Fast Track Troubleshooting

Publication # tsRF268AB Revision Date 03/30/2011

Models Covered:
RF268AB/XAA**
RF268AC/XAA**
French Door Refrigeration

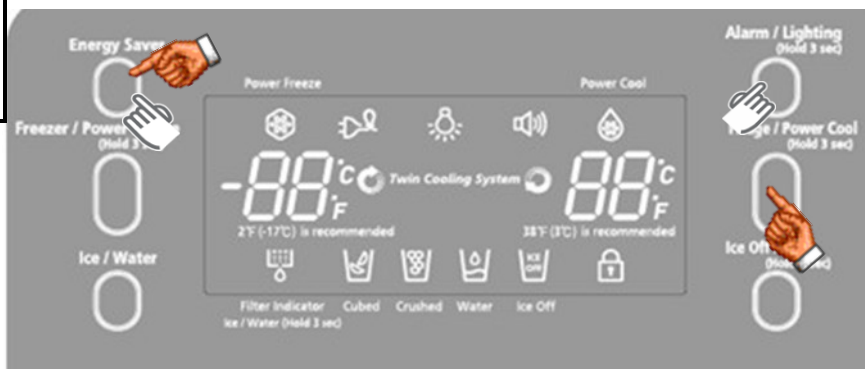
NOTICE:
Parts Change: Refer to bulletins.
11/2010 Door Handle Parts Change
2/2011 Door Handle Parts Change

IMPORTANT SAFETY NOTICE – "For Technicians Only" This service data sheet is intended for use by persons having electrical, electronic, and mechanical experience and knowledge at a level generally considered acceptable in the appliance repair trade. Any attempt to repair a major appliance may result in personal injury and property damage. The manufacturer or seller cannot be responsible, nor assume any liability for injury or damage of any kind arising from the use of this data sheet.

NOTICE: Parts Change

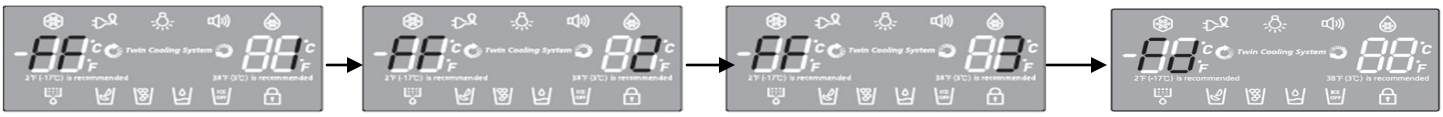
The interior lighting has been changed from incandescent lighting to LED lighting. The new parts are NOT interchangeable with the old parts. See page 5

Forced Mode: Press both buttons (Energy Saver– Fridge) *simultaneously* (No sound when both buttons are pressed at the same time) 'til it beeps and goes blank, 8-12 seconds



Self Diagnosis: Press both buttons (Energy Saver– Alarm) *simultaneously* (No sound when both buttons are pressed at the same time) 'til the display quits blinking and beeps, 8-12 seconds, then release and read Fault Codes. This will also cancel the Fault Mode created by self-diagnosis at power up.

3600RPM **2450RPM** **2200RPM** **Wait 5 seconds between button pushes**



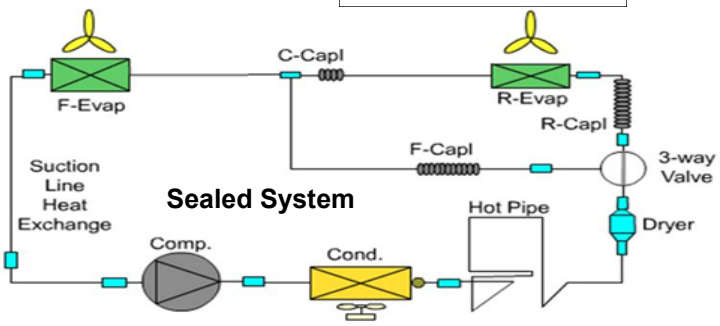
Press Freezer button one time at the Test Mode to Force Compressor High Speed Run, measure fan and Compressor volt-ages at main PCB

Press Freezer button a second time to Force Mid Speed Run

Press Freezer button a third time to Force Low Speed Run

Press Freezer button a forth time to Force De-frost of Fridge & Freezer, measure defrost voltage at main PCB

Refrigerant Charge
R134a 5.64 oz.



Component Value Chart

Component	Resistance	Wattage	Voltage
Freezer Defrost Heater	60Ω	240	120vac
Fridge Defrost Heater	120Ω	120	120vac
French Mullion Heater	1800Ω	8	120vac
Ice Duct Heater	3600Ω	4	120vac
Dispenser Heater	9000Ω	1.6	120vac
Water Tank Heater	72Ω	2	12vdc
Fill Tube Heater FRZ	72Ω	2	12vdc
Sensors	2.5kΩ-89kΩ	N/A	1~4.5vdc
Fans	N/A	N/A	7~12vdc

Sales Mode, No Compressor Operation: Press Energy Saver & Freezer temp buttons simultaneously for 3 sec (you will hear a "Ding Dong") to remove or put into Sales Mode. When in the Sales Mode the Display will show "OF" "OF". Removing power will not cancel this mode.

