



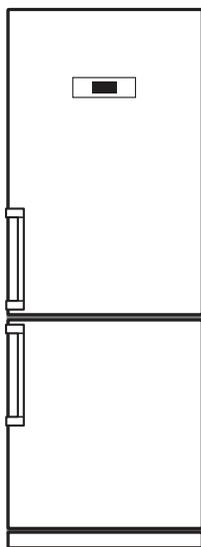
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REFRIGERATOR

SERVICE MANUAL

CAUTION

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



MODEL: GA-B409U*QA/B379U*QA

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SERVICING PRECAUTIONS

Please read the following instructions before servicing your refrigerator.

1. Check the set for electric losses.
2. Unplug prior to servicing to prevent electric shock.
3. Whenever testing with power on, wear rubber gloves to prevent electric shock.
4. If you use any kind of appliance, check regular current, voltage and capacity.
5. Don't touch metal products in the freezer with wet hands. This may cause frostbite.
6. Prevent water from following to electric elements in the mechanical parts.
7. When standing up after having checked the lower section of the refrigerator with the upper door open, move with care to avoid hitting the upper door.
8. When tilting the set, remove any materials on the set, especially the thin plates(ex. Glass shelf or baskets).
9. When servicing the evaporator, wear cotton gloves. This is to prevent injuries from the sharp evaporator fins.
10. Leave the disassembly of the refrigerating cycle to a specialized service center. The gas inside the circuit may pollute the environment.
11. When you discharge the refrigerant, wear the protective safety glasses or goggle for eye safety.
12. When you repair the cycle system in refrigerator, the work area is well ventilated. Especially if the refrigerant is R600a, there are no fire or heat sources. (No smoking)

SERVICING PRECAUTIONS

Features of refrigerant (R600a)

- Achromatic and odor less gas.
- Flammable gas and the ignition (explosion) at 494°C.
- Upper/lower explosion limit: 1.8%~8.4%/Vol.

Features of the R600a refrigerator

- Charging of 60% refrigerant compared with a R134a model
- The suction pressure is below 1bar (abs) during the operation.
- Because of its low suction pressure, the external air may flow in the cycle system when the refrigerant leak, and it causes malfunction in the compressor.
- The displacement of compressor using R600a must be at least 1.7 times larger than that of R134a.
- Any type of dryer is applicable (XH-5, 7, 9).
- The EVAPORATOR or any other cycle part that has welding joint is hidden in the foam. (If not hidden inside, the whole electric parts must be tested with the LEAKAGE TEST according to the IEC Standard.)
- The compressor has label of the refrigerant R600a.
- Only the SVC man must have an access to the system.

Installation place

- Must be well ventilated.
- Must be 20 m³ or larger.
- Must be no-smoking area.
- No ignitable factors must be present.

Utilities

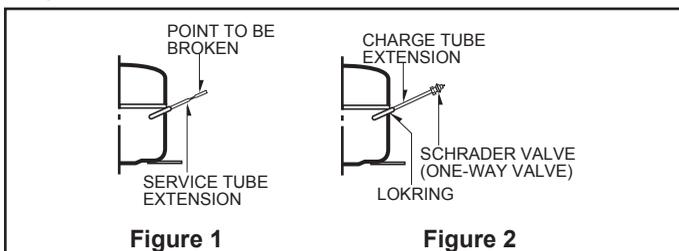
- Refrigerant cylinder (MAX NET 300g)
- Manometer
- Vacuum pump (600l /min)
- Piercing Clamp
- Quick coupler
- Hoses (5m-1EA, 1m-3EA)
- LOKRING
- Portable Leakage detector (3g/year↓)
- Nitrogen cylinder (for leakage test)
- Concentration gauge

Make sure before Servicing

- Refrigerant
Confirm the refrigerant by checking Name Plate and the label on the compressor, after opening the COVER ASSY, BACK-M/C.
- If the refrigerant is R600a, you must not weld or apply a heat source.

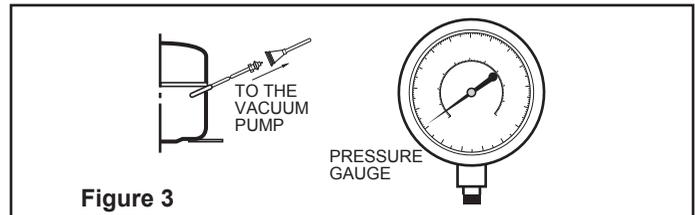
Air Recharging in Compressor

Before refilling the refrigerant, you must perform the test according to Chapter 5 (TROUBLESHOOTING CHART). When the defects are found, you must discharge the residual refrigerant (R600a) in the outdoor. For discharging the refrigerant R600a, break the narrow portion of tube extension by hand or with a pipe cutter as shown in Figure 1. Leave it for 30min in outside to stabilize the pressure with ambient. Then, check the pressure by piercing the dryer part with piercing pliers. If the refrigerant is not completely discharged, let the refrigerator alone for more 30min in outside.



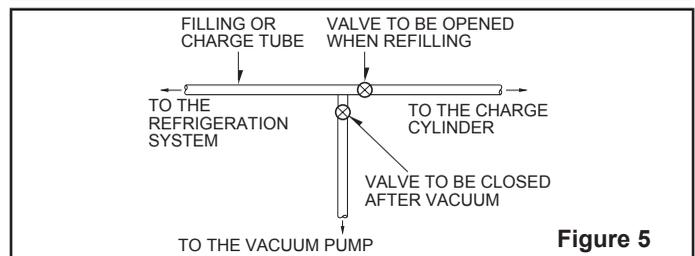
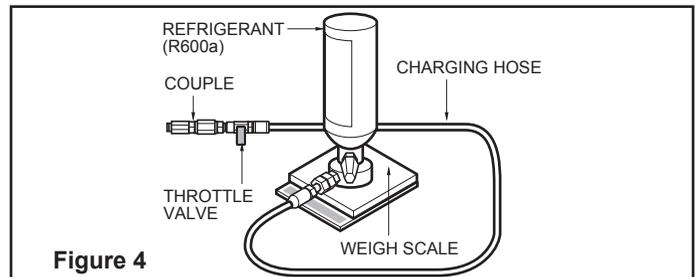
Attach the service tube installed with a Schrader valve (one-way valve) by using the LOKRING (Figure 2). Then, connect the Schrader valve (one-way valve) to the pump that is connected to the discharging hose leading to the outside. When discharging the residual refrigerant, repeat 3 cycle that includes 3min of the pump running->pump off->30sec of the compressor running.

After the refrigerant (R600a) is completely discharged, repair any defective parts and replace the dryer. At any case you must use the LOKRING for connecting or replacing any part in the cycle (No Fire, No Welding). Connect the Schrader valve to pump with the coupler. And then turn the pump on for vacuum state (Figure 3). Let the pump run until the low-pressure gauge indicates the vacuum (gauge pressure 0, absolute pressure -1atm or -760mmHg). Recommended vacuum time is 30 min. Charge the N₂ gas in order to check for leakage from welding points and the LOKRING. If leakages are found, repair the defects and repeat the vacuum process.



After the system is completely vacuumed, fill it with the refrigerant R600a up to what has been specified at your refrigerator Name Plate. The amount of refrigerant (R600a) must be precisely measured within the error of ±2g by an electron scale (Figure 4).

If you use the manifold connected with both the refrigerant (R600a) cylinder and the vacuum pump simultaneously, make sure the pump valve is closed (Figure 5).



Connect the charging hose (that is connected to the refrigerant (R600a) cylinder) to the Schrader valve installed on the service tube. Then, charge the refrigerant (R600a) by controlling the Throttle valve. When you do so, do not fully open the Throttle valve because it may make damage to the compressor. Gradually charge the refrigerant (R600a) by changing open and close the Throttle Valve (5g at each time). The charging hose must use a one-way valve to prevent the refrigerant reflux. Close the Schrader valve cap after the refrigerant (R600a) is completely recharged.

After you completely recharge the refrigerant (R600a), perform the leakage test by using a portable leakage detector or soapy water. Test the low pressure (suction) parts in compressor off time and high pressure parts in compressor on time. If the leakages are found, restart from the refrigerant (R600a) discharging process and repairs defects of leaks.

After the leakage test, check the temperature of each parts of the cycle. Check with hands if the CONDENSER and the case (HOT-LINE pipe) that is contacted to the door gasket are warm. Confirm that frost is uniform distributed on the surface of the EVAPORATOR.

SPECIFICATIONS

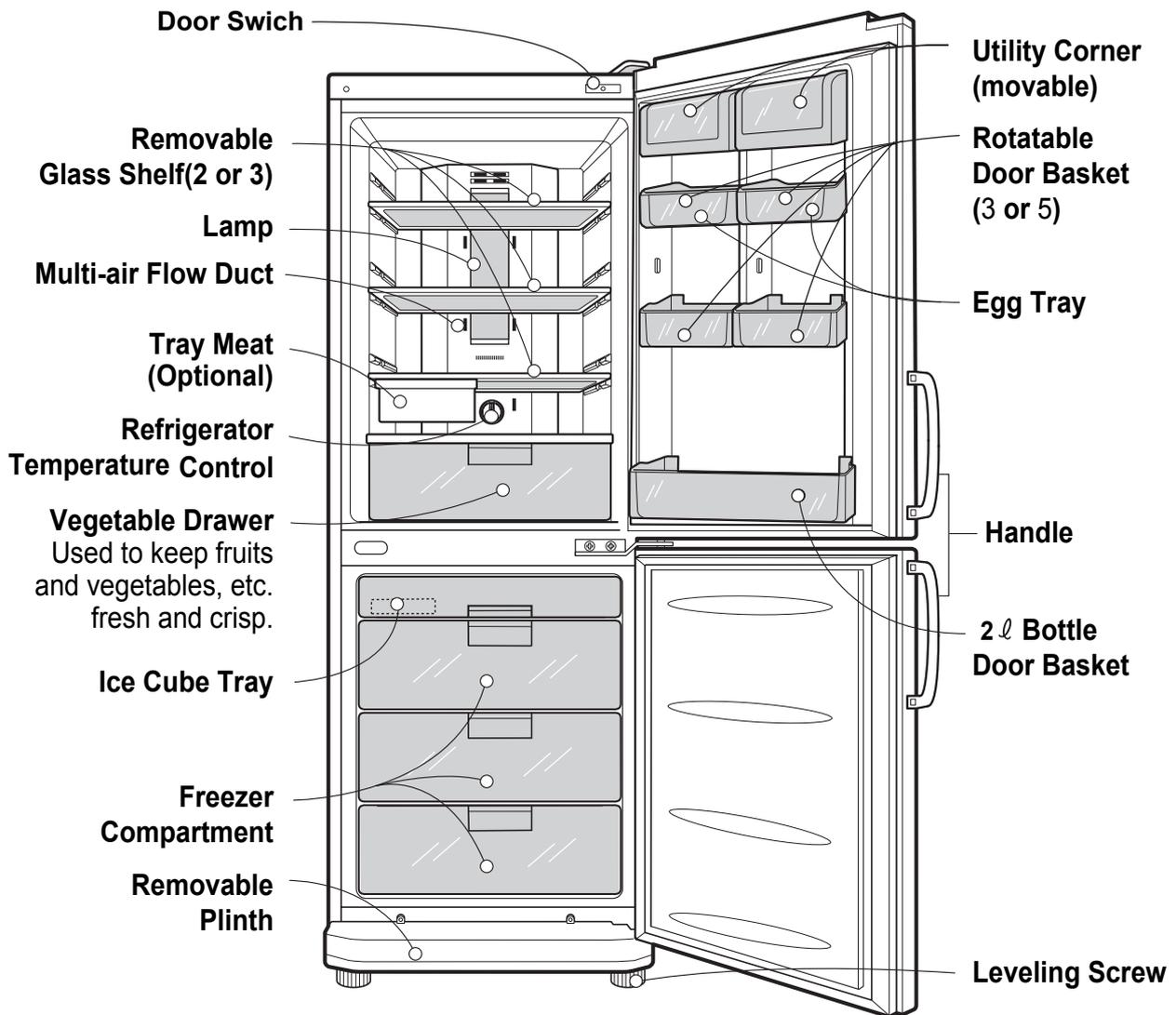
1.Ref. No: GA-B409U*QA

ITEMS		SPECIFICATIONS	ITEMS	SPECIFICATIONS
DIMENSIONS (mm)		595(W)X651(D)X1896(H)	REFRIGERATOR COMPARTMENT	Transparent Shelf(3 EA)
NET WEIGHT (kg)		77		Vegetable Container(1 EA)
COOLING SYSTEM		Fan Cooling		Vegetable Container Cover(1 EA)
TEMPERATURE CONTROL	REFRIGERATOR	Knob Dial		Tray Meat (1 EA)*
	FREEZER	Button	DOOR POCKET	Dairy Pocket Cover(2 EA)
DEFROSTING SYSTEM		Full Automatic		Egg Tray(2 EA)
		Heater Defrost		Little Pocket 4 or 6 EA
DOOR FINISH		Pre-Coated Metal or Vinyl Coated Metal		Bottle Pocket(1 EA)
OUT CASE		Painted Steel Sheet	FREEZER COMPARTMENT	Tray Drawer(3 EA)
INNER CASE		ABS		Ice Tray(1 EA)
INSULATION		Polyurethane Foam	COMPRESSOR	PTC Starting Type
DEFROSTING DEVICE		Heater, Sheath	EVAPORATOR	Fin Tube Type
REFRIGERANT		R600a(60g)	CONDENSER	Side & Wire Condenser
LUBRICATION OIL		FREOL S10(280 cc)	* Optional Parts	

2.Ref. No: GA-B379U*QA

ITEMS		SPECIFICATIONS	ITEMS	SPECIFICATIONS
DIMENSIONS (mm)		595(W)X651(D)X1726(H)	REFRIGERATOR COMPARTMENT	Transparent Shelf(2 EA)
NET WEIGHT (kg)		69		Vegetable Container(1 EA)
COOLING SYSTEM		Fan Cooling		Vegetable Container Cover(1 EA)
TEMPERATURE CONTROL	REFRIGERATOR	Knob Dial	DOOR POCKET	Egg Tray(2EA)
	FREEZER	Button		Little Pocket (4 EA)
DEFROSTING SYSTEM		Full Automatic		Bottle Pocket(1 EA)
		Heater Defrost		FREEZER COMPARTMENT
DOOR FINISH		Pre-Coated Metal or Vinyl Coated Metal	Ice Tray(1 EA)	
OUT CASE		Painted Steel Sheet	COMPRESSOR	PTC Starting Type
INNER CASE		ABS	EVAPORATOR	Fin Tube Type
INSULATION		Polyurethane Foam	CONDENSER	Side & Wire Condenser
DEFROSTING DEVICE		Heater, Sheath	* Optional Parts	
REFRIGERANT		R600a(60g)		
LUBRICATION OIL		FREOL S10(280 cc)		

PARTS IDENTIFICATION



NOTE : This is a basic model. The shape of refrigerator is subject to change.

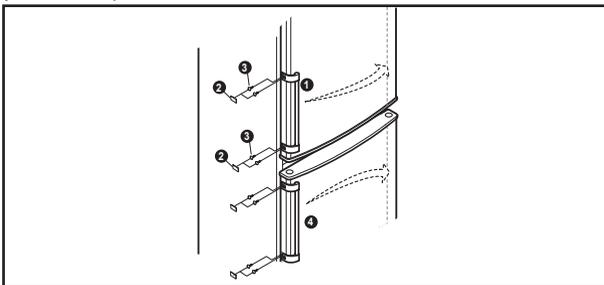
REPLACEMENT OF DOOR OPENING TYPE

Precaution

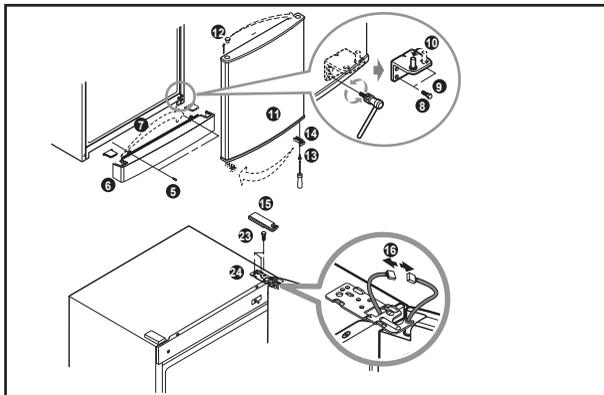
1. Before reversing the door, first of all, you should take out food and accessories like shelves or trays which aren't fixed in the fridge-freezer.
2. Use Torque Wrench or Spanner to fix or remove the bolt.
3. Do not lay the fridge-freezer down. This will cause problems.
4. Be careful not to drop the doors in disassembling or assembling.

