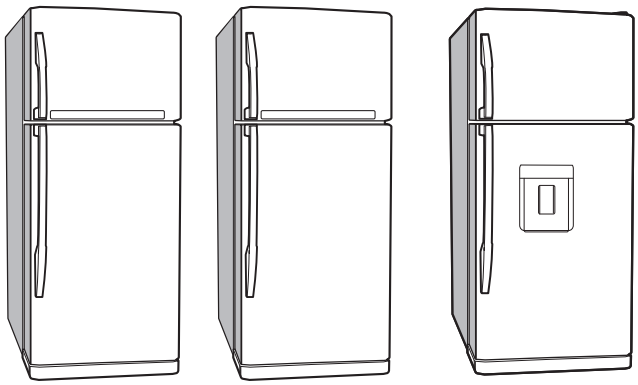
LG

REFRIGERATOR

SERVICE MANUAL

CAUTION
BEFORE SERVICING THE UNIT, READ THE "SAFETY PRECAUTIONS" IN THIS MANUAL.



MODEL : GL-F/H/C/T502/432H***

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SAFETY PRECAUTIONS

Please read the followings before servicing your refrigerator.

1. Check if an electric leakage occurs in the set.
2. To prevent electric shock, unplug prior to servicing.
3. In case of testing with power on, wear rubber gloves to prevent electric shock.
4. If you use any appliances, check regular current, voltage and capacity.
5. Don't touch metal products in cold freezer with wet hand. It may cause frostbite.
6. Prevent water flowing to electric elements in mechanical parts.
7. When you stand up during observing the lower part with the upper door open, move with care to prevent head wound which may happen by hitting the upper door.
8. When sloping the set, remove any materials on the set, especially thin plate type. (ex.: glass shelf or books.)
9. When servicing evaporator part, wear cotton gloves without fail. It is to prevent wound by sharp fin of vaporator.
10. Leave a breakage of refrigerating cycle to a heavy service center. The gas in cycle inside may soil ambient air.

SERVICING PRECAUTIONS

Air Recharging in Compressor

Test the refrigeration by connecting it electrically before refilling operation. It is necessary to ascertain the function of the motor-compressor and identify the defects immediately. If the defects have been found, empty the old system of eventual R-600a residue by breaking off the end of the extension piece at its narrow point. (Figure 1)

Replace the filter and any damaged components. Unsolder and pull off the piece remaining inside the service tube and then attach an extension completely with male Hansen and last, solder it to the same tube again. (Figure 2)

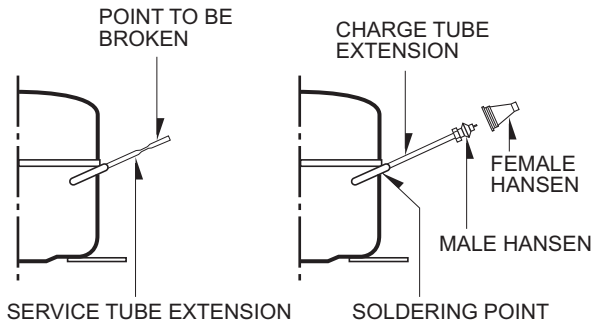


Figure 1

Figure 2

It is necessary to execute the soldering operation with valve open so that the fumes caused by oil residue can come out freely without blowholes between two tubes during heating the point to be soldered.

The extension fitted with the male Hansen is connected to the female fitting of the vacuum pump tube. (Figure 3)

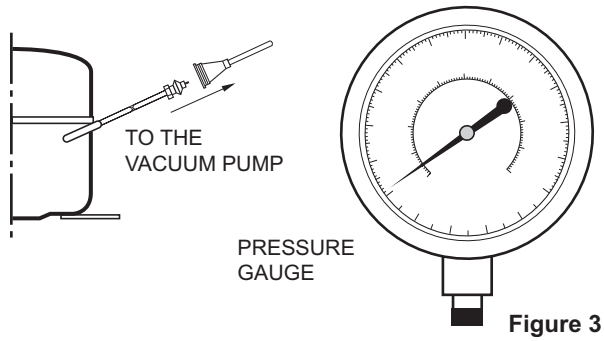


Figure 3

Air evacuating from the system begins so soon as the pump starts. The refrigeration system must be kept under vacuum until the reading on the low-pressure gauge indicates vacuum (0 absolute, -1 atm., -760 mm hg) in any case it is advisable to keep the pump running for about 60 minutes. (Figure 3)

In case that a considerable leakage occurs and to stop the vacuum pump will be necessary and add a small quantity of gas to the system, if vacuum should not be obtained (pressure gauge can't fall to 1 atmosphere), start the refrigeration unit and find the leakage with the special leak-finder. When the defective soldering point is visible, re-do it after opening the extension tube valve and reestablishing the normal outside pressure inside the group.

Because the melted alloy is sucked into the tubes and block them, the pressure must be rebalanced when vacuum is in the system in soldering. As soon as the vacuum operation is over, add the quantity in grams of R-600a to the refrigerant system. Remember that every system has an exact quantity of R-600a with a tolerance of ⊥5 grams that can be added. (Figure 4)

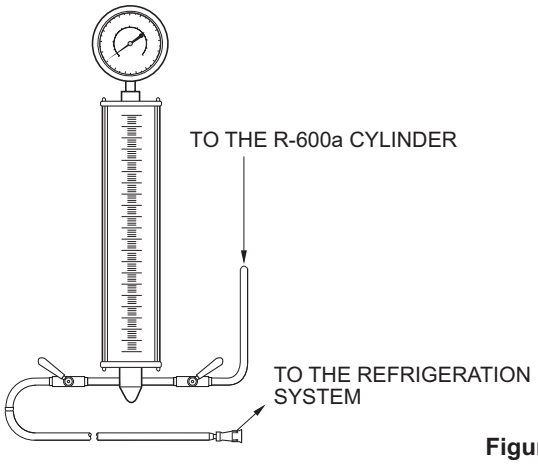


Figure 4

Before performing this operation (if the vacuum pump and refilling cylinder are connected), make sure that the valve placed between the vacuum pump and refilling tube are closed to keep the gas for adding to the system. (Figure 5)

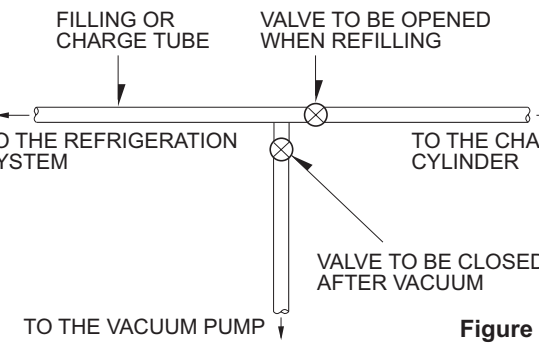


Figure 5

In addition, check the graduated scale on the cylinder for the quantity of R-600a to be added, for example, if we have 750 grams of Gas in the cylinder and must add 165 grams to the group, this amount will be reached when R-600a has dropped to 585 grams, remembering that the indicator shows a lower limit of meniscus. Do this after choosing the scale corresponding to the gas pressure different scales reported as the same gas pressure indicated by the pressure gauge on the top of the column.

To make R-600a flow into the system, open the valve placed at the base of the cylinder and connected to the filling tube. The amount of gas cannot be added to the system all at once because it may cause a blocking of motor-compressor. Therefore, proceed by adding original quantity of about 20-30 grams and close the valve immediately.

The pressure rises and the motor-compressor must start, sucking the gas and making the pressure go down again. Regulate the valve again, maintaining the same manner until reaching to the quantity of R-600a established for the system being charged. When the system is running, the suction pressure must be stabilized between 0.10 to 0.4 atmosphere.

1. SPECIFICATIONS

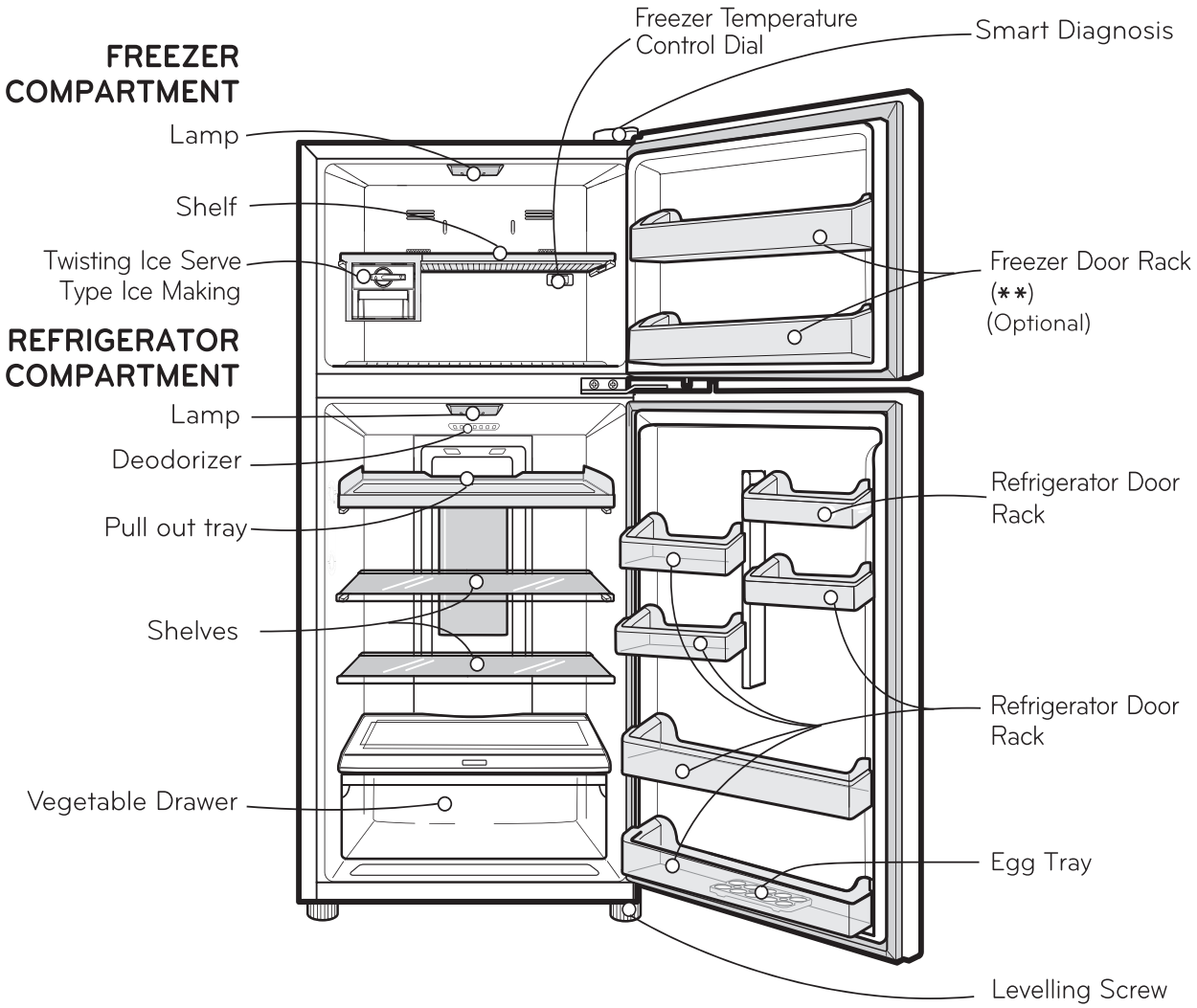
ITEMS		SPECIFICATIONS					
		GL-F502	**GL-H502**	**GL-C502**	**GL-F432**	**GL-H432**	**GL-C432**
NET CAPACITY (l)	FREEZER	117	117	117	117	117	117
	REFRIGERATOR	321	321	321	293	293	293
	TOTAL	438	438	438	410	410	410
DIMENSIONS (mm)		700(W) x 730(D) x 1780(H)			700(W) X 730(D) X 1680(H)		
NET WEIGHT (kg)		73			71		
TEMPERATURE CONTROL	FREEZER	Knob Dial					
	REFRIGERATOR	Micom Control					
DEFROSTING SYSTEM		Full Automatic Heater Defrost					
OUT CASE		Pre Coated Metal					
INNER CASE		ABS					
INSULATION		Cyclo-Pentane Foam					
SHELF	FREEZER	1 EA					
	REFRIGERATOR	2 EA					
VEGETABLE TRAY		Drawer Type					
EGG TRAY		1 Piece					
ICE TRAY		2 Pieces					
ICE BANK		1 Piece					
COMPRESSOR		Middle Inverter Comp					
EVAPORATOR		Fin Tube Type					
CONDENSER		Wire Condenser					
REFRIGERANT		R-600a (61g)					
DEFROSTING DEVICE		L-Cord Heater					

2. PARTS IDENTIFICATION

2-1. FEATURE CHART

▶ GL-H/C502/432

❒ Regular Model



NOTE

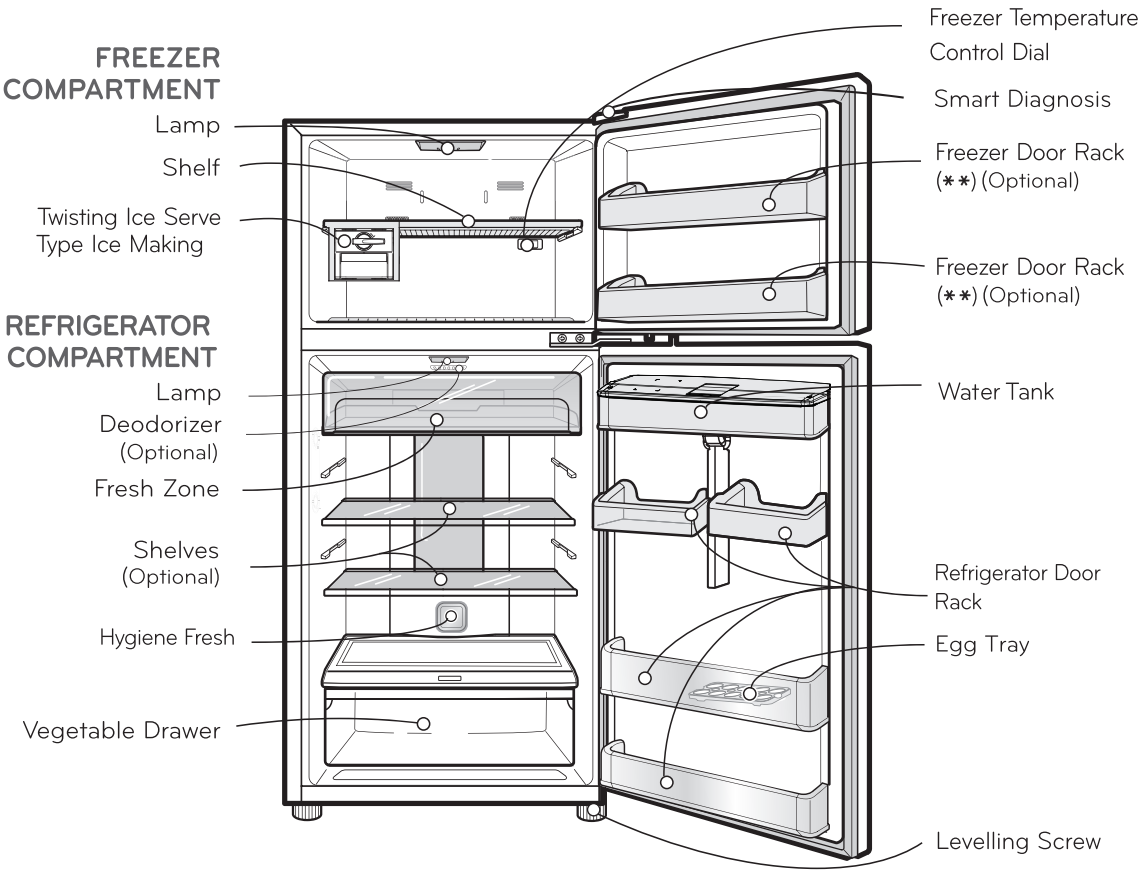
- This guide covers several different models. The refrigerator you have purchased may have some or all of the features shown above.
- To keep a position of inner parts like as baskets, drawers and shelves supplied by manufactureris the most efficient usage for energy saving.

2. PARTS IDENTIFICATION

2-1. FEATURE CHART

▶ GL-F/T502/432

❒ DISPENSER MODEL



NOTE

- This guide covers several different models. The refrigerator you have purchased may have some or all of the features shown above.
- To keep a position of inner parts like as baskets, drawers and shelves supplied by manufactureris the most efficient usage for energy saving.

