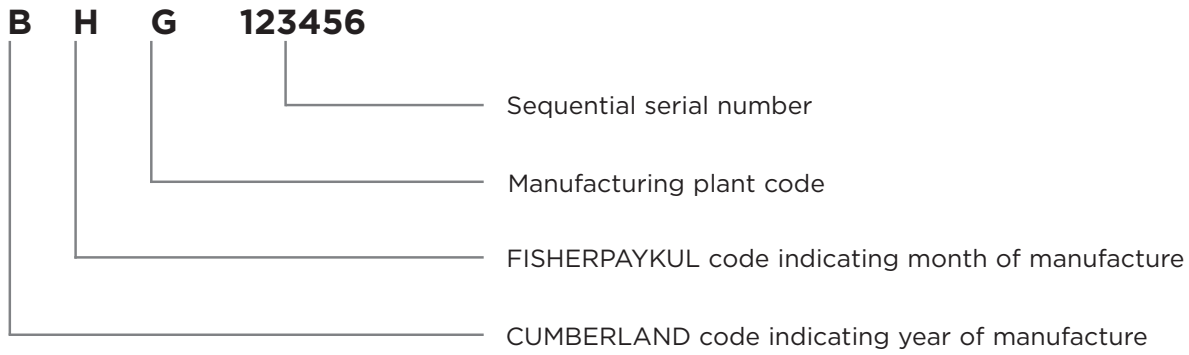
The product data label is located at the front right-hand side of the cabinet edge, open the lower door/drawer to locate. The data label contains information specific to that model, like product code number, model number and serial number.

The product code is a dedicated number used to identify the model variants, e.g colour, markets, features.
E.g. 23691-A is an E522B left hinged white model built for the Australasian market.

The letter shown after the product code is used to signify the service version of that product. The service version is used to highlight changes that may not be backwards compatible between models. When ordering parts it is very important that the correct product code and service version is used, as each model variant has a dedicated parts manual.

E.g 23691-A may use different parts to 23691-B.

The serial number consists of three letters and six digits and contains the information shown in the following example:



Cumberland code

Letter	C	U	M	B	E	R	L	A	N	D
Year	1	2	3	4	5	6	7	8	9	0

Letter	F	I	S	H	E	R	P	A	Y	K	U	L
Month	1	2	3	4	5	6	7	8	9	10	11	12

Manufacturing Plant Codes
Between January 1st 2011 and December 2020

Code	Factory
B	New Zealand
S	USA
G	Thailand
P	Mexico

In the example above, the appliance was manufactured in the fourth month (April) of 2014 in the Thailand factory

The model number on the data label shows the following information relating to that product:

E.g. RF610ADUX5

RF = Refrigerator Freestanding

610 = Capacity (610L)

A = French door

D = FC Drawer

U = Ice & Water

X = Stainless Steel

5 = Series 5

4 COMPONENT SPECIFICATIONS

The following specifications apply to all markets, however some items are market specific, for example, the compressor.
Where possible the wiring colours and test point are included in the specs tables below. The wiring diagrams can also be used to help identify the location of plugs on the control module refer section "14 WIRING DIAGRAM"

4.1 Fans

There are two fans in the food storage areas of the refrigerator, one in the freezer compartment (FC), and one in the provision compartment (PC). A third fan, condenser fan, is used on some models where an external condenser unit is fitted. This is mounted on the rear of the product at the end of the condenser. All fans are 12V DC. Fan speed is controlled via rapid pulsed DC voltage which makes testing the output from the controller difficult with a multimeter as the pulses are so fast that a multimeter is not able to read a voltage.
Testing the resistance of any of the fans is also not possible.
The fans will run during the on cycle when the compressor is running and, in the case of the PC and FC fans, when the door is shut. A magnet over the door reed Hall sensor will aid in servicing to see if the fans are operating.
By connecting a 9 volt battery to the positive and negative connections on the fan it can be run individually and isolated from the refrigerator circuit for testing, however polarity must be correct.

COMPONENT	WIRING COLOURS	TEST POINT	SPECIFICATIONS	
PC FAN	RD & BU	N/A	12 V	2.6W
FC FAN	BR & WH	N/A	12 V	2.9W
CONDENSER FAN	YL, BK & GY	N/A	12 V	4.3W

4.2 Water Valves

Located at the rear of the product. These can be tested from either the controller or from the water valves.

COMPONENT	WIRING COLOURS	TEST POINT	SPECIFICATIONS		
DISPENSER VALVE	WH & WH	At the valve	12V DC	9Ω	16W
ICE MAKER VALVE	RD & RD	At the valve	12V DC	9Ω	16W

4.3 Ambient/Humidity Sensor

Located under the hinge cover of the refrigerator, the ambient/humidity sensor can be tested in diagnostic mode, level 5. Refer section"10.3 Diagnostic Mode" It cannot be tested with a multimeter.

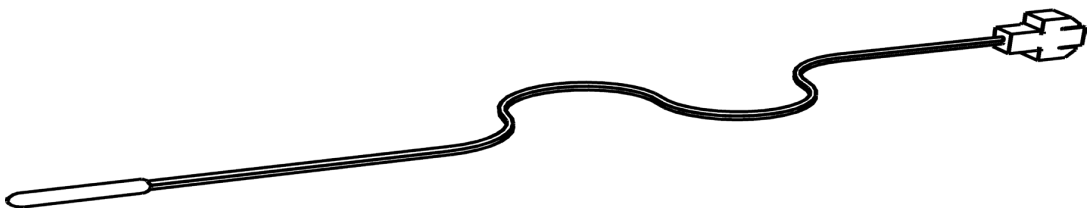
4.4 Display module

Located on the right internal side of refrigerator section. Supply voltage to the display can be tested.

COMPONENT	WIRING COLOURS	TEST POINT	SPECIFICATIONS
DISPLAY	RD & BU	Controller or display	12V DC

4.5 Temperature Sensors

There are a number of sensors within the refrigerator to monitor temperatures of various areas, These thermistor sensors all have the same electrical resistances in relation to temperature.
The resistance changes as the temperature changes as shown in the table below, these sensors can be tested from the control module on the rear of the refrigerator. The temperature can also be read using Diagnostic Mode as described in Section "10.3 Diagnostic Mode"



COMPONENT	WIRING COLOURS	TEST POINT
PC SENSOR	BR & BR	Sensors plug at controller
AMBIENT (PC2) SENSOR	BK & BK	Sensors plug at controller
DEFROST SENSOR	BK & BK	Sensors plug at controller
FC SENSOR	WH & WH	Sensors plug at controller
ICE TRAY SENSOR	WH & WH	Icemaker plug at controller

Thermistor Sensor Resistance Table	
TEMPERATURE	**RESISTANCE (K Ohms ±5%)**
-30.0°C (-22°F)	25.17
-25.0°C (-25°F)	19.43
-20.0°C (-4°F)	15.13
-15.0°C (5°F)	11.88
-10.0°C (14°F)	9.392
-5.0°C (23°F)	7.481
0.0°C (32°F)	6.000
5.0°C (41°F)	4.844
10.0°C (50°F)	3.935
15.0°C (59°F)	3.217
20.0°C (68°F)	2.644
25.0°C (77°F)	2.186
30.0°C (86°F)	1.817
35.0°C (95°F)	1.518
40.0°C (104°F)	1.274
45.0°C (113°F)	1.075
50.0°C (122°F)	0.9106

4.6 Door Switches

Normally open Hall sensor are used to detect door openings. The FC Hall sensor is located at the base of the cabinet, and the PC switch(es) are located behind the cross rail cover. They can be tested from the PCB in the rear of the product.

COMPONENT	WIRING COLOURS	TEST POINT	SPECIFICATIONS
PC 1 & PC 2 DOOR SWITCH	BK & BK	Cross rail plug at controller	Normally Open Contact
FC DOOR SWITCH	RD & RD	Base rail plug at controller	Normally Open Contact

4.7 Defrost Heater

There are 2 types of defrost heater used. These are market specific and are determined by the mains supply voltage. The defrost heater is clipped to the base of the evaporator in the FC. It contains 2 in-line thermal fuses rated at 72°C, 1 on each conductor.

COMPONENT	WIRING COLOURS	TEST POINT	SPECIFICATIONS		
230V ELEMENT	BR & BR	Defrost plug at plug or element	230V AC	220Ω	240W
120V ELEMENT	BR & BR	Defrost plug at plug or element	120V AC	40.5Ω	355W

4.8 Auxiliary Heaters

Depending on the model the following heaters are located within the refrigerator. These can all be tested from the controller in the rear of the product.

COMPONENT	WIRING COLOURS	TEST POINT	SPECIFICATIONS		
FLAPPER ELEMENT	GY & GY	Flapper heater plug at controller or at flapper heater	12V DC	18Ω	8W
ICE TUBE HEATER	RD & RD	LAH & ice tube heater plug at controller	12V DC	120Ω	1.2W
LOW AMBIENT HEATER	OR & OR	LAH & ice tube heater plug at controller	12V DC	21.6Ω	7W

4.9 LED PCBs

The LED PCB's are loacted in the PC and some models also contain an LED in the FC. It is not possible to test the LED boards for resistance or voltage.

COMPONENT	WIRING COLOURS	TEST POINT	SPECIFICATIONS
PC LED	BK & YL	N/A	12V DC
FC LED	BK & VT	N/A	12V DC

4.10 Compressor

Two types of compressors are used on these products, fixed speed or variable capacity compressors (VCC).
The windings of the compressor can be tested from the fusite on the compressor.
To test the compressor measure the resistance between each pin, then test each pin to earth. There should be no resistance to earth. If the compressor is a VCC type it will be controlled via an inverter. It is not possible to test for any voltage from the inverter to the compressor. If any faults develop with the controller or inverter a fault code should show on the inverter, refer section "10.2 Inverter Fault Alarms" fault codes and their meanings.

COMPONENT	WIRING COLOURS	TEST POINT	SPECIFICATIONS		
230V VCC COMP VEMC9C					
Power supply	WH & BK	H-Rail (VCC supply) at controller or inverter	230 V		
Windings		Compressor	8.44Ω Per winding	Input 123W	Output 222W
230V RECIP COMP EGX80					
Power supply	VT & PK	Compressor	230V		
Windings		Compressor	Start Winding		
		Compressor	Run Winding	Input 154W	Output 347W
120V VCC COMP EEI57C13DGH					
Power supply		H-Rail (VCC supply) at controller or inverter	120 V		
Windings		Compressor	8.44Ω Per winding	Input 150W	Output 245W

4.11 Refrigerant

Refrigerant charge and type varies depending on the model. The type and quantity is indicated on the serial label of the product.

5 OPERATION

5.1 Adjusting compartment temperatures

Press the button to change between the PC and FC temperature settings.

To increase the temperature press the + button, this will increase the number of lights.

To decrease the temperature press the - button, this will decrease the number of lights.

Fewer lights illuminated indicates a colder temperature for the compartment selected.

5.2 Alarm mute

To activate, press the button once. The 'Alarm Mute' light will be illuminated when the function is activated.
'Alarm Mute' will deactivate after 20 minutes and the door alarms will return to normal.
To deactivate 'Alarm Mute' manually, press the button again. When 'Alarm Mute' is deactivated the light is off.

5.3 Key mute

To activate, press the button for 4 seconds. The light will be illuminated when this function is activated. In this mode all key presses will be silenced, door alarms and bottle chill alarm will still function.
To deactivate press the button for 4 seconds.

5.4 Key lock

To activate, press the - and + button for 4 seconds. The light will be illuminated when this function is activated. In this mode all key presses will be disabled.
To deactivate press the - and + button for 4 seconds.

5.5 Bottle chill

To activate, press the button on the internal display, after 15 minutes an alarm will sound to remind the user to remove the bottle from the freezer.
Press the to silence the alarm.

5.6 Fast freeze

To activate, press the button. In this mode the freezer runs at its coldest temperature for 12 hours. After 12 hours has elapsed the freezer will revert to its normal settings.
To exit the mode within the 12 hour period press the button.

5.7 Ice boost

To activate, press the button. In this mode ice production is increased by running maximum air flow over the ice tray. After 24 hours the mode is automatically exited.
To deactivate within the 24 hour period press the button.

6 AIRFLOW

6.1 Internal Air Flow

This Refrigerator is a single evaporator, ducted system with 2 fans, one in the freezer compartment (FC), and the other in the divider, which supplies cold air to the provision compartment (PC).

A third fan – the condenser fan, is used for external air flow refer section "5.9 External Air Flow"

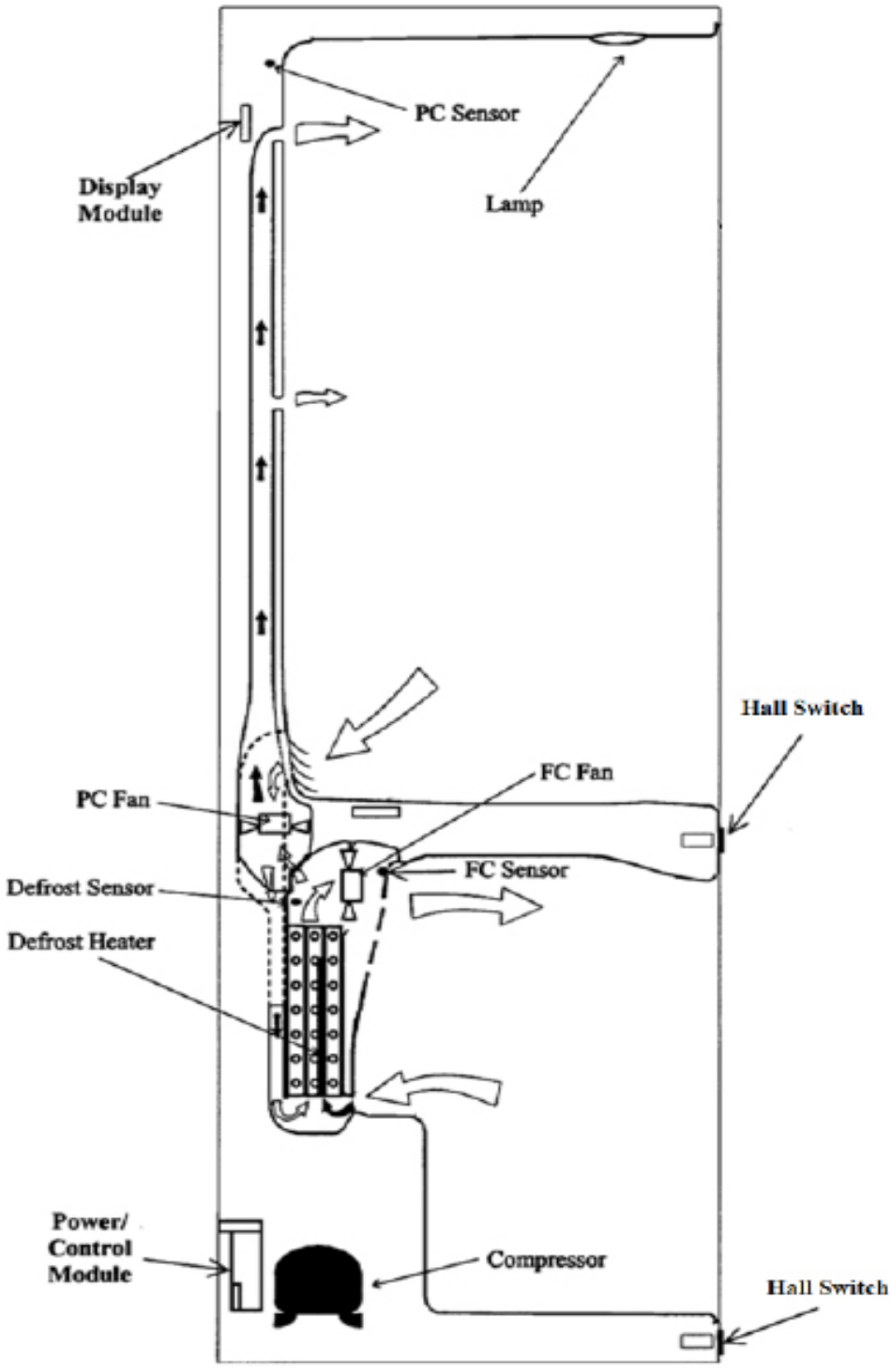


Figure 6.1

Air Circulation & Temperature Control

The freezer fan draws air through the evaporator and circulates it through the fan grill at the top rear of the freezer compartment where it circulates around the compartment and then returns to the bottom of the evaporator.
Cold air is also drawn through the evaporator and into the PC via an air duct in which the PC fan is located. It is then circulated through the PC before returning to the bottom of the evaporator through another duct (refer to Figure 6.1).
The power/control module monitors the temperatures of both compartments through the PC and FC sensors. The power/control module also regulates the fan speed by means of PWM (Pulse Width Modulation), turning the fans on and off very fast to control the speed. The longer it's on, the faster the fan speed, the longer it's off, the slower the speed (refer to Figure 6.2). Only the speed of the PC fan varies; it can speed up or slow down. The FC fan runs at a constant speed. Both fans are regulated to maintain the Set Temperature. (Set Temperature – the temperature selected by the customer using the User interface.)
Both compartments, PC & FC, can be independently adjusted, via the user interface, to run at different temperatures.