How to Reverse the Door

1. Separate the screw ③ after separating the nut ② on the left of the refrigerator door handle ①, then separate the refrigerator door handle ①. Separate the freezer door ④ handle in the order in which you separating the refrigerator door handle ①. (The hidden handle does not need this procedure)

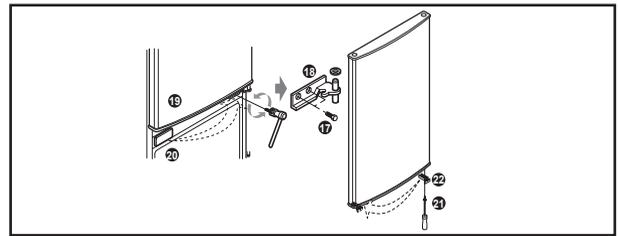


2. Separate the screw ⑤ and bottom cover ⑥, then separate the cap ⑦ of bottom cover and install it on the corresponding position on the right side. Separate the hinge lower right ⑨ and the pin ⑩ after separating the screw ⑧. Install the bolt into the corresponding left hole on the hinge lower. Separate the freezer door ⑪, then remove the CAP ⑫ on the door and install it on the corresponding position on the right side. Separate the door stop ⑬ after your separating the screw ⑭, then install the door stop on the corresponding position on the left.



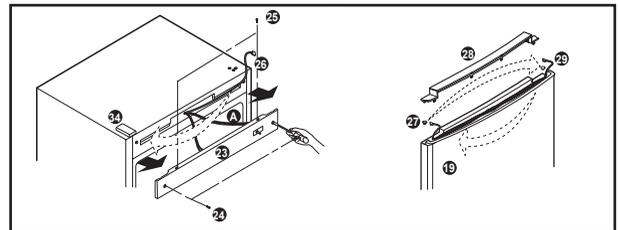
3. Separate the cover of hinge upper ⑮, separate the two wire ⑯. Separate the screw ⑰, separate the hinge middle ⑱, then separate the refrigerator door ⑲. Separate cap ⑳ and install it on the corresponding position on the right. Separate the door stop ㉒ after your separating the screw ㉑, then install the door stop on the corresponding position on the left. Separate the screw ㉓, then separate the hinge upper right (Hinge Upper) ㉔.

Note: Reversing the doors is not covered by the warranty.

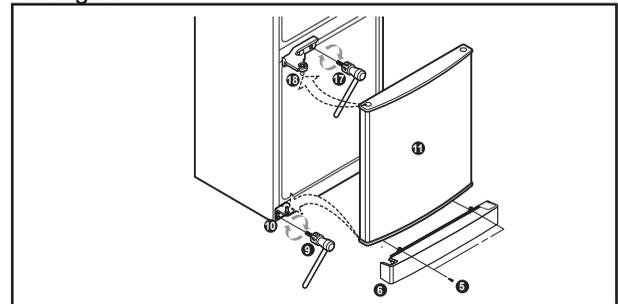


4. Remove two small caps on the front of the cover front ㉖ with a screw driver, then separate the screw ㉗ and ㉘. Separate the cover front ㉙. Move the wire ㉚ to left, install the cover front ㉙ and the screw. Take the small caps out of the alternate bag, then install the small caps.

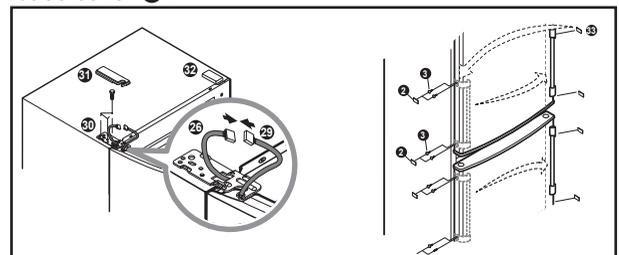
Note: It's unnecessary to change door switch wire ㉛.



5. Remove the small cap ㉗ of the refrigerator door ⑲, then separate the small cap ㉘. Move the cable ㉚ from left to the corresponding position on the right. Install the small cap ㉘, then install the small cap ㉗ on the corresponding position on the right.



6. Install the hinge lower ⑩ and the freezer door ⑪, then install the hinge middle ⑱. Separate the cap ㉛ on the freezer. Install the freezer door, take the hinge upper ㉔ out of the alternate bag and install it on upper left. Pull out the wire ㉚ ㉚ from the individual holes and connect these cables. Take the small caps ㉜ ㉜ out of the alternate bag, then install the small caps. Install base cover ⑥.



7. Separate the cap ㉝ on the right side of the door, then install it into the left screw hole (you can see this hole after the left handle is removed). Install the handle and the screw which previously separated on the corresponding position on the right. (The hidden handle does not need this procedure) Then Installation completed.

DISASSEMBLY

1. DOOR

• Freezer Door

- 1) Loosen 2 screws and pull the Cover Lower.
- 2) Loosen hexagonal bolts fixing the lower hinge to the body to remove the freezer door only.

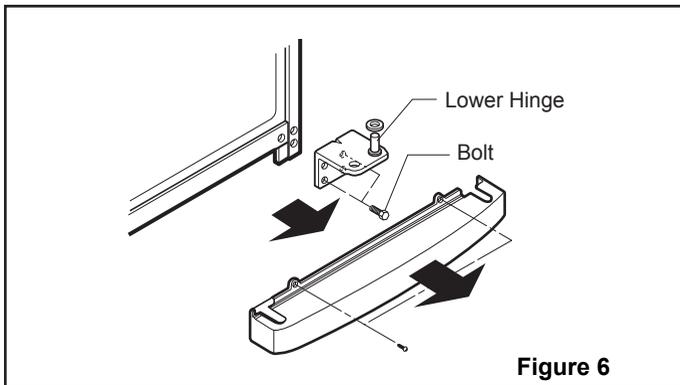


Figure 6

- 3) Pull out the Door Gasket to remove from the Door Foam Assy, F.

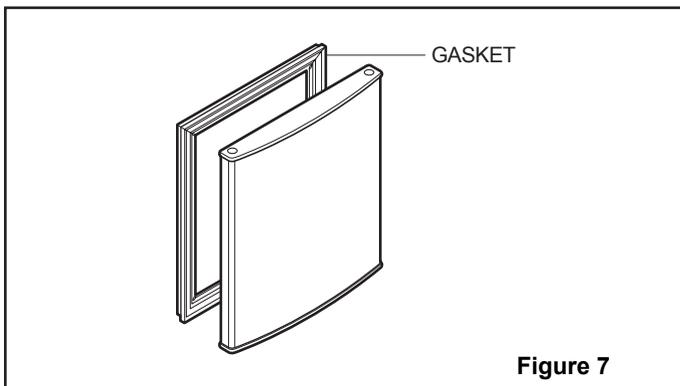


Figure 7

• Refrigerator Door

- 1) Loosen hexagonal bolts fixing the center hinge(Hinge,C) to the body to remove the refrigerator door only.

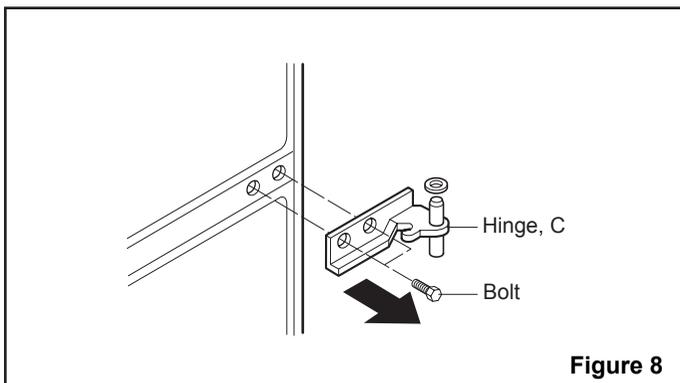


Figure 8

- 2) Pull out the Door Gasket to remove from the Door Foam Assy, R.

2. DOOR SWITCH

- 1) Using the driver remove two small cap of the front.
- 2) Loosen four screws in upper part and disconnect top cover.
- 3) Disconnect Lead Wire from switch.
- 4) Disengage hook behind the switch by pressing it with hands.

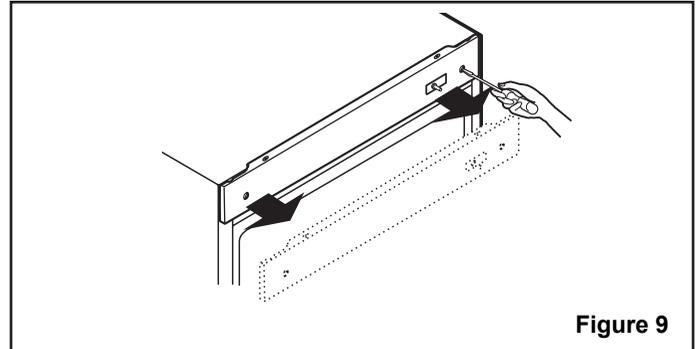


Figure 9

3. REFRIGERATOR ROOM LAMP

- 1) Remove the Cover Lamp, R by pulling with a '-' type driver.
- 2) Remove the Lamp by turning.

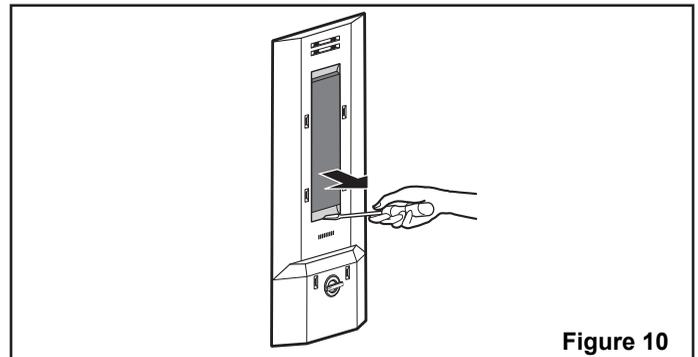
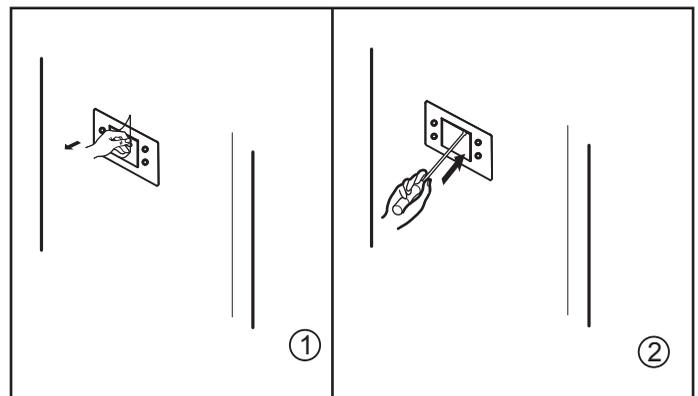


Figure 10

- 3) After removing the lamp, you must check the O-RING, which is made by rubber and prevent electric spark, in the socket.

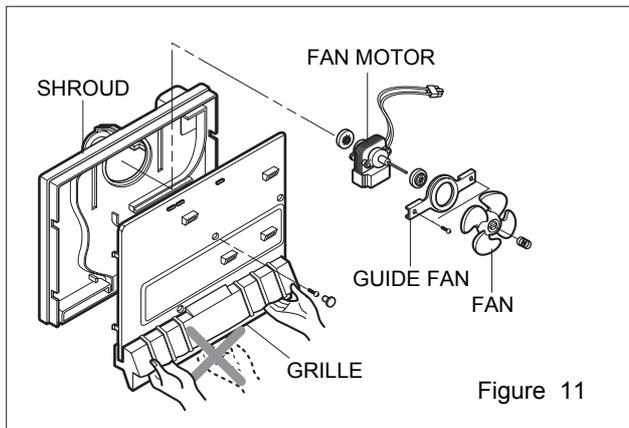
4. DISPLAY

- 1) Tear the PC SHEET on the cover of the display.(OPTION)
- 2) Pry the display's cover from the gap between the display and display cover by using a (-) screw driver. Then pull out the display circuit board to replace.



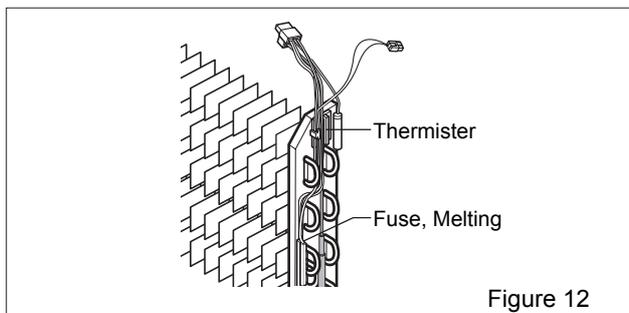
4 FAN AND FAN MOTOR

- 1) Remove freezer drawers.
- 2) Remove two cap, screws and loosen two screws in Grille Fan.
- 3) Pull out the Grille Fan and Shroud, F.
- 4) Disconnect the housing of lead wire.
- 5) Separate the Fan Assy.
- 6) Losse 2 screw fixed to the Bracket.
- 7) Pull out Shroud, F remove the Fan Motor Assy.
- 8) Separate the Motor Bracket and Rubber.



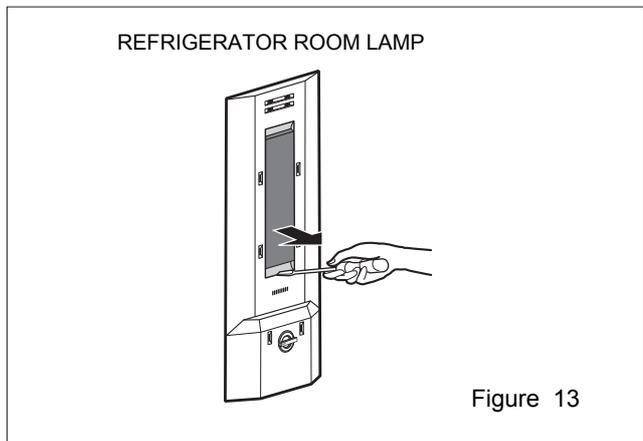
5 DEFROST CONTROL ASSY

- Defrost Control Assy consists of Thermistor and Fuse, Melting. Thermistor functions to defrost automatically and it is attached to metal side of the Evaporator and senses temperature. Fuse, Melting 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 heat from the Heater.
- 1) Pull out the Shroud, F after removing the Grille.
 - 2) Separate the connector connected with the Defrost Control Assy and replace new one.



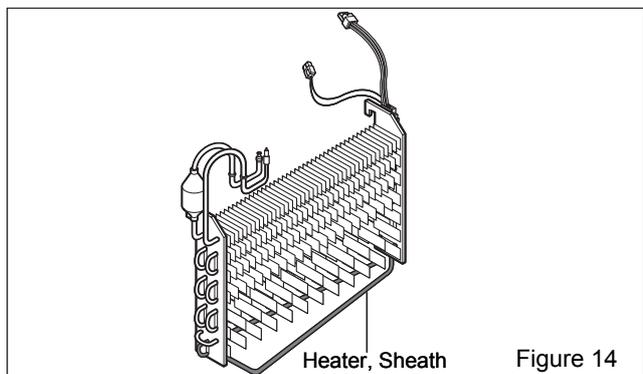
6 DAMPER CONTROL

- 1) Remove the Cover Lamp, R and loosen 2 screw.
- 2) Pull the Control Box, R and separate the lead wire housing.
- 3) Remove the Cover Lamp, R.
- 4) Separate the Insulation Multi Duct and Control Box, R.
- 5) Disassemble the Knob.



