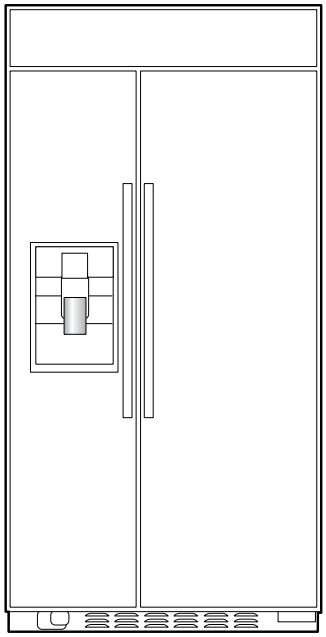
REFRIGERATOR
SERVICE MANUAL



LSSB2691ST

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Chapter 1 Safety Warning and Cautions

▶ Observing cautions for safety can prevent accidents and dangers.

▶ Cautions are classified into **Warning** and **Caution** and the meanings are as follows

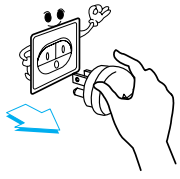
⚠ Warning WARNING indicates the possibility of serious injury or death if the instructions are not followed.

⚠ Caution Caution indicates a hazardous situation with the possibility of product damage or personal injury if the instructions are not followed.

⚠ Warning

Be cautious of electric shock.

Control board (PWB Main and Sub) uses power supply of about 120 VAC.



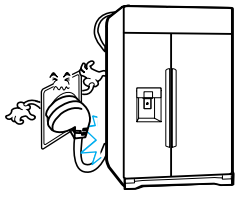
Do not allow consumers to directly repair, disassemble, or modify the refrigerator.

Harm, electric shock, or fire could occur.



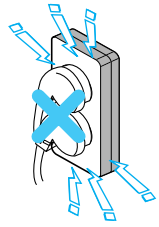
Be sure the plug and cord are not pressed by the rear side of the refrigerator.

Damage to power plugs could result in fire or electric shock.



Plug the refrigerator into a dedicated circuit.

Plugging in too many appliances can result in fire or problems with the operation of your refrigerator.



Safety warnings and cautions

⚠ Warning

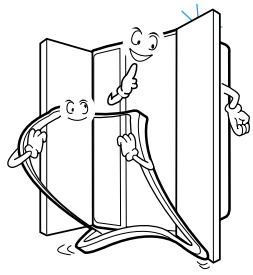
Do not store poisonous, flammable, or explosive chemicals in the refrigerator.

There is danger of explosion and fire.



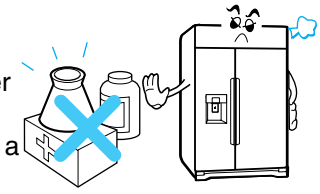
If storing or disposing of the refrigerator, remove the doors to eliminate the possibility of children playing in it.

Children may become entrapped in the refrigerator.



Do not store medications or biohazardous products requiring precise temperature control. Do not use the refrigerator to store papers, electronic storage media, or similar items.

The refrigerator is for storing food. This is a consumer household appliance and not a precision device.



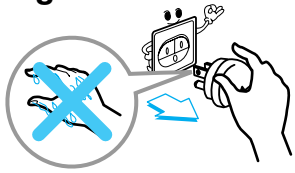
Be sure the plug and socket are clean and the connection is tight.

Dust or incomplete connection may result in fire.



Unplug the refrigerator for cleaning or repair. Be sure your hands are dry when handling the power cord or plug.

Electric shock or harm may occur.

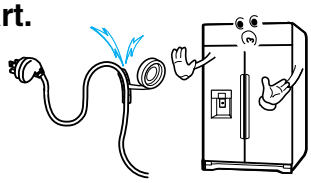


Safety warnings and cautions

⚠ Warning

Do not alter the power cord. Replace it only with an exact factory replacement part.

Electric shock or fire may occur due to electrical damage of power cables.



Do not place heavy objects on the refrigerator.

Falling objects when opening or closing doors may cause injury.



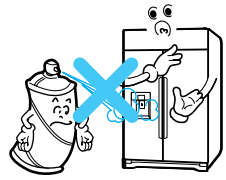
Do not hang or swing from the refrigerator doors.

Do not allow children to play with the refrigerator. The refrigerator may turn over. Hands and fingers may be pinched.



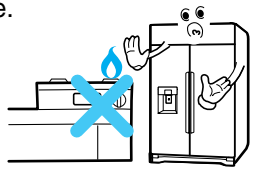
Do not use flammables near a refrigerator.

There is danger of fire.



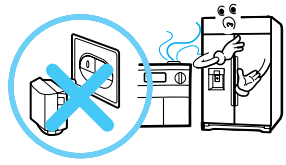
Do not install the refrigerator next to a stove or other sources of heat.

There is danger of fire.



When a gas leak occurs, do not unplug the refrigerator. Open the doors for ventilation.

There is danger of burning due to explosion and sparking.



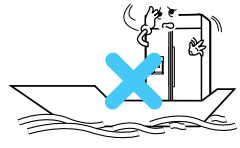
Do not clean the refrigerator by spraying water inside or outside.

It may result in product damage, fire, or electric shock.



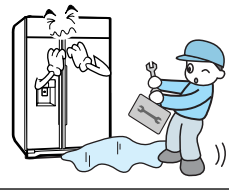
This refrigerator is designed for use as a consumer home appliance only.

It is not a precision device for storing medication or valuables. Do not install the refrigerator in a vehicle, aircraft, maritime vessel, or other than in a home environment.



If the refrigerator is submerged or otherwise inundated with water, have it checked by an authorized servicer.

Electric shock or fire may occur.



Safety warnings and cautions

⚠ Caution

Do not put glass bottles or other sealed containers in the freezer.

They may burst, leaving glass fragments in the food and possibly causing injury.

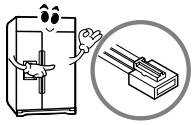


Be sure to use rated parts for replacement of electric parts.

Use factory replacement parts.

Secure the cord behind the refrigerator.

Do not allow the cord to hang where it can be pinched, damaged, or rolled over by the refrigerator.



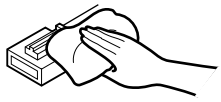
Pull the plug out by the plug body; do not pull the wire to disconnect the cord.

Damage to power cords may cause fire or electric shock.



Keep electrical parts and connections free from dust and contamination.

There is danger of fire from shorting or arcing.



Be sure replacement parts are an exact fit.

Replacement parts should look and fit exactly like the original parts and have the same electric rating.

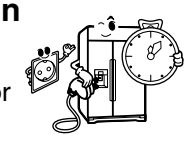


Do not let moisture drop onto electrical parts.

If there is a problem in this area, replace the parts or tape the wires to prevent contamination and degradation.

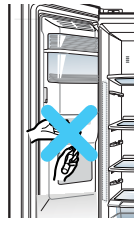
If you unplug the refrigerator or turn off the power, wait 5 minutes before plugging it back in or turning the power on.

Rapid cycling of the compressor could cause failure.



Do not put your hands, fingers, tools, or other objects into the icemaker, crusher, or discharge outlet. Do not check the operation of the ice dispenser or crusher in this manner.

You may damage your product, fingers, or tools.

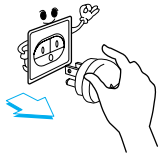


Safety warnings and cautions

⚠ Caution

Unplug the refrigerator if it is going to be unused for an extended period.

Remove all food items, wipe down the inside of the refrigerator, dry it thoroughly, and prop the doors open to allow air circulation.



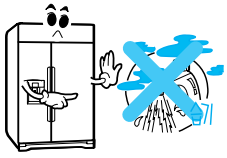
Be sure the floor will support the weight of the refrigerator.

If the refrigerator is not installed at a firm, level location, the doors and icemaker may not operate properly.

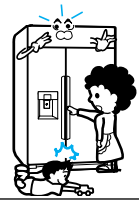


Do not install the refrigerator in a place where it is subject to splashing and excess moisture.

Deterioration of insulation may cause electrical leakage.



Be careful to avoid pinching hands or feet when opening the doors.

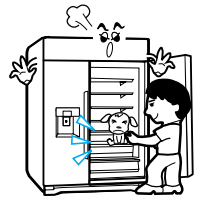


Do not touch foods, containers, or the inside of the freezer compartment with wet hands.

Your hands may stick to the cold items. It could cause frost bite.

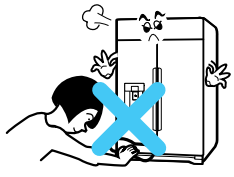


Do not put live animals in the refrigerator.



Do not stick your hands or fingers under the bottom of the refrigerator.

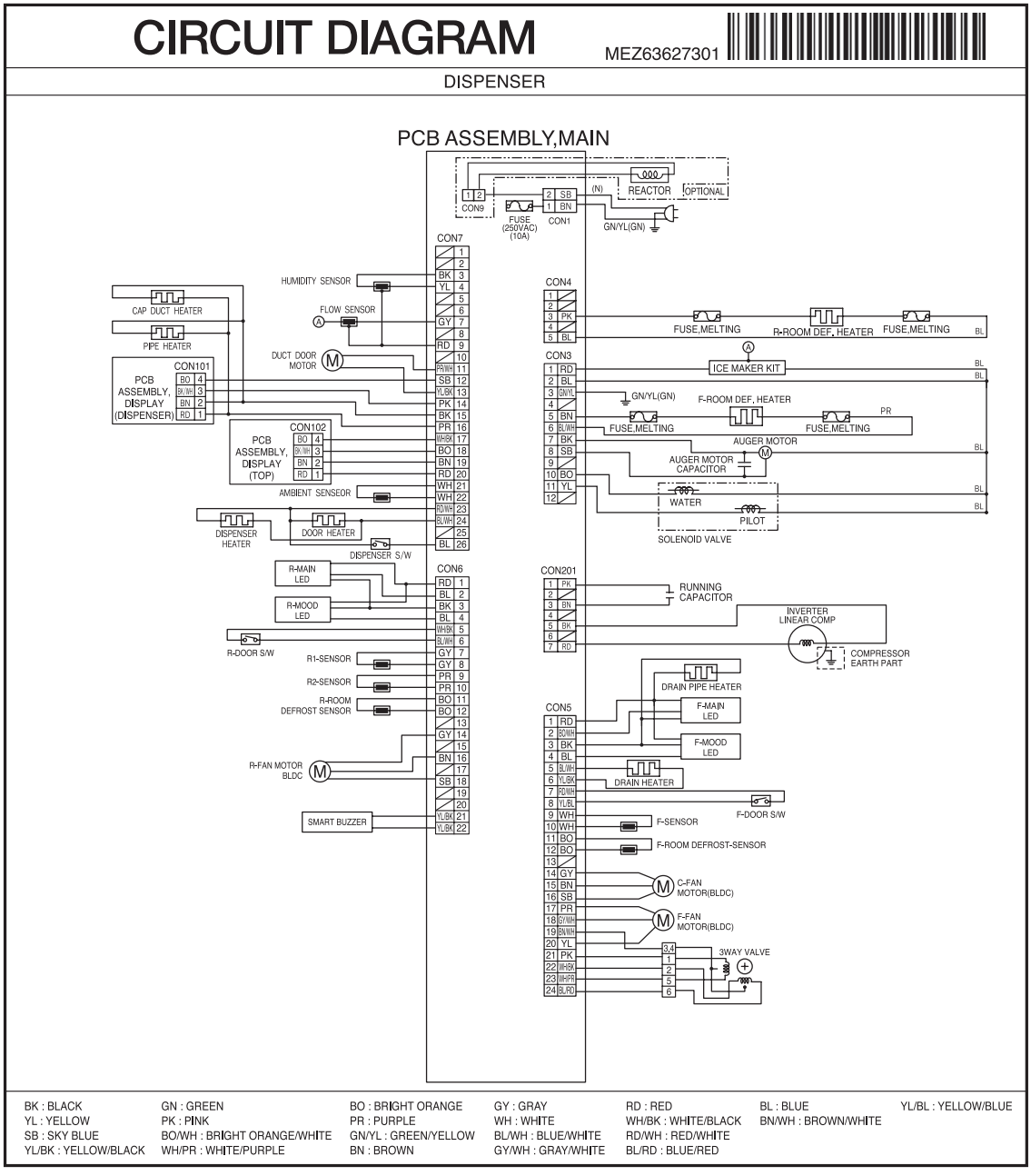
Watch out for sharp edges.



Chapter 2 Product Standards

Divison \ Model Name			LSSB2691ST
Effective inner capacity	Total inner capacity(L)		726.4L (25.6cuft.)
	F-Room		264.8L (9.35cuft.)
	R-Room		461.6L (16.25cuft.)
Outer dimension (W x D x H)			1067 X 645 X 2114 (42in X 25.4in X 83.2in)
Rated voltage and frequency			115V / 60Hz
Product weight (kg)			255 (538lb)
Rated consumption power of motor			90 ± 15% [W]
Heater	Freezer		200 ± 15% [W]
Rated consumption power	Refrigerator		160 ± 15% [W]
Cooling method			Indirect cooling (Freezer/Refrigerator Control)
Temperature control	Freezer		Micom (Outside)
	Refrigerator		Micom (Outside)
Defrost	Method		Forced method
	Start		Auto
	End		Auto
	Insulation		Forced method
	Type of heat shield		Cyclo-Pentane
Freezer	Shelf		4
	Door Basket		2ea
	In-door icemaker		1
	drawer		3
Refrigerator	Shelf		4
	Door Basket		5 (Easy moving 3ea)
	Magic room		-
	Drawer		3
Freezing cycle	Compressor driving method		IPM operation
	Evaporator		Fin tube type
	Condenser		Forced convection method
	Compressor Oil		FREOL-α10G (180cc)
	Type of refrigerant		HFC-134a (170g)
	Capillary tube	Freezer	0.75
		Refrigerator	0.9
	Dryer (Capillary Tube)		MOLECULAR SIEVE XH-9
Electrical parts standard	Product -related parts	Initial defrost	4~5 hours (vary depending on condition)
		Defrost cycle	9~11 hours (vary depending on condition)
		Rest time	Freezer 5 Minutes / Refrigerator 7 minutes
		Defrost sensor	Freeze -41°F, Refrigerator - Returns to normal operation when it reaches 50°F
		Temp. fuse (rated/ operation temperature)	115 / 162°F
		Heater sheath	120 VAC (Freezer 200 W, Refrigerator 150 W)
	Parts consens ation with dewing prevention	Dispenser duct door heater	-
		Dispenser heater	DC 3 W
		Refrigerator home bar heater	-
		Freezer home bar heater	-
	For preventing ice making	Water supply heater	DC 0.8 W
	For controlling the temperature in Magic Room	Drain Heater	DC 12 / 2.6 W
		Drain Pipe Heater	DC 12 V / 1 W
	Overload protective device		-
	Cold/freezing fan motor		13 VDC
	Fan motor for cooling condenser		14 VDC
	Inside lamp at Freezer		12 VDC / 8.7 W
	Inside lamp at Refrigerator		12 VDC / 8.7 W
	Freezer-Lower lamp switch		-
	Door switch (Freezer and Refrigerator Compartments)		-
	Home bar door switch		-
	Freezer-Lower lamp		-
	Main Fuse		120 VAC / 9 A
	Power cord		120 VAC / 10 A
Ice and water dispenser	Icemaker unit		DC 12VDC
	Ice feeding and crushing motor (Motor, geared)		120 VAC / 60 Hz / 16.5 RPM
	Solenoid cube		120 VAC / 60 Hz
	Duct door motor		DC 12VDC
	Water valve		120 VAC / 60 Hz
	Pump (option)		-

Chapter 3 Circuit Diagram



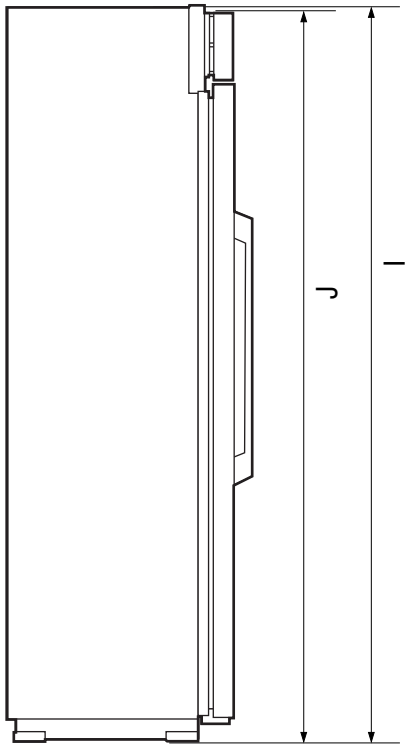
BK : BLACK	GN : GREEN	BO : BRIGHT ORANGE	GY : GRAY	RD : RED	BL : BLUE	YL/BL : YELLOW/BLUE
YL : YELLOW	PK : PINK	PR : PURPLE	WH : WHITE	WH/BK : WHITE/BLACK	BN/WH : BROWN/WHITE	
SB : SKY BLUE	BO/WH : BRIGHT ORANGE/WHITE	GN/YL : GREEN/YELLOW	BL/WH : BLUE/WHITE	RD/WH : RED/WHITE		
YL/BK : YELLOW/BLACK	WH/PR : WHITE/PURPLE	BN : BROWN	GY/WH : GRAY/WHITE	BL/RD : BLUE/RED		

Chapter 4 Specifications

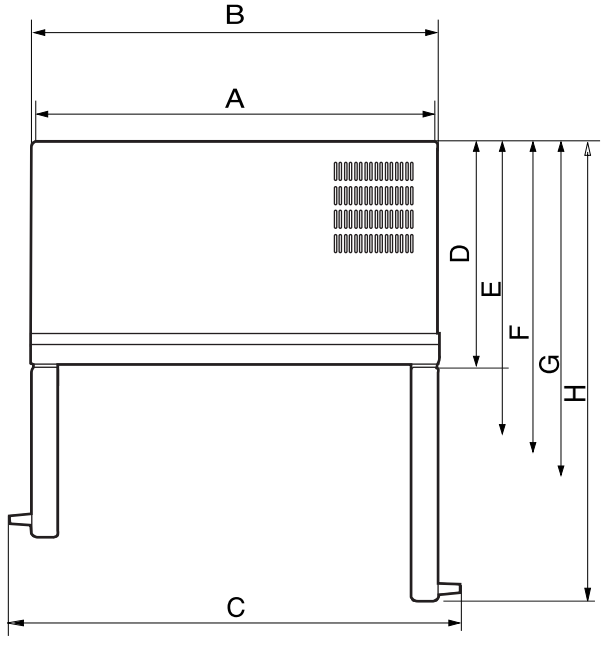
1. Specifications

Unit : inch (mm)

Width	Width (A)	41 (1041)
	Frame to frame(B)	42 (1067)
	When opening door by 90° (including handle) (C)	45 (1143)
Depth	Case (including back handle) (D)	22 1/2 (572)
	After disassembling door (including hinge,L) (E)	25 1/2 (649)
	Including door (not including handle) (F)	25 3/8 (645)
	Including handle (G)	27 1/2 (698.5)
	When opening door by 90° (H)	48 1/3 (1228)
Height	At rear (I)	83 1/4 (2114)
	From Floor to Front,Pannel (J)	82 1/2 (2098)
Minimum air circulation space	Top part	1/4 (6)
	Side	1/4 (6)
	Rear part	1/6 (4)



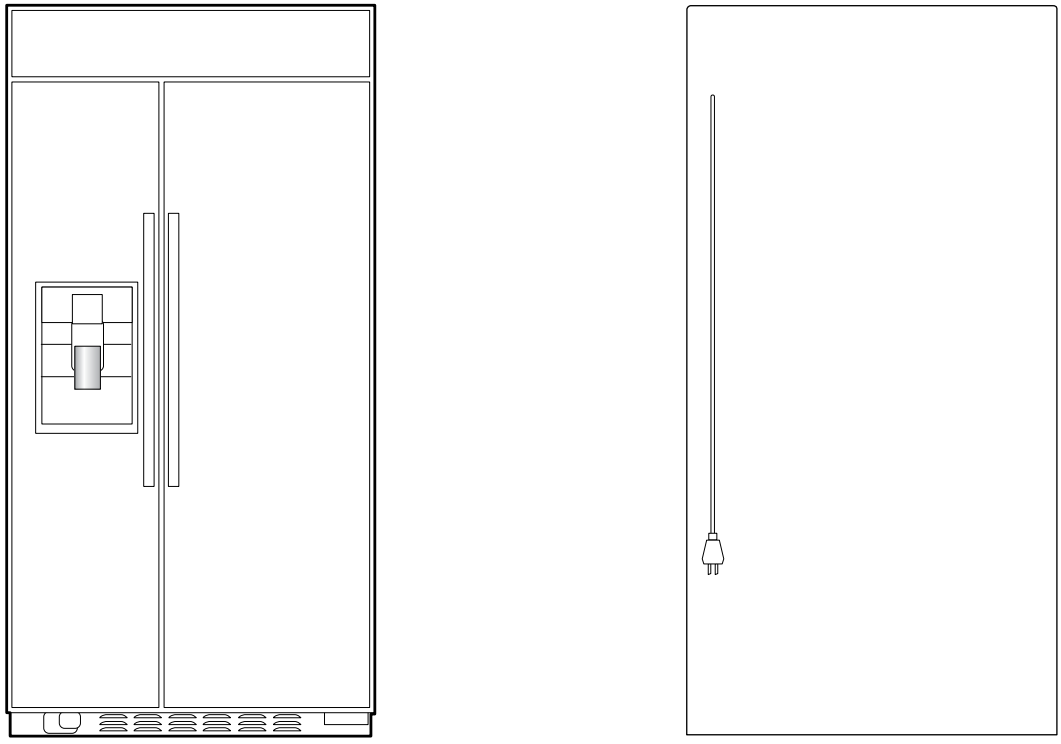
Front View

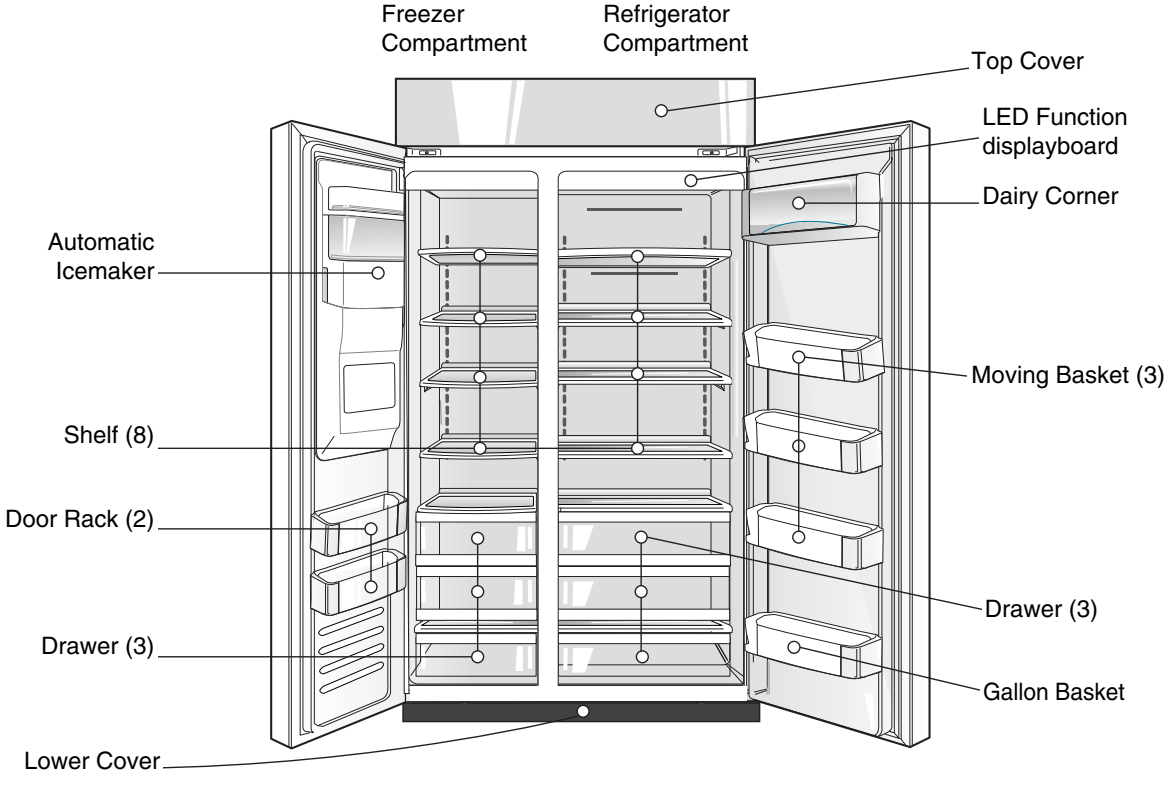


Top View

Specifications

2. Parts

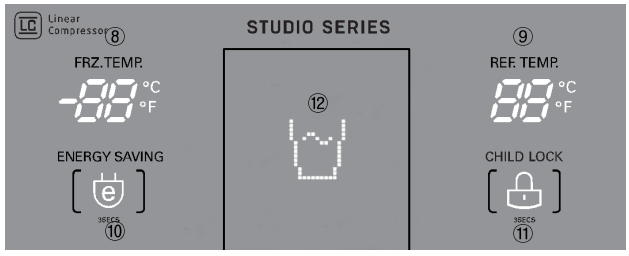




Chapter 5 Micom Function

1. Control Panel





① Power off : Unit Power on/off of refrigerater.
② Quick freezing : When the Quick freezing button is pressed, the display will indicate the selected function has been activated.
③ FRZ TEMP : Indicates the set temperature of the freezer compartment in Celsius or Fahrenheit.
④ REF TEMP : Indicates the set temperature of the refrigerator compartment in Celsius or Fahrenheit.
⑤ ALARM : This indicator shows that the door-open warning alarm is activated.
⑥ Filter reset : This indicator shows the current status for the water filter. See Restting the Filter Indicator
⑦ SVC Call : Call SVC center, when SVC call Icon is turned on.
⑧ Display of setted temperature of F - room
⑨ Display of setted temperature of R - room
⑩ Activating Energy saving : Press the ENERGY SAVING button for at least 3 seconds to activate or deactivate the function. This function is recommended for added energy savings. (Some heaters to reduceexess moisture on the Refrigerator may be turned off) The Energy saving function is also recommended during long periods of time spent away from home-like vacation.
⑪ Lock State : Indicator shows the current status for the control panel functions is set to LOCK.
⑫ Dispenser selection indicator : Shows water, cubed ice or crushed Ice selection that will be dispensed when the push switch is pressed.