Pulse Width Modulation

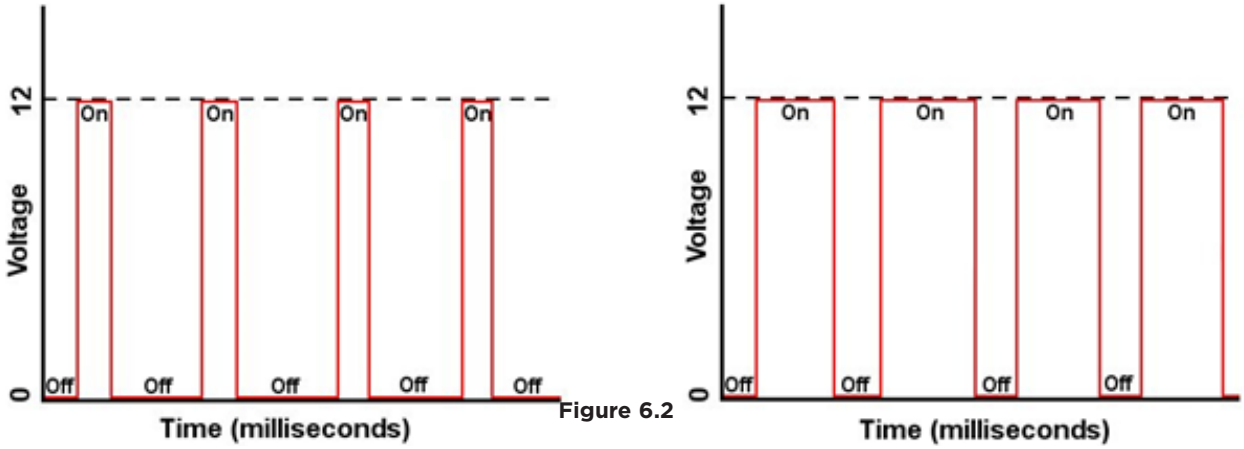


Figure 6.2

Shorter 'On' period
Slower speed

Longer 'On' period
Faster speed

Both fans run at the same time, along with the compressor when on, and will stop if either the PC or FC doors are opened (sensed by the Hall sensor), restarting again when they are closed. Both fans and the compressor will switch off once the cabinet has reached the set temperature.

Air from the PC returns to the evaporator by way of the return air duct, which is built into the divider partition of the cabinet. (Divider Partition - the wall that separates the PC from the FC.) This returning air is drawn across the evaporator by the fans, to be re circulated again throughout the PC and FC compartments.

When the cabinet is turned on, the power/control module attempts to bring both compartments down to a (factory) set PC compartment temperature of +3^{0}C (37^{0}F) and an FC compartment temperature of -18^{0}C (0.4^{0}F). Both compartments are designed to reach these set temperatures at the same time.

The power/control module knows that to reach +3^{0}C (37^{0}F) in the PC, it doesn't have to run the PC fan as fast, and controls the speed of the PC fan to ensure that both compartments reach their set temperatures at the same time, and then cycles the compressor off.

If either compartment warms up past the upper switch point, the compressor will cycle on. (Upper switch point - Temperature at which the compressor turns on.)

- The upper switch point is where the compressor switches on. Both compartments have their upper limits.
- The lower switch point is where the compressor switches off.
- The set point is the average or product temperature (compartment temperature).

The PC has a 2^{0}C difference and the FC has a 4^{0}C difference between their upper and lower switch points.

Crow bar

Both compartments have crow bar limits. This is the limit where either compartment switches off the compressor. If it gets to this crow bar limit it has passed its own lower switch point and the other compartment has failed to reach its lower switch point (refer to Figure 6.3).

This could happen if, say, the PC fan failed and the FC went past its lower switch point, as both compartments should reach their lower switch points together.

The result of reaching the crow bar limit may bring about a fault code.

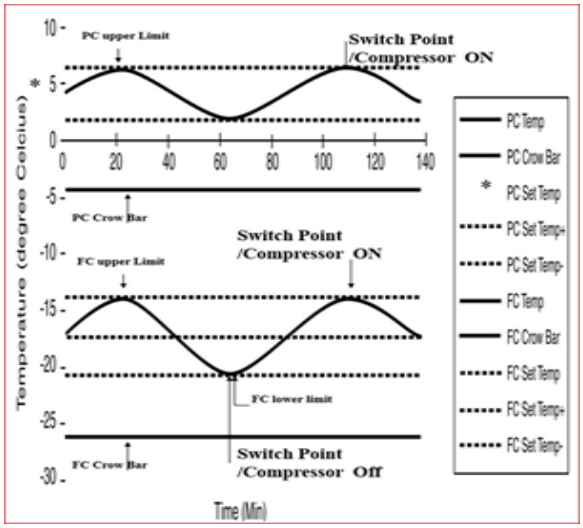


Figure 6.3

6.2 External Air Flow

Air must be allowed to flow around these products, a minimum clearance of 20mm (3/4") is required on each side and 50mm (2") above to allow air to circulate and for the heat from the condenser circuit to dissipate.

The condenser circuit can be either a full skin condenser (condenser tubing attached to the inside of the back and sides) or
A fan forced condenser where a condenser fan draws air into the unit compartment area and through the condenser.

7 REFRIGERATION CIRCUIT

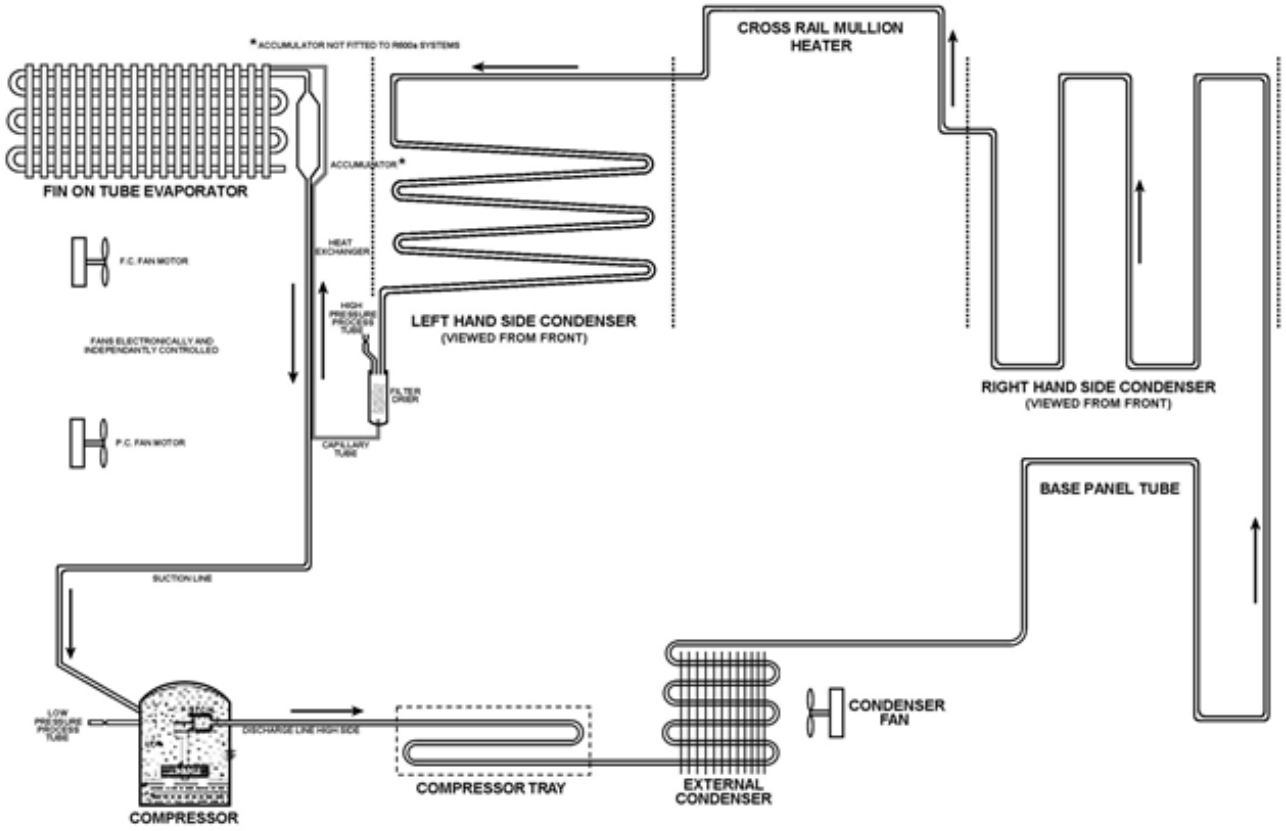
The compressor discharges high pressure, high temperature gas into the water evaporation tray condenser tube circuit first. Then, depending on the model it enters the fan forced condenser located in the unit compartment alongside the compressor, or the back panel skin condenser.

Then it enters the base tube and exits the cabinet at the left rear of the unit compartment, where it is then joined by an external loop to the left side panel condenser circuit. This runs from the base of the left side up to the top front of the cabinet and back down to the left side of the unit compartment where it is then joined by another external loop to the cross rail heater tube.

The cross rail heater tube then exits the cabinet on the right side of the unit compartment where it is then joined by an external loop to the right side panel condenser circuit which runs from the base of the right side up to the top and back down to the unit compartment where it joins into the filter drier.

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

It is important that the condenser is kept clean to maintain good air flow. Poor air flow can result in warmer evaporator temperatures, making the cabinet less efficient.



7.1 Ice & Water Common Complaints

The following are common complaints/problems/concerns regarding ice and water, which may or may not have occurred. Explanation for these faults is given for the serviceman to better deal with customers having concerns.

Sublimation
When ice is not being used on a continual basis, cold dry air from the evaporator passes over the ice, causing the ice to dehydrate (evaporate, moisture is removed) and the ice will slowly disappear.

Ice Sticking Together
If the FC door is left open for an extended period or the ice bin is removed and allowed to warm up, the customer may find the ice cubes sticking together in the bin to form a large block.
Where a large block of ice is formed, the block will need to be removed to start the ice making process again.

Another reason for large blocks of ice can be due to water leaking from the fill tube onto the ice tray and overflowing the mould, check for leaking diaphragm in the water inlet valve.

Discolouration / Metallic Taste
Where the water or ice cubes are discoloured, they should not be used. If the water is a greenish-blue colour the reason for this happening is copper oxide. This is not a common fault but may happen where the water supply to the house is in a copper pipe but for whatever reason the pipe is not earthed. To overcome this problem, the pipe work should be earth bonded to the earth of the house.

Bad Taste
Any fresh food, which is not sealed or wrapped when placed into the freezer, may contaminate the ice with the taste of the unwrapped foodstuff. The ice will need to be thrown out and the ice-making process started again. The customer must be advised to wrap all foodstuffs.

Ice Appears Cloudy
This problem occurs when air or air bubbles are in the water, which normally happens in the early stages and will disappear with use.

Particles In Ice And / Or Water
This is normally due to a new filter where carbon dust in the new filter needs to be flushed out of the system. The particles are harmless and safe for consumption; however, customers are advised to flush the system of 8 litres (2 gal) of water at every filter replacement (refer to Use and Care manual).

7.2 Noisy

ActiveSmart™ refrigerators, can produce sounds somewhat different to other refrigerators. The following noises are normal

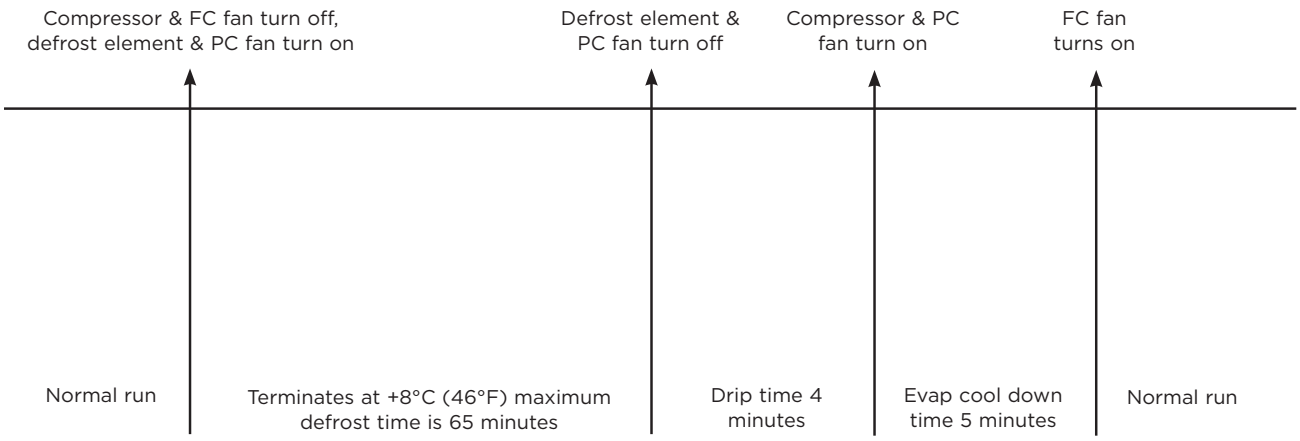
Normal operational sounds include:
- Fan air flow sound. ActiveSmart™ refrigerators have fans which change speed depending on demand. During periods of high demand the fans may run at faster speeds and become more audible.
- Cracking or popping which may occur when the defrost function is operating.
- Running water sound. This is the liquid refrigerant in the system and can be heard as a boiling or gurgling noise.
- An audible hissing sound after closing the freezer door. This is due to the pressure difference between the warm air that has entered the cabinet and suddenly cooled, and the outside air pressure
- Gasket noises which can normally occur due over time due to a build up of dirt and/or grime. To overcome this the gaskets should be cleaned.

For models with an ice maker the following noises may be heard:
- Ice maker gearbox motor operation (low humming).
- Running water as the ice maker and/or water tank fills.
- Water valve opening and closing (hissing sound).
- Ice being loosened from the ice moulding tray (cracking).
- Ice dropping into bin (clunking).

If the product is excessively noisy check the following:
- Cabinet is level.
- That there are no obstructions in or around any of the fans.
- Refrigeration pipe work is not touching each other or other components.
- Compressor mounts are all in place and the compressor tray is not loose.

