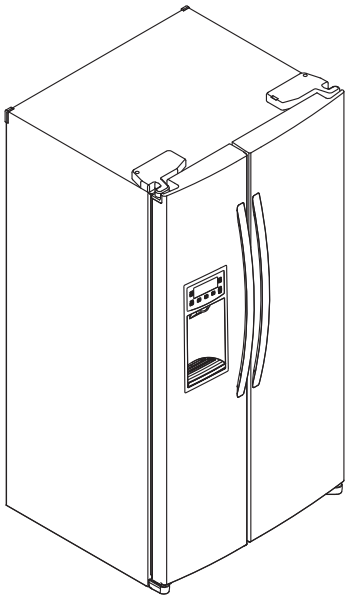
SXS REFRIGERATOR

SERVICE MANUAL

CAUTION

PLEASE READ CAREFULLY THE SAFETY PRECAUTIONS OF THIS MANUAL BEFORE CHECKING OR OPERATING THE REFRIGERATOR.



MODELS:

LSC23924ST
LSC23924SW
LSC23924SB

CONTENTS

⚠ SAFETY PRECAUTIONS

Please read the following instructions before servicing your refrigerator.

1.Check the refrigerator for current leakage.

2.To prevent electric shock,unplug before servicing.

3.Always check line voltage and amperage.

4.Use standard electrical components.

5.Don't touch metal products in the freezer with wet hands.This may cause frost bite.

6.Prevent water from spiling on to electric elements or the machine parts.

7.Before tilting the refrigerator, remove all materials from on or in the refrigerator.

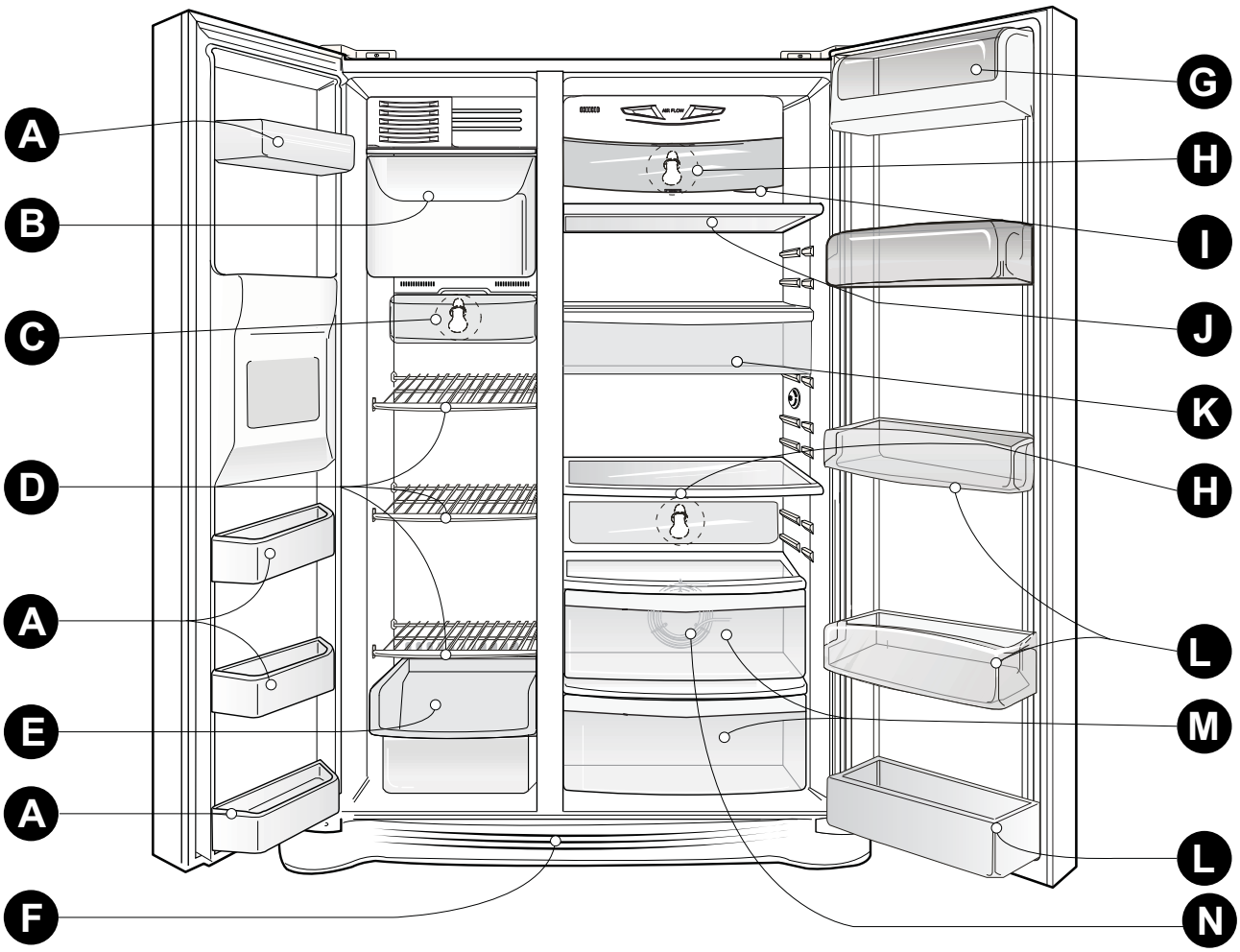
8.When servicing the evaporator, wear gloves to prevent injuries from the sharp evaporator fins.

9.Service on the refrigerator should be performed by a qualified technician.Sealed system repair must be performed by a CFC certified technician.

1. SPECIFICATIONS

	SPECIFICATIONS	MODELS		
		LSC23924SW	LSC23924SB	LSC23924ST
GENERAL FEATURES	Color	SUPER WHITE	BLACK	STAINLESS
	Dimensions (in)	(37)(35 2/7)(70 1/2)in		
	Net Weight (lb)	284.17 Lb		
	Capacity	23cu.ft		
	Refrigerant	R134A		
	Climate Class	TEMPERATURE (N)		
	Rated Rating	115/60		
	Cooling System	FAN COOLING		
	Temperature Control	MICOM CONTROL		
	Defrosting System	FULL AUTOMATIC		
		HEATER DEFROST		
	Insulation	CYCLO PENTANANE		
	Compressor	LQ69LAUM		
	Evaporator	FIN TUBE TYPE		
	Condenser	WIRE CONDENSER		
	Lubricanting Oil	POLIYOL ESTER 310 +/- 10cc		
	Drier	MOLECULAR SIEVE XH-7		
	Capillary Tube	ID Ø 0.75		
	First Defrost	4 HOURS		
	Defrost Cycle	13-70 HOURS		
	Defrosting Device	SHEATH HEATER		
	Anti-freezing Heater	WATER TRANK HEATER		
REFRIGERATOR	Case Material	EMBO		
	Door material	PCM	VCM	STAINLESS
	Handle Type	B-VISTA		
	Guide, drawer	YES		
	Basket,Quantity	4 FULL		
	Ice Tray & Bank	AUTO ICE MAKER + SPACE PLUS		
	Cover T/V	T/GLASS		
	Tray,Drawer	YES		
	Lamp	YES(2 LED)		
	Shelf	S/PROOF		
	Tray, meat	YES		
FREEZER	Basket,Quantity	4 PLASTIC		
	Lamp	YES (1)		
	Shelf	3EA(WIRE)		

2. PARTS IDENTIFICATION



Use this page to become more familiar with the parts and features. Page references are included for your convenience.

Note: This guide covers several different models.The refrigerator you have purchased may have some or all of the items listed below. The locations of the features shown below may not match your model.

- **A** Freezer Door Rack
- **B** Automatic Icemaker
  The ice is produced in the icemaker and sent to the dispenser.
- **C** Freezer Lamp
- **D** Freezer Shelf
  (Wire/Glass)
- **E** Drawer (Wire/Plastic)
- **F** Base Grille
- **G** Dairy Corner
  For storage of dairy products such as butter and cheese.
- **H** Refrigerator Lamp
- **I** Water Filter*
- **J** Refrigerator Shelf
- **K** Snack Pan
  For storage of meat or fresh food.
- **L** Refrigerator Door Rack
  (Crystal/Opaque)
- **M** Vegetable Drawer
- **N** Coil Tank Water

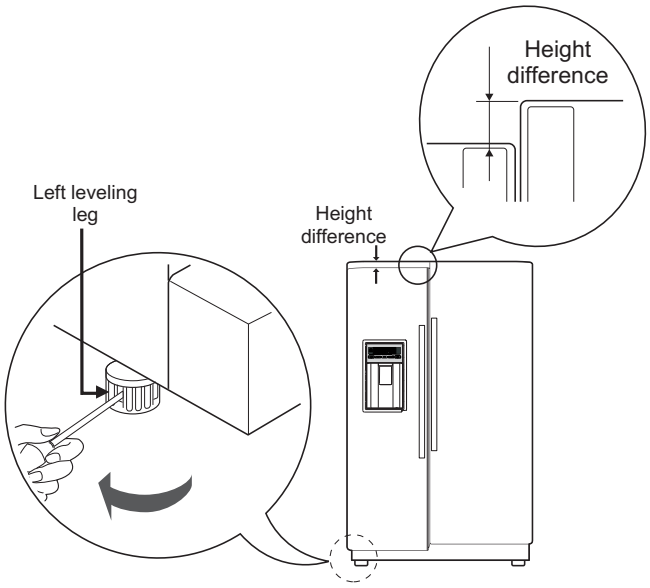
* On some models

3. HOW TO INSTALL THE REFRIGERATOR

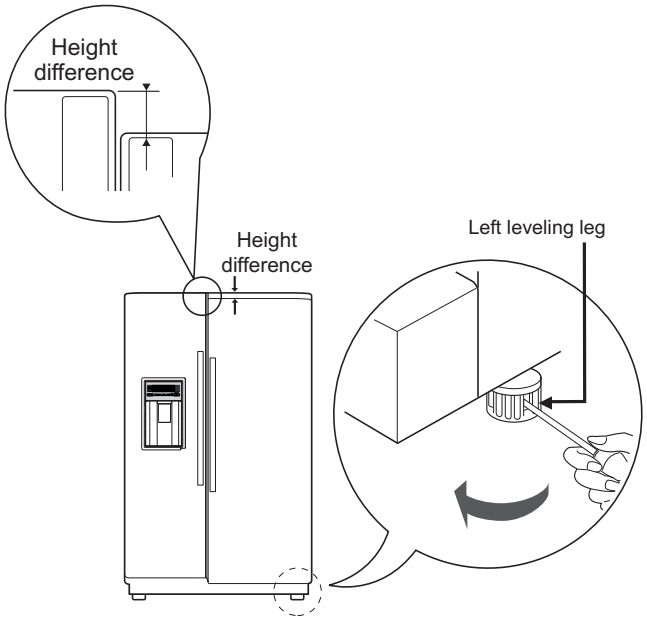
1. DOOR ALIGNMENT

Before adjusting the doors, remove the Base Grille.

If the freezer compartment door is lower than the refrigerator compartment door, make them level by inserting flat blade screwdriver into the groove of the left leveling leg and rotating it clockwise.

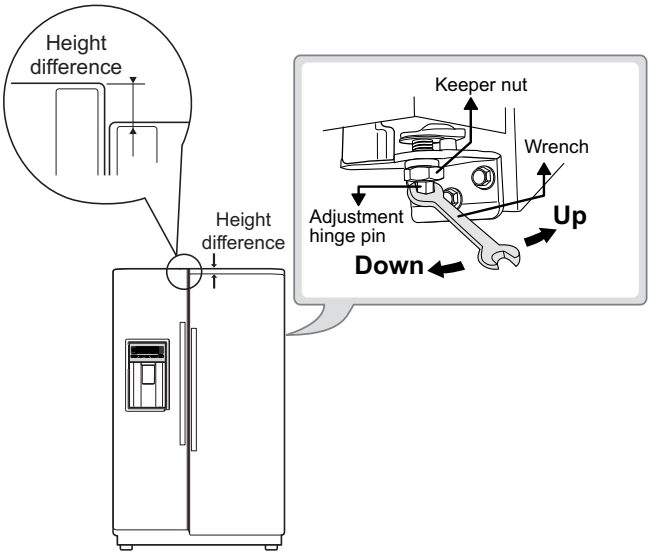


If the freezer compartment door is higher than the refrigerator compartment door, make them level by inserting flat blade screwdriver into the groove of the right leveling leg and rotating it clockwise.



Adjust the level when the refrigerator door is lower than the freezer door during the installation of the refrigerator.

Tools you need
- Wrench 5/16 in (8 mm)
- Wrench 3/4 in (19 mm)



Using a ¾" (19 mm) wrench, turn the keeper nut clockwise to lossen the keeper nut.

Using a 5/16" (8 mm) wrench, turn the adjustment hinge pin clockwise or counterclockwise to level the refrigerator and freezer door.

After adjusting the level door, turn the keeper nut counterclockwise to tighten.

Do not over tightening the door adjustment screw. The hinge pin can be pulled out. (Adjustable range of height is a maximum of ½" (1.27 cm)).

AFTER LEVELING THE DOOR HEIGHT

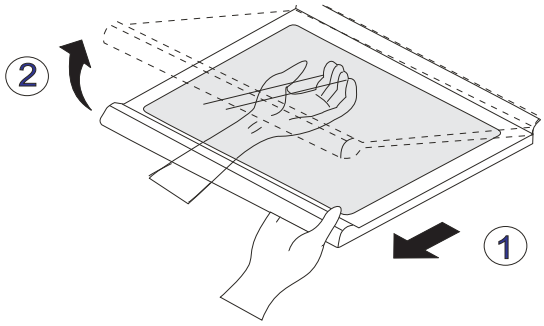
Make sure the front leveling legs are completely touching the floor.

2. INSTALL WATER FILTER

Before removing or installing water filter:

1. Take out the top shelf and move it to the lowest level.

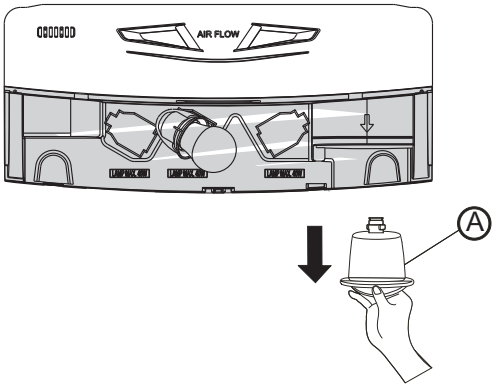
2. **IMPORTANT:** Turn off household water supply.

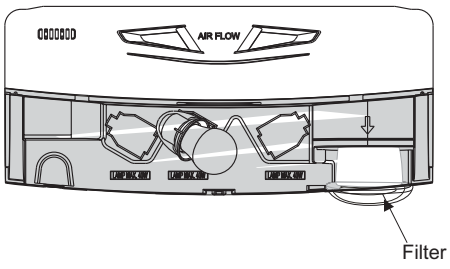


Removing the water filter:

1. For first-time installation, remove filter substitute cap (A) by turning it counterclockwise a quarter turn and pulling it down.

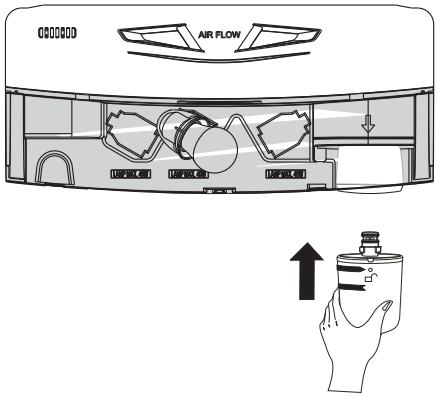
2. For subsequent installation, remove old filter by slowly turning it to the left a quarter turn and pulling it down.





Installing the water filter

Remove red cap from the filter and insert the two tabs on the filter tip into the two slots in the refrigerator filter receptacle. You should feel the filter entering completely. Turn the filter to the right a quarter turn clockwise to lock it into place. The locked symbol will be lined up with the indicator arrow.



After installing water filter

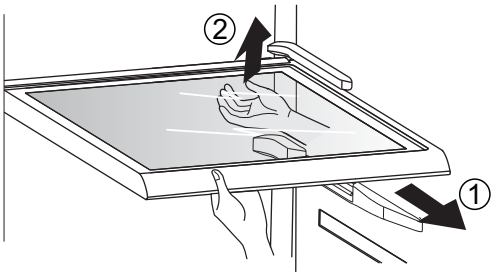
a) Replace the shelf to the initial position.
b) Turn on household water supply.
c) Dispense 2.5 gallons (9.46 L) of water to purge the system, depressing and releasing the dispenser button (30 seconds ON, 60 seconds OFF).
Open the refrigerator door and check the shelf area for leaks.

3. REFRIGERATOR SHELVES

⚠ CAUTION

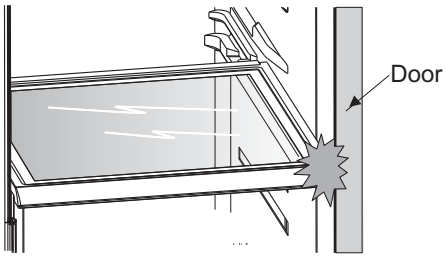
Make sure to keep shelf horizontal while removing; otherwise it may drop.

• Pull the shelf ahead ①, then lift both front and rear ②.

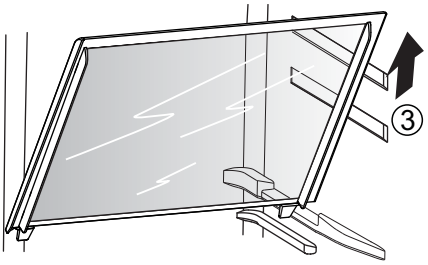


⚠ CAUTION

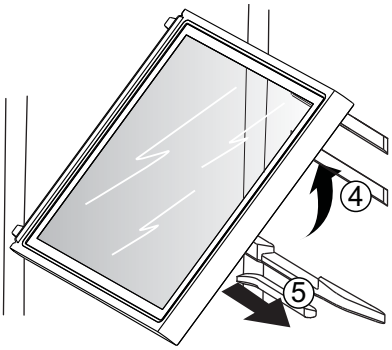
Be careful when pulling out the shelves if you apply too much force, it made hit the refrigerator door and damage it or you could hurt yourself.



• Lift up the shelf on the part of the front in its totally ③.



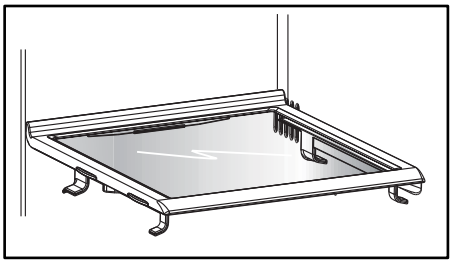
• Finally, tilt the shelf ④ while taking out ⑤ in the same time to remove.



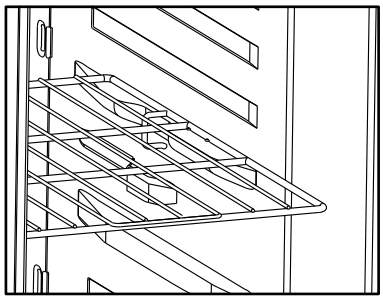
4. FREEZER SHELVES

(Identify your Shelf freezer type

To assemble or disassemble the freezer shelf, follow the next steps:



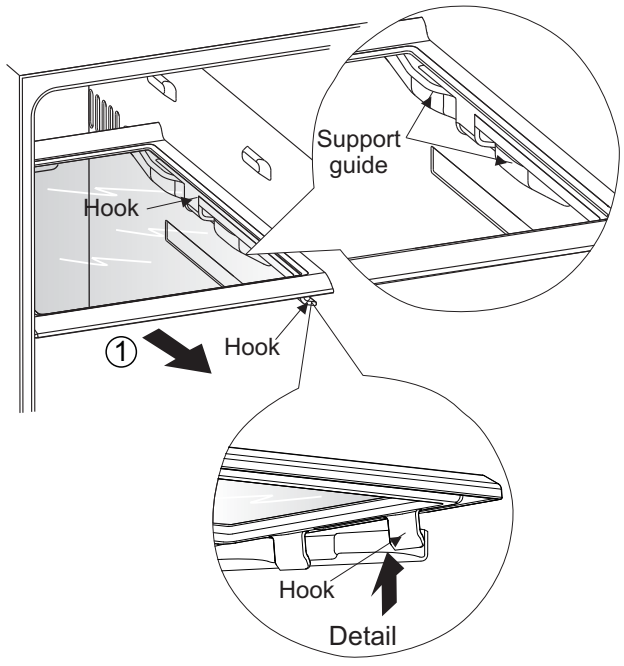
Shelf Freezer glass



Shelf Freezer wire

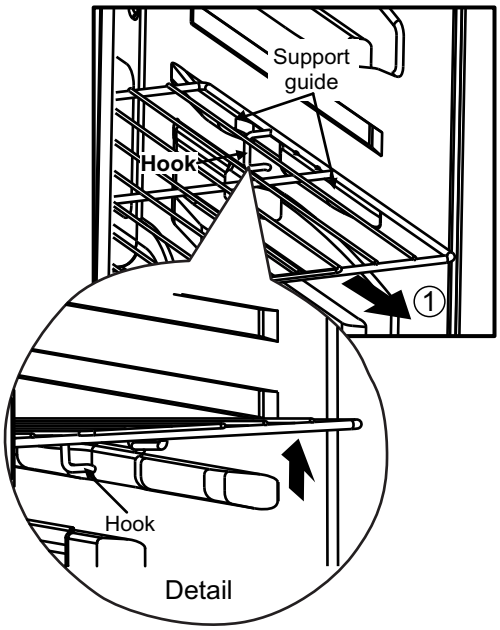
Shelf Freezer glass

• Pull the shelf towards you ①. You will feel the shelf stop, that means that the second hook of the shelf is in part guide that's support the shelf (view detail).

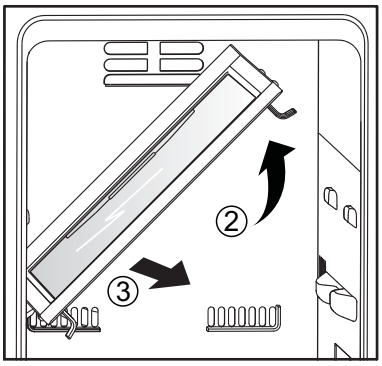


Shelf Freezer wire

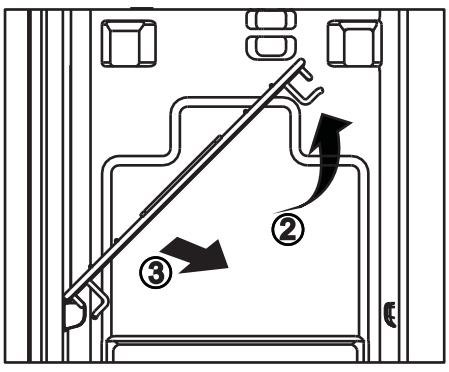
• Pull the shelf towards the front ①. The shelf hook will contact the support on the guide. Lift the shelf so the hook clears the guide support (view detail).



• Tilt the shelf (as shown in figure) ②, and then pull it toward you ③.



Shelf Freezer glass



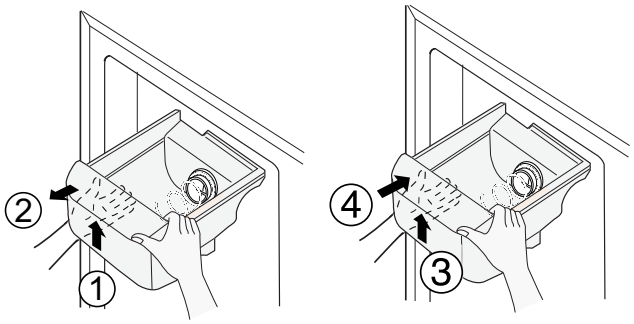
Shelf Freezer wire

5. HOW TO CONTROL THE AMOUNT OF WATER SUPPLIED TO ICE MAKER

1. DISASSEMBLY ICE STORAGE BIN

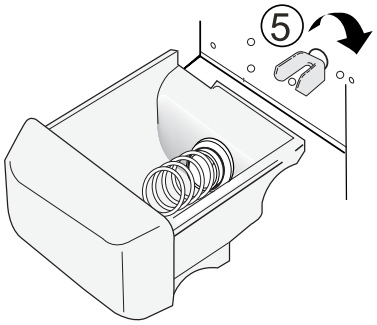
NOTE: Use both hands to remove the ice bin to avoid dropping it. If the ice bin does not slide into place easily, twist the drive device slightly.

• Hold the ice storage bin as shown in the right figure ① and pull it out while slightly lifting it ②.



• To assemble the ice storage bin, push it ③ while slightly lifting it ④.