1-2. Display Second Function

1. Alarm mute Mode

When the power of the refrigerator is turned on for the first time, the buzzer icon lights up and when the door is opened for a long time, the buzzer goes off.
Press the Alarm/Lock key once to activate and again to deactivate the function.

2. Display Power saving Mode

If there is no entry 20~60 seconds after the power of the display is turned on (60 seconds if no button is pressed after the power is turned on and 20 seconds when a button is pressed), it automatically switches to the power saving mode to display only the current selection of dispenser and lock status. All icons on the display will be turned on when the door is opened or the button is pressed.
When you want to cancel the power saving mode, press and hold the Quick Freezing button and Freezer Button simultaneously for more than 5 seconds, and when the mode is canceled, all segments of the displays shows the current status.
If you want to use the Power Saving Mode again, press the same buttons in the same method as canceling.

Micom Function

2. Function description

2-1. Function of Temperature Selection

Notch	Power Initially On	1st press	2nd press	3rd press	4th press	5th press	6th press	7th press	8th press	9th press
Change of Indication lamp	0°F	-1°F	-2°F	-3°F	-4°F	-6°F	8°F	6°F	5°F	4°F
Room Temp.	0.4°F	-1.3°F	-2.2°F	-3.1°F	-4.0°F	-5.8°F	8.6°F	6.8°F	5.0°F	4.1°F
Freezer Control (88 LED)	0.5°F	-0.4°F	-1.3°F	-2.2°F	-3.1°F	-4.9°F	10.4°F	7.7°F	5.9°F	5.0°F

10th press	11th press	12th press	13th press
3°F	2°F	1°F	0°F
3.2°F	2.3°F	1.4°F	-0.4°F
4.1°F	3.2°F	1.4°F	-0.4°F

Notch	Power Initially On	1st press	2nd press	3rd press	4th press	5th press	6th press	7th press	8th press	9th press
Change of Indication lamp	37°F	36°F	35°F	34°F	33°F	46°F	45°F	44°F	43°F	42°F
Room Temp.	37.4°F	36.5°F	35.6°F	33.8°F	32°F	46.4°F	45.5°F	44.6°F	43.7°F	42.8°F
Freezer Control (88 LED)	39.2°F	38.3°F	37.4°F	36.5°F	35.6°F	50.9°F	49.1°F	48.2°F	46.4°F	45.5°F

10th press	11th press	12th press	13th press	14th press
41°F	40°F	39°F	38°F	37°F
41.9°F	41°F	40.1°F	39.2°F	37.4°F
43.7°F	42.8°F	41.9°F	41°F	39.5°F

1. The actual inner temperature varies depending on the food status, as the indicated setting temperature is a target temperature, not actual temperature within refrigerator.
2. Allow the refrigerator at least 24 hours to maintain a stable temperature before loading food into it. It may take additional time to cool everything to an optimum temperature.

- To change temperature display from Fahrenheit to Celsius, press and hold FREEZER and REFRIGERATOR buttons simultaneously for more than 5 seconds.
  Do the same to convert back to Celsius.

Micom Function

2-2. Automatic ice maker

- The automatic icemaker can automatically make 6 cubes at a time, 70~120 pieces per day. This may vary according to various conditions including how many times the refrigerator door opens and closes.
- Icemaking stops when the ice storage bin is full.
- If you don't want to use automatic icemaker, change the ice-maker switch to OFF.
  If you want to use automatic icemaker again, change the switch to ON.

NOTE : It is normal that a noise is produced when ice drops into the ice storage bin.

2-3. When icemaker does not operate smoothly

Ice is lumped together

- When ice is lumped together, take the ice lumps out of the ice storage bin, separate them, and then place them into the ice storage bin again.
- When the icemaker produces too small or lumped ice, the amount of water supplied to the icemaker needs to be adjusted. Contact the service center.

※ If ice is not used frequently, it may lump together.

Power failure

- Ice may drop into the freezer compartment. Take the ice storage bin out and discard all the ice. Then dry it and replace it. After the machine is powered again, crushed ice will be automatically selected.

The unit is newly installed

- It takes about 12 hours for a newly installed refrigerator to make ice.

Micom Function

2-5. Control of variable type of freezer fan

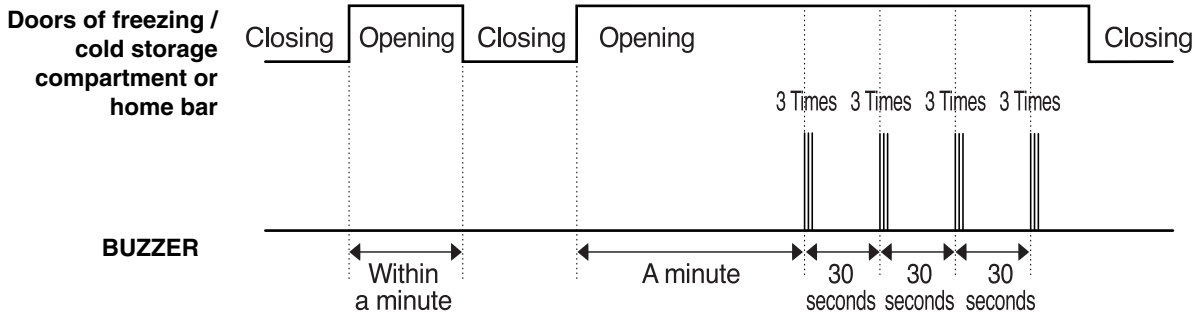
1. To increase cooling speed and load response speed, MICOM variably controls freezing room fan motor at the high speed and standard speed.
2. MICOM only operates in the high speed of RPM during initial power input, special freezing operation, and load response operation MICOM operates in the standard RPM for other general operations.
3. If opening doors of freezing / cold storage room or home bar while fan motor in the freezing room operates, the freezing room will run at normal speed.(If running at high speed, it will revert to the standard speed.) However, if the freezer door or home bar door is open, the freezer fan motor will stop.
4. As for monitoring of BLDC fan motor error in the freezing room, MICOM immediately stops the fan motor by determining that the BLDC fan motor is locked or poor if there is a position signal for more than 65 seconds at the BLDC motor. Then it displays a failure code. (refer to failure diagnosis function table) at the display part of refrigerator, performs re-operation in the cycle of 30 minutes. If operation is normal, failure status halts and the refrigerator returns to the initial status (reset).

2-6. Control of Mechanical Compartment Fan Motor

1. The Mechanical Compartment fan motor performs ON/OFF control by connecting to the compressor.
2. It controls at the single RPM without varying RPM.
3. It has the same failure sensing method of the fan motor in the Freezing fan motor. (refer to failure diagnosis function table for failure display.)

2-7. Door opening alarm

1. The Buzzer generates alarm sound if doors are not closed even when more than a minute has passed with doors of freezing / cold storage compartment or home bar opened.
2. The Buzzer rings three times in the interval of 0.5 second after the first one-minute has passed after doors are opened and then repeats three times of On/Off alarm in the cycle of every 30 seconds.
3. If all the doors of freezing / cold storage compartment or home bar are closed during a door open alarm, the alarm is immediately released.



2-8 Ringing of button selection buzzer

1. If pressing the front display button, a ‘Ding’ sound rings.

2-9. Ringing of compulsory operation, compulsory frost removal buzzer

1. If pressing the test button in the main PCB, a beep sound rings.
2. In selecting forced operation, alarm sound is repeated and completed in the cycle of On for 0.2 second and Off for 1.8 second three times.
3. In selecting forced frost removal, alarm sound is repeated and completed in the cycle of On for 0.2 second , Off for 0.2 second, On for 0.2 second and Off for 1.4 second three times.

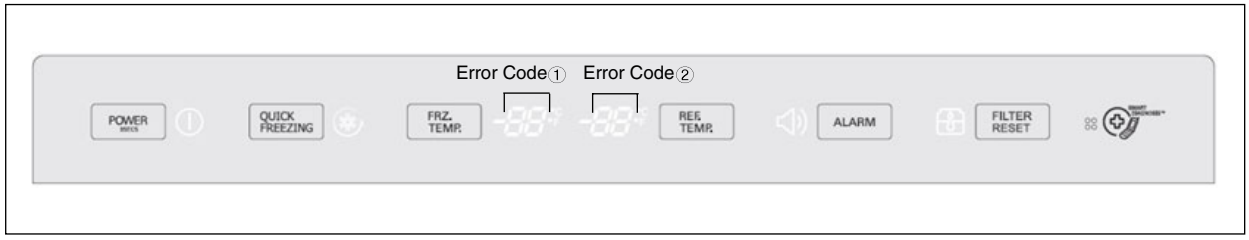
Micom Function

2-10. Function of Trouble Diagnosis (88-LED)

1. Failure diagnosis function is function to facilitate service when nonconforming matters affecting performance of product during use of product.
2. In occurrence of failure, pressing the function adjustment button does not perform function and only alarm sound (Ding) rings.
3. If nonconforming matters occurred are released during display of failure code, MICOM returns to the original state (Reset).
4. Failure code is displayed on the display part of setting temperature for the freezing room and the display part of setting temperature for the cold storage room of LED, which are placed at the display part of a refrigerator. All the LED graphics other than a failure code are turned off.

MICOM FAILURE DIAGNOSIS TABLE

CAUTION 1) DEFECT FAILURE CODE IS INDICATED ON THE DISPLAY PART OF SETUP TEMPERATURE FOR THE COLD STORAGE ROOM AND OF SETUP TEMPERATURE FOR THE FREEZING ROOM, AND THE OTHER DISPLAY PART IS TURNED OFF.
2) MAKE A PROPER OPERATION THROUGH REAPPLICATION AFTER ALWAYS TURNING OFF POWER WHEN DIAGNOSING FAILURE AND FINISHING TEST MODE.



(1) FAILURE DIAGNOSIS FUNCTION

○ : PROPER OPERATION

NO	ITEM	FAILURE CODE INDICATION PART		CONTENTS OF FAILURE	PRODUCT OPERATION STAUS IN FAILURE					
		FREEZER ROOM NOTCH TEMPERATURE DISPLAY	REFRIGERATOR ROOM NOTCH TEMPERATURE DISPLAY		COMPRESSOR	FREEZER FAN MOTOR	REFRIGERATOR FAN MOTOR	CONDENSER FAN MOTOR	FREEZER DEFROST HEATER	REFRIGERAT-OR DEFROST HEATER
1	ABNORMAL FREEZER SENSOR	Er	FS	FREEZER SENSOR SHORT&OPEN CIRCUIT	ON FOR 30 MINUTES/ OFF FOR 10 MINUTES	○	○	○	○	○
2	ABNORMAL REFRIGERATOR SENSOR1(R1) (UPPER PART IN THE REFRIGERATOR COMPARTMENT)	Er	rS	REFRIGERATOR SENSOR(R1) SHORT&OPEN CIRCUIT	○	○	○	○	○	○
3	ABNORMAL REFRIGERATOR SENSOR2(R2) (UPPER PART IN THE REFRIGERATOR COMPARTMENT)	Er	r2	REFRIGERATOR SENSOR(R2) SHORT&OPEN CIRCUIT	○	○	○	○	○	○
4	ABNORMAL FREEZER DEFROST SENSOR	F	dS	FREEZER DEFROST SENSOR SHORT&OPEN CIRCUIT	○	○	○	○	○	○
5	ABNORMAL REFRIGERATOR DEFROST SENSOR	r	dS	REFRIGERATOR DEFROST SENSOR SHORT&OPEN CIRCUIT	○	○	○	○	NO DETROST	○
6	FAILED FREEZER DEFROSTING	F	dH	DEFROST HEATER, TEMPERATURE FUSE SHORT CIRCUIT, UNPLUGGED CONNECTOR (INDICATED 4 HOUR LATER AFTER TROUBLE)	○	○	○	○	○	NO DETROST
7	FAILED REFRIGERATOR DEFROSTING	r	dH							
8	ABNORMAL FREEZER FAN MOTOR	Er	FF	MORTOR DEFECT, HOKED OF LEAD WIRE TO FAN CONTACT OF STRUCTURE WITH FAN, SHORT OR OPEN OF LEAD WIRE(THERE NO SIGNAL OF BLDC FAN MOTOR MORE THAN 65 SECONDS IN OPERATION OF FAN MOTOR	○	OFF (RE-INSPECTS AFTER 30M INUTES)	○	○	○	○
9	ABNORMAL REFRIGERATOR FAN MOTOR	Er	rF		○	○	OFF (RE-INSPECTS AFTER 30M INUTES)	○	○	○
10	ABNORMAL CONDENSOR FAN MOTOR	Er	CF		○	○	○	OFF (RE-INSPECTS AFTER 30M INUTES)	○	○
11	ABNORMAL COMMUNICATION	Er	CO	SHORT OR OPEN OF LEAD WIRE CONNECTING BETWEEN MAIN PCB AND DISPLAY PCB, TRANSMISSION TR AND RECEIVING PART.	○	○	○	○	○	○
12	ABNORMAL AMBIENT SENSOR	Er	rt	AMBIENT SENSOR SHORT&OPEN CIRCUIT	○	○	○	○	○	○
13	ABNORMAL WATER TANK SENSOR	Er	SS	WATER TANK SENSOR SHORT&OPEN CIRCUIT	○	○	○	○	○	○

NOTE1) “Er rt”, “Er SS”, “Er r2”, Appears on the display when Ice Plus key and Freezer Temp. Key pressed at the same time for 1 sec.
NOTE2) Except 3 Errors displayed above, all the errors are displayed on the panel after 3 hours from the initial error.
NOTE3) All the errors can be displayed within the 3-hour period upon pressing the Ice Plus. key and the Freezer Temp. key at the same time for 1 second or longer.

Micom Function

2-11. Test Function

TEST KEY EXISTS ON PWB ASSY. MAIN BOARD.

MODE	OPERATION	CONTENTS	REMARKS
TEST1	PRESS TEST BUTTON ONCE <Strong Cold mode>	1. CONTINUOUS OPERATION OF COMPRESSOR AND CONDENSER FAN MOTOR. 2. ALL DEFROST HEATERS TURNS OFF 3. 10 MINUTES IN EARLY STAGE REFRIGERATOR FAN MOTOR ON 4. AFTER 10 MINUTES ALL FAN MOTORS ON WHEN THE FREEZER SENSOR IS ABOVE 41°F AND REFRIGERATOR SENSOR IS ABOVE 59°F 5. JUST REFRIGERATOR FAN MOTOR ON WHEN THE FREEZER SENSOR IS BELOW 10°F AND REFRIGERATOR SENSOR IS ABOVE 35°F 6. REMAINING CONDITION FREEZER FAN MOTOR ON	FREEZER FAN MOTOR TURNS OFF IN FREEZER ROOM DOOR OPENING. REFRIGERATOR FAN MOTOR TURNS OFF IN REFRIGERATOR ROOM DOOR OPENING.
TEST2	PRESS TEST BUTTON ONCE AT THE TEST MODE 1 STATUS <Forced Defrost mode>	1. COMPRESSOR OFF 2. ALL FAN MOTORS OFF 3. ALL DEFROST HEATERS ON 4. ALL DISPLAY GRAPHICS TURNS OFF (ONLY FAILURE CODE INDICATION PART TURNS ON “22 22” STATUS)	RETURNS TO THE NORMAL MODE WHEN THE FREEZER DEFROST SENSOR IS ABOVE 41°F AND REFRIGERATOR DEFROST SENSOR IS ABOVE 64°F
NORMAL STATUS	PRESS TEST BUTTON ONCE AT THE TEST MODE 2 STATUS	RETURNING TO INITIAL STATUS	COMPERSSOR WILL OPERATE AFTER DELAY FOR 3 MINUTES

Micom Function

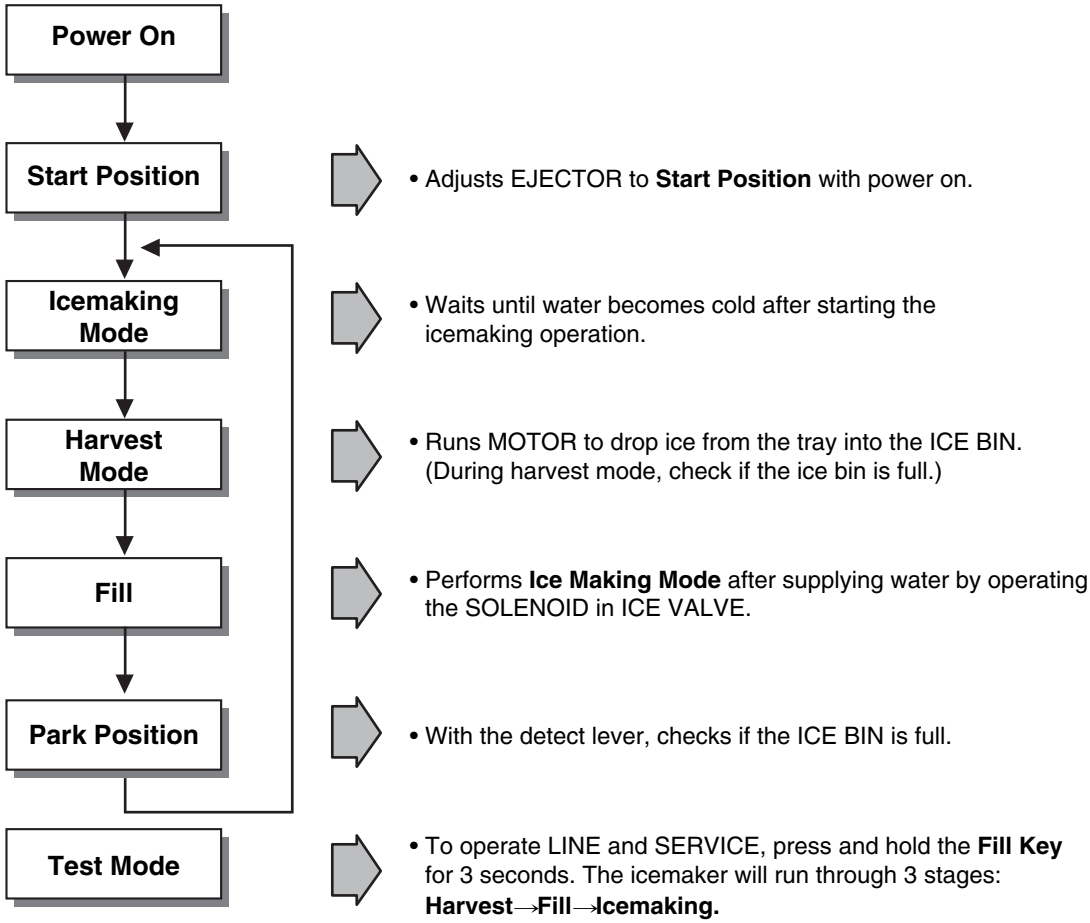
2-12. Functions performed when Ice Dispenser and Water Dispenser are mounted

1. This is function to dispense ice and water outside without opening doors.
2. If pressing the Dispenser Switch (rubber button) after selecting ice (cube ice, crushed ice) or water, relevant ice and water come out. However, when selecting ice, the duct door is opened by DC motor (duct door motor) if pressing the Dispenser Switch. The duct door is closed after it remains for 5 seconds in open status if pressing and then releasing the Dispenser Switch.
3. The dispenser will not work when the freezer door is open.
4. If there is no OFF signal for 3 minutes after pressing the Dispenser Switch after selecting ice (cube ice, crushed ice) or water, the refrigerator automatically turns off both gear motor and solenoid (cube, water).
   However, DC motor (duct door) stops when 5 seconds pass after turning off.
   (This is for preventing coil-short due to heating of solenoid.)
5. Dispenser lamp On/Off function.
   If pressing the Dispenser Switch after selecting ice (cube ice, crushed ice) or water, the lamp on the dispenser part turns on and if releasing it, turns off.
6. Water/Crushed Ice/Cube Select Function
   1) This is function to operate the refrigerator as Water/Crushed Ice/Cube function on the function control part depending on user s selection. If pressing the Select Dispenser button, display and selection are done.
   2) For the initial Power On, cube ice is automatically selected.
   3) If pressing the Switch when cubes are available in the ice bin for selecting Crushed Ice, the refrigerator operates the gear motor so that crushed ice is supplied outside.
   4) If pressing the Switch when cubes are available in the ice bin for selecting Cube Ice, the refrigerator operates the gear motor so that crushed ice is supplied outside.