8 DEFROST CYCLE SEQUENCE

8.1 R600a System



9 ICEMAKER OPERATION

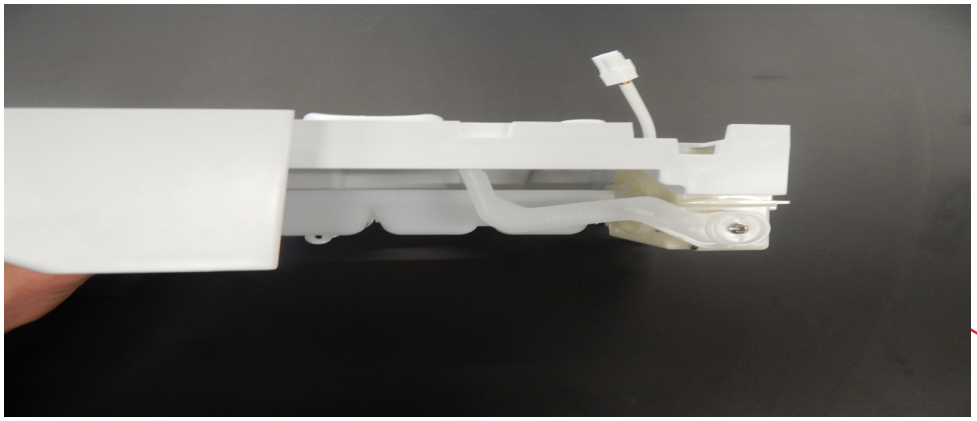
9.1 Ice maker

Ensure the icemaker is turned on, then force a harvest, refer section “10.6 Forced Ice Harvest Mode”

Once the ice tray returns to its normal position, the control module activates the water valve and fills the tray. The rate of production will depend on the temperature of the freezer and the icemaker will not operate if the FC temperature is above -10^{0}C (14^{0}F). When the icemaker sensor reads 0^{0}C (32^{0}F), the icemaker motor will twist the ice tray, causing the cubes to dislodge and fall into the bin. The tray will then return to its normal position and refill with water. The amount of ice storage is controlled by the icemaker bale arm. Once the ice bin fills to the downward position of the arm, the ice maker will stop producing ice until the ice level drops through usage. The large and small freezer bins can be rotated if a large amount of ice is required.

NOTE: A bin needs to be under the ice maker for it to operate. When the bin is in position it unlocks the bale arm with the bin detection lever that makes contact with the rear of the bin. If the ice bin is missing or installed incorrectly, the icemaker will not go through a harvest sequence.

A test sequence will take place every 20 minutes. If the bale arm senses the bin is full, the motor resumes its normal position with no harvest.



10 DIAGNOSTICS

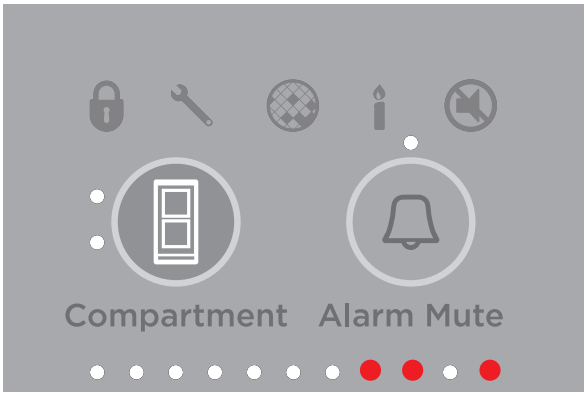
10.1 Fault Alarms

If there is a fault in the temperature measuring system, defrost system, icemaker, fans or low ambient heater, when the PC door is opened the spanner icon will be blinking and the fault code is displayed in a binary code on the flashing LEDs. At the same time, the controller will beep, and the number of beeps is the same as the fault code number. Pressing the ALARM MUTE button will silence the alarm.

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.

The following shows the binary value assigned to each of the LEDs, starting from the right:

To work out the fault code, add up the value of each illuminated LED.



The example fault code shown above:
1 + 4 + 8 = 13 (fault code 13 : Ambient heater open circuit)

10.1.1 Fault Code List

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

Fault Code 2
Reason: The previous 2 defrosts were aborted after 40 minutes.
Primary Action: Check defrost element resistance If not within limits, replace.
Check fuse mounted on Power Module, replace if open circuit
Secondary Action: Replace Power Module.

Fault Code 3
Reason: The resistance of all the temperature sensors are outside the normal range (> 45K Ohms).
Primary Action: Check the connector at the control Module.
Secondary Action: Replace the control Module.

Fault Code 4
Reason: The resistance of all the temperature sensors are outside the normal range (< 660 Ohms).
Primary Action: Check the connector at the control Module.
Secondary Action: Replace the control 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 control 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 control 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 control 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 control 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 control 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 control 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 connector at the control Module.
Secondary 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 connector at the control Module.
Secondary Action:	Replace the control Module.

Fault Code 13 (No audio alarm for this fault)

Reason:	The low ambient heater is drawing less current than expected. Either the heater or wiring is open circuit or the heater is not within limits.
Primary Action:	Check the wiring and connections at both the heater and the control Module.

Fault Code 14

Reason:	The low ambient heater is drawing more current than expected. Either there is a short in the wiring, or the heater is not within limits.
Primary Action:	Check the wiring and connections at both the heater and the control Module.

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 control 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 control 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 control 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 control Module.
Secondary Action:	Check the fan. If faulty, replace.

Fault Code 19 Currently not used

Fault Code 20

Reason:	The flapper heater current is low.
Primary Action:	Check the in-line 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 not within limits, replace the heater.

Fault Code 22 The resistance of the water tank (PC2) sensor is outside the normal range (> 45K Ohms).

Primary Action: Check the connections of the sensor at the control Module. Check the

	resistance of the sensor.
Secondary Action:	Replace the sensor.
Fault Code 23	The resistance of the water tank (PC2) sensor is outside the normal range (< 660 Ohms).
Primary Action:	Check the connections of the sensor at the control Module. Check the resistance of the sensor.
Secondary Action:	Replace the sensor.
Fault Code 24	(No audio alarm for this fault)
Reason:	The resistance of the ice tray sensor is outside the normal range (> 45K Ohms).
Primary Action:	Check the connections of the sensor at the control Module. Check the resistance of the sensor.
Secondary Action:	Replace the sensor.
Fault Code 25	(No audio alarm for this fault)
Reason:	The resistance of the ice tray sensor is outside the normal range (< 660 Ohms).
Primary Action:	Check the connections of the sensor at the control Module. Check the resistance of the sensor.
Secondary Action:	Replace the sensor.
Fault Code 26	(No audio alarm for this fault)
Reason:	The icemaker motor has timed out.
Primary Action:	The icemaker gearbox is not returning to the start position.
Secondary Action:	Check the gearbox, and if faulty, replace.
Fault Code 27	(No audio alarm for this fault)
Reason:	The icemaker motor current is high.
Primary Action:	Check the motor for an obstruction.
Secondary Action:	Check the wiring at both the icemaker gearbox and the control Module.
Tertiary Action:	Check the resistance of the icemaker gearbox. If not within limits, replace motor.
Fault Code 28	(No audio alarm for this fault)
Reason:	The icemaker solenoid is drawing more current than expected. Either there is a short in the wiring, or the solenoid resistance is not within limits.
Primary Action:	Check the wiring and connections at both the solenoid and the control Module.
Secondary Action:	Check the solenoid resistance. If not within limits, replace.
Fault Code 29	
Reason:	The icemaker solenoid is drawing less current than expected. Either the wiring is open circuit, or the solenoid resistance is not within limits.
Primary Action:	Check the wiring and connections at both the solenoid and the control Module.
Secondary Action:	Check the solenoid resistance. If not within limits, replace.
Fault Code 30	
Reason:	Display harness fault – strobe wire.
Primary Action:	Check continuity of harness between internal display and control Module. Replace harness plug if necessary.
Fault Code 31	
Reason:	Display harness fault – clock/data wire.
Primary Action:	Check continuity of harness between internal display and control Module. Replace harness plug if necessary.
Fault Code 32	Currently not used

Fault Code 33 Currently not used

Fault Code 34 Currently not used

Fault Code 35 Currently not used

Fault Code 36 Currently not used

Fault Code 37 Currently not used

Fault Code 38 Currently not used

Fault Code 39 Currently not used

Fault Code 40
Reason: Icemaker solenoid transistor 1 short circuit.
Primary Action: Check the solenoid resistance and connections. If faulty, replace.
Secondary Action: If still faulty, replace the control Module.

Fault Code 41
Reason: Icemaker solenoid transistor 2 short circuit.
Primary Action: Check the solenoid resistance and connections. If faulty, replace.
Secondary Action: If still faulty, replace the control Module.

Fault Code 42 (No audio alarm for this fault)
Reason: Icemaker fill tube heater short circuit.
Primary Action: Check the harness connections at the controller.

Fault Code 43 (No audio alarm for this fault)
Reason: Icemaker fill tube heater open circuit.
Primary Action: Check the harness connections at the controller.

Fault Code 44 Currently not used

Fault Code 45 Currently not used

Fault Code 46 Currently not used

Fault Code 47 Currently not used

Fault Code 48 Currently not used

Fault Code 49 Currently not used

10.2 Inverter Fault Alarms

In addition to the fault codes displayed on the display there are also fault codes related to the inverter and compressor. These fault codes are displayed via a flashing LED on the inverter module located in the unit compartment of the refrigerator. **NOTE - the product will not have an audible beep.**

In normal operation the LED on the inverter module flashes once every 15 seconds. When a fault is detected, the LED flashes faster and the number and frequency of the flashes indicates the fault. The fault code count is repeated after a pause.

NOTE: There are 2 types of inverter used. Please ensure you are checking against the correct list. Refer photo.

10.2.1 F&P Inverter Fault Code List

Fault Code 1
Reason: Inverter Module Error
Primary Action: Replace Inverter Module

Fault Code 2
Reason: Inverter Module Error
Primary Action: Replace Inverter Module

Fault Code 3
Reason: Inverter Module Error
Primary Action: Replace Inverter Module

Fault Code 4
Reason: Inverter Module Error
Primary Action: Replace Inverter Module

Fault Code 5
Reason: Inverter Module Error
Primary Action: Replace Inverter Module

Fault Code 6
Reason: Inverter Module Error
Primary Action: Replace Inverter Module

Fault Code 7
Reason: Inverter Module Error
Primary Action: Replace Inverter Module

Fault Code 8
Reason: Compressor cannot start after 6 attempts
Primary Action: Let compressor rest for 5 mins to allow pressure to equalise then try again
Secondary Action: Check compressor windings and harness

Fault Code 9
Reason: Inverter Module Error
Primary Action: Replace Inverter Module

Fault Code 10
Reason: Inverter Module Error
Primary Action: Replace Inverter Module

Fault Code 11
Reason: Compressor Starts & Stops
Primary Action: Let compressor rest for 5 mins to allow pressure to equalise then try again
Secondary Action: Check compressor windings and harness

Fault Code 12
Reason: Compressor Starts & Stops
Primary Action: Let compressor rest for 5 mins to allow pressure to equalise then try again
Secondary Action: Check compressor windings and harness

Fault Code 13
Reason: Over current detected
Primary Action: Check compressor windings and harness

Fault Code 14
Reason: Communication error between control module and inverter
Primary Action: Check wiring connections on control module and inverter
Secondary Action: Replace control module
Tertiary Action: Replace inverter

Fault Code 15
Reason: AC input voltage is low
Primary Action: Check mains input voltage & H'Rail voltage to inverter

Fault Code 16
Reason: Inverter Module Error
Primary Action: Replace Inverter Module

Fault Code 17
Reason: Motor Bridge Temperature above 100^{0}C (212^{0}F)
Primary Action: Poor air circulation. Clean condenser air grills and check condenser fan
Secondary Action: Check Compressor is cycling off

Fault Code 18
Reason: Inverter PCB over temp
Primary Action: Replace Inverter Module

10.2.2 Embraco Inverter Fault Code List

Fault Code 1 Currently not used

Fault Code 2
Reason: No signal from the controller
Primary Action: Check for frequency input to inverter, if no signal and FC fan is running, replace control module.
Secondary Action: If signal OK replace the inverter.

Fault Code 3
Reason: Compressor to inverter harness interrupted.
Primary Action: Check compressor winding resistance.
Secondary Action: If compressor OK replace inverter.

Fault Code 4
Reason: Compressor fault.
Primary Action: Check compressor windings & compressor short to earth/ground.
Secondary Action: If compressor OK replace inverter.
Tertiary Action: If compressor still will not run assume seized compressor, replace compressor.

Fault Code 5
Reason: Input power failure
Primary Action: Check input voltage to inverter (mains voltage). if no supply replace controller
Secondary Action: If input voltage OK replace inverter.

10.3 Diagnostic Mode

There are seven levels in diagnostic mode available to the service technician to assist with diagnosing any faults within the product. To enter the diagnostic mode, press and hold the COMPARTMENT and WARMER buttons together for 4 seconds. Use the WARMER or COLDER buttons to scroll up or down through the desired modes.

DIAGNOSTIC MODE BUTTON PRESSES			
Level	**Button Press**		**Remarks**
1 **Start**	**To enter Diagnostic mode, press the COMPARTMENT & WARMER buttons together for 4 seconds.**		PC sensor temperature. Refer section"10.3.1 Temperature Sensor Indication Mode"
2	Press the WARMER button a second time.		FC sensor temperature. Refer section "10.3.1 Temperature Sensor Indication Mode"
3	Press the WARMER button a third time.		Defrost sensor temperature. Refer section "10.3.1 Temperature Sensor Indication Mode"
4	Press the WARMER button a fourth time.		Input/Output display. Refer section "10.3.2 Input/ Output Display"
5	Press the WARMER button a fifth time.		Ambient Temperature. Refer section "10.3.1 Temperature Sensor Indication Mode"
6	Press the WARMER button a sixth time.		Ice tray sensor "10.3.1 Temperature Sensor Indication Mode"
7	Press the WARMER button a seventh time.		Fault history. Refer section "10.3.3 Last Fault"
To exit Diagnostic mode at any time, press the COMPARTMENT button. The controller will automatically exit Diagnostic mode if it has been idle for 5 minutes.			

10.3.1 Temperature Sensor Indication Mode

Diagnostic Levels 1, 2, 3, 5 & 6

In these levels, the temperature reading from each of the temperature sensors is displayed using the temperature LED array to show the temperature in a binary code. Figure 10.1 shows the value assignment for each LED in degrees Celsius.

Figure 10.1

To obtain the temperature reading of any of the sensors:

- Enter the diagnostic mode, refer section "10.3 Diagnostic Mode" and scroll to the appropriate sensor temperature.
- Add up the binary number indicated by the LED light pattern (refer to Figure 6.1 above).
- Subtract 40 from the result to get the temperature.

NOTE: If the sensor is not used (not plugged in) all LED's will be on indicating 87.5^{0}C

For example, if LED's 32, 8, 4 and 0.5 are illuminated:
32 + 8 + 4 +0.5 = 44.5.
Subtract 40 from the result.
44.5 – 40 = 4.5

The temperature reading of the sensor is therefore 4.5^{0}C.

When reading the temperature in diagnostic mode it is important to remember that this is air temperature at the time the reading is taken and may alter quickly if the door is opened.

10.3.2 Input/Output Display

Diagnostic Level 4

The Input/Output Status menu displays what devices (e.g. light, PC door, FC door, compressor, etc) are currently running or turned on.

In this mode, the state of each peripheral input and output is displayed. Figure 10.2 shows the input/output assigned to each LED.