7 HEATER, SHEATH

- In this refrigerator, Heater, Sheath is used for defrosting heater. During heating, the temperature of heater rises about 300~350°C. Therefore, be careful not to burn while servicing.
- 1) After removing the Grille and Shroud, separate the Heater, Sheath by disconnecting the connectors.
 - 2) Exchanged Heater, Sheath and connected the housing.



ADJUSTMENT

1. COMPRESSOR

1) Role

The compressor intakes 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.

2) Composition

The Compressor is composed of Compressor Apparatus compressing gas, Compressor Motor moving Compressor Apparatus and Case which protecting Compressor Apparatus and Motor. There are PTC-Starter, and 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 production in absence of dust or humidity, deal and repair with care.

3) Note for Usage

- (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, the result may be poor operation and poor contact may cause.
- (5) Be careful that dust, humidity, and flux welding don't inflow in the Compressor inside in replacing the Compressor. Dust, humidity, and flux due to welding which inflows to Cylinder may cause lockage and noise.

2. PTC-STARTER

1) Composition of PTC-Starter

- (1) PTC (Positive Temperature Coefficient) is a no-contact semiconductor starting device which uses ceramic material and this material consists of BaTiO₃.
- (2) The higher the temperature is, the higher becomes the resistance value. These features are used as starting device for the 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 to single-phase induction Motor.
For normal operation of the single-phase induction motor, in the starting operation current flows in both main coil and sub-coil. After the starting is over, the current in subcoil is cut off. The proper features of PTC play all the above roles. So, PTC is used as a motor starting device.

3) PTC-Applied Circuit Diagram

According to Starting Method for the Motor

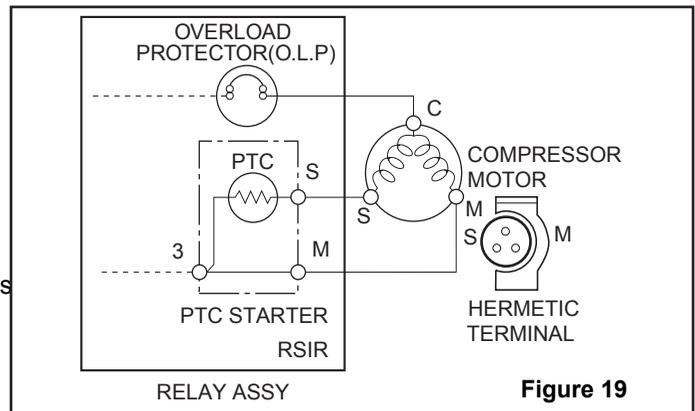


Figure 19

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 the Compressor Motor, PTC elements generate heat continuously. Therefore, if PTC isn't cooled for a while after the power has been shut off, Motor can't operate again.

5) Relation of PTC-Starter and OLP

- (1) If the power is off during operation of Compressor and the power is on before the PTC is cooled, (instant shut-off within 2 min. or reconnect a power plug due to misconnecting), the PTC isn't cooled and a resistance value grows. As a result, current can't flow to the sub-coil and the Motor can't operate and the OLP operates by flowing over current only in the main-coil.
- (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 properly 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 get to the PTC, PTC materials may break due to insulation breakdown of the material itself.
- (4) Don't change PTC at your convenience.
Don't disassemble PTC and mold. If the exterior to the PTC-starter is damaged, resistance value is altered and it may cause poor starting of the compressor motor.
- (5) Use a properly fixed PTC.

3. OLP (OVER LOAD PROTECTOR)

1) Definition of OLP

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

2) Role of the OLP

- (1) The OLP is attached to the Hermetic Compressor used for the Refrigerator and Show Case and prevents the Motor Coil from being started in the Compressor.
- (2) Do not turn the Adjust Screw of the OLP in any way for normal operation of the OLP. (Composition and connection Diagram of OLP)

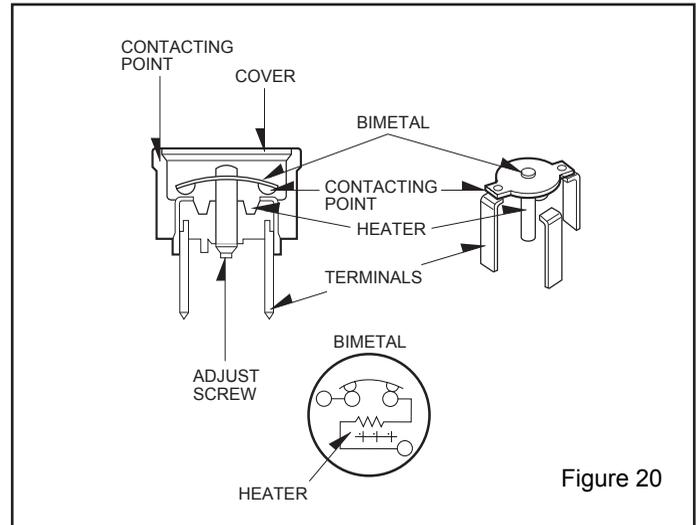
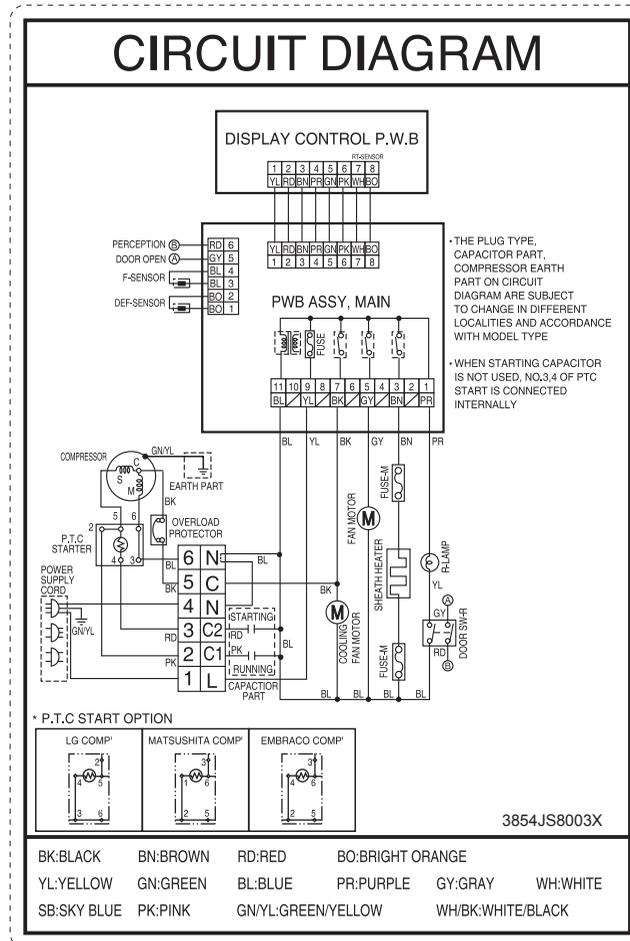


Figure 20

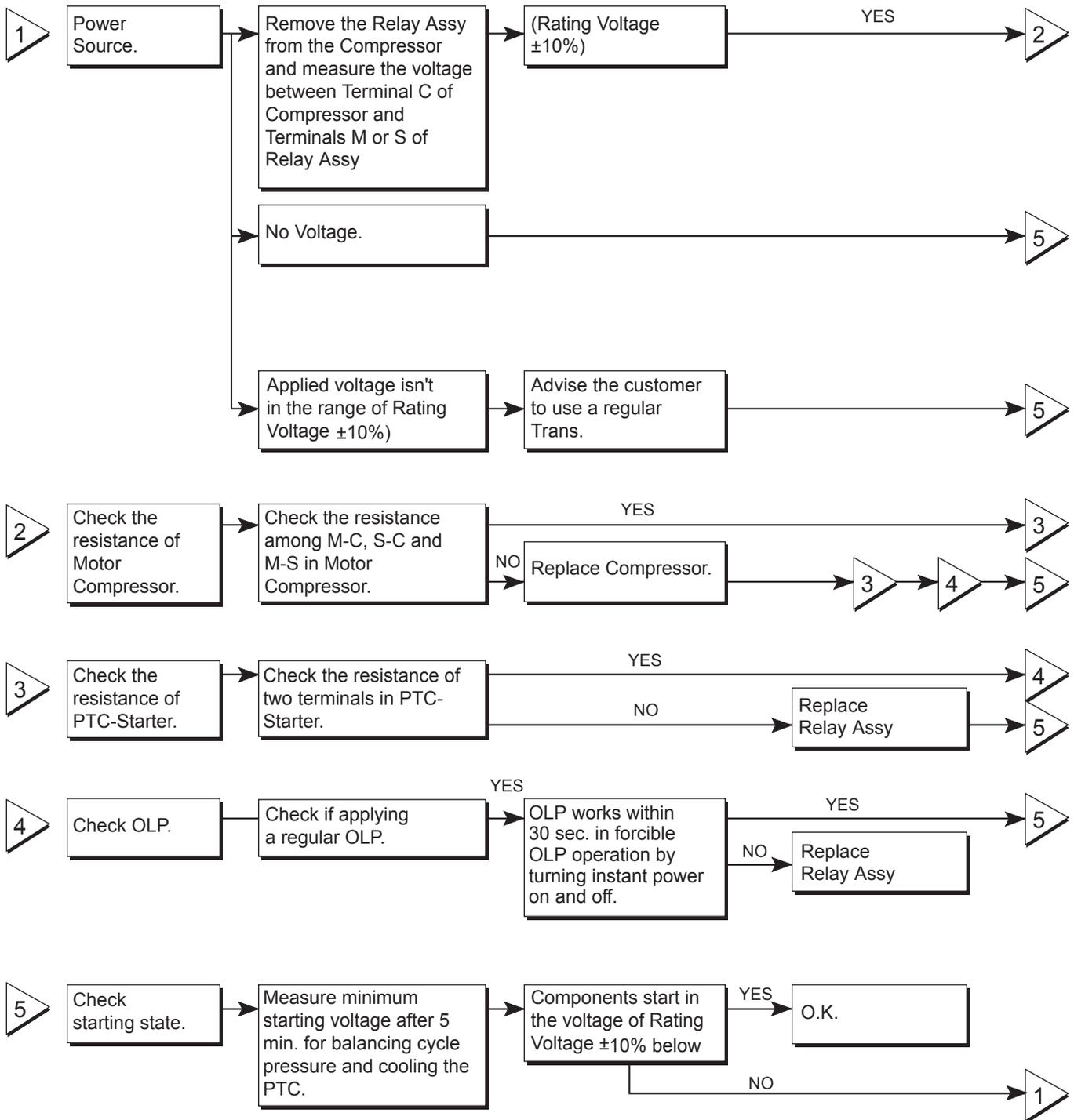
CIRCUIT DIAGRAM



NOTE : 1. This is a basic diagram and specifications vary in different localities.

TROUBLESHOOTING (Mechanical Part)

1. COMPRESSOR AND ELECTRIC COMPONENTS



2. RELAY ASSY (PTC AND OLP)

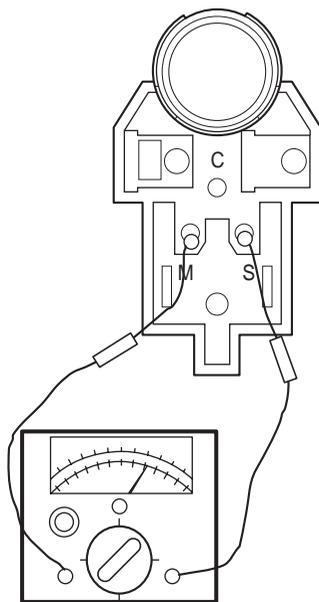
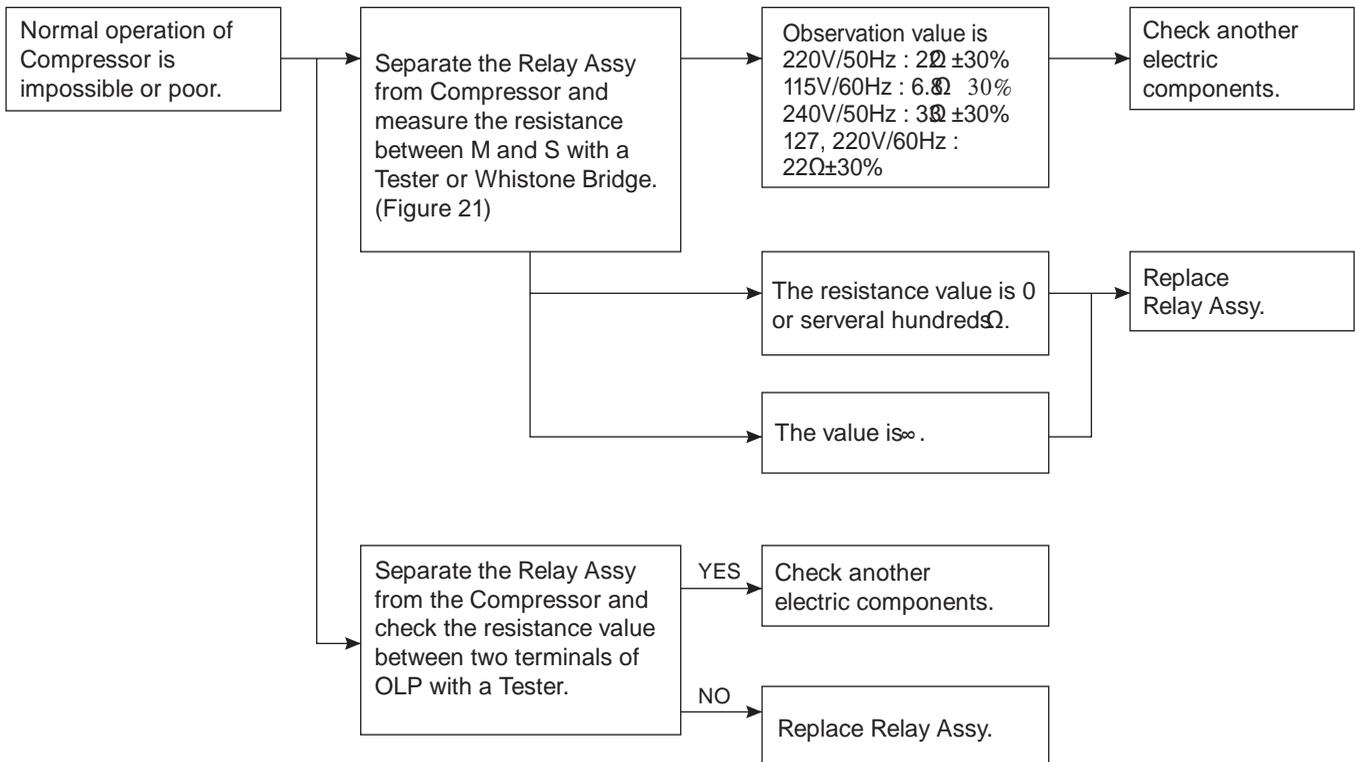


