



REFRIGERATOR

SERVICE MANUAL

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

GL-241

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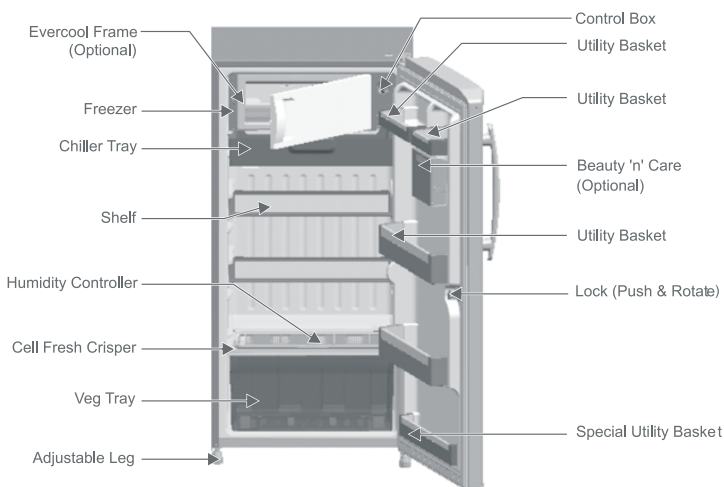
SAFETY CAUTIONS

Please read the following before servicing your refrigerator

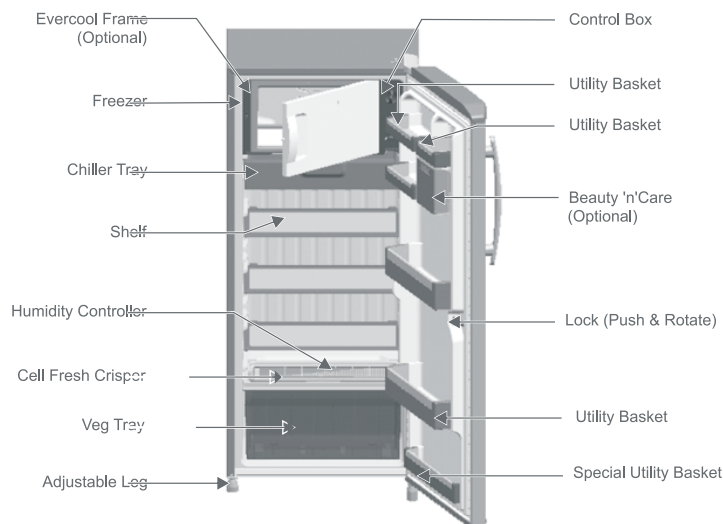
1. Check if an electric leakage occurs in the set.
2. To prevent electric shock, unplug prior to servicing.
3. In case of testing with power on, wear rubber gloves to prevent electric shock.
4. If you use any appliances, check regular current, voltage and capacity.
5. Don't touch metal product in cold 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.

PARTSIDENTIFICATION

GL 221



GL-241 / GL-285 / GL-281



GL-221 / GL-241 / GL-285 / GL-281

Specification of Refrigerators

MODEL	GL-221	GL-241	GL-285/281
Capacity(Ltrs.)	215	235	275
Overall Dimension (mm)	591(W)x638(D)x1230(H)	591(W)x638(D)x1375(H)	591(W)x638(D)x1550(H)
Net Weight(kg)	41	44	47



Outer Case
Insulation
Temperature Control
Cooling System

PCM Sheet
PU Foam
Thermostat-Knob Dial
Direct

*Specifications & Dimensions are subject to change without prior notice.
*Product Content depends according to Model Spec wise.

THE REFRIGERATION CYCLE

The Refrigeration Cycle means a series of operations in which the refrigerant absorbs the heat from inside the Refrigerator, the absorbed heat is rejected from the refrigerant into the atmosphere and thereby the refrigerant is back to its original state to again remove the heat from inside the Refrigerator. This cyclic operation continues to maintain low temperature in the refrigerator.

The common refrigerator systems in use in domestic Refrigerators are :

- 1) Vapor Compression System
- 2) Vapor Absorption System

The Vapor compression system is used in majority of Refrigerators.

Vapor Compression System

The Refrigeration cycle consists of following steps :

1. The Compressor pumps the refrigerant through the entire system.
2. The refrigerant gas is drawn from the evaporator through the Suction Line by the Compressor, Compressed and pumped into the Condenser. As the Gas is compressed, its temperature raised sharply.
3. As the Refrigerant gas passes through the condenser, the heat is expelled from the refrigerant into the atmosphere. During this process the refrigerant changes into liquid state.
4. The hot liquid refrigerant enters capillary tube through Filter Drier. The Filter Drier absorbs moisture and filters the impurities.
5. The capillary allows the exact amount of liquid refrigerant to flow. As the refrigerant passes through the capillary, the required pressure drops takes place due to heavy frictional resistance offered by the small diameter of the Capillary Tube. Since the Capillary Tube is soldered along the suction line, the hot liquid refrigerant is cooled while it passes through the Capillary Tube.
6. As the liquid refrigerant from the Capillary Tube enters the Evaporator there is a sudden increase in diameter of the tubing forming a low pressure area, causing evaporation of liquid refrigerant into gas. There by the temperature of the refrigerant drops rapidly. In this process, the refrigerant absorbs heat through the Evaporator from the storage area.
7. Low pressure Refrigerant gas leaving the evaporator enters the header (Accumulator). The header traps any refrigerant liquid which is not changed into gas in the evaporator and prevents any liquid entering into the Compressor.
8. The refrigerant gas from the Header is drawn by the compressor through the Suction Line, thus completing the cycle.

COMPRESSOR

The domestic refrigerators are provided with Hermetically Sealed Compressors. In this type, the compressor and electric motor are enclosed in one welded steel case. Compressor and electric motor are permanently lubricated. As the motor in the casing is exposed to low temperature refrigerant vapor, it helps to cool the motor, the only connections to this type Compressors are the suction and discharge connections to the casing and the electrical connections to the motor. Dehydration of the Unit, before gas charging is essential as the moisture in the system may damage the motor. Main advantages of this type of compressors are :

- i) Compact Size
- ii) Less Noise
- iii) No leak of Refrigerant

The Compressor is provided with a single phase, two pole split phase induction motor. The Motor is provided with two windings i.e. Start Winding and Run Winding. Start Winding is made of thin wire with more number of turns and has high resistance. Run winding is made of thick wire with small number of turns and has low resistance. When the motor is started, current flows through both the windings, but there will be phase difference in the magnetic field generated by them. Due to this phase difference a rotating magnetic field is developed which generates sufficient starting torque. As the motor picks up speed, the Relay disconnects the supply to the Start Winding and the motor continues to run.

The compressors design is reciprocating scotch-yoke design by which Compressor is made compact and light. The low pressure vapor from the Suction Line is drawn into the cylinder by the piston, compressed into high pressure gas and pumped through discharge valve into the condenser. Whenever the compressor is stopped, the equalization of pressure in Suction and discharge sides is required due to low starting torque of the Motor. The Pressure equalization is made possible with the usage of capillary tube in the system.

THERMOSTATIC SWITCH

Refrigerators with vapor compressor system are designed so that the cooling capacity is greater than required, even under the highest possible load conditions. Because of this excess capacity, the temperature can be easily controlled by switching the unit on and off automatically, so that it runs, just sufficiently to provide the exact quantity of refrigeration required, it is general practice to design units so that they only run 18 to 20 Hours per day even under the heaviest expected loading, normally the running time is considerably less. The cycling of the unit and consequently the Cabinet temperature is controlled by a Thermostatic Switch.

Thermostatic Switch is the connecting link between the Evaporator and Compressor. It consists of a Sensing Bulb (which is clamped to the Evaporator), together with a Capillary Tube and metal bellows. The Capillary Tube Bellows are filled with refrigerant. Variation in the temperature of the refrigerant varies the pressure causing the movement of bellows. The bellows movement is checked by a control spring. The movement of the bellows due to varying pressure operates a switch mechanism. The switch Mechanism consists of a movable contact and a stationary contact. Power Supply to the compressor is provided through these contacts.

As the Compressor runs, the Sensing Bulb is cooled gradually reducing the pressure in the bulb-bellows assembly. The reduction in pressure allows the control spring to push the movable contact away from the stationary contact which stops the Compressor. As the Compressor is stopped the sensing Bulb slowly warms up increasing the pressure in the bellows, thereby the bellows pushes the movable contact on to the stationary contact which starts the Compressor and the Cycle repeats.

The number of degrees between the cutting-out and cutting-in temperatures of the switch is known as the differential. Operating Temperature of the switch can be varied by increasing or decreasing the tension of the Control spring by rotating shaft of the thermostat switch. By increasing the tension of the Spring against the bellows a greater pressure and hence temperature is required to operate and close the switch points. While a reduction of the Spring tension lowers the temperature at which this occurs.

STARTING PTC & OVERLOAD PROTECTOR

PTC-STARTER (Except BMG, BSA Compressor)

1. Composition of PTC-Starter

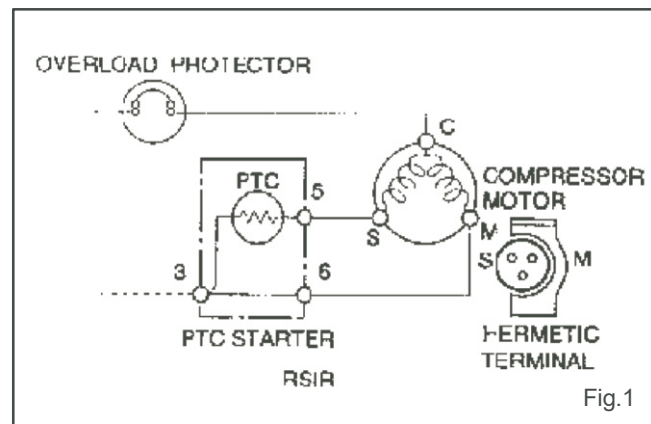
- (1) PTC (Positive Temperature Coefficient) is non-contact semiconductor starting device which uses ceramic material and the material consists of BaTiO_3 .
- (2) The higher the temperature is the higher resistance value becomes. These features are used as starting device of Motor.

2. Role of PTC-Starter

- (1) PTC is attached to Hermetic Compressor used for Refrigerator, Show Case and starts Motor
- (2) Compressor for household refrigerator applies single-phase induction Motor.
For normal operation of single-phase induction motor, in the starting operation flows in both main coil and sub-coil. After the starting is over, the current is cut off in sub-coil. The proper features of PTC play the above all roles. So, PTC is used as a starting device of motor

3. PTC-Applied Circuit Diagram

According to Starting Method of Motor



4. Motor Restarting and PTC Cooling

- (1) For restarting after power off during normal Compressor Motor operation, plug the power cord after 5 min. for pressure balance of Refrigerating Cycle and PTC cooling
- (2) During normal operation of Compressor Motor, PTC elements generate heat continuously. Therefore, if PTC isn't cooled for a while after power off, Motor can't operate again.