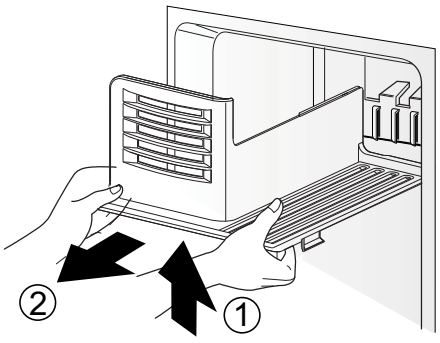
Make sure it is fully engaged into the auger drive ⑤.



2. DISASSEMBLY ICEMAKER COVER

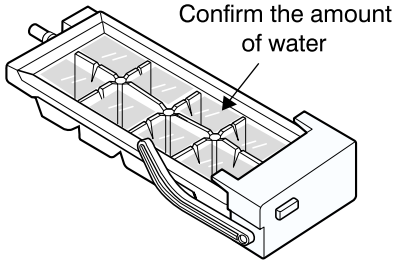
If you need acces to the Icemaker, follow these steps:

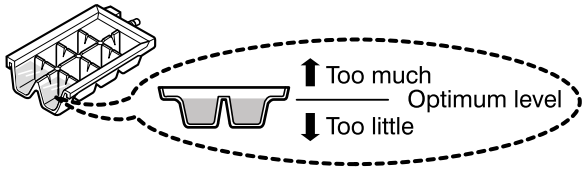
• Remove the ice storage bin. See **ICE STORAGE BIN** for reference.
• Lift the icemaker cover ① and pull it out ② as shown in the figure below.

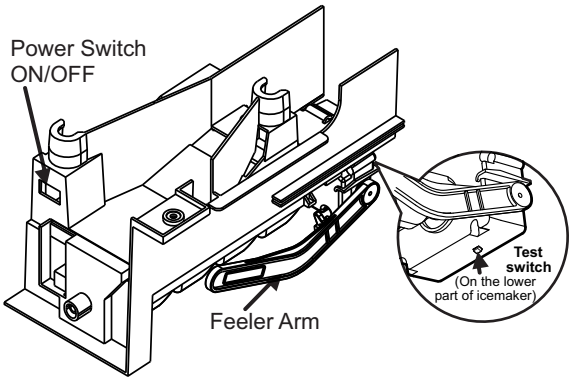


Turn on the electricity after connecting water pipe.

1) Press the test switch under the icemaker for two seconds as shown below.
2) The bell rings (ding ~ dong), the ice tray rotates, and water comes out the icemaker water tube.
3) The water is supplied into the tray two or three times. The amount is small each time. Put a container under the ice tray and press test switch.
4) When the ice tray rotates, the water in it will spill. Collect the spilled water and discard it.
5) When ice tray has finished rotation, water comes out the water tube. Check the amount that goes into the ice tray. (Refer to the drawing below. The optimum amount is 110cc. (Almost 4 oz.)).

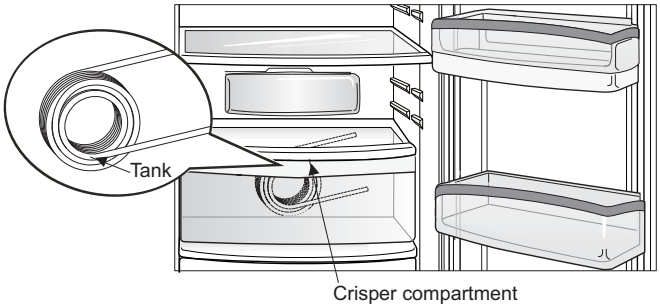






* It is acceptable is the adjusted water level is less than the optimum level.

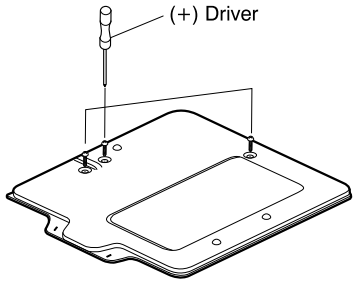
⚠ CAUTION
When removing the CRISPER compartment you will see the water tank. Do not remove it, you can produce water leakage. The water tank is not a removable part.



Control the amount of water supplied to the icemaker.

Caution: • Unplug the power cord from the wall outlet and wait at least three minutes before removing the main PWB cover. 310 Volts are present in the control panel.

1. Disconnect PWB cover from the upper part of the refrigerator.
2. Adjust the amount of water supplied by using the DIP switches.

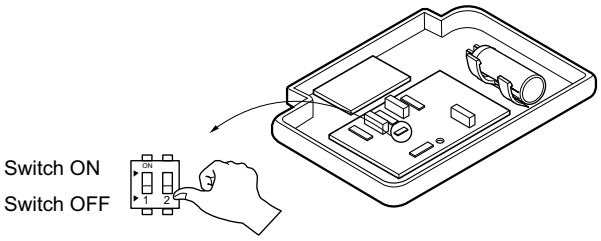


Water Supplying Time Control Option

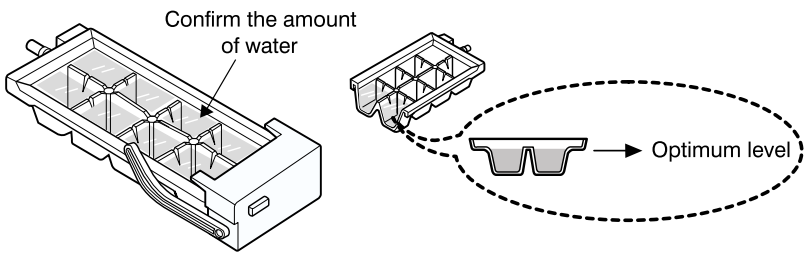
SWITCH		WATER SUPPLY TIME	NOTE
SW2	SW1		
OFF	OFF	6.5s	FACTORY SETTING
OFF	ON	5.5s	
ON	OFF	7.5s	
ON	ON	8.5s	

1) The water supplying time is set at 6.5s when the refrigerator is delivered.
2) The amount of water supplied depends on the setting time and water pressure (city water pressure).
3) If the ice cubes are too small, increase the water supplying time. This happens when too little water is supplied **into the ice tray.**
4) If the ice cubes stick together, decrease the water supplying time. This happens when too much water is supplied **into the ice tray.**

Caution: When adjusting the amount of water supplied, adjust step by step. Otherwise the water may spill over.



3. When the adjustment of the control switch for the amount of water supplied is complete, check the level of water in the ice.

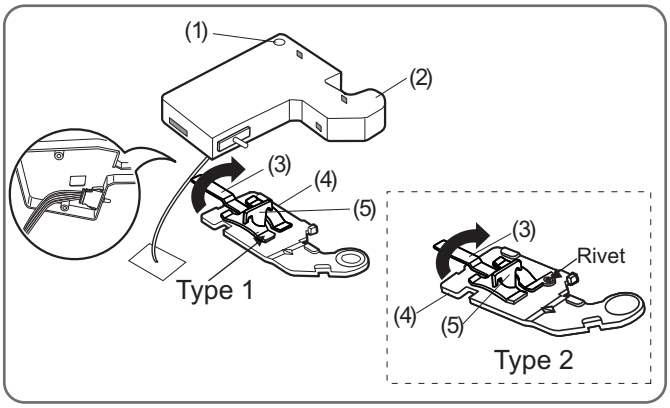


4. HOW TO DISASSEMBLY AND ASSEMBLE

1. REMOVING AND REPLACING REFRIGERATOR DOORS

Before removing the doors, remove the base grille.

To remove the right (refrigerator) door:



1. Open the door. Remove the top hinge cover screw (1).
2. Use a flat blade screwdriver to pry back the hooks (not shown) on the cabinet underside of the cover (2). Lift up the cover.
3. Rotate the hinge lever (3) clockwise. Lift the top hinge (4) free of the hinge lever latch (5).

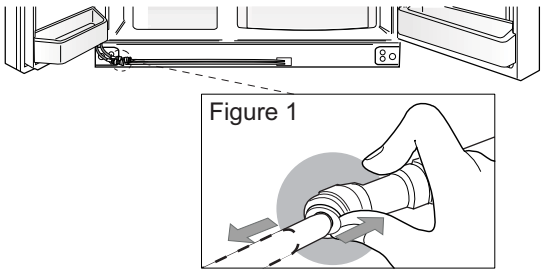
NOTE: Regardless the type of hinge lever (3); type1: without rivet or type 2: with rivet the removal process is the same.

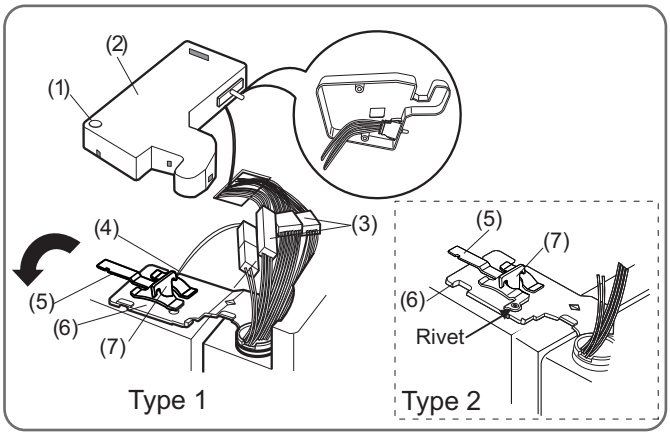
4. Lift the door from the lower hinge pin.
5. Place the door, inside facing up, on a nonscratching surface.

⚠ CAUTION: When lifting the hinge free of the latch, be careful that the door does not fall forward.

Removing the left (freezer) door with water line connection.

- Pull up the water feed tube while pressing area (Figure 1) as shown in the figure below.
- **NOTE:**If a tube end is deformed or abraded, trim the part away. Disconnecting the tube under the door causes about 0.2 liters water to flow out. Put a large container at end of tube to prevent water from draining onto the floor.





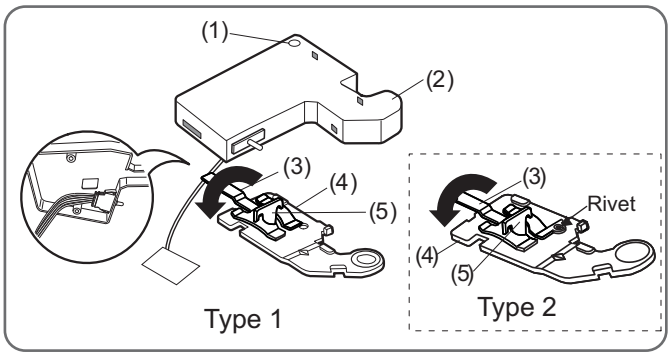
1. Open the door. Remove the top hinge cover screw (1).
2. Use a flat blade screwdriver to pry back the hooks (not shown) on the cabinet underside of the cover (2). Lift up the cover.
3. Disconnect all the wire harnesses (3).
4. Remove the grounding screw (4).
5. Rotate hinge lever (5) counterclockwise. Lift the top hinge (6) free of the hinge lever latch (7).

NOTE: Regardless the type of hinge lever (5); type1: without rivet or type 2: with rivet the removal process is the same.

⚠ CAUTION: When lifting the hinge free of the latch, be careful that the door does not fall forward.

6. Lift the door from the lower hinge pin being careful to pull the water lines through the lower hinge pin.
7. Place the door, inside facing up, on a nonscratching surface.

Reinstalling the right (Refrigerator) door

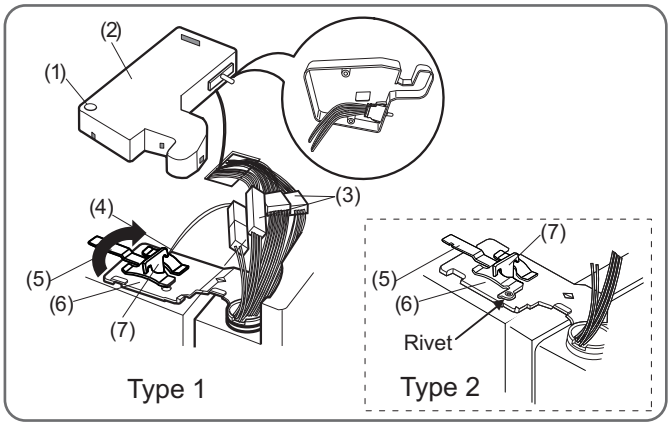


1. Place the door onto the lower hinge pin.
2. Fit top hinge (4) over hinge lever latch (5) into place. Rotate lever (3) counterclockwise to secure hinge.

NOTE: Regardless the type of hinge lever (3); type1: without rivet or type 2: with rivet the removal process is the same.

3. Hook tab on switch side of corner under edge of wire opening in cabinet top. Position cover (2) into place. Insert and tighten cover screw (1).

Reinstalling the left (Freezer) door



1. Feed the water tubes through the lower hinge pin and place the door onto the lower hinge pin.
2. Fit top hinge (6) over hinge lever latch (7) and into place. Rotate lever (5) clockwise to secure hinge

NOTE: Regardless the type of hinge lever (5); type1: without rivet or type 2: with rivet the removal process is the same.

3. Install the grounding screw (4) and connect all the wire harnesses (3).
4. Hook tab on door switch side of cover (2) under edge of wire opening in cabinet top. Position cover into place. Insert and tighten cover screw (1).
5. Reconnect the water tubes by inserting the tubes into the connectors.

2. HANDLE REMOVAL

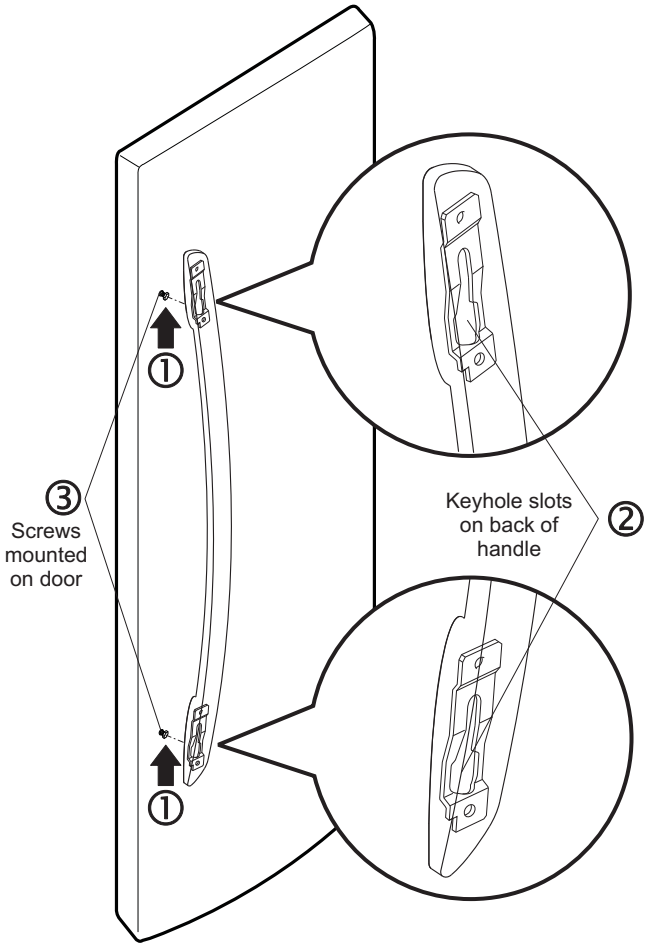
▸ Identify you handle type

• Type 1

- Grasp the handle tigthtly with both hands and slide the handle up (1) (this may required some force).
- The keyhole slots (2) on the back of the handle allow the handle to separate from the mounting screws (3).

⚠ CAUTION: It could be damaged and broken when you hit with hammer while you remove and attach the handle.

⚠ CAUTION: When you assemble or dissasemble handle, you must push and pull with moment force.

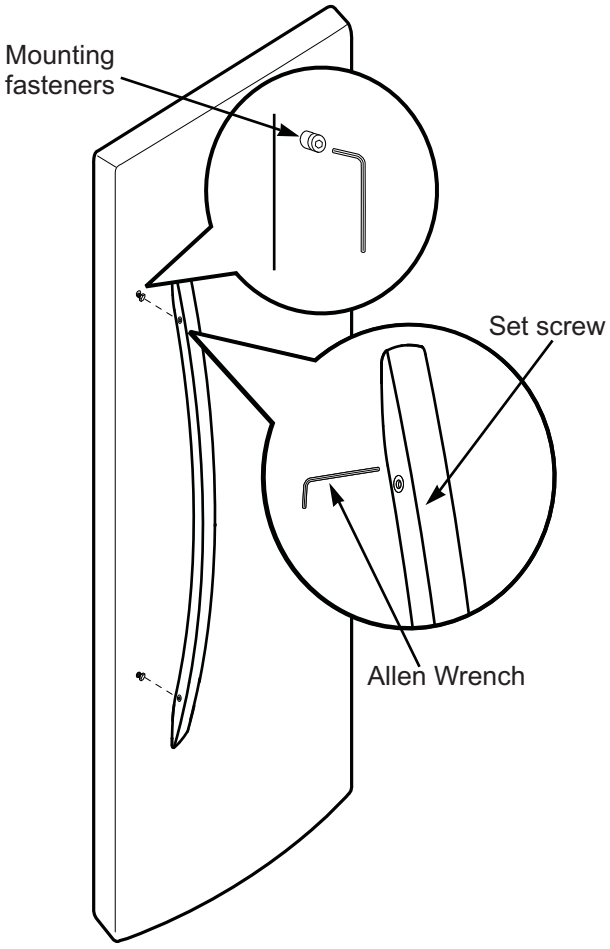


• Type 2

NOTE: It is ALWAYS recommended to remove the refrigerator doors when it is necessary to move the refrigerator through a narrow opening. If necessary, follow the directions below to remove the door handles.

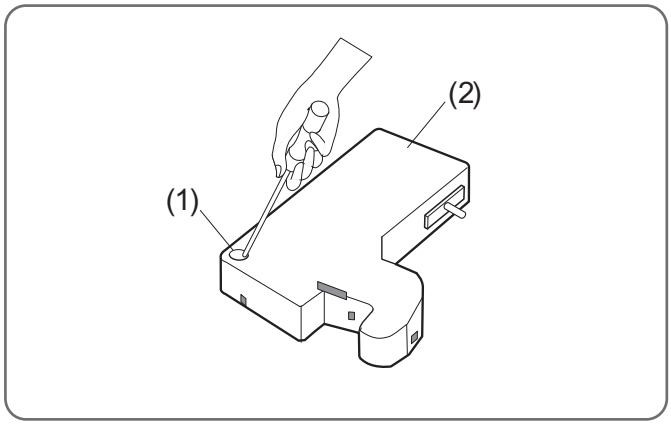
• Loosen the set screws with a 3/32” (2.38 mm) Allen wrench and remove the handle.

NOTE: If the handle mounting fasteners need to be tightened or moved, use a 1/4” (6.35 mm) Allen wrench.



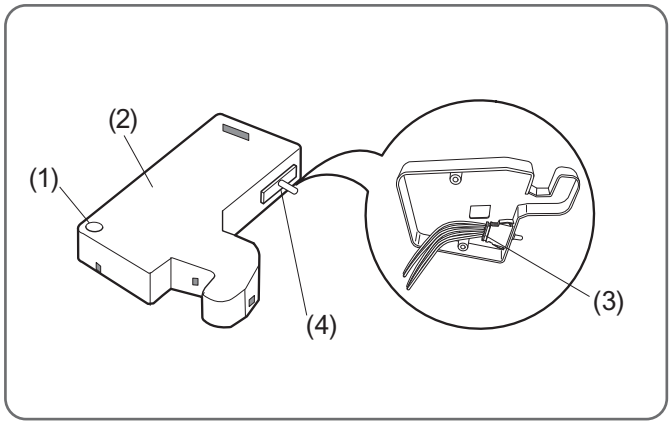
3. HOW TO REMOVE SWITCH LAMP

1. Open the door. Remove the top hinge cover screw (1).

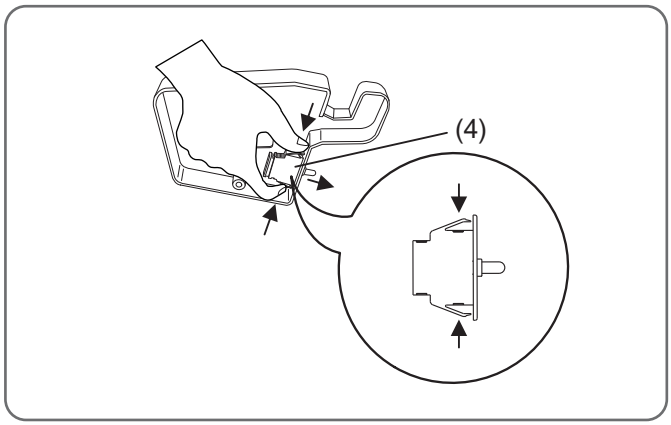


2. Use a flat blade screwdriver to pry back the hooks (not shown) on the cabinet underside of the cover (2). Lift up the cover.

3. Disconnect the wire harnesses(3).

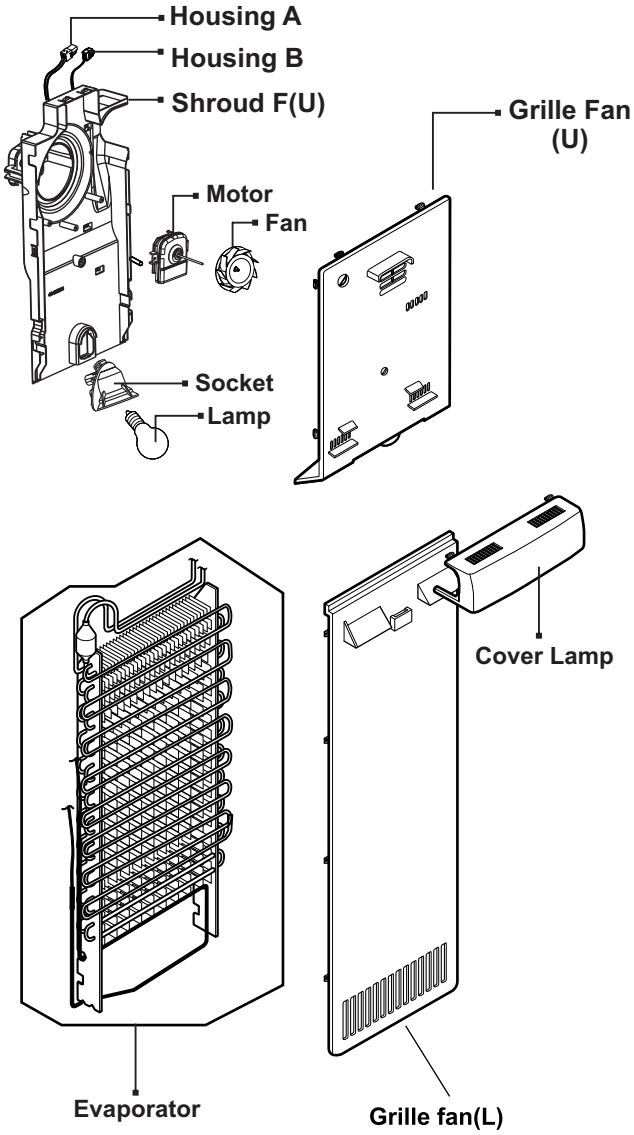


4. To remove the switch (4) press and hold the hooks and push it out.



4. FAN SHROUD GRILLE

1. Loosen one screw with a screwdriver blade.
2. Disassembly of an upper grille fan: Hold upper part of an upper grille fan (U) and pull forward carefully.
3. Disassembly of a lower grille fan: Hold upper part of a lower grille fan and pull forward carefully.
4. Disassembly of an upper freezer shroud: Hold lower part, pull forward and disconnect housing A and B.
5. Check for foam sticking conditions around a shroud, upper freezer and lower freezer during assembling. If damaged, torn, or badly stuck, assemble with a new one afer sealing well.

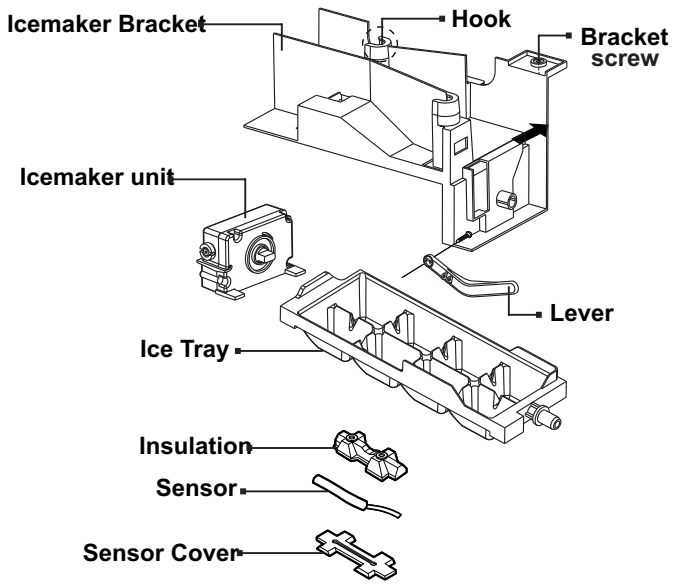


5. ICEMAKER ASSEMBLY

1. Dispenser Model

1) How to disassemble:
   (1) Remove ice bin from the freezer compartment.
   (2) Loosen the screw on the upper part of icemaker bracket.
   (3) Disconnect icemaker bracket so that it can slide forward.
   (4) Disconnect icemaker housing and sensor housing.
   (5) Disconnect icemaker horizontally by pressing bracket hook part. (Don't disassemble further. The set value may be changed).