3. DISASSEMBLY

3-1 DOOR

● Freezer Door

1.Remove the Cover PCB by loosening 2 screw first.
2.Remove the hinge cover by loosening 2 screw and pulling it upwards.
3.Remove Door L/Wire From Main PCB and Wifi PCB, SDS from Cover hinge.
4.Loosen hexagonal bolts fixing the upper hinge to the body and lift the freezer door.

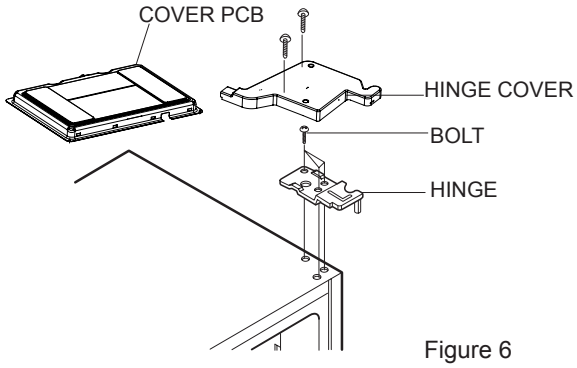


Figure 6

4. Pull out the door gasket to remove from the door foam Ass'y.

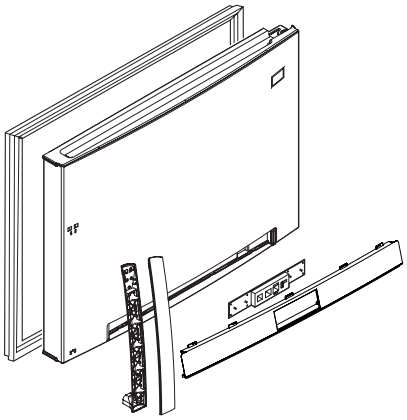


Figure 7

● **Refrigerator Door**

1. After disassembly Cover Lower, remove Heater L/Wire from case.
2. Loosen front screw and hexagonal bolts fixing the lower hinge to the body to remove the refrigerator door only.

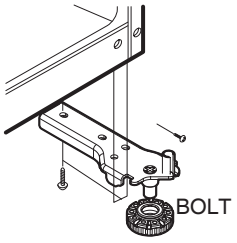


Figure 8

3. Pull out the door gasket to remove from the door foam Ass'y.

3-2HANDLE

1.Disassemble the handle, deco and handle, base

1) Remove handle, deco by pulling it out with tooling.



Freezer handle



Refrigerator handle

2) Remove handle, base by loosening screws.



Freezer (2 screws)
Refrigerator (3 screws)



Freezer (2 screws)
Refrigerator (2 screws)

2.Assemble the new handle, deco and handle, base

1) Assemble new handle, base by tightening screws.



Freezer (2 screws)
Refrigerator (3 screws)



Freezer (2 screws)
Refrigerator (2 screws)

2) Assemble handle, deco by pushing it after inserting upper and lower part first.





3-3 DOOR SWITCH

1.To remove the door leed switch,Pull out cover,hinge as shown in (Figure 9)
2. Disconnect the lead wire from the leed switch at red box.

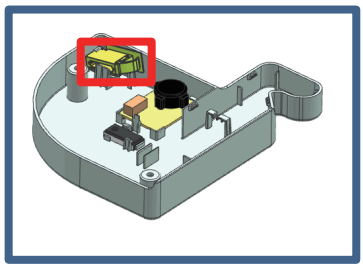


Figure 9

3-7 FAN AND FAN MOTOR

1. Remove freezer shelves.
2. Remove the Cover Lamp-F by loosening 2 screws fixed to ceiling of Inner Liner.

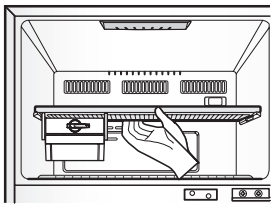


Figure 10

3. Remove the Grille by pulling it out.
4. Pull out the Shroud and remove the Fan Motor Assy by loosening 2 screws.
5. Pull out the fan and, separate the Fan Motor, Brackets and the Guide Fan.

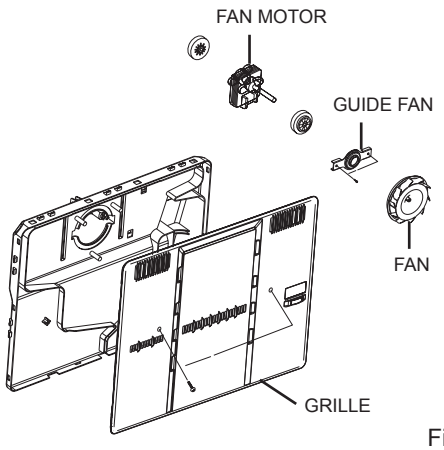


Figure 11

3-4 DEF' CONTROL ASSY

Def control ASM consists of Defrost Sensor and FUSE-M. Defrost Sensor functions to defrost automatically and it is attached to the Evaporator and the metal side of the case senses Temp.
Fuse-M is a kind of safety device for preventing overheating of the Heater when defrosting.
At the temperature of 77°C, it stops the emission of TEMP from the Defrost Heater.

1. Pull out the shroud-F after removing the Grille Fan. (Figure 12)
2. Separate the connectors connected with the Def Control ASM and replace the Def Control ASM after cutting the Tie Wrap. (Figure 13)

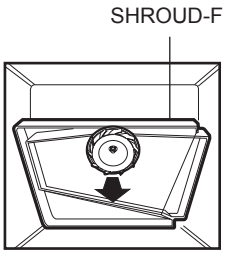


Figure 12

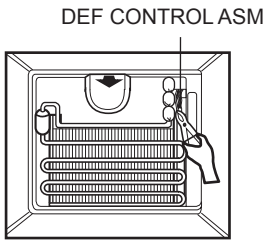


Figure 13

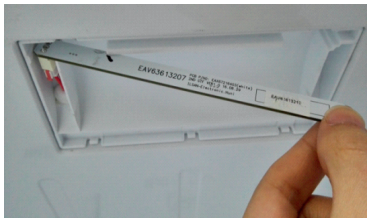
3-5 LAMP

3-5-1 Freezer room lamp

1.Remove the cover lamp by tool



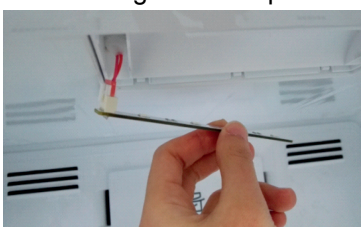
2.Take down the led lamp



3.Take down the led housing



4.Exchange new lamp



5.Install new lamp



6.Install the cover lamp

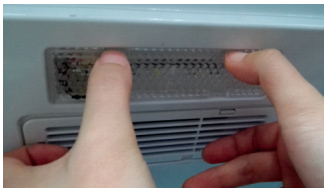


7.OK



3-5-2 Referigerator room lamp

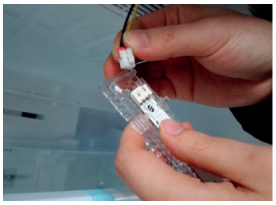
1.Remove the cover lamp with manual



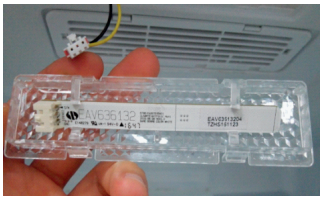
2.Take down the led lamp



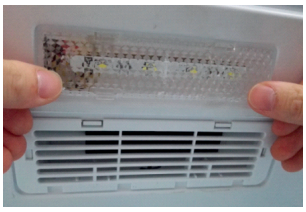
3.Take down the led housing



4.Exchange new lamp



5.Install new lamp



6.OK



3-6 CONTROL BOX-R

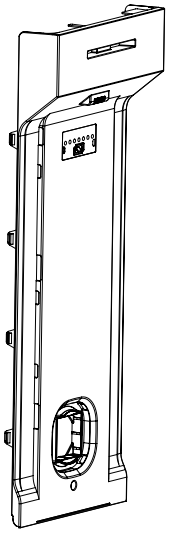


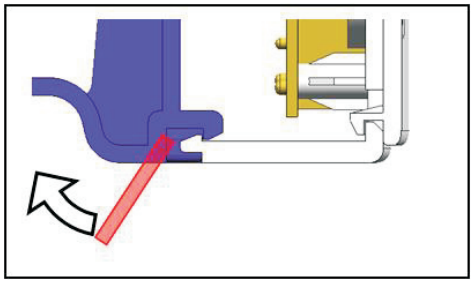
Figure 15

1. First, remove all shelves in the refrigerator.
2. Loosen 1 screw fixing the Control Box-R to The Inner Case.
3. Remove the Control Box-R by pulling it downward.

3-7DISPLAY

1. Remove Display by pulling it out with tool.
2. Remove L/wire from Display Assembly





Front

4. ADJUSTMENT

4-1 COMPRESSOR

4-1-1 Role

The compressor inhales low temperature and low pressure gas evaporated from Evaporator of the Refrigerator, and condenses this gas to high temperature and high pressure gas, and then plays delivering role to Condenser.

4-1-2 Composition

The Compressor is Composed of Compressor Apparatus compressing gas, Compressor Motor moving Compressor Apparatus and Case protecting Compressor Apparatus and Motor. There is Over Load Protector (OLP) in the Compressor outside. On the other hand, because the Compressor consists of 1/1000mm processing precision components and is sealed after producing without dust or humidity, deal and repair with care.

4-1-3 Note to Use

(1) Be careful not to allow over-voltage and over-current.
(2) No Strike
If applying forcible power or strike (dropping or careless dealing), poor operation and noise may occur.
(3) Use proper electric components appropriate to the Compressor.
(4) Note to Keep Compressor.
If Compressor gets wet in the rain and rust in the pin of Hermetic Terminal, poor operation and poor contact may cause.
(5) Be careful that dust, humidity, and flux due to welding don't inflow in Compressor inside in replacing Compressor. Dust, humidity, and flux due to welding which inflows to Cylinder may cause lock and noise.

4-2 OLP (OVER LOAD PROTECTOR)

4-2-1 Definition of OLP

(1) OLP (OVER LOAD PROTECTOR) is attached to Hermetic Compressor and protects Motor by cutting off current in Compressor Motor by Bimetal in the OLP in case of over-rising temperature.
(2) When over-voltage flows to Compressor motor, Bimetal works by heating the heater inside OLP, and OLP protects Motor by cutting off current which flows to Compressor Motor.

4-2-2 Role of OLP

(1) OLP is attached to Hermetic Compressor used to Refrigerator and Show Case and prevents Motor Coil from being started in the Compressor.

(2) Do not turn the Adjust Screw of OLP in any way for normal operation of OLP.
(Composition and connection Diagram of OLP)

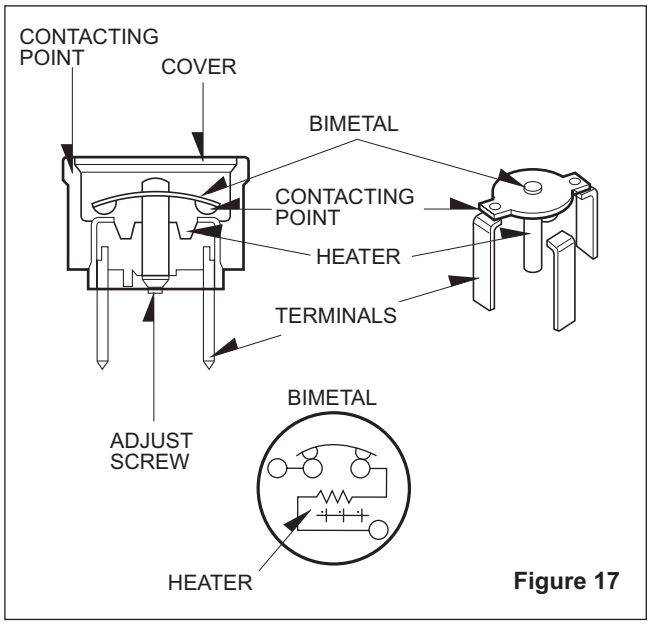
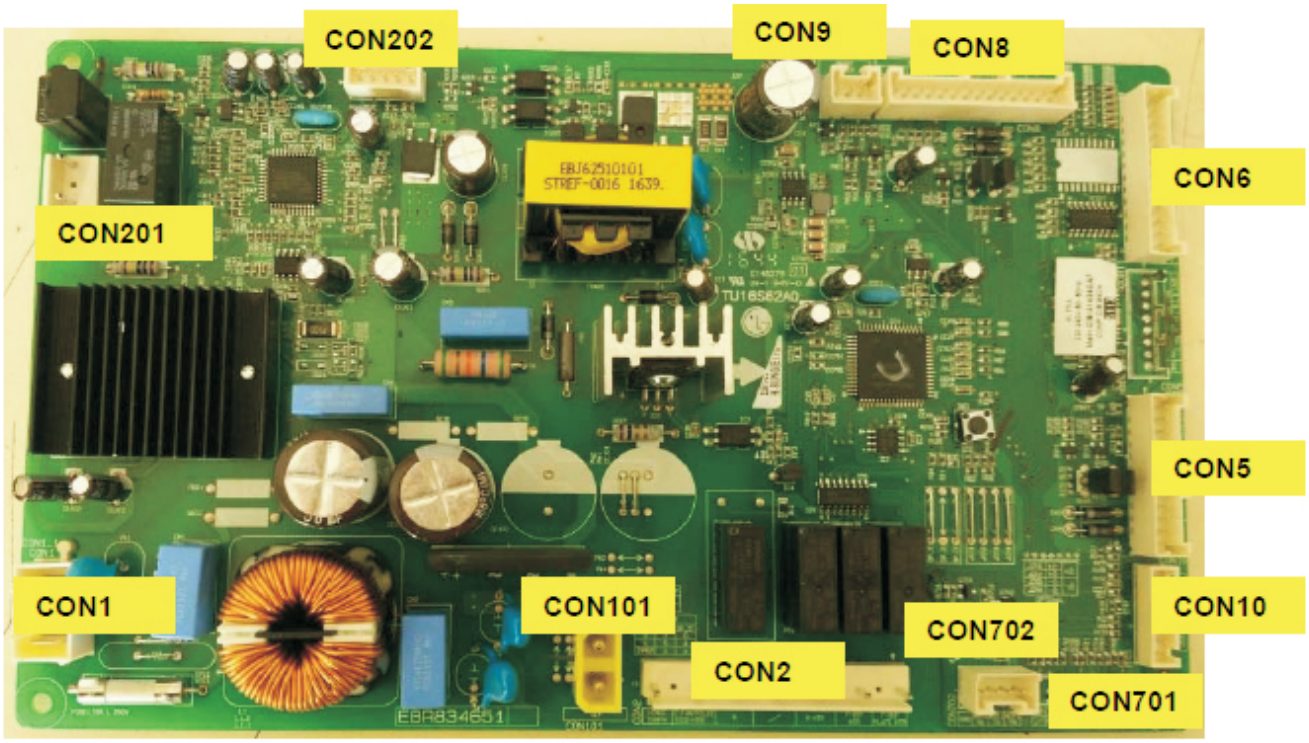


Figure 17

7.PCB Picture

7.1 Main PCB
(P/N : EBR834651XX)



Notes :

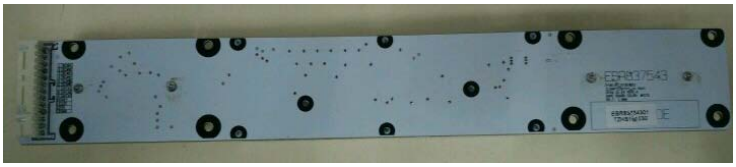
CON1: Power supply
CON2: AC load
CON5: Fan load (F-fan, C-fan, Hygiene Fan)
CON6: Touch display/Inner Display
CON8: Sensor/door switch/lighting
CON9: Smart buzzer
CON10: Programming part(main Micom)
CON101: Reactor
CON201: Linear compressor
CON202: Programming part(compressor Micom)

7. PCB Picture

7-2. Display PCB

(P/N : EBR837543**





(P/N : EBR732440





7-3. PCB LED

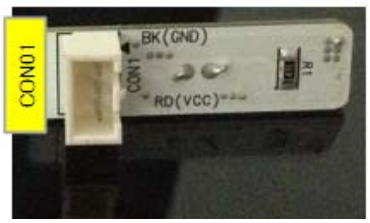
(P/N : EAV6361321**)