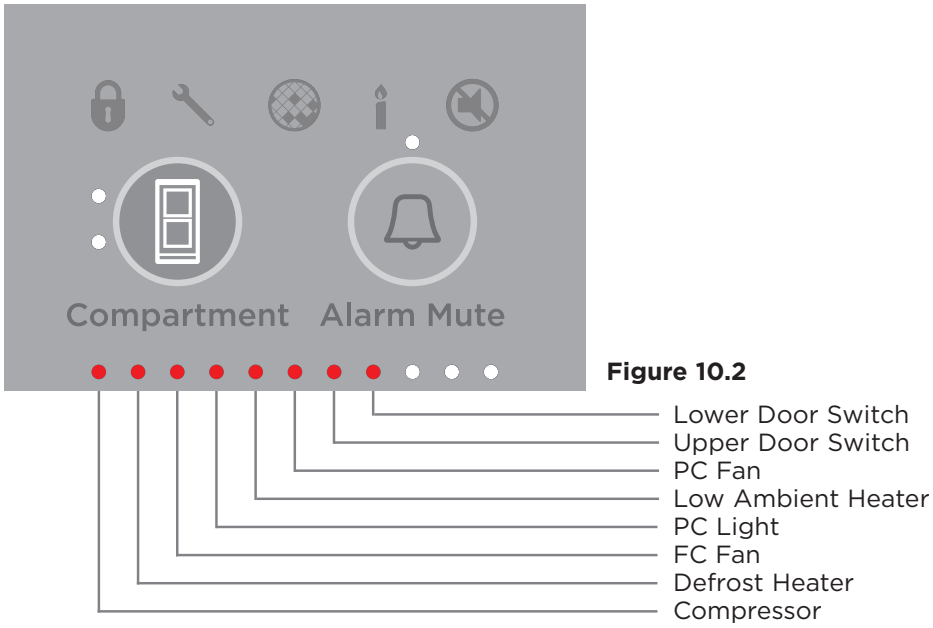


Figure 10.2

10.3.3 Last Fault

Diagnostic Level 7

The Last Fault will be indicated on the internal display in binary (refer section "10.1 Fault Alarms"). However, this will only be displayed for a period of 4 days, after which it can only be accessed through an optical download (refer section "10.5 Optical Download Mode").

10.4 Forced Defrost Mode

To manually force a defrost, press the COMPARTMENT & COLDER buttons together for 4 seconds.

The refrigerator will automatically exit from the Manual Defrost mode when the defrost is completed. Or to exit Manual Defrost mode, switch the refrigerator off at the power supply, and then while pressing the COMPARTMENT button, switch the refrigerator on again at the power supply. For defrost cycle information refer to section "8 defrost cycle sequence"

10.5 Optical Download Mode

This sends encoded data out the Lock LED icon at the top of the display and can be captured by an optical download pen.

To retrieve information from the control module, the following is required:

- A Light Pen (part number 425930) and a laptop computer with the Fisher & Paykel Smart Tool diagnostic program loaded.

The steps to download data are:

- Enter the diagnostic mode by pressing and holding the COMPARTMENT and WARMER buttons together for 4 seconds.
- Enter the Optical Download mode by pressing the COLDER button.
- Place the Light Pen over the top of the Lock LED icon or the water dispenser light (for water dispensing models) until downloading is complete.

Return to normal operation by pressing the COMPARTMENT button.

10.6 Forced Ice Harvest Mode

To manually force an ice harvest, press the ALARM MUTE & COLDER & WARMER buttons together for 4 seconds and then close the PC door.

NOTE: The icemaker will not harvest if the PC lights are on, as the controller directs power to the PC lights. The icemaker starts/resumes when the PC light switches off after the door is closed.

10.7 Reset Water Filter Icon

To reset the filter replacement icon, press the ALARM MUTE & WARMER buttons together for 4 seconds.

10.8 Showroom Mode

To enter Show Room mode, press the COMPARTMENT & WARMER & COLDER buttons together until a long beep is heard.

To exit Show Room mode, switch the refrigerator off at the power supply.

10.9 Disable Water Filter Warning

To disable the filter replacement warning, press the COMPARTMENT & ALARM MUTE & WARMER buttons together for 4 seconds.

10.10 Sabbath Mode

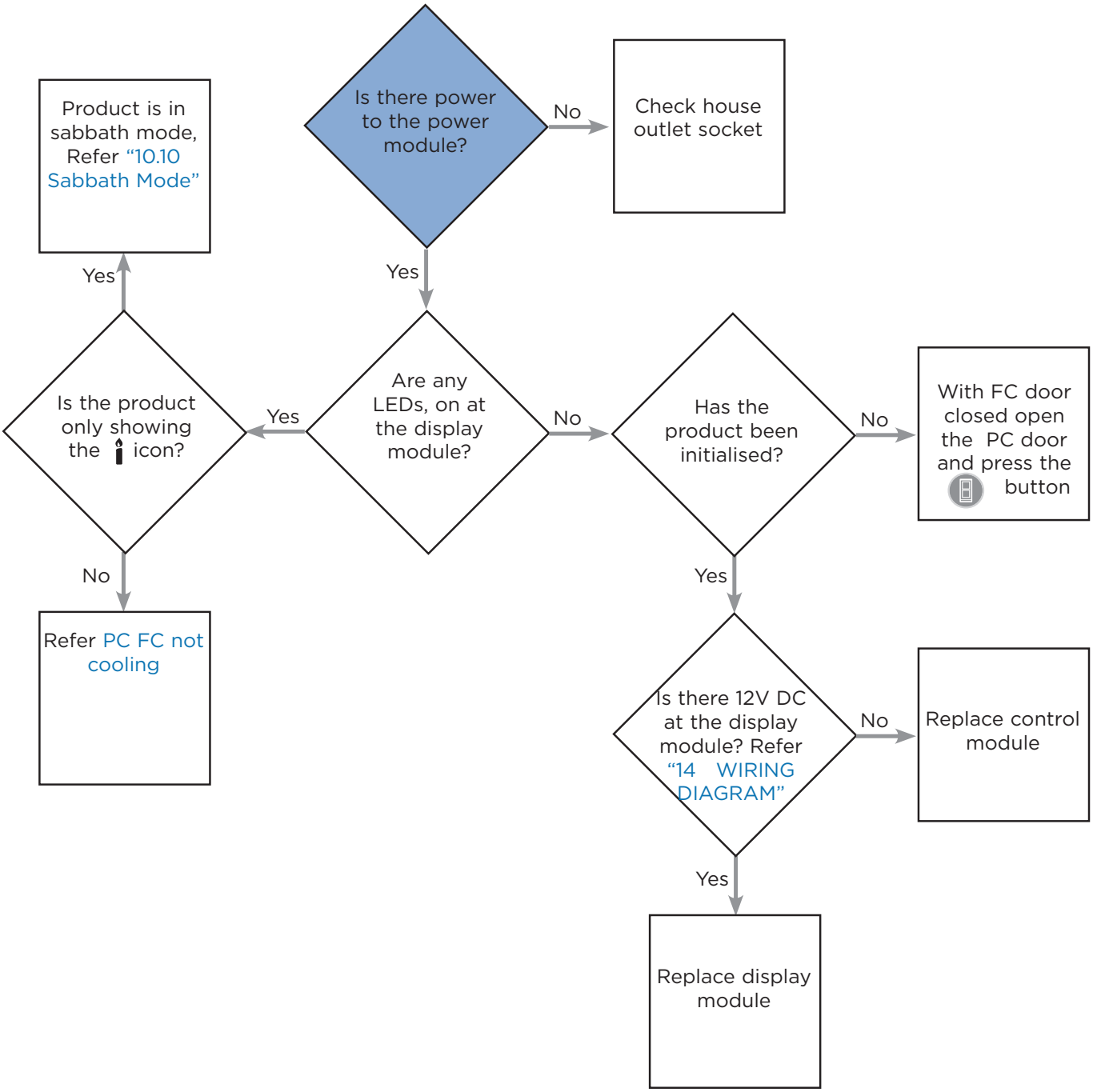
To enter Sabbath mode, press the COMPARTMENT & ALARM MUTE & COLDER buttons together FOR 10 seconds. To exit Sabbath mode press the same combination again for 10 seconds. The product will also exit the Sabbath mode automatically after 80 hours.
When in this mode the following will not operate:

- The interior light will not turn on when the PC door is opened.
- There will be no set temperature lights (LEDs) displayed on the display interface.
- The door alarm will be disconnected and will not sound even if the doors were to be left open.

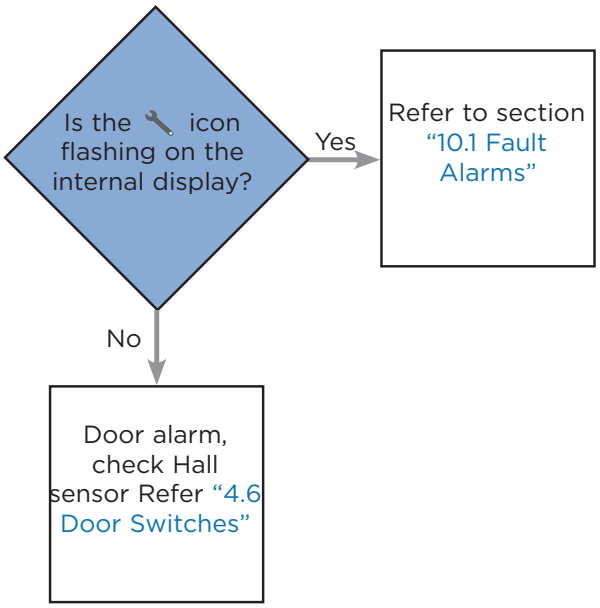
The Sabbath mode LED icon will be illuminated when the appliance is in this mode. Other indicators, dispense lock LED and filter change LED, will hold their last state when the mode is activated, and the dispense lock button will be deactivated. Any chill mode is automatically disabled when Sabbath mode is switched on, thus the bottle chill indicator will not activate if the bottle chill function is turned on prior to going into Sabbath mode. Water can still be dispensed when in Sabbath mode unless the dispense lock was activated prior to enabling Sabbath mode.