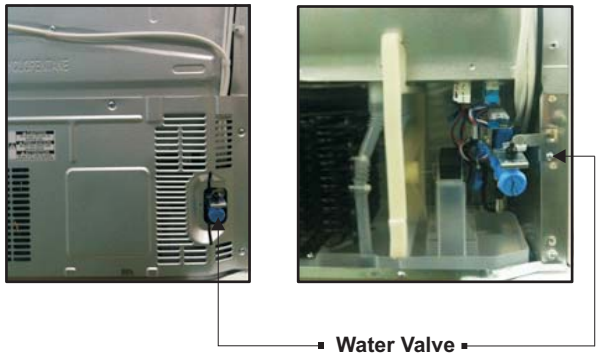
2) The assembly is the reverse order of the above disassembly.



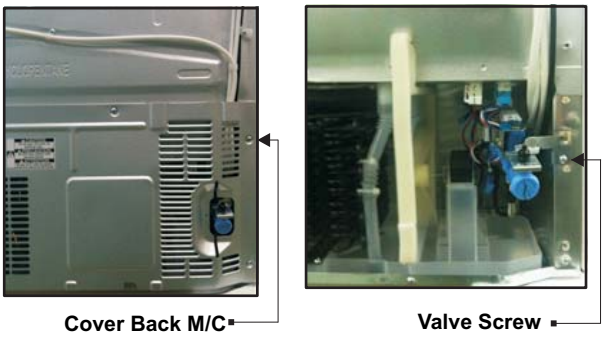
NOTE: **If the ice tray (mold) is not horizontal after repair and assembly, something must be wrong. Check it and reassemble if necessary.**

6. WATER VALVE DISASSEMBLY METHOD

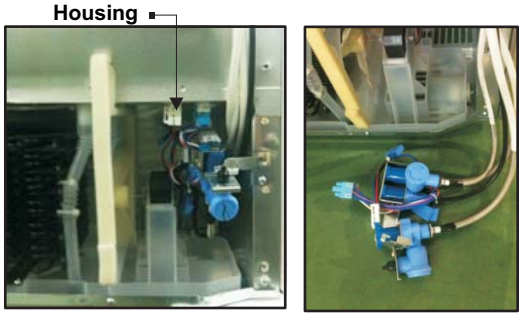
1) Turn off the water supply. Then separate the water connection connected to the water valve.



2) Separate the cover back MC and valve screw.



3) Separate the housing and pull out the valve.



7. WATER VALVE TUBES ASSEMBLY METHOD

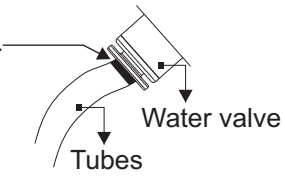
1) Connect the Water Filter tube (IN) ① to the water valve.

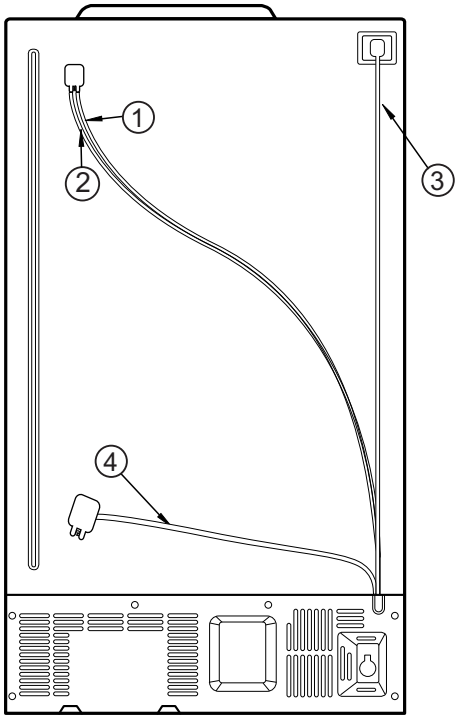
2) Connect the Water Filter tube (OUT) ② to the water valve.

3) Connect the Ice maker tube (IN) ③ to the water valve.

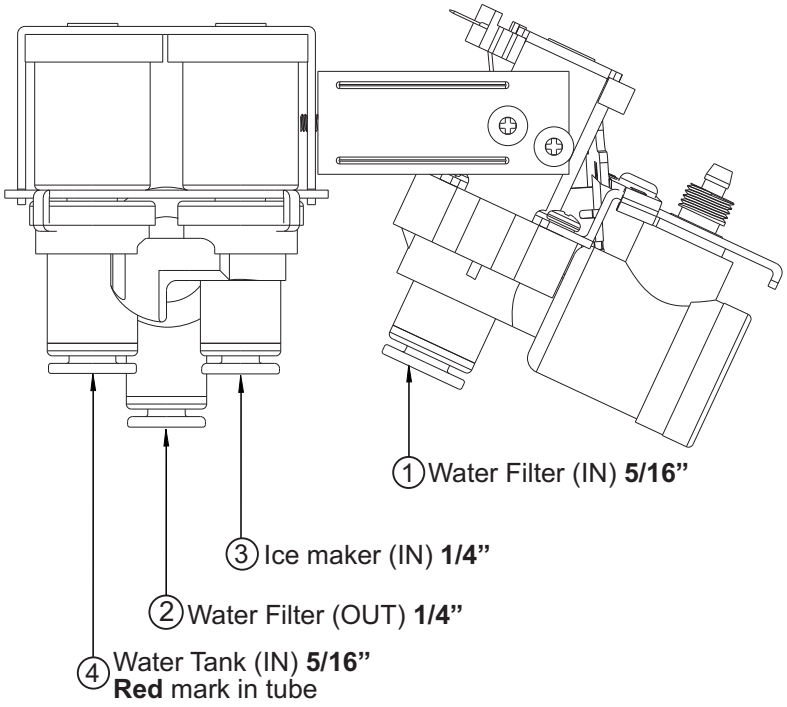
4) Connect the Water Tank tube (IN) ④ to the water valve.
The pipe ④ has a **Red** mark on the end that connects to the water valve, make sure it is the correct tube.

NOTA: For a successful connection, insert the tubes to the water valve until you can see only a line.





Side View of Water Valve

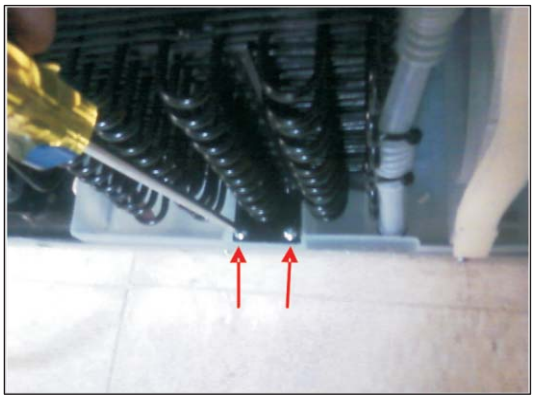


8. FAN MOTOR DISASSEMBLY

1. Remove fan motor by pushing fan motor in direction of the arrow.

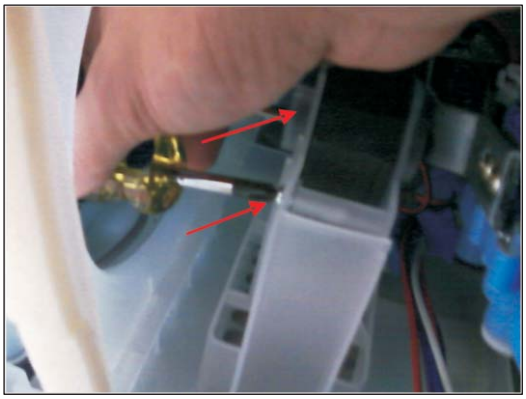
2. Remove guide fan screw using a philips screwdriver for remove it.

3. Remove screws from wire condenser bracket. Use philips screwdriver for remove it.

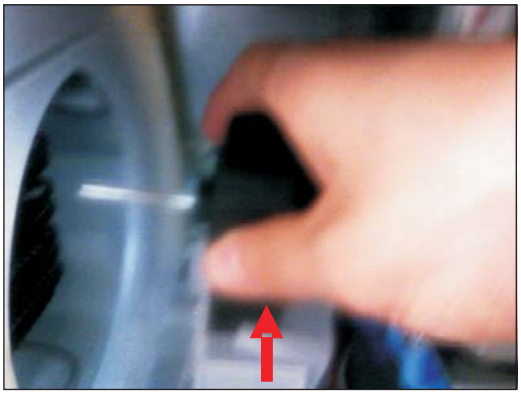


4. Move condenser to left at least 2cm

5. Using a small phillips screwdriver remove screws from bracket motor.



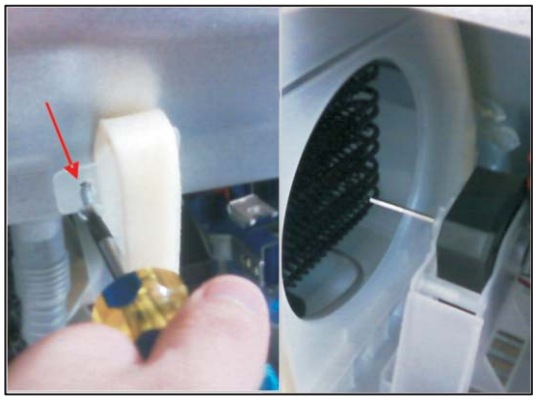
6. Unplug motor and take out it.



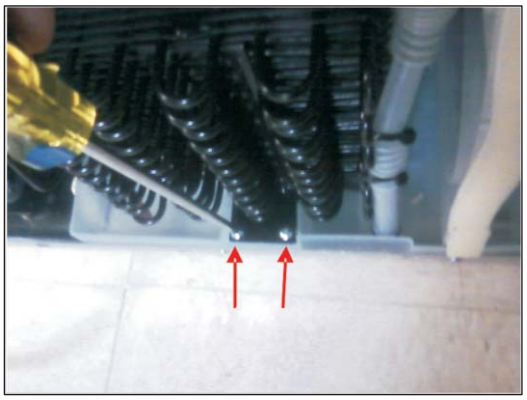
9. TRAY DRIP DISASSEMBLY

1. Remove fan motor by pushing fan motor in direction of the arrow.

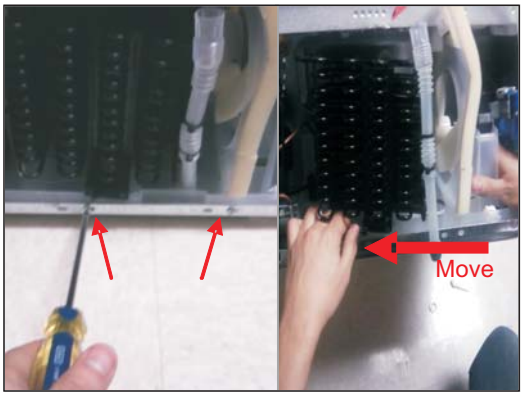
2. Remove guide fan screw using a phillips screwdriver.



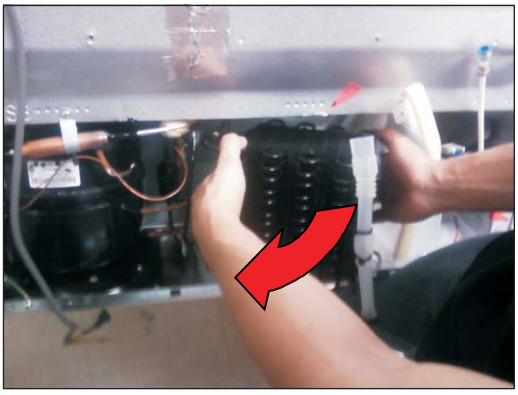
3. Remove screws from wire condenser bracket using a phillips screwdriver.



4. Remove screws in compressor base in order to release tray drip.



5. Turn condenser clockwise carefully in order to take it out from tray drip. Avoid any damage to pipes.

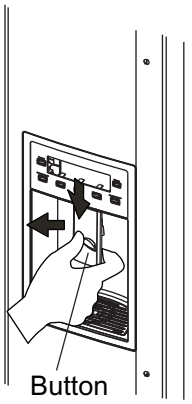


6. Move tray drip to left and push up for release tray drip hooks and then take out it carefully.

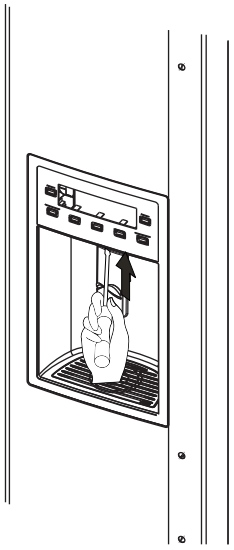
Avoid any damage to condenser or pipes.

10. DISPENSER

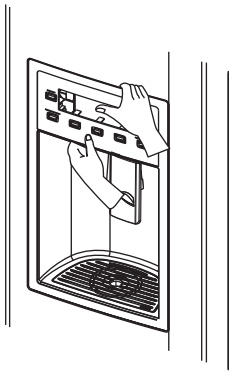
1) Disconnect funnel and button assembly by pulling down and forward.



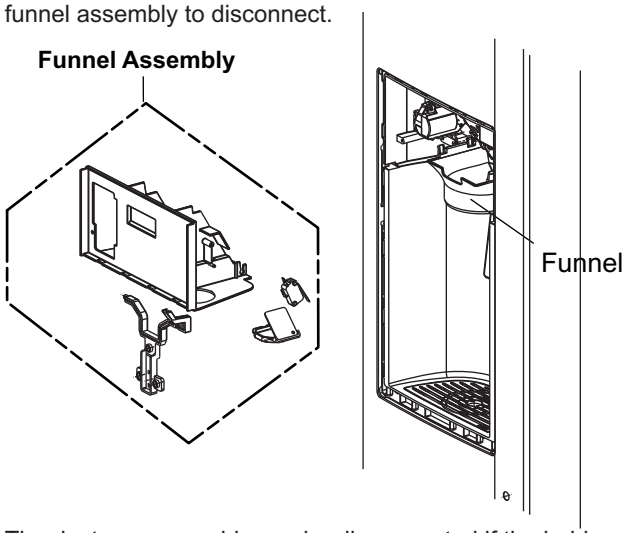
2) Remove the display frame pulling out with both hands on one side and repeat the process on the other side while pulling it forward as shown in the picture.



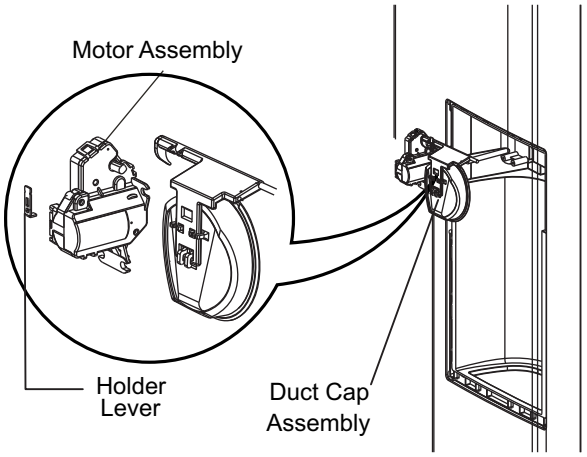
3) The display assembly can be disconnected by pressing the top of the dispenser cover and pushing it after separating the display frame from its housing.



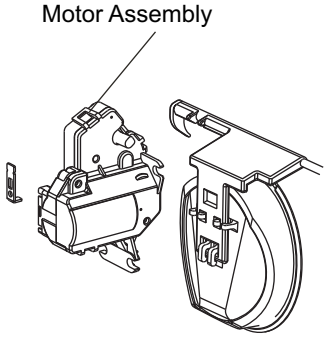
4) Loosen four screws with a phillips screwdriver and pull the funnel assembly to disconnect.



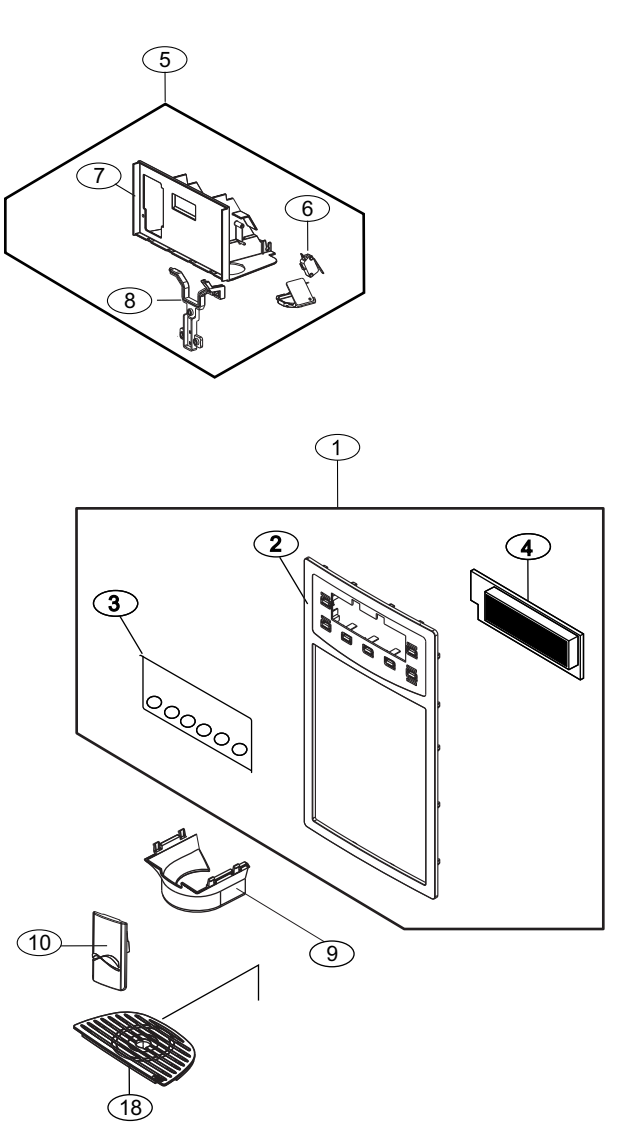
5. The duct cap assembly can be disconnected if the hold lever connecting screws are loosened with a phillips driver.

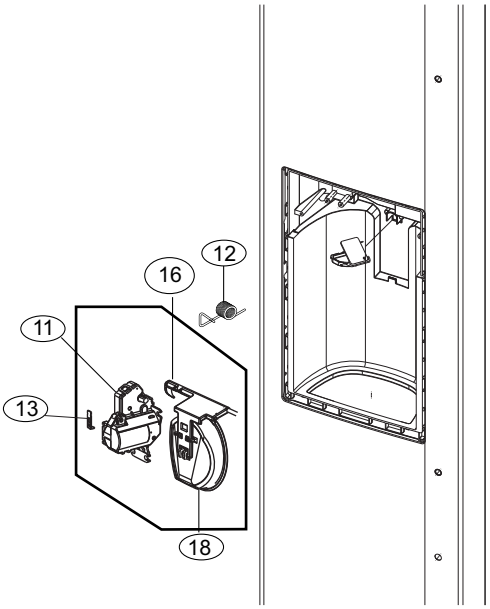


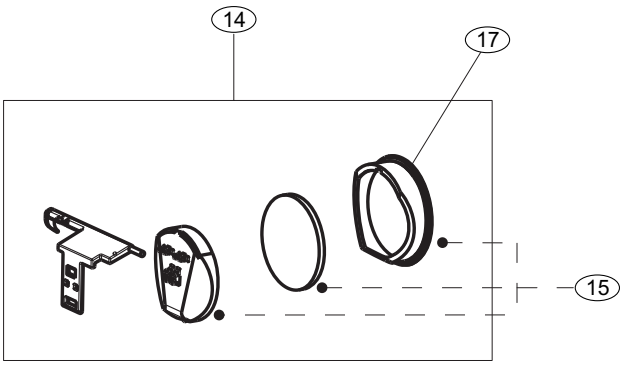
6) To install the duct cap assembly, insert one end of the spring into the right hole of the dispenser lever and insert the other end into the right hole in the top part of the dispenser. Then attach the holder at the solenoid switch.



7) Dispenser related parts







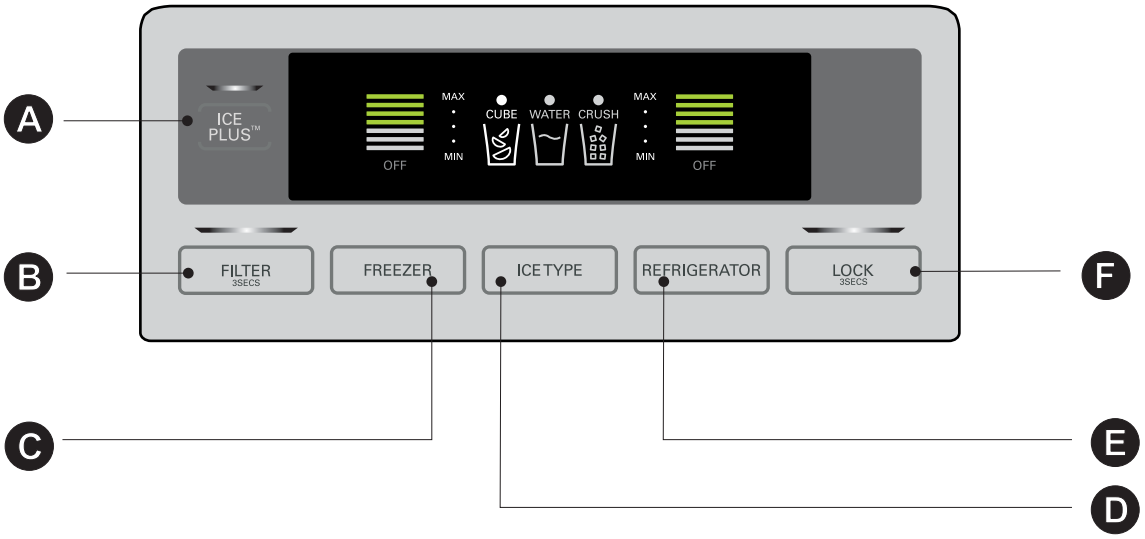
1	FRAME ASSEMBLY, DISPLAY
2	COVER, DISPLAY
3	DECO, DISPLAY
4	PCB ASSEMBLY, DISPLAY
5	FRAME FUNNEL ASSEMBLY
6	SWITCH
7	FRAME, FUNNEL
8	LEVER DISPENSER (BUTTON)
9	FUNNEL
10	BUTTON LEVER
11	MOTOR ASSEMBLY
12	SPRING
13	HOLDER LEVEL
14	CAP ASSEMBLY, DUCT
15	CAP, DUCT
16	DISPENSER LEVER, (CAP DUCT)
17	RUBBER, CAP
18	DECO, DRAIN

5. MICOM FUNCTION

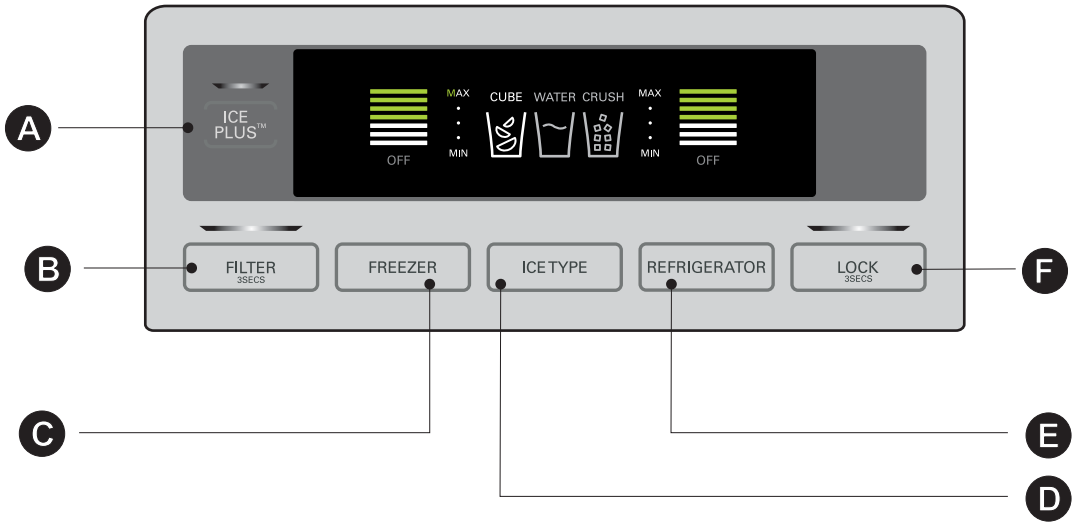
1. MONITOR PANEL

▸ Identify your Control type

• Type A



• Type B



A ICE PLUS function selection.