Figure 21

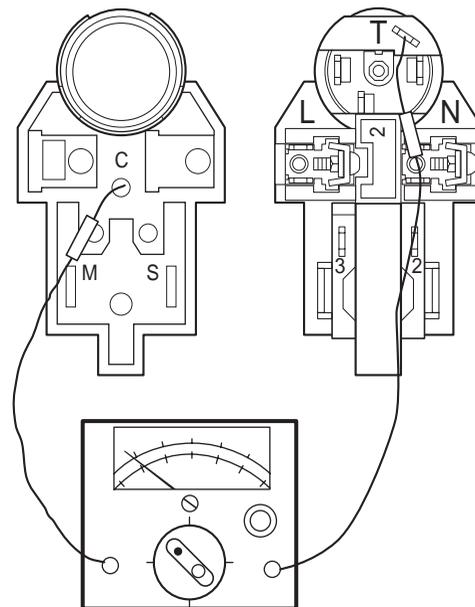
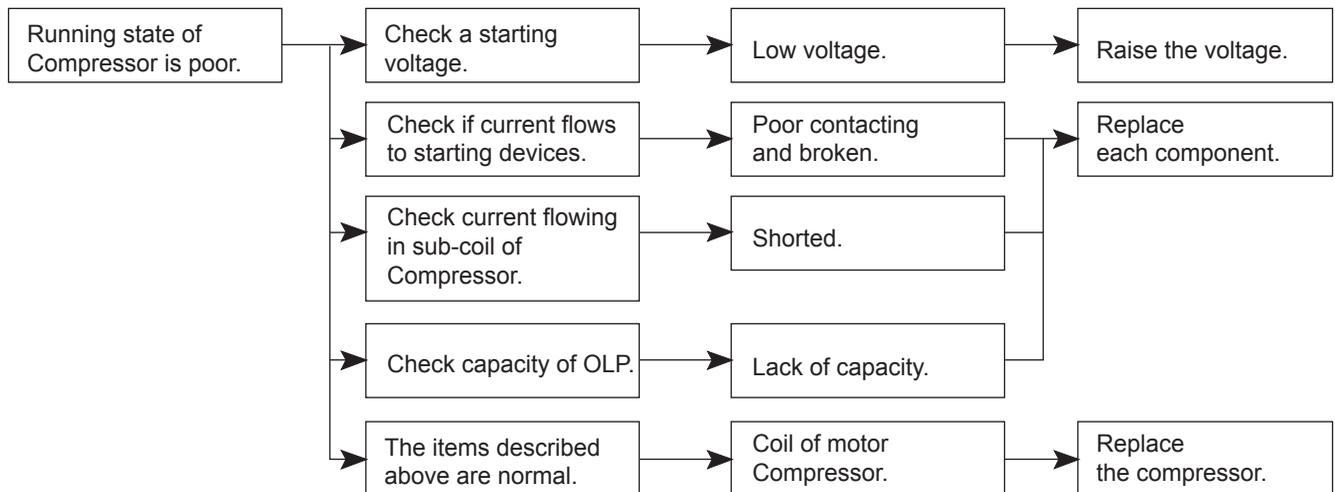
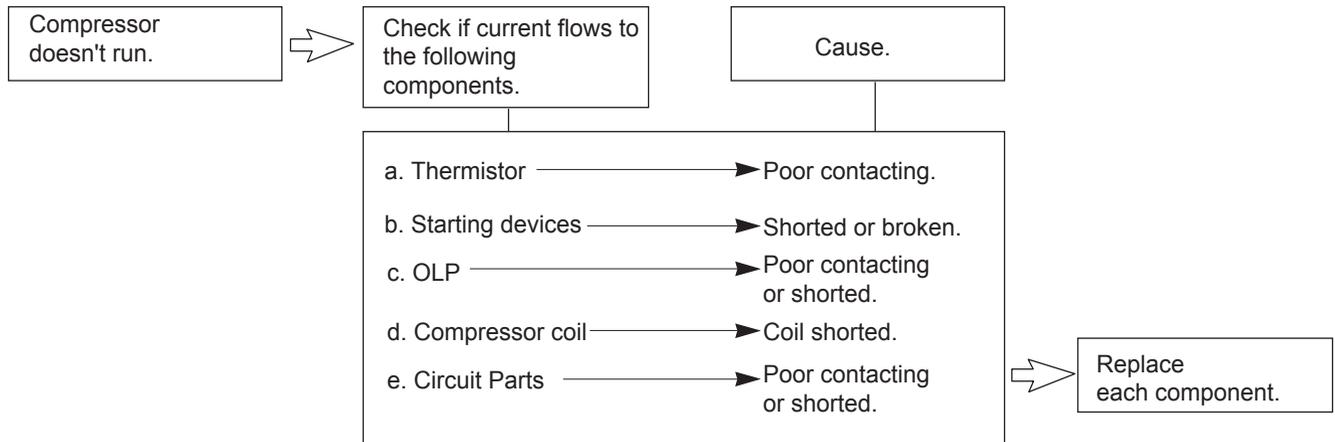


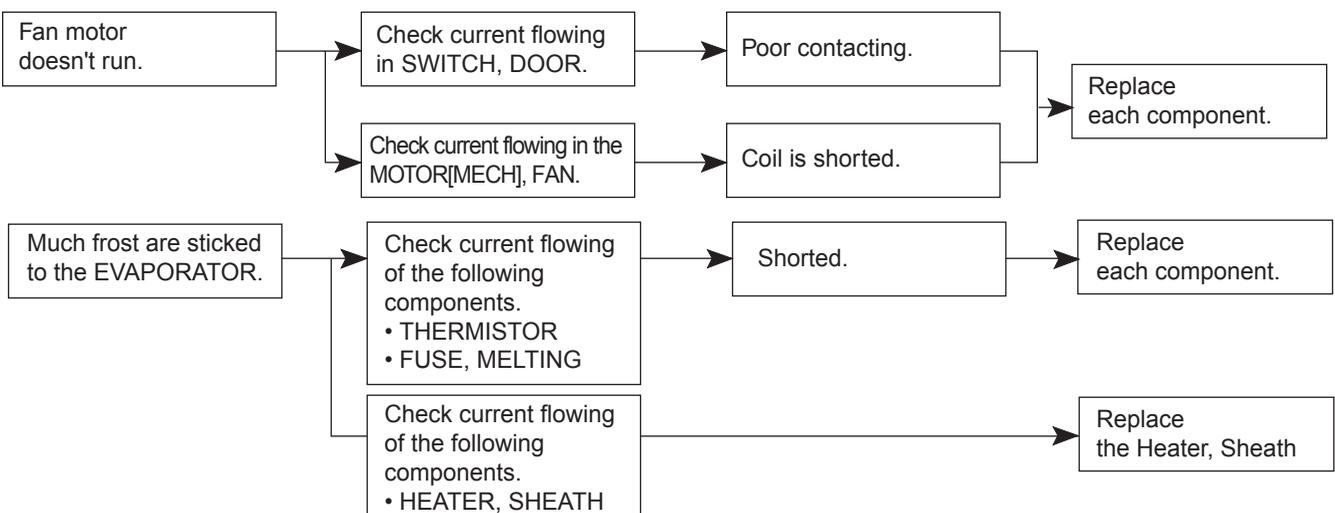
Figure 22

3. ANOTHER ELECTRIC COMPONENTS

▼ Cooling is impossible



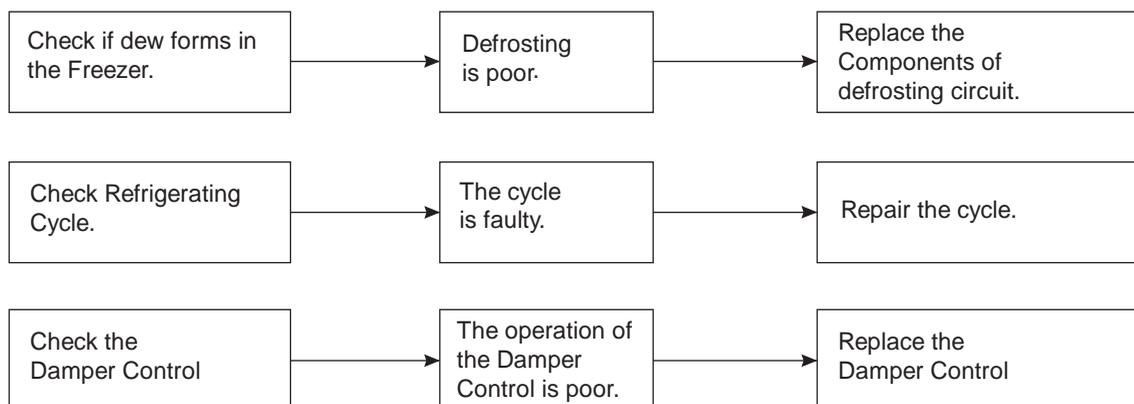
▼ Cooling ability is poor



4. SERVICE DIAGNOSIS CHART

COMPLAINT	POINTS TO BE CHECKED	REMEDY
Cooling is impossible.	<ul style="list-style-type: none"> • Is the power cord unplugged from the outlet? • Check if the power switch is set to OFF. • Check if the fuse of power switch is shorted. • Measure the voltage of power outlet. 	<ul style="list-style-type: none"> • Plug to the outlet. • Set the switch to ON. • Replace a regular fuse. • If voltage is low, wire newly.
Cooling ability is poor.	<ul style="list-style-type: none"> • 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 put in is hot. • Did you open the door of the set too often or check if the door is closed up? • Check if the Damper Control is set to "cold-position". 	<ul style="list-style-type: none"> • 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 cooled down. • Don't open the door too often and close it firmly. • Set the control to mid-position.
Foods in the Refrigerator are frozen.	<ul style="list-style-type: none"> • Are foods placed in cooling air outlet? • Check if the control is set to "cold-position". • Is the ambient temperature below 5°C? 	<ul style="list-style-type: none"> • Place foods in high temperature section.(Front Part) • Set the control to "mid-position". • Set the control to "warm-position".
Dew or ice forms in the chamber of the set.	<ul style="list-style-type: none"> • Is liquid food stored? • Check if put in is hot. • Did you open the door of the set too often or check if the door is closed up. 	<ul style="list-style-type: none"> • Seal up liquid foods with wrap. • Put in foods after cooled down. • Don't open the door too often and close it firmly.
Dew forms in the Exterior Case.	<ul style="list-style-type: none"> • Check if ambient temperature and humidity of surrounding air are high. • Is there gap in the door packed? 	<ul style="list-style-type: none"> • Wipe dew with a dry cloth. This occurrence is solved naturally in low temperature and humidity. • Fill up the gap.
Abnormal noise generates.	<ul style="list-style-type: none"> • Are the set positioned in a firm and even place? • Are any unnecessary objects set in the back side of the set? • Check if the Tray Drip is not firmly fixed. • Check if the cover of mechanical room in below and front side is taken out. 	<ul style="list-style-type: none"> • Adjust the Adjust Screw, and position in the firm place. • Remove the objects. • Fix it firmly on the original position. • Place the cover at the original position.
To close the door is not handy.	<ul style="list-style-type: none"> • Check if the door packing is dirty with filth such as juice. • Is the set positioned in a firm and even place? • Is too much food putted in the set? 	<ul style="list-style-type: none"> • 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.	<ul style="list-style-type: none"> • Check if the inside of the set is dirty. • Did you keep smelly foods without wrapping? • It smells of plastic. 	<ul style="list-style-type: none"> • Clean the inside of the set. • Wrap smelly foods. • The new products smells of plastic, but it is eliminated after 1-2 weeks.

• In addition to the items described left, refer to the followings to solve the complaint.



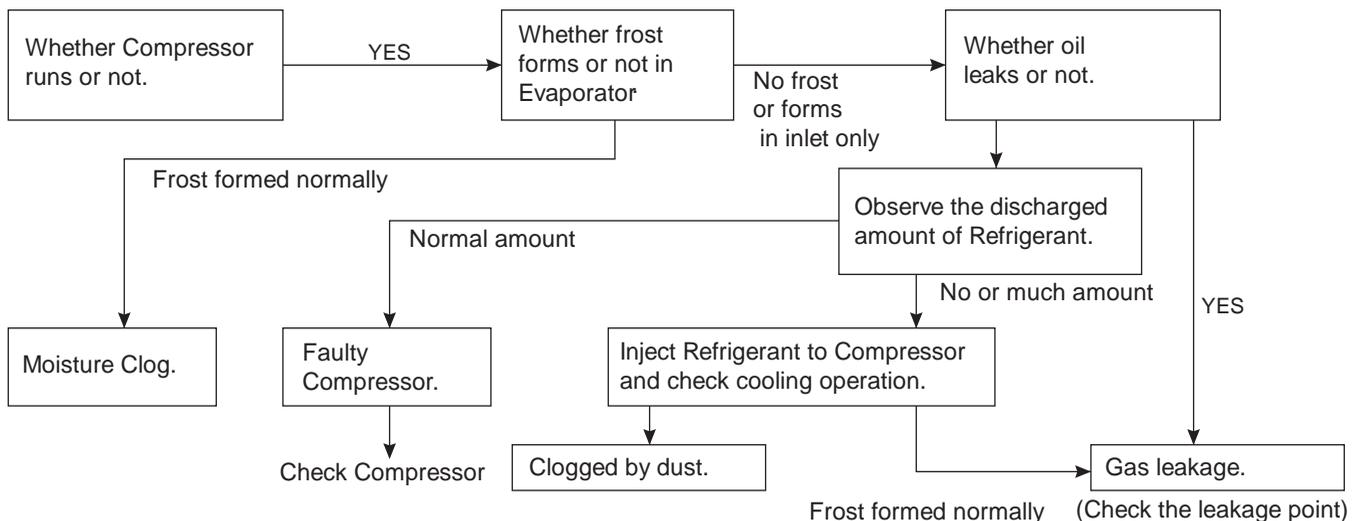
5. REFRIGERATING CYCLE

▼ Troubleshooting Chart

CAUSE		STATE OF THE SET	STATE OF THE EVAPORATOR	TEMPERATURE OF THE COMPRESSOR	REMARKS
LEAKAGE	PARTIAL LEAKAGE	Freezer room and Refrigerator don't cool normally.	Low flowing sound of Refrigerant is heard and frost forms in inlet only.	A little high more than ambient temperature.	<ul style="list-style-type: none"> A little Refrigerant discharges. Normal cooling is possible when injecting of Refrigerant the regular amount.
	WHOLE LEAKAGE	Freezer room and Refrigerator don't cool normally.	Flowing sound of Refrigerant is not heard and frost isn't formed.	Equal to ambient temperature.	<ul style="list-style-type: none"> No discharging of Refrigerant. Normal cooling is possible when injecting of Refrigerant the regular amount.
CLOGGED BY DUST	PARTIAL CLOG	Freeze room and Refrigerator don't cool normally.	Flowing sound of Refrigerant is heard and frost forms in inlet only.	A little high more than ambient temperature.	<ul style="list-style-type: none"> Normal discharging of refrigerant. The capillary tube is faulty.
	WHOLE CLOG	Freezer room and Refrigerator don't cool.	Flowing sound of Refrigerant is not heard and frost isn't formed.	Equal to ambient temperature.	<ul style="list-style-type: none"> Normal discharging of Refrigerant.
MOISTURE CLOG		Cooling operation stops periodically.	Flowing sound of Refrigerant is not heard and frost melts.	Low than ambient temperature.	<ul style="list-style-type: none"> Cooling operation restarts when heating the inlet of capillary tube.
DEFECTIVE COMPRESSION	COMP-RESSION	Freezer and Refrigerator don't cool.	Low flowing sound of Refrigerant is heard and frost forms in inlet only.	A little high than ambient temperature.	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> No pressure of high pressure part in the compressor.

