



Fast Track Troubleshooting

Publication # nwRFG29PHD Revision Date 09/28/11

Models Covered:
RFG29PHDBP
RFG29PHDPN
RFG29PHDRS
RFG29PHDWP

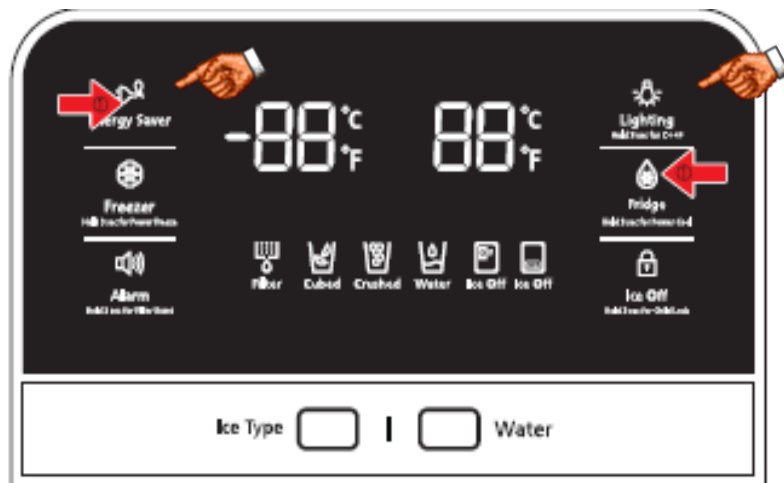
IMPORTANT SAFETY NOTICE – “For Technicians Only” This service data sheet is intended for use by persons having electrical, electronic, and mechanical experience and knowledge at a level generally considered acceptable in the appliance repair trade. Any attempt to repair a major appliance may result in 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.



Self Diagnosis: Press both buttons (Energy Saver– Lighting) *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.

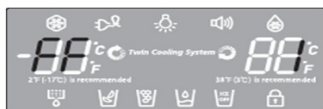
This will also cancel the Fault Mode created by self-diagnosis at power up.

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



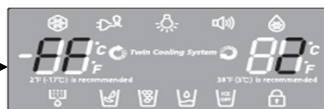
Wait 5 seconds between button pushes

3600RPM



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

2450RPM



Press Freezer button a second time to Force Mid Speed Run

2200RPM



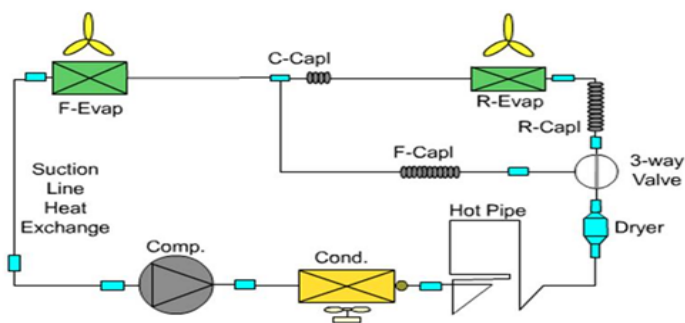
Press Freezer button a third time to Force Low Speed Run



Press Freezer button a fourth time to Force Defrost of Fridge & Freezer, measure defrost voltage at main PCB

Sealed System

Refrigerant Charge
R134a 5.64 oz.



1. Compressor → Sub-condenser → Hot Pipe → Back Cluster Pipe → Dryer → R Capillary Tube → Refrigerator Evaporator → Connected Capillary → Freezer Evaporator → Suction Pipe → Compressor
2. Compressor → Sub-condenser → Hot Pipe → Back Cluster Pipe → Dryer → F Capillary Tube → Freezer Evaporator → Suction Pipe → Compressor

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.

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	7200Ω	2	120vac
Water Tank Heater	72Ω	2	12vdc
Sensors	2.5kΩ-89kΩ	N/A	1~4.5vdc
Fans	N/A	N/A	7~12vdc

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 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.

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.