5. Relation of PTC-Starter and OLP

- (1) If power off during operation of Compressor and power on before PTC is cooled, (instant shut-off within 2 min. or reconnect a power plug due to misconnecting), PTC isn't cooled and a resistance value grows. As a result, current can't flow to the sub-coil and Motor can't operate and OLP operates by flowing over current in only main-coil

STARTING PTC & OVER LOAD PROTECTOR

- (2) While the OLP repeats on and off operation about 3-5 times, PTC is cooled and Compressor Motor performs normal operation.
If OLP doesn't operate when PTC is not cooled, Compressor Motor is worn away and causes circuit-short and fire. Therefore, use a proper fixed OLP without fail.

6. Note to Use PTC-Starter

- (1) Be careful not to allow over-voltage and over-current.
- (2) No Strike. Don't apply a forcible power or strike.
- (3) Keep apart from any liquid.
If liquid such as oil or water inflows into PTC, PTC materials may break due to insulation breakdown of material itself.
- (4) Don't change PTC at your convenience.
Don't disassemble PTC and mold. If damaging to outside of PTC-starter, resistance value alters and poor starting of compressor motor may cause.
- (5) Use a properly fixed PTC

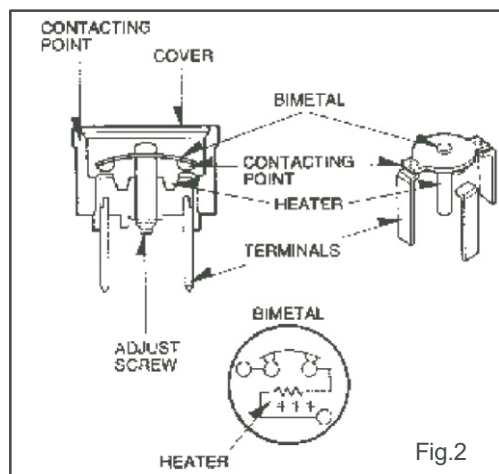
OLP(OVER-LOAD PROTECTOR) (Included BMG, BSA Compressor)

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.

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)



REFRIGERATOR

The Refrigerator can be divided into 3 main parts :

- 1) The Cabinet
- 2) The Refrigeration System
- 3) The Controls

1. The Cabinet provides necessary space for storing the food stuffs to be preserved. The cabinet and Door are designed in such a way that Cabinet is made air-tight when the Door is closed. A magnetic Door Seal is provided on the Door for perfect sealing when the Refrigerator Door is closed.

The Cabinet and the Door are insulated with PUF for minimising the leakage of heat into the Cabinet from outside.

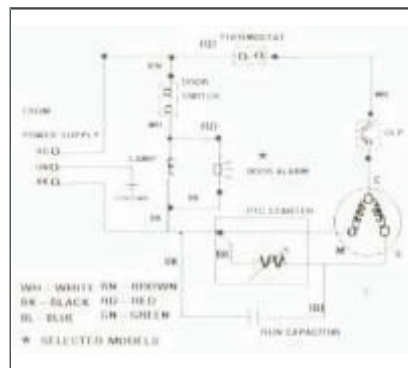
2. The Refrigerator System, otherwise known as Sealed Unit maintains the low temperature required for preservation of food stuffs inside the Cabinet.

As explained in the Refrigeration Cycle the Evaporator records lowest temperature in the Refrigeration System and heat removed by it from inside the Refrigerator is dissipated into the atmosphere through the condenser.

The Evaporator is mounted inside the Cabinet at the Top. Air inside the Cabinet at the top becomes cool when it comes into contact with the cold Evaporator. As it cools, it becomes denser and starts settling downward. During downward travelling it picks up heat from the warm food and the walls of the cabinet through which some heat leaks through. In the process of picking up heat the air becomes lighter and it again goes up to the Evaporator. This Cyclic Operation continues to maintain low temperature inside the Cabinet.

3. A Thermostat Control is provided in the Refrigerator for regulating the Temperature as per the requirement. How the Temperature is regulated by Thermostat is explained in the Chapter "Thermostatic Switch".

CIRCUIT DIAGRAM



INSTALLATION OF REFRIGERATOR

The Installation of Refrigerator is an important factor and has to be carried out carefully and systematically to achieve trouble free operation of appliance. Following is the installation procedure for Refrigeration.

Location :

1. Refrigerator should be installed away from any heating appliance such as Cooking Range or Gas Stove.
2. Avoid installation in open verandah where direct sun rays or rain would affect the efficiency and operation of the Refrigerator.
3. Ensure that the maximum ventilation is available to the condenser. Avoid installation where there is no air circulation. The mechanic should insist upon the place where free air circulation is ensured. If customer is not able to provide such a location, certain additional precautions are to be taken such as providing a 150 to 200 mm high stand with a recess at the bottom to improve air circulation.
The responsibility of proper functioning of refrigerator lies with the customer if the above alternative are not met with.
4. Do not install the refrigerator in wall recess where the air circulation is restricted.

Power Supply :

1. Advise customer to provide a separate socket which is to be used for refrigerator only.
2. Supply to socket should be taken direct from the electric supply mains to ensure that the most consistent voltage is supplied to the Refrigerator.
3. Use 5Amps capacity socket with 5Amps fuse in phase with on and off switch.
4. Check Voltage with Voltmeter.
5. Refrigerator is designed to operate within the Voltage Range of 170 to 250 volts. However, the Refrigerator should be operated very near to the normal Voltage (220V) for the best performance.

Transport :

1. Use always rubber wheeled vehicle to transport the Refrigerator.
2. Transport the Refrigerator upright. Read the printed directions on the carton for its correct position.
3. Do not drop the Refrigerator on the ground but place it carefully.
4. At no time should the refrigerator be dragged. Instead lift the refrigerator and place it gently at the required place.

Unpacking :

1. Cut the binding strip of carton.
2. Open the top flaps of carton by removing the adhesive tapes.
3. Remove Top Buffers.
4. Remove carton.
5. Remove Base Plate Assy.

INSTALLATION OF REFRIGERATOR

6. Inspect Refrigerator for any damage to Sealed System or Cabinet.
7. Remove all the packages from inside the Refrigerator in which following accessories are packed :
 - a) Vegetable Tray b) Cover T/V c) Chiller Tray d) FIR Lamp (Optional)
 - e) Ice Trays f) Bulb g) Glass Shelves
 - h) Drain Tray i) Egg Shelf j) Cover, Display (optional)
 - k) Door Baskets l) User Manual-cum-warranty card
8. If any stand is provided by the customer, place the refrigerator on it carefully. Otherwise, refrigerator may be placed on the floor near the plug point leaving a minimum gap of 200 mm, for condenser ventilation from the wall.
9. The refrigerator should be levelled properly with the help of adjustable leg provided, so that it is firm on the ground. This will avoid the compressor making undue noise. Any wobbling of the refrigerator will also result in excessive vibration while starting and stopping of the compressor or during automatic cycling.
10. Clean the refrigerator (Refer cleaning).
11. Fit all the accessories in their proper position.

Electric Supply Connections :

1. Check power supply with voltmeter.
2. If supply voltage is below 170V or above 250 V, install Voltage Stabilizer. Warranty will not be applicable if found the Sealed Unit damaged due to high or low voltage.
3. Check the position of phase, neutral and earth in the supply socket as per the following sequence :
 1. Phase : Right
 2. Neutral : Left
 3. Earth : Top
4. Three pin plug should be connected as per the following (if the plug is supplied separately).
 1. Red : Phase
 2. Black : Neutral
 3. Green : Earth
5. Incorporation fuse of 5Amps capacity of tinned copper wire 35 gauge in the phase of the supply. Check Relay connections and ensure that it is fixed intact to the Compressor casing and properly fitted.
6. Connect the plug to the supply socket.
7. Thermostat should be switched on to the normal position (normally 2 to 3 hr. will be required to stabilize the temperature in the Refrigerator).
8. While the Refrigerator is operating, the Service Mechanic should educate the customer the various aspects in utilizing the Refrigerator as explained in Owner's Manual / Instruction Booklet.

Cleaning

Exterior should be cleaned with wet clean soft cloth. No soap, detergent or vim should be used as this will result in dull appearance of painted surface. If required after wet cloth cleaning any good brand CarWax Polish may be used for polishing painted surface. Avoid oil or grease to come into contact with painted surface as this will cause permanent stain.

Interior

With the aid of clean cloth dipped in Lukewarm water mixed with 1/2 teaspoon Baking Soda, clean the surface and interior fittings. Do not use any Soap, Vim or any Wax Polish.

Storage of Food

All vegetables, fruits should be put into polythene bags and kept on the shelves or in the vegetable tray. Store packages in such a way to have easy access for free air circulation inside.

All liquid, semi liquid containers should be provided with airtight lids or covers. All the frozen foods such as meat, beef, fish etc., ice creams can be stored in the Freezer.

Thermostat Position

The temperature inside the Refrigerator can be varied with the help of thermostat.

Advise the customers to position the thermostat for controlling the temperature as explained in the User's Manual.

Defrosting

Due to the obvious phenomenon for moisture in the air to condense on the cold surface there will be regular buildup of the frost on the Freezer. This frost accumulation acts in reducing the cooling effect thereby reduces efficiency. Therefore periodic defrosting is necessary to ensure optimum performance.

Advise the customers to defrost the refrigerator periodically as explained in the User's Manual

During Holiday

Customer going on Holidays must shut down the Refrigerator.

- a) Disconnect 3-pin plug from socket
- b) Remove every stored item including ice trays
- c) Defrost the Refrigerator
- d) Wipe the Refrigerator Dry
- e) Leave the door open as your fridge needs fresh air

When restarting the Refrigerator

- a) Clean (Refer cleaning refrigerator)
- b) Connect 3-pin plug
- c) Load the Refrigerator after temperature has been stabilized i.e. after 2 to 3 hours.



Installation Instruction for Power Cut EVERCOOL

★ Power Cut EverCool™ / पावर कट एवरकूल

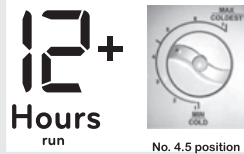
LG Power cut Evercool, consists unique phase change material in Freezer section, maintains optimum cooling inside inside refrigerator up to 9 hours# even during long power cuts.