7-4. PCB HYGIENE LED（option）



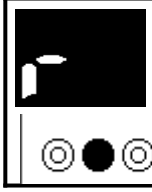


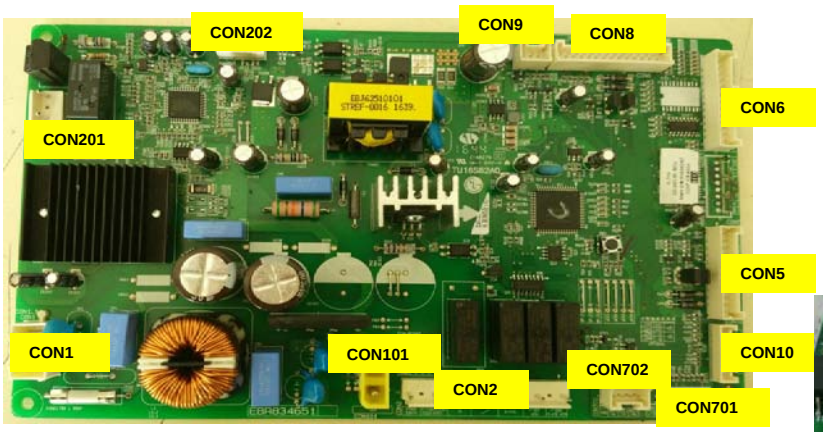
7-5 PCB UV LED（option）

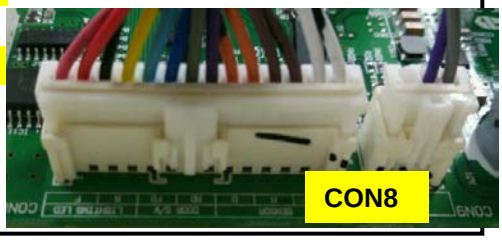


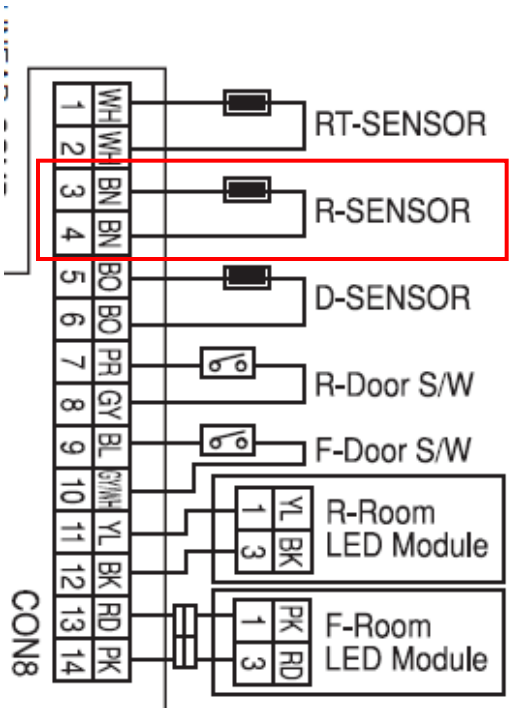
8. Trouble Shooting

8-1. Refrigerator Sensor Error (r)

Symptom	Check Point
 OR 	1. Check for a loose connection 2. Check Sensor Resistance







	Resistance [Ω]	
CON8 3rd pin ~ 4th pin	**Short**	**0**
	Open	**OFF**
	Other	**Normal**

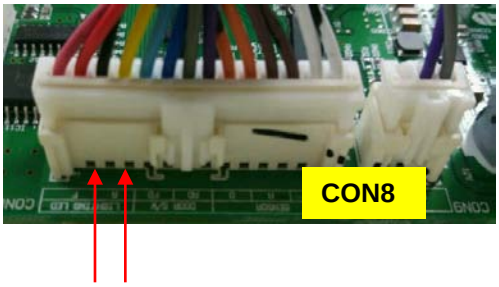
CON8 3rd pin ~ 4th pin	**Resistance [Ω]**
23°F / -5°C	**38k**
32°F / 0°C	**30k**
41°F / 5°C	**24k**
50°F / 10°C	**19.5k**
59°F / 15°C	**16k**

Refrigerator Sensor Error (r)

1

Is the Connector disconnected or loose between Main PCB and sensor?

Yes → Reconnect or repair the connector



No

2

Check the Sensor resistance.
Is resistance 0Ω (Sensor short)?

Yes → Change the Sensor

No

3

Check the Sensor resistance.
Is resistance OFF (Sensor open)?

Yes → Replace the refrigerator

No

4

Check the Sensor resistance.
Is resistance normal?

Yes

5

Check the Temperature and resistance refer to the table.
No problem?

CON8 3rd pin ~ 4th pin	**Resistance [Ω]**
23ºF / -5ºC	**38k**
32ºF / 0ºC	**30k**
41ºF / 5ºC	**24k**
50ºF / 10ºC	**19.5k**
59ºF / 15ºC	**16k**

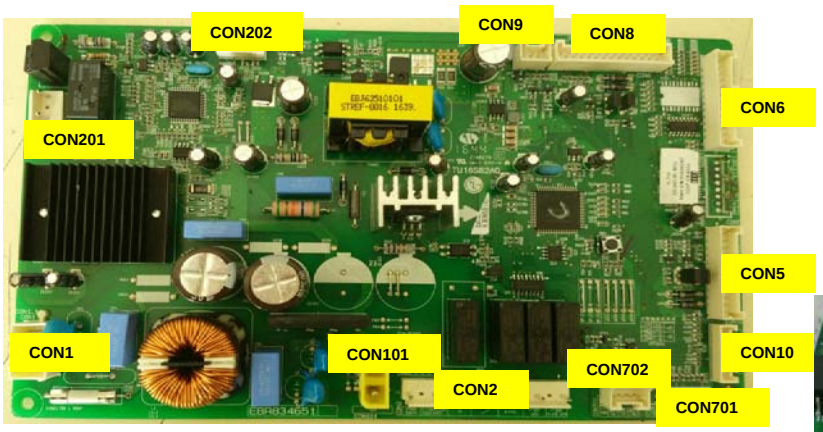
Yes

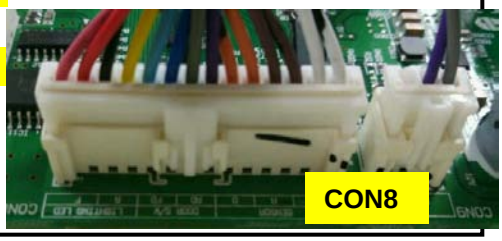
6

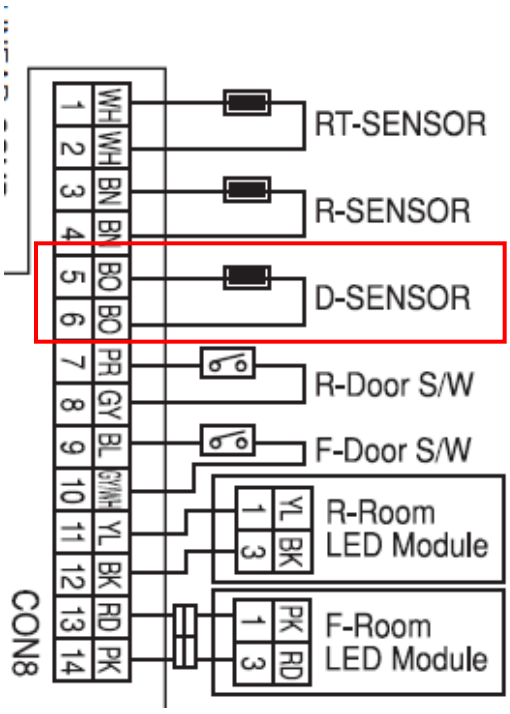
Explain to customer

8-2. Defrost Sensor Error (d)

Symptom	Check Point
 OR 	1. Check for a loose connection 2. Check Sensor Resistance







	Resistance [Ω]	
CON8 5th pin ~ 6th pin	**Short**	**0**
	Open	**OFF**
	Other	**Normal**

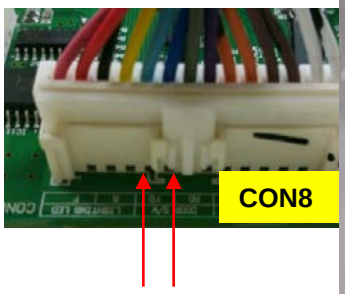
CON8 5th pin ~ 6th pin	Resistance [Ω]
23ºF / -5ºC	**38k**
32ºF / 0ºC	**30k**
41ºF / 5ºC	**24k**
50ºF / 10ºC	**19.5k**
59ºF / 15ºC	**16k**

Defrost Sensor Error (d)

1

Is the Connector disconnected or loose between Main PCB, Defrost controller and Sensor?

Yes → Reconnect or repair the connector





No

2

Check the Sensor resistance.
Is resistance 0Ω (Sensor short)?

Yes → Change the Sensor

No

3

Check the Sensor resistance.
Is resistance OFF (Sensor open)?

Yes → Replace the refrigerator

No

4

Check the Sensor resistance.
Is resistance normal?

Yes

5

Check the Temperature and resistance refer to the table.
No problem?

CON8 5th pin ~ 6th pin	**Resistance [Ω]**
23ºF / -5ºC	**38k**
32ºF / 0ºC	**30k**
41ºF / 5ºC	**24k**
50ºF / 10ºC	**19.5k**
59ºF / 15ºC	**16k**

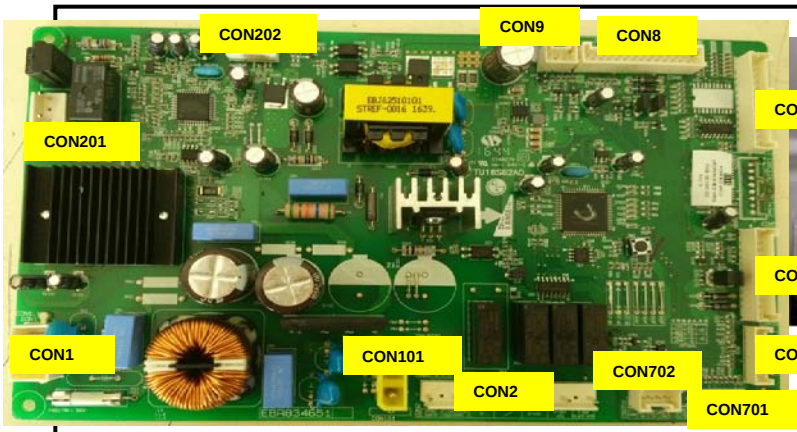
Yes

6

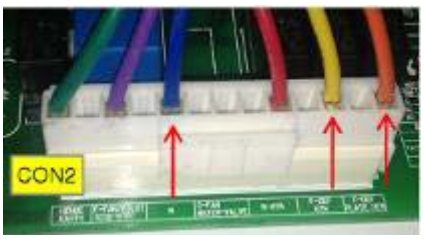
Explain to customer

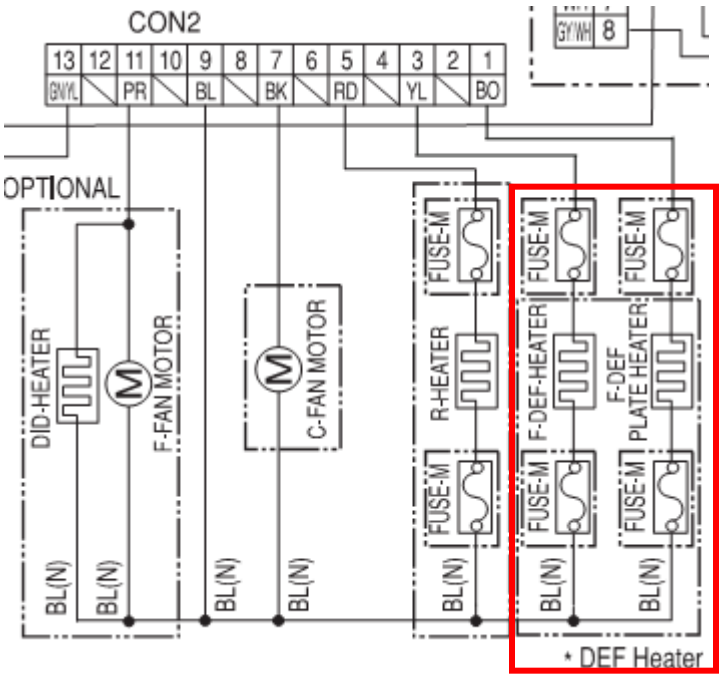
8-3. Defrost Heater Error (H)

Symptom	Check Point
 OR 	1. Check the door gasket 2. Check the Defrost control part 3. Check the PCB output voltage









Part	Resistance [Ω]	
Voltage	200~240 V	100~130 V
FUSE-M	0	0
Heater Cord	289~333	78~91
Heater Plate	826-952	225~261

TEST MODE 2	Voltage [V]
CON2 3rd pin ~ 9th pin	100V ~ 240V

TEST MODE 1	Voltage [V]
CON2 3rd pin ~ 9th pin	0V

Defrost Heater Error (H)

1

Check the Door gasket .
Is door gasket damaged?

Yes → Replace the Door gasket

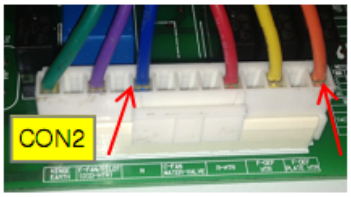
No

2

Disconnect housing from PCB.
Check heater plate resistance
Is resistance value like below table?

No → Change Heater Plate

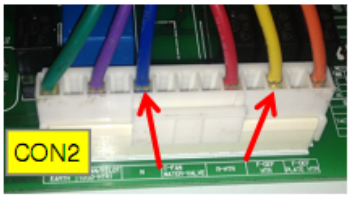
Part	Resistance [Ω]	
	200 V	100 V
Heater Plate	826-952	225~261



Yes

3

Check heater cord resistance.
Is resistance value like below table?



Yes → Go to **6**.

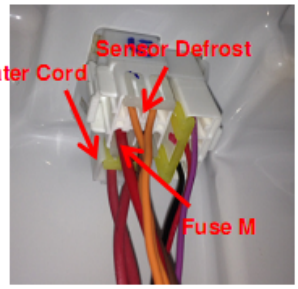
Part	Resistance [Ω]	
	200 V	100 V
Heater Cord	289~333	78~91

No

4

Disconnect housing Fuse-M.
Check the Defrost control part.
Is Fuse-M resistance 0Ω?

No → Replace Fuse-M

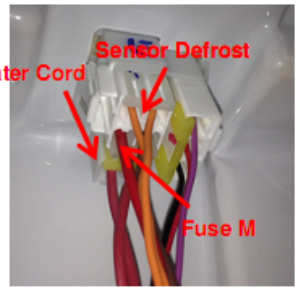


Yes

5

Check housing heater cord.
Is the housing disconnect or loose?

No → Replace Heater Cord



Yes

Reconnect or repair the housing/connector.

6 Input Test Mode 2 (Defrost Test)

Check the Heater Voltage.
Is voltage 100~240V?

No → Replace Main PCB



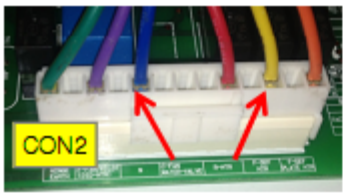
TEST MODE 2	Voltage [V]
CON2 3rd pin ~ 9th pin	100V ~ 240V

Yes

7 Input Test Mode 1 (Cooling test)

Check the Heater Voltage.
Is voltage 0V?