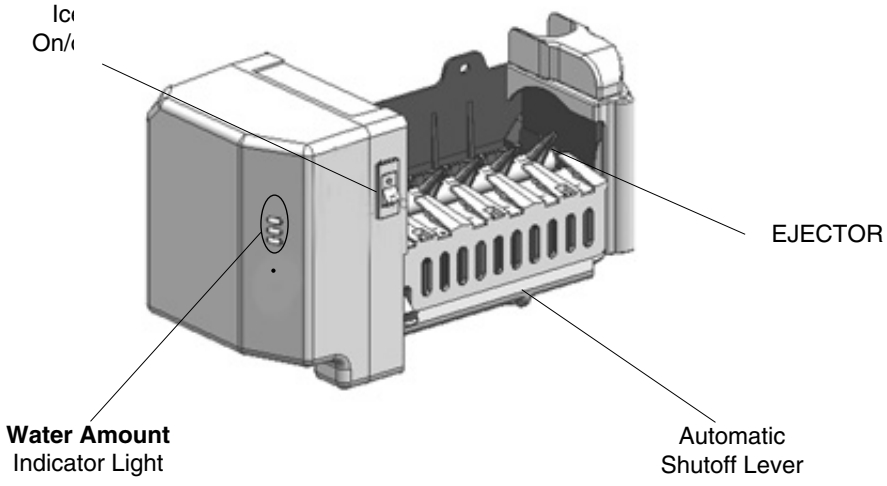
ICEMAKER AND DISPENSER WORKING OPERATION AND REPAIR

1. OPERATION PRINCIPLE

1-1. Operation Principle of Icemaker



1. Turning the icemaker stop switch off (O) stops the ice making function.
2. Setting the icemaker switch to OFF and then turning it back on will reset the icemaker control.



2. ICEMAKER FUNCTIONS

2-1. Start Position

1. After power off or power outage, check the ejector's position with MICOM initialization to restart.
2. How to check if it is in place:
   - Check **HIGH/LOW** signals from the hall sensor in MICOM pin.
3. Control Method to check if it is in place:
   (1) The ejector is in place,
      - It is an initialized control, so the mode can be changed to icemaking mode.
   (2) The ejector isn't in place,
      A. If the ejector is back in place within 2 minutes with the motor on, it is being initialized. If not, go to Step B.
      B. Control the heater using the temperature sensor until the ejector reaches the correct location.

2-2. Icemaking Mode

1. Icemaking refers to the freezing of supplied water in the ice tray. Complete freezing is assured by measuring the temperature of the tray with icemaking sensor.
2. Icemaking starts after completion of the water fill operation.
3. The icemaking function is completed when the sensor reaches 19°F (-7°C), 55 minutes after starting.
4. If the temperature sensor is defective, the icemaking function will be completed in 4 hours.

NOTE : After Icemaker power is on, the icemaker heater will be on for test for 6 sec.

2-3. Buzzer Mode (Harvest Mode)

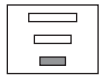
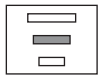
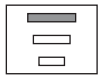
1. Harvest (Ice removing) refers to the operation where the ice cubes drop from the tray to the ice bin when icemaking has completed.
2. Buzzer Mode (Harvest Mode)
   (1) The Heater is ON for 30 seconds, then the motor starts.
   (2) The feeler arm senses the quantity of ice in the ice storage bin while rotating with the ejector.
      A. If the ice bin is full, the ejector stops and the heater is turned off.
      B. If the ice bin is empty, the ejector rotates twice to eject the ice.

※ If the ejector does not rotate once within 5 minutes of B mode, separate heater control mode starts operating to prevent the ejector from being constrained. (It is recommended that the user open for ice to return to normal mode.)

2-4. Fill/Park the ejector's Position

1. Once a normal harvest mode has been completed, the water solenoid will be activated.
2. The amount of water is adjusted by pressing the fill key repeatedly. This changes the time allowed for fill as illustrated in the table below.

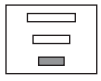
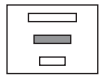
Water supply amount TABLE

STAGE	TIME TO SUPPLY	INDICATIONS	REMARKS
1	5 sec.		The water amount will vary depending on the water control switch setting as well as the water pressure of the connected water line.
2	5.5 sec. (FIRST STAGE)		
3	6 sec.		

2-5. Function Test

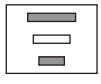
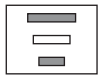
1. This is a forced operation for test, service, cleaning, etc. It is operated by pressing and holding the fill key for 3 seconds.
2. The test works only in the Icemaking Mode. It cannot be entered from the harvest or fill mode. (If there is an error code, it can only be checked in the test mode.)
3. **Caution!** If the test is performed before water in the icemaker is frozen, the ejector will pass through the water. When the fill mode begins (Stage 4), unless the water supply has been shut off, added water will overflow into the ice bin. If the control doesn't operate normally in the test mode, check and repair as needed.
4. After water is supplied, the normal cycle is followed: **Icemaking→Harvest→Fill→Park Position**.
5. Five seconds after Stage 5 is completed, the icemaker returns to MICOM control. The time needed to supply water resets to the pretest setting.

Diagnosis TABLE

STAGE	ITEMS	INDICATOR	REMARKS
1	HEATER		Five seconds after heater starts, a heater will go off if the temperature of sensor is higher than 10°C
2	MOTOR		Five seconds after heater starts, you can confirm that a motor is moving.
3	HALL IC I (detection of position)		After the icemaker detects that ice has been made, the motor and heater are off but on standby until the cycle is cancelled.
4	HALL IC II (detection of position)		You can confirm HALL IC detection of position.
5	VALVE		Two seconds after detection of initial position, you can confirm that valve is on.
6	Reset	Return to Status prior to TEST MODE	Five seconds after fifth stage is completed, The icemaker resets to initial status.

3. DEFECT DIAGNOSIS FUNCTION

3-1. Error codes shown on Icemaker water supply control panel

NO	DIVISION	INDICATOR	CONTENTS	REMARKS
1	Normal	Mark time to supply	None	Display switch operates properly
2	Icemaking Sensor malfunction		Open or short-circuited wire	Make sure that the wire on each sensor is connected.
3	Flow sensor malfunction	 No change for 2 seconds	Open or short-circuited wire Low presure of water	

Error indicators in table can be checked only in TEST mode.

TROUBLE DIAGNOSIS

1. Cooling Cycle Heavy Repair

1-1. The Heavy Repair Standards for Refrigerator with R134a Refrigerant

NO.	Items		Unit	Standards	Purposes	Remarks
1	Pipe and piping system opening time.		Min.	Pipe:within 1 hour. Comp: within 10 minutes. Drier: within 20 minutes.	To protect Moisture Penetration.	The opening time should be reduced to a half of the standards during rain and rainy seasons (the penetration of water into the pipe is dangerous).
2	Welding.		Nitrogen Pressure.	Weld under Nitrogen atmosphere (N_2 pressure: 0.1~0.2 kg/cm^2)	To protect oxide scale formation.	- Refet to repair note in each part. - R134a refrigerant is more susceptible to leaks than R12 and requires more care during welding. - Do not apply force to pipes before and after welding to protect pipe from cracking.
3	N_2 sealed parts.		Confirm N_2 leak.	Confirm air leaking sounds when removing rubber cap. Sound:usable No sound:not usable	To protect moisture penetration.	- In case of evaporator parts, if it doesn't noise when removing rubber cap blow dry air or N_2 gas for more than 1 min use the parts.
4	Refrigeration Cycle.	Evacuation time	Min.	More than 40 minutes.	To remove moisture.	
		Vacuum degree	Torr	Below 0.03 (ref)		Note: Only applicable to the model equipped with reverse flow protect plate.
		Vacuum	EA	High and low Pressure sides are evacuated at the same time for models above 200 ℓ		Vaccum efficiency can be improved by operating compressor during evacuation.
		Vacuum piping	EA	Use R134a exclusive manifold.	To protect mixing of mineral and ester oils.	The bushing pipes for R12 refrigerant will be melted when they are used for R134a refrigerant causes of leak.
		Pipe coupler	EA	Use R134a cxclusive.	To protect R12 Refrigerant mixing.	
		Outlet (Socket)		R134a exclusive.		
		Plug		R134a exclusive.		
5	Refrigerant weighing.		EA	Use R134a exclusively. Weighing allowance: ±5g Note: Winter: -5g Summer: +5g	Do not mix with R12 refrigerant.	- Do not weigh the refrigerant at too hot or too cold an area. (25°C [77°F] is adequate.) - Use copper charging canister Socket:2SV Plug: 2PV R134a Note : Do not burn O-ring (rubber) during welding.
6	Drier replacement.			- Use R134a exclusively for R134a refrigerator - Use R12 exclusively for R12 refrigerator - Replace drier whenever repairing refrigerator cycle piping.	To remove the moisture from pipe.	
7	Leak check.			- Do not use soapy water for check. It may be sucked into the pipe.	Detect refrigerant leak area.	- Check oil leak at refrigerant leak area. Use electronic leak detector if oil leak is not found. - The electronic leak detector is very sensitive to halogen gas in the air. It also can detect R141b in urethane. Please practice, therefore, many times before use.

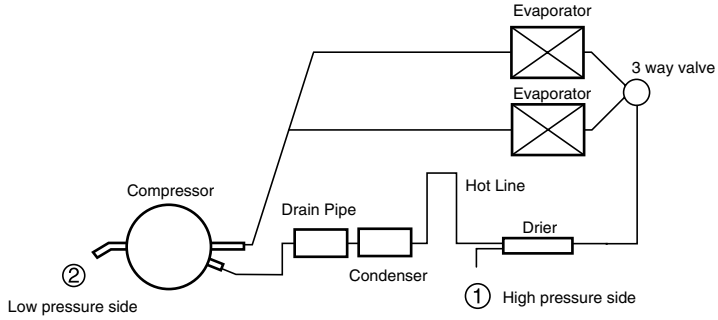
TROUBLE DIAGNOSIS

1-2. Summary Of Heavy Repair

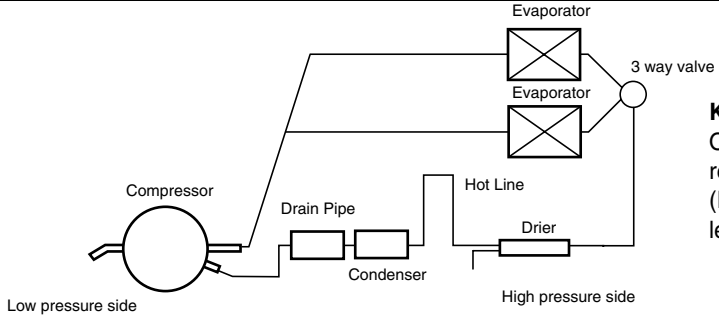
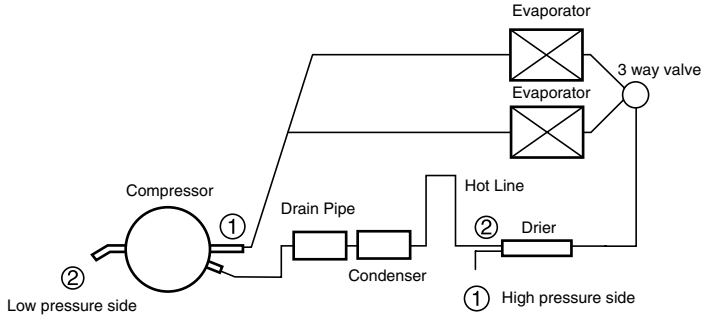
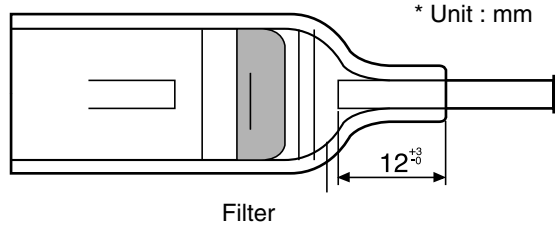
Process	Contents	Tools
Trouble diagnosis		
Remove refrigerant Residuals	- Cut charging pipe ends and discharge refrigerant from drier and compressor.	Filter, side cutters
Parts replacement and welding	- Use R134a oil and refrigerant for compressor and drier - Confirm N2 sealing and packing conditions before use. Use good one for welding and assembly. - Weld under nitrogen gas atmosphere. (N_2 gas pressure: 0.1-0.2kg/cm^2). - Repair in a clean and dry place.	Pipe Cutter, Gas welder, N_2 gas
Vacuum	- Evacuate for more than forty minutes after connecting manifold gauge hose and vacuum pump to high (drier) and low (compressor refrigerant discharging parts) pressure sides. - Evacuation Speed:113 liters/minute.	Vacuum pump R134a exclusively, Manifold gauge.
Refrigerant charging and charging inlet welding	- Weigh and control the allowance of R134a charging canister in a vacuum conditions to be ±5 g with electronic scales and charge through compressor inlet (Charge while compressor operates). - Weld carefully after pinching off the inlet pipe.	R134a exclusive charging canister (mass cylinder), refrigerant R134a manifold gauge, electronic scales, pinch-off plier, gas welding machine
Check refrigerant leak and cooling capacity	- Check leak at weld joints. ┌ Minute leak : Use electronic leak detector └ Big leak : Check visually. Note:Do not use soapy water for check. - Check cooling capacity ① Check radiator manually to see if warm. ② Check hot line pipe manually to see if warm. ③ Check frost formation on the whole surface of the evaporator.	Electronic Leak Detector, Driver (Ruler).
Compressor compartment and tools arrangement	- Remove flux from the silver weld joints with soft brush or wet rag. Flux may be the cause of corrosion and leaks. - Clean R134a exclusive tools and store them in a clean tool box or in their place.	Copper brush, Rag, Tool box
Transportation and installation	- Installation should be conducted in accordance with the standard installation procedure. Leave space of more than 5 cm (2 inches) from the wall for compressor compartment cooling fan mounted model.	

TROUBLE DIAGNOSIS

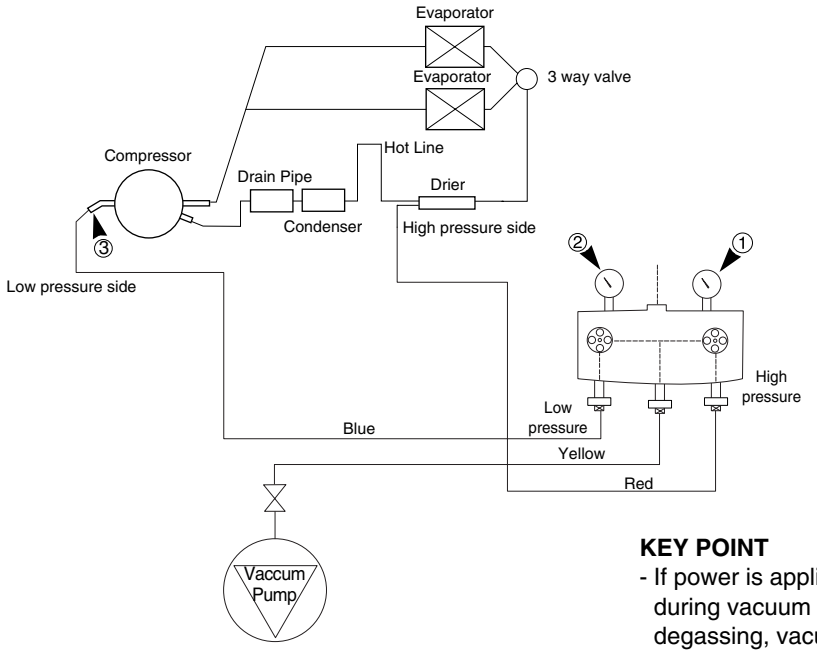
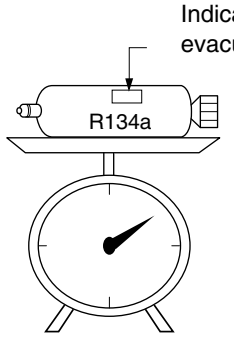
1-3. Precautions During Heavy Repair

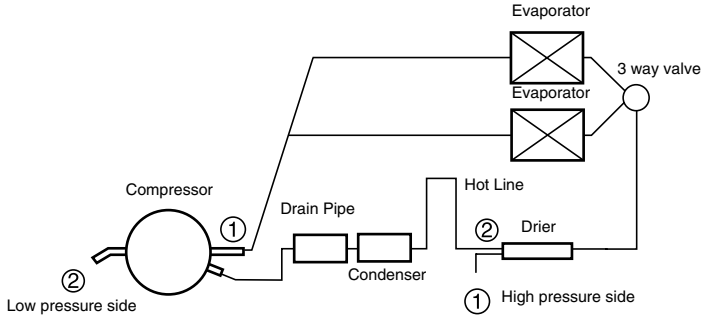
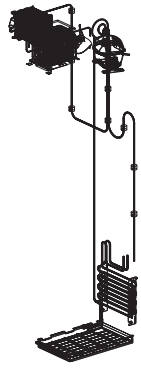
Items	Precautions
1. Use of tools.	1) Use special parts and tools for R134a.
2. Recovery of refrigerant.	1) Continue to recover the refrigerant for more than 5 minutes after turning the refrigerator off. 2) Install a piercing type valve on the high pressure line (drier side). Then use the appropriate recovery equipment to recover the refrigerant from the system. When the refrigerant has been recovered, install a piercing type valve on the low pressure side. IT IS IMPORTANT TO OPEN THE SYSTEM IN THIS ORDER TO KEEP THE OIL FROM BEING FORCED OUT. The use of piercing type valves will allow future servicing and eliminates the possibility of a defective pinch off. 
3. Replacement of drier.	1) Be sure to replace drier with R134a only when repairing pipes and injecting refrigerant.
4. Nitrogen blowing welding.	1) Use pressurized nitrogen to prevent oxidation inside the piping. (Nitrogen pressure : 0.1~0.2 kg/cm^2.)
5. Others.	1) Only nitrogen or R134a should be used when cleaning the inside of piping of the sealed system. 2) Check leakage with an electronic leakage tester. 3) Be sure to use a pipe cutter when cutting pipes. 4) Be careful not the water let intrude into the inside of the cycle.

1-4. Practical Work For Heavy Repair

Items	Precautions
1. Removal of residual refrigerant.	 **KEY POINT** Observe the sequence for removal of refrigerant. (If not, compressor oil may leak.) 1) Continue to recover the refrigerant for more than 5 minutes after turning the refrigerator off. 2) Install a piercing type valve on the high pressure line (drier side). Then use the appropriate recovery equipment to recover the refrigerant from the system. When the refrigerant has been recovered, install a piercing type valve on the low pressure side. IT IS IMPORTANT TO OPEN THE SYSTEM IN THIS ORDER TO KEEP THE OIL FROM BEING FORCED OUT. The use of piercing type valves will allow future servicing and eliminates the possibility of a defective pinch off.
2. Nitrogen blowing welding.	 **KEY POINT** Welding without nitrogen blowing produces oxidized scales inside a pipe, which affect the performance and reliability. **When replacing a drier:** Weld ① and ② parts by blowing nitrogen (0.1~0.2kg/cm²) to high pressure side after assembling a drier. **When replacing a compressor:** Weld ① and ② parts by blowing nitrogen to the low pressure side. Note) For other parts, nitrogen blowing is not necessary because it does not produce oxidized scales inside pipe because of its short welding time.
3. Replacement of drier.	 **KEY POINT** Be sure to check the inserted length of capillary tube when it is inserted. (If inserted too far, the capillary tube will be blocked by the filter.) **Inserting a capillary tube** Measure distance with a ruler and put a mark ($12^{+3/-0}$)on the capillary tube. Insert tube to the mark and weld it.

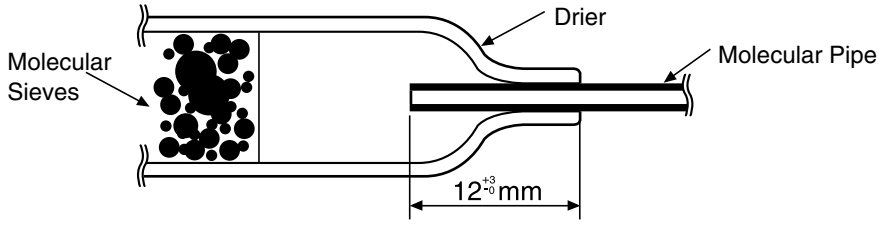
TROUBLE DIAGNOSIS

Items	Precautions
4. Vacuum degassing.	 **Pipe Connection** Connect the red hose to the high pressure side and the blue hose to the low pressure side. **Vacuum Sequence** Open valves ① and ② and evacuate for 40 minutes. Close valve ①. **KEY POINT** - If power is applied during vacuum degassing, vacuum degassing shall be more effective. - Run the compressor while charging the system. It is easier and works better.
5. Refrigerant charging.	**Charging sequence** 1) Check the amount of refrigerant supplied to each model after completing vacuum degassing. 2) Evacuate charging canister with a vacuum pump. 3) Measure the amount of refrigerant charged. - Measure the weight of an evacuated charging canister with an electronic scale. - Charge refrigerant into a charging canister and measure the weight. Calculate the weight of refrigerant charged into the charging canister by subtracting the weight of an evacuated charging canister.  **KEY POINT** - Be sure to charge the refrigerant at around 25°C [77°F]. - Be sure to keep -5g in the winter and +5g in summer. **Calculation of amount of refrigerant charged** the amount of refrigerant charged= weight after charging - weight before charging (weight of an evacuated cylinder)

Items	Precautions
	 4) Refrigerant Charging Charge refrigerant while operating a compressor as shown above. 5) Pinch the charging pipe with a pinch-off plier after completion of charging. 6) Braze the end of a pinched charging pipe with copper brazer and test for gas leakage at the brazed parts.
6. Gas-leakage test	* Test for leaks on the welded or suspicious area with an electronic leakage tester.
7. Pipe arrangement in each cycle	When replacing components, be sure each pipe is replaced in its original position before closing the cover of the mechanical area. 