11 FAULT FINDING

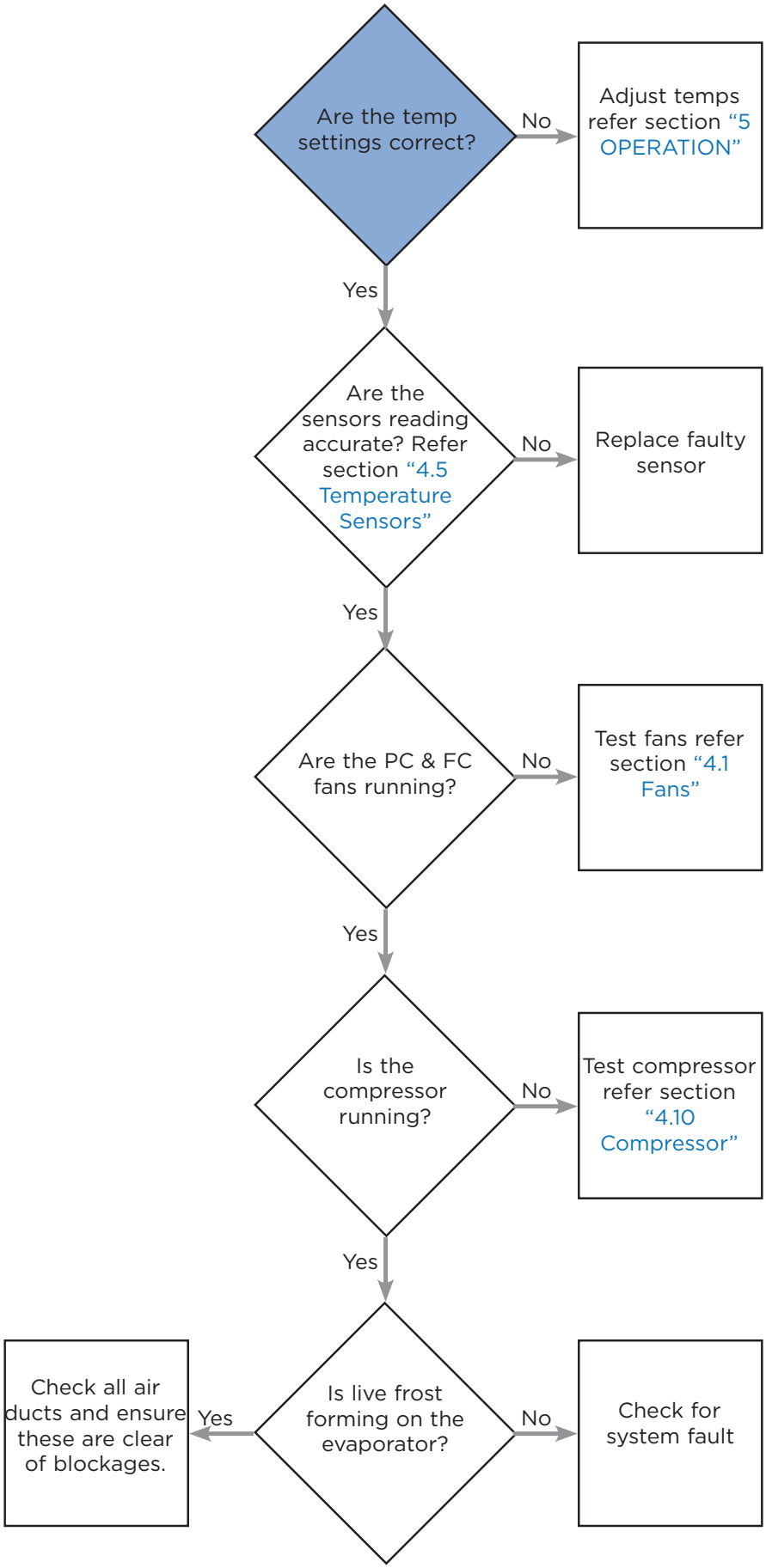
11.1 Refrigerator Not Operating



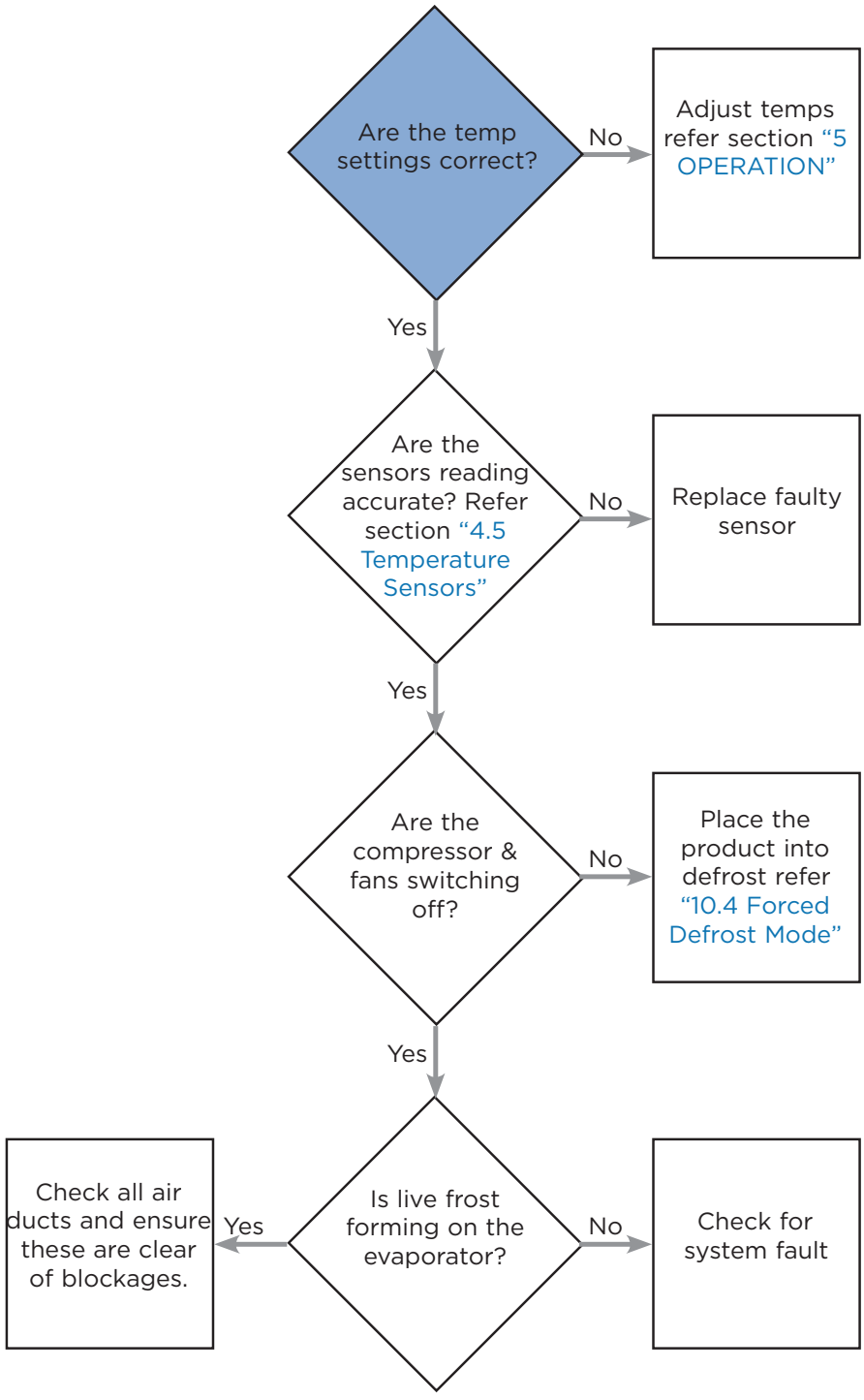
11.2 Refrigerator is beeping



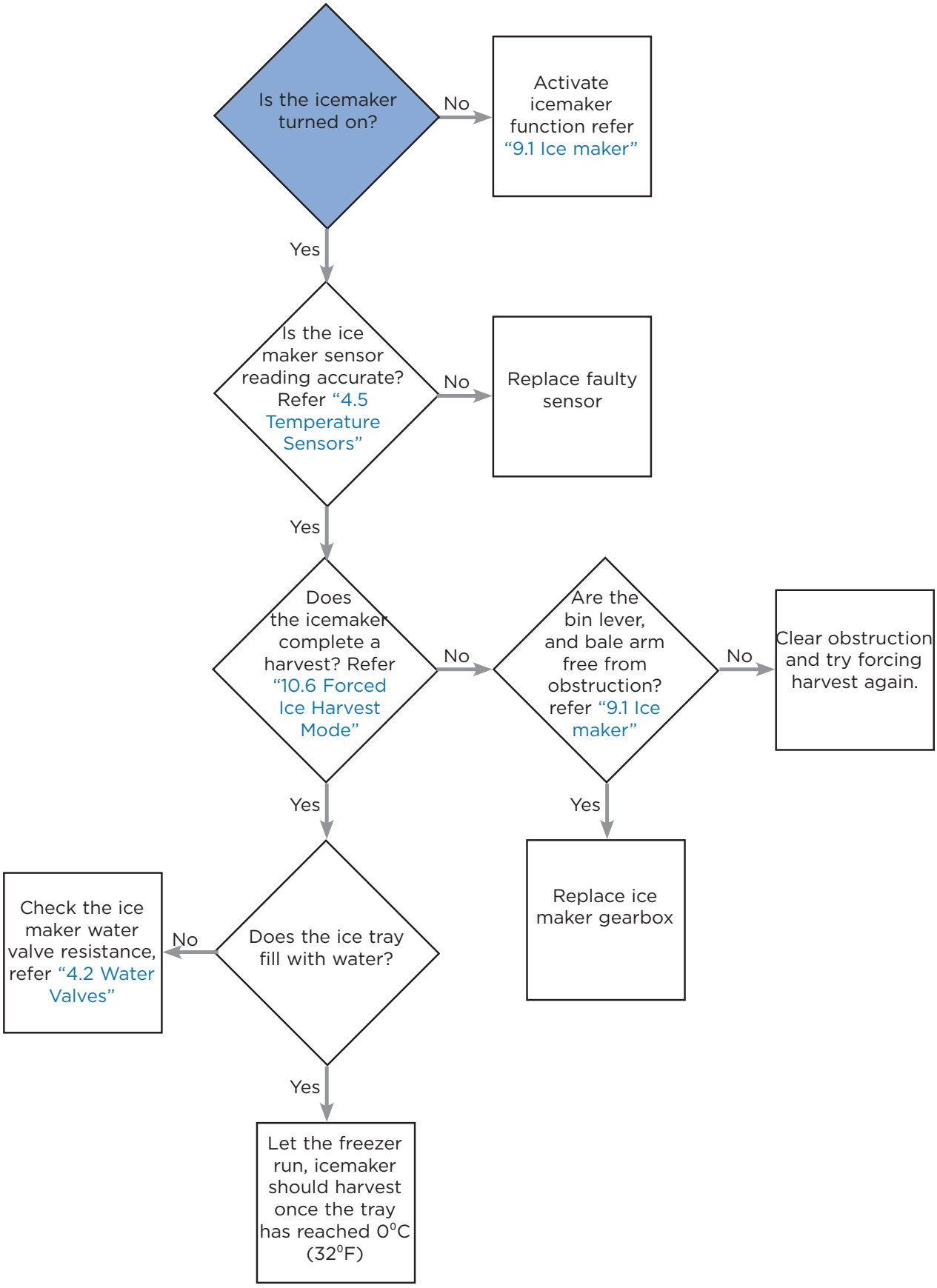
11.3 Too Warm in PC and/or FC



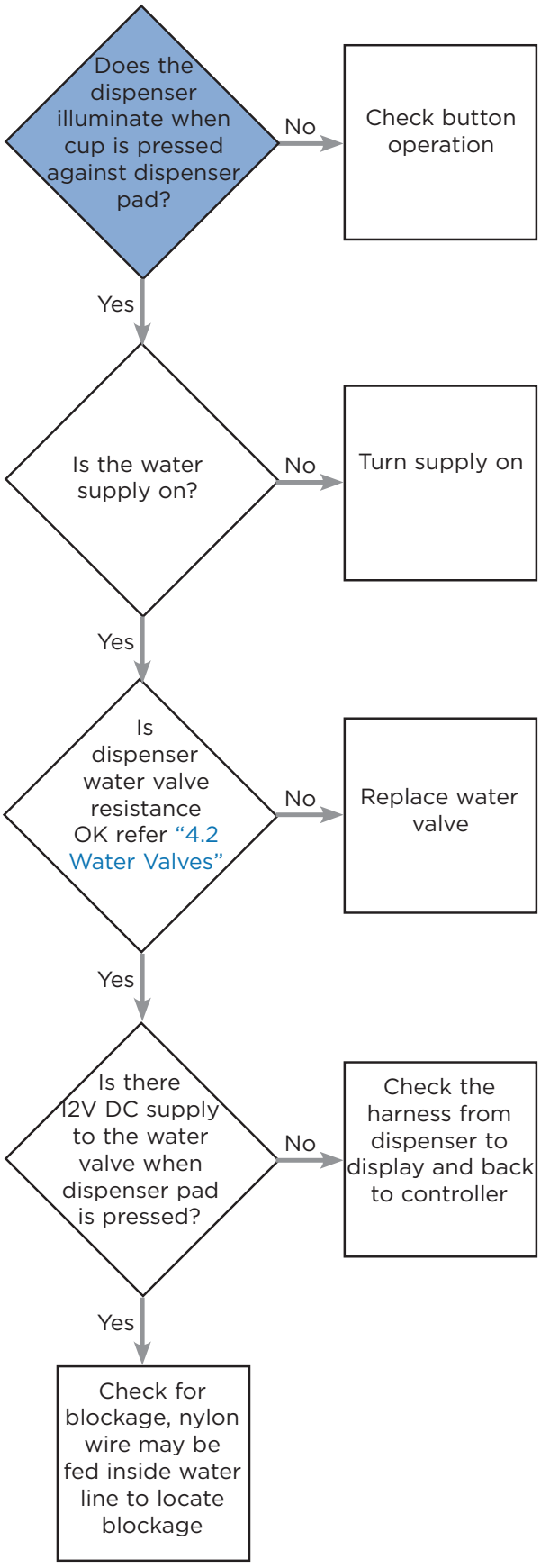
11.4 Too cold in PC and/or FC



11.5 Not producing ice

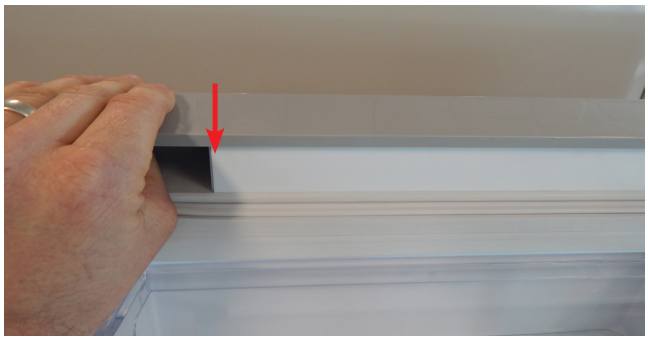


11.6 Not dispensing water

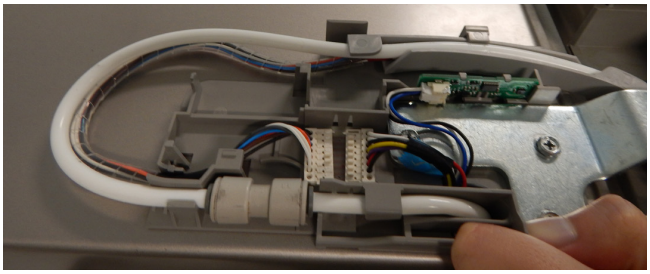


12.1 Replacing the PC door

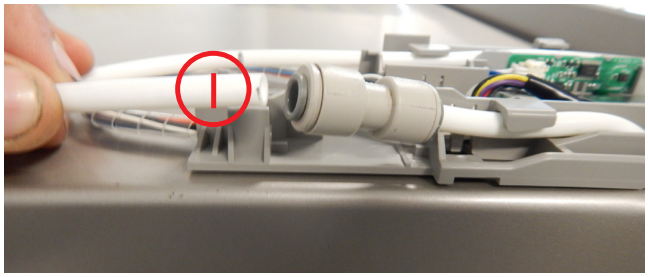
Open the top compartment door. Remove the hinge cover and with the door open slide the door cap towards you starting from the hinge end to release the clips.



With the hinge cover removed and door shut the water and wiring can be disconnected from the cabinet (if ice n water model), then remove the hinge screws. Lift the door off the lower hinge.

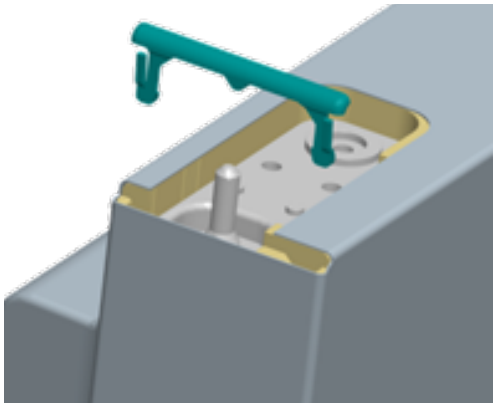


When refitting the door mark the water tube 15mm (5/8") in from the end and then push the tube into the John Guest fitting, the tube should push in all the way to the mark. This will ensure the tube is fully inserted. Once reconnected test the water dispenser and ensure there are no leaks before refitting the hinge cap.

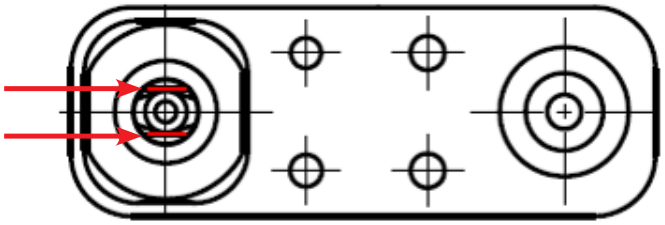


Some models are fitted with a soft close mechanism. To replace the soft close mechanism the door must be removed from the cabinet , when removing the door ensure it is opened at 90 degrees to the cabinet.

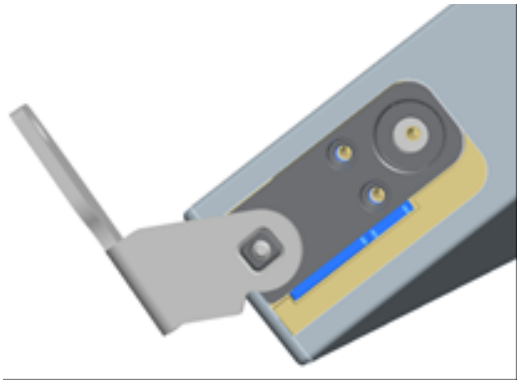
Remove the corner trim and unscrew the stop bracket and the soft close mechanism. Slide the mechanism out.



When refitting the soft close mechanism ensure that the flat edges on the end of the shaft are in the correct orientation. This is what will engage with the hinge and ensure the door pulls shut from approximately 45 degrees



If the flat edges are not in the correct location as mentioned above remove the hinge off the cabinet and use this to move the soft close mechanism to the “open” position.



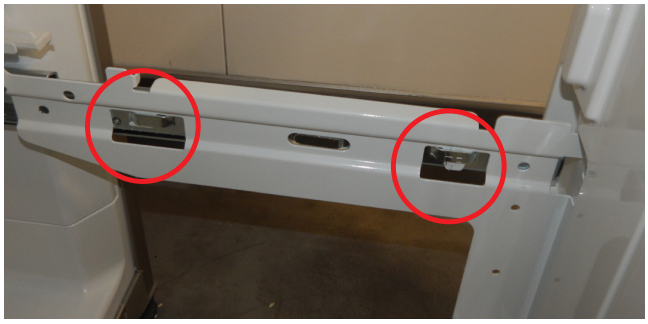
When refitting the door back onto the cabinet ensure the door is at 90 degrees to the cabinet, and ensure the flat edges engage back into the hinge before closing the door. When you do close the door you should feel the soft close mechanism take over.

12.2 Replacing the FC drawer or door

To replace the FC door remove the PC door first, refer “12.1 Replacing the PC door”
For FC drawer removal the PC door does not need to be removed.
Remove all bins from within the FC. Then remove the shelves, some of these will be retained by a clip under the slide.
Lift the shelf from the front and remove.

Push the locking tab on each of the FC bracket mount slides as shown and lift the drawer out. the anti-racking parts can come out with the drawer, but will need to be removed before the drawer is refitted.

When refitting there are two locating tabs on the drawer that are required to be fitted first.
Align the rear locating tab into the slot as shown.
Align the front locating tab into the slot as shown



Fit the anti-racking bar into the racking pinion gear ready to fit to the drawer.
Both anti-racking pinion gears need to be fitted simultaneously. (If this is not achieved, the drawer will not close correctly.)
Place the anti-racking pinion on an angle and slide both pinion gears into position on the slide.
Fit the locking tab into position as shown.