B Filter RESET function selection.

C Temperature adjustment button for Freezer compartment.

D Dispensing Selection button (Cubed Ice / Water / Crushed Ice).

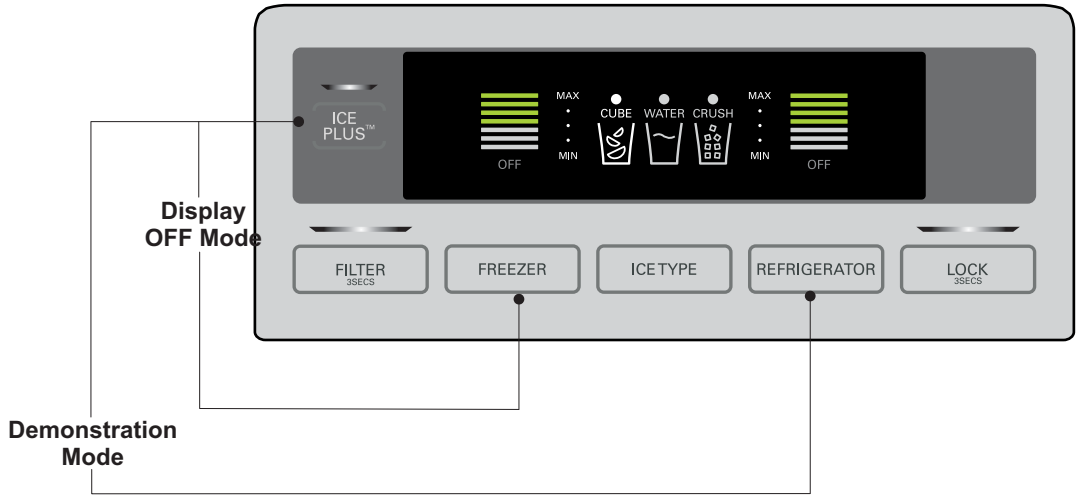
E Temperature adjustment button for Refrigerator compartment.

F Lock function button.

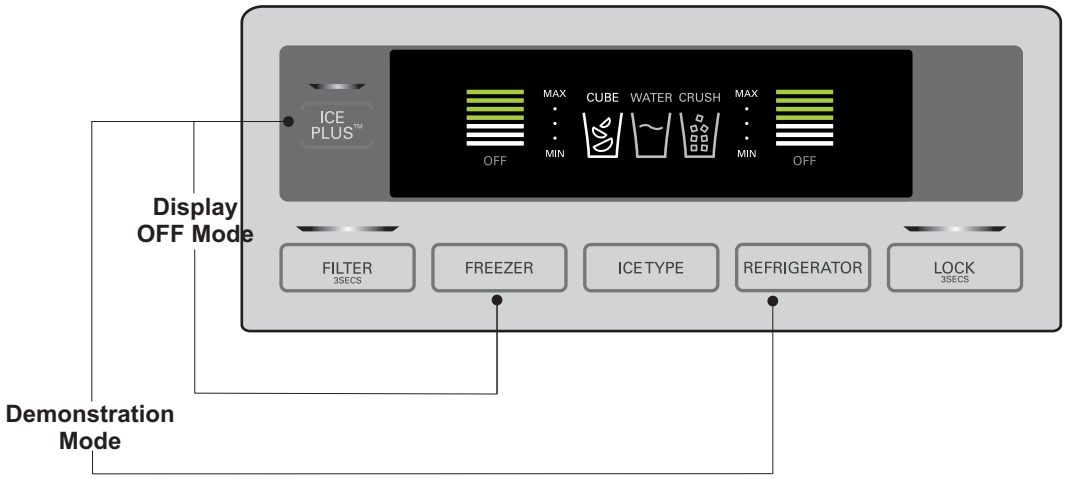
1-1. Display Function

1) When the appliance is plugged in, it is set to 37°F for refrigerator and 0°F for freezer. You can adjust the Refrigerator and the Freezer control temperature by pressing the ADJUST button.
2) When the power initially applied or restored after a power failure, it is set to the previously controlled temperature.

• Type A



• Type B



1-2. Display OFF Mode

It places display in standby mode until any door is opened or any button is pressed.
Press FREEZER and ICE PLUS buttons simultaneously to turn ON all leds and 5 seconds after, these will turn OFF with the recognition sound of “Ding~” (Be sure press both buttons for this to work).
Once the mode activates, all leds are always OFF except to dispensing icon (This depends on last selection dispensed). To deactivate this mode, perform the same sequence used for activation.

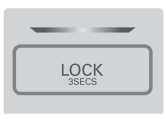
1-3. Demonstration Mode (OFF Mode)

1) Any Door must be opened to enter in this mode.
2) To activate this mode press and hold ICE PLUS and REFRIGERATOR button over 5 seconds.
3) The display will show the word “OFF” in Freezer and Refrigerator Temperature level.
4) In this mode all loads are turned off(Compressor, Heater, Fans, etc)
5) Lamps and Dispenser Functions will work normally (even in demonstration mode the refrigerator Lamp automatic off function works normally)
6) To exit Demonstration mode open any Door then press and hold ICE PLUS and REFRIGERATOR button over 5 seconds (Display return to normal mode).

1-4. Lock function (dispenser and display button lock)

1) When the refrigerator is first turned on, the buttons are not locked. The display panel shows the padlock unlocked icon.
2) To lock the display, the dispenser, and the control panel, press, and hold the LOCK button for 3 seconds. The locked pad lock icon is displayed.
3) The LOCK button is the only control feature that remains active in the locked state. The buzzer sound, other control buttons, and the dispenser are deactivated.
4) To release from the locked state, press and hold the LOCK button again for 3 seconds.

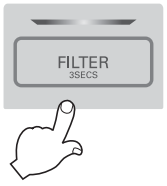
Ex) “LOCK”
Function ON



Ex) “LOCK”
Function OFF

1-5. Filter condition display function

1) There is a replacement indicator for filter cartridge on the dispenser.
2) Water filter needs replacement once six months.
3) At initial power ON, filter indicator is OFF.
4) After six months, filter indicator turns ON to tell you need replace the filter as soon as possible.
5) Once that filter is replaced, press and hold 3 seconds the FILTER button to reset the filter indicator, then, filter indicator turns OFF.
6) Indicator will turn ON after six months, when you need change the filter again.



In initial Power On / Filter RESET	Replace indicator light on
	

1-6. ICE PLUS selection

Please select this function for quick freezing.
This function automatically turns off after a preset time and must be selected each time for operation.

1-7. Dispenser Light

1) Normal status of dispenser light is OFF.
2) When dispenser pad is pressed, dispenser light turns ON.
3) Dispenser light will turns OFF immediately after dispenser pad is released.

1-8. ICE PLUS

1) The purpose of this function is to intensify the cooling speed of freezer and to increase the amount of ice.
2) Whenever selection switch is pressed, selection/ release, the icon will turn ON or OFF.
3) If there is a power outage and the refrigerator is powered on again, ICE PLUS will be canceled.
4) To activate this function, press the ICE PLUS key and the icon will turn ON. This function will remain activated for 24 hrs. The first three hours the compressor and Freezer Fan will be ON. The next 21 hours the freezer will be controlled at the lowest temperature. After 24 hours or if the ICE PLUS key is pressed again, the freezer will return to its previous temperature.
5) During the first 3 hours:
(1) Compressor and freezer fan (HIGH RPM) run continuously.
(2) If a defrost cycle begins during the first 90 minutes of ICE PLUS, the ICE PLUS cycle will complete its cycle after defrosting has ended. If the defrost cycle begins when ICE PLUS has run for more than 90 minutes, ICE PLUS will run for two hours after the defrost is completed.
(3) If ICE PLUS is pressed during defrost, ICE PLUS icon is On but this function will start seven minutes after defrost is completed and it shall operate for three hours.
(4) If ICE PLUS is selected within seven minutes after compressor has stopped, the compressor (compressor delays seven minutes) shall start after the balance of the delay time.
(5) The fan motor in the freezer compartment runs at high speed during ICE PLUS.
(6) For the rest of the 21 hours, the freezer will be controlled at the lowest temperature.

1-9. Control of variable type of freezing fan

1. To increase cooling speed and load response speed, MICOM variably controls he freezer fan motor at the high RPM speed and standard RPM.
2. MICOM only operates in the input of initial power, ICE PLUS, load response and Test mode 1 for the high RPM speed and operates in the standard RPM in other general operation.
3. If the freezer door is opened while the fan motor is operating, the fan motor will continue to operate normally. (If the fan motor is running at high speed, it will automatically be reduced to the standard speed). However, if the refrigerator door is opened, the freezer fan motor will stop operating.
4. As for monitoring of BLDC fan motor error in the freezer, MICOM will immediately stop the fan motor by determining that the BLDC fan motor is locked or failed if the fan motor position does not change for more than 115 seconds at the BLDC motor. Then a failure code will be displayed (refer to failure diagnosis function table) on the refrigerator, for BLDC motor failure. If you want to operate the BLDC motor, turn off and on at the power source.

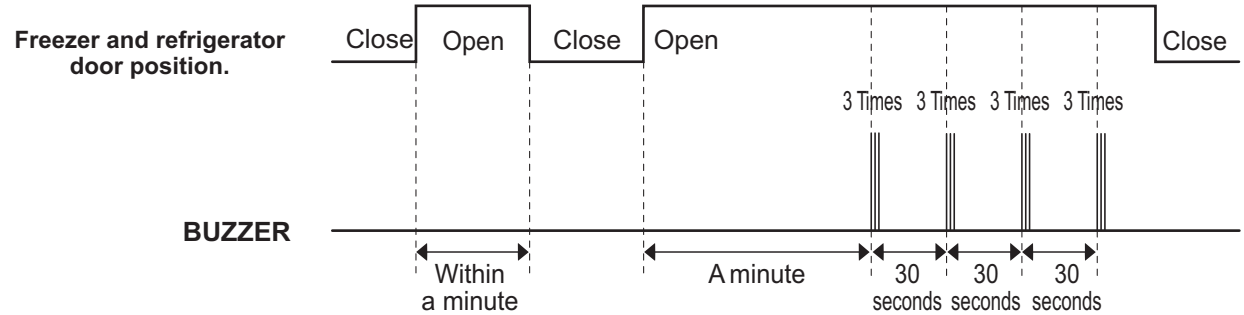
1-10. Control of cooling fan motor

1. The cooling fan motor performs ON/OFF control by linking with the COMP.
2. It controls at the single RPM without varying RPM.
3. Failure sensing method is same as in the freezer fan motor (refer to failure diagnosis function table for failure display).

1-11. Door opening alarm

1. The buzzer will sound if the freezer or refrigerator doors have been left open for longer than one minute.
2. The buzzer will ring three times every 30 seconds if the doors have been left open for longer than 1 minute.
3. Closing all refrigerators doors will stop the Buzzer alarm function.

3. If all the doors of freezing / cold storage room or Refrigerator Room are closed during door open alarm, alarm is immediately released.



1-12. Ringing of compulsory operation, compulsory frost removal buzzer

1. If pressing the test button in the main PCB, "Phi ~" sound rings.
2. In selecting compulsory 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 compulsory 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.

1-13. Defrosting (Removing frost)

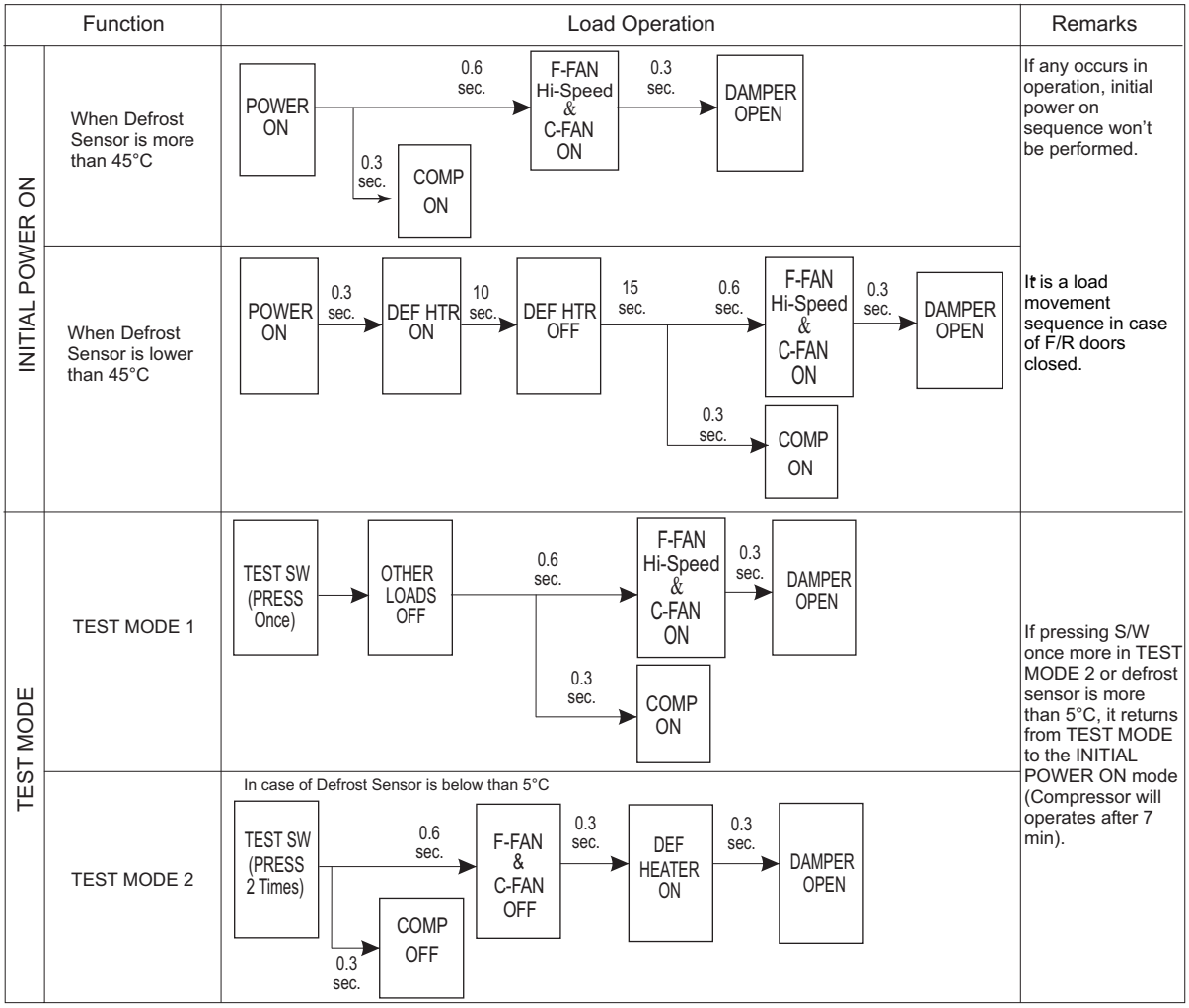
1. Defrosting starts each time the accumulated COMPRESSOR runnig time is between 7 and 50 hours. This time is determinated by how often and how long the dorrs are opened.
2. For initial power on or for restoring power, defrosting starts when the compressor running tume reaches 4 hours.
3. Defrosting stops if the sensor tempreature reaches 41°F (5°C) or more. If the sensor doesn´t reach 41°F (5°C) in 1 hours, the defrost mode is malfunctioning. (Refer to the defect diagnosis function, 8-1-15).
4. Defrosting won´t function if its sensor is defective (wires are cut or short circuited).

1-14. Refrigerator room lamp automatically off

- The refrigerator compartment lamp will turn on and off by refrigerator door switch.
- The refrigerator compartment lamp will turn off automatically if it has been on for longer than 7 minutes.

1-15. Sequential operation of built-in product

Built-in components such as the compressor, defrost removal heater, freezer compartment fan, Cooling Fan and step motor damper are sequentially operated as follows to prevent noise and part damage from occurring during testing procedure.



1-16. Failure Diagnosis Function

To display the error message, press and hold ICE PLUS button and FREEZER button. If no errors are displayed, all LEDs will be illuminated. If a primary or secondary error is present, certain LEDs will be illuminated indicating failure mode.

No.	ITEM	FAILURE CODE INDICATOR (F-Section)	CONTENTS OF FAILURE	PRODUCT OPERATION STATUS IN FAILURE				
				Compressor	Freezer Fan	Cooling Fan	Defrost Heater	STEP MOTOR
1	No Error	ALL LED ON	-	○	○	○	○	○
2	Abnormal Freezer Sensor		Cut o short circuit wire	15min ON / 15min OFF	Standard RPM	○	○	○
3	Abnormal Refrigerator Sensor (1)			○	Standard RPM	○	○	10 min OPEN / 15min CLOSE
4	Abnormal Refrigerator Sensor (2)	SEE NOTE (1)		○	○	○	○	○
5	Abnormal Defrost Sensor			○	Standard RPM	○	No Defrost	○
6	Abnormal Room Temperature Sensor	SEE NOTE (1)		○	○	○	○	○
7	Abnormal Icemaker Sensor	SEE NOTE (1)		○	○	○	○	○
8	Abnormal Defrost		Defrost heater defective, fuse melting, short circuit, unplugged connector (error indicated 80 min later after trouble).	○	Standard RPM	○	○	○
9	Icemaker UNIT	SEE NOTE (1)	Faulty Icemkaer unit, Motor or Hall IC; Lead wire short circuit; Faultumotor driver.	○	○	○	○	○
10	Abnormal Freezing BLDC Fan Motor		Motor defect, hooked of lead wire to fan, contact of structures with fan, short or open of lead wire (there is no signal of BLDC Motor for more than 115s in operation of fan motor).	○	Off (Re-check after 30min)	○	○	○
11	Abnormal Cooling BLDC Fan Motor			○	○	Off (Re-check after 30min)	○	○

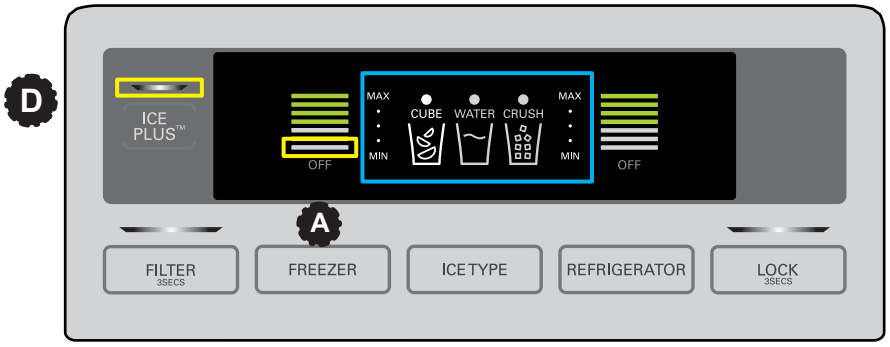
Primary Error: F sensor, R1 sensor, D sensor, Defrost errors, F-FAN errors, C-FAN Error.
Secondary Error: R2 sensors, RT sensors, W / T sensors, I / M sensors, I / M Kit.

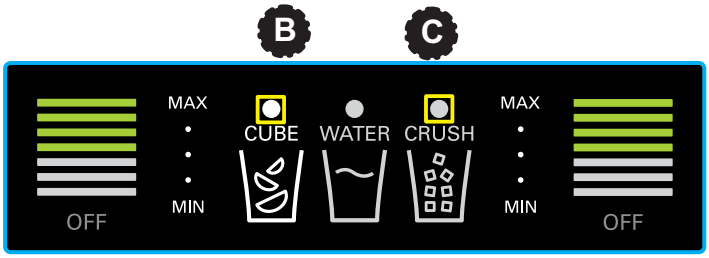
When an error occur the first 3 hours the Primary Error and Secondary Error is indicated in the display check mode (Pressing FRZ TEMP and ULTRA ICE button at the same time more than one second). After the 3 hours and if the error is still present the Primary Error will show in the display automatically (See Note 1) and the Secondary Error is indicated in the display check mode.

Note1: In the Primary Error after 3 hours of the error occurs all display lights turn OFF except the Freezer Temperature (Trouble Code Index) indicating the failure mode.

Failure Diagnosis Function

• Type A





ROOM TEMPERATURE SENSOR

ABNORMAL: SECTION A TURNS OFF

NORMAL: SECTION A TURNS ON

ICEMAKER SENSOR

ABNORMAL: SECTION B TURNS OFF

NORMAL: SECTION B TURNS ON

ICEMAKER UNIT FAILURE

ABNORMAL: SECTION C TURNS OFF

NORMAL: SECTION C TURNS ON

REFRIGERATOR SENSOR (2) [MIDDLE ROOM]

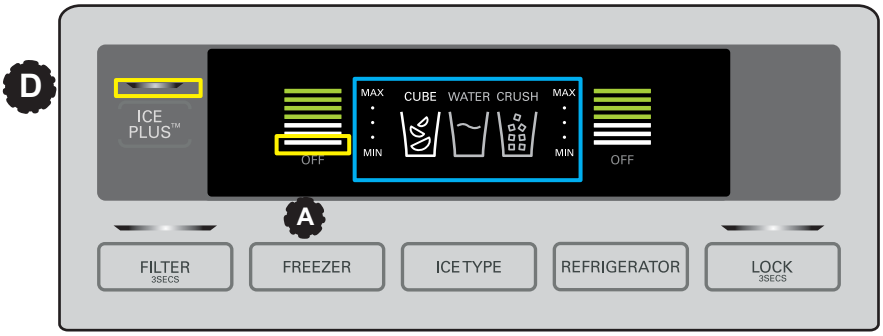
ABNORMAL: SECTION D TURNS OFF

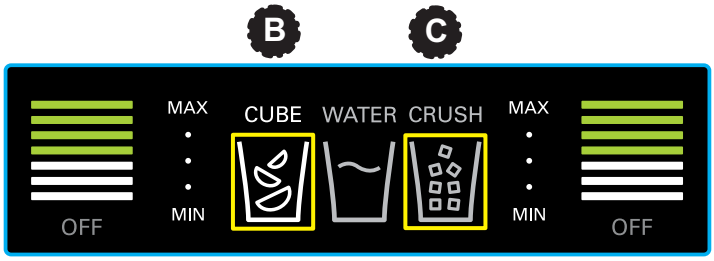
NORMAL: SECTION D TURNS ON

The other display graphics Turn On

Failure Diagnosis Function

• Type B





ROOM TEMPERATURE SENSOR
- ABNORMAL: SECTION A TURNS OFF
- NORMAL: SECTION A TURNS ON

ICEMAKER SENSOR
- ABNORMAL: SECTION B TURNS OFF
- NORMAL: SECTION B TURNS ON

ICEMAKER UNIT FAILURE
- ABNORMAL: SECTION C TURNS OFF
- NORMAL: SECTION C TURNS ON

REFRIGERATOR SENSOR (2) [MIDDLE ROOM]
- ABNORMAL: SECTION D TURNS OFF
- NORMAL: SECTION D TURNS ON

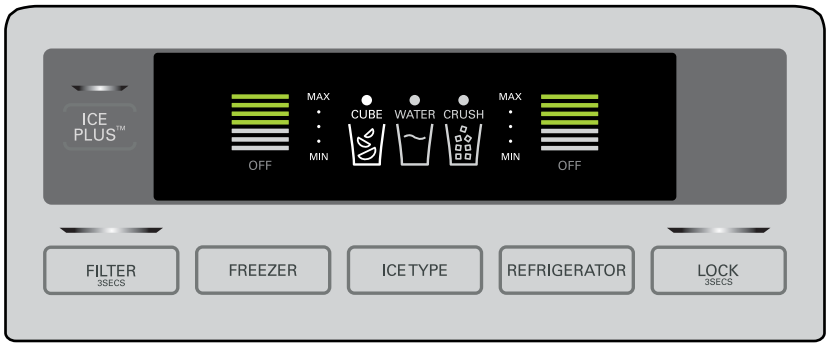
The other display graphics Turn On

1-17. Test Function

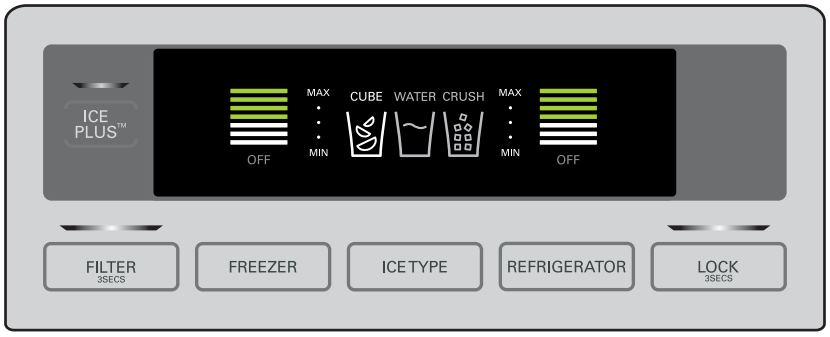
1. The purpose of test function is to check function of the PWB and product and to search for the failure part at the failure status.
2. Test button is placed on the main PCB of refrigerator (test switch), and the test mode will be finished after maximum 2 hours irrespective of test mode and then is reset to the normal status.
3. Function adjustment button is not perceived during performance of test mode.
4. In finishing test mode, always pull the power cord out and then plug-in it again for the normal state.
5. If non conforming contents such as sensor failure are found during performance of test mode, release the test mode and display the failure code.
6. Even if pressing the test button during failure code display, test mode will not be performed.