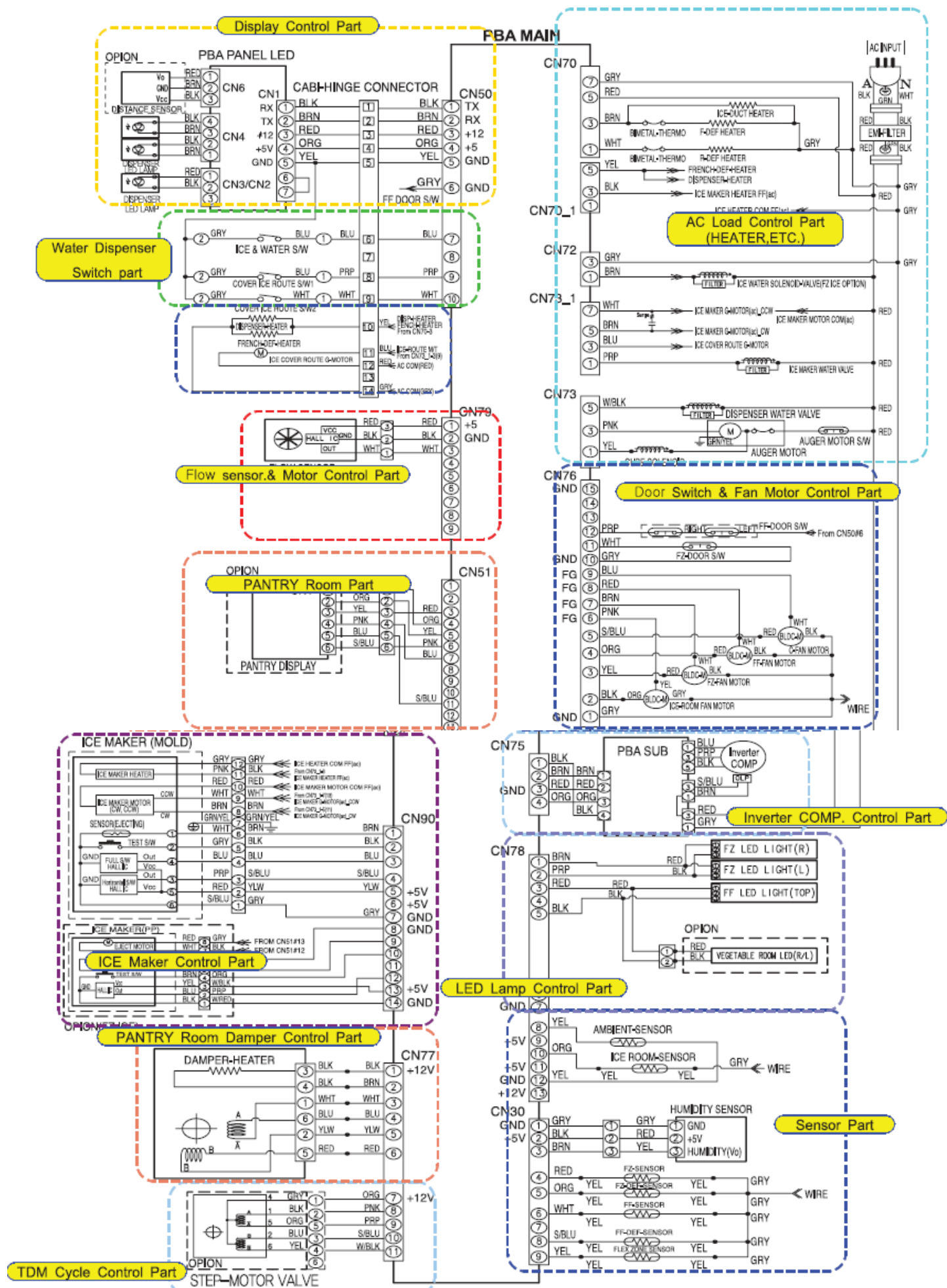
FREEZER TEMPERATURE CONTROL BY THE ICE MAKER

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.