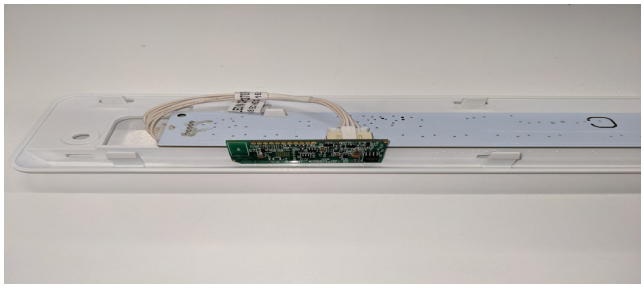
12.3 Replacing the interior lights

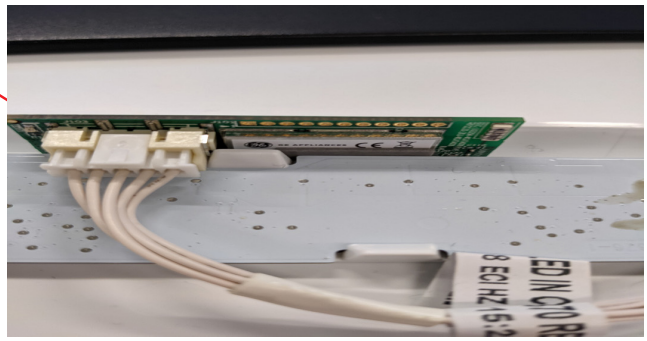
Remove the light cover. Use a flat blade screwdriver to lever the clips.

Unscrew or unclip (depending on model) the LED PCB and disconnecting the plug.

12.3.1 Replacing the WiFi Module

Remove the light cover refer to 12.3
Disconnect at the plug,
The Wifi board can be removed easily as its attached with sticky foam tape
The foam tape and harness will be provided with new part when required to replace
Refit in reverse

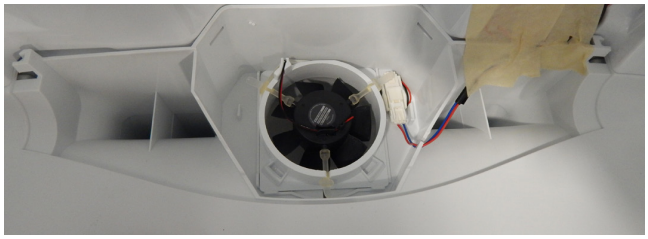




12.4 Replacing the refrigerator fan

Remove all PC shelving.

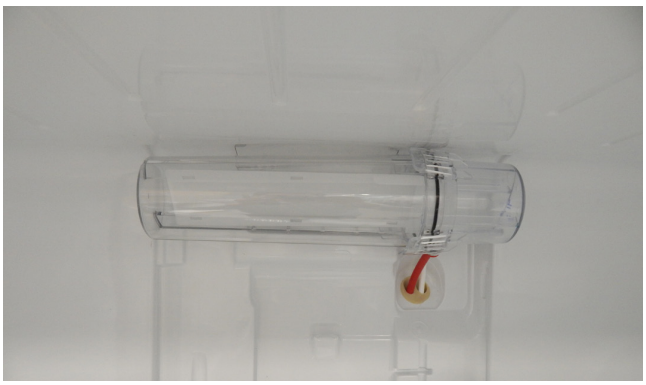
For a “B” model (freezer on the bottom)
Pull from the top centre of the air duct to release.
Remove the return air grill from the bottom of the PC by pulling up.
Lift out the polystyrene to access the fan.
When refitting ensure the back of the fan motor faces upwards.



For a “T” model (freezer on top)
Release the duct from the bottom using a flat blade screwdriver. Rotate up and out to release from top cover. Disconnect low ambient heater.
Remove the screw holding the top cover and pull the top cover down to release.

12.5 Replacing the water tank

The water tank is located at the top of the PC, above the duct. Follow the same steps as “12.4 Replacing the refrigerator fan” Pull the cover forward to expose the tank.



To remove the tank slide a spatula or putty knife from left to right as shown (plastic works best so as to avoid damaging the plastic liner). The water tubes are connected using John Guest fittings, remove any locking collets if fitted then slide the collar in to release the water tube.

When refitting the tank sit it on the lower ledge then rotate the top and click this into place.

12.6 Replacing the freezer fan

For “B” models (freezer on bottom)
With the freezer bins removed, refer “12.2 Replacing the FC drawer or door” the side panels may need to be removed, (for wider products this step may not be required)
Locate the screw at the rear of the panel and remove.

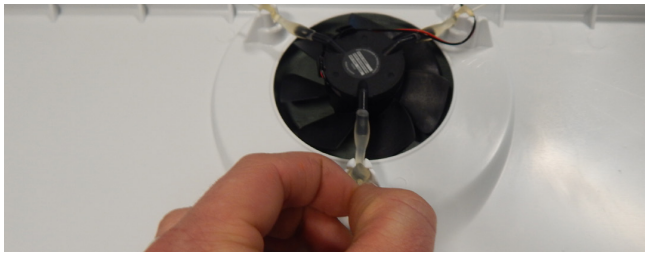
Pull the panel out from the top or midway (depending on model) to release the lug and slide the whole panel forward and out.

Remove the air deflector from in front of the fan cover. Then pull from the centre to release the fan cover. Rotate to the right to gain access to the fan plug and the sensor to disconnect the fan cover altogether.

For “T” models (freezer on top) remove the FC shelves then release the FC cover from the top. Lever these clips down and pull the panel out at the same time. Rotate to the right to access the plug and sensor, release these to remove the fan cover.

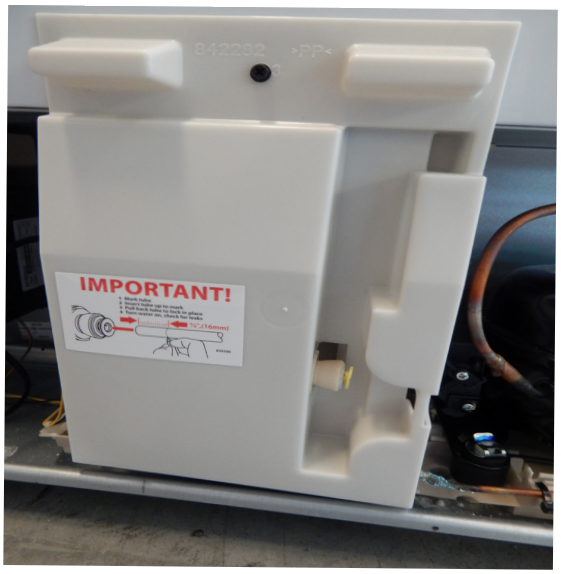
With the fan cover out separate the fan cover and shroud by lifting the clip and sliding the shroud up.

Flip the fan shroud over and release the fan. When refitting the fan ensure the wires are not tight as this will cause excessive noise and could lead to wire fatigue

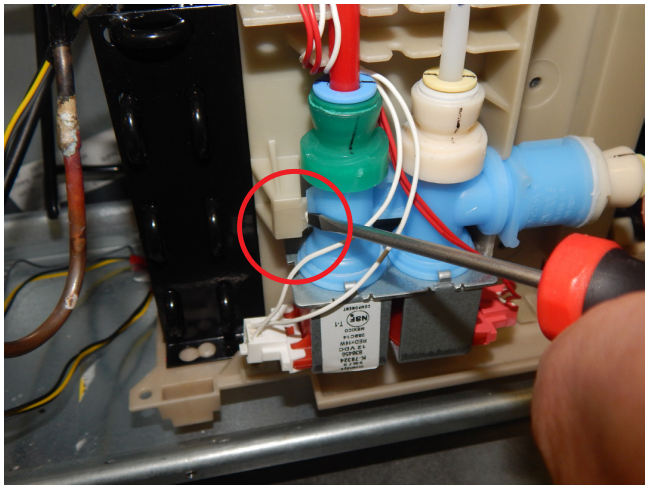


12.7 Replacing the water valve

To replace the water valve first remove the rear unit compartment cover. Some models are a full cover, some are only a partial cover as pictured right.



Unplug the water valve harness.
Bend the clip to release the valve from the housing.
Slide the collars towards the valve to release the water tube from the valve.



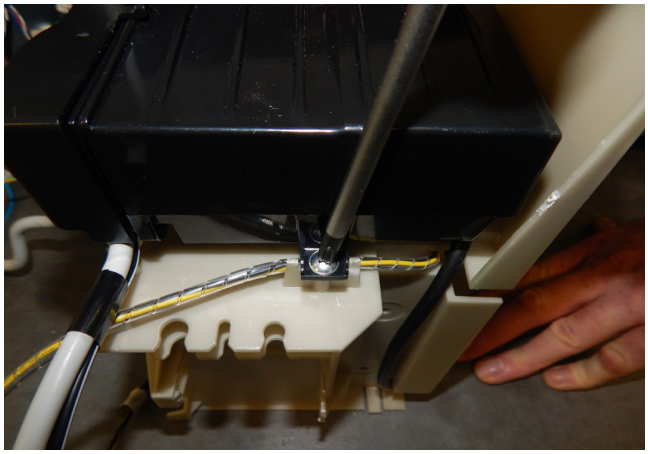
12.8 Replacing the inverter

Invertor is assembled/screwed along side with power module.

Unscrew 2 screws from power module and slide the inverter or unscrew 1 screw from invertor and slide, Refer next picture to move the suction tube before sliding the invertor.

Take care while sliding the invertor, you need to carefully move the suction tube a little on right inorder to slide easily. Make sure the tube is not damaged/ cracked.

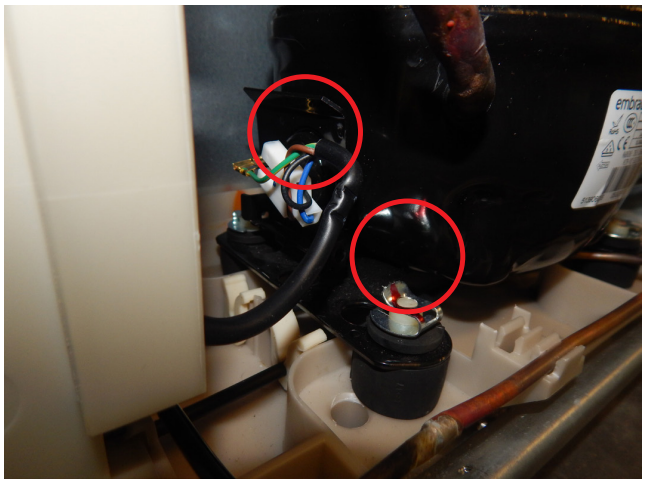
Remove the fixing screw from the front of the inverter. To disconnect the wiring from the compressor refer to “12.9 Removal of the compressor”



12.9 Removal of the compressor

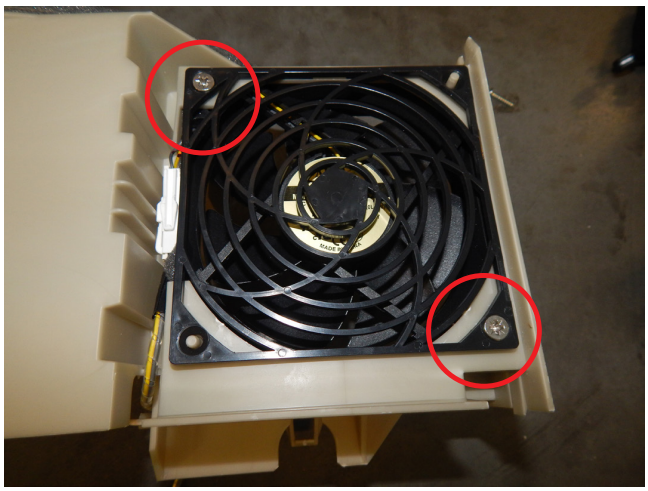
With the rear unit compartment cover removed the compressor can be accessed. Remove the screw holding the wiring termination cover in place and lift this cover off.

Unplug the wiring connection from the compressor and slide the clips off from the compressor posts. Before un-sweating or cutting any pipe-work refer “13 WORKING ON THE SEALED SYSTEM”

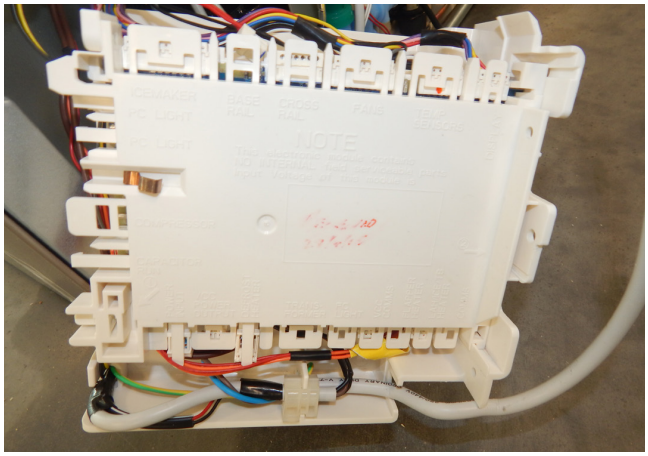


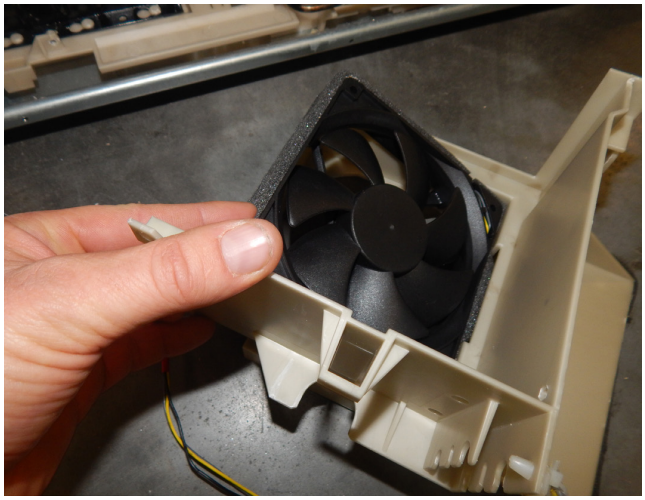
12.10 Replacing the condenser fan

First remove water valve and inverter (refer “12.7 Replacing the water valve” & “12.8 Replacing the inverter”) With the housing lying on its side remove the screws from the fan grill (if fitted)



Flip the housing over and slide the fan out on an angle

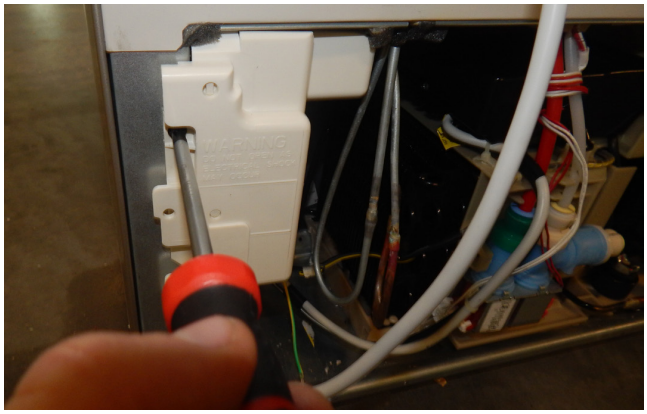




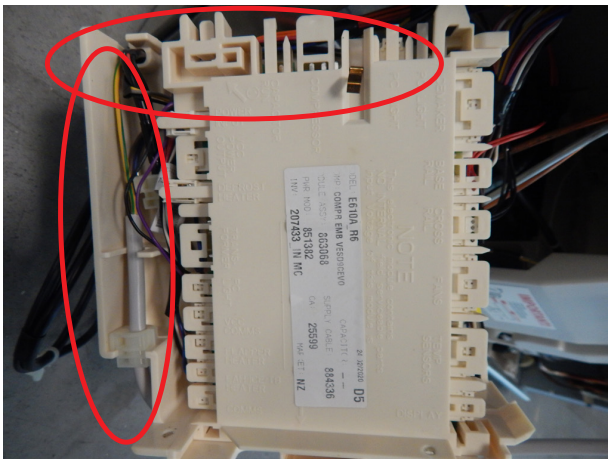
When refitting ensure the plug is tucked in above the fan as shown on right. Also it is important that the fan is facing the correct way to ensure correct air flow direction. Once reassembled the label on the fan motor should face the compressor.