MODE	OPERATION	CONTENTS	REMARKS
TEST 1	Press once Test S/W <Forced Freezing Mode>	1. COMP & C Fan ON 2. Freezer fan in high speed 3. Defrost Heater OFF 4. Stepping Motor OPEN 5. Display fully illuminated	Under TEST 1, if the test circuit is shorted continuously, stay to keep the TEST 1.
TEST 2	From Test 1 press again TEST S/W	1. COMP & C Fan OFF 2. Freezer fan OFF 3. Defrost Heater ON 4. Stepping Motor CLOSE 5. Only F & R notch are illuminated (first four bars from bottom to top)	If Defrost Sensor is lower than +5°C, then Defrost Heater turn ON. If Desfrost Sensor reach greater than +5°C, then Defrost Heater turn OFF.
NORMAL OPERATION	From Test 2 press again TEST S/W	Compressor will turn ON after a 7min delay.	

• **Type A**



• **Type B**

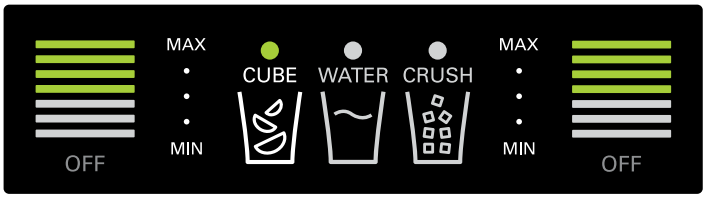


1-18. Function of dispenser and water dispenser built-in

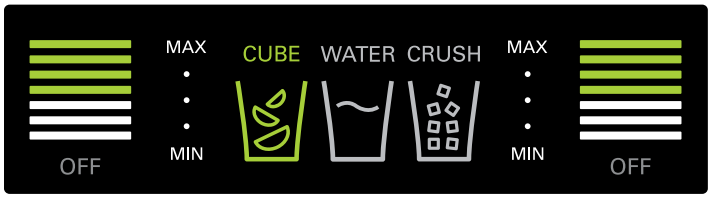
1) While any door of refrigerator is open, Ice type function can't be used.

2) There is 1 dispenser pad, this can be used to dispense cubed ice, crushed ice and water.

3) Press SELECT ICE TYPE button to illuminate your desired option to be dispensed.



LED turn on to indicate option selected
Control Type A



LED turn on to indicate option selected
Control Type B

4) When pressing ICE TYPE pad in cubed ice or crushed ice option, Duct motor is activated by 1 second to open the duct door, it remains open mean while you keep pressed the pad, 5 seconds after pad release, duct motor becomes activated inverting motor polarity, in order to close duct door. Dispenser Pad has direct communication to the Main PCB, Main PCB read this signal as input to control Duct Motor and GEARED MOTOR. When Dispenser PAD is released, GEARED MOTOR will stop immediately, after 5 seconds Duct Motor will be activated to close Duct Door.

5) When pressing ICE TYPE pad in water option, water solenoid is activated allowing water dispensing. ICE TYPE pad has direct communication with the main PCB, Main PCB read this signal as input to control PILOT VALVE and WATER VALVE, When ICE TYPE pad is released, the PILOT VALVE and WATER VALVE is closed and water dispenser will stop.

6) While using any dispensing function and any door is opened, dispensing operation will be stopped immediately.

7) If ICE TYPE pad exceeds 3 minutes, GEARED MOTOR, CUBE SOLENOID or WATER SOLENOID will turn OFF automatically (this is a protection to avoid the overheating in the mentioned components), the duct motor will close Duct Door after 5 seconds after this interruption.

8) Last dispensing option (CUBED ICE, CRUSHED ICE or WATER) is saved in the internal memory of Main PCB and displayed by Display. Even after energy failure, Main PCB will display the last dispensing function used.

6.EXPLANATION FOR MICOM CIRCUIT

1. EXPLANATION FOR PCB CIRCUIT

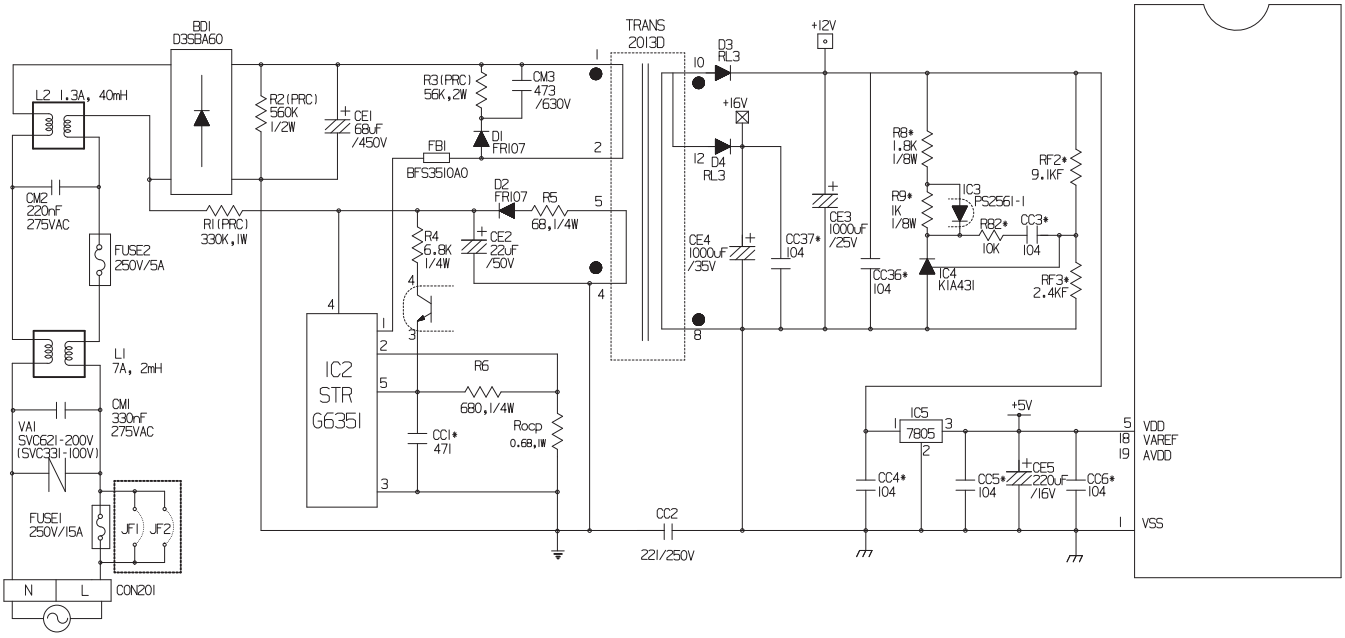
1-1. Power circuit

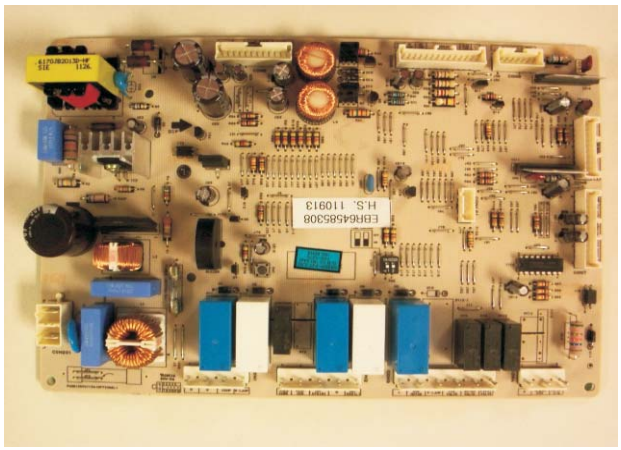
The power circuit includes a Switched Mode Power Supply (SMPS). It consists of a rectifier (BD1 and CE1) converting AC to DC, a switch (IC2) switching the DC voltage, a transformer, and a feedback circuit (IC3 and IC4).

Caution : Since high voltage (160 Vdc) is maintained at the power terminal, wait at least 3 minutes after unplugging the appliance to check the voltages to allow the current to dissipate.

Voltage of every part is as follows:

Part	VA1	CE1	CE2	CE3	CE4	CE5
Voltage	110~127 Vac	160 Vdc	14 Vdc	12 Vdc	15.5 Vdc	5 Vdc

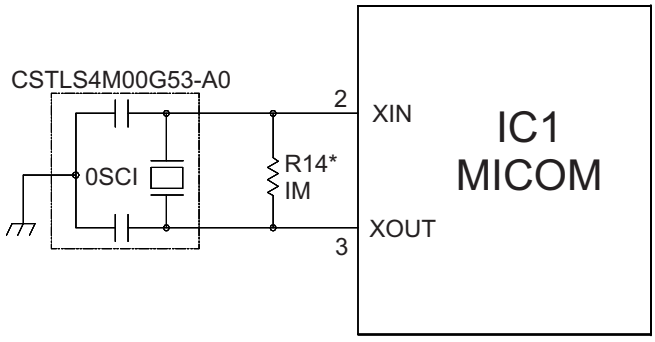




The part highlighted, are the components of the Switched Mode Power Supply

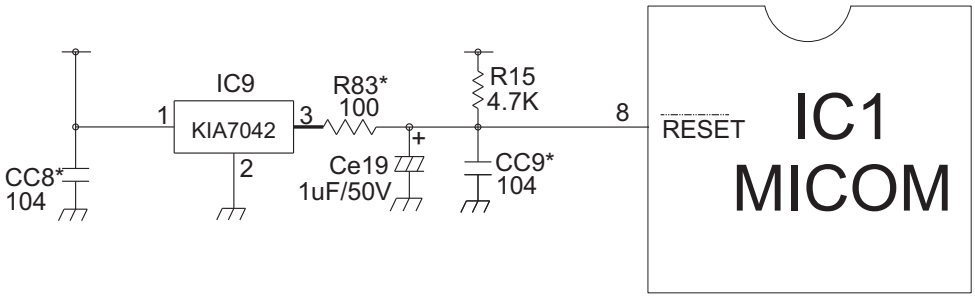
1-2. Oscillation circuit

The oscillation circuit generates a basic clock signal for synchronization and time calculation related to the transmission of data and calculations made by the MICOM (IC1). The oscillator (OSC1) must always be replaced with an exact rated part, because if this changes, the time calculations of the MICOM will be affected and it might not work at all.



1-3. Reset circuit

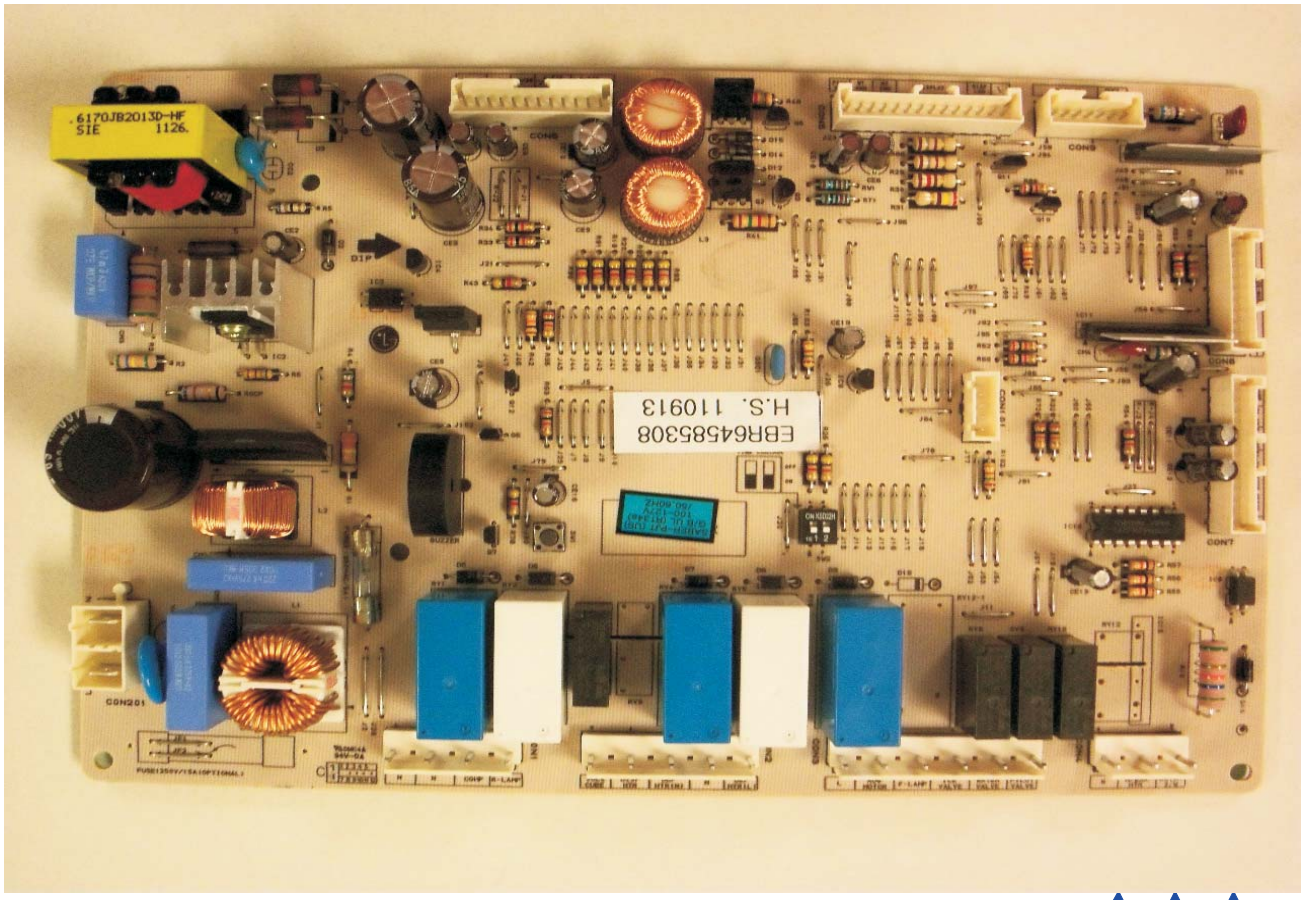
The RESET circuit allows various parts of the MICOM, such as RAM, defrosting, etc., to be restarted from the initial state when power is interrupted or restored. A LOW signal applied to the reset terminal for 10 ms causes the MICOM to reset itself. During normal operation, the voltage at the reset terminal is 5 Vdc. If the reset fails, the MICOM will not operate.

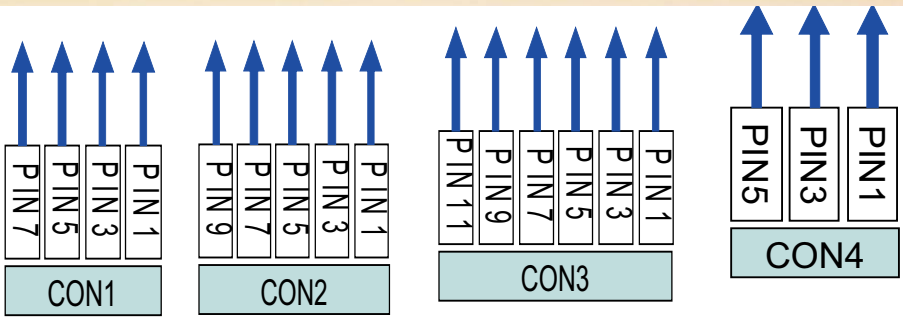


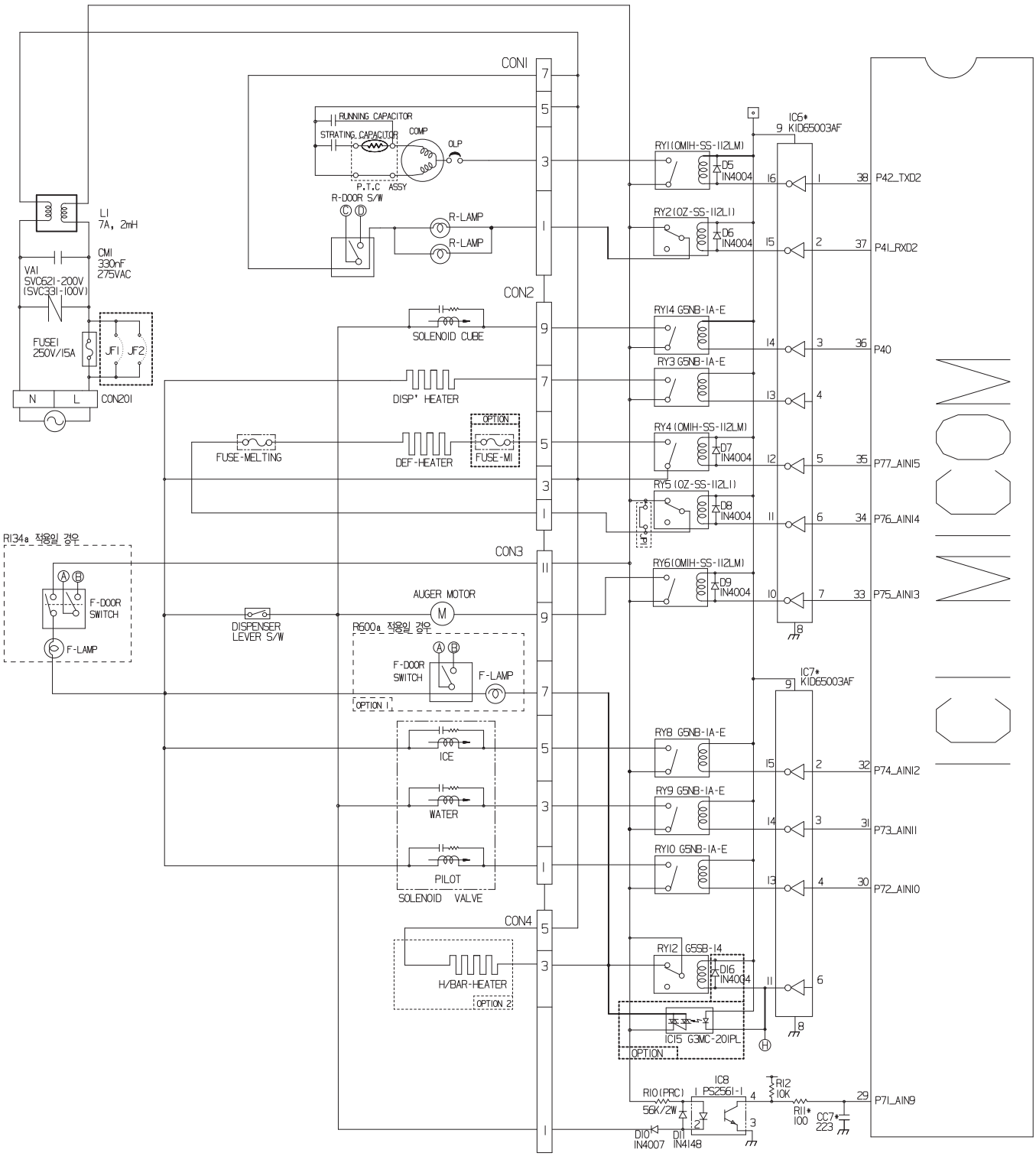
1-4. Load/dispenser operation, door opening circuit

1. Load Driving Circuit

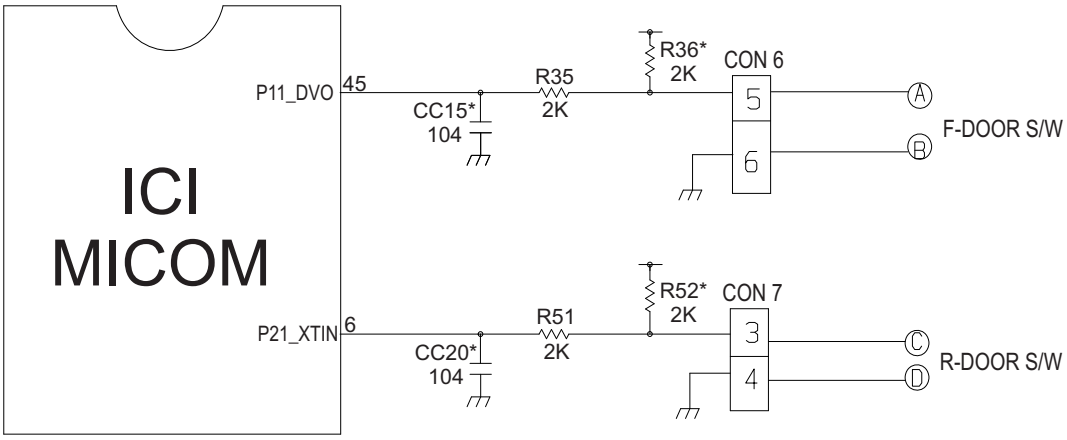
LOAD		COMPRESSOR		REFRIGERATOR LAMP		DEFROST HEATER		AUGER MOTOR		SOLENOID CUBE		ICE VALVE		WATER VALVE	
MEASURING PART		+	-	+	-	+	-	+	-	+	-	+	-	+	-
		CON 1 PIN 3	CON 1 PIN 7	CON 1 PIN 1	CON 1 PIN 7	CON 2 PIN 1	CON 2 PIN 5	CON 3 PIN 9	CON 4 PIN 5	CON 2 PIN 9	CON 2 PIN 3	CON 3 PIN 5	CON 4 PIN 5	CON 3 PIN 3	CON 4 PIN 5
STATUS	ON	115 ~ 127 VAC		115 ~ 127 VAC		115 ~ 127 VAC		115 ~ 127 VAC		115 ~ 127 VAC		115 ~ 127 VAC		115 ~ 127 VAC	
	OFF	0 VAC		0 VAC		0 VAC		0 VAC		0 VAC		0 VAC		0 VAC	

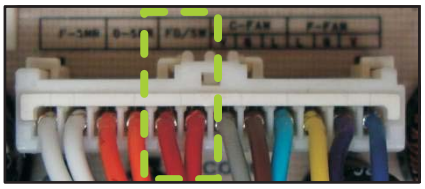





CON1
CON2
CON3
CON4
RUNNING CAPACITOR
STRATING CAPACITOR
COMP
OLP
P.T.C ASSY
R-DOOR S/W
R-LAMP
R-LAMP
L1
7A, 2mH
CM1
330nF
275VAC
VA1
SVC621-200V
(SVC331-100V)
FUSE1
250V/15A
JF1
JF2
N
L
CON201
SOLENOID CUBE
DISP' HEATER
FUSE-MELTING
DEF-HEATER
OPTION
FUSE-M1
R134a 적용일 경우
F-DOOR
SWITCH
F-LAMP
AUGER MOTOR
M
DISPENSER
LEVER S/W
R600a 적용일 경우
F-DOOR
SWITCH
F-LAMP
OPTION 1
ICE
WATER
PILOT
SOLENOID VALVE
H/BAR-HEATER
OPTION 2
IC6*
9 KID65003AF
RY1(OMIH-SS-112LM)
D5
IN4004
RY2(OZ-SS-112L1)
D6
IN4004
RY14 G5NB-1A-E
RY3 G5NB-1A-E
RY4(OMIH-SS-112LM)
D7
IN4004
RY5(OZ-SS-112L1)
D8
IN4004
RY6(OMIH-SS-112LM)
D9
IN4004
P42_TXD2
P41_RXD2
P40
P77_AIN15
P76_AIN14
P75_AIN13
IC7*
9 KID65003AF
RY8 G5NB-1A-E
RY9 G5NB-1A-E
RY10 G5NB-1A-E
RY12 G5SB-14
D16
IN4004
IC15 G3MC-201PL
OPTION
P74_AIN12
P73_AIN11
P72_AIN10
IC8
PS2561-1
R10(PRC)
56K/2W
D10
IN4007
D11
IN4148
R12
10K
R11*
100
CC7*
223
P71_AIN9
CI MICOM

2. Door opening sensing circuit



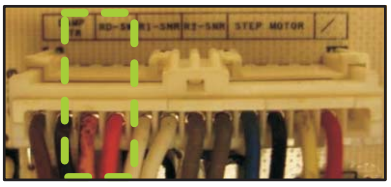


CONNECTOR 6

F- DOOR S/W

2*RD

PIN 5&6



CONNECTOR 7

R- DOOR S/W

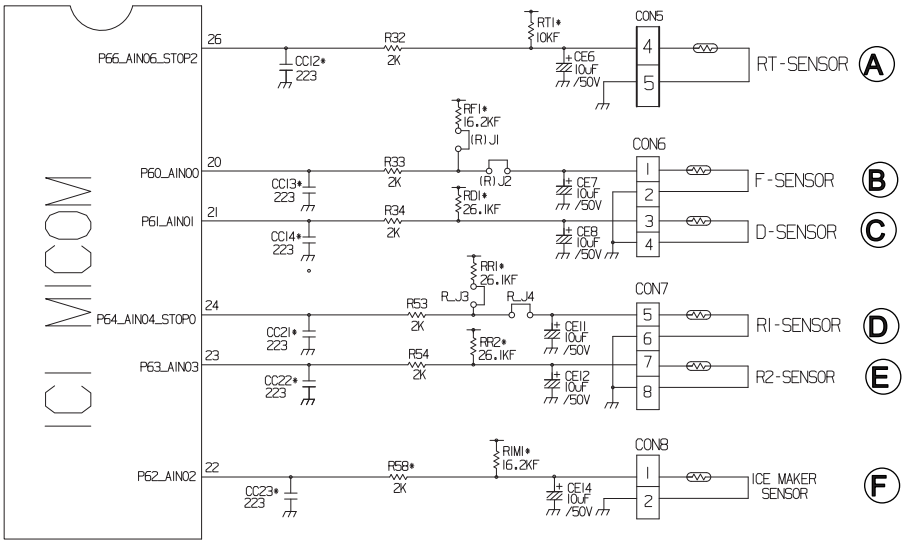
BO, PK

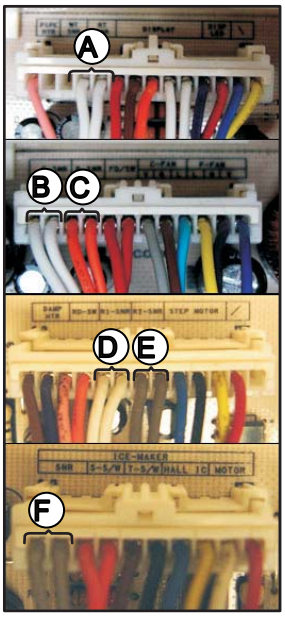
PIN 3&4

Measuring Part / Door of Freezer / Refrigerator	IC1 (MICOM) PIN 39, 40
Closing	5 V (Ⓐ - Ⓑ, Ⓒ - Ⓓ . Switch at both ends are at Off status.
Opening	0 V (Ⓐ - Ⓑ, Ⓒ - Ⓓ . Switch at both ends are at On status.