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

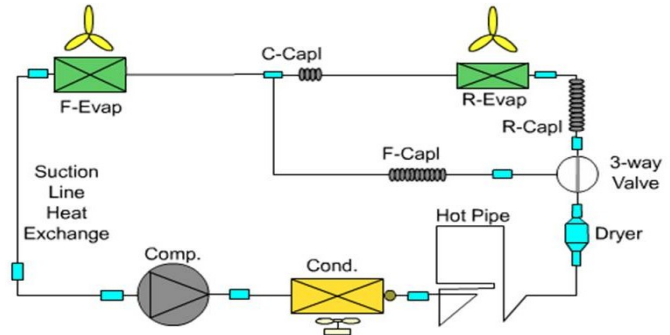
Error Code	Item	Trouble contents
1 E	FZ SENSOR ERROR	The respective sensor is read as open or shorted, check the wiring connections in the respective compartment and at the Main PCB
2 E	R SENSOR ERROR	
4 E	FZ DEF SENSOR ERROR	
5 E	R DEF SENSOR ERROR	
6 E	AMBIENT-SENSOR ERROR	
7 E	FLEX SENSOR ERROR	
13 E	HUMIDITY-SENSOR ERROR	The Humidity sensor is read as open or shorted, check the wiring connections in the respective compartment and at the Main PCB
14 E	IM SENSOR ERROR	The respective sensor is read as open or shorted, check the wiring connections in the respective compartment and at the Main PCB
15 E	ICE RM SENSOR ERROR	
21 E	FZ FAN ERROR	The Freezer Fan motor is read as not connected or the fan has stopped, check the wiring connections in the freezer and at the Main PCB
22 E	R FAN ERROR	The Ref. Fan motor is read as not connected or the fan has stopped, check the wiring connections in the freezer and at the Main PCB
23 E	C-FAN ERROR	The Comp. Fan motor is read as not connected or the fan has stopped, check the wiring connections in the freezer and at the Main PCB
24 E	FZ DEF FUNCTION ERROR	The freezer defrost heater is read as open or the heater has been heating continuously for more than 80 minutes.
25 E	R DEF FUNCTION ERROR	The refrigerator defrost heater is read as open or the heater has been heating continuously for more than 80 minutes.
39 E	IM FUNCTION ERROR	The Icemaker release heater reads as open circuit
40 E	ICE-ROOM-FAN ERROR	The Ice Room Fan motor is read as not connected or the fan has stopped, check the wiring connections in the freezer and at the Main PCB
41 E	MAIN<->LCD COMM ERROR	The Main PCB and the LCD display are not communicating properly verify the wiring at both PCB's
81 E	COMP STARTING FAILURE	The compressor did not start properly, check for an overload condition
82 E	COMP IPM FAULT ERROR	Inverter power control issue, Check the Inverter Drive PCB
83 E	COMP ABNORMAL CURRENT DETECTION	Excessive current detected at the Compressor check the compressor windings for shorts
84 E	COMP MOTOR LOCKED OVER RPM ERROR	Compressor Over speed error check for low refrigerant levels
85 E	COMP UNDER VOLTAGE	Low voltage to the compressor Check the DC supply from the Main PCB
86 E	COMP OVER VOLTAGE	Over voltage to the compressor Check the DC supply from the Main PCB



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 2.5vdc (if not there replace Main PCB)
3. 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.
4. Disconnect CN02 (SMPS PCB), check resistance to Overload , if open replace overload.

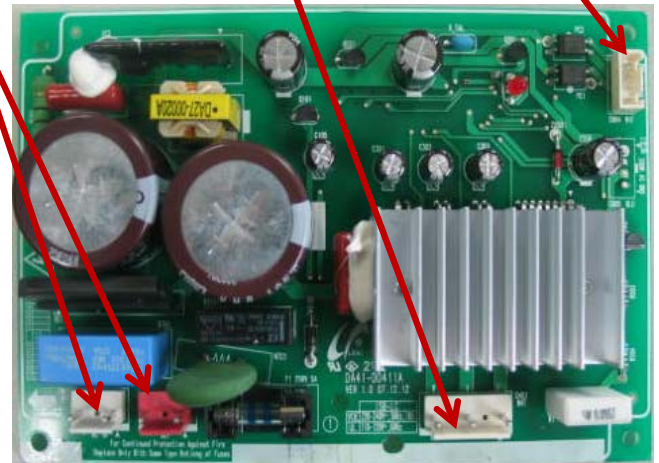
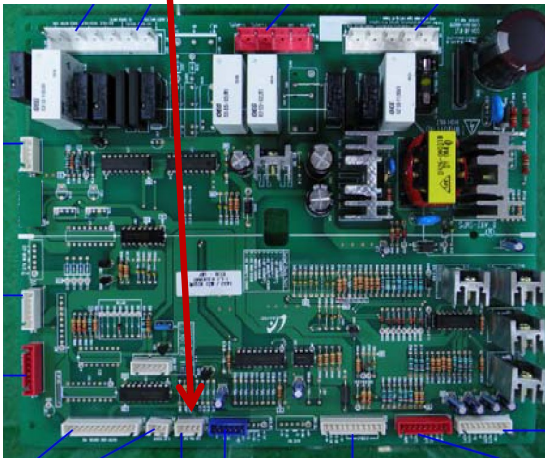