SUPPORT INFORMATION
Training — Plus One **http://my.plus1solutions.net/clientPortals/samsung/**
Help — GSPN **http://service.samsungportal.com/**
Samsung Product Support TV **http://support-us.samsung.com/spstv/howto.jsp**
Customer information videos and chat programs. Programs for Fridges, Laundry, Ranges & D/W

DC FAN MOTORS

Brushless DC Fan motors are used to save energy. The fans operate at two speeds. Fan speed information is read by the Main PCB. If the fan speed exceeds 600 RPM or the speed is too slow, or stopped the fan drive circuit is disabled, After 10 seconds the circuit tries again with 3 seconds of DC voltage. If the fan continues this activity for 5 cycles, 10 seconds off 3 seconds on, the fan drive circuit is disabled for 10 minutes.

TO TEST THE FAN CIRCUIT VOLTAGE.

Power off and back on to check the DC voltage to the motor, wait from 10 to 60 seconds for the fan voltage to kick in, and then check fan voltage, the average reading is 9 VDC. If you get 3 seconds of voltage every 10 seconds for the 5 fan power up cycles, then the Main PCB is good.

NOTE: You may need to put unit in FORCED FREEZE mode to activate the fans/compressor.

If the fan blade is blocked by ice, then defrost and check the motor again, after removing power from the unit.

If the evaporator is ice blocked and thus blocking the air flow, the fan will over RPM and it is stopped. Remove ice and check the motor again. If everything is clear around the fan blade then the motor would be at fault. Continuous fan errors will be displayed on the front panel display. **PLEASE NOTE:** The door switches control the evaporator fan motors. Have them closed to test the motors. Delay time 10 – 60 seconds.

Sensors

Defrost – The sensor voltage tells the Main PCB to turn off the Defrost Heater At 50^{o} in Freezer, 63^{o} in Fridge

Compartment Temp – The sensor controls fan/compressor on/ off to maintain temp

Ice Production – harvests when the I/M sensor reads 1.5 degrees for 5 minutes, Flex Tray Only.

If the door is opened during that 5 minutes harvest is delayed.

Ambient Sensor

Fan Speeds – Below 60 degrees condenser fan is off

Defrost Timing – The warmer the room the more often the defrost

How to Check Sensor Resistances Accurately

Make ice slurry. To do this, fill a cup with ice (preferably crushed), then add water and a teaspoon of salt to make a slush. Mix thoroughly and allow to sit for 2 to 3 minutes. This will give you a 32*F reference. Now, lower the sensor into the mixture and leave for about 1 minute, then check the resistance. It should be very close to 13,300 ohms. Before reinstalling the sensor, be sure to rinse it with fresh water and dry it.

Temperature/Resistance/Voltage Chart for Samsung Refrigerators Sensors

Temp.	(Ω)	Volts		Temp.	(Ω)	Volts		Temp.	(Ω)	Volts		Temp.	(Ω)	Volts
-29.2°F	64227	4.326		1.4°F	28021	3.685		32.0°F	13290	2.853		62.6°F	6771	2.019
-27.4°F	61012	4.296		3.2°F	26760	3.64		33.8°F	12749	2.802		64.4°F	6521	1.974
-25.6°F	57977	4.264		5.0°F	25562	3.594		35.6 °F	12233	2.751		66.2°F	6281	1.929
-23.8°F	55112	4.232		6.8°F	24425	3.548		37.4 °F	11741	2.7		68.0°F	6052	1.885
-22.0°F	52406	4.199		8.6°F	23345	3.501		39.2 °F	11271	2.649		69.8°F	5832	1.842
-20.2°F	49848	4.165		10.4°F	22320	3.453		41.0°F	10823	2.599		71.6°F	5621	1.799
-18.4°F	47431	4.129		12.2°F	21345	3.405		42.8°F	10395	2.548		75.2°F	5225	1.716
-16.6°F	45146	4.093		14.0°F	20418	3.356		44.6°F	9986	2.498		77.0°F	5000	1.675
-14.8°F	42984	4.056		15.8°F	19537	3.307		46.4°F	9596	2.449		78.8°F	4861	1.636
-13.0°F	40938	4.018		17.6°F	18698	3.258		48.2°F	9223	2.399		80.6°F	4690	1.596
-11.2°F	39002	3.98		19.4°F	17901	3.208		50.0°F	8867	2.35		86.0°F	4218	1.483
-9.4°F	37169	3.94		21.2°F	17142	3.158		51.8°F	8526	2.301		87.8°F	4072	1.447
-7.6°F	35433	3.899		23.0°F	16419	3.107		53.6°F	8200	2.253		89.6°F	3933	1.412
-5.8°F	33788	3.858		24.8°F	15731	3.057		55.4°F	7888	2.205		91.4°F	3799	1.377
-4.0°F	32230	3.816		26.6°F	15076	3.006		57.2°F	7590	2.158		95.0°F	3547	1.309
-2.2°F	30752	3.773		28.4°F	14452	2.955		59.0°F	7305	2.111		96.8°F	3428	1.277
-0.4°F	29350	3.729		30.2°F	13857	2.904		60.8°F	7032	2.064		100.4°F	3204	1.213