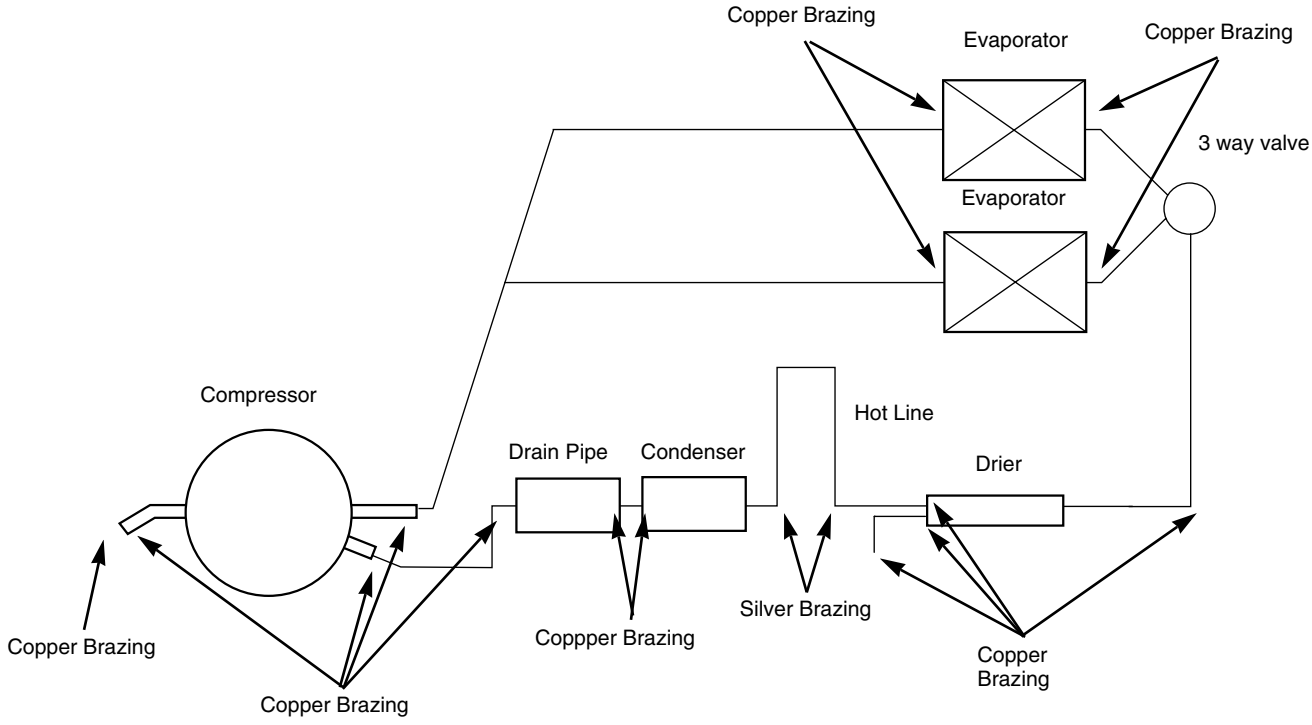
1-5. Standard Regulations For Heavy Repair

1) Observe the safety precautions for gas handling.
2) Use JIG (or a wet towel) in order to prevent electric wires from burning during welding. (In order to prevent insulation break and accident.)
3) The inner case will melt and the insulation will burn.
4) The copper piping will oxidize.
5) Do not allow aluminum and copper pipes to touch. (In order to prevent corrosion.)
6) Observe that the inserted length of a capillary tube into a drier should be 12 mm.



7) Make sure that the inner diameter is not distorted while cutting a capillary tube.
8) Be sure that the suction pipe and the filling tube should not be substituted each other during welding. (High efficiency pump.)

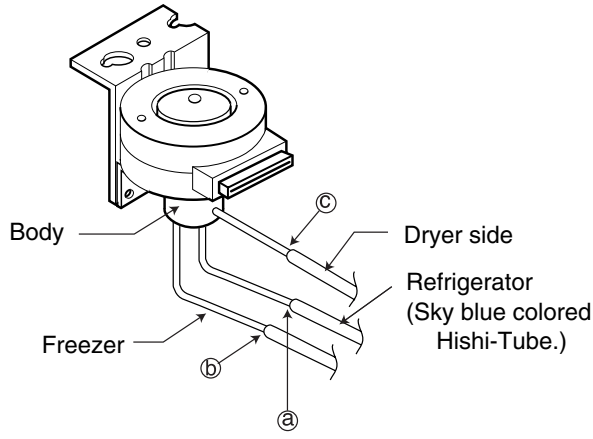
1-6. Brazing Reference Drawings



1-7. 3-Way Valve Service

■ Since 3-way valve controls refrigerant with an inner plastic damper, defect may occur because the plastic damper is deteriorated and welding heat is delivered to a pipe during welding for repair and replacement of the valve welding part.
So perform service in following service method.

1) Replace 3-way valve assembly where refrigerant leakage occurs at the joint pipe (ⓐ, ⓑ, ⓒ part) connected with the service valve of valve welding part.
(For unavoidable welding, wrap the body part of valve with a water towel so that delivery of welding heat is minimized 100 °C or less.
2) Service in replacement of valve (valve failure.) Perform service in the same method as above.
3) Other cautions.

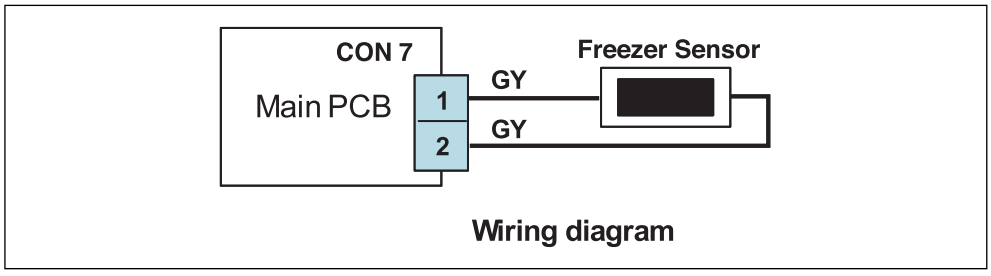


(1) Pipe for capillary tube should be welded through insertion by 20+3-3mm. (For preventing clogging during welding)
(2) Take care since inner ejecting objects may be damaged if falling a valve or giving a strong shock.(Poor operation and leakage quantity may be increased due to damage of inner parts.)
(3) Entirely remove and check ice formation which occurred in the Evaporator before or after improvement work for non-insertion of 3-way valve housing, defect or shortage of goods, defective welding.

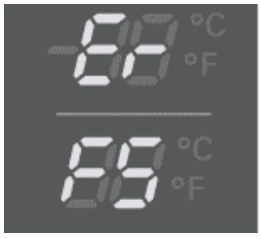
TROUBLESHOOTING

1. Troubleshooting By Error Code

Freezer Sensor Error

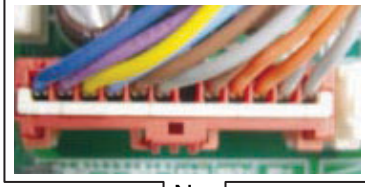


Does the display look like this?



Yes

Is the connection loose? (CON 7)



Yes → Reconnect

No

Unplug to avoid damaging the microprocessor.

Disconnect CON 7 and measure the value. Is resistance value between pins 1 & 2 of CON 7 as below? (Gray to gray)



Test Point	Result
Pin 1 to Pin 2	1.4 ~ 120 kΩ

No → Replace Freezer Sensor

Yes

Reconnect CON 7 and Power ON

If the same situation appears, Replace the main PCB. Otherwise, explain to the customer!

TROUBLESHOOTING

Contents

1. PCB Picture.

-. Main PCB

2. Troubleshooting with Error Code.

1) Er FS
2) Er rS
3) Er r2
4) Er rt
5) F dS
6) F dH
7) r dS
8) r dH
9) Er FF
10) Er CF
11) Er rF
12) Er CO_TOP DISPLAY
13) Er CO_DISPENSER DISPLAY

3. Troubleshooting without Error Code.

14) Cube mode not working.
15) Crush mode not working.
16) Water mode not working.
17) Poor cooling in refrigerator compartment.
18) Poor cooling in freezer compartment.

4. Reference

19) TEST MODE and Removing TPA.
20) Temperature chart.

TROUBLESHOOTING

1. PCB Picture. - Main PCB

P/No & MFG	EBR720641
Picture	

2. Troubleshooting With Error Display

1) Freezer Sensor Error(Er FS)

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check for a loose connection.</td><td></td></tr>
<tr><td>2</td><td>Check the Pin9(1) to Pin10(2) of CON5.

CON 5
</td><td>
<table>
<tr><th colspan="2">Result</th><th>SVC Action</th></tr>
<tr><td>0 Ω</td><td>Short</td><td>Change the swnsor</td></tr>
<tr><td>OFF</td><td>Open</td><td>Replace the refrigerator</td></tr>
<tr><td>Other</td><td>Normal</td><td>Check the Temp and resistance(Table-1)</td></tr>
</table>

<Temperature table-1>
<table>
<tr><th>(1) To (2)</th><th>Result</th></tr>
<tr><td>-22°F / -30℃</td><td>40 kΩ</td></tr>
<tr><td>-13°F / -25℃</td><td>30 kΩ</td></tr>
<tr><td>-4°F / -20℃</td><td>23 kΩ</td></tr>
<tr><td>5°F / -15℃</td><td>17 kΩ</td></tr>
<tr><td>14°F / -10℃</td><td>13 kΩ</td></tr>
<tr><td>23°F / -5℃</td><td>10 kΩ</td></tr>
<tr><td>32°F / 0℃</td><td>8 kΩ</td></tr>
</table>

※ The sensor is determined by the temperature.
For example, 23 kΩ indicates -20 ℃
</td></tr>
</table>

2. Troubleshooting With Error Display

2) Refrigerator Sensor Error(Er rS)

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check for a loose connection.</td><td></td></tr>
<tr><td>2</td><td>Check the Pin7(1) to Pin8(2) of CON6.

</td><td>
<table>
<tr><th colspan="2">Result</th><th>SVC Action</th></tr>
<tr><td>0Ω</td><td>Short</td><td>Change the sensor</td></tr>
<tr><td>OFF</td><td>Open</td><td>Replace the refrigerator</td></tr>
<tr><td>Other</td><td>Normal</td><td>Check the Temp and resistance(Table-2)</td></tr>
</table>

<Temperature table-2>
<table>
<tr><th>(1) To (2)</th><th>Result</th></tr>
<tr><td>23˚F / -5℃</td><td>38 kΩ</td></tr>
<tr><td>32˚F / 0℃</td><td>30 kΩ</td></tr>
<tr><td>41˚F / 5℃</td><td>24 kΩ</td></tr>
<tr><td>50˚F / 10℃</td><td>19.5kΩ</td></tr>
<tr><td>59˚F / 15℃</td><td>16 kΩ</td></tr>
</table>
※ The sensor is determined by the temperature.
For example, 30kΩ indicates 0℃
</td></tr>
</table>

2. Troubleshooting With Error Display

3) Refrigerator Sensor Error(Er r2)

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check for a loose connection.</td><td></td></tr>
<tr><td>2</td><td>Check the Pin9(1) to Pin10(2) of CON6.


CON 6</td><td>
<table>
<tr><th colspan="2">Result</th><th>SVC Action</th></tr>
<tr><td>0Ω</td><td>Short</td><td>Change the sensor</td></tr>
<tr><td>OFF</td><td>Open</td><td>Replace the refrigerator</td></tr>
<tr><td>Other</td><td>Normal</td><td>Check the Temp and resistance(Table-2)</td></tr>
</table>

<Temperature table-2>
<table>
<tr><th>(1) To (2)</th><th>Result</th></tr>
<tr><td>23°F / -5℃</td><td>38 kΩ</td></tr>
<tr><td>32°F / 0℃</td><td>30 kΩ</td></tr>
<tr><td>41°F / 5℃</td><td>24 kΩ</td></tr>
<tr><td>50°F / 10℃</td><td>19.5kΩ</td></tr>
<tr><td>59°F / 15℃</td><td>16 kΩ</td></tr>
</table>

※ The sensor is determined by the temperature.
For example, 30kΩ indicates 0℃
</td></tr>
</table>

2. Troubleshooting With Error Display

4) Refrigerator Sensor Error(Er rt)

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check for a loose connection.</td><td></td></tr>
<tr><td>2</td><td>Check the Pin21(1) to Pin22(2) of CON7.

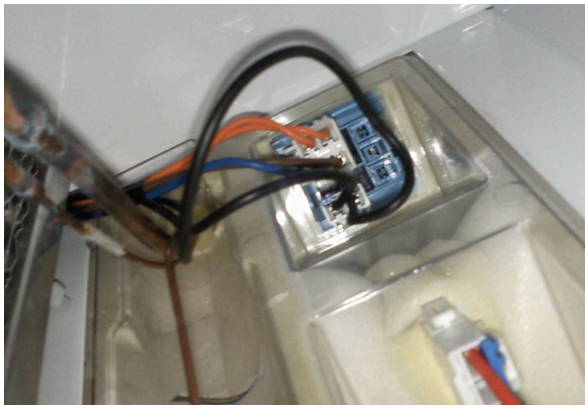
CON 7
</td><td>
<table>
<tr><th colspan="2">Result</th><th>SVC Action</th></tr>
<tr><td>0Ω</td><td>Short</td><td>Change the sensor</td></tr>
<tr><td>OFF</td><td>Open</td><td>Replace the refrigerator</td></tr>
<tr><td>Other</td><td>Normal</td><td>Check the Temp and resistance(Table-2)</td></tr>
</table>

<Temperature table-2>
<table>
<tr><th>(1) To (2)</th><th>Result</th></tr>
<tr><td>23°F / -5℃</td><td>38 kΩ</td></tr>
<tr><td>32°F / 0℃</td><td>30 kΩ</td></tr>
<tr><td>41°F / 5℃</td><td>24 kΩ</td></tr>
<tr><td>50°F / 10℃</td><td>19.5kΩ</td></tr>
<tr><td>59°F / 15℃</td><td>15.6 kΩ</td></tr>
</table>

※ The sensor is determined by the temperature.
For example, 30kΩ indicates 0℃
</td></tr>
</table>

2. Troubleshooting With Error Display

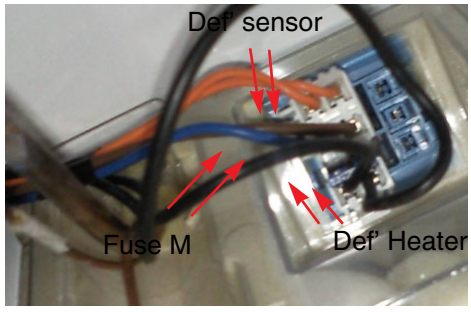
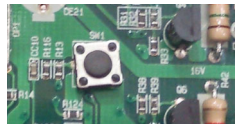
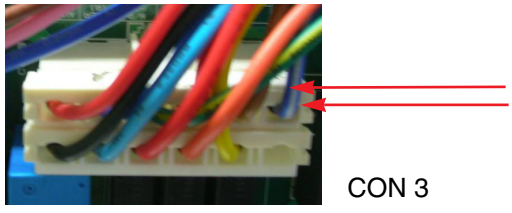
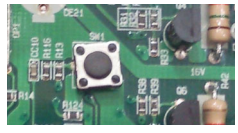
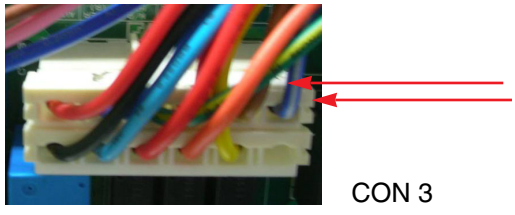
5) Defrost Sensor Error(F dS)

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>• Check for a loose connection. (CON8)
• Check the Pin11(1) to Pin12(2) of CON8.
 CON 8</td><td>
<table>
<tr><th colspan="2">Result</th><th>SVC Action</th></tr>
<tr><td>0Ω</td><td>Short</td><td rowspan="2">Go to the 2</td></tr>
<tr><td>OFF</td><td>Open</td></tr>
<tr><td>Other</td><td>Normal</td><td>Check the Temp and resistance(Table-3)</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Check the Orange(1) to Orange(2).
(Remove Housing)
</td><td>
<table>
<tr><th colspan="2">Result</th><th>SVC Action</th></tr>
<tr><td>0Ω</td><td>Short</td><td rowspan="2">Change the sensor</td></tr>
<tr><td>OFF</td><td>Open</td></tr>
<tr><td>Other</td><td>Normal</td><td>• Check the Temp and resistance(Table-3)
• Check the Harness PCB to this Joint</td></tr>
</table>

<Temperature table-3>
<table>
<tr><th>(1) To (2)</th><th>Result</th></tr>
<tr><td>-22°F / -30℃</td><td>40 kΩ</td></tr>
<tr><td>-13°F / -25℃</td><td>30 kΩ</td></tr>
<tr><td>-4°F / -20℃</td><td>23 kΩ</td></tr>
<tr><td>5°F / -15℃</td><td>17 kΩ</td></tr>
<tr><td>14°F / -10℃</td><td>13 kΩ</td></tr>
<tr><td>23°F / -5℃</td><td>10 kΩ</td></tr>
<tr><td>32°F / 0℃</td><td>8 kΩ</td></tr>
</table>
※ The sensor is determined by the temperature.
For example, 23kΩ indicates -20℃
</td></tr>
</table>

2. Troubleshooting With Error Display

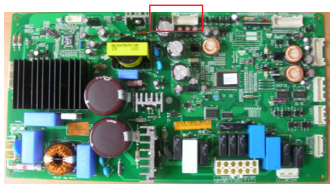
6) Defrost Heater Error(F dH)

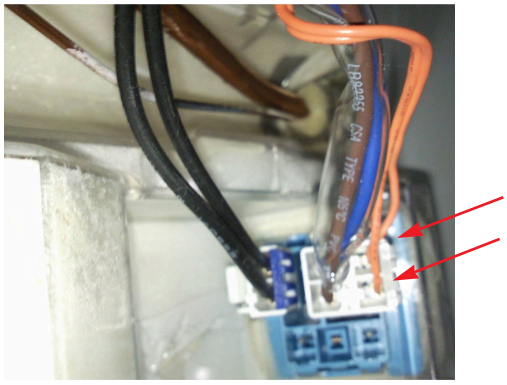
<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check the Door gasket.</td><td rowspan="2"><table>
<tr><th>Part</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Fuse-M</td><td>0 Ω</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Change Fuse_M</td></tr>
<tr><td rowspan="2">Def' Heater</td><td>34~42 Ω</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Change Fuse_M</td></tr>
<tr><td rowspan="2">Def' sensor</td><td>0 Ω</td><td>Go to the 3</td></tr>
<tr><td>OFF</td><td>Replace product</td></tr>
</table></td></tr>
<tr><td>2</td><td>Check the Defrost control part.

</td></tr>
<tr><td>3</td><td>Input Test 2 Mode
(Push the button 2 times)</td><td></td></tr>
<tr><td>4</td><td>Check the Brown to Blue&White.

</td><td><table>
<tr><th>Result</th><th>SVC Action</th></tr>
<tr><td>100 ~ 127V</td><td>Go to the 5</td></tr>
<tr><td>0V</td><td>Replce Main PCB</td></tr>
</table></td></tr>
<tr><td>5</td><td>Release the test mode.
Push the button 1 times. (normal)</td><td></td></tr>
<tr><td>6</td><td>Check the Brown to Blue&White.

</td><td><table>
<tr><th>Result</th><th>SVC Action</th></tr>
<tr><td>0V</td><td>Explain to customer</td></tr>
<tr><td>100 ~ 127V</td><td>Replce Main PCB</td></tr>
</table></td></tr>
</table>

2. Troubleshooting With Error Display

7) Defrost Sensor Error(r dS)

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>• Check for a loose connection. (CON6)
• Check the Pin11(1) to Pin12(2) of CON6.

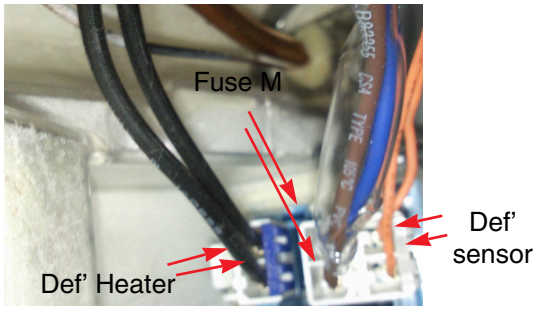
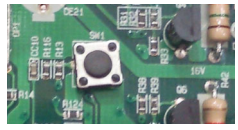
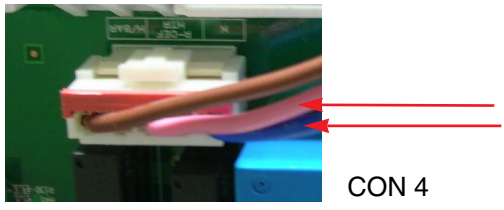
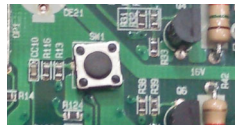
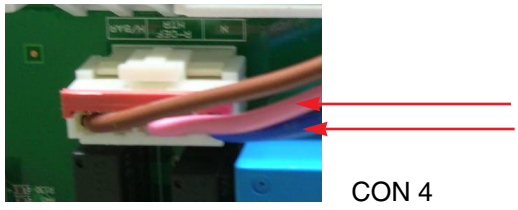
CON 6
</td><td>
<table>
<tr><th colspan="2">Result</th><th>SVC Action</th></tr>
<tr><td>0Ω</td><td>Short</td><td rowspan="2">Go to the 2</td></tr>
<tr><td>OFF</td><td>Open</td></tr>
<tr><td>Other</td><td>Normal</td><td>Check the Temp and resistance(Table-3)</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Check the Orange(1) to Orange(2).
(Remove Housing)

</td><td>
<table>
<tr><th colspan="2">Result</th><th>SVC Action</th></tr>
<tr><td>0Ω</td><td>Short</td><td rowspan="2">Change the sensor</td></tr>
<tr><td>OFF</td><td>Open</td></tr>
<tr><td>Other</td><td>Normal</td><td>• Check the Temp and resistance(Table-3)
• Check the Harness PCB to this Joint</td></tr>
</table>

<Temperature table-3>
<table>
<tr><th>(1) To (2)</th><th>Result</th></tr>
<tr><td>-22°F / -30℃</td><td>40 kΩ</td></tr>
<tr><td>-13°F / -25℃</td><td>30 kΩ</td></tr>
<tr><td>-4°F / -20℃</td><td>23 kΩ</td></tr>
<tr><td>5°F / -15℃</td><td>17 kΩ</td></tr>
<tr><td>14°F / -10℃</td><td>13 kΩ</td></tr>
<tr><td>23°F / -5℃</td><td>10 kΩ</td></tr>
<tr><td>32°F / 0℃</td><td>8 kΩ</td></tr>
</table>
※ The sensor is determined by the temperature.
For example, 23kΩ indicates -20℃
</td></tr>
</table>

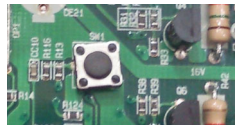
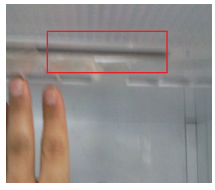
2. Troubleshooting With Error Display

8) Defrost Heater Error(r dH)

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check the Door gasket.</td><td rowspan="2"><table>
<tr><th>Part</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Fuse-M</td><td>0 Ω</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Change Fuse_M</td></tr>
<tr><td rowspan="2">Def' Heater</td><td>34~42 Ω</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Change Fuse_M</td></tr>
<tr><td rowspan="2">Def' sensor</td><td>0 Ω</td><td>Go to the 3</td></tr>
<tr><td>OFF</td><td>Replace product</td></tr>
</table></td></tr>
<tr><td>2</td><td>Check the Defrost control part.

</td></tr>
<tr><td>3</td><td>Input Test 2 Mode
(Push the button 2 times)</td><td></td></tr>
<tr><td>4</td><td>Check the Pink to Blue.

</td><td><table>
<tr><th>Result</th><th>SVC Action</th></tr>
<tr><td>100 ~ 127V</td><td>Go to the 5</td></tr>
<tr><td>0V</td><td>Replce Main PCB</td></tr>
</table></td></tr>
<tr><td>5</td><td>Release the test mode.
Push the button 1 times. (normal)</td><td></td></tr>
<tr><td>6</td><td>Check the Pink to Blue.