- Since door switches (A) and (B) are interconnected, if either fails, the other will not respond properly.
- If either switch fails, the light will not come on.

1-5. Temperature sensing circuit

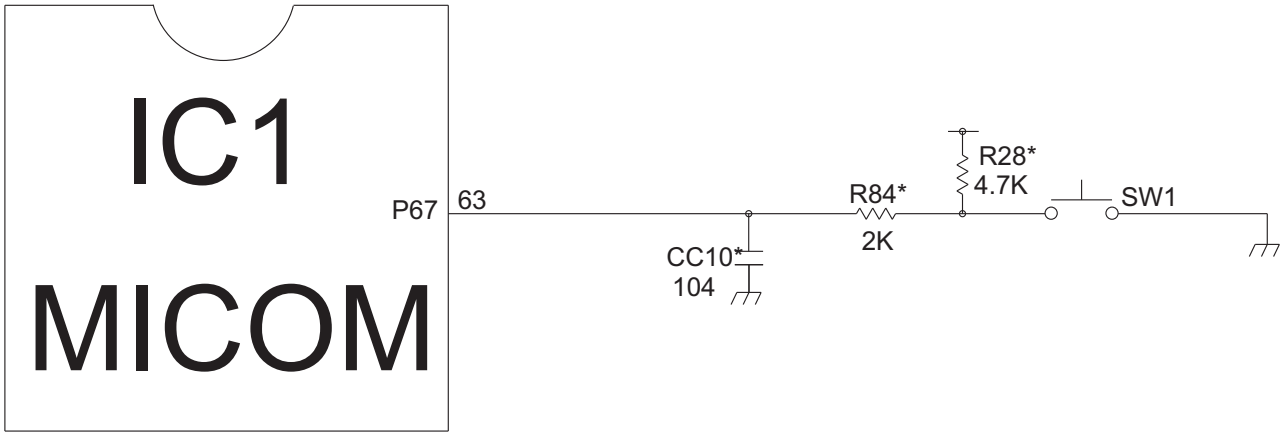




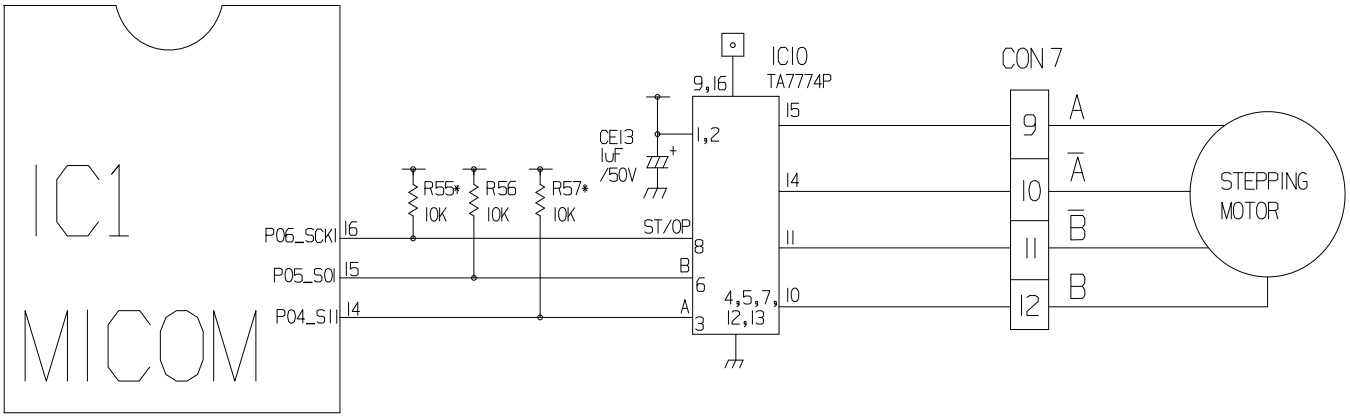
ITEM	SENSOR	LOCATION	COLOR
A	RT	CON5 PIN4,5	2*WH
B	F	CON6 PIN1,2	2*WH
C	D	CON6 PIN3,4	2*BO
D	R1	CON7 PIN5,6	2*WH
E	R2	CON7 PIN7,8	2*GY
F	I/M	CON8 PIN1,2	2*GY

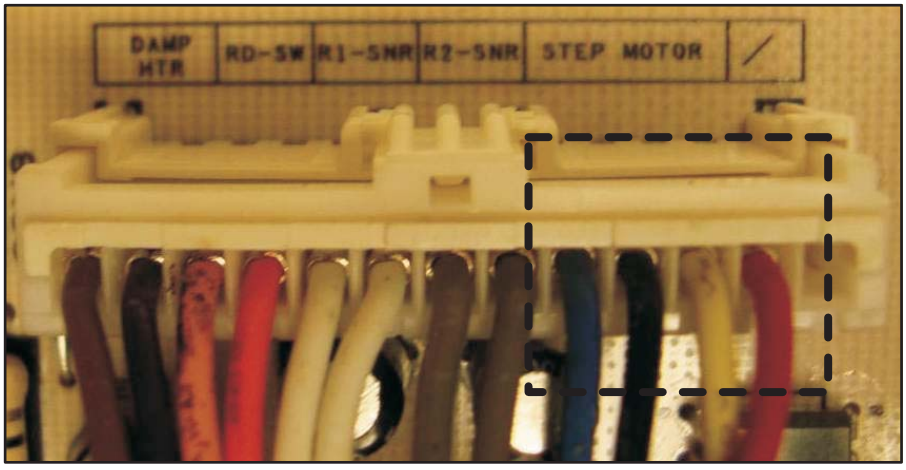
1-6. Switch entry circuit

The following circuits are sensing signal form the test switch, damper motor reed switch for testing and diagnosing the refrigerator.



1-7. Stepping motor operation circuit





CONNECTOR 9

STEPPING MOTOR

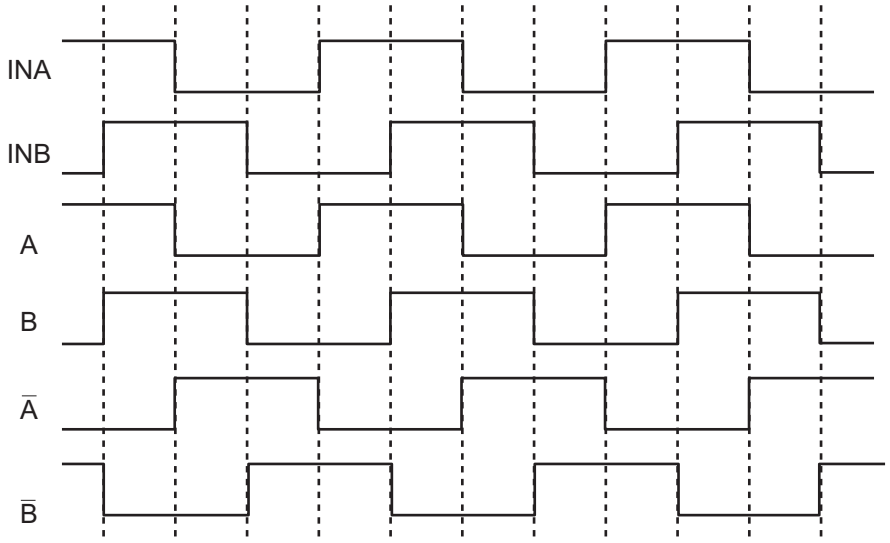
PIN 9, 10, 11, 12

BL, BK, YL, RD

The motor is driven by magnetism formed in the areas of the coils and the stator. Rotation begins when a HIGH signal is applied to MICOM Pin 16 of IC10 (TA7774P). This causes an output of HIGH and LOW signals on MICOM pins 14 and 15.

Explanation) The stepping motor is driven by sending signals of 3.33 mSEC via MICOM pins 14, 15, and 16, as shown in the chart below. These signals are output via terminals 10, 11, 14, and 15 via input terminals 3, 6, and 8 of IC10 (TA7774P), the motor drive chip. The output signals allow the coils wound on each phase of the stator to form a magnetic field, which causes rotation. Input to the terminals INA and INB of IC10 as shown in the chart below drives the motor.

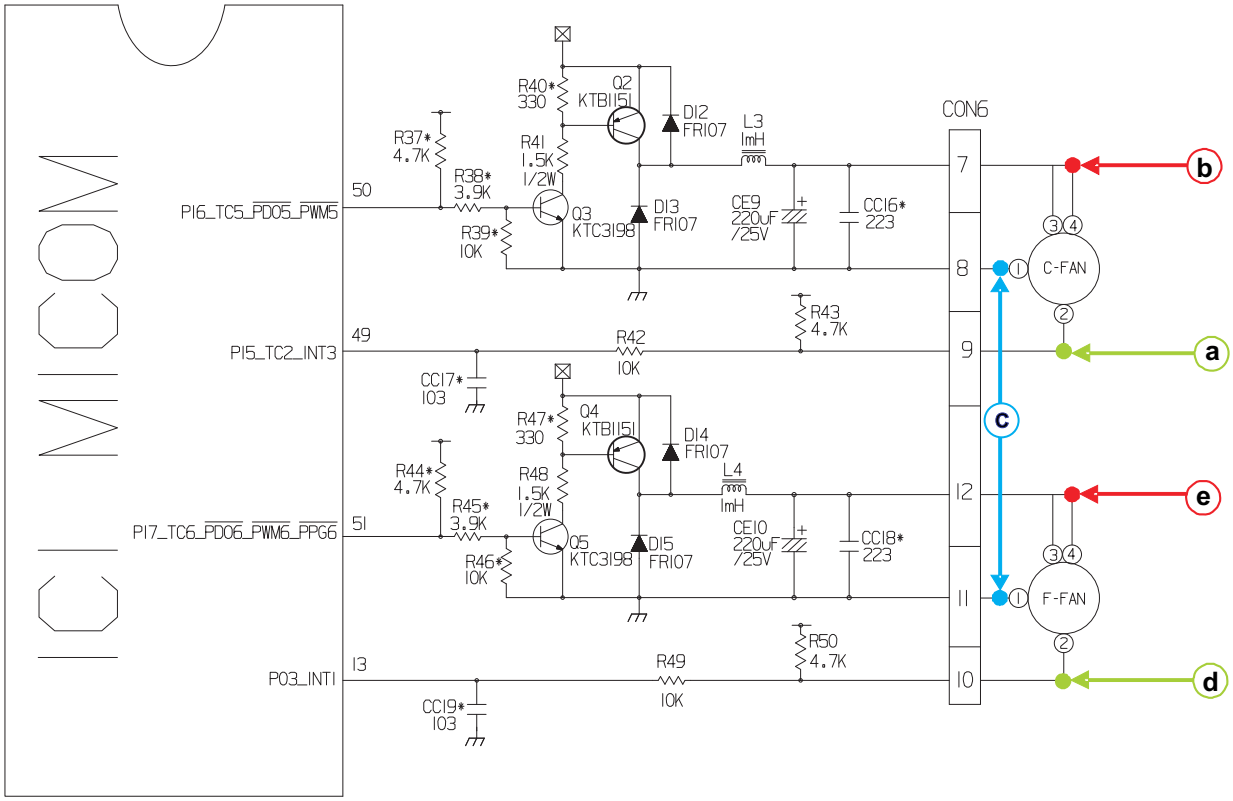
CCW (Reverse rotation) ◀——— ——— ▶ (Positive rotation) CW

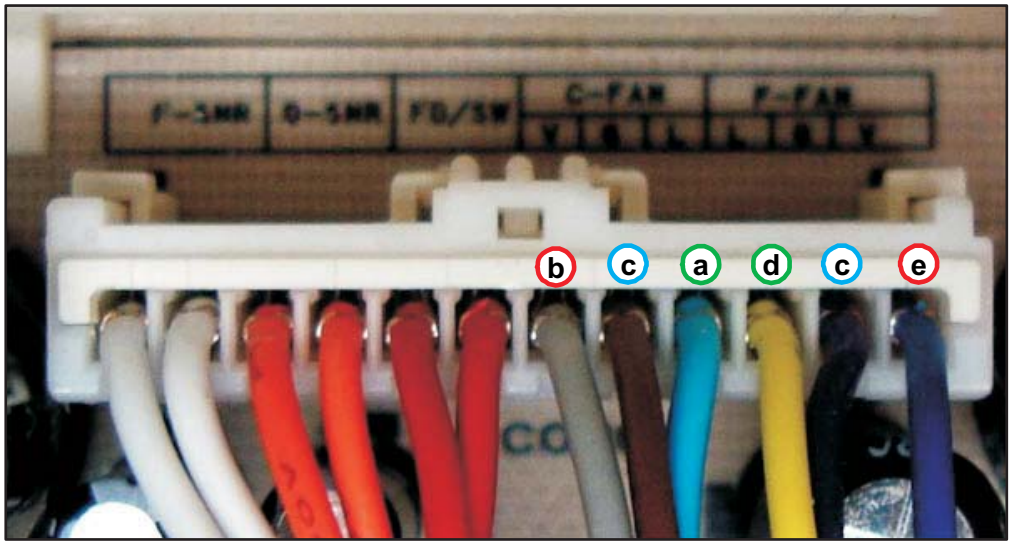


1-8. Fan motor driving circuit (freezer, mechanical area)

1. The circuit cuts all power to the fan drive IC, resulting in a standby mode.
2. This circuit changes the speed of the fan motor by varying the DC voltage between 7.5 Vdc and 16 Vdc.
3. This circuit stops the fan motor by cutting off power to the fan when it senses a lock-up condition.
4. The ground is connector 7, pin 2.

	Between ⓐ ⓒ , ⓓ ⓒ	Between ⓑ ⓒ	Between ⓔ ⓒ
Motor OFF	5V	2V or less	2V or less
Motor ON	2~3V	12~14V	8~16V





Temperature compensation table at the refrigerator is as follows:

	Modification resistance / Current resistance	470 Ω	2 kΩ	3.3 kΩ	5.6 kΩ	8.2 kΩ	10 kΩ	12 kΩ	18 kΩ	33 kΩ	56 kΩ	180 kΩ
Refrigerator (RCR1)	470Ω	No change	0.5 °C [0.9 °F] Up	1 °C [1.8 °F] Up	1.5 °C [2.7 °F] Up	2 °C [3.6 °F] Up	2.5 °C [4.5 °F] Up	3 °C [5.4 °F] Up	3.5 °C [6.3 °F] Up	4 °C [7.2 °F] Up	4.5 °C [8.1 °F] Up	5 °C [9 °F] Up
	2 kΩ	0.5 °C [0.9 °F] Down	No change	0.5 °C [0.9 °F] Up	1 °C [1.8 °F] Up	1.5 °C [2.7 °F] Up	2 °C [3.6 °F] Up	2.5 °C [4.5 °F] Up	3 °C [5.4 °F] Up	3.5 °C [6.3 °F] Up	4 °C [7.2 °F] Up	4.5 °C [8.1 °F] Up
	3.3 kΩ	1 °C [1.8 °F] Down	0.5 °C [0.9 °F] Down	No change	0.5 °C [0.9 °F] Up	1 °C [1.8 °F] Up	1.5 °C [2.7 °F] Up	2 °C [3.6 °F] Up	2.5 °C [4.5 °F] Up	3 °C [5.4 °F] Up	3.5 °C [6.3 °F] Up	4 °C [7.2 °F] Up
	5.6 kΩ	1.5 °C [2.7 °F] Down	1 °C [1.8 °F] Down	0.5 °C [0.9 °F] Down	No change	0.5 °C [0.9 °F] Up	1 °C [1.8 °F] Up	1.5 °C [2.7 °F] Up	2 °C [3.6 °F] Up	2.5 °C [4.5 °F] Up	3 °C [5.4 °F] Up	3.5 °C [6.3 °F] Up
	8.2 kΩ	2 °C [3.6 °F] Down	1.5 °C [2.7 °F] Down	1 °C [1.8 °F] Down	0.5 °C [0.9 °F] Drop	No change	0.5 °C [0.9 °F] Up	1 °C [1.8 °F] Up	1.5 °C [2.7 °F] Up	2 °C [3.6 °F] Up	2.5 °C [4.5 °F] Up	3 °C [5.4 °F] Up
	10 kΩ	2.5 °C [4.5 °F] Down	2 °C [3.6 °F] Down	1.5 °C [2.7 °F] Down	1 ◦ C [1.8 °F] Down	0.5 °C [0.9 °F] Down	No change	0.5 °C [0.9 °F] Up	1 °C [1.8 °F] Up	1.5 °C [2.7 °F] Up	2 °C [3.6 °F] Up	2.5 °C [4.5 °F] Up
	12 kΩ	3 °C [5.4 °F] Down	2.5 °C [4.5 °F] Down	2 °C [3.6 °F] Down	1.5 °C [2.7 °F] Down	1 °C [1.8 °F] Down	0.5 °C [0.9 °F] Down	No change	0.5 °C [0.9 °F] Up	1 °C [1.8 °F] Up	1.5 °C [2.7 °F] Up	2 °C [3.6 °F] Up
	18 kΩ	3.5 °C [6.3 °F] Down	3 °C [5.4 °F] Down	2.5 °C [4.5 °F] Down	2 °C [3.6 °F] Down	1.5 °C [2.7 °F] Down	1 °C [1.8 °F] Down	0.5 °C [0.9 °F] Down	No change	0.5 °C [0.9 °F] Up	1 °C [1.8 °F] Up	1.5 °C [2.7 °F] Up
	33 kΩ	4 °C [7.2 °F] Down	3.5 °C [6.3 °F] Down	3 °C [5.4 °F] Down	2.5 °C [4.5 °F] Down	2 °C [3.6 °F] Down	1.5 °C [2.7 °F] Down	1 °C [1.8 °F] Down	0.5 °C [0.9 °F] Down	No change	0.5 °C [0.9 °F] Up	1 °C [1.8 °F] Up
	56 kΩ	4.5 °C [8.1 °F] Down	4 °C [7.2 °F] Down	3.5 °C [6.3 °F] Down	3 °C [5.4 °F] Down	2.5 °C [4.5 °F] Down	2 °C [3.6 °F] Down	1.5 °C [2.7 °F] Down	1 °C [1.8 °F] Down	0.5 °C [0.9 °F] Down	No change	0.5 °C [0.9 °F] Up
	180 kΩ	5 °C [9 °F] Down	4.5 °C [8.1 °F] Down	4 °C [7.2 °F] Down	3.5 °C [6.3 °F] Down	3 °C [5.4 °F] Down	2.5 °C [4.5 °F] Down	2 °C [3.6 °F] Down	1.5 °C [2.7 °F] Down	1 °C [1.8 °F] Down	0.5 °C [0.9 °F] Down	No change

Temperature compensation at the freezer is performed the same as at the refrigerator. The value for the freezer is twice that of the refrigerator.

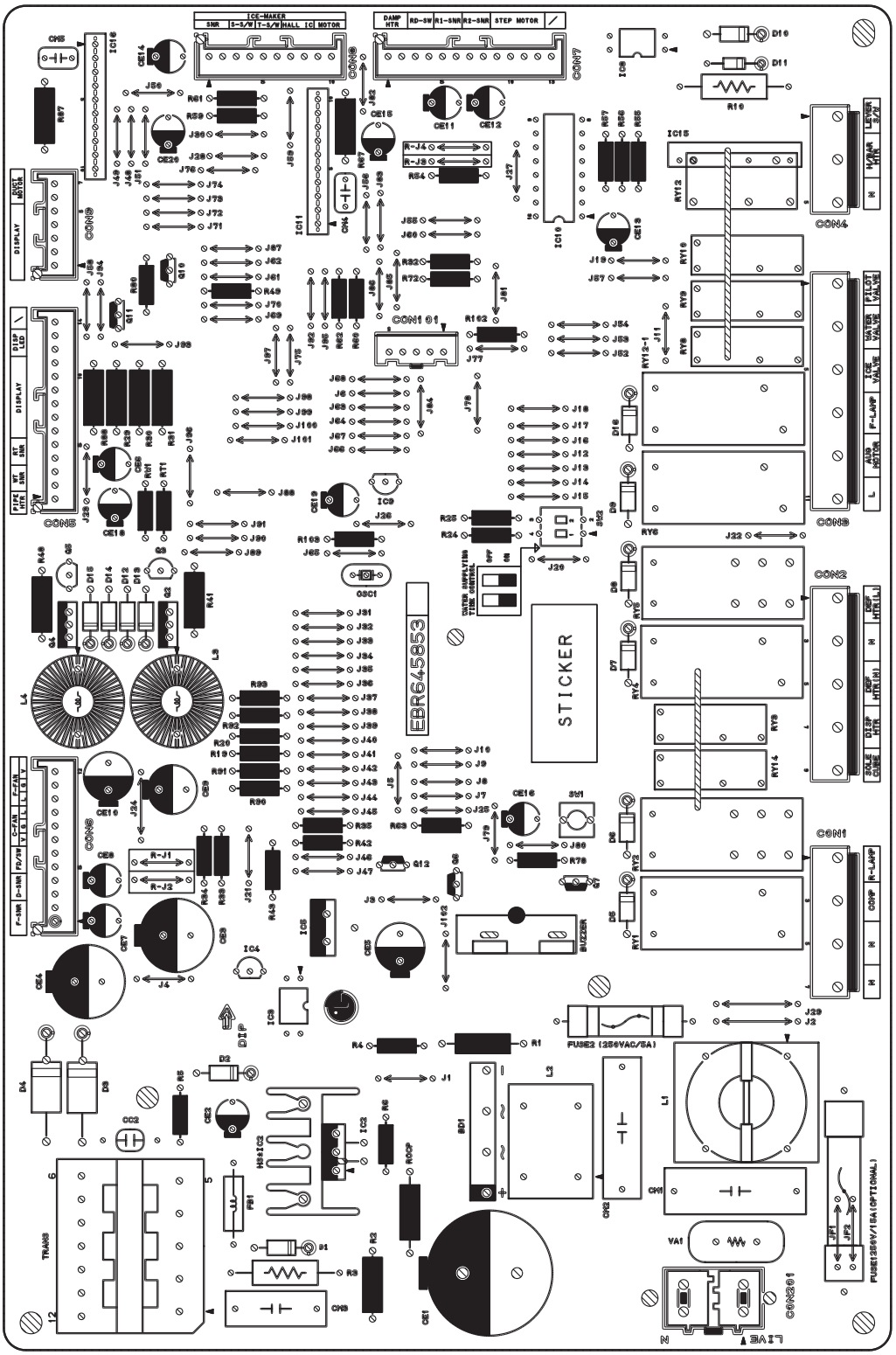
This circuit enters the necessary level of temperature compensation for adjusting the appliance. The method is the same for every model in this appliance family.