Defrost Cycle Timing		
First Defrost Cycle, Both Fridge & Freezer	**Defrost Cycle Fridge only**	**Defrost Cycle Fridge & Freezer**
6 hrs, Pause Time 10 minutes	6~11 hrs (varies according to conditions)	12~23 hrs (varies according to conditions)

FREEZER TEMPERATURE CONTROL BY THE ICE MAKER

Interior Temperature of the freezer will be set to -14 degrees Fahrenheit until the ice bucket is full. When the ice bucket is full, the freezer will maintain original set temperature. Also, whenever the ice is used, the freezer will again set to -14 degrees Fahrenheit. Selecting "Ice Off" will allow the freezer to be controlled by the set temperature. If water is not hooked up, the freezer will always be at –14 unless "Ice Off" is selected.

Heat Release Ice Makers

Heat Release Ice Production Explanation

38 minutes after the water fill is complete, the control board will check the temperature of the eject Thermistor, on the Ice Maker Head, if the Thermistor reads a temperature lower than 18.5 degrees for more than 5 seconds, then the ice production process is completed. The Ice maker will harvest if the ice bucket is not sensed as full. If a Fault Mode is detected with the Ice Maker operation, the Ice Maker stops working for 3 hours. Which means, the Ice Maker checks the operation every 3 hours until it works properly.

Heat Release I/M Test Mode

Press and hold the ICE TEST S/W for at least 1.5sec, the harvest function will start. If the ice maker Thermistor is below 0 degrees the Ice maker heater turns on for about 2 minutes. If the temperature exceeds 0 degrees, Ice maker heater turns on for 30 seconds. After the Ice maker heater turns on for 30 seconds, the heater turns off and then Ice maker harvest motor turns on. The motor will rotate in right direction for about 3 minutes, after this, water supply valve is turned on, then the valve is turned off, the test mode is completed. If the above operation is not carried out within 6 minutes, it will go into a fault mode.

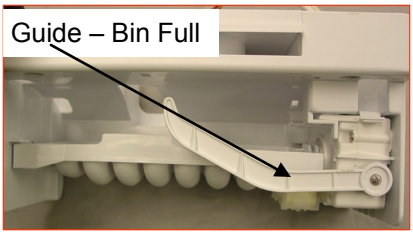
FLEX TRAY Ice Makers

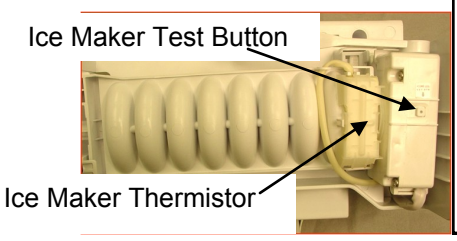
FLEX TRAY Ice Makers

When the initial power is applied, the ice tray will stand by for 2 hours. After the 2-hour standby time, the Ice Maker Sensor will check the temperature, when it is lower than 1.5℉ for more than 5 minutes, it will do a harvest, with or without ice in the tray, then fill with water. 58 minutes after water is supplied to the Ice Tray, the Ice Maker Sensor temperature will be checked. When the Ice Maker Sensor maintains lower than 1.5℉ for 5 minutes, it completes the harvest (if the ice bin is not sensed as full).
Thermistor senses temperature to determine water fill on newer units

Filling the tray

After the water fill is completed, the ice maker sensor will evaluate the water volume one and a half minutes later. When it detects no or low water level, it will add more water. First supply time will be 1.5 sec, next one will be 1 sec and the last will be 2 sec.





Shattered Ice – Flex Tray

When all ice shatters, it's because of a bad tray or ice cube temp that is too cold (lower than -5 degrees). In some areas, there are water issues that can also cause shattered cubes. The temp in the freezer should not have any effect on this issue, as long as it's below 1.5 degrees F, as a properly installed sensor will not read the freezer temp, only the water/ice temp.

Check the Ice tray for defects in the plastic. Ice that is too cold will shatter during harvest. This can be from the (1) sensor not reading the correct temp (2) or the sensor not mounted correctly (3). By programming the icemaker offset value to a lower number (4), the board not understanding the reading.

To check the sensor, you must check the tray temp (not air temp) and compare it to the sensor reading. The sensor should read 3.7 volts at the main board connector when the cube temperature is 1 degree. After the fill, the sensor will read water temp 1.5 to 2.2 volts.

To clear offsets, put unit into Diagnostics mode.

Please note, some shattering is normal for a flex tray icemaker.