</td><td><table>
<tr><th>Result</th><th>SVC Action</th></tr>
<tr><td>0V</td><td>Explain to customer</td></tr>
<tr><td>100 ~ 127V</td><td>Replce Main PCB</td></tr>
</table></td></tr>
</table>

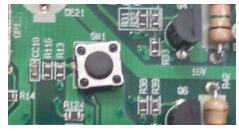
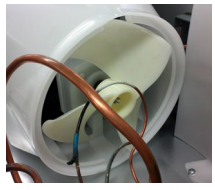
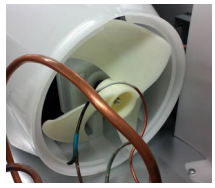
2. Troubleshooting With Error Display

9) Freezer Fan Error(Er FF)

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Reset the unit and Input Test 1 Mode.
(Push the button 1 time)</td><td></td></tr>
<tr><td>2</td><td>Open the freezer door and Check the air flow.
※ While an error code is displayed, the fan is not working.</td><td>
<table>
<tr><th>Status</th><th>SVC Action</th></tr>
<tr><td>No windy</td><td>Go to 3</td></tr>
<tr><td>Windy</td><td>Go to 4</td></tr>
</table></td></tr>
<tr><td>3</td><td>Check the Fan motor.</td><td>Rotate fan using your hand.
It feel sticky, change the motor.
(cause of ice or rust inside of motor)</td></tr>
<tr><td>4</td><td>Check the Fan motor voltage. Pin17(2), Pin18(3), Pin20(1) of CON8.
CON 8
</td><td><table>
<tr><th>Point</th><th>Result</th><th>SVC Action</th></tr>
<tr><td>(2)~(3)</td><td>Below 8V</td><td>Change the PCB</td></tr>
<tr><td>(1)~(2)</td><td>0 or 5V</td><td>Change the motor</td></tr>
</table></td></tr>
</table>

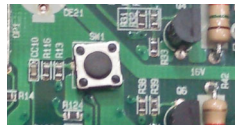
2. Troubleshooting With Error Display

10) Condenser Fan Error(Er CF)

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Reset the unit and Input Test 1 Mode.
(Push the button 1 time)</td><td></td></tr>
<tr><td>2</td><td>Check the fan rotating.</td><td>
<table>
<tr><th>Status</th><th>SVC Action</th></tr>
<tr><td>No windy</td><td>Check motor</td></tr>
<tr><td>Windy</td><td>Go to the 5</td></tr>
</table></td></tr>
<tr><td>3</td><td>Check the Fan motor and surrounding.
</td><td>Rotate fan using your hand.
It feel sticky, change the motor.</td></tr>
<tr><td>4</td><td>Check the Fan motor voltage. Pin15(2), Pin14(1), Pin16(3) of CON8.
CON 8
</td><td>
<table>
<tr><th></th><th>Result</th><th>SVC Action</th></tr>
<tr><td>(1)~(2)</td><td>Below 8V</td><td>Change the PCB</td></tr>
<tr><td>(2)~(3)</td><td>0 or 5V</td><td>Change the motor</td></tr>
</table></td></tr>
</table>

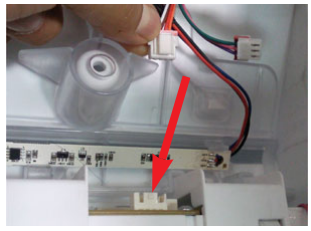
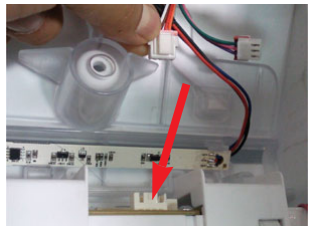
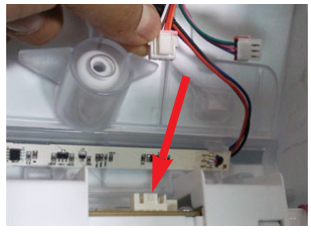
2. Troubleshooting With Error Display

11) Refrigerator Fan Error(Er rF)

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Reset the unit and Input Test 1 Mode.
(Push the button 1 time)</td><td></td></tr>
<tr><td>2</td><td>Open the freezer door and Check the air flow.
※ While an error code is displayed, the fan is not working.</td><td>
<table>
<tr><th>Status</th><th>SVC Action</th></tr>
<tr><td>No windy</td><td>Go to 3</td></tr>
<tr><td>Windy</td><td>Go to 4</td></tr>
</table></td></tr>
<tr><td>3</td><td>Check the Fan motor.</td><td>Rotate fan using your hand.
It feel sticky, change the motor.
(cause of ice or rust inside of motor)</td></tr>
<tr><td>4</td><td>Check the Fan motor voltage. Pin14(2), Pin16(3), Pin18(1) of CON6.
CON 6
</td><td><table>
<tr><th></th><th>Result</th><th>SVC Action</th></tr>
<tr><td>(2)~(3)</td><td>Below 8V</td><td>Change the PCB</td></tr>
<tr><td>(1)~(2)</td><td>0 or 5V</td><td>Change the motor</td></tr>
</table></td></tr>
</table>

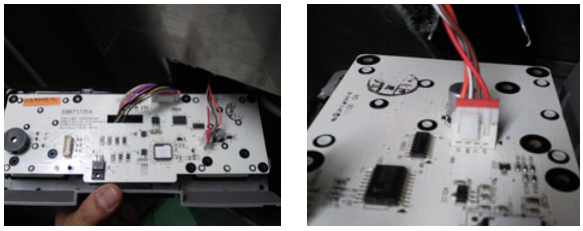
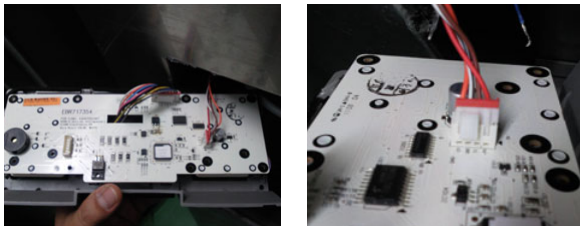
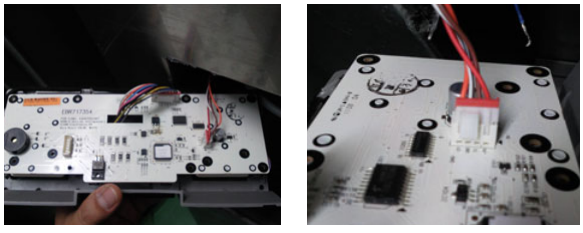
2. Troubleshooting With Error Display

12) Communication Error(Er CO)_TOP DISPLAY

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check the loose connection.</td><td></td></tr>
<tr><td>2</td><td>Check the White&Black to Orange.
</td><td><table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>12V</td><td>Go to the 3</td></tr><tr><td>Other</td><td>Check the Hinge
(loose connection)
Change the Main PCB</td></tr></table></td></tr>
<tr><td>3</td><td>Check the Orange to Brown .
</td><td><table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0V or 5V</td><td>Change the Display PCB</td></tr><tr><td>Other</td><td>Go to the 4</td></tr></table></td></tr>
<tr><td>4</td><td>Check the Orange to Red .
</td><td><table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0V or 5V</td><td>Change the Main PCB</td></tr><tr><td>Other</td><td>Go to the 5</td></tr></table></td></tr>
<tr><td>5</td><td>Check the Pin19 to Pin20 of CON7.</td><td><table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0V or 5V</td><td>Change the Display PCB</td></tr><tr><td>Other</td><td>Go to the 6</td></tr></table></td></tr>
<tr><td>6</td><td>Check the Pin18 to Pin19 of CON7.</td><td><table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0V or 5V</td><td>Change the Main PCB</td></tr><tr><td>Other</td><td>Explain to customer</td></tr></table></td></tr>
</table>

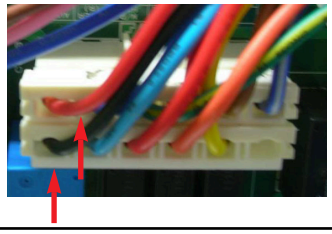
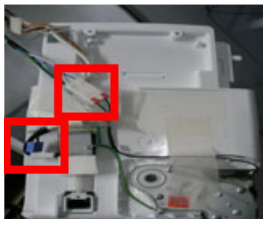
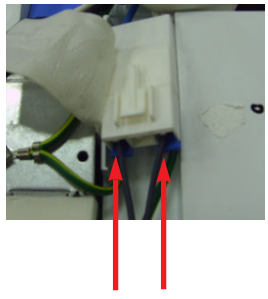
2. Troubleshooting With Error Display

13) Communication Error(Er CO)_DISPENSER DISPLAY

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check the loose connection.</td><td></td></tr>
<tr><td>2</td><td>Check the White&Black to Orange.
</td><td><table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>12V</td><td>Go to the 3</td></tr><tr><td>Other</td><td>Check the Hinge
(loose connection)
Change the Main PCB</td></tr></table></td></tr>
<tr><td>3</td><td>Check the Orange to Brown .
</td><td><table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0V or 5V</td><td>Change the Display PCB</td></tr><tr><td>Other</td><td>Go to the 4</td></tr></table></td></tr>
<tr><td>4</td><td>Check the Orange to Red .
</td><td><table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0V or 5V</td><td>Change the Main PCB</td></tr><tr><td>Other</td><td>Go to the 5</td></tr></table></td></tr>
<tr><td>5</td><td>Check the Pin15 to Pin12 of CON7.</td><td><table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0V or 5V</td><td>Change the Display PCB</td></tr><tr><td>Other</td><td>Go to the 6</td></tr></table></td></tr>
<tr><td>6</td><td>Check the Pin14 to Pin15 of CON7.</td><td><table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0V or 5V</td><td>Change the Main PCB</td></tr><tr><td>Other</td><td>Explain to customer</td></tr></table></td></tr>
</table>

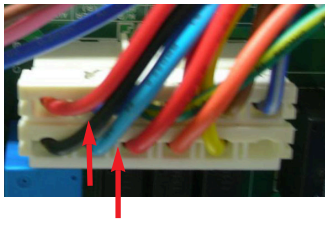
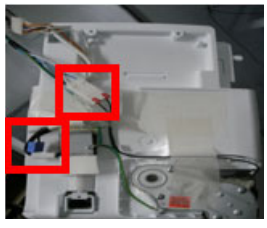
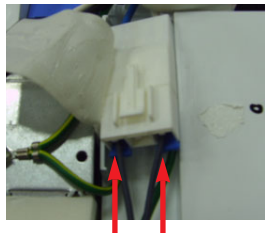
3. Troubleshooting Without Error Display

14) Cube mode doesn't work

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check the loose connection.</td><td></td></tr>
<tr><td>2</td><td>Check the Black to Blue.
(While pushing the lever S/W)

CON 3</td><td>
<table>
<tr><th>Lever s/w</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Pushing</td><td>100~127V</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Change PCB</td></tr>
<tr><td rowspan="2">Not pushing</td><td>0~2V</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Change PCB</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Check the Pin25 to Pin26 of CON7.
(While pushing the lever S/W)</td><td>
<table>
<tr><th>Lever s/w</th><th>Result</th><th>SVC Action</th></tr>
<tr><td>Pushing</td><td>4.5~5V
Other</td><td>Go to the 5
Change PCB</td></tr>
<tr><td>Not pushing</td><td>0~2V
Other</td><td>Go to the 5
Change PCB</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Check the resistance value.

<Ice Maker>

(1) (2)
<Geared Motor></td><td>
<table>
<tr><th>Point</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">(1) to (2)</td><td>15.3~19.3Ω</td><td>Explain</td></tr>
<tr><td>Other</td><td>Replace Geared Motor</td></tr>
</table>
</td></tr>
</table>

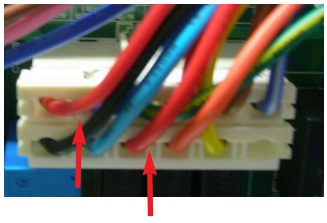
3. Troubleshooting Without Error Display

15) Crush mode doesn't work

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check the loose connection.</td><td></td></tr>
<tr><td>2</td><td>Check the Blue to Sky Blue.
(While pushing the lever S/W)

CON 3</td><td>
<table>
<tr><th>Lever s/w</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Pushing</td><td>100~127V</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Change PCB</td></tr>
<tr><td rowspan="2">Not pushing</td><td>0~2V</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Change PCB</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Check the Pin25 to Pin26 of CON7.
(While pushing the lever S/W)</td><td>
<table>
<tr><th>Lever s/w</th><th>Result</th><th>SVC Action</th></tr>
<tr><td>Pushing</td><td>4.5~5V
Other</td><td>Go to the 4
Change PCB</td></tr>
<tr><td>Not pushing</td><td>0~2V
Other</td><td>Go to the 4
Change PCB</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Check the resistance value.

<Ice Maker>

(1) (2)
<Geared Motor></td><td>
<table>
<tr><th>Point</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">(1) to (2)</td><td>15.3~19.3 Ω</td><td>Explain</td></tr>
<tr><td>Other</td><td>Replace Geared Motor</td></tr>
</table>
</td></tr>
</table>

3. Troubleshooting Without Error Display

16) Water mode doesn't work

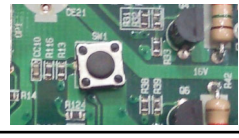
<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check the loose connection.</td><td></td></tr>
<tr><td>2</td><td>Check the Red to Blue.
(While pushing the lever S/W)

CON 3</td><td>
<table>
<tr><th>Lever s/w</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Pushing</td><td>100~127V</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Change PCB</td></tr>
<tr><td rowspan="2">Not pushing</td><td>0~2V</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Change PCB</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Check the Pin25 to Pin26 of CON7.
(While pushing the lever S/W)</td><td>
<table>
<tr><th>Lever s/w</th><th>Result</th><th>SVC Action</th></tr>
<tr><td>Pushing</td><td>4.5~5V
Other</td><td>Go to the 4
Change PCB</td></tr>
<tr><td>Not pushing</td><td>0~2V
Other</td><td>Go to the 4
Change PCB</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Check the resistance value.

(1) (2)</td><td>
<table>
<tr><th>Point</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">(1) to (2)</td><td>1500~1700Ω</td><td>Explain</td></tr>
<tr><td>Other</td><td>Replace Water valve</td></tr>
</table>
</td></tr>
</table>

TROUBLESHOOTING

3. Troubleshooting With Error Display

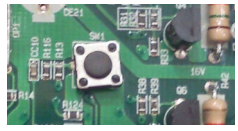
17) Poor cooling in Refrigerator compartment

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check the sensor resistance.
※The sensor is determined by the temperature.
For example, 30㏀ indicates 0℃.</td><td>
<table>
<tr><th>(1) To (2)</th><th>Result</th></tr>
<tr><td>23°F / -5℃</td><td>38 ㏀</td></tr>
<tr><td>32°F / 0℃</td><td>30 ㏀</td></tr>
<tr><td>41°F / 5℃</td><td>24 ㏀</td></tr>
<tr><td>50°F / 10℃</td><td>19.5 ㏀</td></tr>
<tr><td>59°F / 15℃</td><td>16 ㏀</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Reset the unit and Input Test 1 Mode.
(push the button 1 time)</td><td></td></tr>
<tr><td>3</td><td>Open the refrigerator & freezer door and Check the air flow.
</td><td>
<table>
<tr><th>Status</th><th>SVC Action</th></tr>
<tr><td>Windy</td><td>Go to the 4</td></tr>
<tr><td>No windy</td><td>Check the Fan motor(Next page)</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Check the air temperature. Cold or not?</td><td>
<table>
<tr><th>Status</th><th>SVC Action</th></tr>
<tr><td>Cold</td><td>Explain to customer</td></tr>
<tr><td>Not cold</td><td>Check the Compressor And sealed system</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>Check the Fan motor.
Rotate fan using your hand.
it feel sticky, change the motor.
(cause of ice or rust inside of motor)</td><td>
<table>
<tr><th>Point</th><th>Result</th><th>SVC Action</th></tr>
<tr><td>Motor</td><td>Sticky</td><td>Change the motor</td></tr>
</table>
</td></tr>
<tr><td>6</td><td>Check the Fan motor voltage.
Pin14(2), Pin16(1), Pin18(1) of CON6.</td><td>
<table>
<tr><th>Point</th><th>Result</th><th>SVC Action</th></tr>
<tr><td>(1)~(2)</td><td>Below 8V</td><td>Change the PCB</td></tr>
<tr><td>(2)~(3)</td><td>0 or 5V</td><td>Change the motor</td></tr>
</table>
</td></tr>
</table>

TROUBLESHOOTING

3. Troubleshooting With Error Display

18) Poor cooling in Freezer compartment

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check the sensor resistance.
※The sensor is determined by the temperature.
For example, 23㏀ indicates -20℃.</td><td>
<table>
<tr><th>(1) To (2)</th><th>Result</th></tr>
<tr><td>-22°F / -30℃</td><td>40 ㏀</td></tr>
<tr><td>-13°F / -25℃</td><td>30 ㏀</td></tr>
<tr><td>-4°F / -20℃</td><td>23 ㏀</td></tr>
<tr><td>5°F / -15℃</td><td>17 ㏀</td></tr>
<tr><td>14°F / -10℃</td><td>13 ㏀</td></tr>
<tr><td>23°F / -5℃</td><td>10 ㏀</td></tr>
<tr><td>32°F / 0℃</td><td>8 ㏀</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Reset the unit and Input Test 1 Mode.
(push the button 1 time)</td><td></td></tr>
<tr><td>3</td><td>Open the freezer door and Check the air flow.
</td><td>
<table>
<tr><th>Status</th><th>SVC Action</th></tr>
<tr><td>Windy</td><td>Go to the 4</td></tr>
<tr><td>No windy</td><td>Check the Fan motor(Next page)</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Check the air temperature. Cold or not?</td><td>
<table>
<tr><th>Status</th><th>SVC Action</th></tr>
<tr><td>Cold</td><td>Explain to customer</td></tr>
<tr><td>Not cold</td><td>Check the Compressor And sealed system</td></tr>
</table>
</td></tr>
</table>

3. Troubleshooting With Error Display

18) Poor cooling in Freezer compartment

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>5</td><td>Check the Fan motor.
Rotate fan using your hand.
it feel sticky, change the motor.
(cause of ice or rust inside of motor)</td><td>
<table>
<tr><th>Point</th><th>Result</th><th>SVC Action</th></tr>
<tr><td>Motor</td><td>Sticky</td><td>Change the motor</td></tr>
</table>
</td></tr>
<tr><td>6</td><td>Check the Fan motor voltage.
Pin17(2), Pin18(3), Pin 20(1) of CON8.

CON 8
</td><td>
<table>
<tr><th>Point</th><th>Result</th><th>SVC Action</th></tr>
<tr><td>(1)~(2)</td><td>Below 12V</td><td>Change the PCB</td></tr>
<tr><td>(2)~(3)</td><td>0 or 5V</td><td>Change the motor</td></tr>
</table>
</td></tr>
</table>

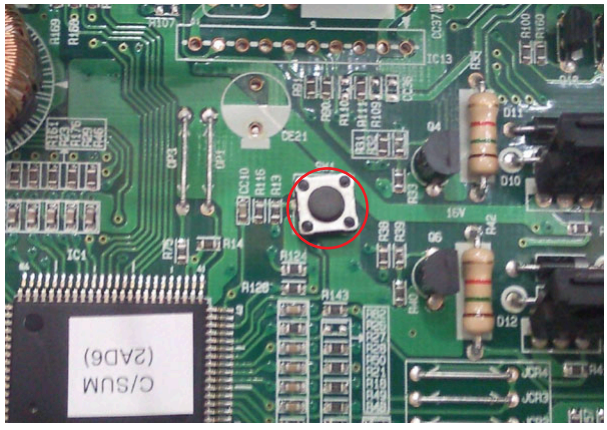
TROUBLESHOOTING

4. Reference

19) TEST MODE and Removing TPA

1. How to make TEST MODE

If you push the test button on the Main PCB, the refrigerator will be enter the TEST MODE



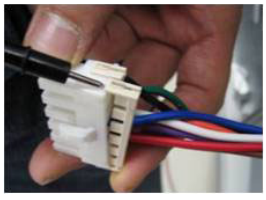
Main PWB

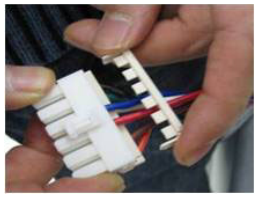
※ 1 time : Comp / All FAN on
(All things displayed)

※ 2 time : Forced defrost mode (all)
(22 22 displayed)

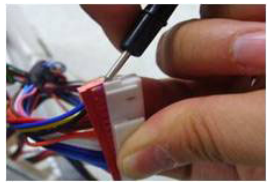
2. How to remove Terminal Position Assurance (TPA)

<AC TPA>





<DC TPA>





※ After measure the values, you should put in the TPA again.

4. Reference

20) TEMPERATURE CHART -FRZ AND ICING SENSOR

TEMP	RESISTANCE	VOLTAGE
-39°F (-40℃)	73.29 kΩ	4.09 V
-30°F (-35℃)	53.63 kΩ	3.84 V
-30°F (-21℃)	39.66 kΩ	3.55 V
-13°F (-25℃)	29.62 kΩ	3.23 V
-4°F (-20℃)	22.33 kΩ	2.89 V
5°F (-15℃)	16.99 kΩ	2.56 V
14°F (−10℃)	13.05 kΩ	2.23 V
23°F (-5℃)	10.10 kΩ	1.92 V
32°F (0℃)	7.88 kΩ	1.63 V
41°F (+5℃)	6.19 kΩ	1.38 V
50°F (+10℃)	4.91 kΩ	1.16 V
59°F (+15℃)	3.91 kΩ	0.97 V
68°F (+20℃)	3.14 kΩ	0.81 V
77°F (+25℃)	2.54 kΩ	0.67 V
86°F (+30℃)	2.07 kΩ	0.56 V
95°F (+35℃)	1.69 kΩ	0.47 V
104°F (+40℃)	1.39 kΩ	0.39 V

4. Reference

20) TEMPERATURE CHART -REF, MAGIC ROOM AND DEF SENSOR

TEMP	RESISTANCE	VOLTAGE
-39°F (-40℃)	225.1 kΩ	4.48 V
-30°F (-35℃)	169.8 kΩ	4.33 V
-30°F (-21℃)	129.3 kΩ	4.16 V
-13°F (-25℃)	99.30 kΩ	3.95 V
-4°F (-20℃)	76.96 kΩ	3.734 V
5°F (-15℃)	60.13 kΩ	3.487 V
14°F (-10℃)	47.34 kΩ	3.22 V
23°F (-5℃)	37.55 kΩ	2.95 V
32°F (0℃)	30 kΩ	2.67 V
41°F (+5℃)	24.13 kΩ	2.40 V
50°F (+10℃)	19.53 kΩ	2.14 V
59°F (+15℃)	15.91 kΩ	1.89 V
68°F (+20℃)	13.03 kΩ	1.64 V
77°F (+25℃)	10.74 kΩ	1.45 V
86°F (+30℃)	8.89 kΩ	1.27 V
95°F (+35℃)	7.40 kΩ	1.10 V
104°F (+40℃)	6.20 kΩ	0.96 V

4. Reference

20) TEMPERATURE CHART -AMBIENT SENSOR

TEMP	RESISTANCE	VOLTAGE
-39°F (-40℃)	225.1 kΩ	4.79 V
-30°F (-35℃)	169.8 kΩ	4.72 V
-21°F (-30℃)	129.3 kΩ	4.64 V
-13°F (-25℃)	99.30 kΩ	4.54 V
-4°F (-20℃)	76.96 kΩ	4.43 V
5°F (-15℃)	60.13 kΩ	4.29 V
14°F (−10℃)	47.34 kΩ	4.13 V
23°F (-5℃)	37.55 kΩ	3.95 V
32°F (0℃)	30 kΩ	3.75 V
41°F (+5℃)	24.13 kΩ	3.54 V
50°F (+10℃)	19.53 kΩ	3.31 V
59°F (+15℃)	15.91 kΩ	3.07 V
68°F (+20℃)	13.03 kΩ	2.83 V
77°F (+25℃)	10.74 kΩ	2.59 V
86°F (+30℃)	8.89 kΩ	2.35 V
95°F (+35℃)	7.40 kΩ	2.13 V
104°F (+40℃)	6.20 kΩ	1.91 V
113°F (+45℃)	5.19 kΩ	1.71 V

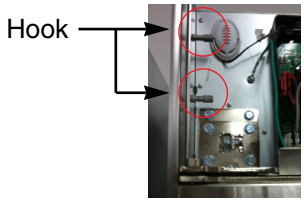
HOW TO DISASSEMBLE AND ASSEMBLE

1. Top Cover

1) Remove 2 screws located at upper side of top cover.