LG पावर कट एवरकूल — फ्रीजर विभाग में चरण बदलने वाली विशिष्ट सामग्री होती है, जो लम्बे समय तक विद्युत आपूर्ति न होने पर भी रेफ्रिजरेटर में 9 घंटे तक अनुकूलतम ठंडक बनाये रखता है।



Suggestion for better cooling & cooling retention / बेहतर ठंडक और प्रतिधारण के लिए सुझाव

1. Before loading let the refrigerators run for **12 hours**. Set the thermostat at **4.5**.
लोड करने से पहले रेफ्रिजरेटर को 12 घंटे के लिए चलाएं। थर्मोस्टेट नोब को 4.5 पर सेट करें।

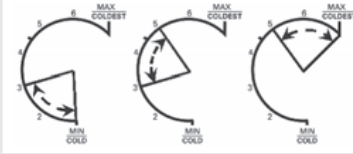


2. Refrigerator need to run minimum **8 hours** continuously to freeze the EverCool case to provide maximum cooling retention.
रेफ्रिजरेटर को कम से कम 8 घंटे तक लगातार चलाएं जिससे कि एवरकूल टैंक फ्रीज हो जाए और अधिकतम कूलिंग बनाए रख सकें।

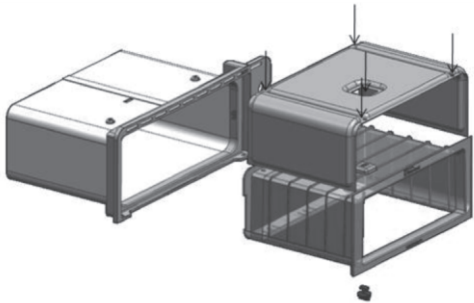


3. Temperature Setting as per shown picture.
तापमान को विभिन्न मौसमों के लिए दिखाए गए चित्र के अनुसार सेट करें।

WINTER (1~3) MONSOON (3~5) SUMMER (5~7)

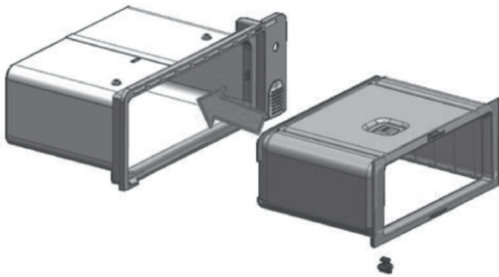


As per LG Standard / LG आन्तरिक परीक्षण के अनुसार



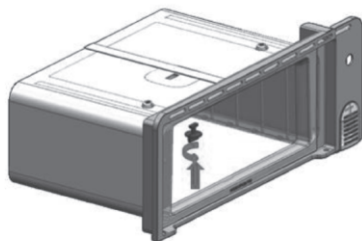
STEP-1

Align the 4 holes on the PCM Pouch with the bosses on the Case display.



STEP-2

Slide the PCM pouch and Case Display assembly in the evaporator assembly till the front flange of Case Display touches the front face of the Display.



STEP-3

Align the Evaporator bracket with slot in the Evaporator and rotate either clockwise or anti-clockwise by 90 degrees to lock the PCM pouch and Case display assembly.

Note

- Evercool parts will be Assembled in product from Factory in Evercool Models.
- Disassembly & Assembly to be done by Service Engineer only.

CHECKLIST

Every Refrigerator must be checked for its correct operation soon after it is installed. Installation check should be made before service mechanic leaves the place of installation. Carry out inspection as per the installation checklist.

Installation Check List

Cabinet		Check
1.	RefrigeratorLevel	()
2.	LockingMechanism	()
3.	DoorSealing	()
4.	LightSwitch	()
5.	LightBulb	()
6.	ChillerTray	()
7.	DrainTray	()
8.	ThermostatSwitchoffandon	()
9.	ThermostatKnobfitment	()
10.	ThermostatCycling	()
11.	SupplyVoltage	()
12.	PTCConnections	()
Sealed System		
1.	FreezerTemperature	()
2.	SystemBalancingTime(3to4½min)	()
3.	CompressorMountingClips	()
4.	SuctionLineantiratlletube	()
5.	PTCFitment	()
6.	Vibration	
	a) SuctionLine	()
	b) DischargeLine	()
7.	Walltocondensergap(200mm)	()

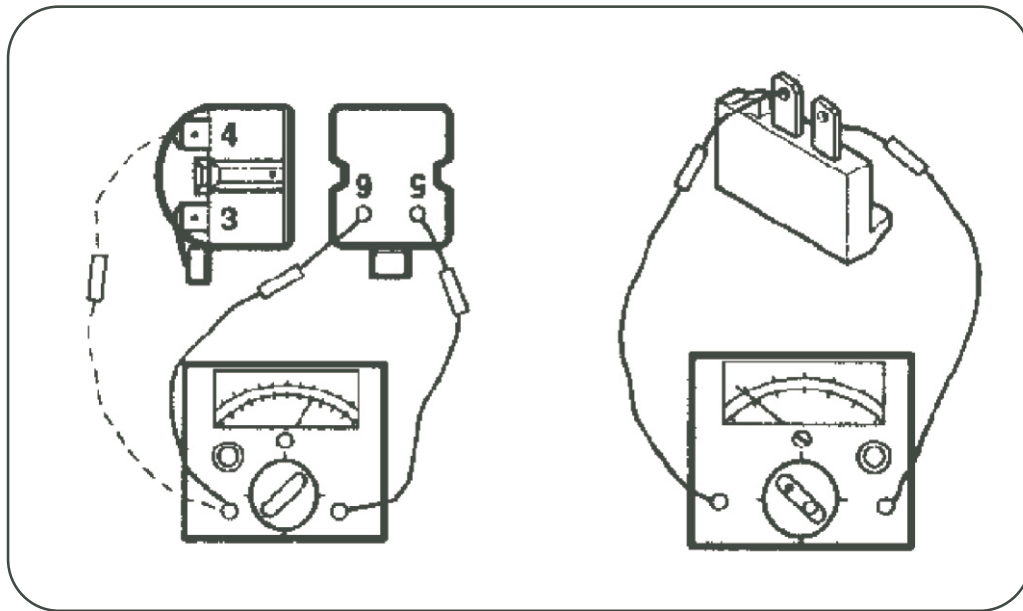
FAULTDIAGNOSISOFPPTC&OLP

PTC : (Except BMG, BSA Compressor)

If the normal operation compressor is impossible or poor, then separate the PTC from the compressor and measure the resistance between No.5 &6 of PTC with a tester or a Whistone Bridge, if the resistance value is 0 or several hundred W or ¥ then replace the PTC and if the observed resistance is $30 \pm 20\%$ W then check another electric components.

OLP: (Included BMG, BSA Compressor)

Separate the OLP from the Compressor and check resistance value between two terminals of OLP with Tester as shown in fig. If the resistance is 0 or ¥ or several hundred ohm, then replace it, otherwise check other electric components.



FAULTDIAGNOSISOFTHERMOSTAT

It is very much important that the following points are thoroughly checked before rejecting the Thermostat for erratic defrosting that

- a) The Refrigerator is defrosted periodically once in two days without fail.
 - b) The cooling performance of the Sealed Unit is satisfactory.
 - c) There is no door seal leakage.
6. Check the Thermostat Visually for the functioning of the shaft and reject if it is out of order as "MSD".

FAULTDIAGNOSISOFTHERMOSTAT

In this procedure, the possible defects that can be noticed in Thermostats used for Refrigerator are standardized, briefly described and coded. Further, brief guidelines are given to diagnose the defect in these Thermostats.

Description of Coding of Defects

S.No.	Description of Defect	Code
1.	Refrigeration not starting in 'ON' position	RNS
2.	Refrigerator Working in 'OFF' position	RWO
3.	Refrigerator not cycling (Working Continuous)	RNC
4.	Refrigerator Tripping in Cycling	RTC
5.	Erratic Defrosting or Defrosting incomplete	ED
6.	Main Shaft Damaged / Dislocated	MSD

Fault Diagnosis

- When the Refrigerator does not start with a suspected defective Thermostat, ensure that the defect is with the Thermostat only as follows.
Remove Thermostat and short circuit both the Thermostat terminals of Refrigerator wiring and check up if the Refrigerator is starting and Working all right. Then separately check the defective Thermostat for continuity between terminals in "ON" position, if no continuity, reject it as 'RNS'.
- When the Refrigerator is found to be working even if Thermostat is set on "OFF" position, reject the Thermostat as "RWO".
- When Refrigerator is observed to be not cycling, ensure that not cycling is because of defect in Thermostat only by checking that the lowest evaporator plate temperature is as per the standard and if so, reject Thermostat as "RNS".
- If tripping during cycling is observed, check the following :
 - There is no leakage through Door Seal.
 - The Cooling in the Evaporator is normal.
 - The balancing time as 3½ mts i.e., the compressor starts satisfactory with an off time of 3½ mts.
 If all the above points are O.K. and still the Refrigerator trips in cycling, then check the off time and it is less than 2½ mts, reject thermostat as "RTC".
- If the refrigerator suffers from any of the following defects with Push Button Defrost then Thermostat can be rejected as "ED".
 - Push Button cuts in before ice melts completely.
 - Defrosting is complete in some cycles and incomplete in some cycles.
 - Push Button does not cut in Automatically.

TROUBLE SHOOTING

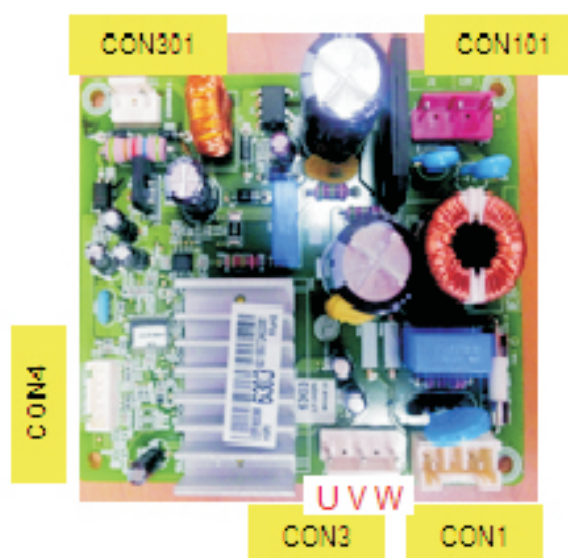
COMP activation defect

①



- OPEN PWB COVER

②



- Check the number of LED blinking
(Refer to the next chapter for actions for each number of LED blinking)

If COMP is normal,
it will not blink.

③



Check Disconnection of OLP
and comp connection
(U,V,W=SB, Red, Yellow)