No → Replace Main PCB



TEST MODE 1	Voltage [V]
CON2 3rd pin ~ 9th pin	0V

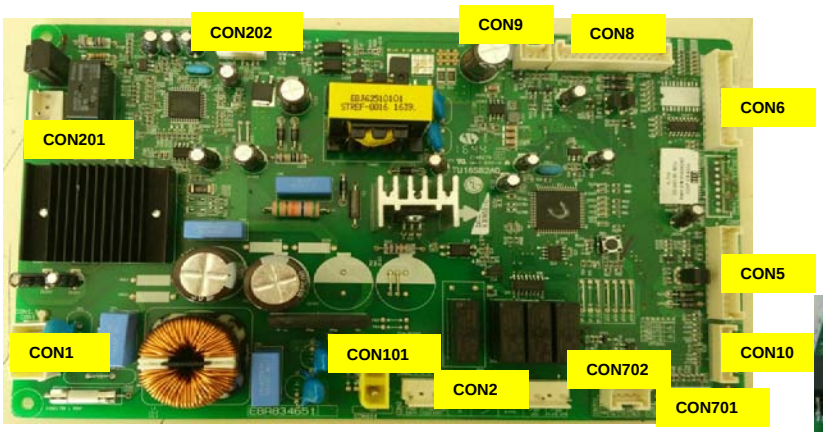
Yes

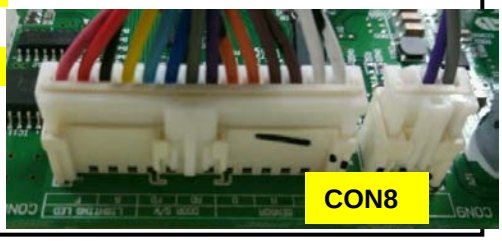
8

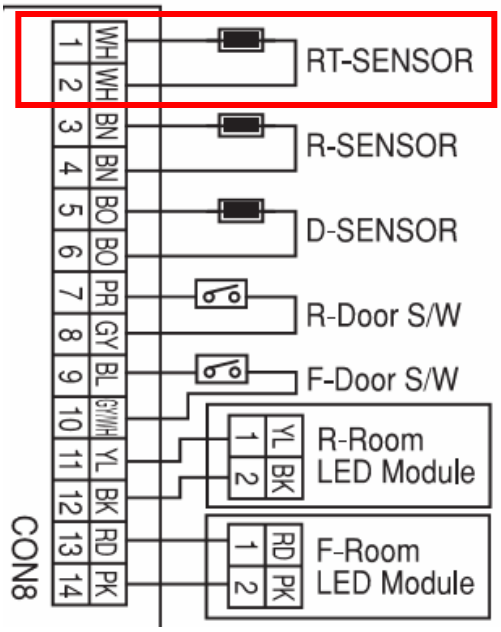
Explain to customer
(Part is checked and its normal & already replace the NG part.

8-4. room temperature sensor error

Symptom	Check Point
 OR 	1. Check the loose connection 2. Check sensor resistance







	Resistance [Ω]	
CON8 1st pin ~ 2nd pin	Short	0
	Open	OFF
	Other	Normal

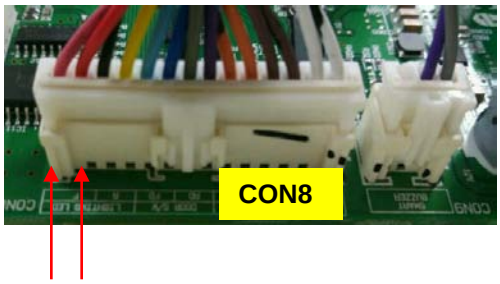
CON8 1st pin ~ 2nd pin	Resistance [Ω]	CON8 1st pin ~ 2nd pin	Resistance [Ω]
-39ºF / -40ºC	225.1k	32ºF / 0ºC	30k
-30ºF / -35ºC	169.8k	41ºF / 5ºC	24.13k
-21ºF / -30ºC	129.3k	50ºF / 10ºC	19.53k
-13ºF / -25ºC	99.3k	59ºF / 15ºC	15.91k
-4ºF / -20ºC	76.96k	68ºF / 20ºC	13.03k
5ºF / -15ºC	60.13k	77ºF / 25ºC	10.74k
14ºF / -10ºC	47.34k	86ºF / 30ºC	8.89k
23ºF / -5ºC	37.55k	95ºF / 35ºC	7.40k
32ºF / 0ºC	30k	104ºF / 40ºC	6.20k

Room temperature sensor error (display all off)

1

Is the Connector disconnected or loose between Main PCB and sensor?

Yes → Reconnect or repair the connector



No

2

Check the Sensor resistance.
Is resistance 0Ω (Sensor short)?

Yes → Change the Sensor

No

3

Check the Sensor resistance.
Is resistance OFF (Sensor open)?

Yes → Replace the refrigerator

No

4

Check the Sensor resistance.
Is resistance normal?

Yes

5

Check the Temperature and resistance refer to the table.
No problem?

CON8 1st pin ~ 2nd pin	Resistance [Ω]	CON8 1st pin ~ 2nd pin	Resistance [Ω]
-39°F / -40°C	225.1k	32°F / 0°C	30k
-30°F / -35°C	169.8k	41°F / 5°C	24.13k
-21°F / -30°C	129.3k	50°F / 10°C	19.53k
-13°F / -25°C	99.3k	59°F / 15°C	15.91k
-4°F / -20°C	76.96k	68°F / 20°C	13.03k
5°F / -15°C	60.13k	77°F / 25°C	10.74k
14°F / -10°C	47.34k	86°F / 30°C	8.89k
23°F / -5°C	37.55k	95°F / 35°C	7.40k
32°F / 0°C	30k	104°F / 40°C	6.20k

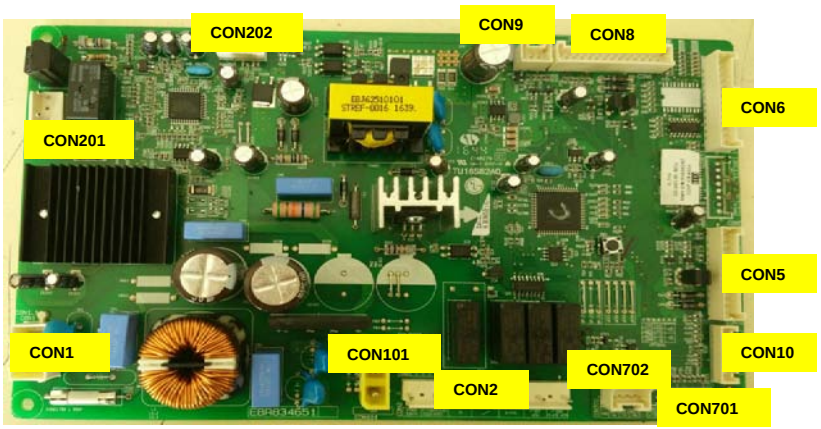
Yes

6

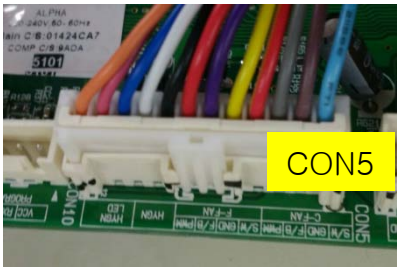
Explain to customer

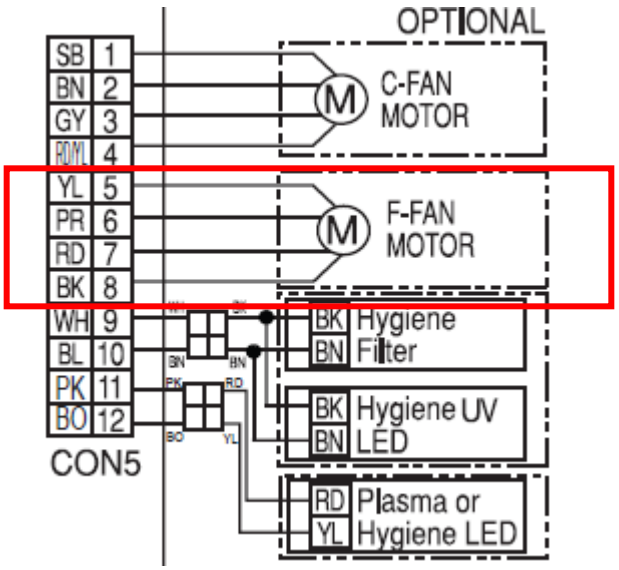
8-5. freezer fan BLDC motor failure

Symptom	Check Point
 OR 	1. Check the air flow 2. Check the PCB fan motor voltage









Test mode1	**Voltage（v）**
CON5 5th pin~6th pin	**≈12V**
CON5 6th pin~7th pin	**NOT 0V,5V**

F FAN BLDC Motor failure （F）

1

RESET the unit, and input test mode 1



2

Open the freezer room and check the air flow, windy?

No → Go to 3



Yes

Go to 4

3

Check the fan motor potate fan Using hand ,it feel sticky?

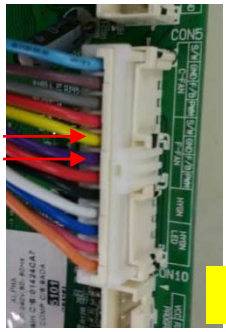
No



4

Check the fan motor voltage Is fan voltage 12V?

No → Replace the PCB



Yes

5

Check the fan motor voltage Is fan feed back voltage 0V,5V?

Yes → Replace motor



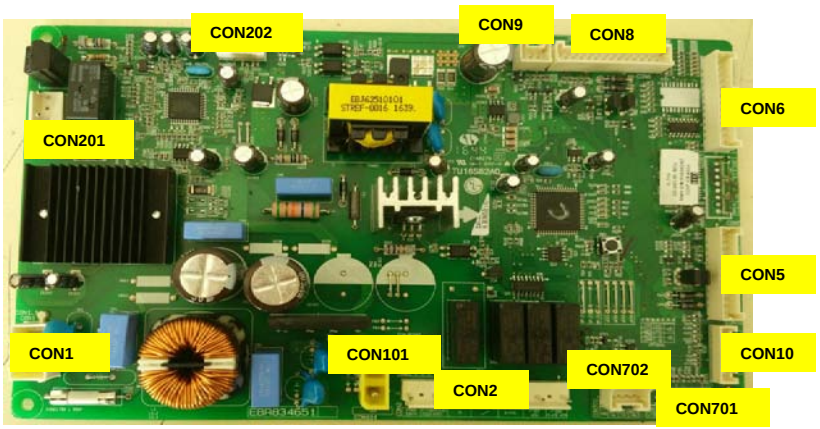
NO

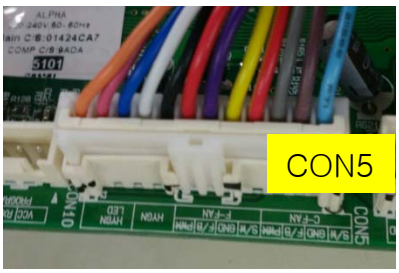
6

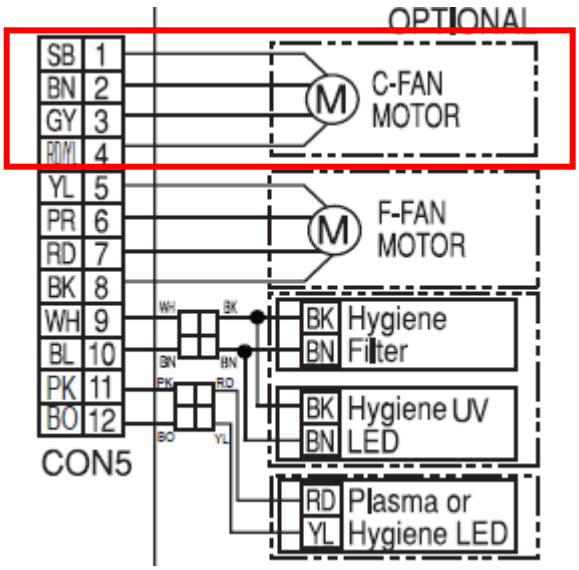
Explain to customer (all part already checked and normal, if there is NG part its already replace)

8-6. cooling fan BLDC motor failure（C）

Symptom	Check Point
 OR 	1. Check the air flow 2. Check the PCB fan motor voltage 3. Check the connector







Test mode1	**Voltage（v）**
CON5 1st pin~2nd pin	**≈12V**
CON5 2nd pin~3rd pin	**NOT 0V,5V**

F FAN BLDC Motor failure （C）

1

RESET the unit, and input test mode 1



2

Open the machine room and check the air flow, windy?

No → Go to 3



Yes

Go to 4

3

Check the fan motor potate fan Using hand ,it feel sticky?

yes → Change the fan motor



4

Check the fan motor voltage
Is fan voltage ~12V?

No → Replace the PCB



CON5 1st pin~2nd pin	**~12V**

Yes

5

Check the fan motor voltage
Is fan feed back voltage 0V,5V?

Yes → Replace motor



CON5 2nd pin~3rd pin	**Not 5V, 0V**

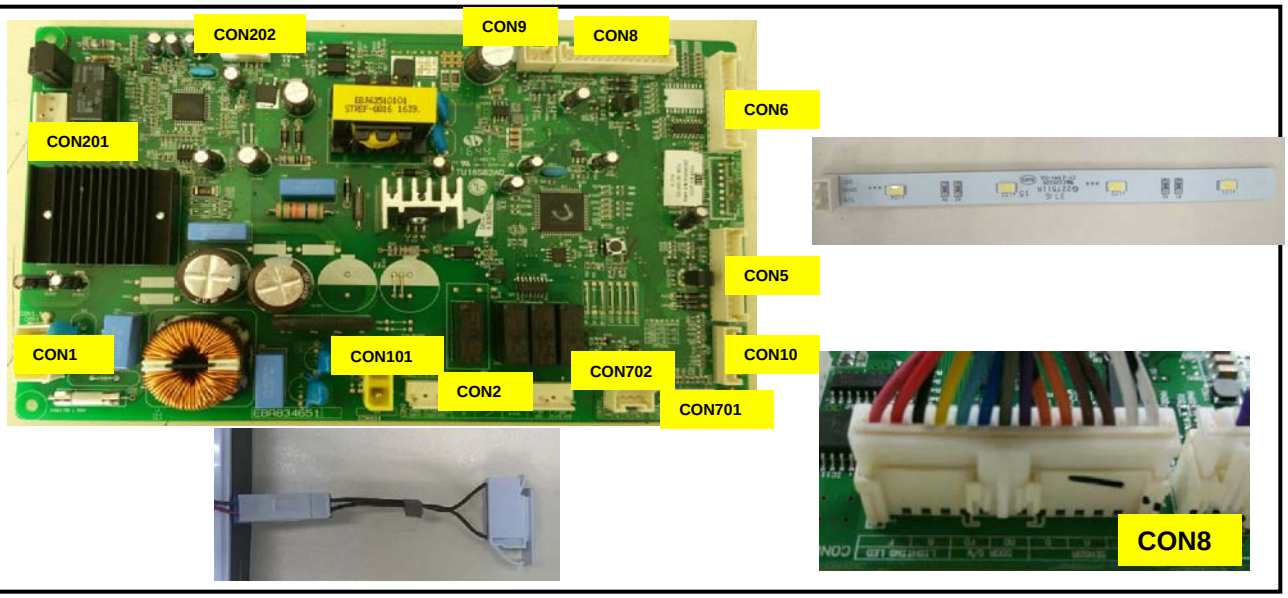
NO

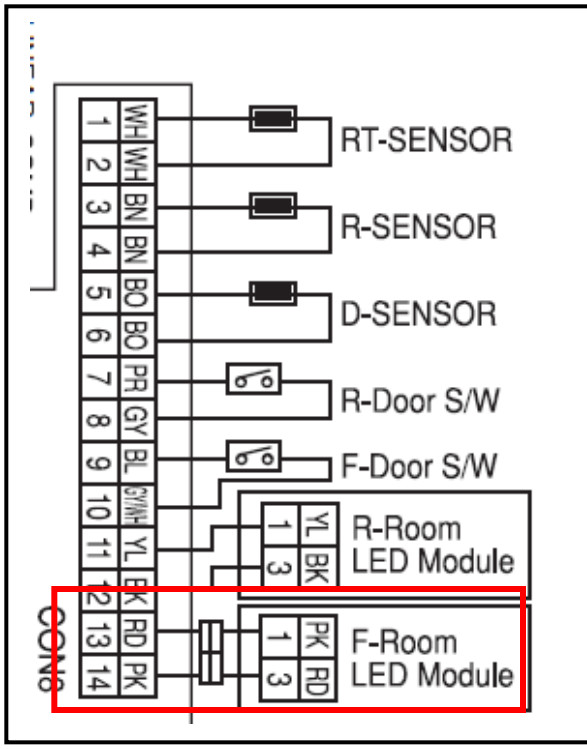
6

Explain to customer
(all part already checked and normal, if there is NG part its already replace)

8-7. Freezer room lamp doesn't work

Symptom	Check Point
1. freezer room lamp doesn't work	1. Check the freezer door switch sticky 2. Check the door S/W resistance 3. Check the LED Lamp





	Resistance [Ω]	
Door S/W	Normal	0
	Push S/W	Infinity

	Voltage [V]
CON8 13th pin ~ 14th pin	12V

F Room led voltage

Voltage [V]	
12V	
Closed	0~2V
Open	12V

Freezer room lamp doesn't work

1

Dissconnect the door switch from Case foam, check the resistance Is it corrector?