2) Be caution of hanger and remove the top cover upward.



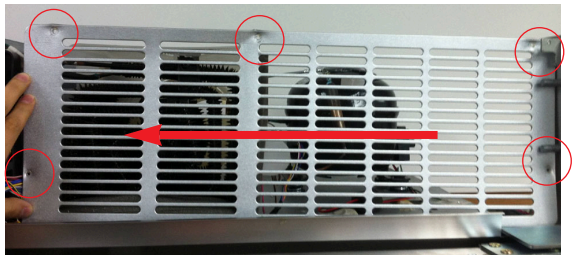
2-1. Top Decor

1) Remove top cover
2) Remove 2 screws below and remove the Top Decor.



2-2. Machine Cover

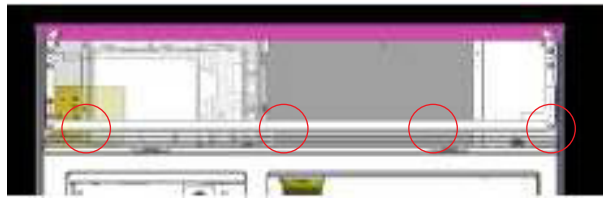
1) Remove top cover
2) Remove the screw located on the edge of the cover.



3) Remove direction of red arrow.

2-3. Case Decor

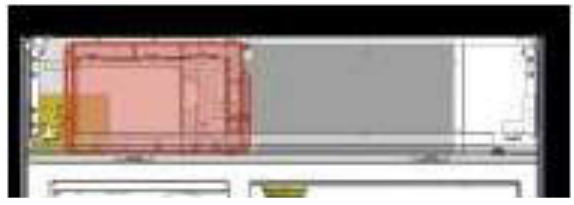
1) Remove top cover
2) Remove 2 screws below and remove the Decor case.



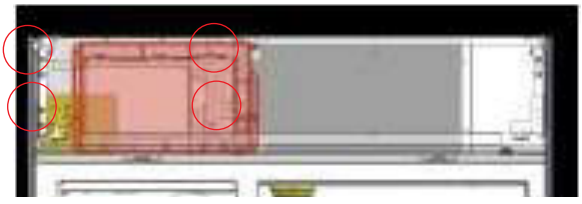
CAUTION - Deco case of the connecting lines are connected to the sensor, so please carefully separated.

2-4. PCB Cover

1) Remove the top cover
2) Remove the Top decor.
3) Remove the Case Decor.
4) Remove the ground.



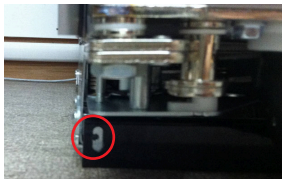
5) After removing PCB Cover Screw, remove the cover.



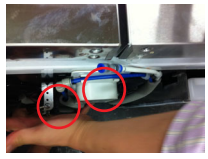
3. F - Door

CAUTION - Before remove the door, remove the foods on the shelfs and empty the ice bucket.

1) Remove both side of screw, and separate lower cover.




2) Disconnect the water tube to the dispenser (Blue Tubing).

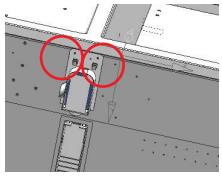


3) Loosen the ground screw pointed in red

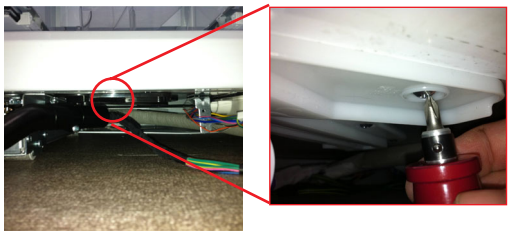


CAUTION - Work space is limited, so use a small screw or a rachet.

4) Use offset rachet driver for loosen two screws in red

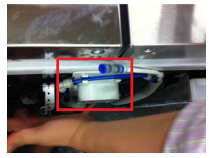
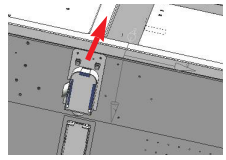
5) Open the Freezer door to full fully opened position (130 degrees)
6) Loosen screw in red with rachet or small driver.



7) Pull the lead wire cover coming from the bottom of the door.



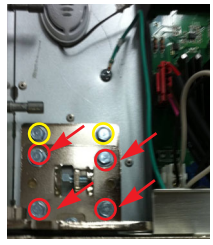
8) Separate housing supporter.

9) Disconnect the all wire coming from the bottom of the door.

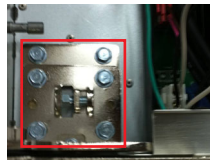


10) Close the door.
11) Remove the top cover.
12) Loosen the bolts in red



CAUTION - Do not loosen the bolts in yellow.
Another worker hold the F-door.

13) Remove the upper bracket.



14) Raise the F-door and remove it.
15) Loosen two screws bottom of the F-door.
16) Split lead wire cover.

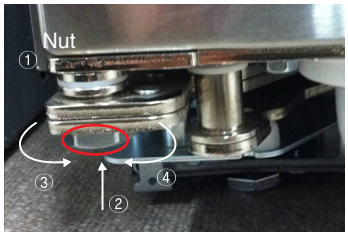



CAUTION - Do not discard the connector or the cover for the water tubing an wires. Hold these for use when reinstalling the door.

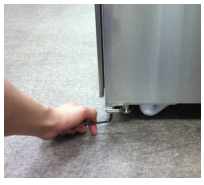
HOW TO DISASSEMBLE AND ASSEMBLE

3-1. F - Door, adjustment top and bottom.

1) Loosen the hexagon nuts located in the bottom of the lower hinge below F-door.(①)



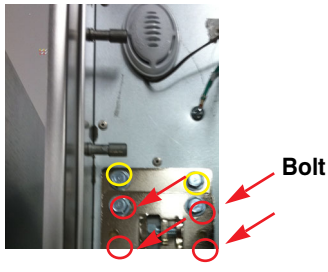
2) Loosen or tightening the hex wrench into ② to adjust the door top and bottom.
3) To raise the door, turn the nut toward ③ direction. To drop the door, turn the nut toward ④ direction.



4) After adjustment, Tightening the hexnut located at the bottom of lower hinge.

3-2. F - Door, adjustment Right and left.

1) Remove the top cover.
2) Loosen the 4 bolts of F - upper hinge by vox wrench counterclockwise 4~5 times.
Do not loosen the bolts marked in yellow.



3) To modify the level difference right and left, use the adjust - bolt marked in red.

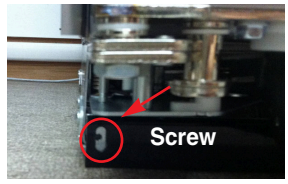


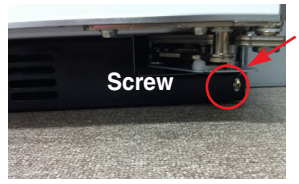
4) After modify the level difference right and left, Tightening the 4 bolts of F - upper hinge.

4. R - Door

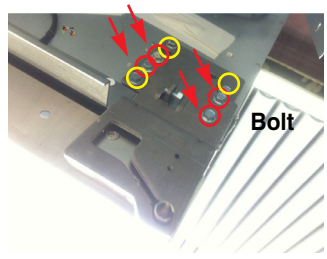
CAUTION - Please remove all food on the shelf before removing the door.

1) Remove the both sides of the screw at Lower cover. And remove lower cover.





2) Remove the top cover. See the previous page.
3) Remove the machine cover. See the previous page.
4) Remove 4 bolts marked in red. Do not loosen 3 bolts marked in yellow.

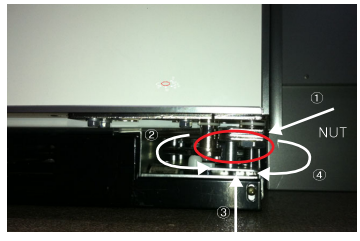


CAUTION - Use small driver, Ratchet or vox wrench.

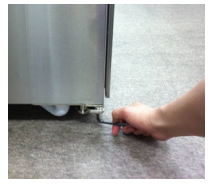
5) To remove R - door, lift up R - door.
**Assembly is reverse order.

4-1. R - Door, adjustment top and bottom.

1) Loosen the hex ① nut at the bottom of the lower hinge below R – door.



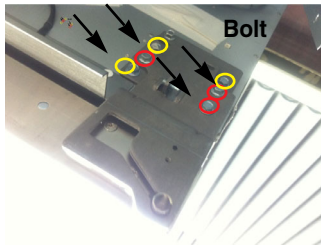
2) By loosen or tight the nut at ② by hex wrench, adjust the level difference of top and bottom.
3) To raise door turn toward ③ direction, To drop door turn toward ④ direction.



4) After adjustment, tighten the hex nut at the bottom of lower hinge.

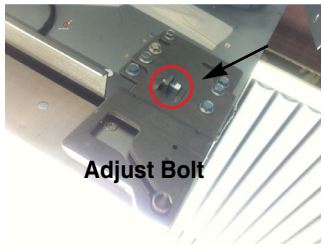
4-2. R - Door, adjustment of level difference of right and left.

1) Remove the top cover. See the previous page.
2) Remove the Machine cover. See the previous page.
3) Loosen 4 bolts 4 or 5 times counterclockwise.
   Do not loosen bolts marked in yellow



CAUTION - Use small driver, Ratchet or vox wrench.

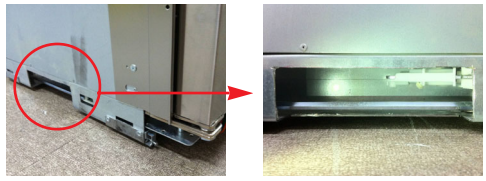
3) Use adjust bolt to adjust level difference.



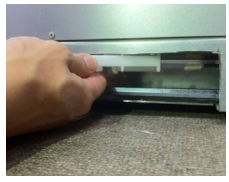
4) After step 3), tighten 4 bolts at R - Upper Hinge.

4-3. Door hinge damper

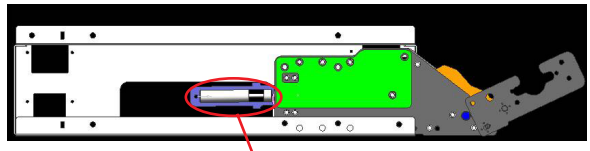
1) Pull out the refrigerator from the installation.
2) Open the door fully. (130°)
3) Remove white cable tie of guide stopper.

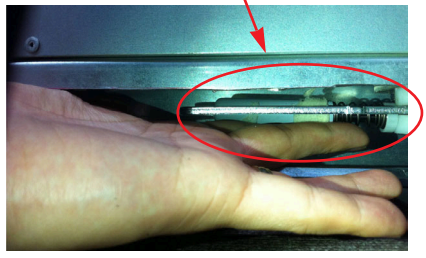


4) Pull out the guide stopper completely.



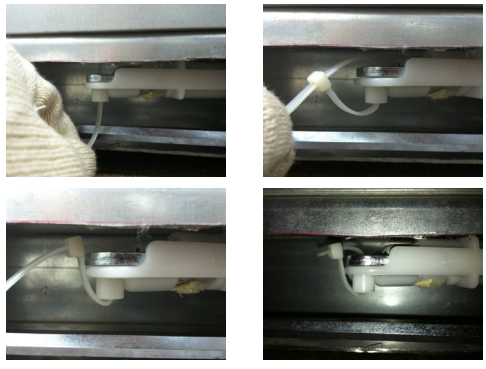
5) Open the door at 60° And then remove / change white colored damper.





NOTE - It is easy to remove when door opened 60°

6) Open the door fully. (130°)
7) Assemble Guide stopper.
Fasten guide - stopper and hinge by using cable tie.



NOTE - Working space is small, and the work surface is narrow. so, should be wearing gloves.

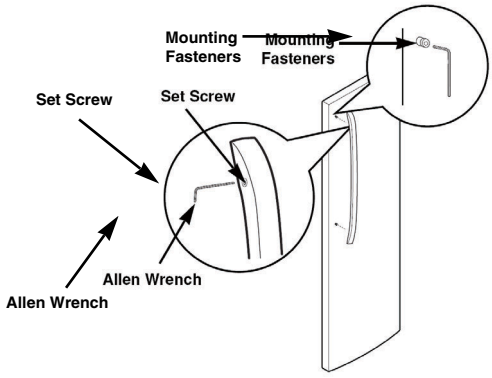
HOW TO DISASSEMBLE AND ASSEMBLE

5. HANDLE

1) HANDLE REMOVAL

• To move the refrigerator through a house door, it may be necessary to remove the refrigerator door handles.

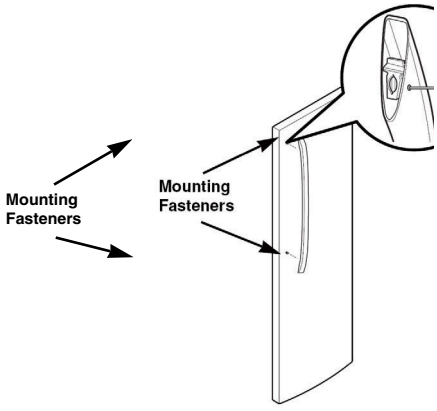
Note : • Handle appearance may vary from illustrations on this page.



• Loosen the set screws with a 2.5mm (3/32”) Allen wrench and remove the handle.

Note : • If the handle mounting fasteners need to be tightened or removed, use a 1/4" Allen wrench.

2) HANDLE REINSTALLATION

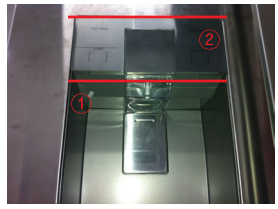


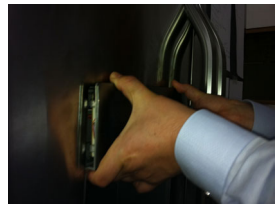
• Place the handle on the door by aligning handle footprints to fit mounting fasteners and tighten the set screws with a 2.5mm (3/32”) Allen wrench.

Note : • If the handle mounting fasteners need to be tightened or removed, use a 1/4" Allen wrench.

6-1. DISPENSER DISPLAY

1) As below picture, separate part ① from unit and Pull part ②

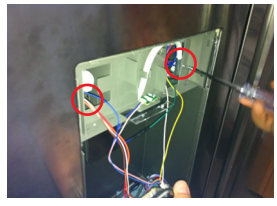




2) Separate housings and remember the pair to prevent Miss assembly.



3) Loosen two screws pointed in red, separate one housing, separate water-supply-pipe from hook.







HOW TO DISASSEMBLE AND ASSEMBLE

6-2. FUNNEL ASSEMBLY

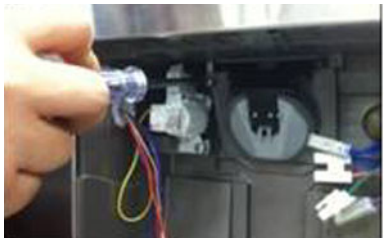
1) Remove the screw fixing the button lever.
2) Pull out funnel assembly.



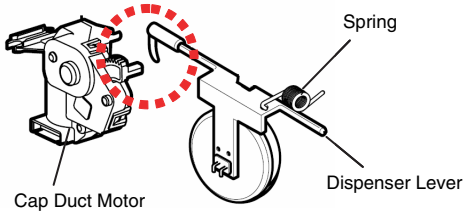


6-3. CAP DUCT

1) Remover the metal tab shown below to remover the duct cap.



2) To install the duct cap assembly, insert one end of the spring into the right hole of the dispenser lever and insert the other end into the right hole in the top part of the dispenser. Then attach the holder at the cap duct motor.



6-4. CAP DUCT MOTOR

1) Remove the duct cap motor housing.



2) Unscrew 3 screws to disassemble the motor.



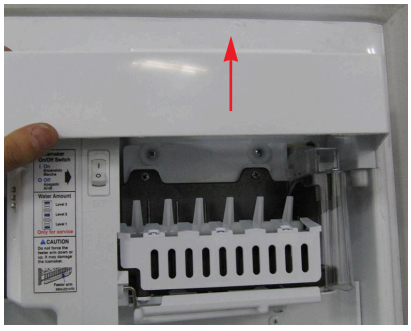
HOW TO DISASSEMBLE AND ASSEMBLE

7-1. ICE MAKER

1) Separate Ice bucket as picture below.



2) Push up bucket cover.



3) Loosen the screws as shown in the picture.And disconnect housing and ground wire.

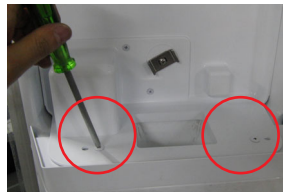


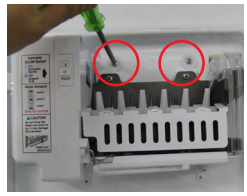


4) Separate Icemaker.

7-2. AUGER MOTOR COVER

1) Separate bucket cover and Ice bucket. Loosen The screws pointed in red.





2) Sepatate Icemaker with disconnect housing at the behind of Icemaker





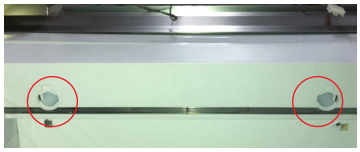
3) Find the motor cover at the back of icemaker, Loosen screws and separate motor cover.



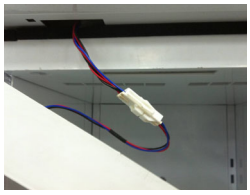
HOW TO DISASSEMBLE AND ASSEMBLE

8-1. F –LAMP CASE

1) Loosen the two screws and remove the lamp case.



2) Separate a housing and remove F-lamp case.

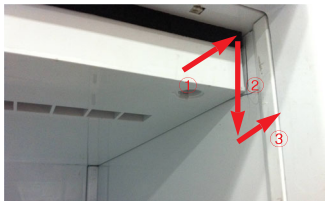


3) Assembly is reverse order.

8-2. F –SHROUD ASSEMBLY

1) Remove the F-lamp case.
And 2 screws marked in red.





2) To remove the Multi-Duct: 1st pull out then down then out again.
Caution this has a tight fit, so it is necessary to pul with some force.

3) Separate multi duct.

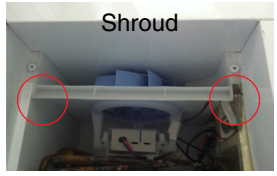


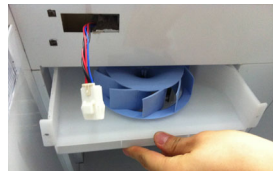
NOTE – turn the multi duct when remove it.

5) Separate a housing as remarked.

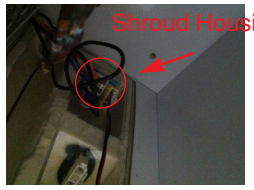


6) Remove 2 screws marked in red.
And separate shroud on the way of picture below.





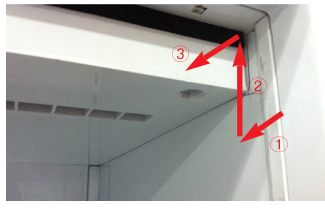
7) Separate the housing as remarked.



8) When you assemble multi duct, please refer to below instruction.



① Insert the housing of multi duct.
② As like above picture, please hold up back of multi duct.
③ Then push as shown as shown below steps.



NOTE – At step ③, push the multi duct strongly.
(Because it is tight fit.)

HOW TO DISASSEMBLE AND ASSEMBLE

9-1. R –DISPLAY CASE

1) Remove 2 screws marked in red.



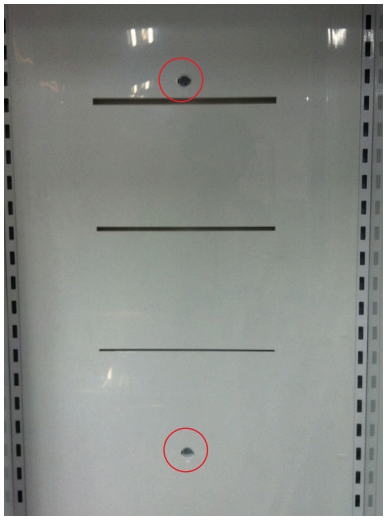
2) Separate a housing.And remove display case completely.

3) Assembly is reverse order.

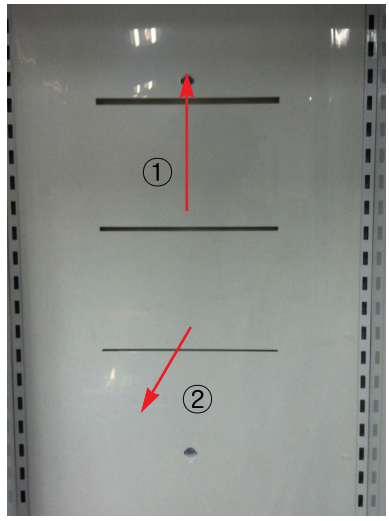
9-2. R –MULTI DUCT

1) Remove all of the shelfs and drawers.

2) Remove 2 screws marked in red.



3)Raise the multi duct (①)Pull the multi duct.(②).



4)Assembly is reverse order.

9-3. R –WATER VALVE

1) Turn off the power of the refrigerator (Press the POWER button for 3 second to turn off the power). And turn off the water.

2) Follow [R-Damper 4)] Open the refrigerator door.then disassemble drawers.See the DISASSEMBLE COMPARTMENT.



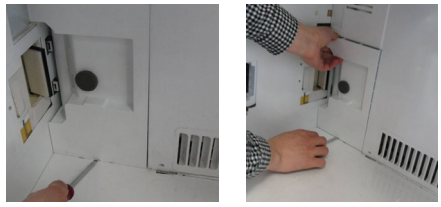
3) Remove the attaching screw on the left side.Then take off the rail.



4) Remove the screw on the duct. And pull out the duct to remove.



5) Insert a screwdriver to bottom hole. then lift up and pull out bracket .