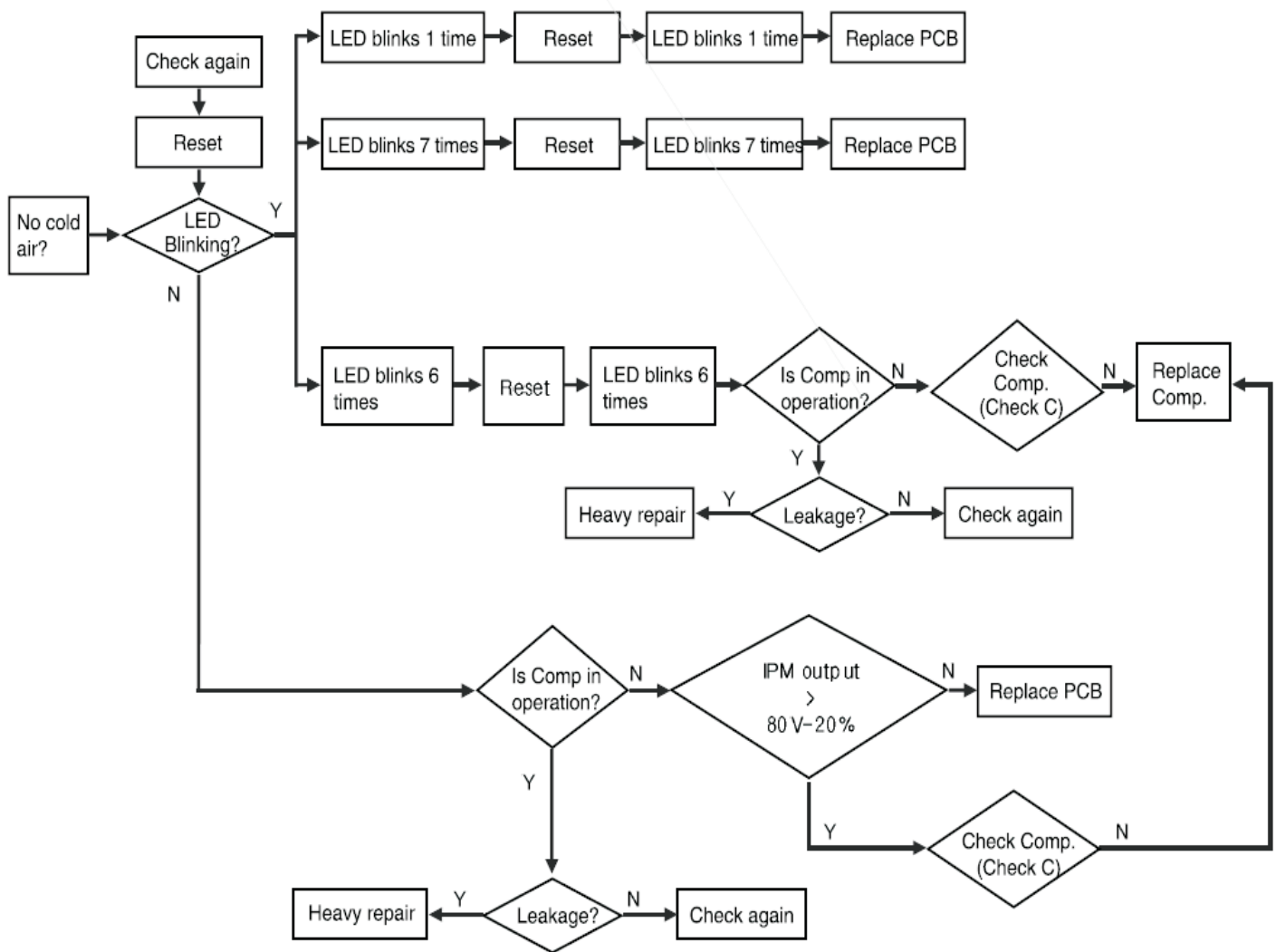
Check discharge
pipe and comp
temperature

COMP SVC MANUAL

1. Check LED Trip

- ① Separate PCB COVER, and check number of LED blinking
 - ② Verify the actions for each number of blinking → Check when it is not RESET(Before turning off the power of the refrigerator)
 - ③ Write the service information according to the number of LED blinking
 - ④ Write SVC information, and check again after power reset
 - ⑤ 7 Min Delay Occur After Power Reset
- Refer to the actions for each number of Trip and LED blinking

Simple Check order



Actions for each number of LED blinking

No.	LED operation status	Cause	Service Tips
1	LED 1 time repeated  --Blink-Off-Blink-Off-Blink-Off-Blink-Off-Blink-Off-Blink-Off-Blink-Off-- Repeated	AD-offset Error	1. Check normal operation after power reset 2. If same error occurs after 1, replace PCB.
2	LED 6 times repeated  --Blink-Blink-Blink-Blink-Blink-Blink-Off-Blink-Blink-Blink-Blink-Blink-Blink-Off-- Repeated	Circuit over-current error	1. Check normal operation after power reset 2. If same error occurs after 1, replace PCB. 3. If same error occurs after 2, replace COMP unit.
3	LED 7 times repeated  --Blink-Blink-Blink-Blink-Blink-Blink-Blink-Off-Blink-Blink-Blink-Blink-Blink-Blink-Blink-Off-- Repeated	PCB defect part (IPM)	1. Check normal operation after power reset 2. If same error occurs after 1, replace PCB.
4	LED 2 times repeated  Blink-Blink-Off Repeated Blink-Blink-Off	Circuit over voltage error	1. Check normal operation after power reset 2. If same error occurs after 1, replace PCB.

Actions for each number of LED blinking

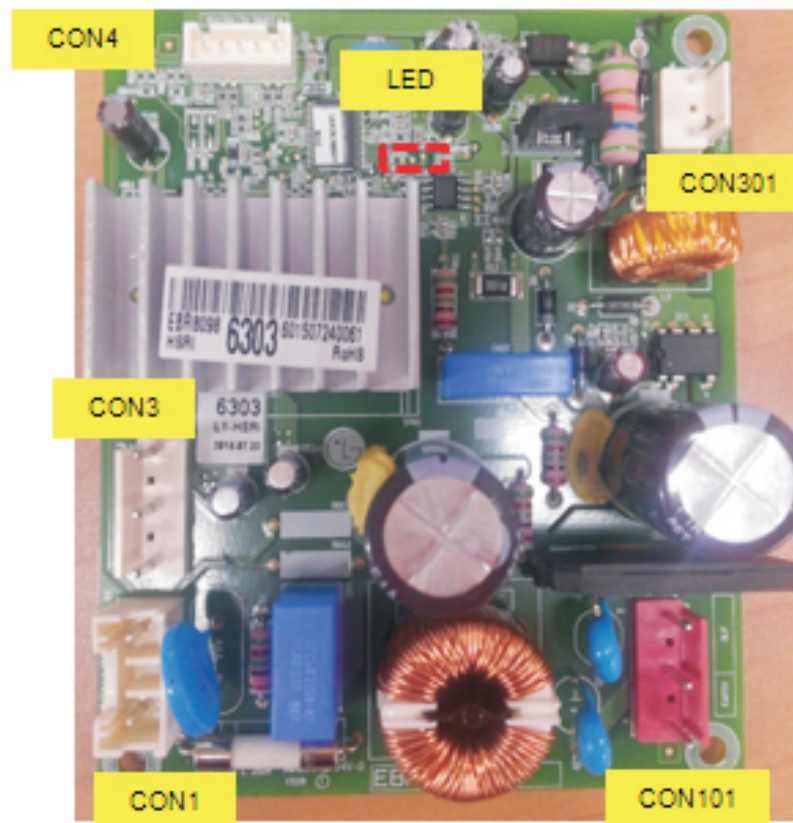
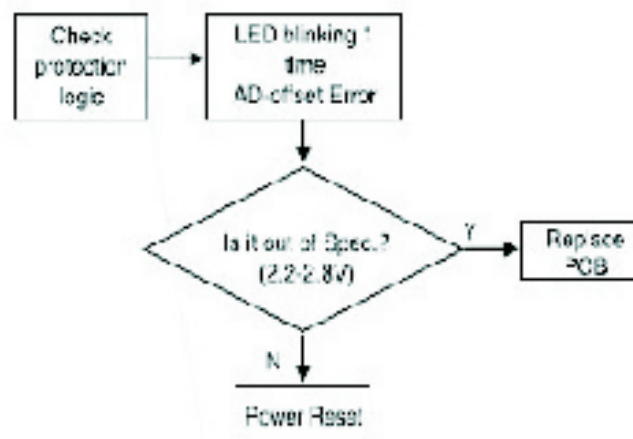
5	LED 3 times repeated  Blink-Blink-Off Blink-Blink-Off Repeated	Miss Cable Error	1. Power Reset (Power code off and wait for 10 sec.) 2. If same error occurred, Check a comp harness. 3. Comp harness is correct, Check a resistance. 4. If regsstance is 0, Comp must be changed.
6	LED 5 times repeated  Blink-Blink-Off Blink-Blink-Off Repeated	Sensorless Error	1. Power Reset (Power code off and wait for 10 sec.) 2. If same error occurred, Check a comp harness. 3. Comp harness is correct, Check a resistance. 4. If resistance is 0, Comp must be changed.

Actions for each Trip and number of LED blinking

1. LED blinking 1 time (AD-offset Error)



- Cause: PCB Short, sensing part defect
- Objective: to detect Motor voltage or current sensing defect
- Action: check CC310 voltage and if it is outside 2.2~2.5v, replace PCB



Actions for each number of TRIP and LED blinking

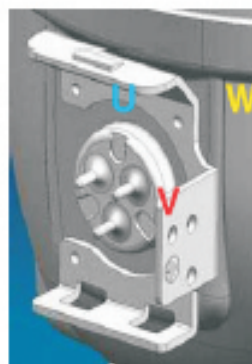
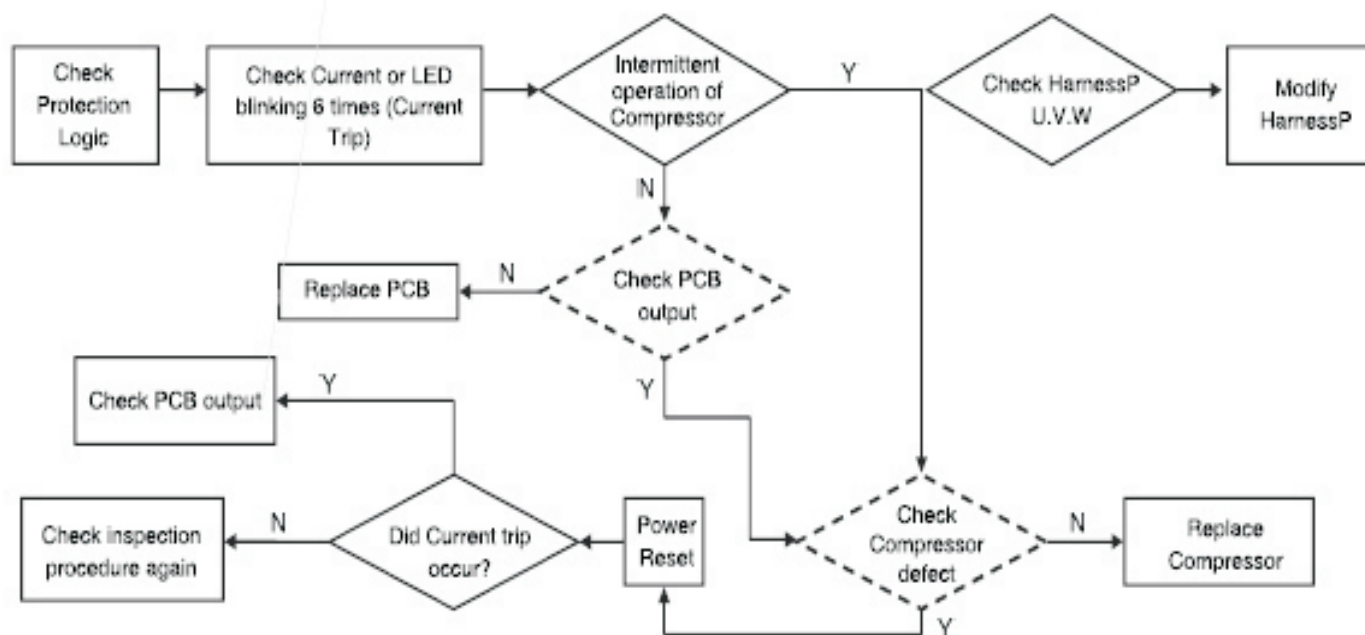
2. Current Trip and LED blinking 6 times (Current Trip)



Blink Blink Blink Blink Blink Blink OFF

※ 6 times blinking (Current Trip) may occur in a situation like temporary blackout such as refrigerator power off/on within 3 min.