▼ Leakage Detection

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



▼ General Control of Refrigerating Cycle

NO.	ITEMS	CONTENTS AND SPECIFICATIONS	REMARKS
1	WELDING ROD	(1) H 30 <ul style="list-style-type: none"> • Chemical Ingredients Ag: 30%, Cu: 27%, Zn: 23%, Cd: 20% • Brazing Temperature: 710~840°C (2) Bcup-2 <ul style="list-style-type: none"> • Chemical Ingredients Cu: About 93% P: 6.8~7.5% The rest: within 0.2% • Brazing Temperature: 735~840°C 	<ul style="list-style-type: none"> • Recommend H34 containing 34% Ag in the Service Center.
2	FLUX	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Make amount for only 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	LOKRING (Figure 23,24)	(1) Both of the tube is inserted up to the stop. (2) Both of the LOKRING is pushed up to the stop. (3) The bending point is not too close to the joint ending. (4) During the assembly it is important that both ends remain completely within the joint.	<ul style="list-style-type: none"> • For a hermetically sealed metal/metal connection, the tube ends have to be clean. • LOKPREP is distributed all of out-surface of the tube ends.
4	DRIER ASM	(1) Assemble the drier within 30min. after unpacking. (2) Keep the unpacked drier at the temperature of 80~100°C.	<ul style="list-style-type: none"> • Don't keep the drier in a outdoors because humidity damages it.
5	VACUUM	(1) When measuring with pirant Vacuum (1)gauge the charging M/C, vacuum (1)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.	<ul style="list-style-type: none"> • 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.
6	DRY AND AIR NITROGEN GAS	(1) The pressure of dry air must be more han 12~16kg/cm ² (2) Temperature must be more than -20 ~ -70°C. (3) Keep the pressure at 12~16kg/cm ² also when substituting dry air for Nitrogen Gas.	
7	NIPPLE AND COUPLER	(1) Check if gas leaks with soapy water. (2) Replace Quick Coupler in case of leakage.	<ul style="list-style-type: none"> • Check if gas leaks from joint of the Coupler.
8	PIPE	<ul style="list-style-type: none"> • Put all Joint Pipes in a clean box and cover tightly with the lid so that dust or humidity is not inserted. 	

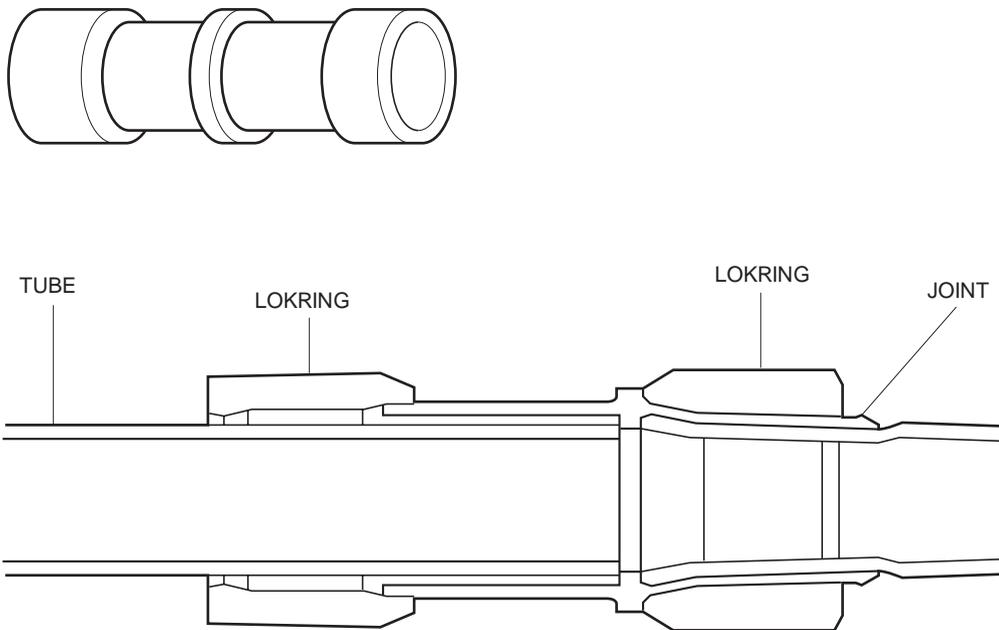


Figure 23. LOKRING

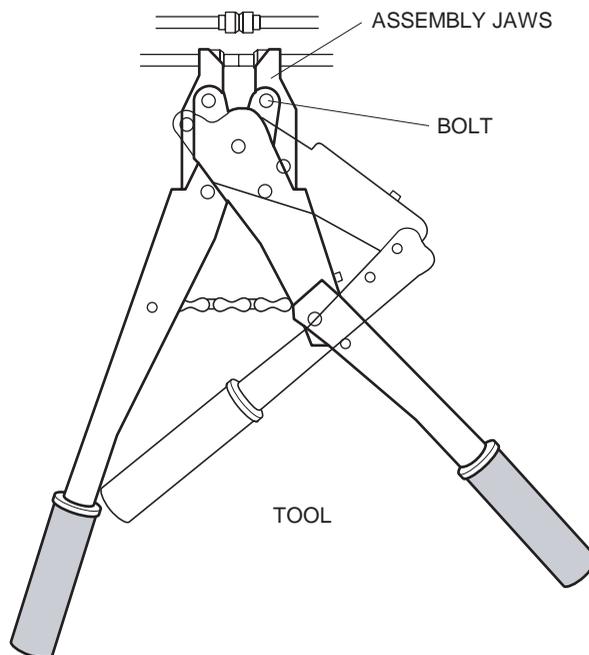


Figure 24. LOKRING TOOL

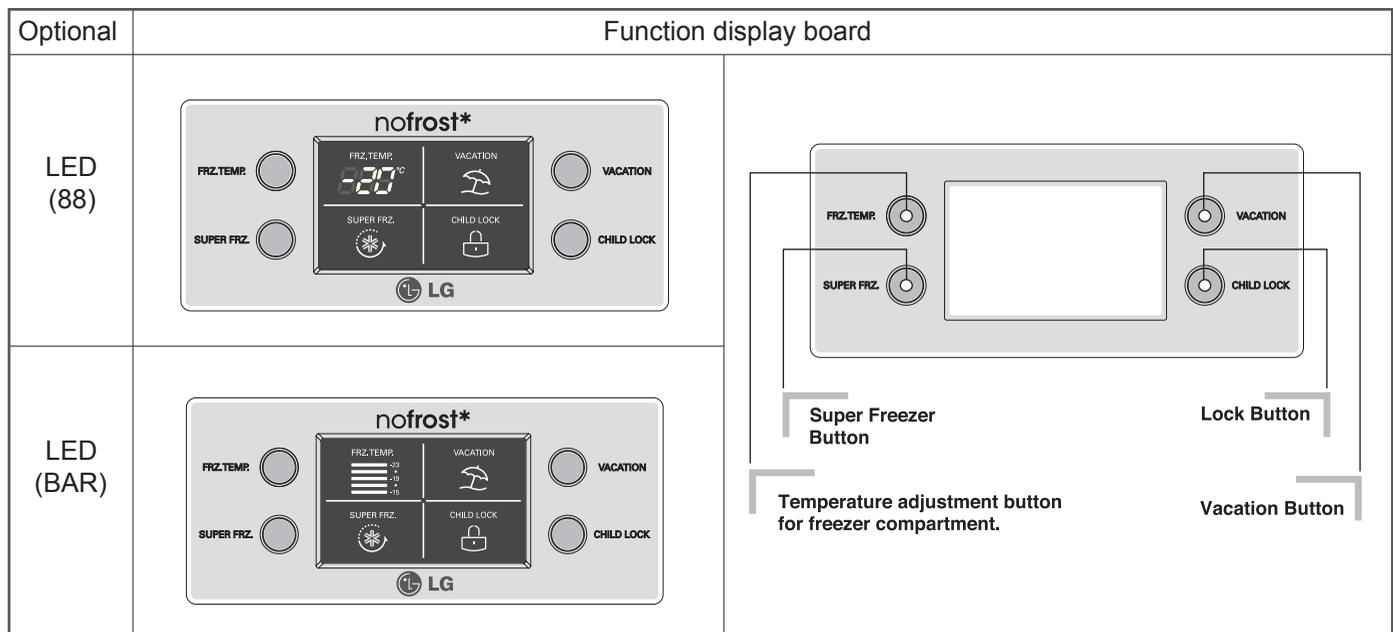
MICOM FUNCTION & PCB CIRCUIT EXPLANATION

This description is made for GA-B359, B399. Please refer to overall PCB circuits for other models.

1 FUNCTION EXPOSITION

1) FUNCTION

- The initial Temperature of the Freezer Compartment is -19°C respectively. You can now adjust the temperature of the compartments as you want.



2) FUNCTION OF TEMPERATURE SELECTION

- When you press the temperature control buttons, the temperature of Freezer compartment is repeated in the following order.

Division		Power Initially On	1st Press	2nd Press	3rd Press	4th Press
Change of Indication Lamp	LED(BAR)					
		Middle	Middle Strong	Strong	Weak	Middle Weak
Freezer Control		-19°C	-21°C	-23°C	-15°C	-16°C

Division		Power Initially On	1st Press	2nd Press	3rd Press	4th Press	5th Press	5th Press	5th Press	5th Press
Change of Indication Lamp	LED(88)									
		Freezer Control	-18°C	-19°C	-20°C	-21°C	-22°C	-23°C	-15°C	-16°C

3) SUPER FREEZING

- (1) It is the function which increases the cooling speed of freezer by continuously operating compressor and freezer fan. When it's button is pressed, GRAPHIC is on.
- (2) Whenever selection switch is pressed, selection/release (GRAPHIC on/off) changes in turn.
- (3) If power is on after power cut, SUPER FREEZING function is canceled.
- (4) It shall be cancelled after compressor and freezer fan continuously operate for three hours.
- (5) If defrost starts during SUPER FREEZING, SUPER FREEZING operates for the rest of time after defrost is complete when SUPER FREEZING operation time is less than 90 minutes. If SUPER FREEZING operated for more than 90minutes, the SUPER FREEZING shall operate for two hours before it stops.
- (6) If SUPER FREEZING is pressed during defrost, SUPER FREEZING GRAPHIC is on but SUPER FREEZING operation starts seven minutes after defrost is complete and it shall operate for three hours.
- (7) If SUPER FREEZING is selected within seven minutes after compressor has stopped, the compressor (compressor delays seven minutes) shall start after the balance of the delay time.
- (8) If VACATION button is pressed during the SUPER FREEZING, the SUPER FREEZING function is immediately released.

4) VACATION FUNCTION

- (1) When pressing the VACATION button, the VACATION GRAPHIC is on and its function is operated.
- (2) In the status of VACATION mode, regardless of current notch, freezer is controlled at -13°C and refrigerator is controlled at 7°C . (but, above temperature is displayed in the case of BEST model.)
- (3) When pressing the VACATION button again, VACATION GRAPHIC is off and its function is released.(Here, freezer and refrigerator is controlled at previous setting temperature.)

5) BUZZER SOUND

- (1) When the button on the front Display is pushed, a Ding ~ sound is produced.
(Refer to the BUZZER OPERATION CHECK)

5) DEFROSTING

- (1) If the accumulated time for the operation of the COMPRESSOR is meet with 7 hours, the DEFROSTING HEATER is started.
- (2) The first defrosting is performed at 4 hours(compressor ON) later since the power is on.
- (3) If DEFROST SENSOR is over 7°C during DEFROSTING, end the operation of DEFROSTING with DEFROSTING HEATER paused, And after 7 minutes, the operation for the freezing is started. But, if DEFROST SENSOR is not reach to 7°C after 2 hours' operation of the defrosting heater, it represents a defrosting trouble.(See the TROUBLE REPRESENTING FUNCTION)
- (4) If DEFROST SENSOR is short or open, defrosting is not performed.

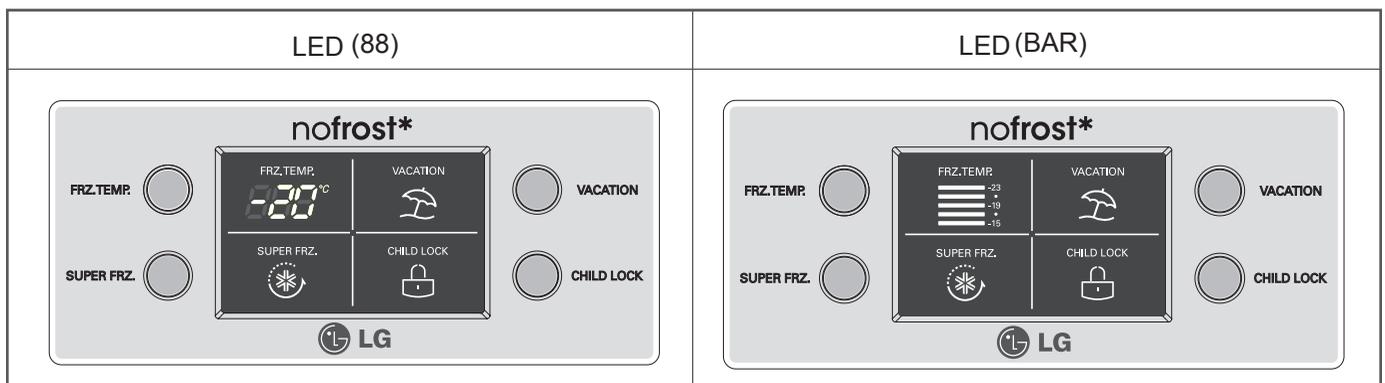
6) ORDERLY OPERATION OF ELECTRIC PARTS

To avoid NOISE and DAMAGE, the items containing an electric parts such as COMP, DEFROSTING HEATER and FAN MOTOR operate in order as follows.

	OPERATION STATE	OPERATION ORDER
WHEN PLUGGED AT FIRST	WHEN DEFROST SENSOR TEMPERATURE IS OVER 7°C. (WHEN PURCHASING OR MOVING)	POWER ON → after 0.5 sec. → COMP ON → after 0.5 sec. → FAN ON
	WHEN DEFROST SENSOR TEMPERATURE IS BELOW 7°C. (WHEN POWER FAILURE OR SERVICING)	POWER ON → after 0.5 sec. → DEFROSTING HEATER ON → after 10 sec. → DEFROSTING HEATER OFF after 0.5 sec. → COMP ON → after 0.5 sec. → FAN ON
	WHEN RETURNING TO NORMAL STATE FROM TEST MODE	All Elec. Parts OFF → after 7 min. → COMP ON → after 0.5 sec. → FAN ON

7) SELF-TEST

- (1) Function to make service easy in case of occurring a trouble in the product.
- (2) When occurring a trouble, if the button is pushed, but the function could not operate.
- (3) If a trouble release during the representation of trouble, a refrigerator performs the normal function(RESET).
- (4) To represent a ERROR CODE, it use FREEZE TEMP LEDs in the door. If ERROR occurs, the other LEDs except ERROR CODE LEDs are all off.



O : OPERATE NORMAL

NO.	ITEMS	ERROR CODE LEDs	DESCRIPTION	OPERATION IN TROUBLE'S OCCURRING		
				COMP	FAN	DEFROST HEATER
1	FREEZER SENSOR abnormal		FREEZER SENSOR open or short.	15 minutes On/ 15 minutes Off	O	O
2	DEFROST SENSOR abnormal		DEFROST SENSOR open or short.	O	O	No defrosting
3	DEFROSTING FUNCTION is abnormal		DEFROST HEATER, TEMP. FUSE open or disconnection (Displayed after at least 4 hours from the trouble's occurring.)	O	O	O
4	RT-SENSOR abnormal	NOTE 1)	Room Temperature SENSOR open or short	O	O	O

* NOTE 1) If one second pass after pressing the QUICK FREEZE and FREEZE TEMP buttons together in normal operation, operates as follow.

RT-SENSOR If normal, LEDs on the TOP COVER is all on.
 If abnormal, LEDs are all on except VACATION LED.