CN75 To Comp Inverter Board
 2- (CN76-1) (Brn-Gry) 5vdc
 4- (CN76-1) Comp control (Org-Gry) 2.5vdc

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

CN04 Compressor Control
 1-(CN76-1) +13vdc (Blk-Gry)
 2-(CN76-1) 5vdc (Brn-Gry)
 4 Comp Signal (Org)

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



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

CN70 - AC LOAD

- ① : FF-DEF-HEATER
- ② : FZ-DEF-HEATER
- ③ : ICE DUCT HEATER
- ④ : COMMON2 LINE(L)
- ⑤ : COMMON1 LINE(N)

CN70_1 - AC LOAD

- ① : Open
- ② : ICE MAKER HEATER(FF)
- ③ : FRENCH-HEATER
- ④ : DISPENSER-HEATER

CN72 - AC LOAD

- ① : Open
- ② : COMMON1 LINE(N)

CN73_1 - AC LOAD

- ① : ICE WATER SOLENOIDE VALVE(FF)
- ② : ICE COVER ROUTE
- ③ : ICE MAKER MOTOR(CW)
- ④ : ICE MAKER MOTOR(CCW)

CN73 - AC LOAD

- ① : CUBE SOLENOIDE VALVE
- ② : AUGER MOTOR
- ③ : WATER SOLENOIDE VALVE

CN78 - LAMP(LED)/Sensor

- ① : FZ LAMP(LED)
- ② : GND
- ③ : FF LAMP(LED)
- ④ : Open
- ⑤ : GND
- ⑥ : Open
- ⑦ : Open
- ⑧ : AMBIENT Sensor
- ⑨ : Open
- ⑩ : ICE ROOM Sensor
- ⑪ : +5V
- ⑫ : GND
- ⑬ : +12V

CN75 - Inverter

- ① : COMP. SIGNAL INPUT
- ② : +5V
- ③ : GND
- ④ : COMP. SIGNAL OUTPUT

CN50

- ① : LED PANEL TX
- ② : LED PANEL RX
- ③ : +12V
- ④ : +5V
- ⑤, ⑥ : GND
- ⑦ : ICE&WATER Switch
- ⑧ : Open
- ⑨ : ICE Route Switch 1
- ⑩ : ICE Route Switch 2

CN30 - Sensor

- ① : GND
- ② : +5V
- ③ : Humidity
- ④ : FZ-Sensor
- ⑤ : FZ-DEF-Sensor
- ⑥ : FF-Sensor
- ⑦ : ICE MAKER DEF-Sensor
- ⑧ : FF-DEF-Sensor
- ⑨ : Pantry Room Sensor

CN76 - BLDC Motor & door Switch

- ① : GND
- ② : Ice Room-FAN operation signal
- ③ : FZ-FAN operation signal
- ④ : FF-FAN operation signal
- ⑤ : C-FAN operation signal
- ⑥ : Ice Room-FAN signal input volt
- ⑦ : FZ-FAN signal input volt
- ⑧ : FF-FAN signal input volt
- ⑨ : C-FAN signal input volt
- ⑩ : GND
- ⑪ : FZ-Door Switch
- ⑫ : FF-Door Switch
- ⑬ : Open
- ⑭ : Open
- ⑮ : Open

CN51 - Pantry Room Display

- ① : Open
- ② : Open
- ③~⑦ : Open
- ⑧~⑩ : Open
- ⑪ : Pantry Room Switch
- ⑫ : ICE MAKER(FZ) MOTOR CW
- ⑬ : ICE MAKER(FZ) MOTOR CCW

CN79

- ① : +5V
- ② : GND
- ③ : Flow Sensor Out
- ④ ~ ⑥ : Open

CN77 - Damper & Valve

- ①~② : Damper Heater
- ③~⑥ : Damper Motor
- ⑦ : +12V
- ⑧~⑩ : Step Valve

CN90 - Ice Maker

- ① : Sensor(FF)
- ② : Test Switch(FF)
- ③ : Full Switch
- ④ : Horizontal Switch
- ⑤ : +5V
- ⑥ : Open
- ⑦ : GND
- ⑧ : GND
- ⑨ : Sensor(FZ)
- ⑩ : Test Switch(FZ)
- ⑪ : Open
- ⑫ : Hall IC Output
- ⑬ : +5V
- ⑭ : GND