1. If it blinks 6 times, but there is no significant difference between the temperature inside the refrigerator and the set temperature, there is no problem in PCB, Compressor, or Cycle.
2. If it blinks 6 times and problem such as no cooling occurs, it means cycle leakage or cycle clogged (moisture, trash).
 - Cause: Cycle leakage or clogging, excessive Compressor temperature increase, compressor piston locked, PCB IPM device burned due to Condenser fan defect
 - Cause: Over-current protection
 - Action: Check PCB output, Check operation of the Compressor single unit, leakage inspection and check cycle clogging (For re-vacuum, 30min. additional vacuum)



Actions for each TRIP and the number of LED blinking

3. LED blinking 7 times (IPM Fault)



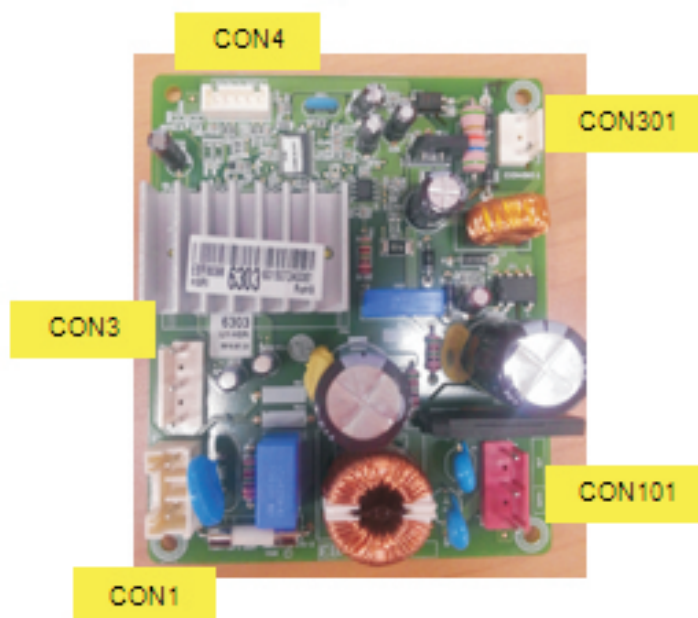
Blink Blink Blink Blink Blink Blink Blink OFF

→ Cause: IPM Short, defect (burned or damaged)

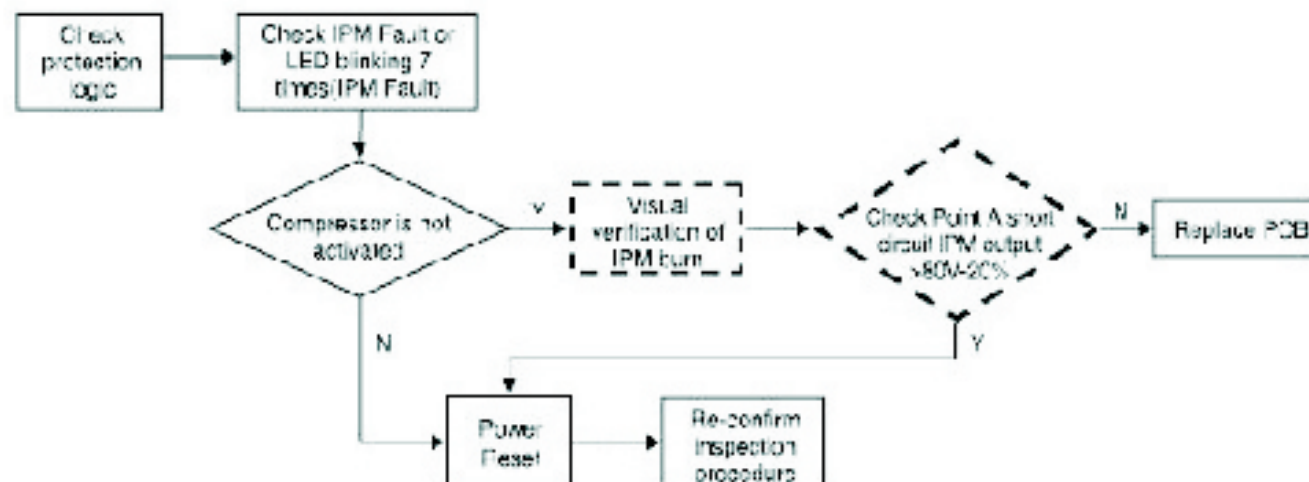
→ Objective: Protection of the over-current caused by IPM short or defect.

→ Actions: Visual verification of IPM burn when OCOMP is not in operation. Check whether there is a short circuit in U, V, or W part.

→ Replace PCB

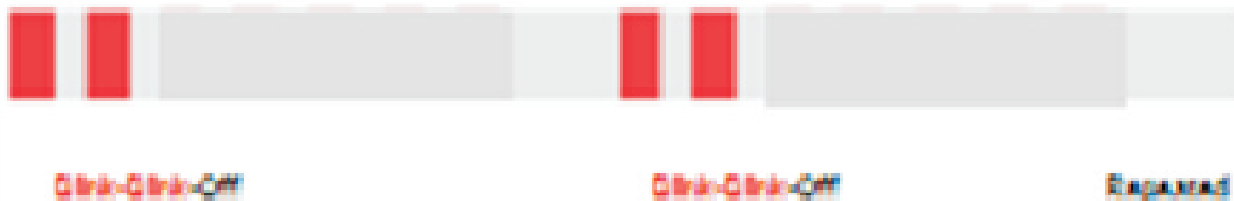


□ +: U part among Comp 3 phase connectors(CON201)
○ -: GND



Actions for each TRIP and the number of LED blinking

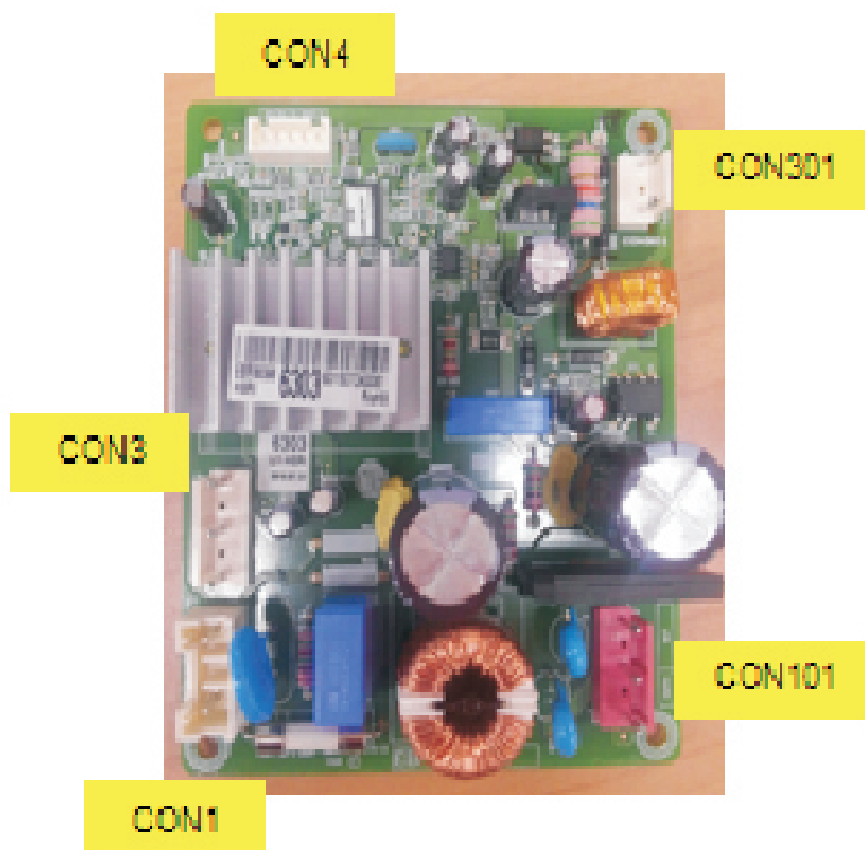
LED 2 times repeated



Cause: Over Voltage Protection

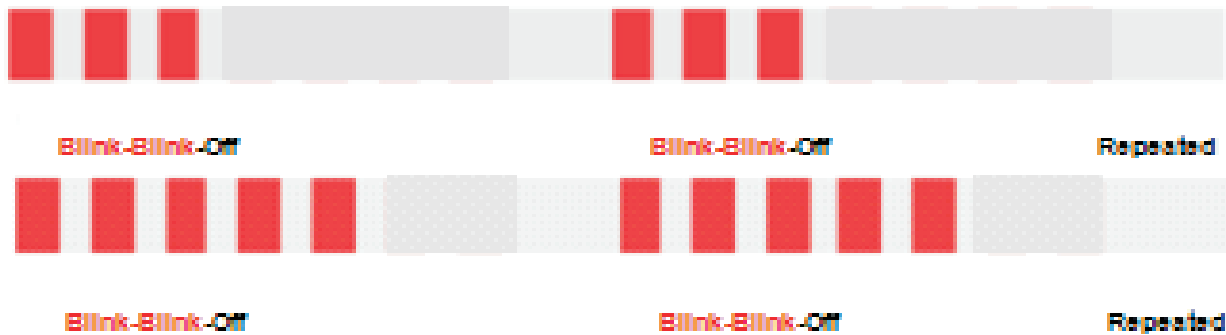
Objective: PCB A Protect

Action: Check PCB output, check operation of the Compressor single unit, leakage inspection and check cycle clogging



Actions for each TRIP and the number of LED blinking

LED 3 times & 5 times repeated



Cause: miss cable protection(3: miss cable protection in drive condition, 5: miss cable protection in start sequence)

Objective: PCBA Protect

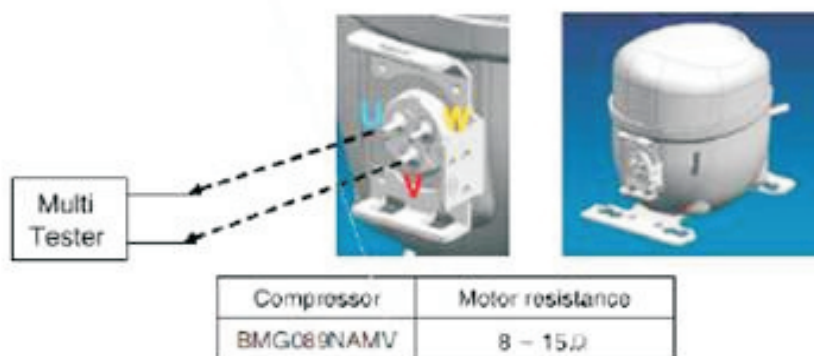
Action: replace a PCBA. Check a comp harness

if same error is occurred, check a resistance of compressor.(U -V, V-W, W-U)

if compressor's resistance is equal to 0, that comp' is must be changed.