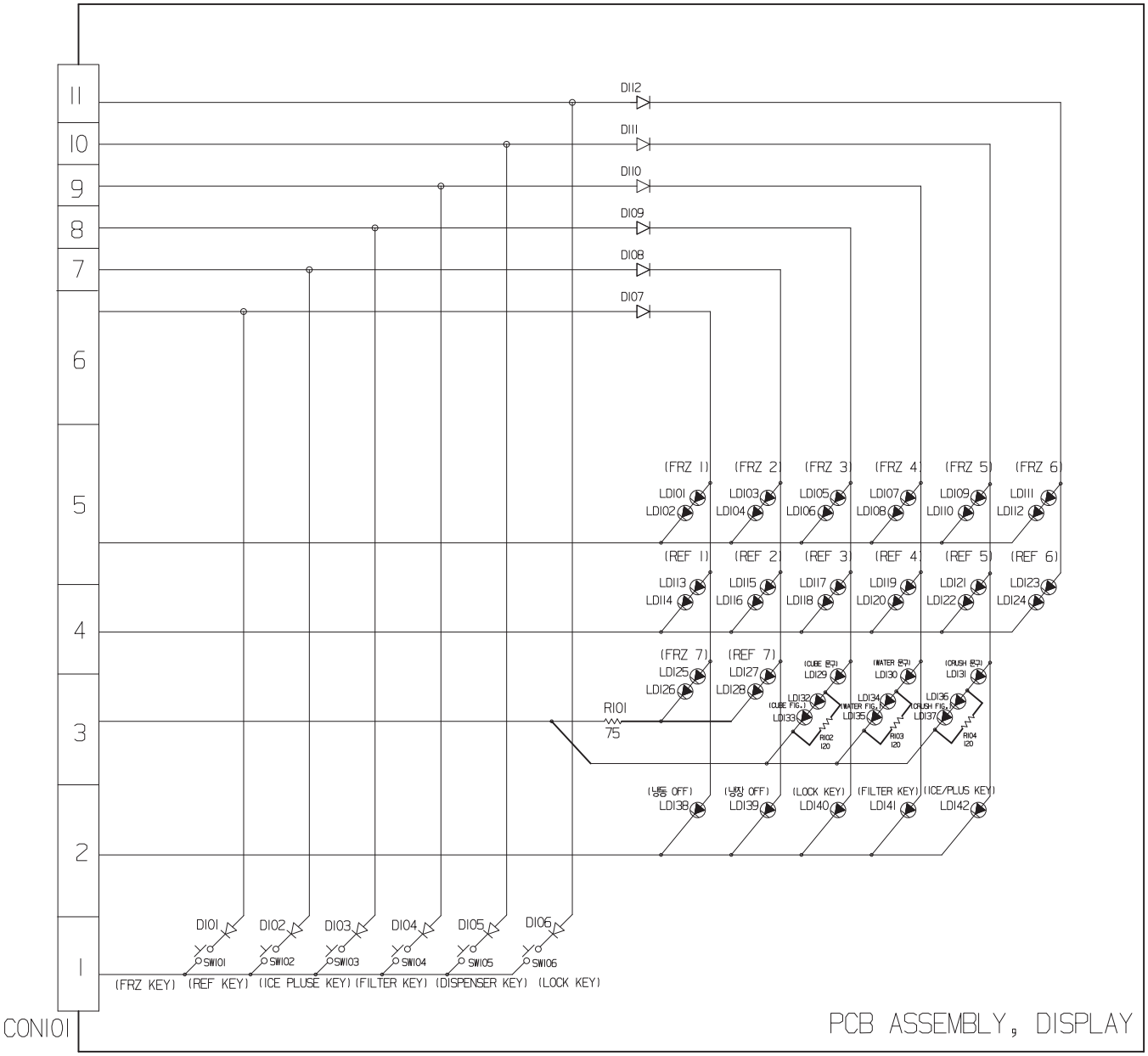
1) Sensor resistance characteristics table

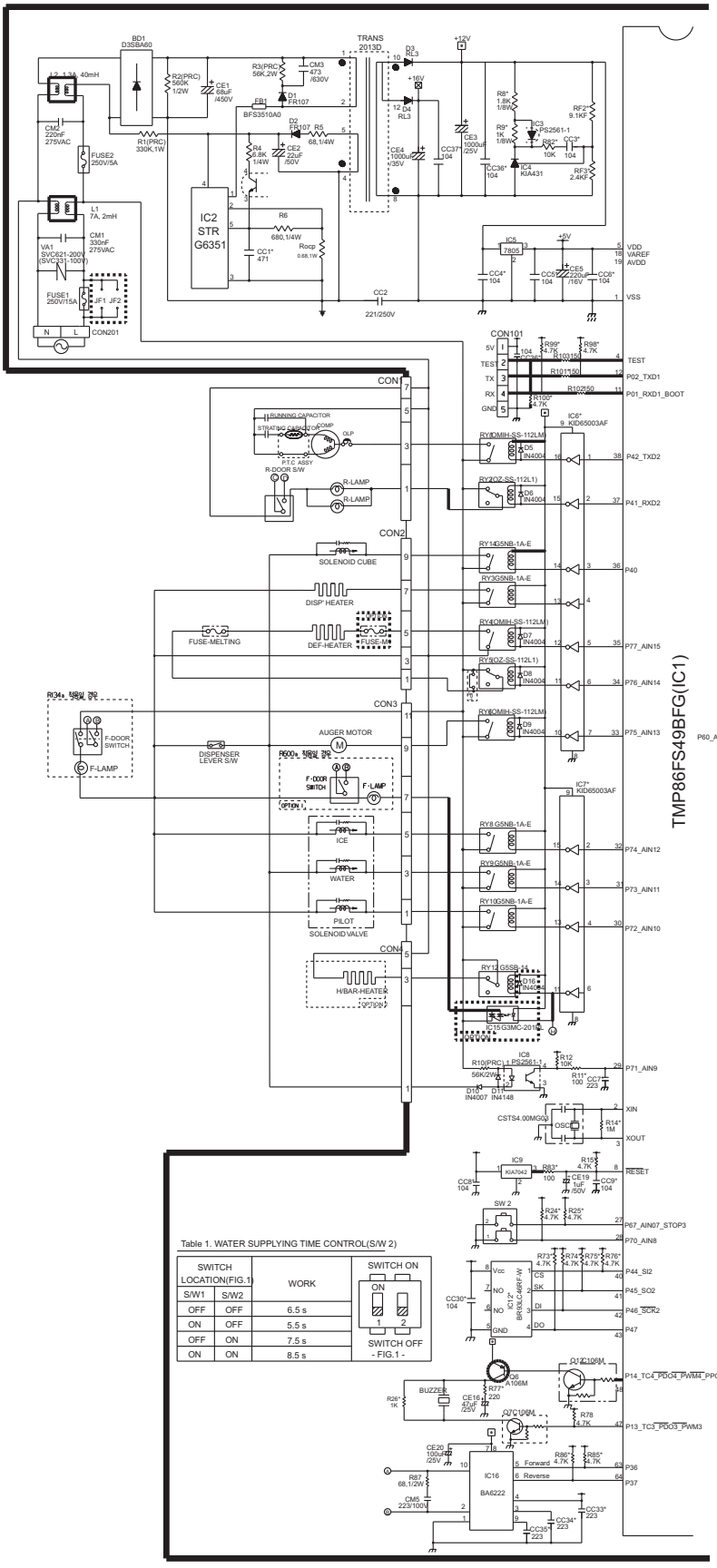
Measuring Temperature (℃)	Freezing Sensor	Cold storage sensor 1&2 Frost removal sensor, Outside sensor
-20 °C	22.3 kΩ	77 kΩ
-15 °C	16.9 kΩ	60 kΩ
-15 °C	13.0 kΩ	47.3 kΩ
-5 °C	10.1 kΩ	38.4 kΩ
0 °C	7.8 kΩ	30 kΩ
+5 °C	6.2 kΩ	24.1 kΩ
+10 °C	4.9 kΩ	19.5 kΩ
+15 °C	3.9 kΩ	15.9 kΩ
+20 °C	3.1 kΩ	13 kΩ
+25 °C	2.5 kΩ	11 kΩ
+30 °C	2.0 kΩ	8.9 kΩ
+40 °C	1.4 kΩ	6.2 kΩ
+50 °C	0.8 kΩ	4.3 kΩ

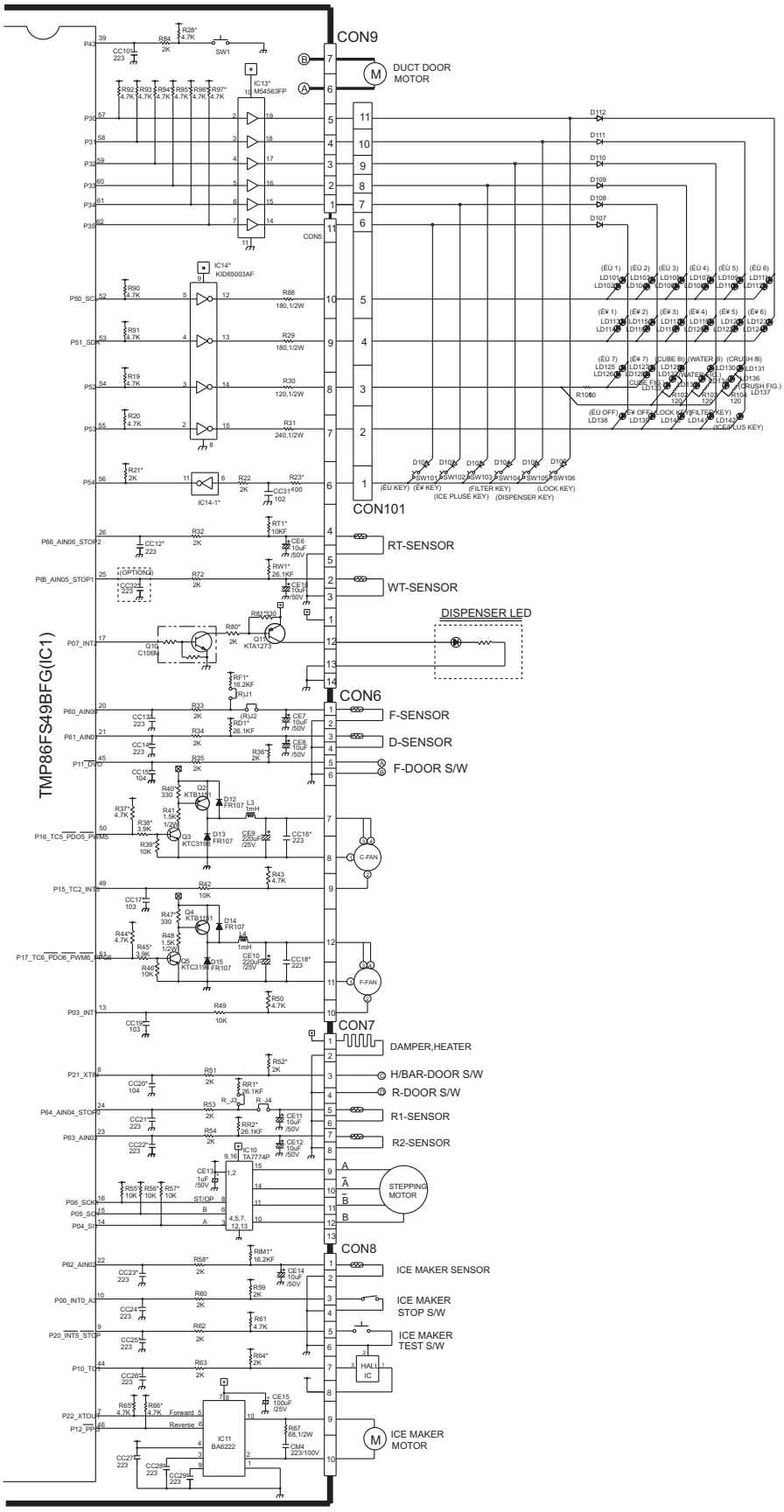
- Resistance value allowance of sensor is ±5%.
- When measuring the resistance value of the sensor, allow the temperature of that sensor to stabilize for at least 3 minutes before measuring. This delay is necessary because of the sense speed relationship.
- Use a digital tester to measure the resistance. An analog tester has to great a margin of error.
- Resistance of the cold storage sensor 1 and 2 shall be measured with a digital tester

- Resistance of the freezing sensor shall be measured with a digital tester after separating CON7 of the PWB ASSEMBLY and the MAIN part.


EBR64585303
STICKER
ICE-MAKER
DAMP HTR
STEP MOTOR
DISPLAY
CON1
CON2
CON3
CON4
CON5
CON6
CON7
CON8
FUSE2 (250VAC/5A)
FUSE1(250V/15A(OPTIONAL))
TRANS
BUZZER
LINE
N


CON101
PCB ASSEMBLY, DISPLAY
11
10
9
8
7
6
5
4
3
2
1
D112
D111
D110
D109
D108
D107
(FRZ 1) (FRZ 2) (FRZ 3) (FRZ 4) (FRZ 5) (FRZ 6)
LD101 LD103 LD105 LD107 LD109 LD111
LD102 LD104 LD106 LD108 LD110 LD112
(REF 1) (REF 2) (REF 3) (REF 4) (REF 5) (REF 6)
LD113 LD115 LD117 LD119 LD121 LD123
LD114 LD116 LD118 LD120 LD122 LD124
(FRZ 7) (REF 7)
LD125 LD127
LD126 LD128
(CUBE 온고)
LD129
(WATER 온고)
LD130
(CRUSH 온고)
LD131
LD132
(CUBE FIG.)
LD133
LD134
(WATER FIG.)
LD135
LD136
(CRUSH FIG.)
LD137
R101
75
R102
120
R103
120
R104
120
(냉동 OFF)
LD138
(냉장 OFF)
LD139
(LOCK KEY)
LD140
(FILTER KEY)
LD141
(ICE/PLUS KEY)
LD142
D101 D102 D103 D104 D105 D106
SW101 SW102 SW103 SW104 SW105 SW106
(FRZ KEY) (REF KEY) (ICE PLUSE KEY) (FILTER KEY) (DISPENSER KEY) (LOCK KEY)

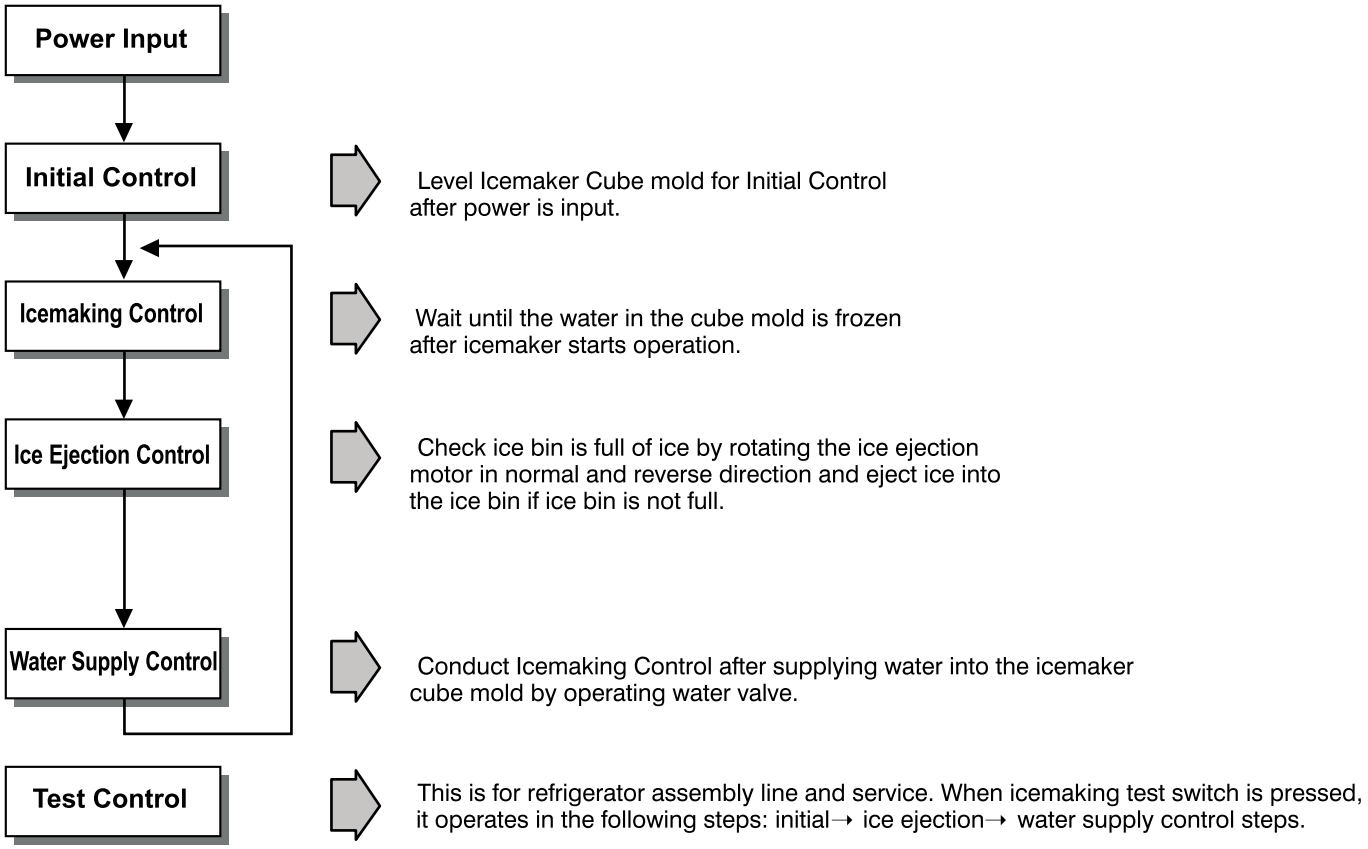

TMP86FS49BFG(IC1)
IC2 STR G6351
TRANS 2013D
CON101
CON1
CON2
CON3
CON4
Table 1. WATER SUPPLYING TIME CONTROL(S/W 2)
SWITCH LOCATION(FIG.1)
S/W1 S/W2
WORK
OFF OFF 6.5 s
ON OFF 5.5 s
OFF ON 7.5 s
ON ON 8.5 s
SWITCH ON
SWITCH OFF
- FIG.1 -


TMP86FS49BFG(IC1)
CON9
DUCT DOOR MOTOR
CON5
CON101
RT-SENSOR
WT-SENSOR
DISPENSER LED
CON6
F-SENSOR
D-SENSOR
F-DOOR S/W
C-FAN
F-FAN
CON7
DAMPER,HEATER
H/BAR-DOOR S/W
R-DOOR S/W
R1-SENSOR
R2-SENSOR
STEPPING MOTOR
CON8
ICE MAKER SENSOR
ICE MAKER STOP S/W
ICE MAKER TEST S/W
HALL IC
ICE MAKER MOTOR

7. ICEMAKER AND DISPENSER OPERATION AND REPAIRING

1. ICE MAKER OPERATION

1-1. Ice Maker Operation



1-2. Dispenser Operation

1. This function is available in Model where water and ice are available without opening freezer compartment door.
2. **Crushed Ice** is automatically selected when power is initially applied or reapplied after power cut.
3. When dispenser selection switch is continuously pressed, light is on in the following sequence: Water →Cube Ice →Crushed Ice.
4. Lamp is on when dispenser button is pressed and vice versa.
5. When dispenser crushed ice rubber button is pressed, dispenser solenoid and geared motor work so that crushed ice can be dispensed if there is ice in the ice bin.
6. If there is ice in the bin, pushing the dispenser button will dispense it.
7. When dispenser water button is pressed, water valve opens and water is supplied if water valve is normally installed on the right side of the machine room.
8. Ice and water are not available when freezer door is open.

2. FUNCTION OF ICE MAKER

2-1. Initial Control Function

1. When power is initially applied or reapplied after power cut, it detects level of icemaker cube mold after completion of MICOM initialization. The detecting lever moves up and down.
2. The level of ice maker cube mold is judged by output signal, high and low signal, of Hall IC. Make the cube mold to be horizontal by rotating ice ejection motor in normal or reverse direction so that High/Low signal can be applied to MICOM Pin No. 44.
3. If there is no change in signal one minute after the geared motor starts to operate, it stops icemaker operation and check the signal every hour. It resets initialization of icemaker when it becomes normal.
4. It judges that the initial control is completed when it judges the icemaker cube mold is horizontal.
5. Ice ejection conducts for 1 cycle regardless of ice in the ice bin when power is initially applied.

2-2. Water Supply Control Function

1. This is to supply water into the ice maker cube mold by operating water valve in the mechanical area when ice ejection control is completed and ice maker mould is even.
2. The quantity of water supplied is determined by DIP switch and time.

Water Supply Quantity Table

No	SWITCH		Water Supply Time
	S1	S2	
1	OFF	OFF	6.5s
2	ON	OFF	5.5s
3	OFF	ON	7.5s
4	ON	ON	8.5s

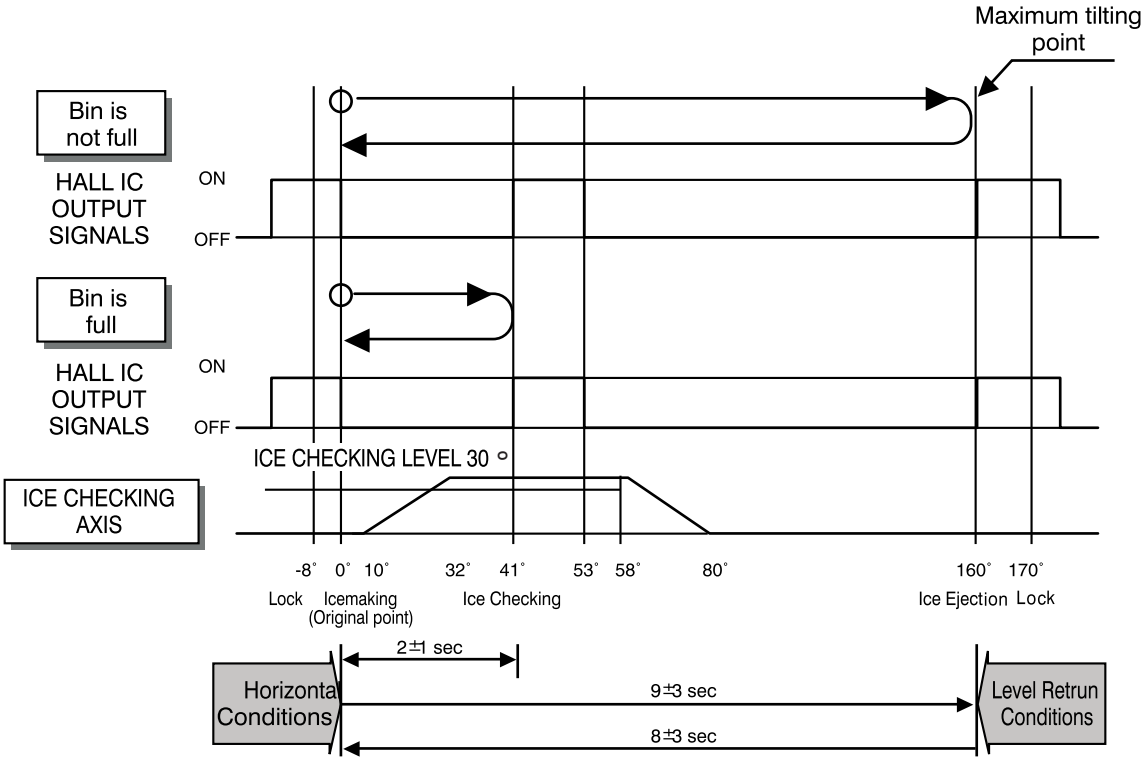
3. If the water supply quantity setting is changed while the power is on, the change will take effect immediately. If it is changed while the icemaker is filling the mold, the new setting will take effect the next time the, icemaker cycles.
4. When water supply signal is applied to water and ice valves at the same time during water supply, water shall be supplied to water valve. If water supply signal is applied to ice valve during water supply, water shall be supplied to both water and ice valves.