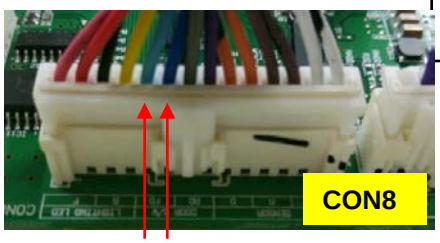
	Resistance	
Door s witch	Close the magnet	0
	Far the magnet	infinity

No → Change the Door S/W

Yes

2

Check the F door switch voltage. Is con8 9th~10th voltage 5v when Door open?

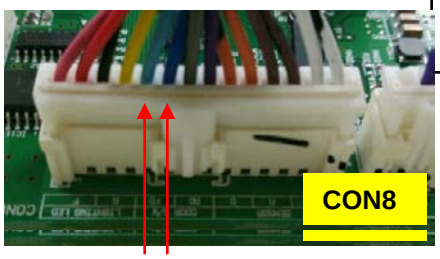


No → Change the main PCB

Yes

3

Check the F door switch voltage. Is con8 9th~10th voltage 0v when Door closed?

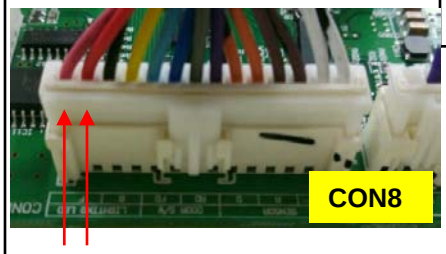


No → Change the main PCB

Yes

4

Check the PCB voltage. Is con8 13th~14th voltage 12v when Door open?

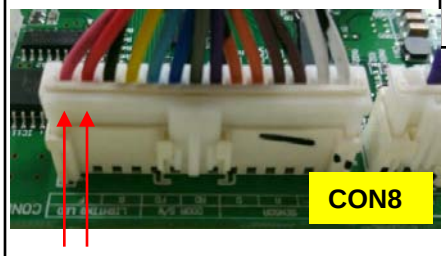


No → Change the main PCB

Yes

5

Check the PCB voltage. Is con8 13th~14th voltage 0v when Door close?



No → Change the main PCB

Yes

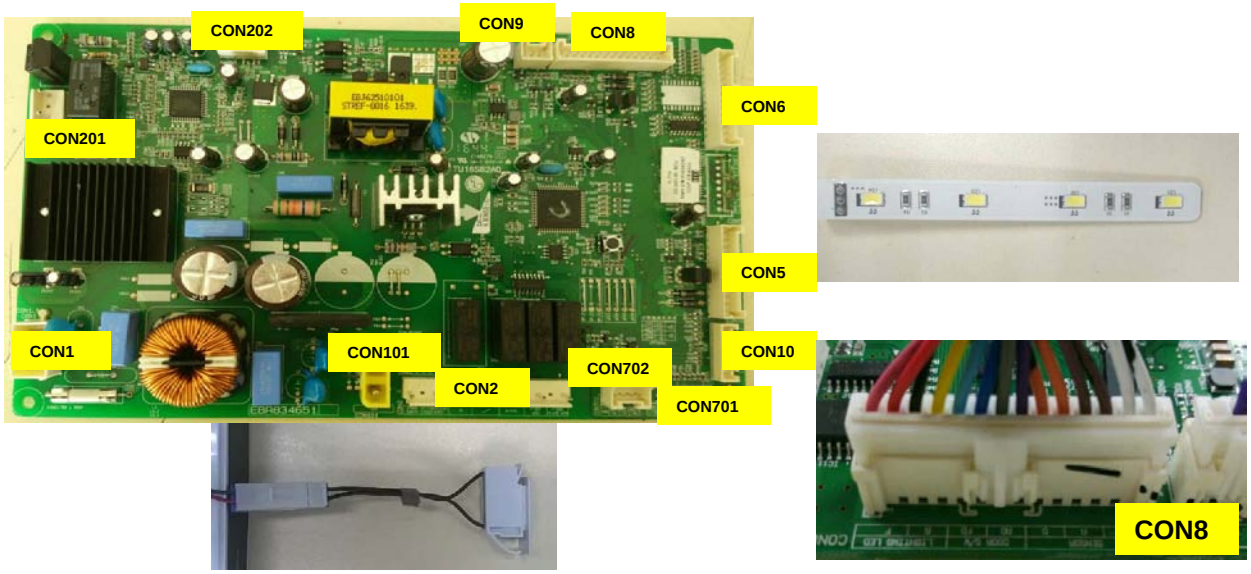
Change the led lamp

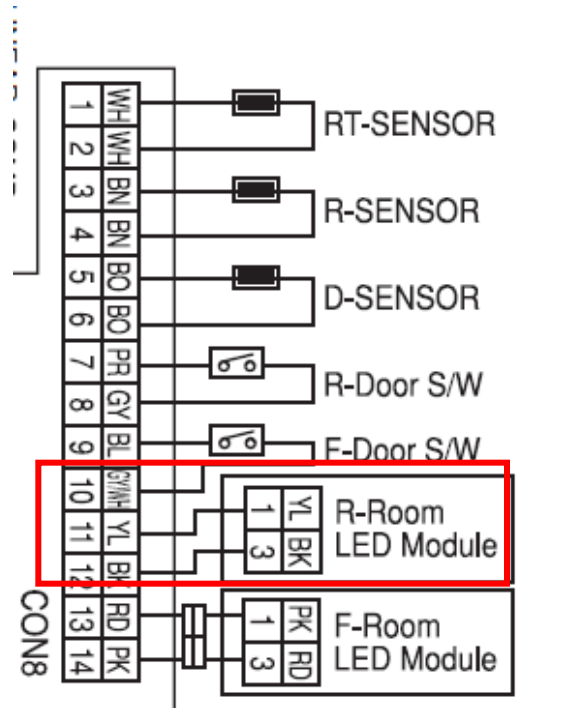
Yes

6 Explain to customer (all part already checked and normal, if there is NG part its already replace)

8-8. refrigerator room lamp doesn't work

Symptom	Check Point
1. **refrigerator** room lamp doesn't work	1. Check the refrigerator door switch sticky 2. Check the door S/W resistance 3. Check the LED Lamp





	Resistance [Ω]	
Door S/W	**Normal**	**0**
	Push S/W	**Infinity**

	Voltage [V]
CON8 11th pin ~ 12th pin	**12V**

R led lamp voltage

Voltage [V]	
12V	
Closed	**0~2V**
Open	**12V**

refrigerator room lamp doesn't work

1

Dissconnect the door switch from Case foam, check the resistance Is it corrector?

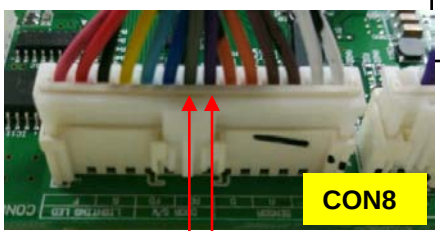
	Resistance	
Door s witch	Close the magnet	0
	Far the magnet	infinity

No → Change the Door S/W

Yes

2

Check the R door switch voltage. Is con8 7th~8th voltage 5v when Door open?

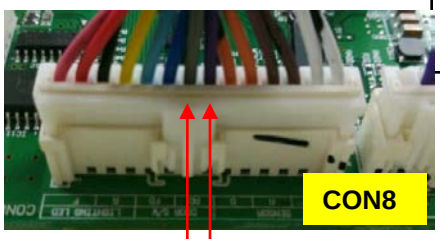


No → Change the main PCB

Yes

3

Check the F door switch voltage. Is con8 7th~8th voltage 0v when Door closed?

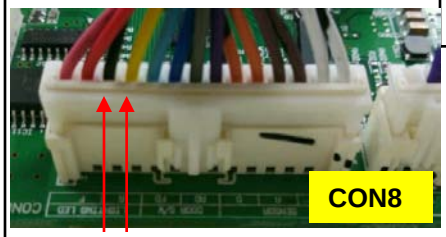


No → Change the main PCB

Yes

4

Check the PCB voltage. Is con8 11th~12th voltage 12v when Door open?

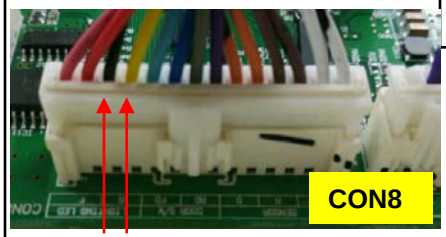


No → Change the main PCB

Yes

5

Check the PCB voltage. Is con8 11th~12th voltage 0v when Door close?



No → Change the main PCB

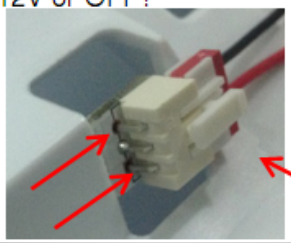
Yes

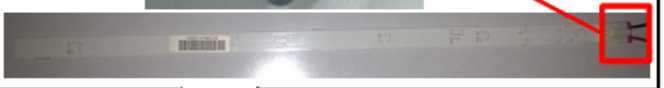
Change the led lamp

Yes

6 Explain to customer (all part already checked and normal, if there is NG part its already replace)

7
Remove control box with housing still connected. Check the LED Lamp voltage
Is voltage 12V or OFF?





OFF → Go To **9**

12 V

8
Replace LED Lamp. Is the problem persist?

NO → Go To **10**

Yes

9
Check for control box housing condition. Is housing disconnect or not connected properly?

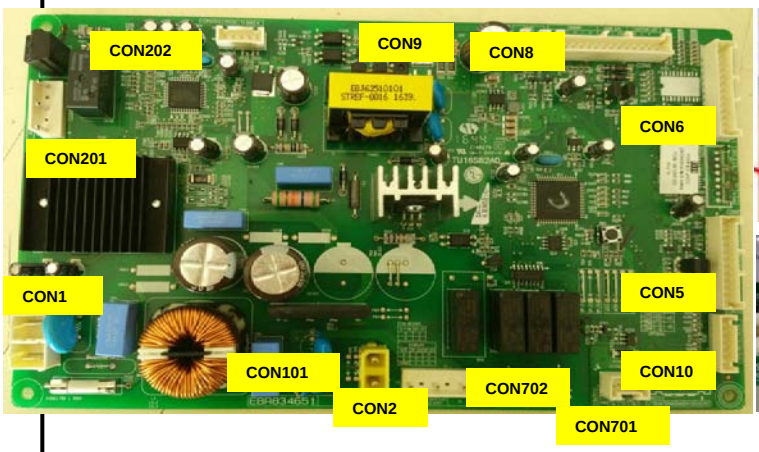
No → Reconnect or repair the connector

Yes

10 Explain to customer
(Explain about the problem & explain that part already change and NG part already replace.)

8-9. Poor cooling in Refrigerator section

Symptom	Check Point
1. Poor cooling in refrige rator food section	1. Check the sensor resistance 2. Check the air flow 3. Check the air Temperature 4. Check the F motor voltage

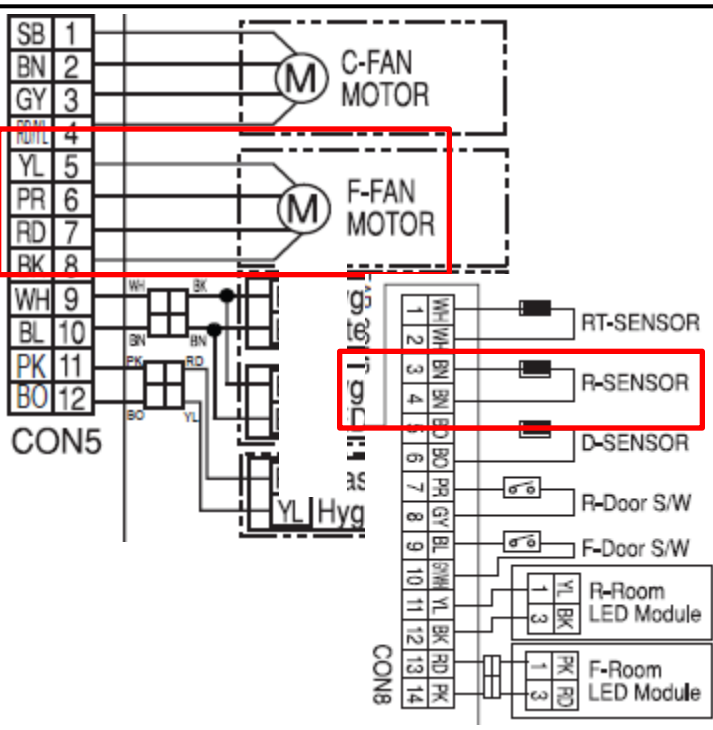












CON8 3rd pin ~ 4th pin	Resistance [Ω]
23ºF / -5ºC	38k
32ºF / 0ºC	30k
41ºF / 5ºC	24k
50ºF / 10ºC	19.5k
59ºF / 15ºC	16k

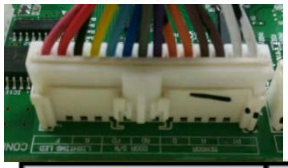
Test mode1	Voltage (v)
CON5 5th pin~6th pin	≈12V
CON5 6th pin~7th pin	NOT 0V,5V

Duct	Status
Air Flow	Windy
Air Temperature	Cold

Poor cooling in Refrigerator Room

1 Disconnect housing from PCB Check the sensor resistance. Is resistance value of sensor is same refer to table below?

No → Replace refrigerator sensor.



CON8 3rd pin ~ 4th pin	**Resistance [Ω]**
23ºF / -5ºC	**38k**
32ºF / 0ºC	**30k**
41ºF / 5ºC	**24k**
50ºF / 10ºC	**19.5k**
59ºF / 15ºC	**16k**

Yes

2 **Reset the unit and Input Test Mode 1. (Cooling Test)**



3 Open the refrigerator door and Check the air flow. Windy?

No → Check the Freezer Control Go To **5** Check the R Fan Motor Go to **6**



Yes

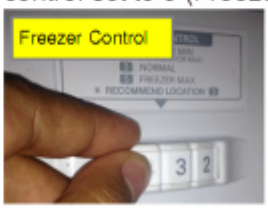
4 Check the air temperature. Is it cold?

No → Check the Compressor and sealed system

Yes → Go to 8

5 Check the freezer Control, Is the freezer control set to 5 (Freezer Max)?

Yes → Set back to 3 and explain to costumer.



Set Point	**Configuration**
1	**Freezer Min**
3	**Normal**
5	**Freezer Max**

No

6 Go to section **8-5. Freezer Fan** DPWM **Motor Failure (F)** Is the Freezer Fan condition is good?

No → Change Motor Fan

Yes

7 After checking all part and all is normal, explain to customer that the refrigerator is running normal. Ask customer is it already cool?

No → Go to **9**

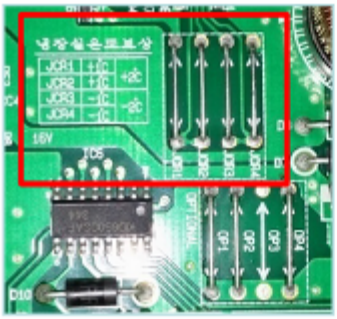
Yes

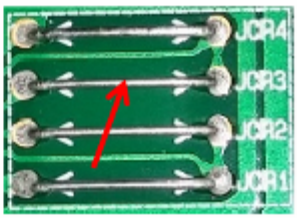
8 Explain to customer. (Explain that all part already checked and normal. If there is NG part, that part already replace. Explain about cutting jumper if its needed)

9 Cut compensate temperature jumper in PCB.

Turn Off refrigerator, then open Cover PCB. Look for jumper in PCB (near relay) marked JCR1~JCR4. Cut 1 jumper (JCR3) for compensate temperature.

No → Cut another jumper (JCR4) to reduce temp.