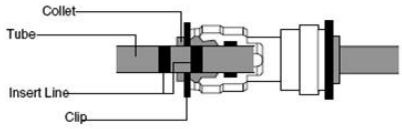


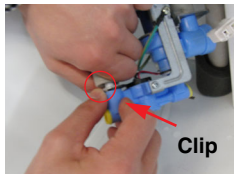
6)Disconnect the housing.

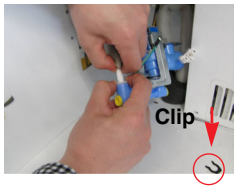


HOW TO DISASSEMBLE AND ASSEMBLE

7) Lay a dry towel on the bottom of inner case and get ready to spill water from the water tank.
Pull out the clip then press the collet to separate the tube from the valve and pour out the water until emptied.

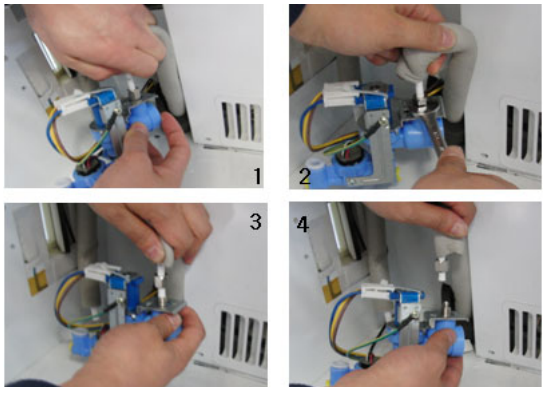






CAUTION – When assemlbly,as shown,do not forget assemble the clip.

8) Disassemble the tube connecting of a valve with wrench.



9)Assembly is the reverse order of disassembly.

9-4. R –WATER TANK

1) Turn off the power of the refrigerator (Press the POWER button for 3 second to turn off the power).
And turn off the water.

2) Follow step 4)of the R-Damper

3) Insert a screwdriver to bottom hole.
then lift up and pull out bracket .





4) Remove the Grille fan cover.
Shown in the picture below.





5) Pull Water tank as shown below and remove tape.





6) Separate two tubes of Water tank marked in red.







7) Assembly is reverse order.

HOW TO DISASSEMBLE AND ASSEMBLE

9-5. R –SHROUD

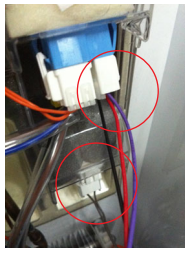
1) Turn off the power of the refrigerator (Press the POWER button for 3 second to turn off the power).
2) Follow as shown [R-Water tank 4)]
3) Follow as shown Disassemble compartment.
4) Remove the [R -Multi duct.]
5) turn the Water tank clockwise.



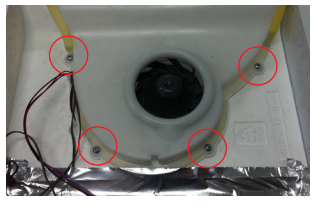
6) Remove 4 screws as shown below at the grille fan.And separate grille fan



7) Separate 2 housings connected to inner case.



8) Remove 4 screws on the shroud assembly.And remove shroud assembly.



9) Assembly is reverse order.

10. Side LED Lamp cover.

1) By use a flat head screwdriver at marked in red,pull the LED lamp cover.



2) When assembly,assemble new LED lamp cover. Because lamp cover is easily destroyed when disassemle step.

11. Guide Rail

1) Firstly pull the rail fully, and Loosen the screw shown in the Picture. Then you can disassemble Rail guide.



HOW TO DISASSEMBLE AND ASSEMBLE

11. Fan And Fan Motor

1) Please draw Ref.to keep an 1 meter distance from the installation location.




2) You should seperate deco screws and then you can separate deco from Ref.

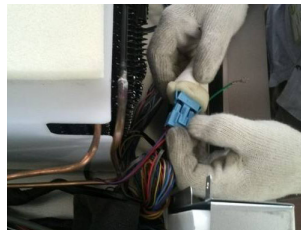
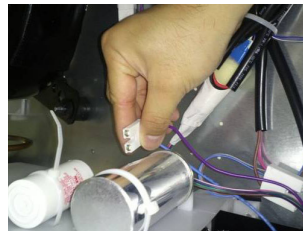



3) If you disassembly all screws fastened on back cover &top cover, you can see machinery room of Ref.

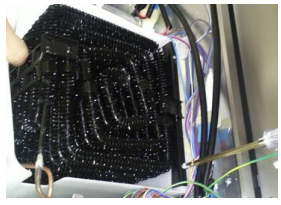
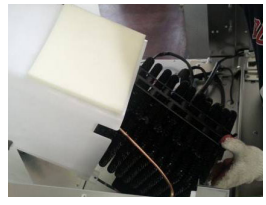
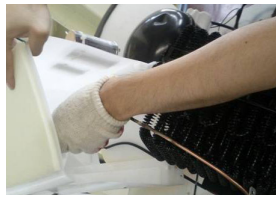




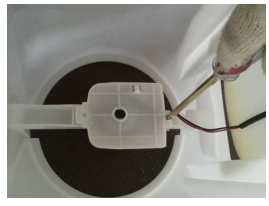
4) You should separate fan from fan guide. And then you should sepatate lead-wires of fan motor and capacitors.

5) Use Cation to make sure you do not bend the tubing.

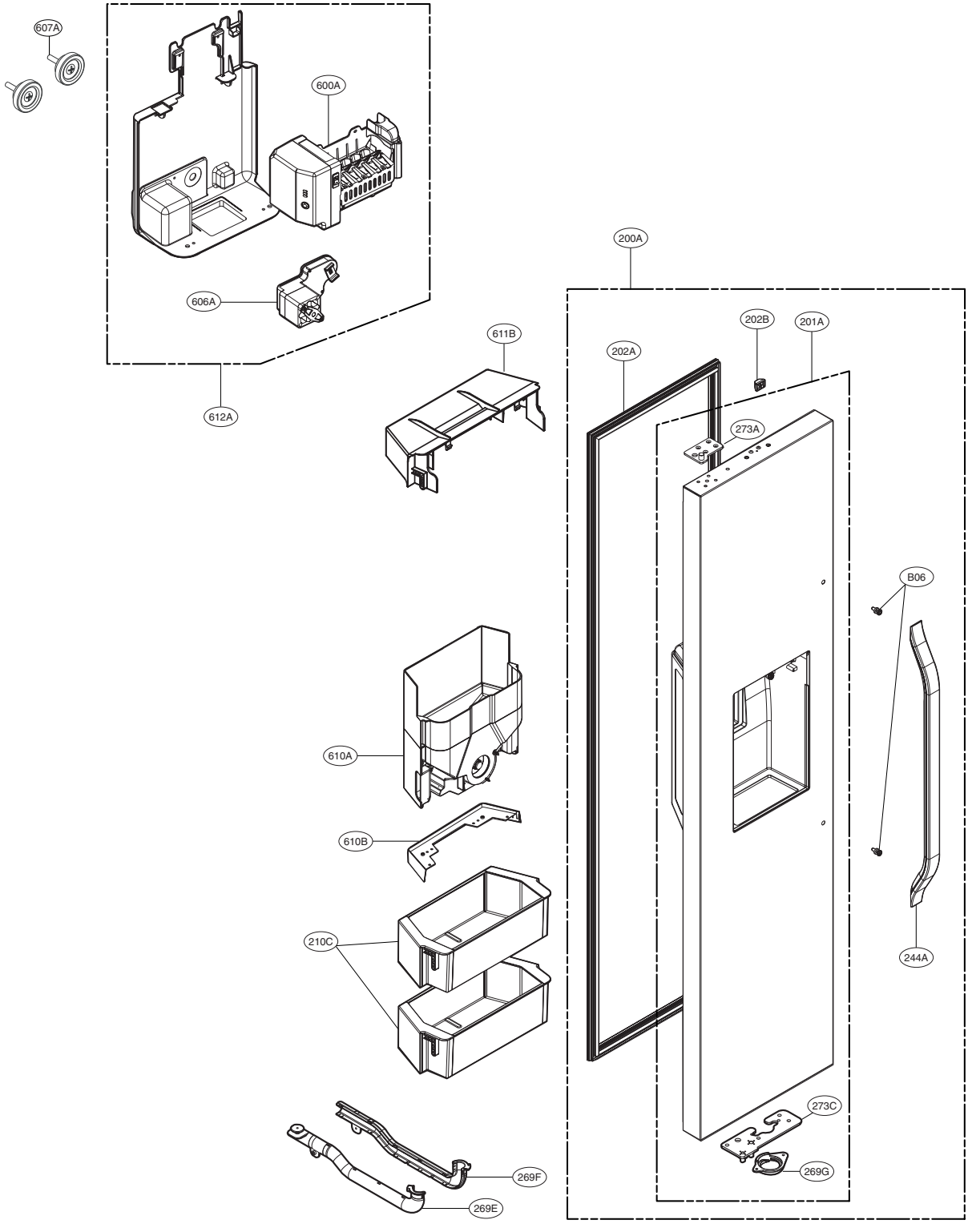
6) You can separate fan motor from guide fan.