Samsung 'Refrigerator' Diagnostic Code Quick Guide			
Error Items	**LED**	**TROUBLE**	**TESTING**
I/M-SENSOR (R on Tw in I/M units)		Ice Maker Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F	The voltage at MAIN PCB Sensor betw een 4.5V~1.0V
R-SENSOR		Refrigerator Room Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F.	The voltage at MAIN PCB Sensor betw een 4.5V~1.0V
DEFROST SENSOR OF R ROOM		Ref. Defrost Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F	The voltage at MAIN PCB Sensor betw een 4.5V~1.0V
R-FAN ERROR		This error indicates the Refrigerator Evap Fan is not spinning at the correct RPM or the fan feedback line is open.	Fan voltage at MAIN PCB shall be betw een 7V~12V
I/M FUNCTION ERROR(R on Tw in I/M)		This error indicates the Ice tray has not returned to level after an ice harvest. The error is displayed after three failed attempts.	Replace I/M
COOL SELECT ZONE SENSOR		Cool Select Zone Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F	The voltage at MAIN PCB Sensor betw een 4.5V~1.0V
R-DEFROSTING ERROR		Refrigerator Room defrost heater- open or short-circuit, connector failure, or defective temperature fuse/bi-metal. Defrost on over 80 minutes	Disconnect defrost connector from PCB, check resistance
PANTRY-DAMPER-HEATER ERROR		Sensor system in Pantry Room errors	Disconnect heater connector from PCB, check resistance
PANTRY-SENSOR ERROR		CR Room Sensor Error- This can be an open or short-circuit, contact failure. Cause is also a temperature reading > 122°or < -58 ° F.	The voltage of MAIN PCB Sensor betw een 4.5V~1.0V
I/M-SENSOR (F on Tw in I/M units)		Ice Maker Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F	The voltage at MAIN PCB Sensor betw een 4.5V~1.0V
I/M FUNCTION ERROR(F on Tw in I/M)		This error indicates the Ice tray has not returned to level after an ice harvest. The error is displayed after three failed attempts.	Replace I/M
WATER HEATER ERROR		Error is displayed w hen the w ater reservoir tank heater is open or shorted	Disconnect heater connector from PCB, check resistance
EXT-SENSOR		Ambient Temp. Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F	The voltage at MAIN PCB Sensor betw een 4.5V~1.0V
F-SENSOR		Freezer Compartment Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F	The voltage at MAIN PCB Sensor betw een 4.5V~1.0V
F-DEF-SENSOR		Freezer Room Defrost Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F	The voltage at MAIN PCB Sensor betw een 4.5V~1.0V
F-FAN ERROR		This error indicates the Freezer Evap. Fan is not spinning at the correct RPM or the fan feedback line is open.	Fan voltage at MAIN PCB shall be betw een 7V~12V
C-FAN ERROR		This error indicates the Condenser Fan is not spinning at the correct RPM or the fan feedback line is open.	Fan voltage at MAIN PCB shall be betw een 7V~12V
FRENCH DOOR ICE ROOM SENSOR		Ice Room Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F	The voltage at MAIN PCB Sensor betw een 4.5V~1.0V
F-DEFROSTING ERROR		Freezer defrosting heater- open or short-circuit, connector failure, or defective temperature fuse/bi-metal. Defrost on for over 80 minutes	Disconnect defrost connector from PCB, check resistance
FRENCH DOOR ICE ROOM FAN ERROR		This error indicates the Ice Room Compartment Evap. Fan is not spinning at the correct RPM or the fan feedback line is open.	Fan voltage at MAIN PCB shall be betw een 7V~12V
ICE PIPE HEATER ERROR		Error is displayed w hen the ice maker fill pipe heater is open or shorted.	Replace Fill Tube Ass'y
Uart ERROR COMMUNICATION		This error is not applicable, if the error is detected during diagnostic testing please ignore it.	No Repair Necessary
L↔M ERROR COMMUNICATION		Communication error w ithin the Main PCB	Replace main PCB
P↔M ERROR COMMUNICATION		Communication betw een the Main PCB and Keypad	Check w iring in door & cabinet, Panel PCB, Main PCB