*** JCR3 cuts : -1℃**

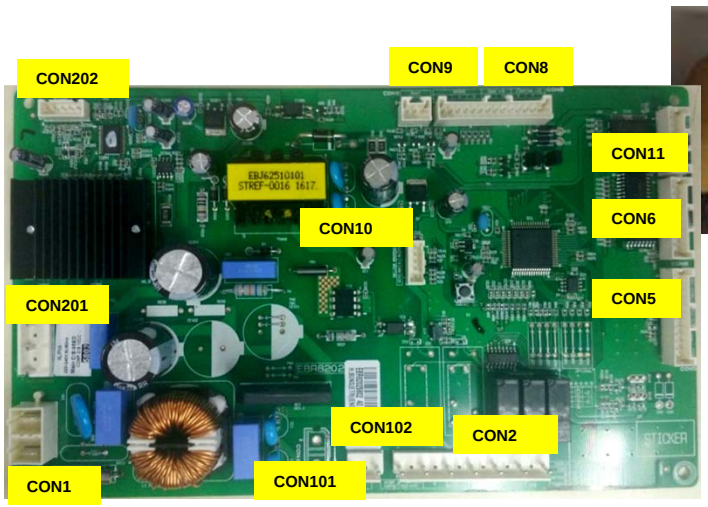
Refrigerator Room	
CUT OPTION	Temperature compensation
JCR3	−1.0℃
JCR4	−1.0℃

Is the customer satisfied?

Yes → Go to 8

8-10. Poor cooling in freezer section

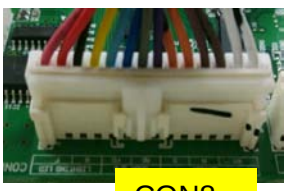
Symptom	Check Point
1. Poor cooling in freeze r section	1. Check the sensor resistance 2. Check the air flow 3. Check the air Temperature 4. Check the fan motor voltage 5. Check the fan motor sticky 6.Check heater plate

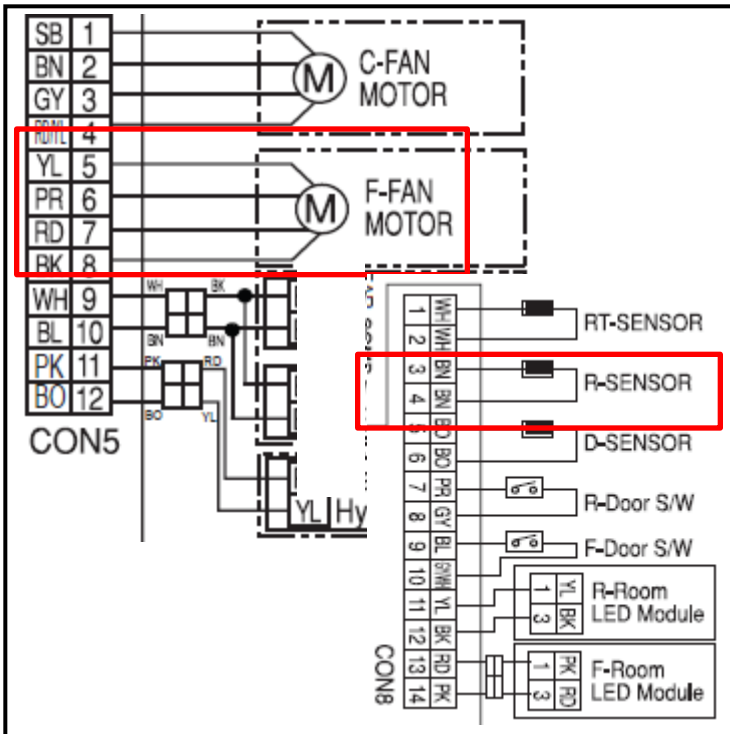












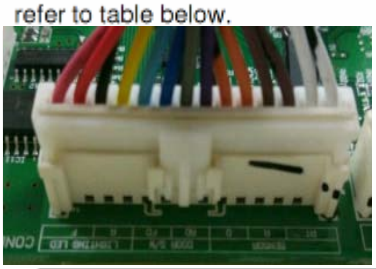
CON8 3rd pin ~ 4th pin	Resistance [Ω]
23º F / -5º C	38k
32ºF / 0ºC	30k
41ºF / 5ºC	24k
50ºF / 10ºC	19.5k
59ºF / 15ºC	16k

Test mode1	Voltage（v）
CON5 5th pin~6th pin	≈12V
CON5 6th pin~7th pin	NOT 0V,5V

Duct	Status
Air Flow	Windy
Air Temperature	Cold

Poor cooling in Freezer Room

1 Disconnect housing from PCB. Check the sensor resistance refer to table below.



CON8 3rd pin ~ 4th pin	**Resistance [Ω]**
23º F / -5º C	**38k**
32ºF / 0ºC	**30k**
41ºF / 5ºC	**24k**
50ºF / 10ºC	**19.5k**
59ºF / 15ºC	**16k**

2 **Reset the unit and Input Test Mode 1. (Cooling Test)**



3 Open the freezer door and Check the air flow. Windy?

No → Check the F Fan Motor Go to 5



Yes

4 Check the air temperature. Is it cold?

No → Check the Compressor and sealed system

Yes

5 Go to section **8-5. Freezer Fan DPWM Motor Failure (F)** Is the Freezer Fan condition is good?

No → Change Motor Fan

Yes

6 Check the F Door gasket . Is door gasket damaged or there is gap between case foam and door gasket?

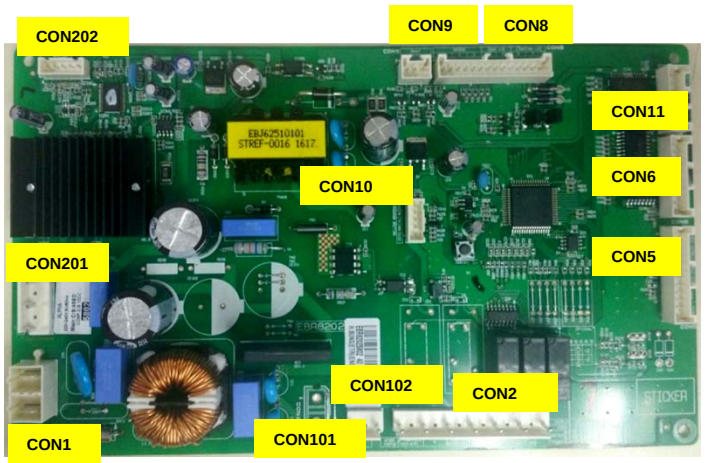
Yes → Replace door gasket & make sure there is no gap.

No

7 Explain to customer (Explain that all part already check its normal & if there is NG part, that already replace)

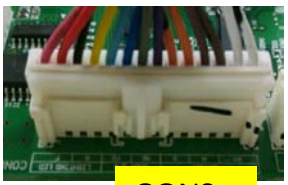
8-11. over cooling in freezer & refirgerator section

Symptom	Check Point
1. Over cooling in freeze r section	1. Check the sensor resistance 2. Check the air Temperature in R room 3. Check the air Temperature in F room 4. Check door gasket 5. Check the fan motor sticky 6. Check heater plate

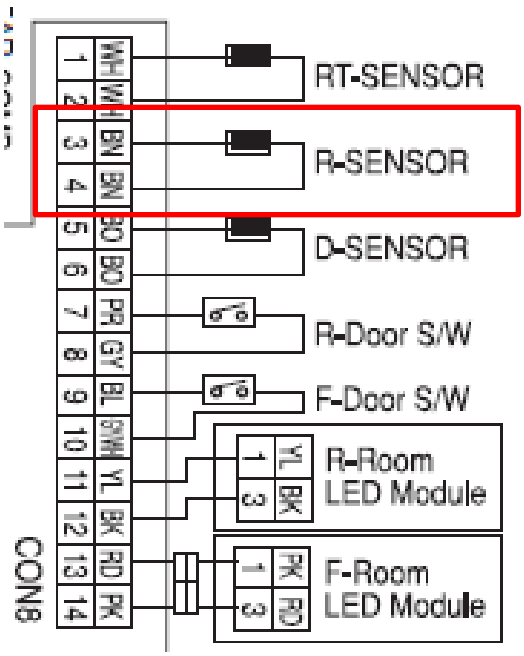




CON5



CON8



CON8 3rd pin ~ 4th pin	Resistance [Ω]
23° F / -5° C	38k
32ºF / 0ºC	30k
41ºF / 5ºC	24k
50ºF / 10ºC	19.5k
59ºF / 15ºC	16k

Over cooling in Freezer & Refrigerator Room

1 Disconnect housing from PCB. Check the sensor resistance refer to table below.

No → Replace refrigerator sensor.



CON8 3rd pin ~ 4th pin	**Resistance [Ω]**
23° F / -5° C	**38k**
32ºF / 0ºC	**30k**
41ºF / 5ºC	**24k**
50ºF / 10ºC	**19.5k**
59ºF / 15ºC	**16k**

Yes

2 Check air temperature in F-room & R-room using thermo meter. Is the temperature normal ?

Yes → Go To **4**

No

3 Check the R Door gasket . Is door gasket damaged or there is gap between case foam and door gasket?

Yes → Replace door gasket & make sure there is no gap.

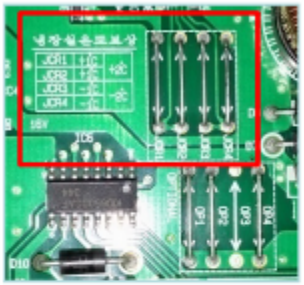
No

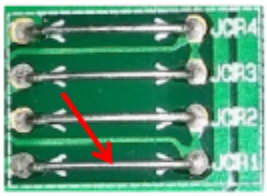
4 Explain to customer (Explain that all part already check its normal & temperature measurement is normal.) If Customer still feel over cooling in refrigerator room go to **5.**

5 Cut compensate temperature jumper in PCB.

Turn Off refrigerator, then open Cover PCB. Look for jumper in PCB (near relay) marked JCR1~JCR4. Cut 1 jumper (JCR1) for compensate temperature.

No → Cut another jumper (JCR2) to increase temp.





*** JCR3 cuts : -1℃**

Refrigerator Room	
CUT OPTION	Temperature compensation
JCR1	+1.0℃
JCR2	+1.0℃

Is the customer satisfied with the refrigerator temperature?

Yes

Go to **4**

TEMPERATURE CHART - REF AND DEFROST SENSOR

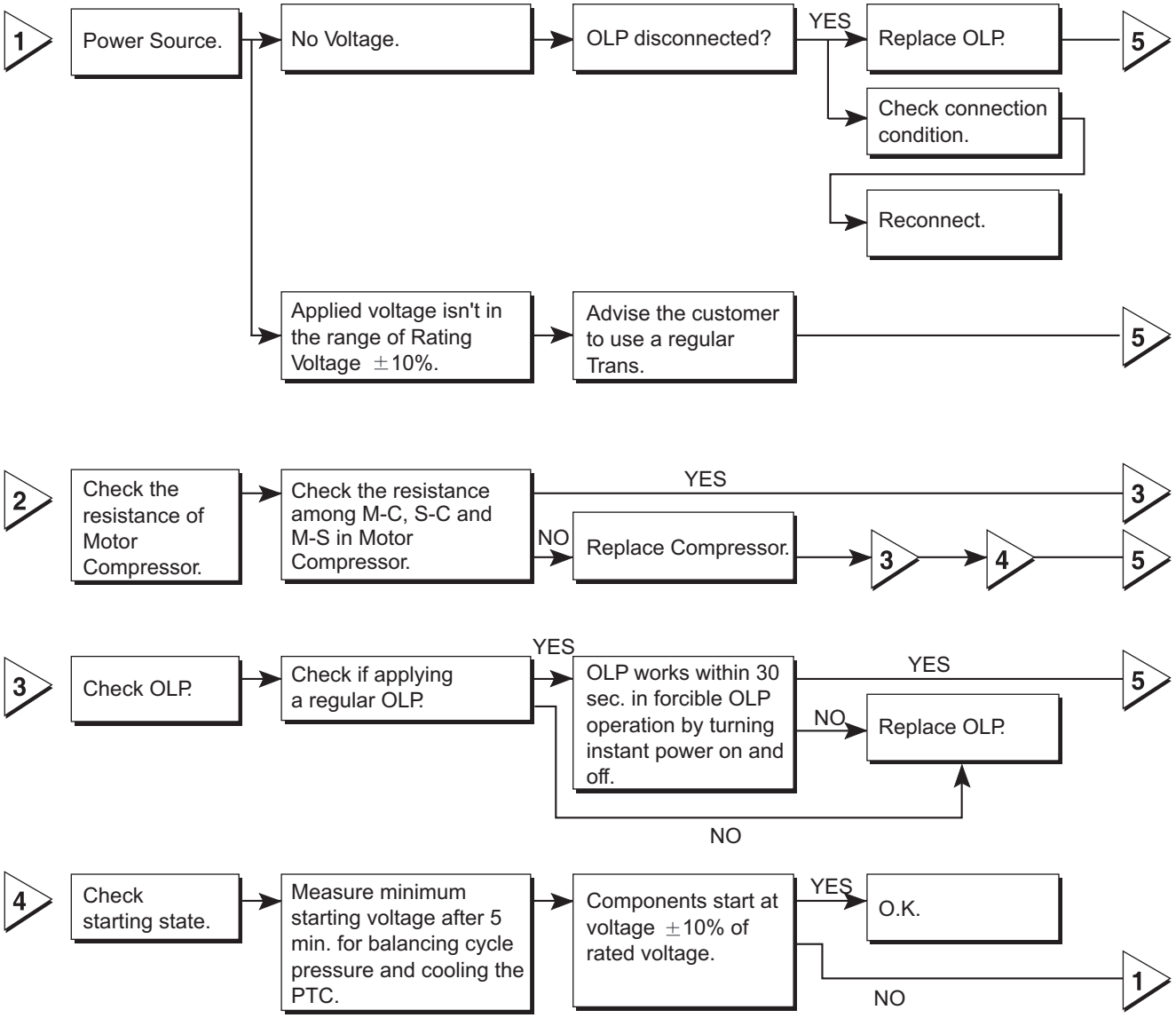
TEMP	RESISTANCE	VOLTAGE
-39°F (-40°C)	225.1 kΩ	4.48 V
-30°F (-35°C)	169.8 kΩ	4.33 V
-30°F (-30°C)	129.3 kΩ	4.16 V
-13°F (-25°C)	99.30 kΩ	3.95 V
-4°F (-20°C)	76.96 kΩ	3.734 V
5°F (-15°C)	60.13 kΩ	3.487 V
14°F (-10°C)	47.34 kΩ	3.22 V
23°F (-5°C)	37.55 kΩ	2.95 V
32°F (0°C)	30 kΩ	2.67 V
41°F (+5°C)	24.13 kΩ	2.40 V
50°F (+10°C)	19.53 kΩ	2.14 V
59°F (+15°C)	15.91 kΩ	1.89 V
68°F (+20°C)	13.03 kΩ	1.64 V
77°F (+25°C)	10.74 kΩ	1.45 V
86°F (+30°C)	8.89 kΩ	1.27 V
95°F (+35°C)	7.40 kΩ	1.10 V
104°F (+40°C)	6.20 kΩ	0.96 V

TEMPERATURE CHART - RT SENSOR

TEMP	RESISTANCE	VOLTAGE
-39°F (-40°C)	225.1 kΩ	4.48 V
-30°F (-35°C)	169.8 kΩ	4.33 V
-21°F (-30°C)	129.3 kΩ	4.641 V
-13°F (-25°C)	99.30 kΩ	4.54 V
-4°F (-20°C)	76.96 kΩ	4.425 V
5°F (-15°C)	60.13 kΩ	4.287 V
14°F (-10°C)	47.34 kΩ	4.128 V
23°F (-5°C)	37.55 kΩ	3.948 V
32°F (0°C)	30 kΩ	3.75 V
41°F (+5°C)	24.13 kΩ	3.535 V
50°F (+10°C)	19.53 kΩ	3.307 V
59°F (+15°C)	15.91 kΩ	3.070V
68°F (+20°C)	13.03 kΩ	2.829 V
77°F (+25°C)	10.74 kΩ	2.589 V
86°F (+30°C)	8.89 kΩ	2.354 V
95°F (+35°C)	7.40 kΩ	2.128V
104°F (+40°C)	6.20 kΩ	1.914 V

5. TROUBLESHOOTING

5-1 COMPRESSOR AND ELECTRIC COMPONENTS



5-2 OLP

Normal operation of Compressor is impossible or poor.

→ Separate the OLP from Compressor and check resistance value between two terminals of OLP with a Tester. (Figure 19)

YES → Check another electric components.