Check COMPRESSOR & HARNESS

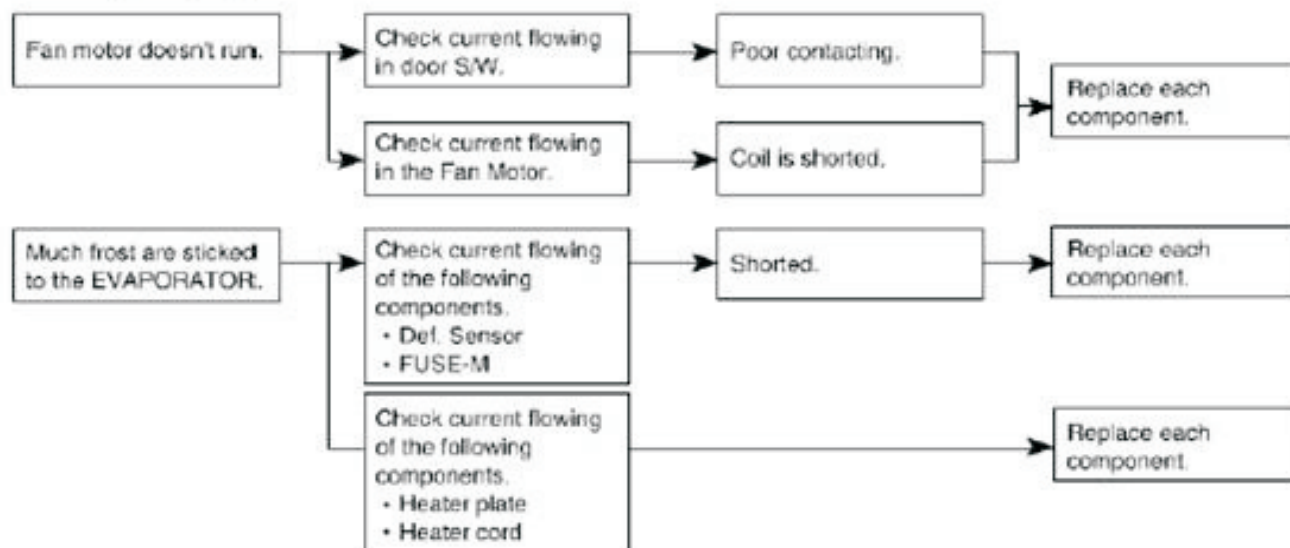
- Measure COMP connector resistance (Power & Common)
- Check insulation destruction : measure the resistance between the COMP power connector and the grounding.



※ There may be difference of several N in the resistance value according to the ambient temperature or operation condition.

4-1 ANOTHER ELECTRIC COMPONENTS

▼ Cooling ability is poor



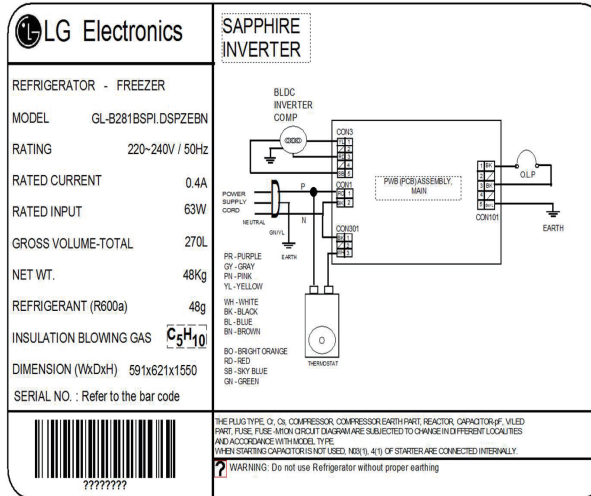


LG Electronics



REFRIGERATOR CIRCUIT DIAGRAM

THIS REFRIGERATOR IS ELECTRONIC ACTIVATION TYPE, SO WHEN THE POWER PLUG IS UNPLUGGED FROM THE SOCKET, PLUG IT IN AGAIN AFTER AT LEAST 5 MINUTES. IF IT IS PLUGGED IN RIGHT AWAY, THE COMPRESSOR OPERATION MAY BE STRESSED AND CAUSE DISORDER.



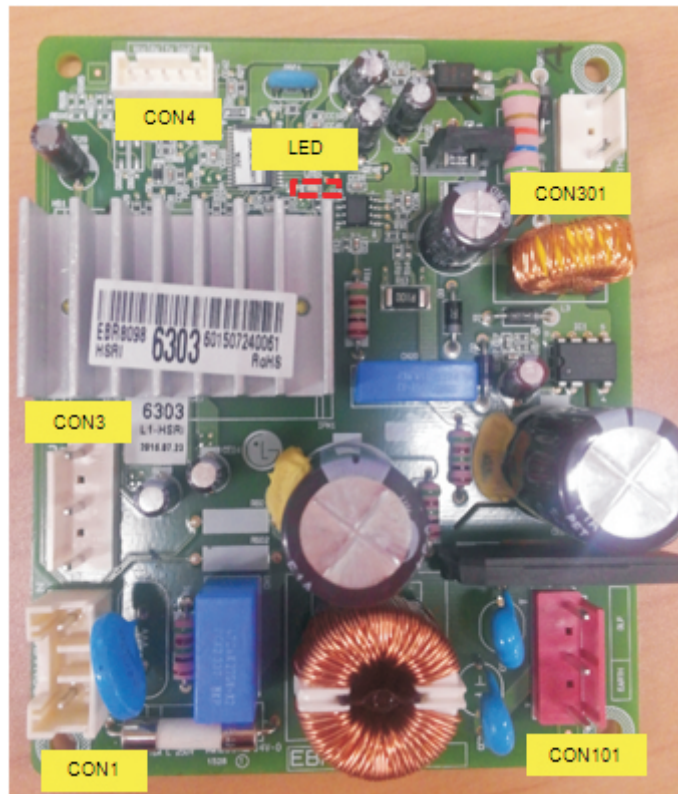
t General Control of Refrigerating Cycle

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.	

PCB Picture

8-1. Main PCB(Inverter Basic Performance PCB)

(P/N : EBR809863)



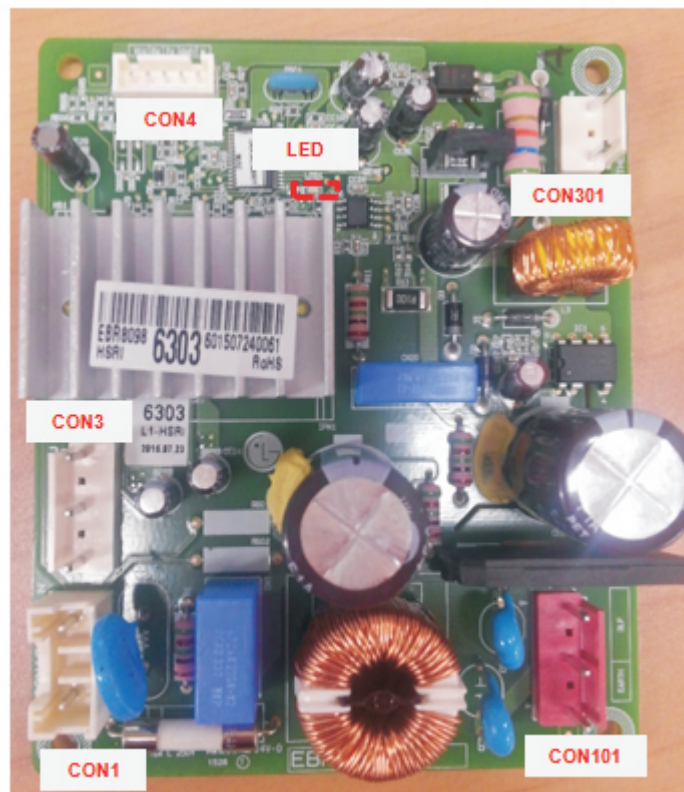
NOTES :

- CON1 : Power Supply
- CON2 : Comp Port
- CON3 : Writing Port
- CON101 : OLP&Earth
- CON301 : Thermostat
- LED : Error Indicator of Micom

Trouble Shooting

9-1. Refrigerator doesn't cool

Symptom	Check Point
1. Ref doesn't cool	1. Check for a loose connection 2. Check CON301 Voltage 3. Check IC13 Voltage



Check CON301 Voltage



Check IC13 Voltage



	Voltage	
CON301 1 st pin~ 2 nd pin	Thermostat Short	230V
	Thermostat Open	0V
	Other	Thermostat change
	Voltage	
IC10 3 rd pin~ 4 th pin	Thermostat Short	1~4V
	Thermostat Open	5V
	Other	PCBA change

FAULT DIAGNOSIS OF COMPRESSOR

In this procedure, the possible defects that can be noticed in Compressor are standardized, briefly described and coded. Further, brief guidelines are given to diagnose the defect in the Compressor.

Condition of Defects

S.No.	Defect	Code
1.	Body to Terminals showing continuity	B.S.
2.	Discontinuity of Terminals	D.T.
3.	Not Starting	N.S.
4.	No Pumping	N.P.
5.	Poor Pumping	P.P.
6.	High Current	H.C.
7.	Starting and stopping Noise	S.N.
8.	Running Noise	R.N.
9.	Tubes Broke, Relay shroud damaged, Terminals Bent	M

Procedure for Diagnosing the Defects

1. Check up continuity between terminals to body of the Compressor, if continuity is shown reject the Compressor as "Body to Terminals showing Continuity" (B.S.).
2. Check up the continuity between the Compressor glassmetic terminals. If there is no continuity reject the Compressor as "Discontinuity of Terminals" (D.T.).
3. If continuity between glassmetic terminals is all right fix correct relay and start the Compressor at correct supply voltage. If the Compressor fails to start reject the compressor as "Not Starting" (N.S.).
4. If the Compressor starts check up pumping. If no pumping is observed, reject the Compressor as "No Pumping" (N.P.).
5. If pumping exists, check up with pressure gauge whether Compressor can build pressure up to 200 PSI if not reject the Compressor as "Poor Pumping" (P.P.).
6. Then check up the compressor at a load of 80 PSI for current consumption. If this value is more than the standard acceptable value, reject the Compressor as "High Current" (H.C.).
7. Check up starting and stopping noise of the Compressor. If excessive, reject the Compressor as "Starting and Stopping Noise" (S.N.).
8. Check up compressor Noise on Load and if excessive, reject it as "Running Noise" (R.N.).
9. If Compressor tubes, terminals bracket are damaged which is beyond field rectification, they should be rejected as "Tube Damaged" (M).

GENERAL SERVICING

A service technician would come across different types of defects while servicing the refrigerator. The common defects, possible causes and corrective action to be taken are indicated below :

Defect :Refrigerator not starting

Possible Cause	Action to be taken
1. FuseBlown	1. Replace fuse.If repeats, check the wiring with componentsforshortcircuit
2. Looseordisconnectedwiring	2. Check wiring connection and 3 core cable wire and rectifythedefectsisfany
3. Thermostatdefectiveduetoopen contactpoints	3. TestThermostat by removing it from the circuit and run the machine.Replace theThermostat if founddefective
4. Overloadprotectorheatelement of the relay fused	4. Substitute the Relay with another known good relay of correct capacity.Replace it if found defective
5. Open Relay Coil	5. -do-
6. Open CompressorWinding	6. Check up the CompressorWinding for its continuity. Replace the compressor if found defective.