SERVICE BULLETIN

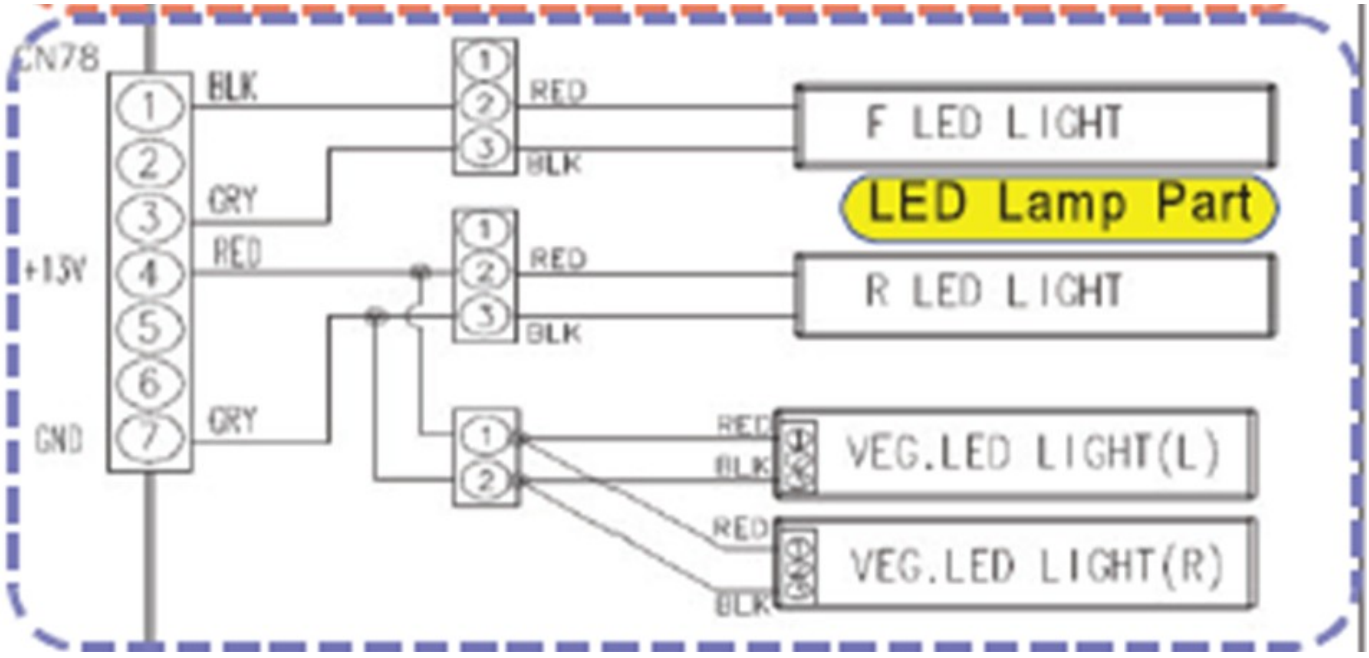
PRODUCT: Refrigerator

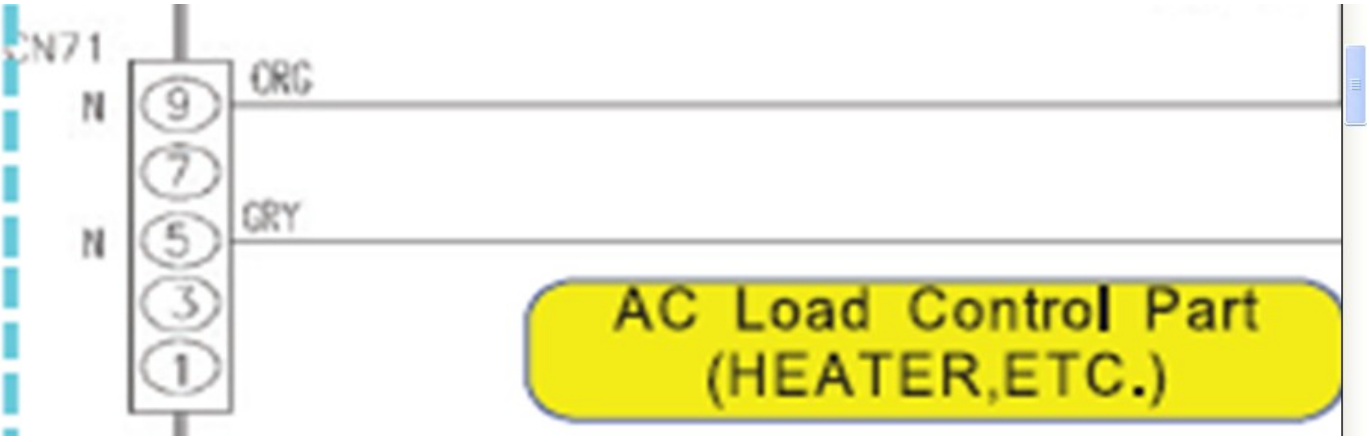
BULLETIN NUMBER: ASC20100714001

DATE:

07/14/2010

Please review before ordering any parts.