8) FUNCTION TEST

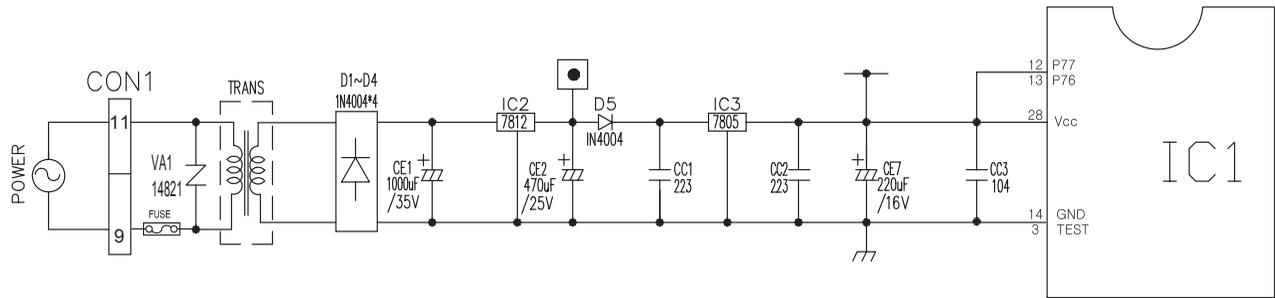
- (1) Function to check the testing function of PCB and refrigerator and to find where the trouble.
- (2) The test switch is on the MAIN PCB of refrigerator.
TEST FUNCTION is released and RESET after MAX. 2hours regardless of TEST MODE.
- (3) If the buttons on the door is pushed during TEST MODE, Function is not operated and only BUZZER ring with "DING~"
- (4) After the end of TEST MODE, pull out the power cord and plug it in again(RESET).
- (5) If a ERROR occurs during the TEST MODE, TEST FUNCTION is released and DISPLAY LEDs represent ERROR CODE.
- (6) If the TEST switch is pushed during ERROR CODE, TEST FUNCT ION is not operated.

MODE	OPERATION	CONTENTS	REMARKS
TEST 1	Press TEST button once.	1. COMP OPERATES SUCCESSIVELY. 2. FAN OPERATES SUCCESSIVELY. 3. DEFROSTING HEATER OFF 4. ALL DISPLAY LEDS ON.	
TEST 2	Press TEST button once in the state of TEST MODE 1.	1. COMP OFF. 2. FAN OFF. 3. DEFROST HEATER ON. 4. ALL THE DISPLAY LEDS OFF EXCEPT QUICK FREEZE AND VACATION LEDS.	If DEFROST HEATER is over 7°C, it returns to the NORMAL STATE.
NORMAL STATE	Press TEST button once in the state of TEST MODE 2.	Return to the initial condition. (RESET)	Comp starts after 7 minutes.

- LED Check Function : Press the QUICK FREEZE and FREEZE TEMP buttons at the same time, all the LEDs of the DISPLAY are ON simultaneously. (This operation must be completed in ten seconds after the power is on.)
When it is ten seconds after the power is on, return to the previous condition.

2 FUNCTION DESCRIPTION

1) ELECTRIC CIRCUITS

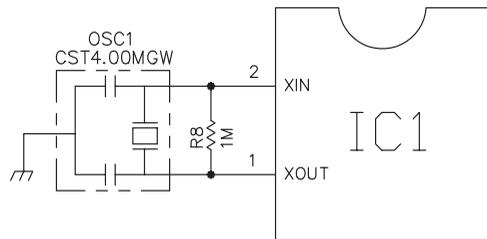


TRANS secondary side is composed of electric power circuits for RELAY driving electricity (12Vdc) and for supplying electricity to MICOM and IC (5Vdc). The voltage in each part is as follows.

PARTS	both ends of VA1	both ends of transformer	both ends of CE1	both ends of CE2	both ends of CC2
VOLTAGE	230Vac	14Vac	17Vdc	12Vdc	5Vdc

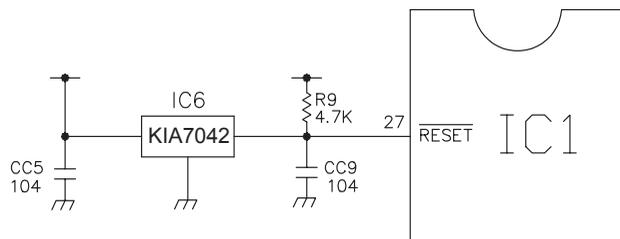
VA1 is the part to protect over voltage and noise. When more than 385V is applied, the thermal-fuse(130°C cut-off, local option) in a first part of TRANS is cut so that the elements in the secondary side of TRANS are protected.

2) OSCILLATION CIRCUIT



CIRCUIT for occurring CLOCK which motivates the internal local element of IC1 to transmit and receive an information and BASIC TIME for calculating time. Use a proper form for OSC 1. Because in case that SPECIFICATION is changed, the calculated time in IC1 is changed or IC1 isn't able to operate.

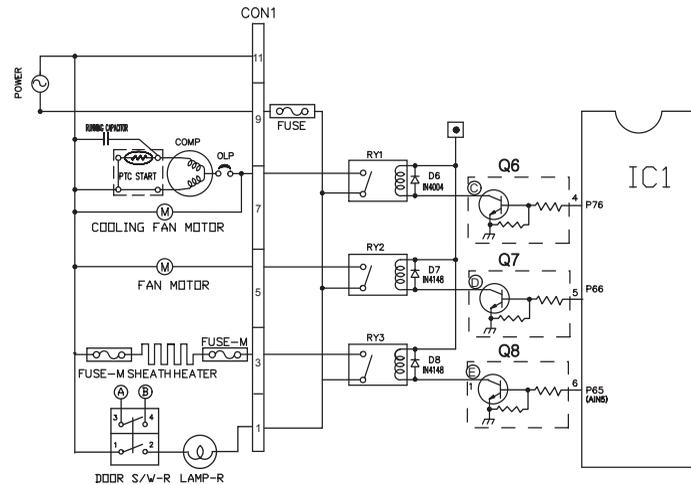
3) RESET CIRCUIT



All the internal parts of MICOM(IC1) return to the initial condition when the early power ON or apply power again in MICOM after temporary power failure. As a result, all the functions operate according to the early condition. At the early period of power ON the "LOW" voltage is applied in the RESET terminal of MICOM for the fixed time. The RESET terminal is 5V during the general operation.

4) LOAD/BUZZER OPERATION

(1) LOAD OPERATION CHECK



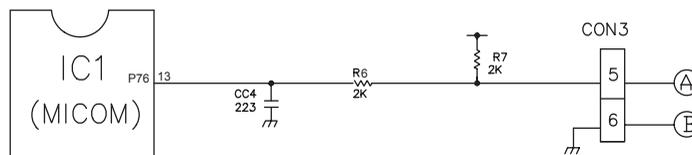
KIND OF LOAD		COMP, COMP COOLING FAN	FAN MOTOR	DEFROSTING HEATER
MEASURING POINT (IC5)		No.C	No.D	No.E
STATE	ON	below 1V		
	OFF	12V		

If the DOOR-R is opened during FAN MOTOR is operated, FAN MOTOR is stopped immediately.

The (A), (B) of DOOR S/W-R is connected DOOR OPEN DETECTION CIRCUIT as follow.

If the DOOR-R is opened or closed, then the DOOR S/W-R is ON/OFF, and the LAMP-R is ON/OFF, and at the same time, S/W of the (A), (B) of DOOR S/W-R for detection of DOOR-R open is ON/OFF.

(2) DOOR OPENING PERCEPTION CHECK



*NOTICE: If you would change DOOR S/W-R, must use the component of right PART NUMBER. Because there is a similar type DOOR S/W-R of NOT MICOM MODEL, it's logic of the (A), (B) of DOOR S/W-R is reversed.

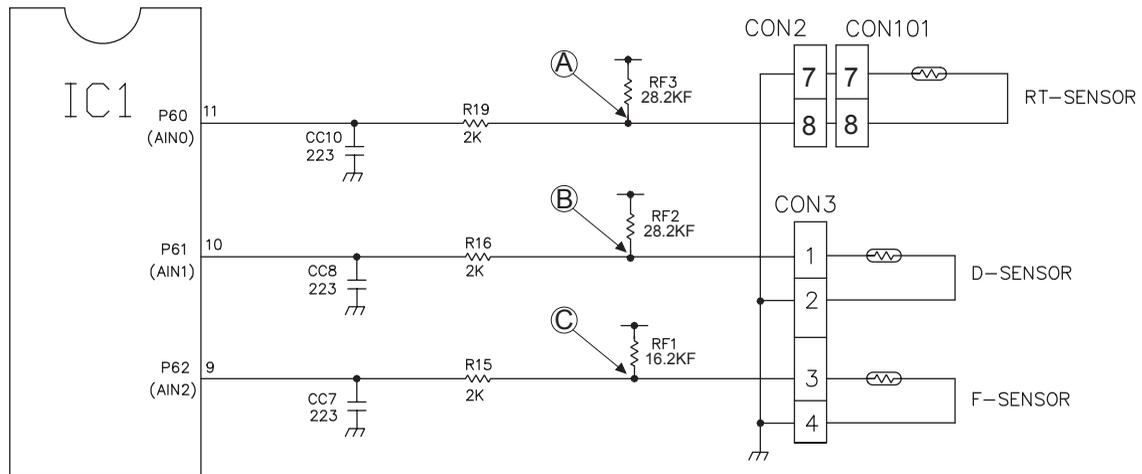
MEASURING POINT	NO.6 OF IC 1 (MICOM)
REFRIGERATOR DOOR	
CLOSE	5V(S/W of (A), (B) is OFF state)
OPEN	0V(S/W of (A), (B) is ON state)

Even though LAMP-R is operated a normal ON/OFF according to DOOR S/W-R, but the MICOM couldn't detect a DOOR-R opened or closed of lead wire of the (A), (B) is abnormal or S/W of the (A), (B) of DOOR S/W-R is abnormal.

When DOOR-R open isn't detected : Even though DOOR-R is opened, FAN MOTOR couldn't stop.

check a lead wire of the (A), (B) and DOOR S/W-R.

5) TEMP SENSOR CIRCUITS

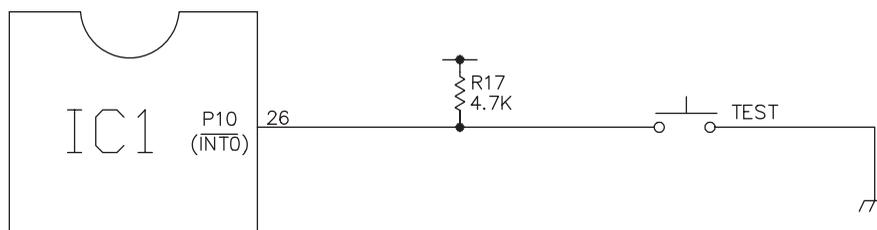


The above circuit reads the surrounding temperature, DEFROSTING temperature and FREEZER ROOM temperature into MICOM(IC1). OPEN or SHORT state of each SENSOR is as follows.

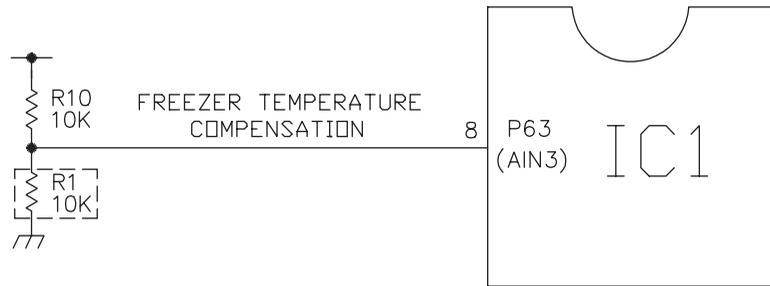
SENSOR	CHECK POINT	NORMAL (-30°C~50°C)	SHORT	OPEN
ROOM TEMPERATURE SENSOR	POINT Ⓐ Voltage	0.5V ~ 4.5V	0V	5V
DEFROST SENSOR	POINT Ⓑ Voltage			
FREEZER SENSOR	POINT Ⓒ Voltage			

6) SWITCH INPUT CIRCUIT

The following circuit is a test switch input circuit for checking the refrigerator.



7) TEMPERATURE COMPENSATION



FREEZER ROOM		REMARKS
RESISTANCE VALUES(R1)	TEMPERATURE COMPENSATION	
180 k Ω	+ 5.0°C	COMPENSATE WARMLY ↑
56 k Ω	+4.0°C	
33 k Ω	+3.0°C	
18 k Ω	+2.0°C	
12 k Ω	+1.0°C	
10 k Ω	0°C	STANDARD
8.2 k Ω	-1.0°C	↓ COMPENSATE COOLLY
5.6 k Ω	-2.0°C	
3.3 k Ω	-3.0°C	
2 k Ω	-4.0°C	
470 Ω	-5.0°C	

- TEMPERATURE COMPENSATION TABLE by adjusting resistance values. (the temp difference compared to the present temp.)
 eg) If the compensation resistance of freezer compartment is changed from 10K (present resistance) to 18K (revised resistance), the temp of freezer compartment goes up by +2°C.

• TEMPERATURE COMPENSATION OF FREEZER ROOM

	Revised resistance	470Ω	2kΩ	3.3kΩ	5.6kΩ	8.2kΩ	10kΩ	12kΩ	18kΩ	33kΩ	56kΩ	180kΩ
	Present resistance											
FREEZER ROOM (R1)	470Ω	NOT COMPENSATE	1°C↑	2°C↑	3°C↑	4°C↑	5°C↑	6°C↑	7°C↑	8°C↑	9°C↑	10°C↑
	2kΩ	1°C↓	NOT COMPENSATE	1°C↑	2°C↑	3°C↑	4°C↑	5°C↑	6°C↑	7°C↑	8°C↑	9°C↑
	3.3kΩ	2°C↓	1°C↓	NOT COMPENSATE	1°C↑	2°C↑	3°C↑	4°C↑	5°C↑	6°C↑	7°C↑	8°C↑
	5.6kΩ	3°C↓	2°C↓	1°C↓	NOT COMPENSATE	1°C↑	2°C↑	3°C↑	4°C↑	5°C↑	6°C↑	7°C↑
	8.2kΩ	4°C↓	3°C↓	2°C↓	1°C↓	NOT COMPENSATE	1°C↑	2°C↑	3°C↑	4°C↑	5°C↑	6°C↑
	10kΩ	5°C↓	4°C↓	3°C↓	2°C↓	1°C↓	NOT COMPENSATE	1°C↑	2°C↑	3°C↑	4°C↑	5°C↑
	12kΩ	6°C↓	5°C↓	4°C↓	3°C↓	2°C↓	1°C↓	NOT COMPENSATE	1°C↑	2°C↑	3°C↑	4°C↑
	18kΩ	7°C↓	6°C↓	5°C↓	4°C↓	3°C↓	2°C↓	1°C↓	NOT COMPENSATE	1°C↑	2°C↑	3°C↑
	33kΩ	8°C↓	7°C↓	6°C↓	5°C↓	4°C↓	3°C↓	2°C↓	1°C↓	NOT COMPENSATE	1°C↑	2°C↑
	56kΩ	9°C↓	8°C↓	7°C↓	6°C↓	5°C↓	4°C↓	3°C↓	2°C↓	1°C↓	NOT COMPENSATE	1°C↑
	180kΩ	10°C↓	9°C↓	8°C↓	7°C↓	6°C↓	5°C↓	4°C↓	3°C↓	2°C↓	1°C↓	NOT COMPENSATE

- This circuit is aimed to input the necessary temperature compensation values into the MICOM in order to adjust the freezer temperature which is different in each model.