12.11 Replacing the power/control module

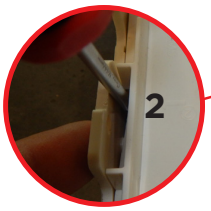
The control module can be accessed from the rear of the product. Remove the back panel (where fitted) and remove the screws securing this to the unit compartment area. The module can now be slid towards you.

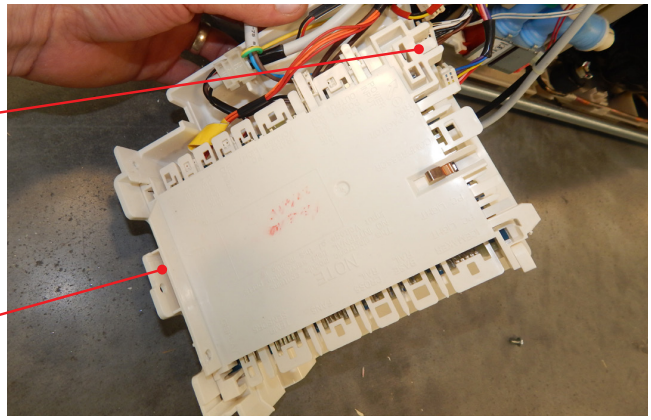


With the controller out of the product remove the top row of plugs and the side row. Do not remove the bottom row yet.

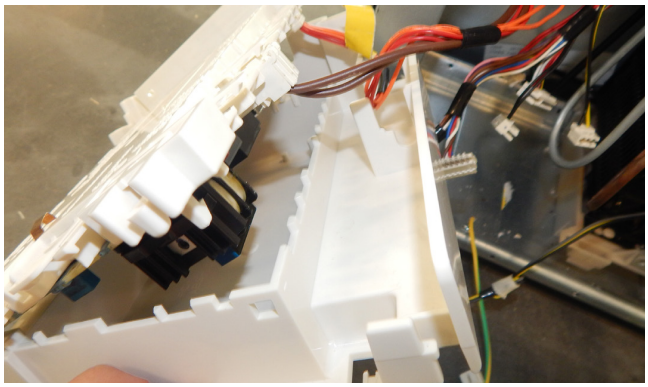


Flip the module over and locate the 2 clips on the control. These are also imprinted 1 & 2 on the controller. From number 1 lift to release, then from number 2 release the clip using a flat blade screwdriver. The module will now hinge open slightly to allow you to remove the lower row of plugs.

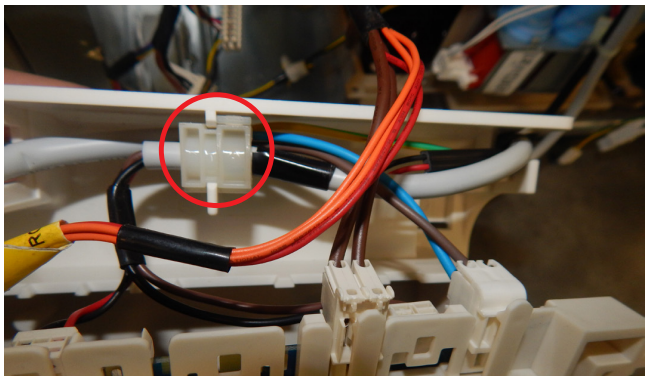




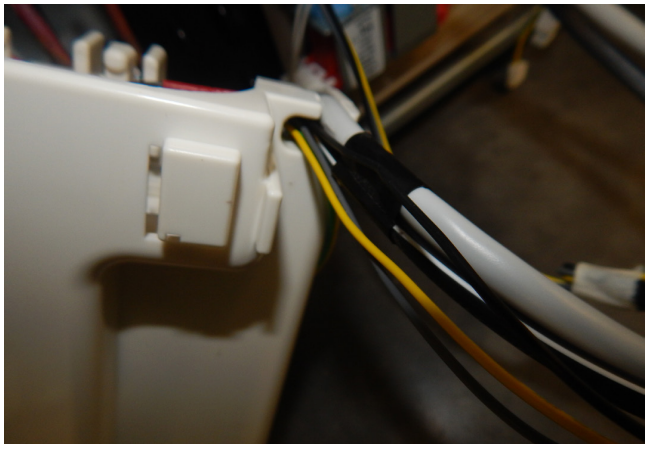
When refitting the controller it is also necessary to hinge the controller open to fit the bottom row of plugs. Once the bottom row of plugs are fitted, clip the module shut before fitting the top and side row of plugs.



When arranging the wiring ensure the mains power supply cord set is underneath the inverter power supply strain relief as shown on the right.



Tuck the condenser fan and inverter harness into the casing as shown on right.
Fit controller back into the unit compartment.

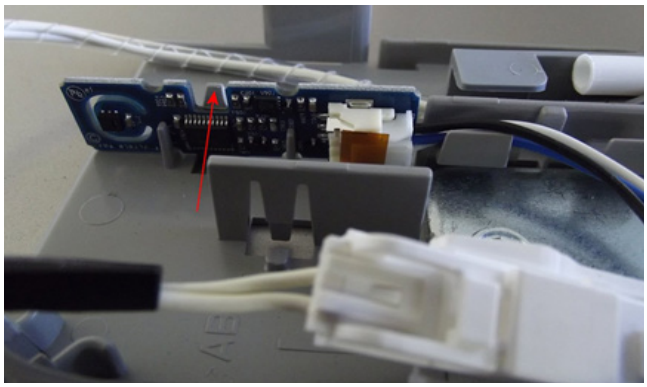


12.12 Replacing the display module

The display module can be easily removed with the aid of a suction cup. Once the suction cup is attached simply pull forward.

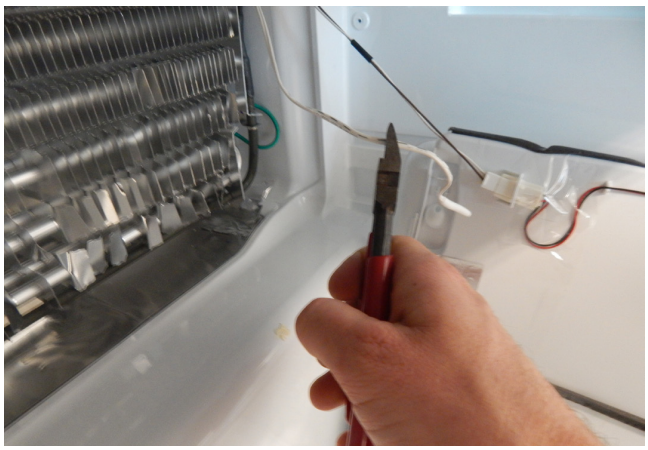
12.13 Replacing the humidity/ambient sensor

For french door models a humidity/ambient sensor is fitted under the left hinge cover. To remove release the clip and lift up.



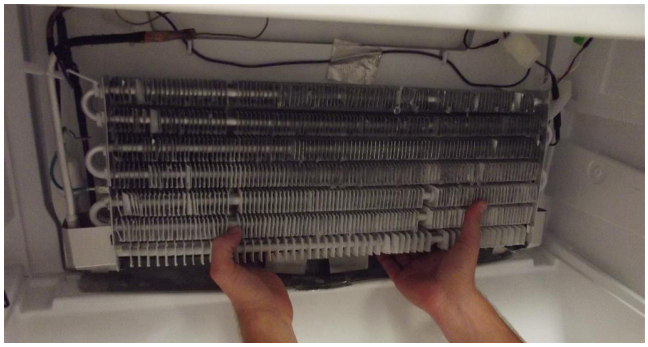
12.14 Replacing the temperature sensors

All the temperature sensors are wired directly back to the controller. Testing of the resistance is carried out at the controller. Should a sensor need replacing this is done by cutting the wiring back from the sensor end and soldering in a new sensor or by using suitable connectors. Once connected the wires need to be insulated with heat shrink sleeving. The colour of each sensor may vary however the replacement sensors are all identical with the exception of the ice tray sensor which has different insulation material to allow the continual flexing of the wires. It is important that if this sensor needs replacing that the correct sensor is used and that the connections are done outside of the area that is moving during operation.

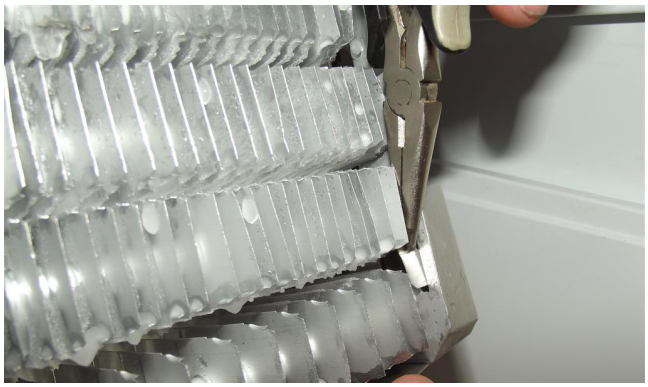


12.15 Replacing the defrost element

Remove all the bins from the freezer and remove the FC drawer (900 Models). Refer “12.2 Replacing the FC drawer or door” Remove the FC fan, refer “12.6 Replacing the freezer fan”
For a “B” model the evaporator assembly can be pulled forward and hinged up. For a “T” model lift the evaporator upwards to clear the bottom of the liner drain and pull the bottom edge of the evaporator forward.
Remove the cable ties from the thermal fuses.
Disconnect the element from the connector.



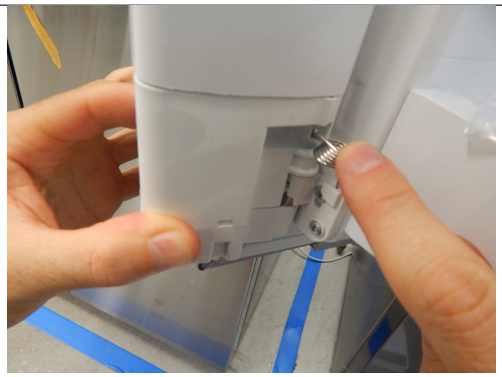
Remove all the bins from the freezer and
Remove the end deflectors from both ends of the evaporator.
Using long nose pliers, bend the aluminium tabs to remove the defrost element.
Ensure element is properly secured and all clips are in place when refitting.



12.16 Replacing the flapper heater & Spring

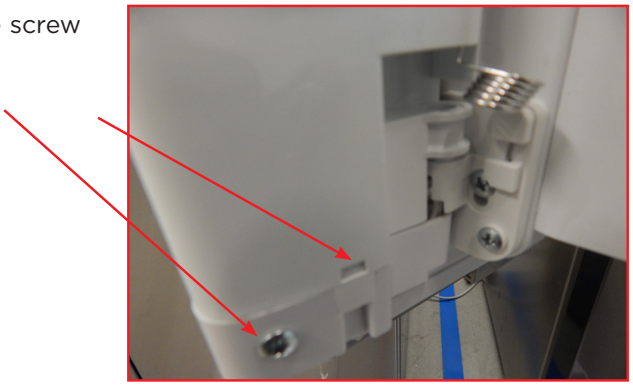
Open the left hand PC door to expose the flapper assembly.
Pull the spring down to release the top leg from the flapper assembly, a pair of long nose pliers may be used to aid this.

To replace the spring push down the spring and lift up the bottom spring side to remove the old spring.

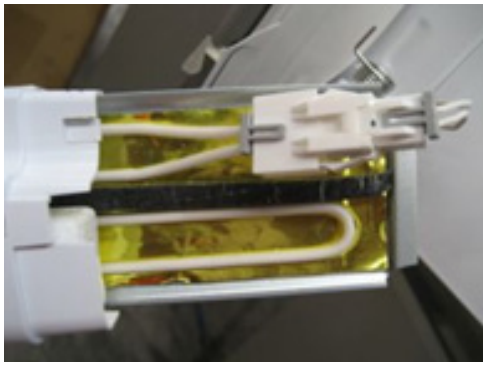


To fit the new spring, slide the spring down into the hinge and slot the top spring to the upper hole of the flapper cavity

To remove the flapper heater remove the screw and unclip the lower cap.



With the lower cap removed slide the heater down enough to expose the plug. Disconnect the plug then continue sliding the heater down, flexing it as you pull down to remove completely. Refit in reverse order.



Take care when re routing the wiring to ensure there is enough slack in the wiring. This will avoid wire fatigue.

12.17 Replacing the low ambient heater

There are two versions of low ambient heater; One for a top mounted freezer (“T” model) product and the other for a bottom mounted (“B” model) freezer product.

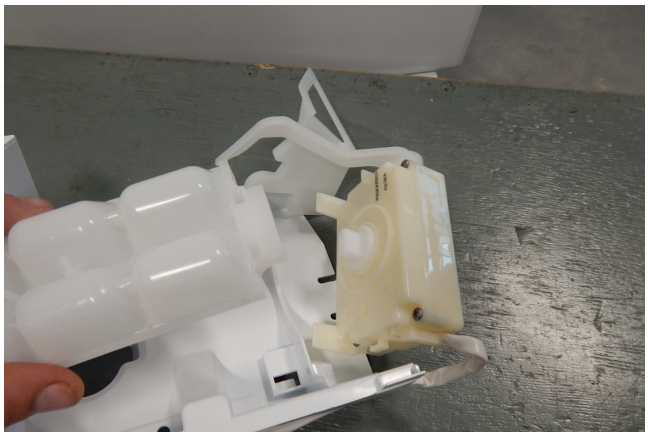
For “T” models the heater is located in the PC rear air duct and can easily be accessed for replacement.

For “B” models the heater is located in the divider and cannot be accessed. However the plug can be accessed and is located to the right of the PC fan. Should a heater need replacing this can be done by placing the heater on the PC duct cover as shown right. The heater is placed 150mm (6 inches) up from the base of the PC duct cover.

12.18 Replacing the icemaker

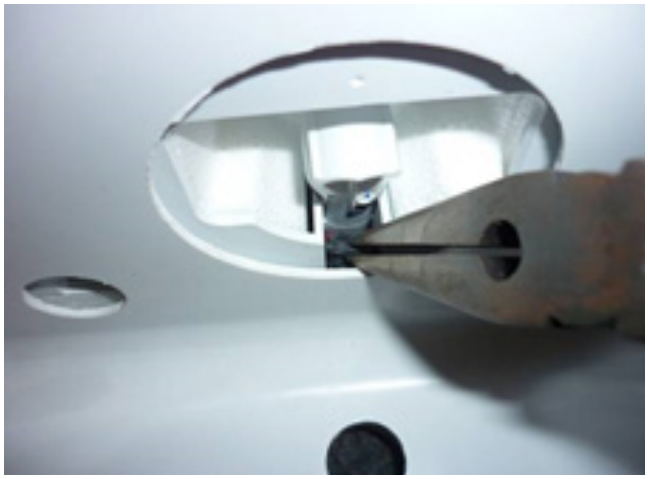
The icemaker is located in the FC, with the bins removed, refer “12.6 Replacing the freezer fan” the icemaker can be accessed. It is clipped to the ceiling of the freezer, and it may have one or two screws securing it to the ceiling also. With the screws removed the icemaker can be lowered and the plug disconnected.
The sensor is held to the tray with a clip and a insulating block, remove these to release the icemaker.

To remove the gearbox and the tray release the clips and slide the gearbox back.