CN78
1-3 Fz LED (Blk-Gry)
4-7-FF LED (Red-Gry)

CN71 All 120vac
5-N (Gry)
9-Def Htr Common (Org)

CN= Connector # for measuring voltages; () means go to connector #, pin # shown in () for voltage common.
CN30 Sensors & Switches Component Name
4-(CN76-1) F Def Sensor (Org-Gry) 2.3~4.2vdc
Voltage on operating component
Pin #s & wire colors on each connector to measure voltages

Key To Read PCB Layout

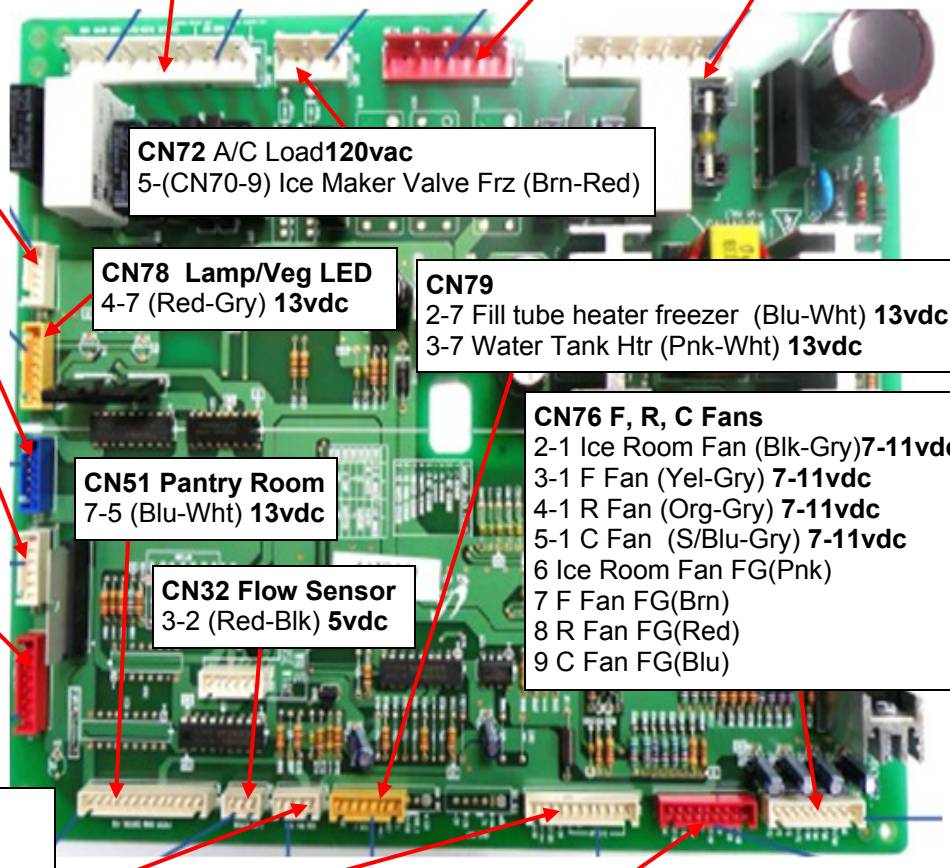
Model: RF268AA/XAA**
Dual Ice Maker
nominal voltages listed
(early production)

CN74 A/C Load **120vac**
1-(CN70-9) Cube Solenoid (Yel-Red)
3-(CN70-9) Auger Motor (Pnk-Red)
5-(CN70-9) Dispenser Valve (W/Blk-Red)
7-(CN70-9) I/M Valve Fridge (Prp-Red)
9-(CN70-9) Ice Cover Route (Blu-Red)
11-(CN70-9) I/M Motor CW (R) (Brn-Red)
13-(CN70-9) I/M Motor CCW (R) (Wht-Red)

CN70 A/C Load **120vac**
1-11 I/M Heater (Blk-Gry)
3-11 French-Dsp Heaters (Yel-Gry)
5- (CN71-9) R Defrost (Wht-Org)
7- (CN71-9) F Def/Ice Duct heater (Brn-Org)
9- L1 (Red)
11- N (Gry)

CN71 A/C Load **120vac**
3-(CN70-9) F Lamp (Prp-Red)
5 N (Gray)
9 Heater Common (Org)

CN31 Sensor
1-4 Ambient Sensor (Wht-Wht) **1.2~2 vdc**
2-(CN90-8) I/M (Blu-S/Blu) **5vdc**
3-(CN76-1) Ice Room Sensor (Org-Gry) **3~3.8vdc**



CN72 A/C Load**120vac**
5-(CN70-9) Ice Maker Valve Frz (Brn-Red)

CN77 Stepper Motor
1-(CN76-1) (Red-Gry) **13vdc**

CN78 Lamp/Veg LED
4-7 (Red-Gry) **13vdc**

CN79
2-7 Fill tube heater freezer (Blu-Wht) **13vdc**
3-7 Water Tank Htr (Pnk-Wht) **13vdc**

CN91 Pantry Room Damper
1-2 Damper Heater (Blk-Brn) **13vdc**
3-4 Damper Motor (Wht-Blu)
5-6 Damper Motor (Yel-Red)

CN76 F, R, C Fans
2-1 Ice Room Fan (Blk-Gry)**7-11vdc**
3-1 F Fan (Yel-Gry) **7-11vdc**
4-1 R Fan (Org-Gry) **7-11vdc**
5-1 C Fan (S/Blu-Gry) **7-11vdc**
6 Ice Room Fan FG(Pnk)
7 F Fan FG(Brn)
8 R Fan FG(Red)
9 C Fan FG(Blu)