Defect :Refrigeration Cycles on Overload

Possible Cause	Action to be taken
1. Supply voltagebeyond specifiedrange	1. Check the Voltage. Advise the customer for rectification.If necessary advice the customer for installation of a voltage stabilizer
2. Compressor re-started before the system pressureequalized	2. Instruct customer to allow a minimum of 4 to 5 minutes before attempting to restart and not to open the door when the unit is off during cycles
3. Insufficientventillationforthecondenser	3. Ensure a gap of 200 mm from wall to condenser, and in case the Refrigerator is to be placed in a wall recess, advise the customer to provide a 150 to 200 mm high stand with a recess at the bottom to improve air circulation
4. System pressure not equalized balancinginthespecifiedtime	4. Check the system for proper time.If it is not able to re-start within 4 to 5 minutes, reject the system for re-operation
5. Thermostat temperature differential less than specified	5. Observe cut out and cut in temperatures.If the differential is less than specified, insert a 1 mm thick HIPsheet between evaporator and thermostat sensing bulb.If this does not help replace the thermostat.

GENERAL SERVICING

Possible Cause	Action to be taken
6. Relay defective	6. Substitute with a known good relay of correct capacity and check the performance
7. Defective compressor	7. Check up the compressor for short or grounded windings. Run the compressor with a known good Relay. Replace Compressor if found defective

Defect : Refrigerator Running Continuously

Possible Cause	Action to be taken
1. Door Seal Gap	1. Adjust the Door Seal for no gap
2. Thermostat sensing bulb fitted loose	2. Check up and tighten Thermostat Phial Clip Screws
3. Excessive loading of the Refrigerator	3. Advise the customer for proper usage
4. Less Refrigerant / Choke / Leak in the system / poor pumping capacity of the compressor	4. Check up for oil traces at Brazing joints and if necessary check up the minimum attained temperature in the freezer. If found defective reoperate the system
5. Thermostat contact points struck	5. Check for operation of Thermostat. Replace it, if found defective

Defect : Less / No Cooling

Possible Cause	Action to be taken
1. Defrosting not done periodically	1. Advise customer to defrost the unit periodically as explained in the user's manual
2. Shelves covered completely with food stuffs leaving no place for free circulation of cold air	2. Advise the customer for proper usage
3. Excessive loading of the fridge	3. Advise the customer for proper usage
4. Door Seal Gap	4. Adjust the Door Seal for no gaps
5. Defective Thermostat	5. Check the Cut-in and Cut-out Temperatures during cycling. If the temperatures are much beyond the specifications replace the Thermostat
6. Less Refrigerant / Leak in the Sealed System / Poor Pumping Capacity of the Compressor	6. Check up for oil traces at Brazing joints and if necessary check up the minimum attained temperature in the freezer. If found defective, reoperate the system
7. Chock or partial chock in the Sealed system / resulting in no frost or partial frost on the evaporator	7. Reoperate the system

GENERAL SERVICING

Defect :Excessive Frost on Evaporator

Possible Cause	Action to be taken
1. Door Seal Gap	1. Adjust the Door Seal for no gap
2. Vessels and Bottles not provided with lids	2. Advise the customer accordingly
3. Unit notdefrosted fora longtime	3. Advise the customer for periodical defrosting as per the User's Manual
4. Opening the Door for a long time frequently	4. Advise the customer not to open the door frequently and not to keep the door open for more than 30 seconds

Defect :Noise Operation

Possible Cause	Action to be taken
1. ImproperlevellingoftheRefrigerator	1. Level the Refrigerator to rest firmly on its 4 feet. Ensure there is no excessive inclination to the Refrigerator
2. Impropermountingofcompressor	2. Check for any deterioration in Compressor Grommets and for missing mounting components. Tighten the bolts properly
3. Vibration from Condenser, Suction Line and Capillary	3. Check up for tubings touching each other or with other components resulting in vibration and ratting
4. Inherentdefectin theCompressor	4. Ensure the noise is due to defect inside the Compressor and if so replace it

Defect :Sweating

Possible Cause	Action to be taken
1. Highhumidityinatmosphere	1. In areas of high humidity, Refrigerators develop sweating especially in monsoon.This should not be considered as defect.Advise customer to wipe off the Sweating periodically.

GENERAL SERVICING

Defect :Automatic Defrosting not Functioning Properly

Possible Cause	Action to be taken
1. Defrosting not done periodically leading to excessive frost on the Evaporator	1. Refrigerator restarts as soon as the forst on the Evaporator melts nearThermostat Sensing Bulb but there will be no sufficient time for defrosting of the excess frost on the remaining portion of Evaporator. To overcome this problem advise the customer to defrost the Unit once in two days
2. Defrosting mechanism of Thermostat outof Order	2. PlaceThermometer in the Evaporator press the defrost button and close the door and record the cut in temperature.If the cut in temperature is not within the specified range i.e.41° to 50°F the defrosting will not be proper.Replace theThermostat

Defect :Delayed Ice Formation

Possible Cause	Action to be taken
1. Defrosting overdue	1. Advise customer to defrost periodically
2. IncorrectThermostatSetting	2. Advise customer to turn Thermostat Knob to maximum or coldest or No.4 position
3. Thermostat outof order	3. Keep thermostat on coldest position.Observe cut in and cut out temperatures.If the temperatures are beyond specification, replace thermostat.
4. Plastic IceTray	4. Refrigerators are provided with plastic ice trays and ice formation will take place in 2½ to 4 hours depending upon the ambient temperature and load in the refrigerator etc.Advise customer accordingly

Defect :Water Dripping

Possible Cause	Action to be taken
1. When defrosting is done with excess frost on the evaporator, the defrost water overflows chiller tray, falls at the bottom of the Inner Liner and flows into the space between the Liner and bottom of the CabinetWater accumulated in this way will subsequently drip on to the floor	1. To avoid overflowing of chill tray advise customer to defrost the Refrigerator once in two days by pressing the defrost button as explained in User's Manual
2. Due to leak in drain cup channel defrosting water instead of flowing into the drain tube is falling into the cabinet and subsequently dripping on to the floor	2. Rectify the leaks

FIELD SERVICE KIT

(For installation and General Service)

Service Mechanics must always carry with them the required tools, checking instruments and spare parts for installation and service of Refrigerators correctly and with speed. A well trained and fully equipped mechanic would create confidence and good will with the customers. The below mentioned list for service kit is suitable to attend complete range of Refrigerators.

S.No.	Name of the term	Specification	Qty
1.	Screw Driver (+/-)	6"	1 No.
2.	Box Spanner	5/16 x 3/16W	1 No.
3.	Cutting Plier	6" insulated	1 No.
4.	Nose Plier	6" insulated	1 No.
5.	Phase Tester	Philips	1 No.
6.	Ammeter	0-10A 2½" dia	1 No.
7.	Voltmeter	0-300V 2½" dia	1 No.
8.	Thermometer Pocket type (Refrigeration)	-20°F to 120°F	1 No.
9.	Araldite	Adhesive	on packet small
10.	Insulation Tape	½"	1 roll
11.	Soldering Iron	150 watts	1 No.
12.	Tool Bag	Heavy Duty Leather	1 No.

SERVICE EQUIPMENT

S.No.	Description of Equipment	Qty
01.	R-134a Charging Plant	1
02.	Rotary High Vacuum Pump 50 Ltrs / min for charging plant	1
03.	Pirani Vacuum Gauge	1
04.	Run Test Panel	1
05.	Oxy-Acetylene or Oxy-LPG welding set	1
06.	Dry Nitrogen Cylinder	1
07.	Field Re-operation Kit	1
08.	Field Service Kit	2
09.	General Workshop Tools set	1
10.	R-134a Gas Cylinder 60 kg capacity	1
	10 kg capacity	1

GAS CHARGING KIT

1.	Portable Vacuum Pump 50 Lt.P.M.	1 No.
2.	R-134a Cylinder 5 Kg Capacity	1 No.
3.	Blow Lamp/Split fire set	1 No.
4.	Compound Gauge 0-30V - 150 PSI	2 Nos.
5.	Flaring Tool with Slip on Yoke	1 No.
6.	Pipe Cutter	1 No.
7.	Pipe Bender	1 No.
8.	Charging Line Flexible 1/4" Flare	1 No.
9.	Pinch off Tool	1 No.
10.	Swedging Tool 1/4" and 5/16"	1 No.
11.	Volt meter 0-300V	1 No.
12.	Ammeter (0-2/10Amps) (2-10Amps Compressed Scale)	1 No.
13.	Test Lamp	1 No.
14.	Watchet Wrench 1/4"	1 No.
15.	Thermometer (20F to 120F)	1 No.
16.	Shut off valves 1/4"	3 Nos.
17.	Silver Brazing Rod 1/8" (43% silver)	80 gms
18.	Rajat Flux	40 gms
19.	Tool Box	1 No.

RE-OPERATION PROCEDURE OR SYSTEMS WITH DEFECTIVE COMPRESSOR

1. Ensure that the Compressor is defective.
 2. Remove the pinched tube from the compressor process tube and allow the refrigerant to escape into the atmosphere.
3. Disconnect the compressor discharge, suction and oil cooler connections and remove the compressor after removing the comp clip. Care should be taken while brazing / de-brazing the joints by providing a suitable protective MS plate so that the Cabinet does not get damaged.
4. Remove the Filter Drier.
5. Flush the Condenser and Evaporator along with suction line thoroughly with dry Nitrogen Gas.
6. Adjust the Nitrogen pressure at 2 to 5 PSIG and silver solder the capillary to a new filter drier with the other end of the filter drier to the condenser, cut off nitrogen supply. This operation should not take more than 3 minutes.
7. Fit the new Compressor to the Cabinet with the help of comp clip after checking the new compressor for proper functioning.
8. Silver solder charging (process) tube to the compressor adopter and connect a good quality leak proof shut off or quick release valve to the charging tube.
9. Connect dry Nitrogen gas supply (2 to 5 PSIG) to the charging tube and silver solder, discharge of the compressor. Disconnect the nitrogen supply and finally silver solder the suction line to the compressor adopter.
10. Clean all the silver soldered joints of the system with hot water using brass wire brush and charge dry nitrogen gas to a pressure of 100 PSIG.
11. Leak Test by resorting to liquid soap application on all the joints to detect leak with Nitrogen pressure of 100 PSI inside the system. (Also the leak can some times be spotted by the presence of oil around the joints).
12. Since dehydration is not possible, we have to de-hydrate by triple evacuation.

Triple Evacuation De-hydration

- a) After leak testing bring the system near the gas charging plant and connect the process (charging) shut off valve to the vacuum line.
 - b) Draw a vacuum of 27" Hg.
 - c) Charge refrigerant R-134a in the System till the running back pressure of the system is 0'PSIG and run the system for 5 minutes.
 - d) Switch off the Compressor and let the refrigerant stay in the system for 15 minutes.
 - e) Again draw a vacuum of 27" Hg.
 - f) Repeat instruction No. c and d.
 - g) Draw (third time) vacuum of 27" Hg. Now the De-hydration is completed.
13. Charge the required amount of refrigeration (R-134a) as per the standards.

14. a) Start the Refrigerator and ensure that there is normal - functioning such as taking high current and tripping off.
- b) Let the Refrigerator run without Thermostat in circuit for a period of 3 hrs. Check the input current and wattage at the end of 3 hours, which should not exceed the rated current and wattage of the system. Also check for the proper frost length on the suction line.
- c) Switch off the Refrigerator and check of balancing time. The unit should restart when switched on after 3 to 4½ minutes.
15. Pinch of the charging tube after the system is found satisfactory and test for leak. Re-connect the Thermostat into circuit.
16. Do not use CTC (Carbon tetrachloride) or any chemical for flushing the tubing.
17. Apply air-drying black-paint on the brazed joints of the system.