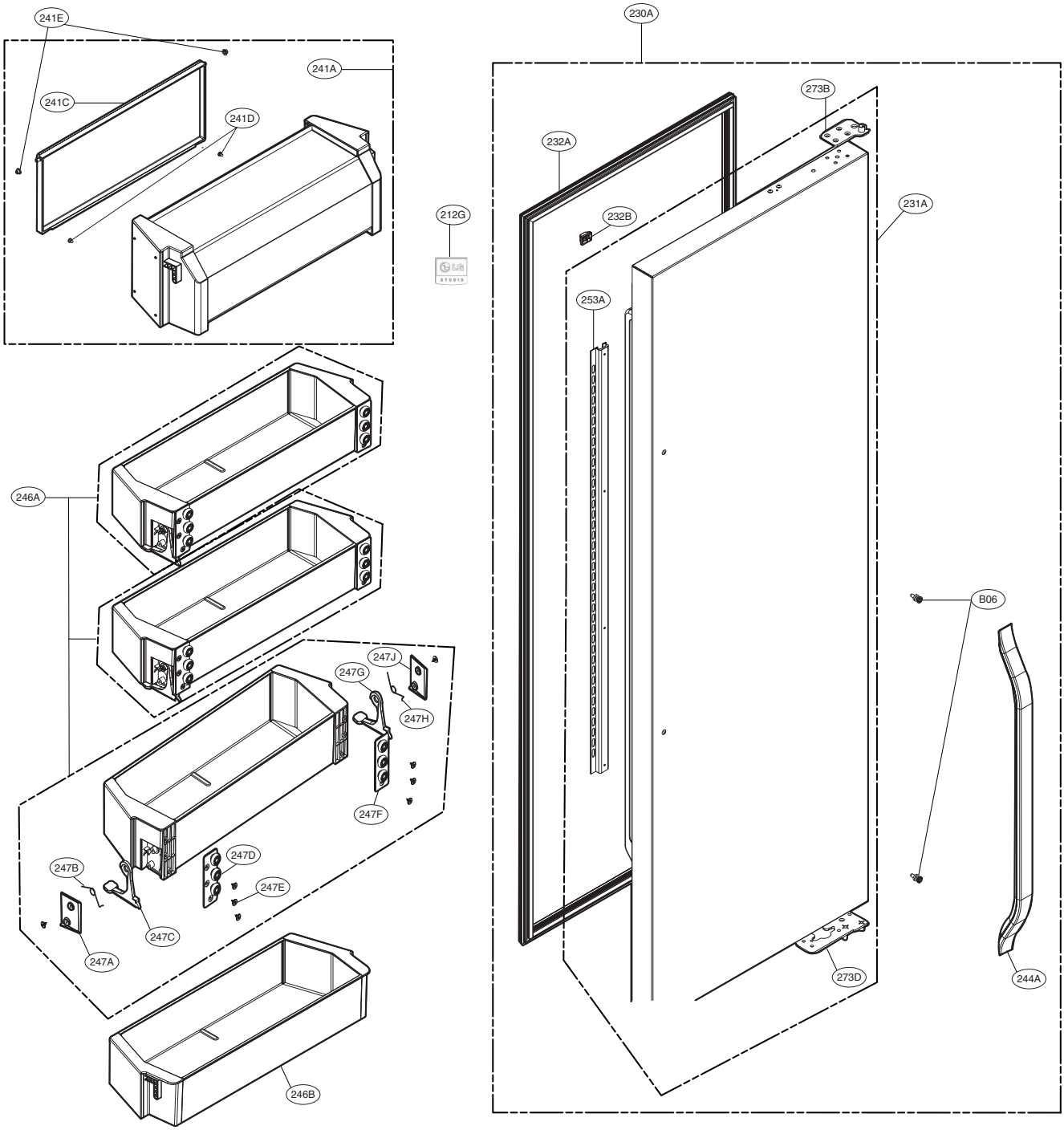
EXPLODED VIEW

FREEZER DOOR PART



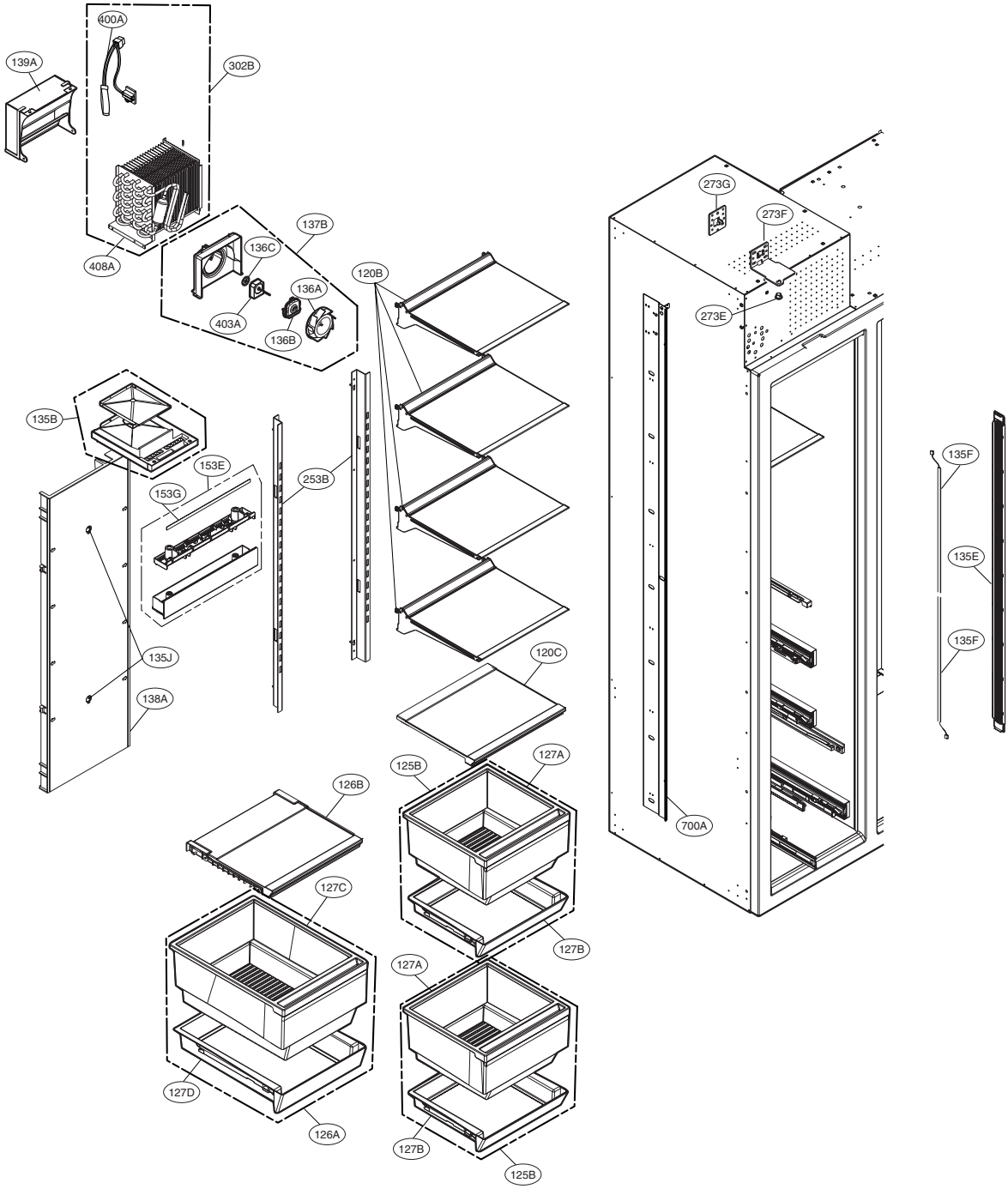
EXPLODED VIEW

REFRIGERATOR DOOR PART



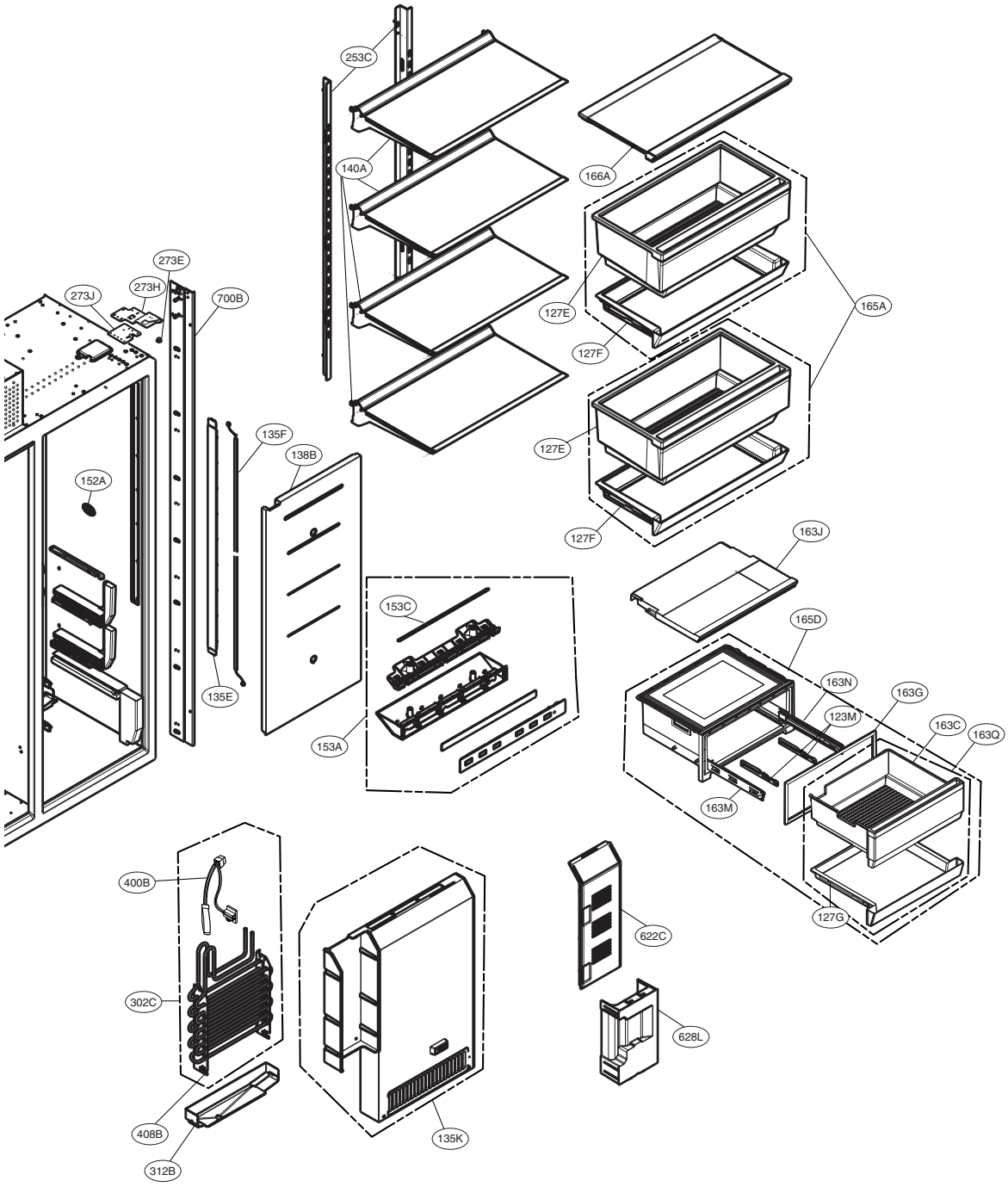
EXPLODED VIEW

FREEZER COMPARTMENT



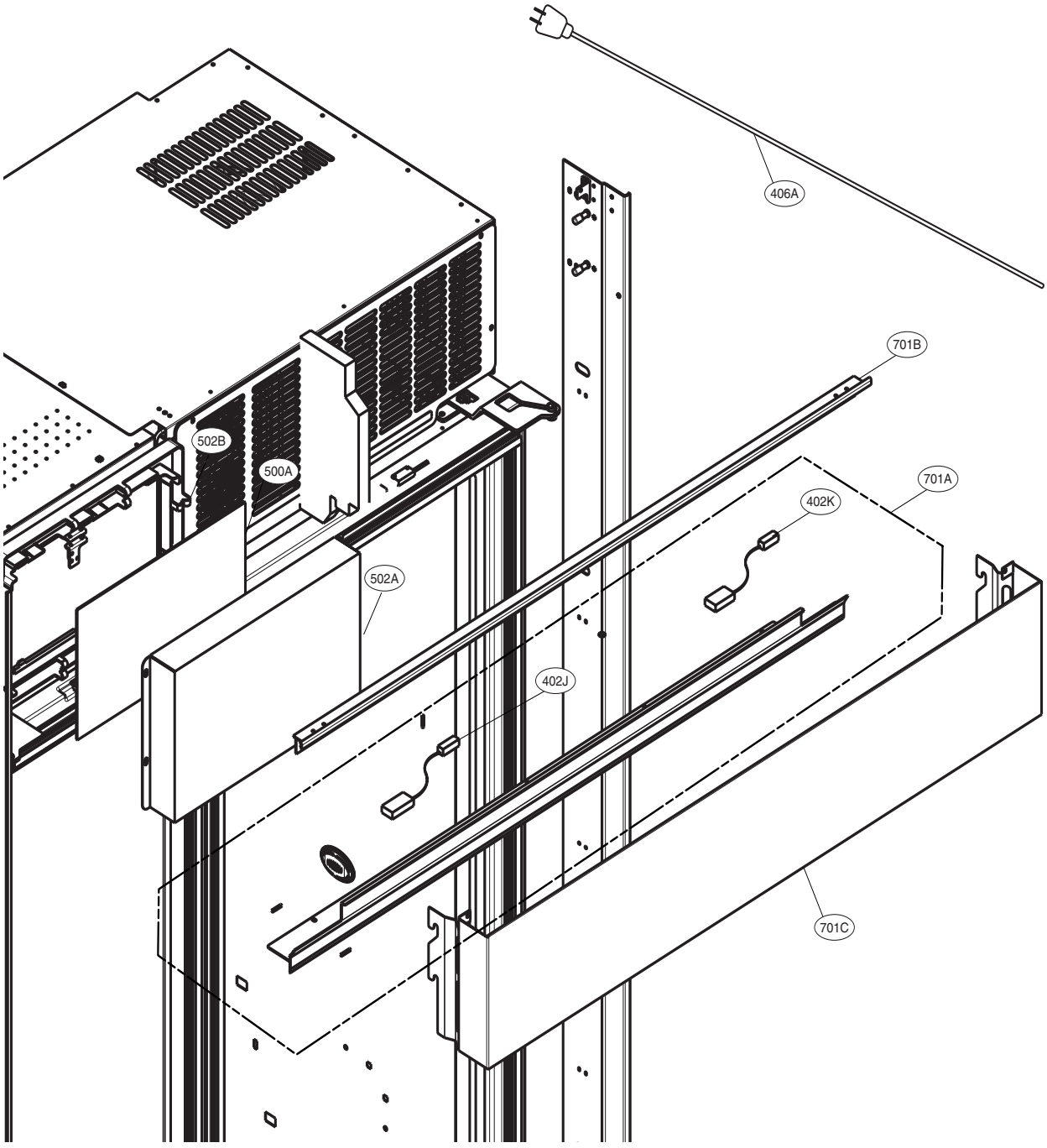
EXPLODED VIEW

REFRIGERATOR COMPARTMENT



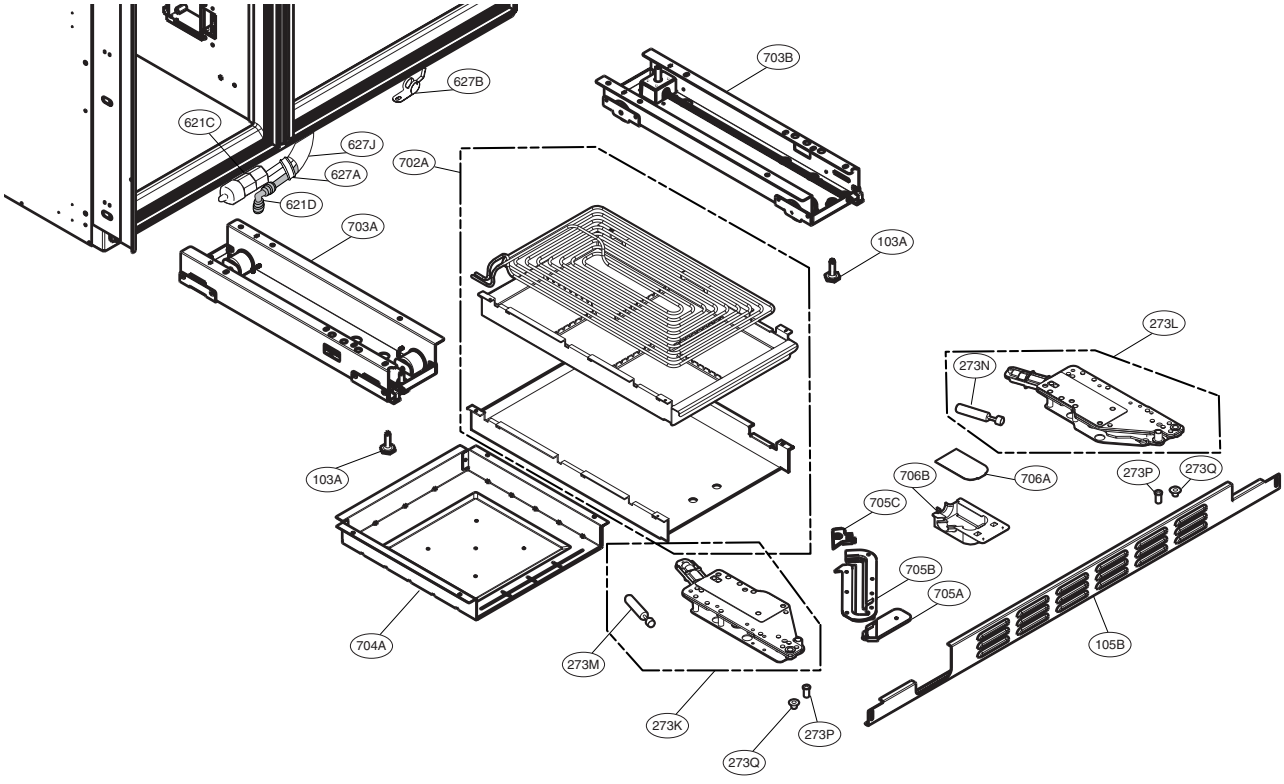
EXPLODED VIEW

TOP PART



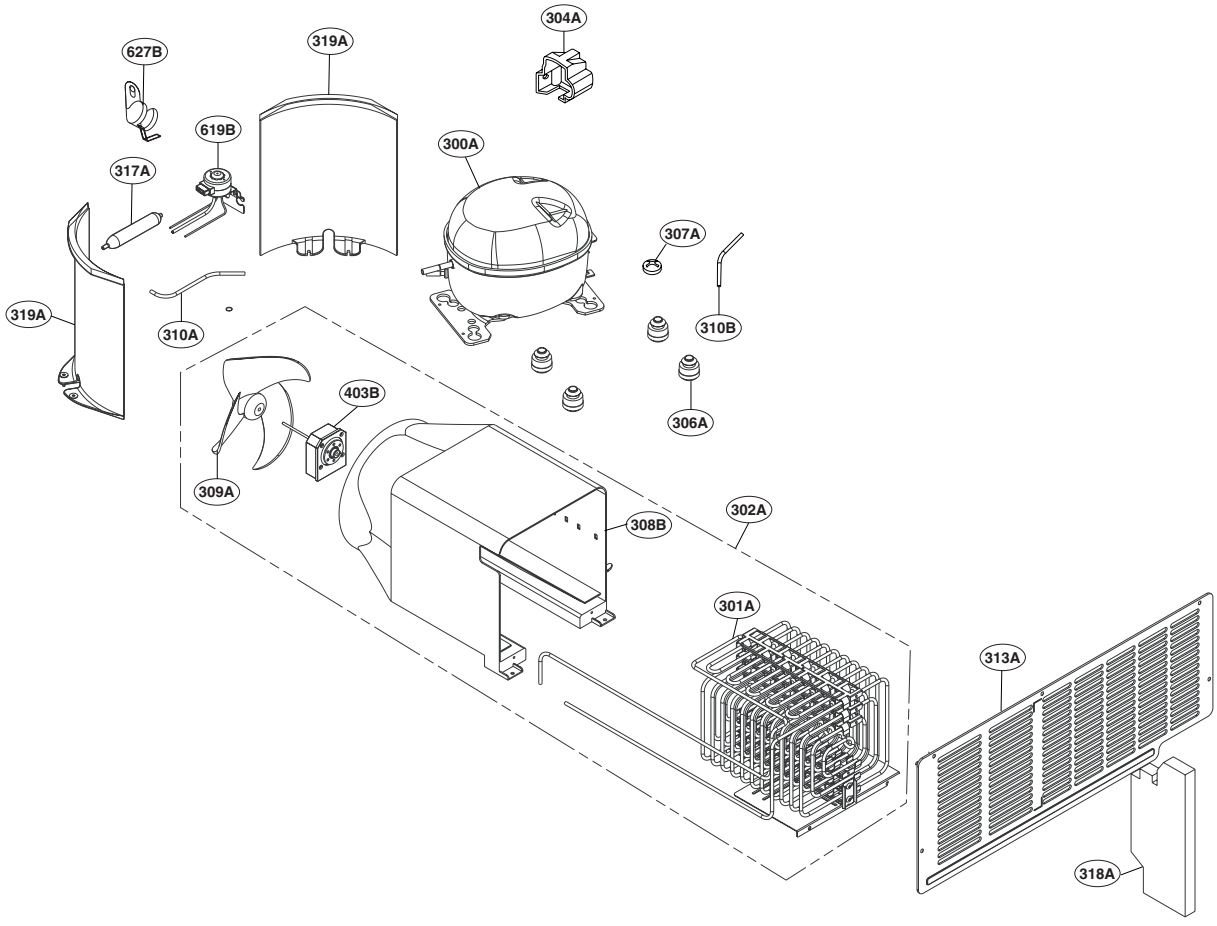
EXPLODED VIEW

LOWER PART



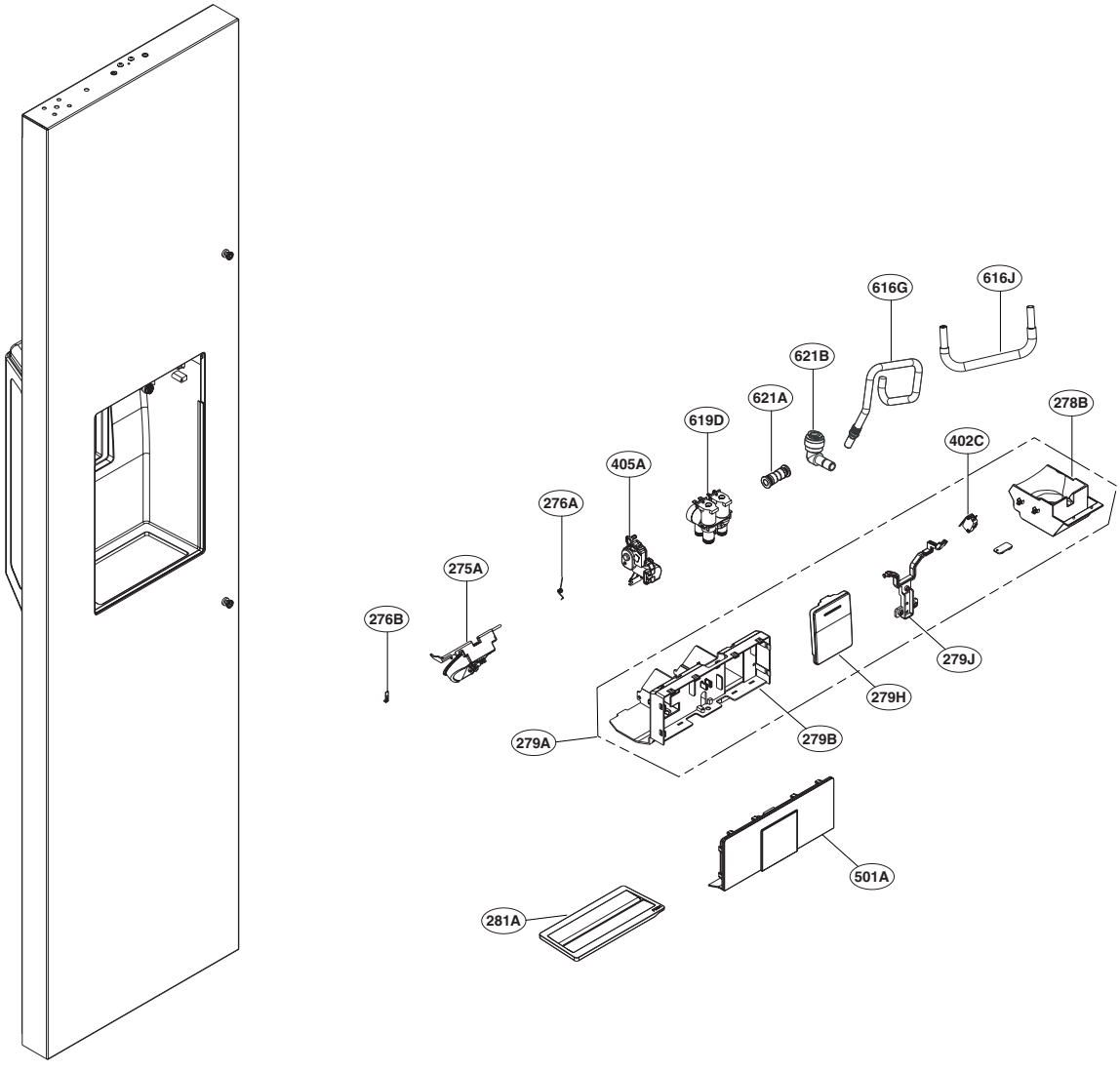
EXPLODED VIEW

MECHANICAL COMPARTMENT



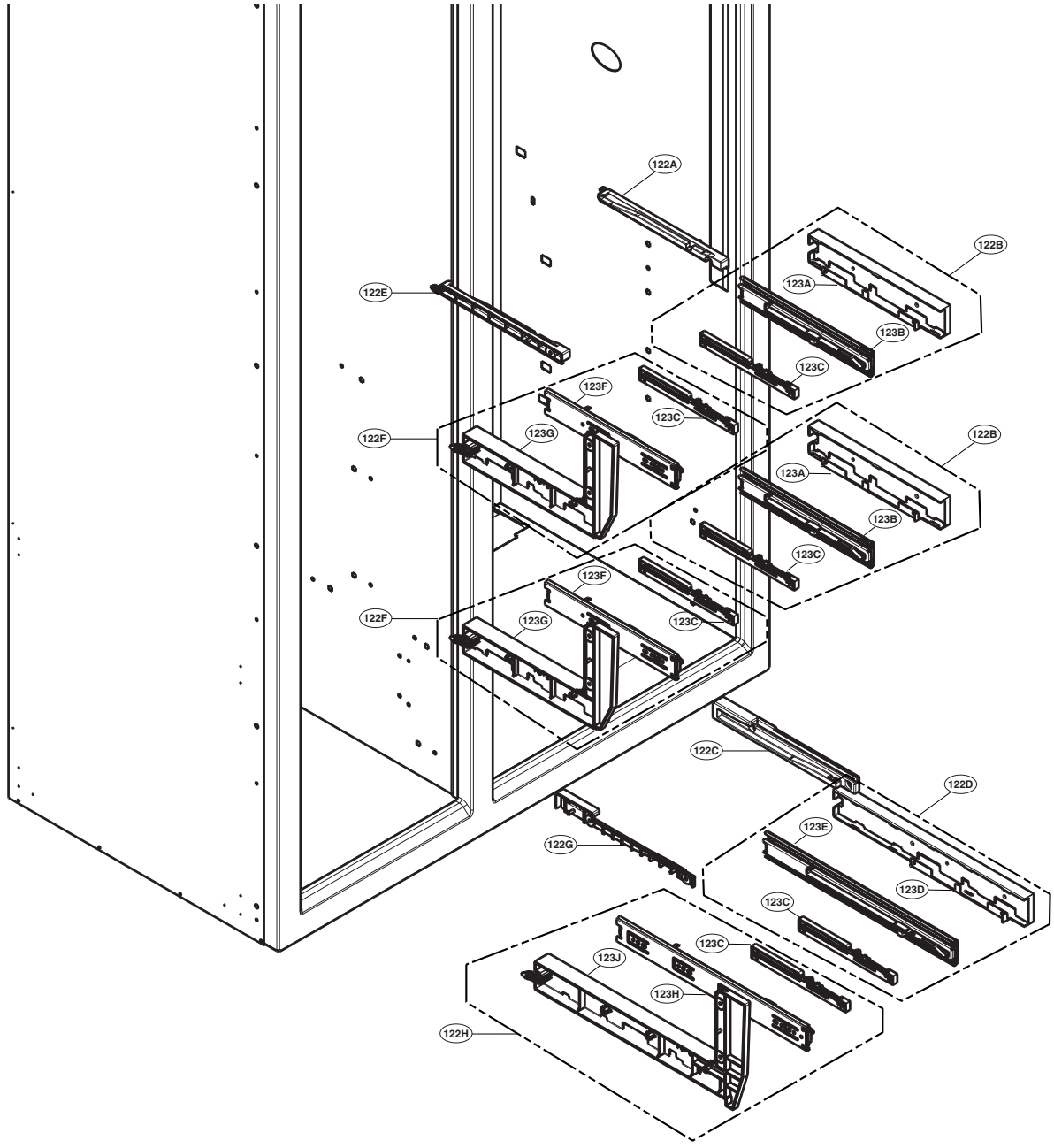
EXPLODED VIEW

DISPENCER PART



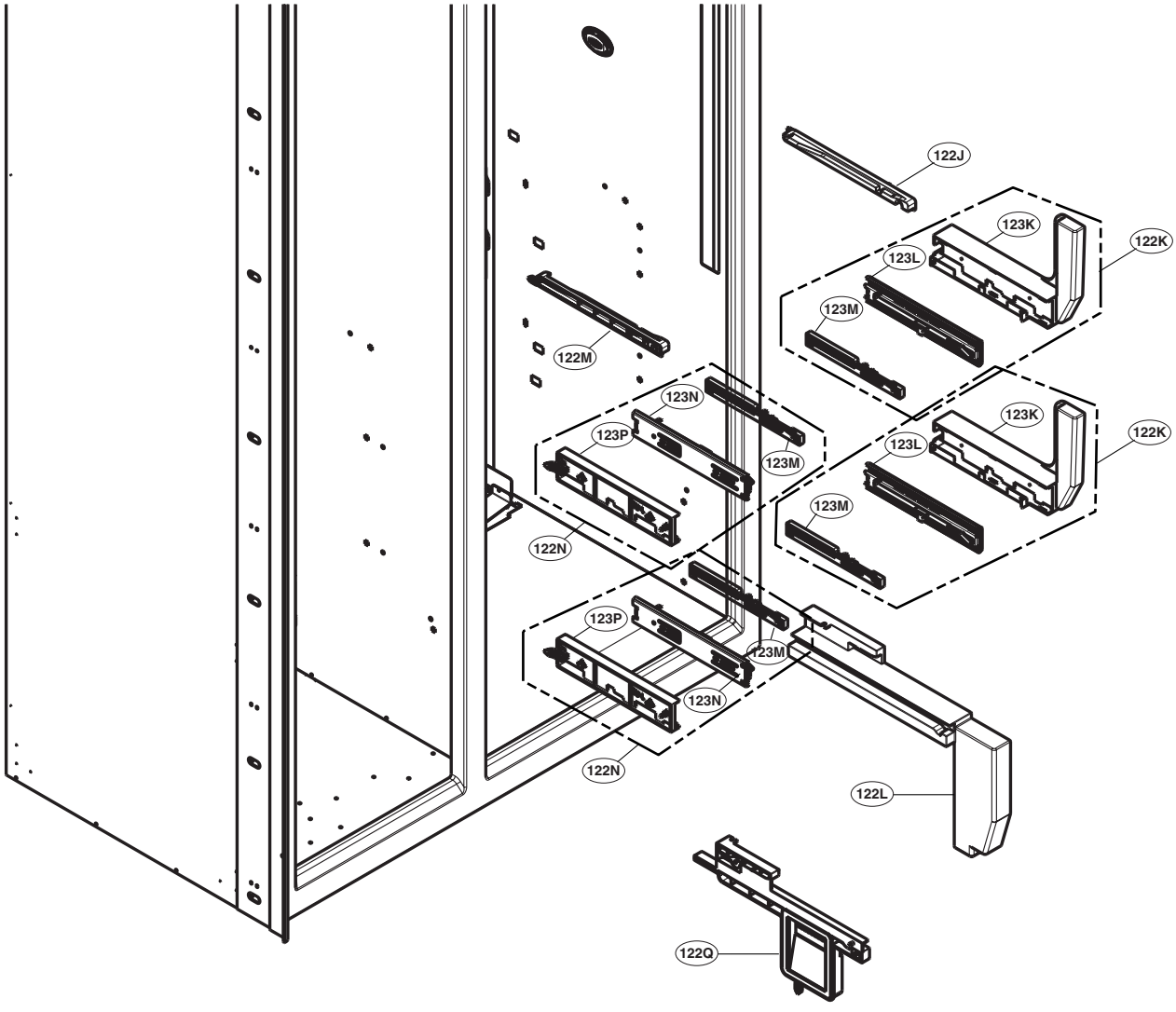
EXPLODED VIEW

FREEZER RAIL PART



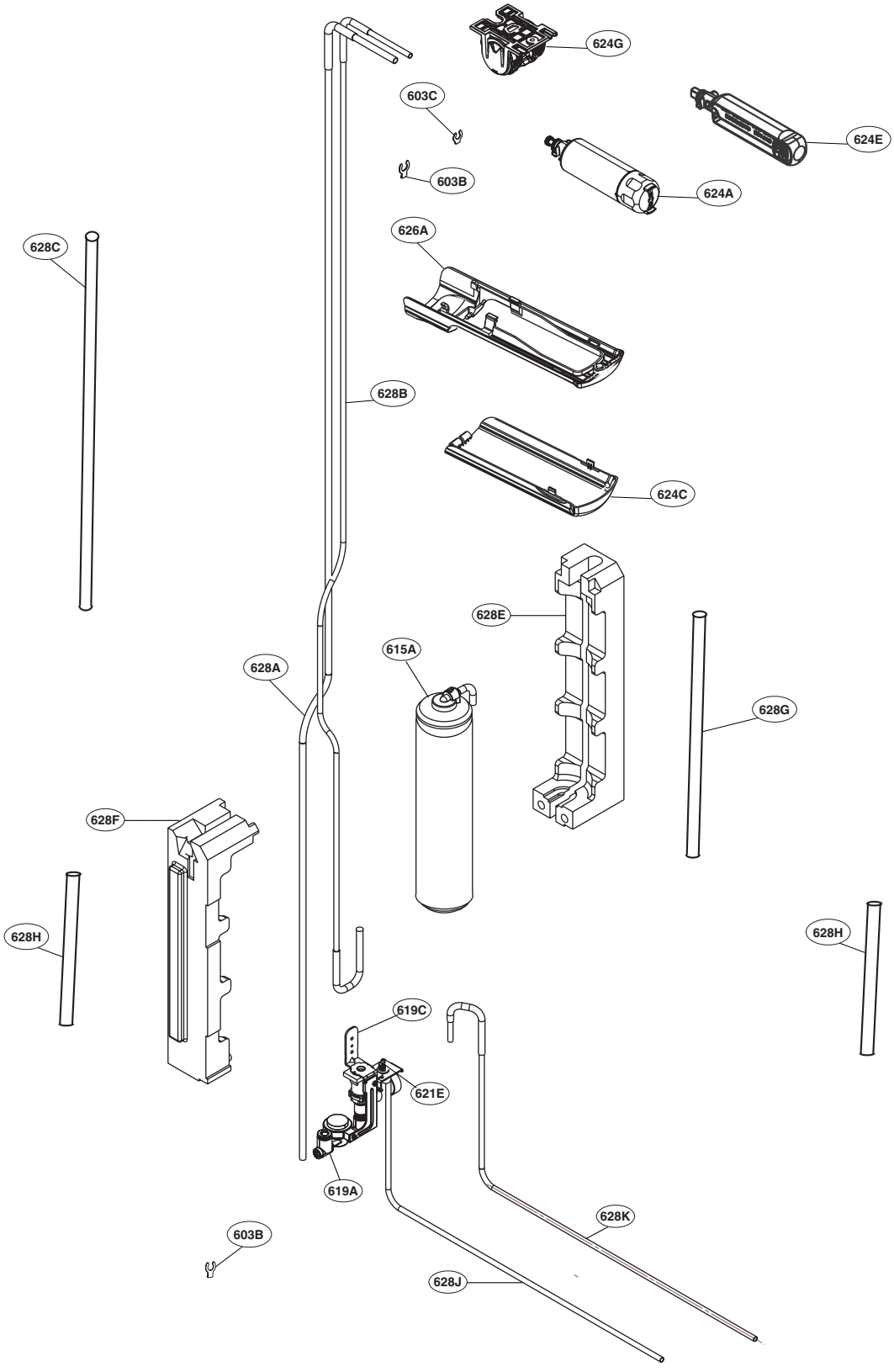
EXPLODED VIEW

REFRIGERATOR RAIL PART



EXPLODED VIEW

REFRIGERATOR RAIL PART





LG Electronics Inc.

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