CN51 Pantry Room
7-5 (Blu-Wht) **13vdc**

CN32 Flow Sensor
3-2 (Red-Blk) **5vdc**

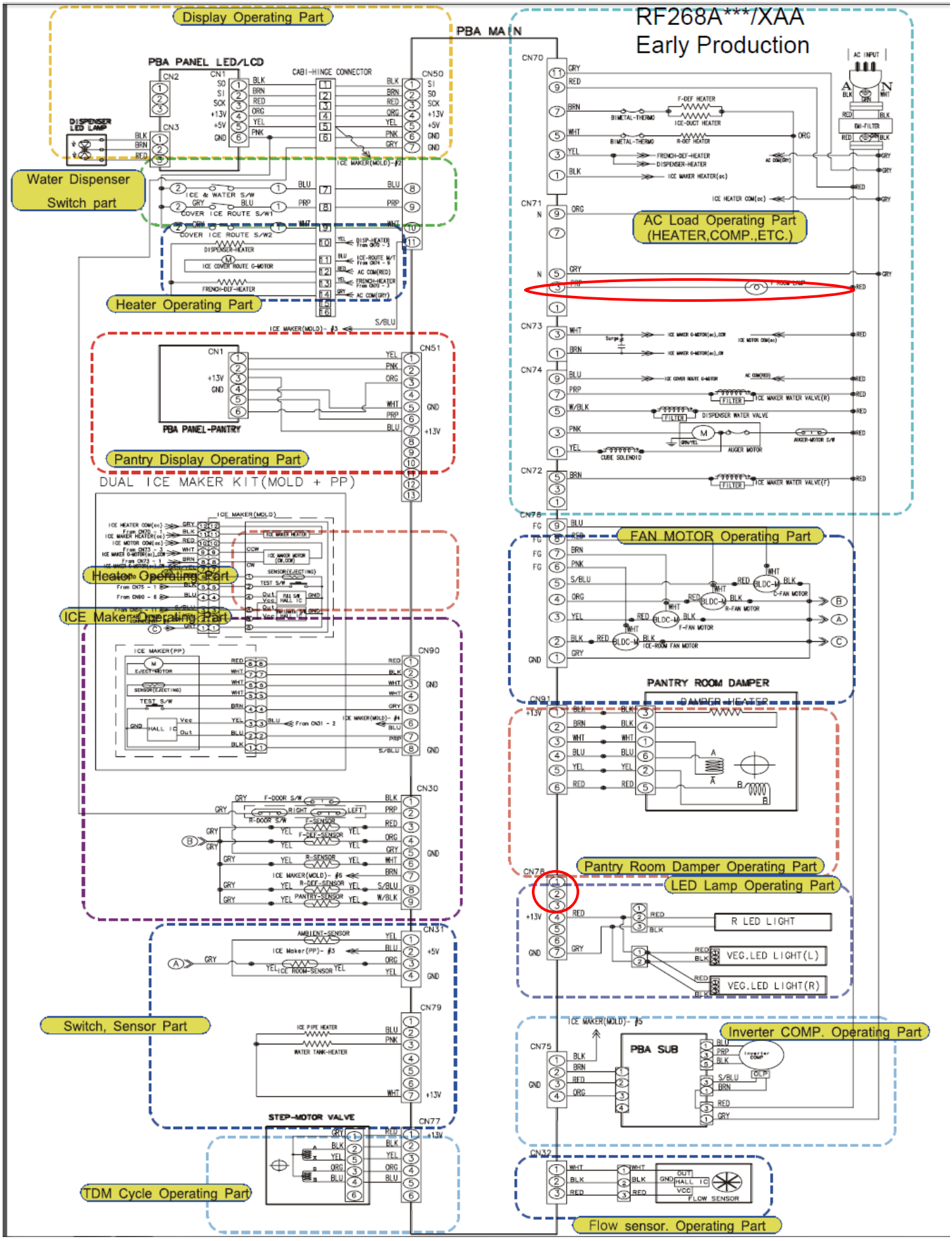
CN90 Ice Maker
1-2 I/M Mtr Frz (Red-Blk) **13vdc**
3-4 Eject Sensor Frz(Wht-Wht) **2.1~3.7vd**
5-8 Test Sw Frz (Gry-S/Blu) **5vdc**
6 Full Hall IC Fridge I/M (Blu)
7 Horiz Hall IC Frz (Prp)
8 **Ground vdc** (S/Blu)

CN75 To Comp Inverter Board
1- (CN76-1) (Blk-Gry) **13vdc**
2- (CN76-1) (Brn-Gry) **5vdc**
4-3 Compressor control (Org-Red) **2~2.8vdc**