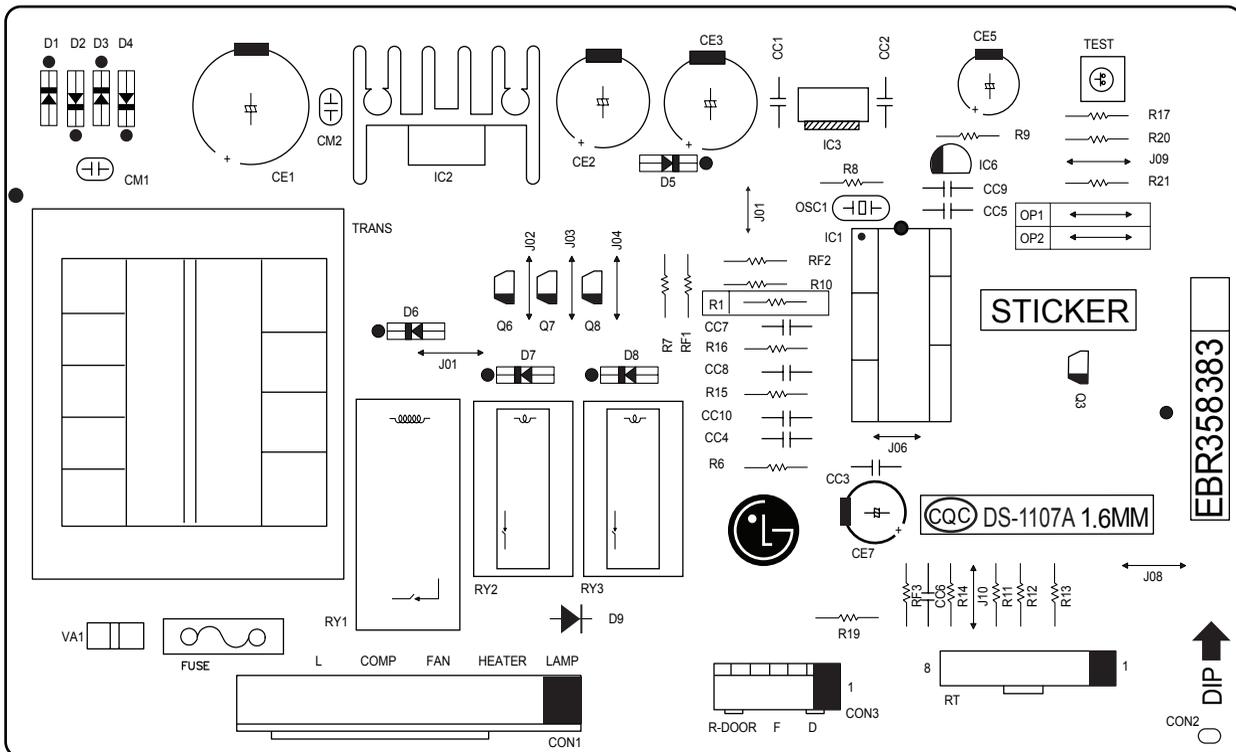
3. SENSOR RESISTANCE CHARACTERISTICS TABLE

MEASURED TEMPERATURE	RESISTANCE OF FREEZER SENSOR	RESISTANCE OF DEFROST SENSOR, ROOM TEMPERATURE SENSOR
-20°C	22.3kΩ	77kΩ
-15°C	16.9kΩ	60kΩ
-10°C	13.0kΩ	47.3kΩ
-5°C	10.1kΩ	38.4kΩ
0°C	7.8kΩ	30kΩ
+5°C	6.2kΩ	24.1kΩ
+10°C	4.9kΩ	19.5kΩ
+15°C	3.9kΩ	15.9kΩ
+20°C	3.1kΩ	13kΩ
+25°C	2.5kΩ	11kΩ
+30°C	2.0kΩ	8.9kΩ
+40°C	1.4kΩ	6.2kΩ
+50°C	0.8kΩ	4.3kΩ

- The tolerance of sensor resistance is $\pm 5\%$.
- Be sure to measure the sensor resistance after keeping the sensor more than 3 minutes at a measuring temperature. (It needs delay due to sensor speed.)
- Measure the resistances of SENSORs with a digital tester after disconnecting CON 3 of MAIN PCB ASSY.

4. MAIN PCB ASS'Y AND PARTS LIST

1) MAIN PCB ASS'Y



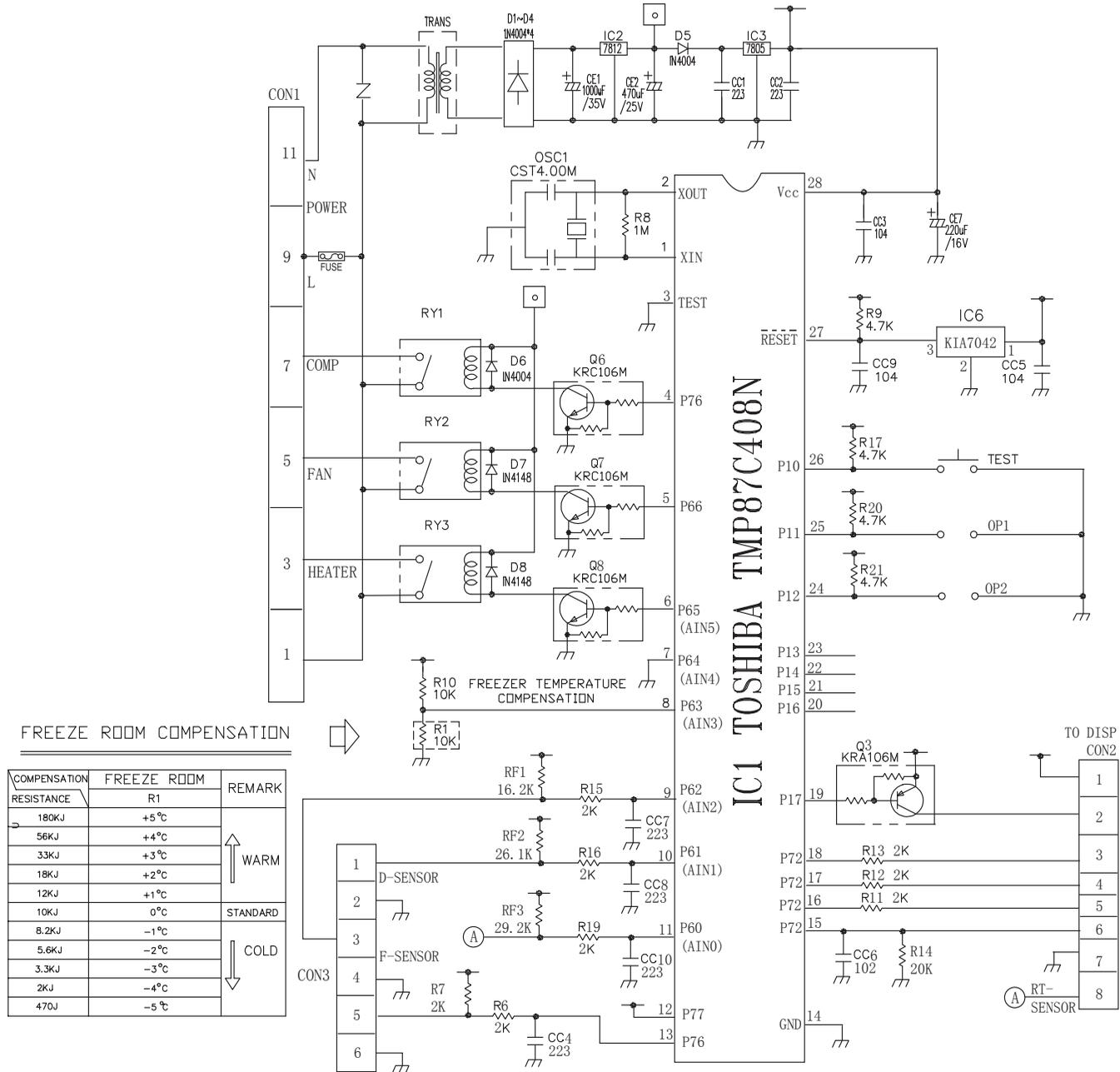
2) REPLACEMENT PARTS LIST

06	05	04	03	02	01	W O R K	DESCRIPTION	SPEC'	MAKER	REMARK	
QTY	QTY	QTY	QTY	QTY	QTY	N O .					
1	1	1	1	1	1	1	PWB, MAIN	FR-1 (DS-1107A)	SUZHONGDAZHAN	t=1.6	
1J	1G	1D	1D	1J	1G	2	TRANS PCB		JIANGSULING K.T.C TAE SUNG	TRANS	
1	1					3	WAFER	JE202-1T-05 (9P-2,4,6,8)	JAE EUN/ YEON HO	CON1	
1	1					4		JE202-1T-06 (1P-2,4,6,8, 10)			
1	1					5		SM W 250-06(1,2,3,4,5,6)	YEON HO	CON3	
1	1					6		SM W 250-08		CON2	
1J	1G	1E	1J	1J	1G	6	MICOM CHIP	87C408NG	TOSHIBA	IC1	
1	1					7	REGULATOR	KIA7812API	KEC	IC2	
1	1					8		(1)UPC7805AHF	NEC	IC3	
1	1					8		(2)KIA78S05P	KEC		
1	1					9	RESET IC	KIA7042AP	K. E. C	IC6	
						9	BMR-0101D	KODENSHI			
		1	1			10	VARISTOR	TVR14271 (SVC271D-14A)	THKING/SAMWHA	VA1	
	1	1				11	RELAY	H2AK012T	F.T	RY1	
						11		OMIH-SS-112LM	OEG		
2	2	2	2	2	2	12		PCJ-112D3MH	OEG	RY2,RY3	
1	1					13	RESONATOR	CSTLS4M00G53	MURATA	OSC1	
1	1					14	VARISTOR	TVR14621	THKING	VA1	
						14	(2)SVC621D-14A	SAMHWA			
1	1	1	1	1	1	15	ELE'CAPACITOR	220uF/16V	SAMHWA/SAMYOUNG	CE7	
1	1	1	1	1	1	16		1000uF/35V		CE1	
1	1	1	1	1	1	17		470uF/25V		CE2	
1						18	RELAY	G5JS-1A-NT 250VAC 16A 12V	OMRON	RY1	
						18		ALE15B12 250V 16A	NAIS		
						18		OMIH-SS-112LM	OEG		
5	5	5	5	5	5	19	RECTIFIER DIODE	IN4004	PYUNGCHANG	D1-5	
						20	RECTIFIER DIODE	IN4004		D6-8	
1	1	1	1	1	1	21	CER' CAPACITOR	102/25V	TAEYANG	CC6	
6	6	6	6	6	6	22		223/25V		CC1, 2, 7, 8, 10, 4	
3	3	3	3	3	3	23		104/50V		CC3,5,9	
1	1	1	1	1	1	24	R,CARBON FILM	180 1/4W	XIANZHENGDIANZI	R11	
1	1	1	1	1	1	25		180 1/4W		R12	
1	1	1	1	1	1	26		180 1/4W		R13	
1	1					27	FUSE DRAWING	15A, 250V	XIA MENG NING LI	FUSE	
2	2					28	FUSE ASSEMBLY, THERMAL			FUSE HOLDER	
						29	R, CARBON FILM		XIANZHENGDIANZI		
5	5	5	5	5	5	30		2K 1/4W		R15,16,19,6,7	
1	1	1	1	1	1	31		20K 1/4W		R14	
4	4	4	4	4	4	32		4.7K 1/4W		R9,17,20,21	
2	2	2	2	2	2	33		10K 1/4W		R1,10	
1	1	1	1	1	1	34		1M 1/4W		R8	
1						35		16.7KF 1/4W		XIANZHENGDIANZI	RF1
	1	1				36		16.2KF 1/4W			RF1
1	1	1	1	1	1	37	26.1KF 1/4W	RF2			
1	1	1	1	1	1	38	29.2KF 1/4W	RF3			
						39					
1	1	1	1	1	1	40	TRANSISTOR	KRA106M	K. E. C	Q3	
3	3	3	3	3	3	41		KRA106M		Q6,7,8	
1	1	1	1	1	1	42	TEST S/W	HCT-1101A	POSTECH	TEST	
9	9	9	9	9	9	43	JUMP WIRE	0.6*10mm	TIANJINHONGYUAN	J01-09	
						44		0.6*8mm			
1	1	1	1	1	1	45				OP1	
	1	1				46		0.6*10mm		OP2	
3.0g	3.0g	3.0g	3.0g	3.0g	3.0g	47	SOLDER	ALMIT KR-19RMA			
25g	25g	25g	25g	25g	25g	48	SOLDER LEAD BAR	H63A			
1.5g	1.5g	1.5g	1.5g	1.5g	1.5g	49	FLUX AUTO	JS71	KOKI		