Re-operation Procedure for Systems with following defects

- a) Loss of Refrigerant due to leak un-detected in the original equipment or due to transit damage.
 - b) Choke in the System.
 - c) Under charging or over charging or inclusion of non-condensable gasses in the original equipment.
1. Remove the pinched tube from the compressor and allow the refrigerant if left any, to escape into the atmosphere.
 2. Silver solder charging (process) tube to the compressor adopter and connect a good quality, leakproof, shut off valve to the charging tube.
 3. Clean the silver soldered joint and charge the system with dry nitrogen to a pressure of 100 PSIG.
 4. Leak test all brazing joints with leak detector or soap solution.
 5. Release of Nitrogen from the System and silver solder the leaking point, if found any in the leak test.

Following precautions should be taken while re-operating the System :

- Assembling must take place as quickly as possible.
- No component should be left open for more than one or two minutes.
- For cleaning and flushing dry Nitrogen should be used.
- For each re-operation Filter Drier is to be replaced. Components such as Condenser and Evaporator are to be flushed with dry Nitrogen.

After leak testing, the System should be evacuated to 80 to 100 microns, to remove air and non-condensable gasses and moisture.

Clean all the brazing joints with hot water and brass wire brush. Care should be taken that the cleaning shall be thorough, otherwise it will lead to leaks.

Always keep the Filter Driers in Sealed containers and in case the filters are to be stored loosely, it should be preferably kept in the de-hydration oven.

In case of burnt compressor replacement, the system should be flushed thoroughly with dry Nitrogen.

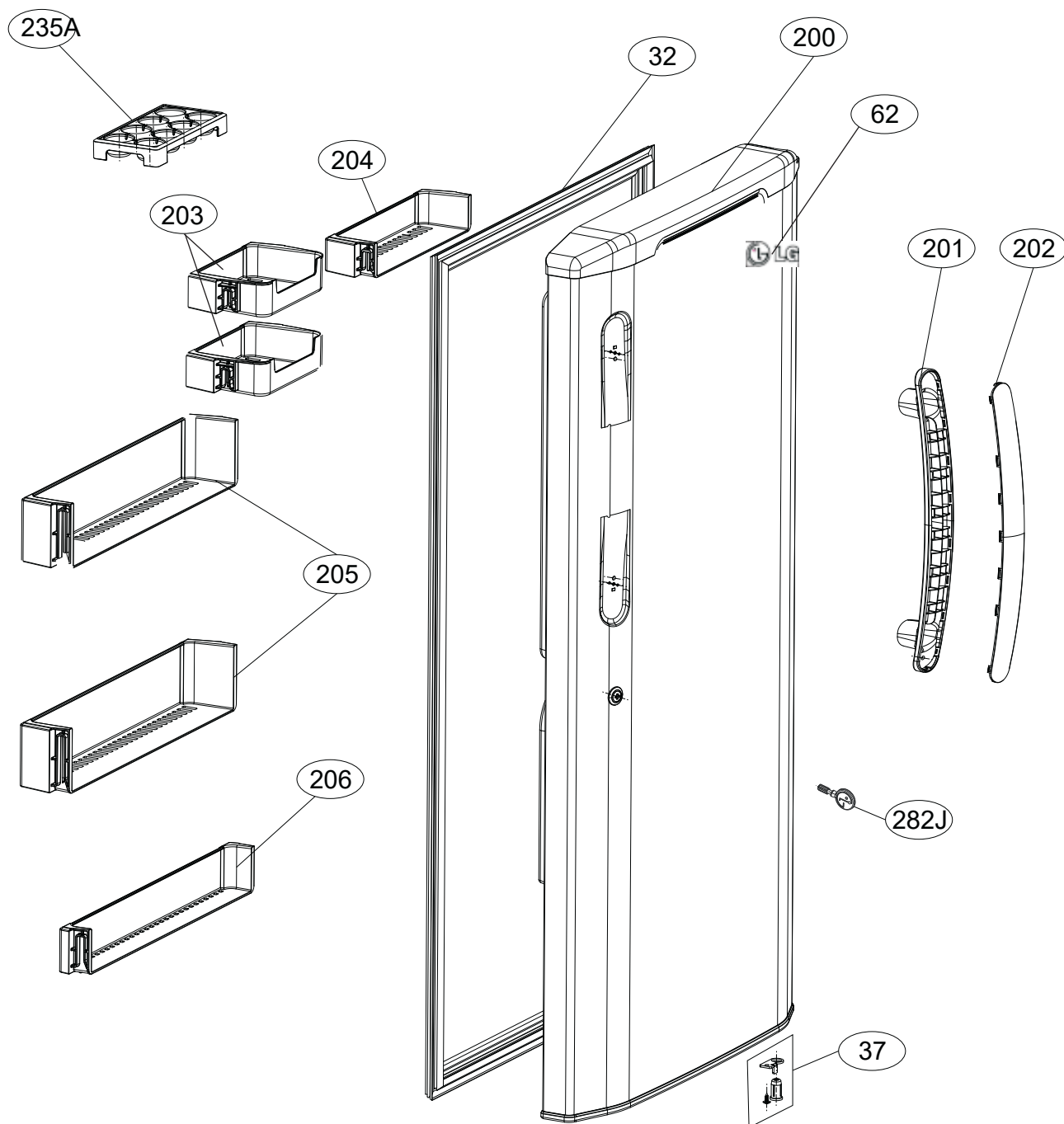
PART LIST

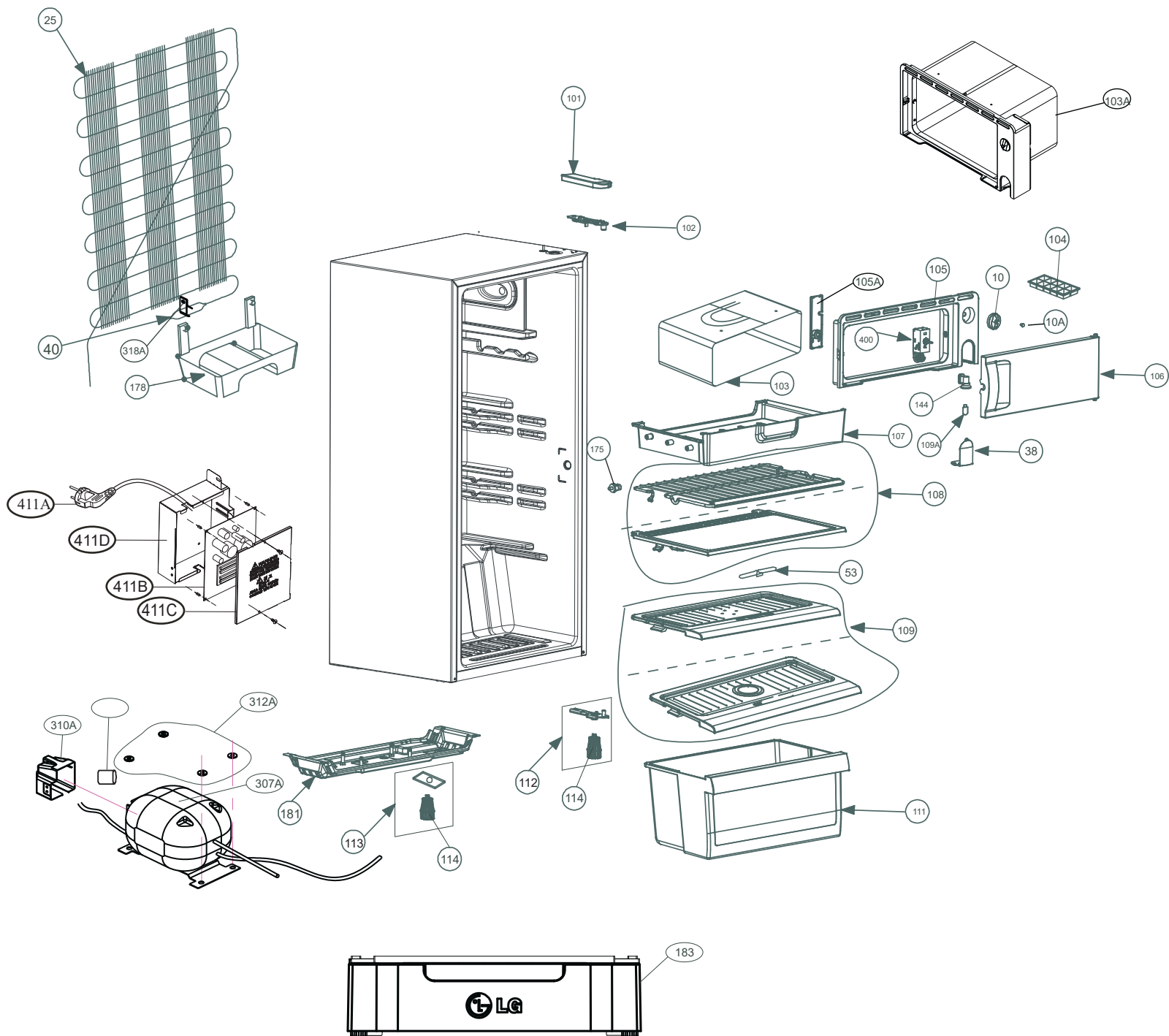
ITEM

106	DOOR ASSEMBLY, FREEZER ROOM
105	FRAME ASSEMBLY, DISPLAY
103	EVAPORATOR ASSY
104	TRAY, ICE
107	TRAY ASSEMBLY, FRESHROOM
400	THERMOSTAT
175	SWITCH,[PUSH]
10	KNOB, THERMO
109A	LAMP, [VACCUM]
144	SOCKET ASSEMBLY, LAMP
108	SHELF, R, WIRE
109	COVER, T/V
111	TRAY, VEGETABLE NORMAL
112	HINGE, L
102	HINGE ASM, U
114	LEG, ADJUST
101	COVER, HINGE(U)
108	GLASS SHELF
178	TRAY, DRIP
25	CONDENSER ASSEMBLY, WIRE
307A	COMPRESSOR, ASSEMBLY
181	COMP BASE ASSEMBLY
312A	RUBBER, SEAT
310A	COVER PTC
308A	O.L.P
113	HINGE ASSEMBLY, SUPPORTER

ITEM

40	DRIER ASSEMBLY
411A	POWER CORD ASSEMBLY
38	COVER LAMP
200	DOOR FOAM ASSY
32	GASKET ASSEMBLY, DOOR
205	BASKET, LARGE
206	BASKET, SMALL
37	STOPPER, DOOR
204	BASKET HALF LARGE
282J	KEY
201	HANDLE, BASE
202	HANDLE-DECO
62	NAME PLATE
203	BASKET HALF
53	KNOB SHUTTER
103A	EVAPORATOR ASSY
105A	COVER THERMAL
10A	KNOB DAMPER
179A	PTC HARNESS
318A	DRIER HOLDER
411B	ASSEMBLY PCB, MAIN
411C	COVER PCB
411D	CASE PCB







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