12.19 Replacing the ice fill tube heater

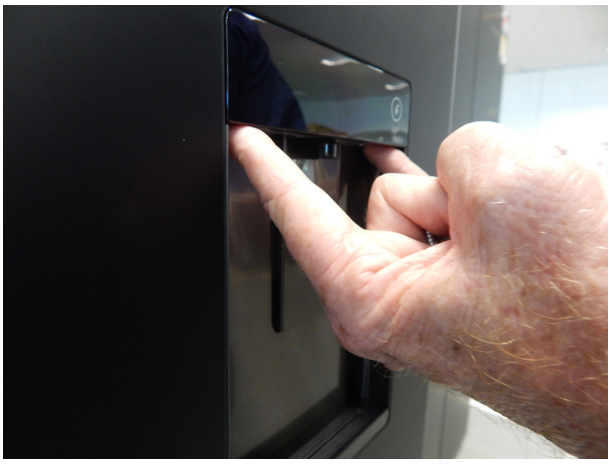
With the icemaker removed, refer "12.18 Replacing the icemaker" grip the end of the heater using long nose pliers and pull the heater out. Cut the heater off ensuring that you leave enough harness to join the new heater in.



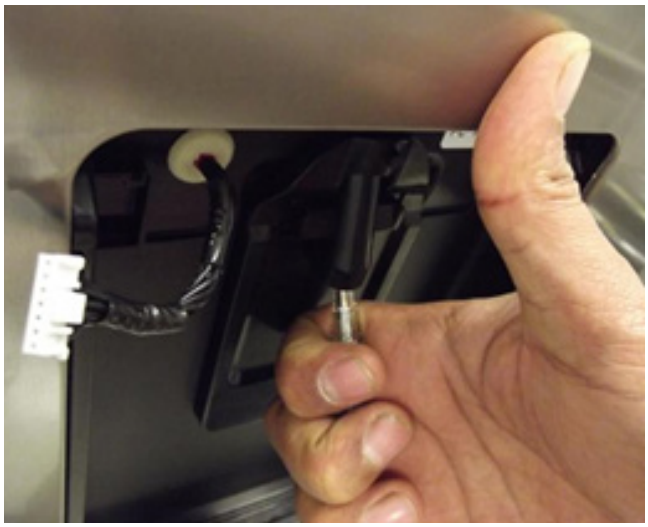
Using the insulation displacement connectors join the new heater into the existing wiring. There is no need to strip the wires first, and ensure the wires are fully inserted into the terminal before crimping. Fit the heater back into position using the clip. Loop excess wire around the spout and tape into place, this will stop the wire falling and interfering with the water flow.

12.20 Replacing the dispenser display & nozzle

To remove the display press on the 2 tabs and pull the display out from the bottom.



With the display removed the nozzle can be unclipped by using a ball point pen or something similar inserted into the end of the nozzle and pulling forward (do not use a sharp object such as a flat blade screwdriver which may damage the check valve).



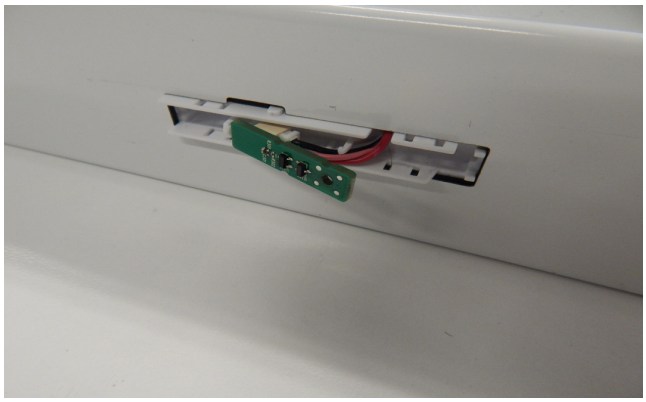
With the nozzle removed the check valve can now be pushed out using a small screwdriver. When refitting ensure the o-ring faces up.

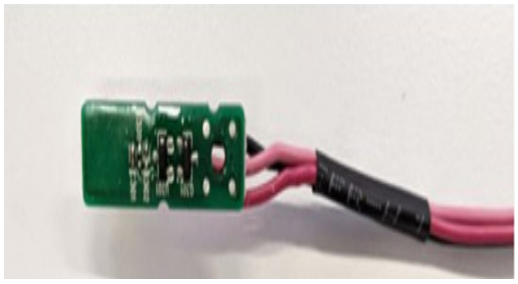
When refitting ensure the o-ring is pushed to the top of the tube first, lubricate the o-ring with Rocol lube, part 842263. Fit the lever on then push the nozzle up and clip into place. Failure to do this could result in dripping issues from the nozzle.
(illustration shows what can happen to the o-ring without adequate lubrication).

12.21 Replacing the Hall sensor

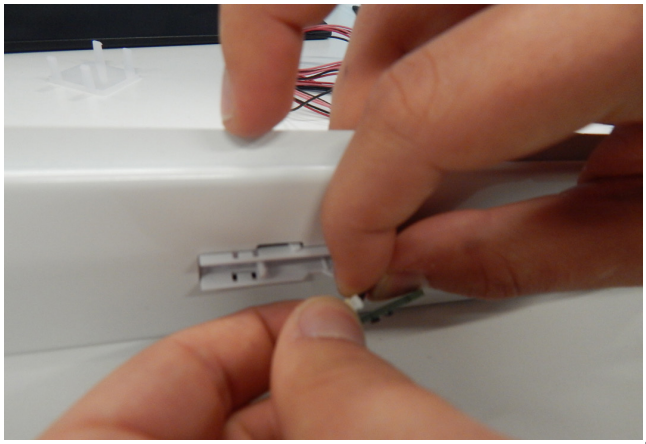
Using a flat screw driver open the reed switch cover carefully

Open the hall sensor from the slot





Unplug the hall sensor from the harness and replace with new hall sensor spare part



13 WORKING ON THE SEALED SYSTEM

13.1 Safe work practices

Safe work practices cannot be overstated. If your work practices are not to a safe standard, you may cause damage not only to your customer's property, but also to yourself.

It is important that on all refrigeration systems being serviced, the type of refrigerant is identified before work commences. The serial label will indicate the gas type and so will the label on the compressor.
Before carrying out any work on a sealed system, the refrigerant type needs to be identified. The refrigerant type and quantity is written on the serial plate of the product.
Before you cut a pipe or light a torch ensure that the refrigerant has been reclaimed if R134a or released to the atmosphere for R600a. R600a is flammable and should not be released into unventilated areas.

13.2 Leak detection

There are special leak detectors available. Ensure these are suitable for the type of refrigerant used in the refrigerator.

Leak detection fluid and a small paintbrush works well.

13.3 Brazing off the system

Brazing off a system that uses flammable refrigerant is no more dangerous than brazing off a refrigeration system that contains R12 that, when burnt, produces phosgene gas.

R600a will burn if it leaks from the system and is ignited.

Crimp-off pliers should be adjusted to prevent any leak. It is recommended that two pairs of pliers are used for the process.

Points to remember are:
- Always work in a well-ventilated area.
- Have your crimp-off pliers adjusted correctly.
- Crimp the filter dryer process pipe off first.
- Open the high side valve on the service manifold and allow liquid trapped in the high side hose to enter the system, as this is part of the total refrigerant charge.
- Disconnect the hose/fitting. Close the end of the tube and braze off.
- Repeat the process on the compressor process pipe.

Should the system be undercharged after the service manifold is disconnected, the problem could have arisen from the fitting of a line tap valve to the process pipe. It is very easy to introduce non-condensables into the system at this point due to the negative pressure in the compressor shell. The practice of charging through line tap valves is not recommended.

As the amount of gas needed is so small to make the correction, it is best to evacuate and recharge the system again with the correct charge.

13.4 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.

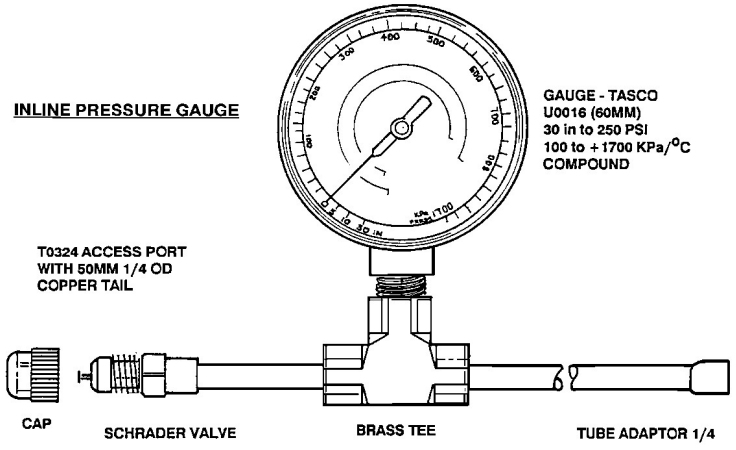
Rule two:
Only use dry nitrogen to pressure test a system.
NOT REFRIGERANT OR COMPRESSED AIR. NEVER OXYGEN

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

How to use the In-line Pressure Gauge:
Step 1:
Reclaim the refrigerant (R134a systems only) from the system and purge the system with Dry Nitrogen.
Step 2:
Cut and connect the pipe circuit to be tested to the in-line pressure gauge and braze this joint.
Step 3:
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 4:
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 5:
Open the nitrogen bottle fully with the regulator backed off.
Step 6:
Increase the regulator pressure in the circuit being tested to 150 psi.
Step 7:
Close the nitrogen bottle valve, then back off the pressure regulator.
Step 8:
Disconnect the hose coupling to the Schrader valve fitting.
Step 9:
Seal the Schrader valve with its sealing cap.
Step 10:
Use a bit of masking tape to mark the face of the pressure gauge at the set pressure. Record date and time on the tape also.
Step 11:
Check all exposed brazed joints with soap bubbles, including the joints on the in-line pressure gauge.
Step 12:
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. 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.



13.5 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 that is housed in the front cover. Refer "12.15 Replacing the defrost element" for detailed steps on evaporator removal.

Before carrying out any work on a sealed system the refrigerant type needs to be identified. The refrigerant type and quantity is written on the serial plate of the product.
Before you cut a pipe or light a torch ensure that the refrigerant has been reclaimed if R134a or released to the atmosphere for R600a. R600a is flammable and should not be released into unventilated areas.

With refrigerant removed it is recommended that the dryer be cut to release the dessicant before unsweating dryer joints. This will avoid heating the dessicant and driving moisture back into the tubing. The copper joints for the evaporator are inside the FC compartment and a new evaporator will come with copper tails already soldered on to the aluminium.
The capillary and suction tubes should be cut as close as possible to the old evaporator. It is also a good idea to clean both suction and capillary pipes with emery cloth before cutting them, this will ensure no particles find their way into the system before brazing.
Wrap damp rags around the heat shrink over the aluminium to copper joints on the new evaporator to protect from heat from the brazing torch. The same can be done for any area of the ABS liner that may get hot while brazing. Take care not to heat the thermal fuse on the defrost element, heat from the brazing torch can cause the thermal fuse to go open circuit.
Adequate evacuation must be carried out following the compressor replacement before recharging with refrigerant can be completed.

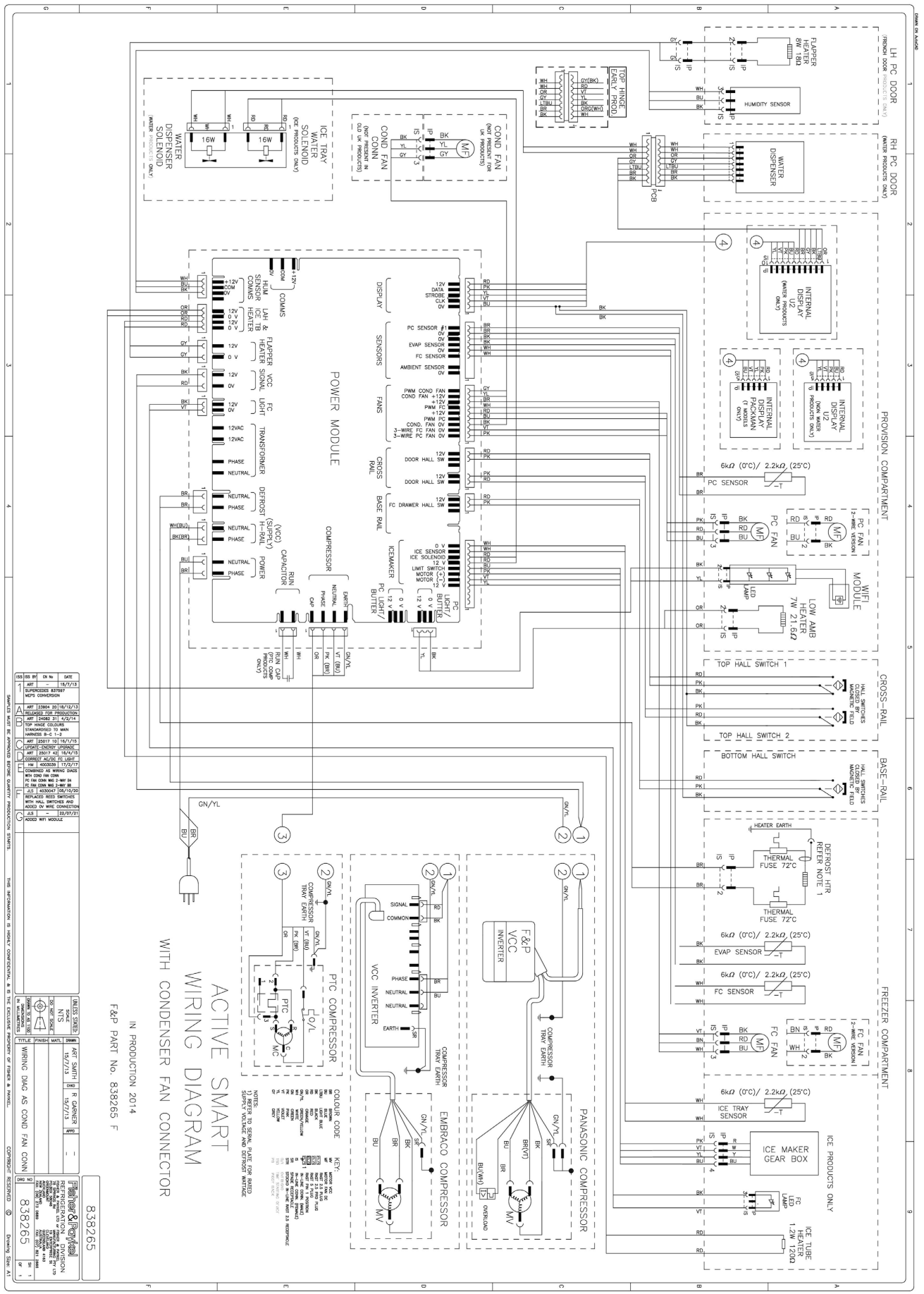
13.6 Compressor replacement

Refer "12.9 Removal of the compressor" for detailed steps on compressor removal.

Before carrying out any work on a sealed system the refrigerant type needs to be identified. The refrigerant type and quantity is written on the serial plate of the product.
Before you cut a pipe or light a torch ensure that the refrigerant has been reclaimed if R134a or released to the atmosphere for R600a. R600a is flammable and should not be released into unventilated areas.

With refrigerant removed it is recommended that the dryer be cut to release the dessicant before unsweating dryer joints. This will avoid heating the dessicant and driving moisture back into the tubing. With the dryer removed unsweating of the joints into the compressor can be completed. The compressor will now be free. Lift clear of the compressor posts and install the replacement. Adequate evacuation must be carried out following the compressor replacement and before recharging with refrigerant.

14. DRAWING


LH PC DOOR
RH PC DOOR
PROVISION COMPARTMENT
CROSS-RAIL
BASE-RAIL
FREEZER COMPARTMENT
POWER MODULE
ACTIVE SMART
WIRING DIAGRAM
WITH CONDENSER FAN CONNECTOR
IN PRODUCTION 2014
F&P PART No. 838265 F
PTC COMPRESSOR
EMBRACO COMPRESSOR
PANASONIC COMPRESSOR
ICE PRODUCTS ONLY
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