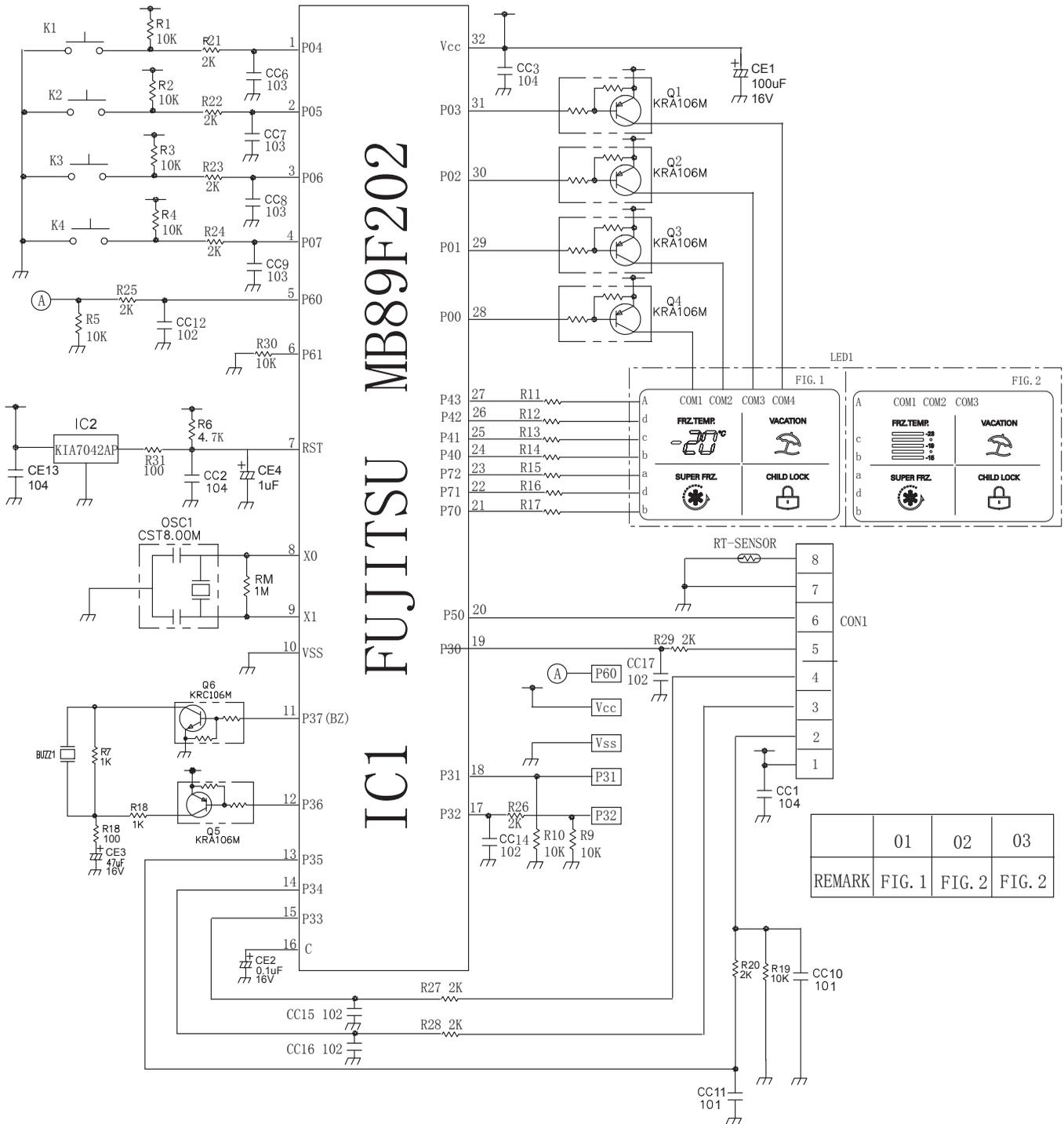
3) P CB ASS'Y, DISPLAY AND PARTS LIST

Q3	Q2	Q1	WORK	DESCRIPTION	SPEC	MAKER	REARK
Qty	Qty	Qty	No.				
1	1	1	1	IC	KIA7042AP	KEC	IC2
1	1	1	2	IC	FUJITSU MB89F202	FUJITSU	IC1
4	4	4	3	TRANSISTOR	KRA106M	KEC	Q2-5
1	1	1	4	TRANSISTOR	KRA106M	KEC	Q6
3	3	3	5	CAPACITOR, METAL GLAZED	104 50V	TAE YANG/YAGEO	CC1-3, 13
1	1	1	6	CAPACITOR, FIXED ELECTROLYTIC	100uF, 16V	YAGEO/SAMWHA/G-LUXON	CE1
1	1	1	7	CAPACITOR, FIXED ELECTROLYTIC	0. 1uF, 16V	YAGEO/SAMWHA/G-LUXON	CE2
1	1	1	8	CAPACITOR, FIXED ELECTROLYTIC	47uF, 16V	YAGEO/SAMWHA/G-LUXON	CE3
3	3	3	9	RESISTOR, METAL FILM	1K 5. 00%	XIANZHENGDIANZI/YAGEO/UNI-OHM	R7, 18, 15
2	2	2	10	RESISTOR, METAL FILM	100 5. 00%	XIANZHENGDIANZI/YAGEO/UNI-OHM	R8, 31
1	1	1	11	RESISTOR, METAL FILM	200 5. 00%	XIANZHENGDIANZI/YAGEO/UNI-OHM	R17
1	1	1	12	RESISTOR, METAL FILM	4. 7K 5. 00%	XIANZHENGDIANZI/YAGEO/UNI-OHM	R6
8	8	8	13	RESISTOR, METAL FILM	10K 5. 00%	XIANZHENGDIANZI/YAGEO/UNI-OHM	R1-5, 9, 10, 19, 30
1	1	1	14	RESONATOR, CRYSTAL	CST 8MHZ +/- 0. 5%	MURATA/TDK	OSC1
4	4	4	15	SWITCH, TACT	HCT-1101A 6*6*5	POSTECH/CKC	K1-4
1	1	1	16	CONECTOR, WAFER	SMAW250-08	YH	CON1
1	1	1	17	LED		HBLED/BOE	LED1
1	1	1	18	RT-SENSOR	PBN-43	CHANGZHOUHUICHANG/YAGEO/UNI-OHM	RT-SENSOR
1	1	1	19	BUZZER, PIEZO	KPT-G2240BP 4KHZ	NINGBOKAIPU	BUZ1
10	10	10	20	RESISTOR, METAL FILM	2K 5. 00%	XIANZHENGDIANZI/YAGEO/UNI-OHM	R20-R29
		1	21	TRANSISTOR	KRA106M	KEC	Q1
		1	22	RESISTOR, METAL FILM	820 5. 00%	XIANZHENGDIANZI/YAGEO/UNI-OHM	R12
1	1	1	23	RESISTOR, METAL FILM	1M 5. 00%	XIANZHENGDIANZI/YAGEO/UNI-OHM	RM
4	4	4	24	CAPACITOR, METAL GLAZED	103 50V	TAE YANG/YAGEO	CC6-9
2	2	2	25	CAPACITOR, METAL GLAZED	101 50V	TAE YANG/YAGEO	CC10, 11
5	5	5	26	CAPACITOR, METAL GLAZED	102 50V	TAE YANG/YAGEO	CC12, 14-17
1	1	1	27	CAPACITOR, FIXED ELECTROLYTIC	1uF, 16V	YAGEO/SAMWHA/G-LUXON	CE4
		1	28	RESISTOR, METAL FILM	250 5. 00%	XIANZHENGDIANZI/YAGEO/UNI-OHM	R11
1	1		29	RESISTOR, METAL FILM	300 5. 00%	XIANZHENGDIANZI/YAGEO/UNI-OHM	R11
		2	30	RESISTOR, METAL FILM	820 5. 00%	XIANZHENGDIANZI/YAGEO/UNI-OHM	R13, 14
2	2		31	RESISTOR, METAL FILM	1K 5. 00%	XIANZHENGDIANZI/YAGEO/UNI-OHM	R13, 14
		1	32	RESISTOR, METAL FILM	200 5. 00%	XIANZHENGDIANZI/YAGEO/UNI-OHM	R16
1	1		33	RESISTOR, METAL FILM	250 5. 00%	XIANZHENGDIANZI/YAGEO/UNI-OHM	R16
13	13	13	34	JUMP WIRE	0. 6*10mm	HONGYUAN/YAGEO	J01-03, 05-12, 14, 15
		1	35	JUMP WIRE	0. 6*10mm	HONGYUAN/YAGEO	J04

5. PCB assembly,MAIN circuit drawing- The PCB assembly,MAIN circuit drawing may change without notice.



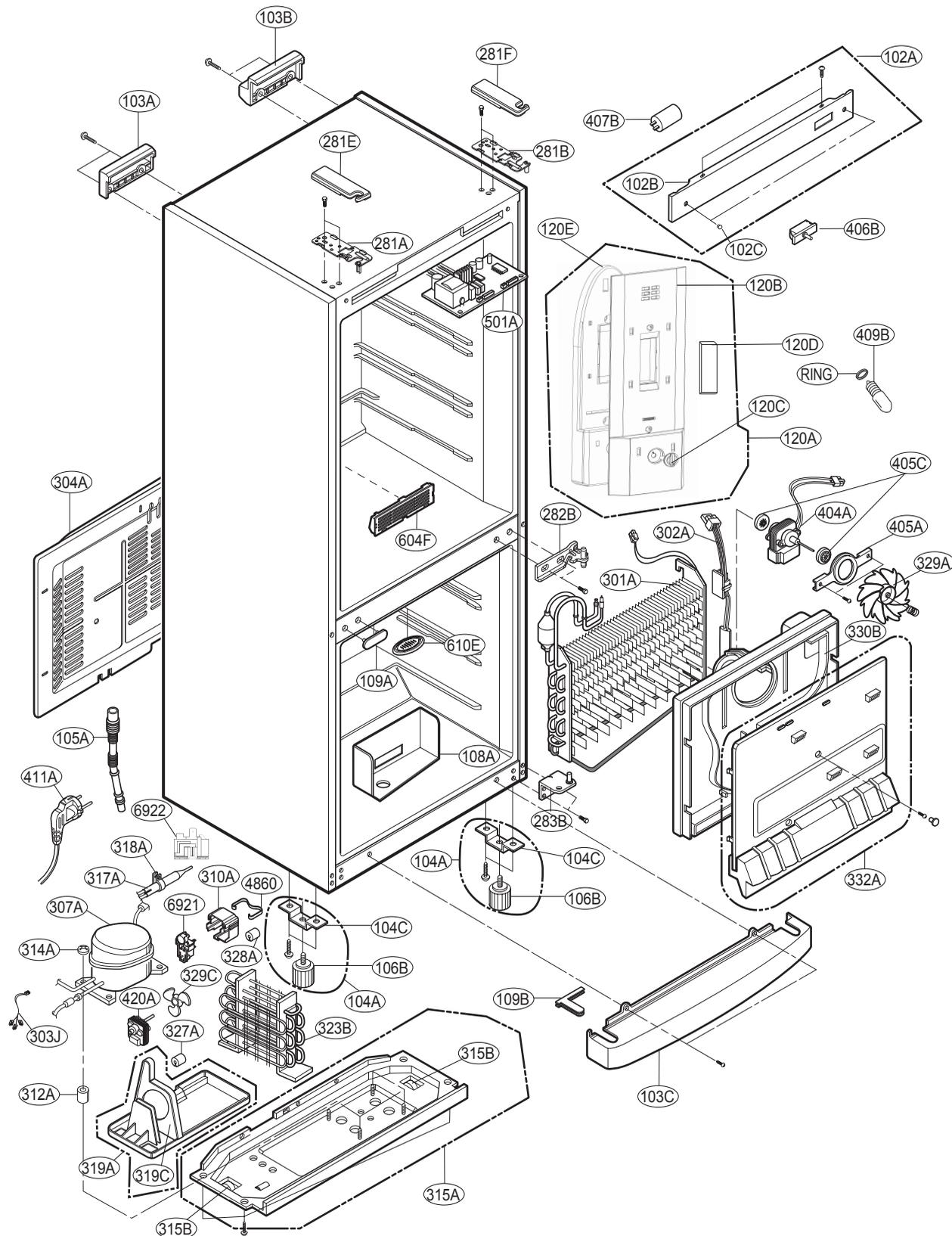
6. PCB assembly,display circuit drawing- The PCB assembly,display circuit drawing may change without notice.



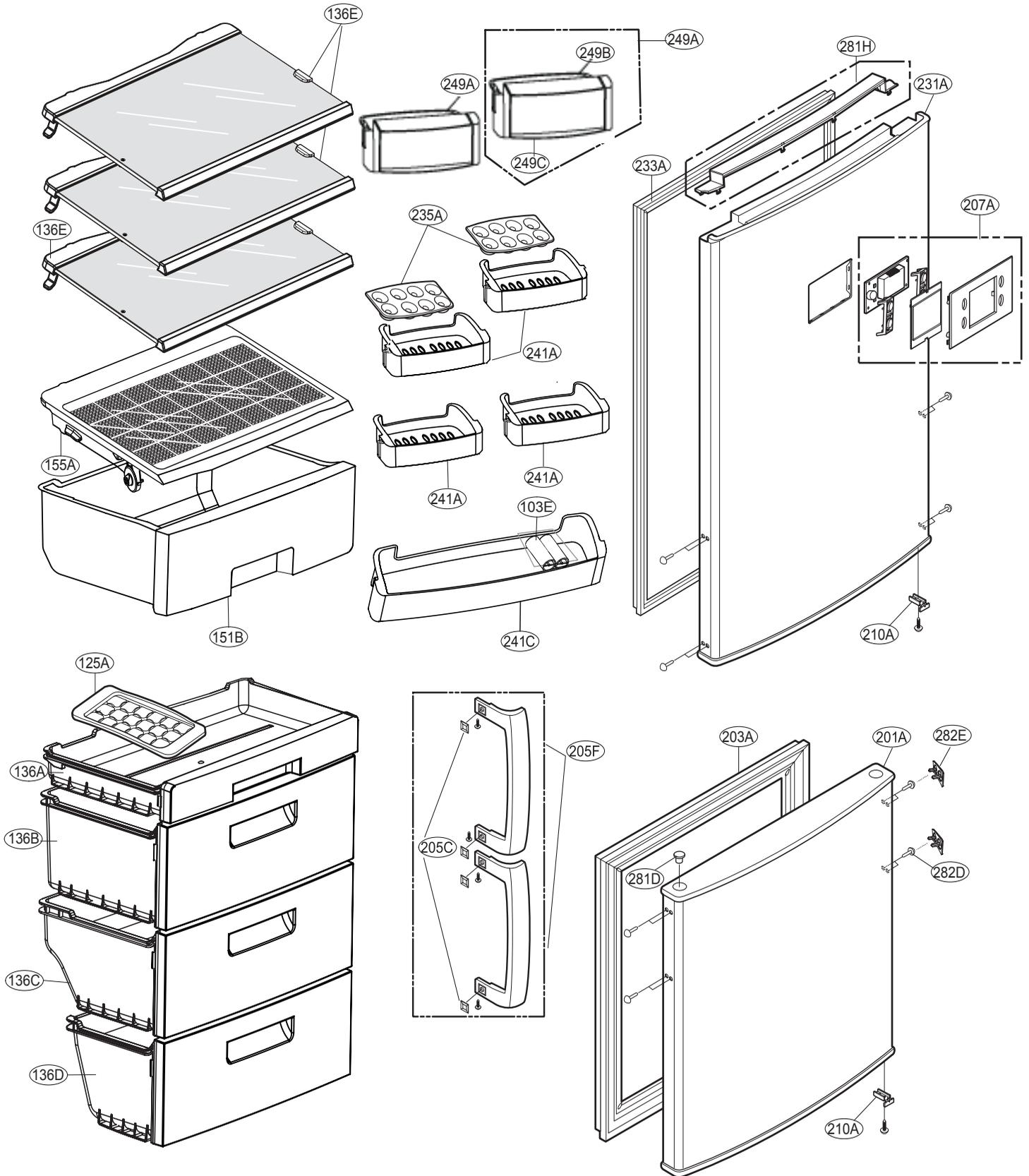
EXPLODED VIEW & REPLACEMENT PARTS LIST

Ref. No : GA-B409U*QA/B379U*QA

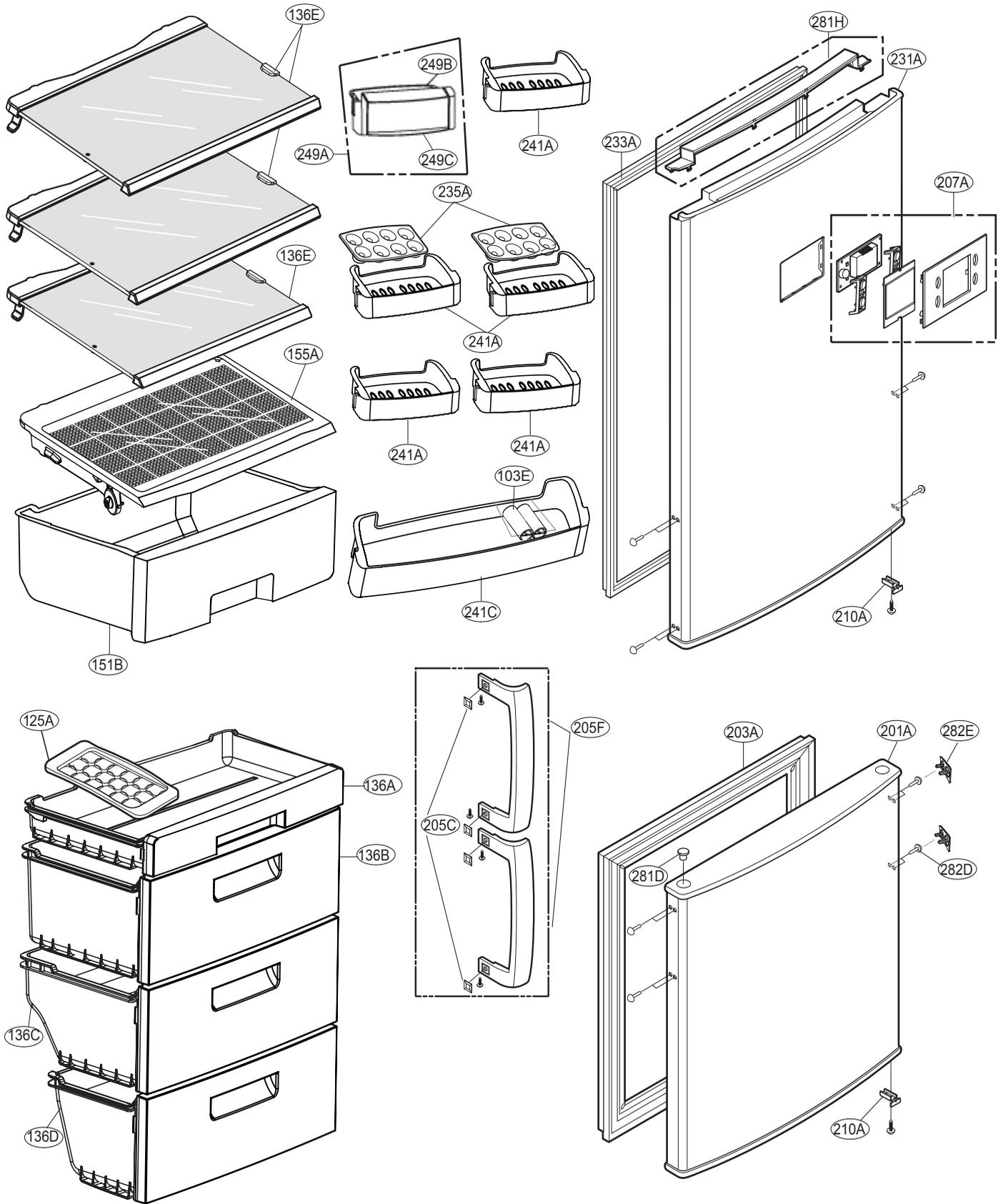
▼ The parts of refrigerator and the shape of each part are subject to change in different localities.



Ref. No : GA-B409U*QA



Ref. No : GA-B379U*QA





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