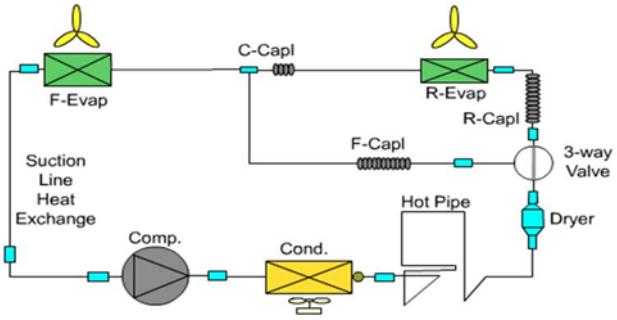
CN50 Display
4-6 (Org-Pnk) **13vdc**
5-6 (Yel-Pnk) **5vdc**
7 Fridge Door Sw (Gry) **(vdc ground)**
8-6 Ice/Water Sw (Blu-Pnk) **5vdc**
9-6 Ice Rte Sw 1(Prp-Gry) **5vdc**
10-6 Ice Rte Sw 2 (Wht-Gry) **5vdc**
11 Fridge I/M Horiz Sw (S/Blu) **5vdc**

CN30 Sensors & Switches
1-5 Freezer Dr Sw (Blk-Gry) **5vdc**
2-(CN50-7) R Door Sw (Prp-Gry) **5vdc**
3-(CN76-1) F Sensor (Red-Gry) **3.5~4.2vdc**
4-(CN76-1) F Def Sensor (Org-Gry) **2.3~4.2vdc**
6-(CN76-1) R Sensor (Wht-Gry) **2.4~2.8vdc**
7-(CN76-1) Eject Sensor Fridge I/M (Brn-Gry) **2.1~3.3vdc**
8-(CN76-1) R Def Sensor (S/Blu-Gry) **2~4.2vdc**
9- (CN76-1) Pantry Sensor (W/Blk-Gry) **2.6~2.8vdc**

= Late Production change



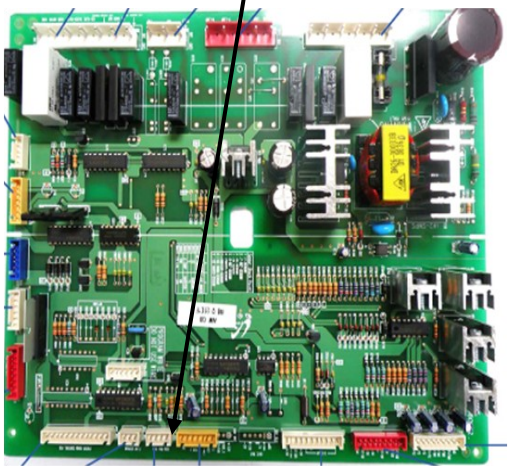
Compressor & System Operation Testing



The Time Divided Multi-cycle (TDM) System (Stepper Valve) is used to switch refrigerant flow . This improves temperature control and energy efficiency.
If it fails in the all evaporator mode, it should work properly, using slightly more energy. If it fails in the Freezer evaporator only mode, there will be a Fridge no cool Force on the Fridge with the "Power Cool" option. Monitor the Fridge evaporator(s) temp by using the Defrost Sensor(s). If the temp doesn't decrease, then suspect the Main PCB is not supplying signal to switch the diverter valve.

TEST BEFORE INTERPRETING LED BLINKING FREQUENCY
Compressor not running
1. Activate Forced Compressor Operation, wait 2 minutes (in case of high head pressure)
2. If compressor doesn't start, check CN75 for 2~2.8vdc (if not there replace Main PCB)
3. Check for 120vac to inverter PCB CN02 L-N
4. If voltage is OK, remove power, disconnect CN03 (Inverter PCB) and check resistance to the windings. Aproxametly10 ohms. If not correct , inspect wire harness, if OK replace compressor.
5. Disconnect CN02 (SMPS PCB), check resistance to Overload , if open replace overload.

CN75 To Comp Inverter Board
2-3 (Brn-Gry) **5vdc**
4-3 Comp control (Org-Gry) **2~2.8vdc**



CN03 Compressor Windings
1 Compressor (Blue)
3 Compressor (Prp)
5 Compressor (Wht)

CN04 Compressor Control
2- (CN40-4) 5vdc (Brn-Gry)
4 Comp Signal (Org)

CN02 Overload & A/C Line
1 OLP (Brn)
3 OLP (S/Blu)
3 L (Blk)
1 N (Red)

Protection Functions	LED Blinking Frequency	Test	Replace
Starting Failure	●	Check the Inverter PCB & Comp Relay Connectors	Connectors OK,replace Inverter PCB, if same, replace compressor
SPM Fault	● ●	If blinking after reset,	Check System for restriction & refrigerant, if OK replace Inverter, if same, replace compressor
Detecting Position Failure	● ● ●	Check Inverter Connectors,	Connectors measure OK, replace compressor, if same, replace Inverter PCB
Motor Locked	● ● ● ●	Compressor Locking	Compressor
Low Voltage	● ● ● ● ●	Compressor Locking, check input voltage	Replace Inverter PCB, if same, replace Compressor
Over Voltage	● ● ● ● ● ●	Compressor Locking, check input voltage	Replace Inverter PCB, if same, replace Compressor