NO → Replace OLP.

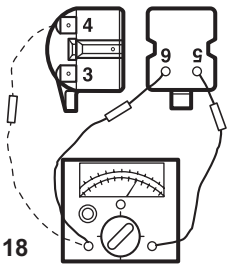


Figure 18

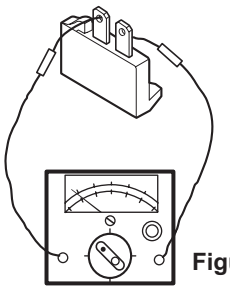
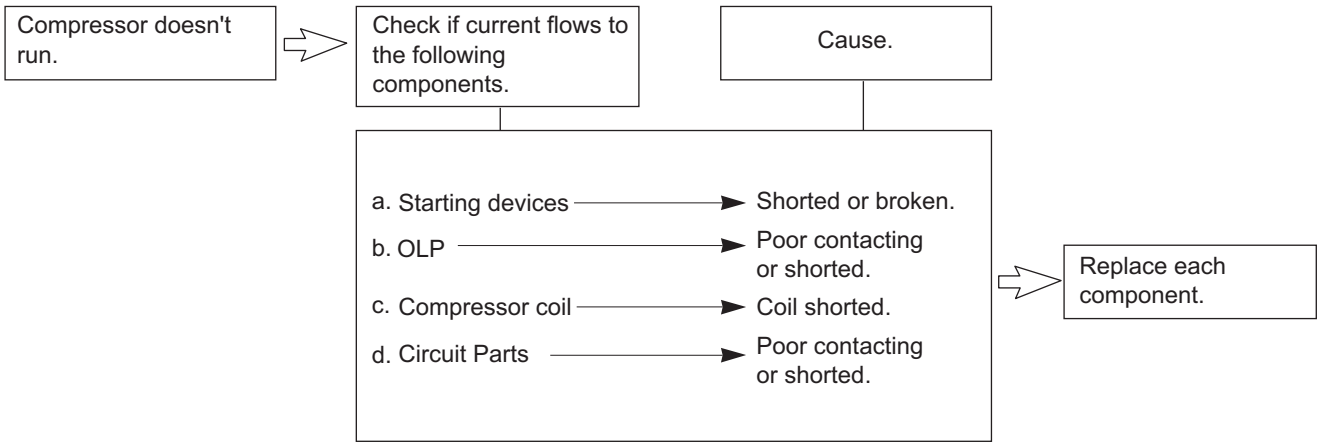
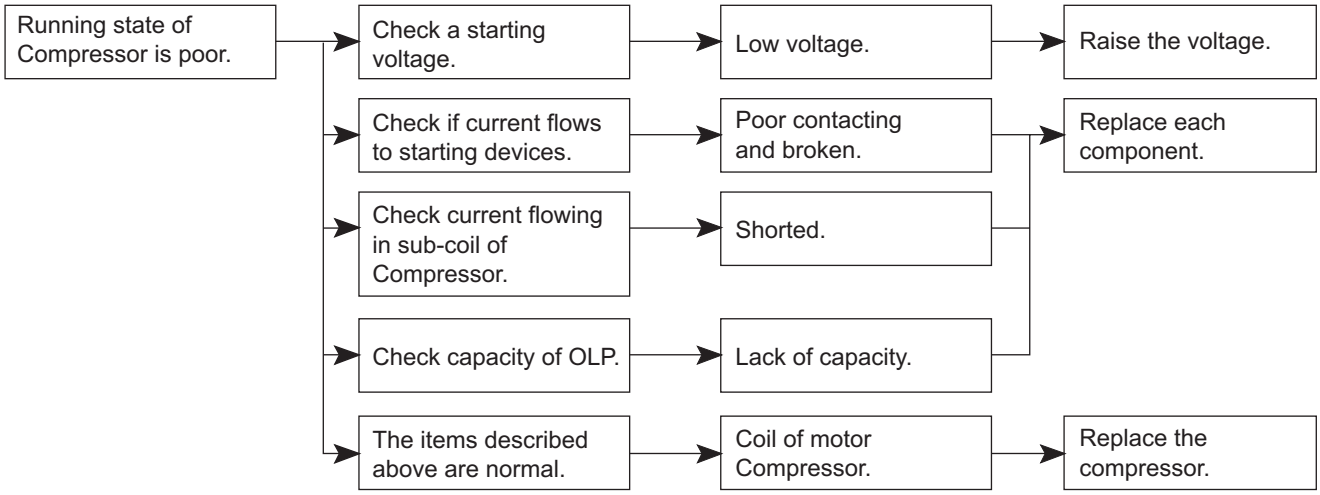


Figure 19

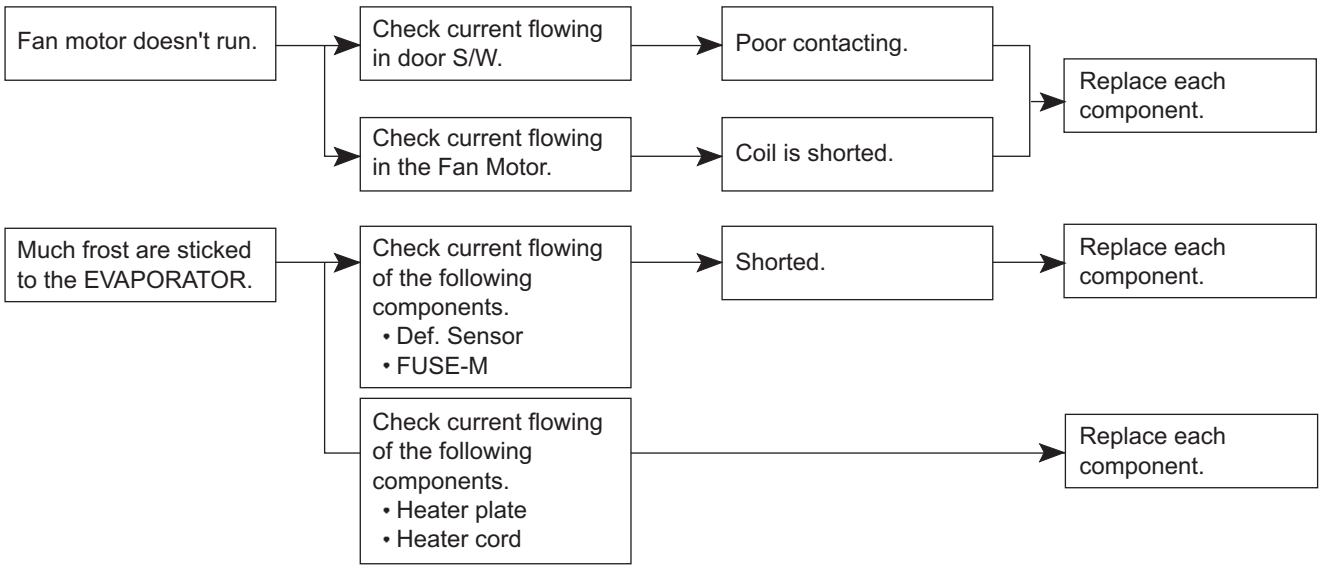
5-3 ANOTHER ELECTRIC COMPONENTS

▼ Cooling is impossible





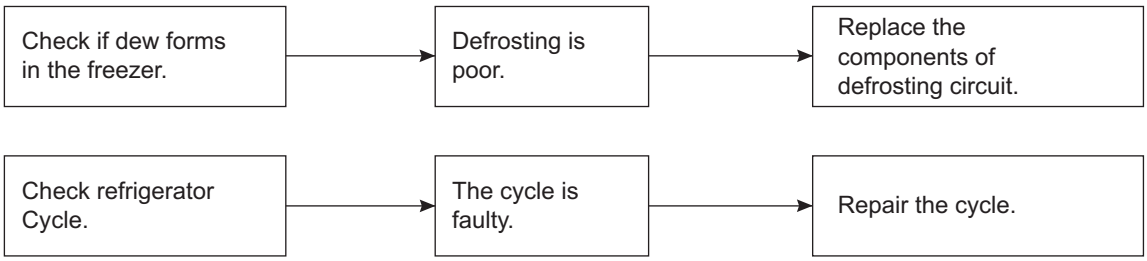
▼ Cooling ability is poor



5-4 SERVICE DIAGNOSIS CHART

COMPLAINT	POINTS TO BE CHECKED	SERVICEACTION
Cooling is impossible.	• Is the power cord unplugged from the outlet? • Checked if the power S/W is set to OFF. • Check if the fuse of power S/W is shorted. • Measure the voltage of power outlet.	• Plug to the outlet. • Set the switch to ON. • Replace a regular fuse. • If voltage is low, wire newly.
Cooling ability is poor.	• Check if the set is placed close to wall. • Check if the set is placed close to stove, gas, cooker and direct rays. • Is the ambient temperature high or the room door closed? • Check if putting in hot foods foods. • Did you open the door of the set too often or check if the door is closed up? • Check if the Control is set to "Min".	• Place the set with the space of about 10cm • Place the set apart from these heat appliances. • Make the ambient temperature below. • Put in foods after they get cold cold. • Don't open the door too often and close it firmly. • Set the control to mid-position.
Foods in the refrigerator are frozen.	• Are foods placed in cooling air outlet? • Check if the Display LED is set to "0-1". • Is the ambient temperature below 5°C.	• Place foods in high temperature section. (Front part) • Set the Display LED to "3". • Set the Display LED to "5-6".
Dew or ice forms in the chamber of the set set.	• Is watery foods kept? • Check if putting in hot foods. • Did you open the door of the set too often or check if the door is closed up.	• Seal up watery foods with wrap. • Put in foods after they get cold. • Don't open the door too often and close it firmly.
Dew forms in the Out Case.	• Check if ambient temperature and humidity of surrounding air are high. • Is the gap in the door packed?	• Wipe dew with a dry cloth. This happening is solved in low temperature and humidity naturally. • Fill up the gap.
Abnormal noise generates.	• Is the set positioned in a firm and even place? • Does any unnecessary objects exists in the back side of the set? • Check if the Drip tray is not firmly fixed? • Check if the cover of mechanical room in below and back side is taken out.	• Adjust the leveling screw, and position in the firm place. • Remove the objects. • Fix it firmly on an original position. • Place the cover at an original position.
To close the door is not handy.	• Check if the door packing becomes dirty by filth such as juice. • Is the set positioned in a firm and even place? • Is too much food putted in the set?	• Clean the door packing. • Position in the firm place and adjust the adjust screw. • Keep foods not to reach the door.
Ice and foods smell unpleasant.	• Check if the inside of the set becomes dirty. • Did you keep smelly foods without wrapping? • It smells plastic.	• Clean the inside of the set. • Wrap smelly foods. • The new products smell plastic, but it is removed after 1-2 weeks.

● In addition to the items describes left, refer to the following to solve the complaint.



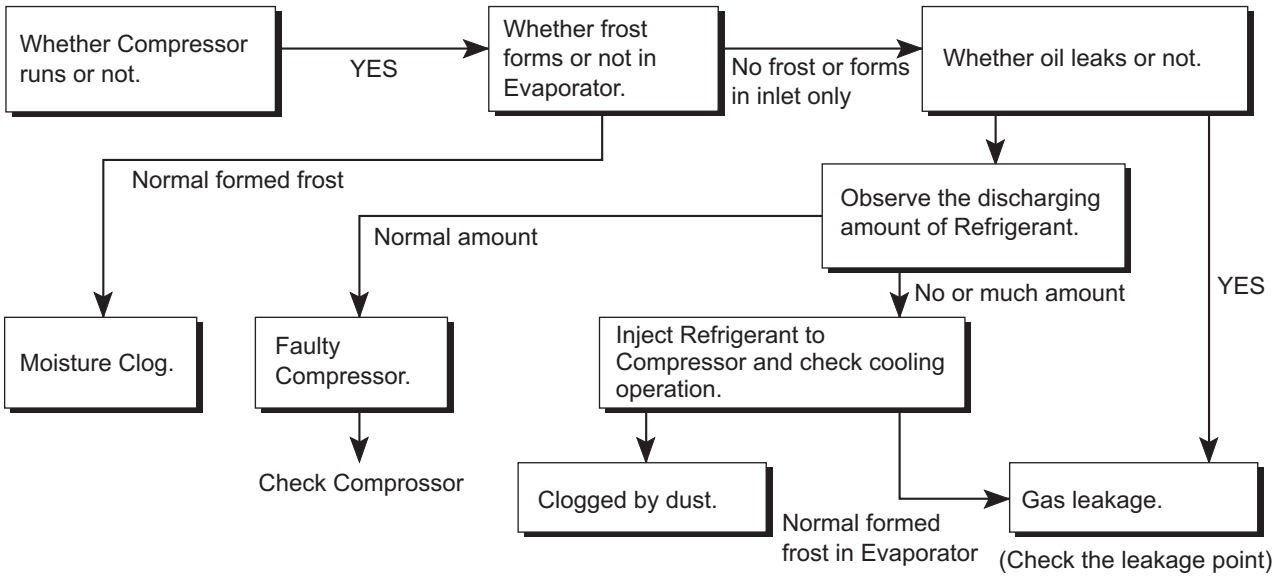
5-5 REFRIGERATING CYCLE

▼ **Troubleshooting Chart**

CAUSE		STATE OF THE SET	STATE OF THE EVAPORATOR	TEMPERATURE OF THE COMPRESSOR	REMARKS
LEAKAGE	PARTIAL LEAKAGE	Freezer and Refrigerator don't get cold normally.	Low flowing sound of Refrigerant is heard and frost forms in inlet only	A little higher than ambient temperature.	• A little Refrigerant discharges. • Normal cooling is possible when injecting Refrigerant of regular amount.
	WHOLE LEAKAGE	Freezer and Refrigerator don't get cold at all.	Flowing sound of Refrigerant is not heard and frost isn't formed.	Equal to ambient temperature.	• No discharging of Refrigerant. • Normal cooling is possible when injecting Refrigerant of regular amount.
CLOGGED BY DUST	PARTIAL CLOG	Freezer room and Refrigerator don't get cold normally.	Flowing sound of Refrigerant is heard and frost forms in inlet only.	A little higher than ambient temperature.	• Normal discharging of refrigerant. • The capillary tube is faulty.
	WHOLE CLOG	Freezer and Refrigerator don't get cold.	Flowing sound of Refrigerant is not heard and frost isn't formed.	Equal to ambient temperature.	• Normal discharging of Refrigerant.
MOISTURE CLOG		Cooling operation stops periodically.	Flowing sound of Refrigerant is not heard and frost melts.	Lower than ambient temperature	• Cooling operation restarts when heating the inlet of capillary tube.
DEFECTIVE COMPRESSION	COMP-RESSION	Freezer and Refrigerator don't get cold.	Low flowing sound of Refrigerant is heard and frost forms in inlet only.	A little higher than ambient temperature.	• The pressure of high pressure part in compressor is low.
	NO COMP-RESSION	No compressing operation.	Flowing sound of Refrigerant is not heard and no frost.	Equal to ambient temperature.	• No pressure of high pressure part in compressor.

▼ **Leakage Detection**

Observe discharging point of refrigerant which may be in oil discharging part in compressor and hole of evaporator.

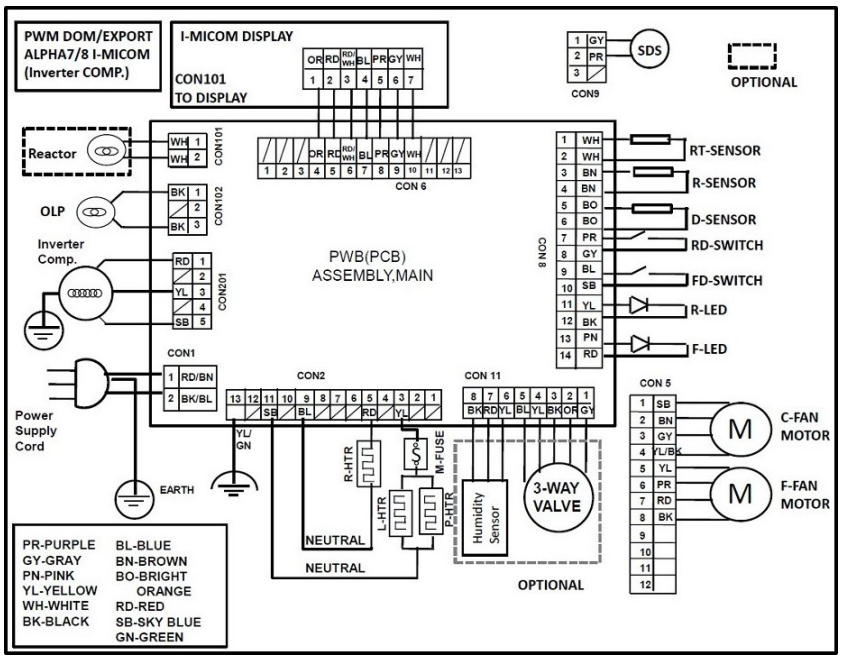


▼ **General Control of Refrigerating Cycle**

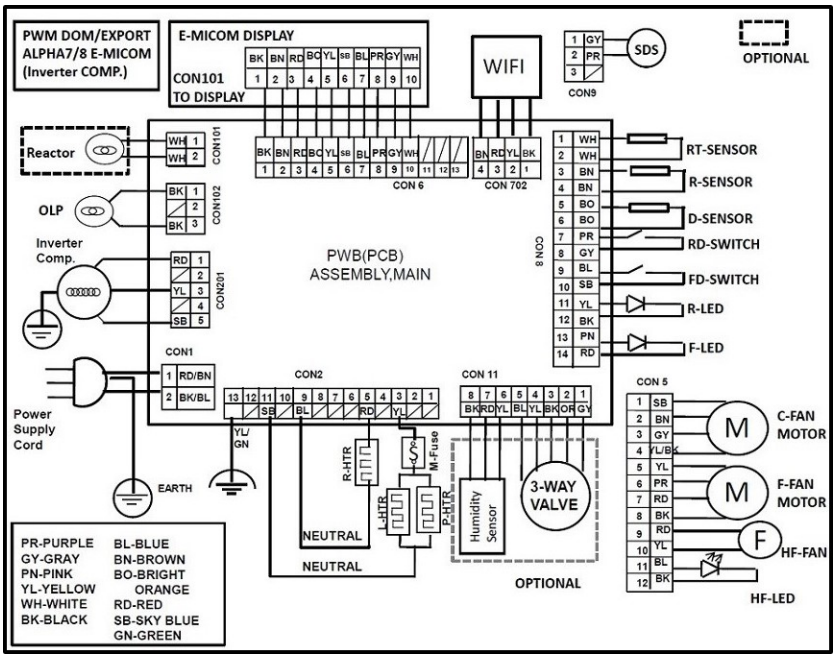
NO.	ITEMS	CONTENTS AND SPECIFICATIONS	REMARKS
1	WELDING ROD	(1) H 30 • Chemical Ingredients Ag : 30%, Cu : 27%, Zn : 23%, Cd : 20% • Brazing Temperature : 710~840°C (2) Bcup-2 • Chemical Ingredients Cu : About 93% P : 6.8~7.5% The rest : within 0.2% • Brazing Temperature : 735~840°C	• Recommend H34 containing 34% Ag in the Service Center.
2	FLUX	• Ingredients and how to make Borax 30% Borax 35% Fluoridation kalium : 35% Water : 4% Mix the above ingredients and boil until they are transformed into liquid.	• Make amount for only a day. Holding period : 1 day • Close the cover of container to prevent dust putting in the FLUX. • Keep it in a stainless steel container.
3	DRIER ASM	(1) Assemble the drier within 30min. after unpacking. (2) Keep the unpacked drier at the temperature of 80~100°C.	• Don't keep the drier in a outdoor because humidity damages to it.
4	VACUUM	(1) When measuring with pirant Vacuum gauge of charging M/C, vacuum degree is within 1 Torr. (2) If the vacuum degree of the cycle inside is 10 Torr. below for low pressure and 20 Torr. for high pressure, it says no vacuum leakage state. (3) Vacuum degree of vacuum pump must be 0.05 Torr. below after 5 min. (4) Vacuum degree must be same to the value described item (2) above for more than 20 min.	• Apply M/C Vacuum Gauge without fail. • Perform vacuum operation until a proper vacuum degree is built up. • If a proper vacuum degree isn't built up, check the leakage from the Cycle Pipe line part and Quick Coupler Connecting part.
5	DRY AND AIR NITROGEN GAS	(1) The pressure of dry air must be more than 12~16Kg/cm^2 (2) Temperature must be more than -20~-70°C. (3) Keep the pressure to 12~6Kg/cm^2 also when substituting dry air for Nitrogen Gas.	
6	NIPPLE AND COUPLER	(1) Check if gas leaks with soapy water. (2) Replace Quick Coupler in case of leakage.	• Check if gas leaks from connecting part of Coupler.
7	PIPE	• Put all Joint Pipe in a clean box and cover tightly with the lid so that dust or humidity is not inserted.	

6. CIRCUIT DIAGRAM

I-MICOM DISPLAY

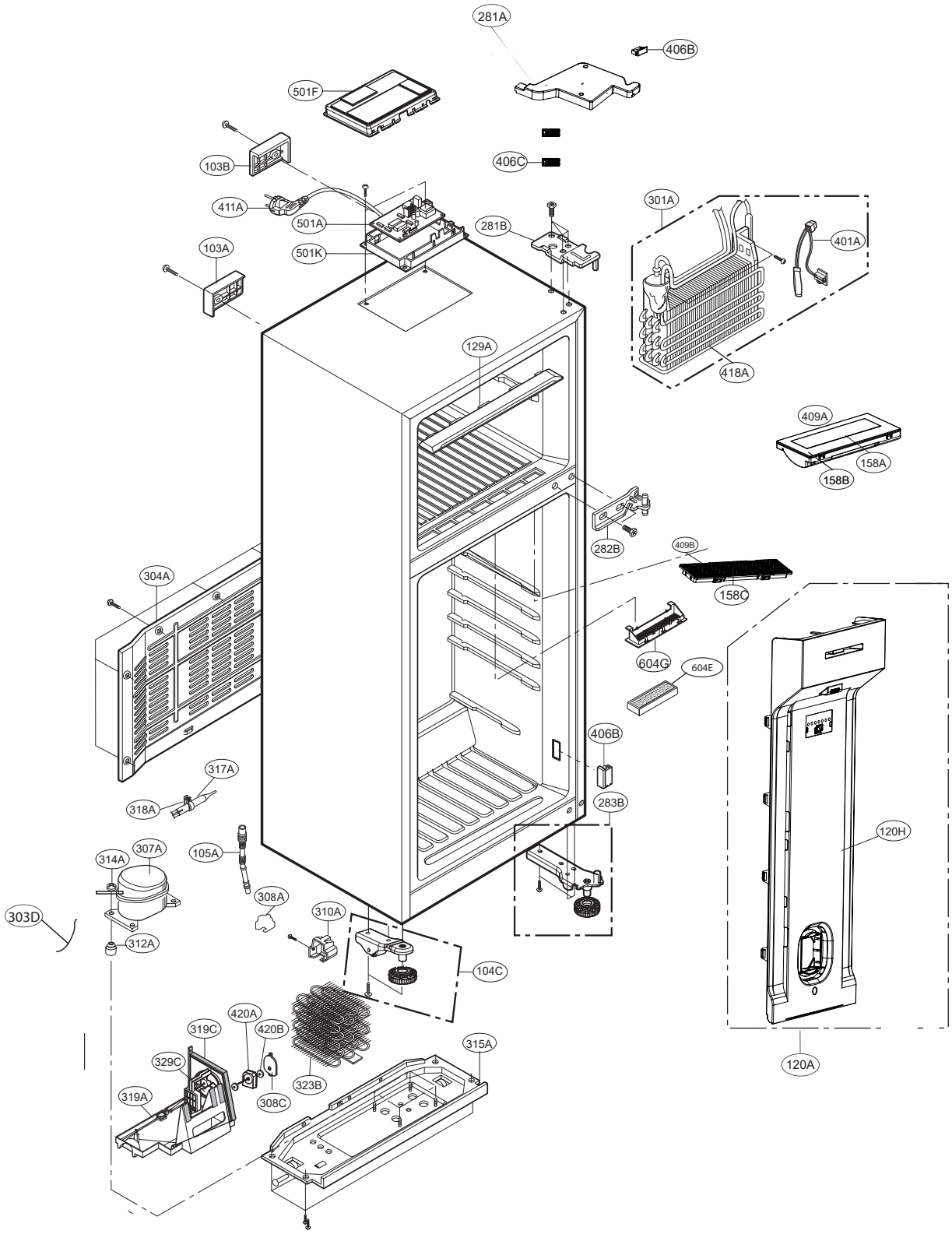


E-MICOM DISPLAY



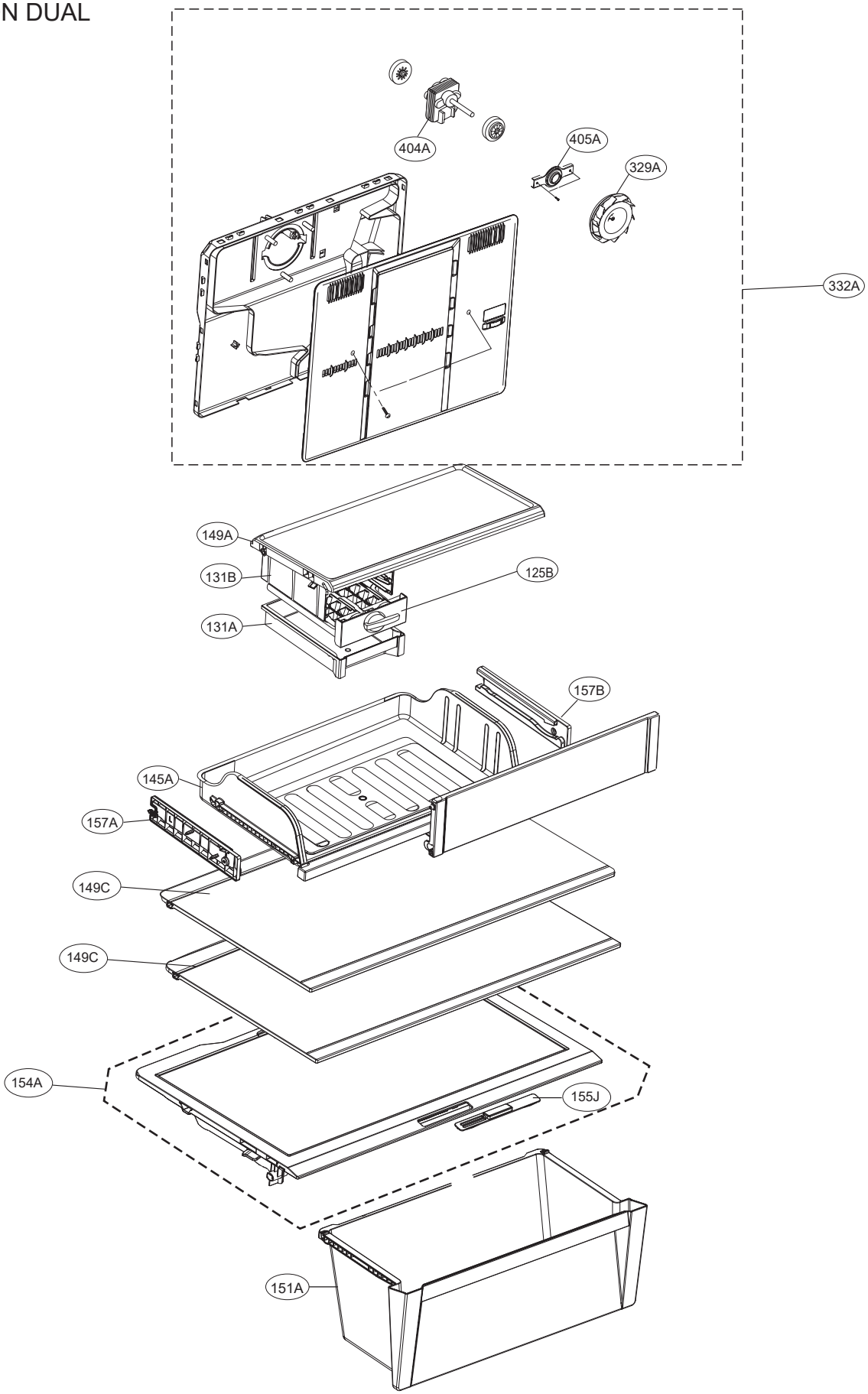
EXPLODED VIEW

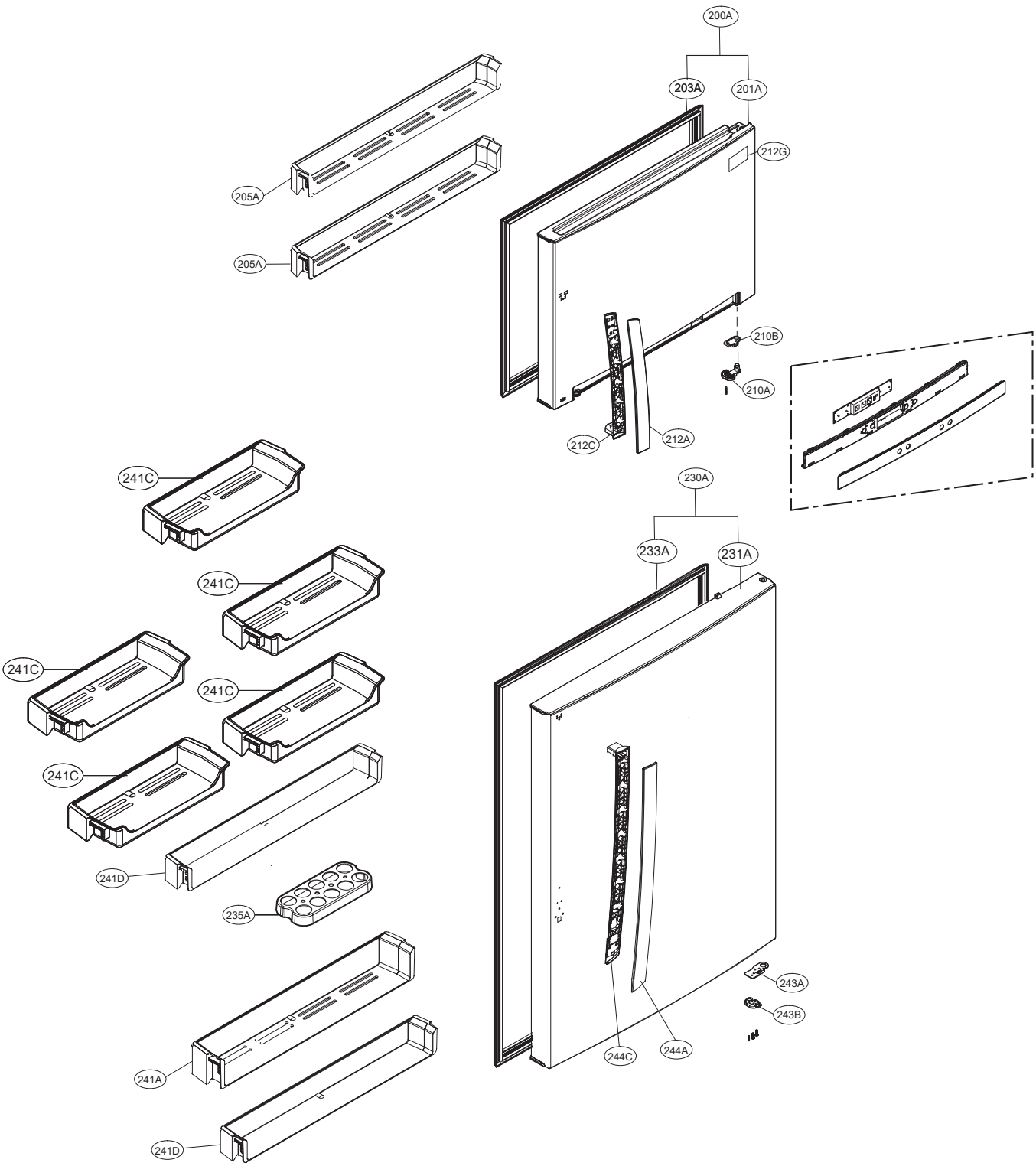
▼ The parts of refrigerator and the shape of each part are subject to change in different localities.
▼ Capacitors and fuse are optional parts.



EXPLODED VIEW & REPLACEMENT P ARTS LIST

NON DUAL




200A
203A
201A
212G
205A
205A
210B
210A
212C
212A
241C
241C
241C
241C
241C
241D
235A
241A
241D
230A
233A
231A
243A
243B
244C
244A



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