2-3. Icemaking Control Function

1. Icemaking control is carried out from the completion of water supply to the completion of ice making in the cube mold. Icemaking sensor detects the temperature of cube mold and completes ice making. (ice making sensor is fixed below icemaker cube mold)
2. Icemaking control starts after completion of water supply control or initial control.
3. The icemaker determined it's cycle is completed when the Icemaking sensor reaches -8 °C (17.6°F) after 10 minutes have passes since water filled the mold.
4. It is judged that icemaking is completed when ice maker sensor temperature reaches below -12 °C after 20 minutes in condition 3.

2-4. Ice Ejection Control Function

1. This is to eject ice from ice maker cube mold after icemaking is completed.
2. If Hall IC signal is on within 3 6/10 seconds after ice ejection motor rotates in normal direction, it does not proceed ice ejection but waits. If the ice bank is full, ice ejection motor rotates in normal direction in every hour to check the condition of ice bank. If the ice bank is not full, the water supply control starts after completion of ice ejection control. If the ice bin is full, ice ejection motor rotates in reverse direction and stops under icemaking or waiting conditions.
3. If ice bin is not full, ice ejection starts. The cube mold tilts to the maximum and ice is separated from the mold and ice checking lever raises.
4. Ice ejection motor stops for 1 second if Hall IC signal changes from OFF (low) to ON (high) after 3 6/10 seconds when ice ejection motor rotates in normal direction. If there is no change in Hall IC signals within 1 minute after ice ejection motor operates, ice ejection motor stops as ice ejection motor or hall IC is out of order.
5. If ice ejection motor or Hall IC is abnormal, ice ejection motor rotates in normal direction to exercise initial operationIt resets the ice maker if ice ejection motor or Hall IC is normal.
6. The mold stops for 1 second at maximum tilted conditions.
7. The mold returns to horizontal conditions as ice ejection motor rotates in reverse direction.
8. When the mold becomes horizontal, the cycle starts to repeat:
   Water Supply→ Ice Making→Ice Ejection →Mold Returns to Horizontal



2-5. Test Function

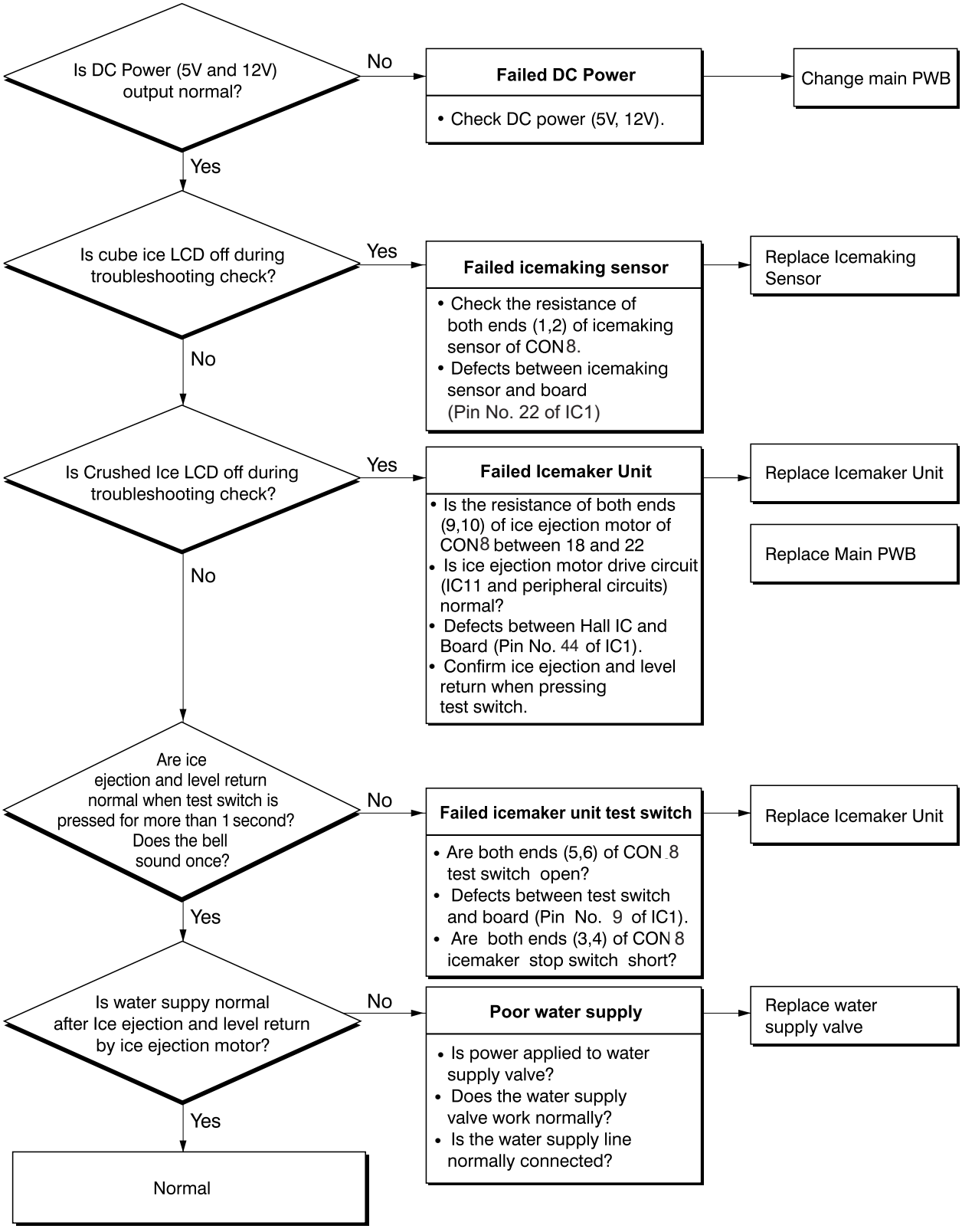
1. It is to force the operation during operation test, service, and cleaning. The test switch is mounted under the automatic icemaker. The test function starts when the test switch is pressed for more than 2 second.
2. Test button does not work during ice ejection and water supply. It works when it is in the horizontal conditions. If mold is full of ice during test function operation, ice ejection control and water supply control do not work.
3. If the mold is in the horizontal (normal) position and the TEST switch is pressed for more than 2 second, ice ejection will begin regardless of how frozen the water might be. When the ejection is completed, the icemaker will refill the mold with water. Consequently, problems related to filling, ejecting, and returning to the horizontal position can be checked using the test switch. When this test is performed, the buzzer will sound and water will fill the mold. Check the icemaker for repair if the buzzer does not sound.
4. When water supply is completed, the cycle operates normally as follows: Icemaking → Ice ejection → Returning to horizontal conditions→Water supply
5. Remove ice from the icemaker cube mold and press test switch when icemaker cube mold is full of ice as ice ejection and water supply control do not work when cube mold is full of ice.

2-6. Other functions relating to freezer compartment door opening

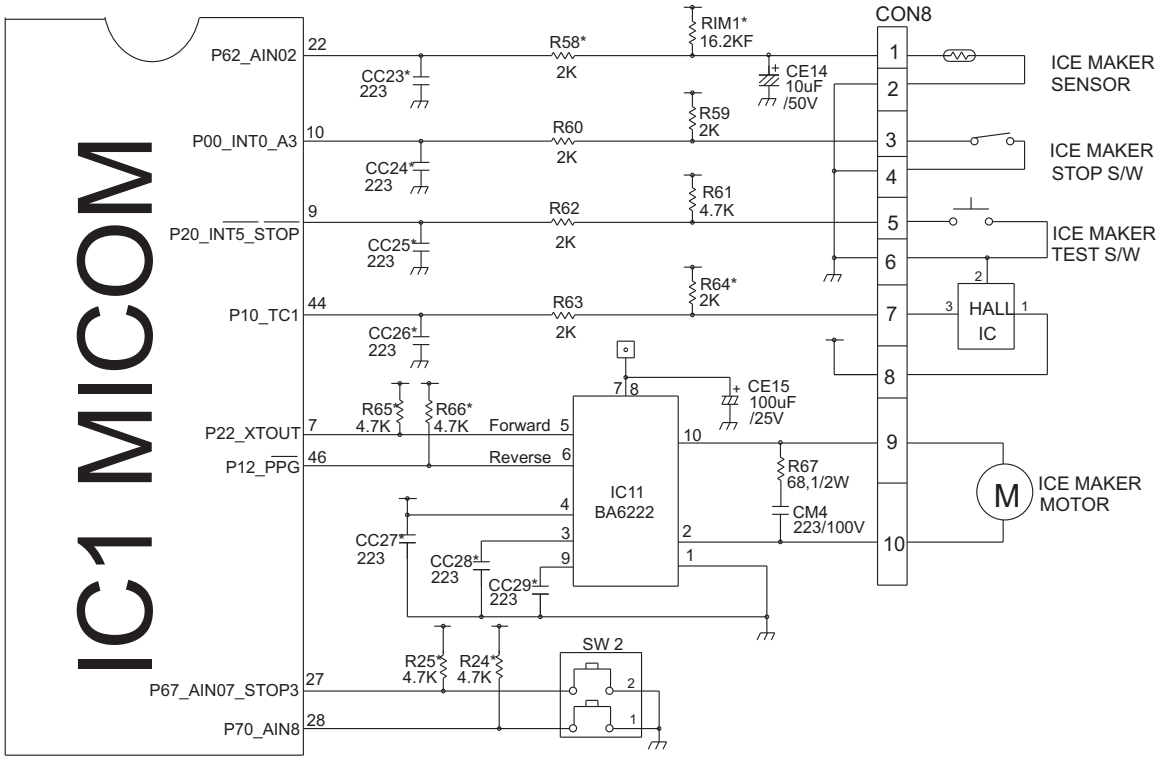
1. When freezer door is open, ice dispenser stops in order to reduce noise and ice drop.
2. When freezer door is open during ice ejection and cube mold returning to horizontal condition, ice ejection and cube mold level return proceed.
3. When freezer door is open, geared motor and cube ice solenoid immediately stop and duct door solenoid stops after 5 seconds.
4. Water dispenser stops in order to protect water drop when freezer door is open.
5. Test function operates normally regardless of refrigearator compartment door opening.

3. ICEMAKER TROUBLESHOOTING

*** Troubleshooting:** It is possible to confirm by pressing freezer and refrigerator temperature control buttons for more than 1 second (icemaker is normal if all LEDs are ON): refer to trouble diagnosis function in MICOM.



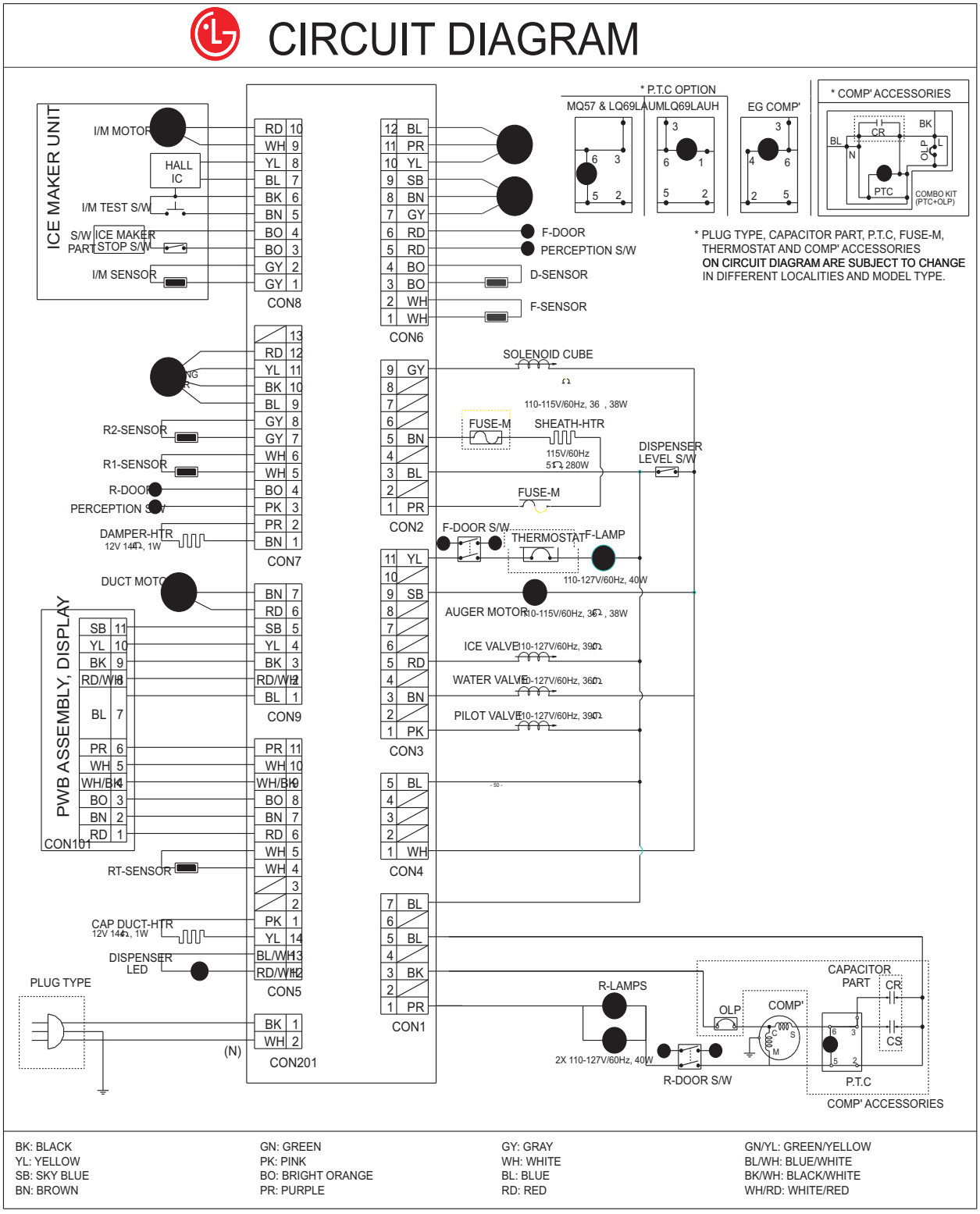
4. ICEMAKER CIRCUIT



The above icemaker circuits are applied to LSC23924** and composed of icemaker unit in the freezer and icemaker driving part of main PWB. Water is supplied to the icemaker cube mold through the solenoid relay for ice valve of solenoid valve in the mechanical area by opening valve for the same time.
Water supply automatically stops when water supply time is elapsed. This circuit is to realize the functions such as ice ejection of icemaker cube mold, ice full detection, leveling, ice making test switch input detection is the same as the door switch input detection circuit of main PWB.

1. It is to force to operate during operation test, service, and cleaning. The test switch is mounted under the automatic icemaker. The test function starts when the test switch is pressed for more than 1/2 second.
2. Test button does not work during ice ejection and water supply. It works when it is in the horizontal conditions. If cube mold is full of ice during test function operation, ice ejection control and water supply control do not work.
3. Ice ejection carries out regardless of ice formation in the ice making tray if test switch is pressed for more than 1/2 second. Water will be splashed if test switch is pressed before the water in the mold is completely frozen. Water will be supplied while the mold returns to the horizontal conditions after ice ejection. Therefore, the problems of ice ejection, leveling, and water supply can be checked by test switch. When test function performs normally, buzzer sounds and water supply shall carry out. Check it for repair if buzzer does not sound.
4. When water supply is completed, normal cycle works: Icemaking→Ice Ejection→ Level Return → Water Supply.
5. If icemaker stop switch is set to ON, normal cycle operates: Icemaking→Ice Ejection→ Level Return → Water Supply. If is set to OFF, ice making conducts but ice ejection, level return, and water supply do not work.

8. CIRCUIT DIAGRAM



9. TROUBLE DIAGNOSIS

1. TroubleShooting

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK

1. Faulty start	1) No power at outlet.
	2) No power on cord.
	- Bad connection between adapter and outlet. (faulty adapter)
	  - The Inner diameter of adapter.
	  - The distance between holes.
	  - The distance between terminals.
	  - The thickness of terminal.
	- Bad connection between plug and adapter (faulty plug).
	  - The distance between pins.
	  - Pin outer diameter.
	3) Shorted start circuit.
	- No power on power cord.
	  - Disconnected copper wire.
	  - Power cord is disconnected.
	  - Faulty soldering.
	  - Internal electrical short.
	  - Faulty terminal contact.
	  - Loose contact.
	  - Large distance between male terminal.
	  - Thin female terminal.
	  - Terminal disconnected.
	  - Bad sleeve assembly.
	  - Disconnected.
	  - Weak connection.
	  - Short inserted cord length.
	  - Worn out tool blade.
	- OLP is off.
	  - Specification of OLP is wrong.
	  - Defect in OLP.
	  - Bad connection.
	  - Power is disconnected.
	  - Inner Ni-Cr wire blows out.
	  - Bad internal connection.
	  - Faulty terminal caulking (Cu wire is cut).
	  - Bad soldering.
	- No electric power on compressor. - Faulty compressor.
	- Faulty PTC
	  - Power does not conduct. - Damage.
	  - Characteristics of PTC is wrong.
	  - Bad connection with compressor.
	  - Too loose.
	  - Assembly is not possible.
	  - Bad terminal connection.
	4) During defrost.
	- Start automatic defrost.
	- Cycle was set at defrost when the refrigerator was produced.
		* Measuring instrument:
		Multi tester
		Check the voltage.
		If the voltage is within ±85% of the rated voltage, it is OK.
		Check the terminal movement.
		Check both terminals of power cord.
		Power conducts:OK.
		No power conducts:NG
		Check rating of OLP
		OLP: 4TM419TFBYY
		Temp. 140°C
		If rating different: change it
		If not: OK
		Check that PTC model it is ok, (6R8MB) then check continuity between terminals 2 and 5 of PTC.

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK

2. No cooling.	2) Refrigeration system is clogged.
	- Moisture clogged.
	  - Residual moisture in the evaporator.
	  - Air Blowing.
	  - Not performed.
	  - Too short.
	  - Impossible moisture confirmation.
	  - Low air pressure.
	  - Leave it in the air.
	  - During rest time.
	  - After work.
	  - Caps are missed.
	  - Residual moisture.
	  - Not dried in the compressor.
	  - Elapsed more than 6 months after drying
	  - Caps are missed.
	  - No pressure when it is open.
	- No electric power on thermo-stat.
	  - Insufficient drier capacity.
	  - Dry drier - Drier temperature.
	  - Leave it in the air.
	  - Check on package condition.
	  - Good storage after finishing.
	  - Residual moisture in pipes.
	  - Caps are missed.
	  - During transportation.
	  - During work.
	  - Air blowing.
	  - Not performed.
	  - Performed.
	  - Too short time.
	  - Low air pressure.
	  - Less dry air.
	  - Moisture penetration into the refrigeration oil. - Leave it in the air. - Moisture penetration.
	- Weld joint clogged.
	  - Short pipe insert.
	  - Pipe gaps.
	  - Too large.
	  - Damaged pipes.
	  - Too much solder.
	- Drier clogging.
	  - The capillary tube inserted depth. - Too much.
	  - Capillary tube melts. - Over heat.
	  - Clogged with foreign materials.
	  - Desiccant powder.
	  - Weld oxides.
	  - Drier angle.
	  - Reduced cross section by cutting. - Squeezed.
	- Foreign material clogging.
	  - Compressor cap is disconnected.
	  - Foreign materials are in the pipe.
		• Heat a clogged evaporator to check it. As soon as the cracking sound starts, the evaporator will begin to freeze.
		• The evaporator does not cool from the beginning (no evidence of moisture attached).
		The evaporator is the same as before even heat is applied.

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK

3. Refrigeration is weak.	1) Refrigerant Partly leaked.
	- Weld joint leak.
	- Parts leak.
	
	2) Poor defrosting capacity.
	- Drain path (pipe) clogged.
	  - Inject adiabatics into drain hose.
	  - Inject through the hole.
	  - Seal with drain.
	  - Foreign materials penetration.
	  - Adiabatics lump input.
	  - Damage by a screw or clamp.
	  - Other foreign materials input.
	  - Cap drain is not disconnected.
	- Defrost heater does not generate heat.
	  - Parts disconnected.
	  - Plate heater
	  - Wire is cut.
	  - Heating wire.
	  - Contact point between heating and electric wire.
	  - Dent by fin evaporator.
	  - Poor terminal contacts.
	  - Cord heater
	  - Wire is cut.
	  - Lead wire.
	  - Heating wire.
	  - Contact point between heating and electric wire.
	  - Heating wire is corroded
	  - Water penetration.
	  - Bad terminal connection.
		• Check visually.
		
		• Check terminal
		Conduction: OK.
		No conduction: NG.
		If wire is not cut, refer to resistance.
		P=Power
		V=Voltage
		R=Resistance
		$P=\frac{V^2}{R}$
		$R=\frac{V^2}{P}$

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK

3. Refrigeration is weak.	Residual frost.
	- Weak heat from heater.
	  - Sheath Heater - rated.
	  - Heater plate
	  - No contact to drain.
	  - Loosened stopper cord.
	  - Heater cord-L
	  - Not touching the evaporator pipe.
	  - Location of assembly (top and middle).
	- Too short defrosting time.
	  - Defrost Sensor.
	  - Faulty characteristics.
	  - Seat-D (missing, location. thickness).
	- Structural fault.
	  - Gasket gap.
	  - Air inflow through the fan motor.
	  - Bad insulation of case door.
	No automatic defrosting.
	Defrost does not return.
	
	3) Cooling air leak.
	Bad gasket adhestion
	- Gap.
	- Bad attachment.
	- Contraction.
	Door sag.
	- Bad adhesion.
	- Weak binding force at hinge.
	
	4) No cooling air circulation.
	Faulty fan motor.
	- Fan motor.
	  - Self locked.
	  - Wire is cut.
	  - Bad terminal contact.
	- Door switch.
	  - Faults.
	  - Contact distance.
	  - Button pressure.
	  - Melted contact.
	  - Contact.
	  - Refrigerator and freezer switch reversed.
	  - Button is not pressed.
	  - Poor door attachment.
	  - Door liner (dimension).
	  - Contraction inner liner.
	  - Misalignment.
	  - Bad terminal connection.
	  - Adiabatics liquid leak.
		• Check the fan motor conduction: OK. No conduction: NG.

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK

3. Refrigeration is weak.	4) No cooling air circulation.
	- Faulty fan motor.
	  - Fan is constrained.
	  - Fan shroud contact. - Clearance.
	  - Damping evaporator contact.
	  - Accumulated residual frost.
	- Small cooling air discharge.
	  - Insufficient motor RPM
	  - Fan overload. - Fan misuse.
	  - Bad low termperature RPM characteristics.
	  - Rated power misuse.
	  - Low voltage.
	  - Faulty fan.
	  - Fan misuse.
	  - Bad shape.
	  - Loose connection. - Not tightly connected.
	  - Insert depth.
	  - Shorud. — Bent.
	  - Ice and foreign materials on rotating parts.
	5) Compressor capacity.
	- Rating misuse.
	- Small capacity.
	- Low valtage.
	6) Refrigerant too much or too little.
	- Malfunction of charging cylinder.
	- Wrong setting of refrigerant.
	- Insufficient compressor. - Faulty compressor.
	7) Continuous operation
	- No contact of temperature controller. - Foreign materials.
	8) Damper opens continuously.
	- Foreign materials jammed.
	  - Adiabatics liquid dump.
	  - The EPS (styrofoam) drip tray has sediment in it.
	  - A screw or other foreign material has fallen into the drip tray or damper.
	- Failed sensor. - Position of sensor.
	- Characteristics of damper.
	  - Bad characteristics of its own temperatue.
	  - Parts misuse.
	  - Charge of temperature - Impact. characteristics.
	9) Food storing place. - Near the outlet of cooling air.
		• Check visually after disassembly.
		• Check visually after disassembly.

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK
4. Warm refrigerator compartment temperature.	1) Colgged cooling path. - Adiabatics liquid leak. - Foreign materials. — Adiabatics dump liquid. 2) Food storate. - Store hot food. - Store too much at once. - Door open. - Packages block air flow.	

5. No automatic operation. (faulty contacts)	1) Faulty temperature sensor in freezer or refrigerator compartment.
	- Faulty contact.
	- Faulty temperature characteristics.
	2) Refrigeration load is too much.
	- Food.
	  - Too much food.
	  - Hot food.
	- Frequent opening and closing.
	- Cool air leak.
	- Poor door close. – Partly opens.
	
	3) Poor insulation.
	4) Bad radiation.
	- High ambient temperature.
	- Space is secluded.
	
	5) Refrigerant leak.
	6) Inadequate of refrigerant.
	7) Weak compressor discharging power.
	- Different rating.
	- Small capacity.
	8) Fan does not work.
	9) Button is set at strong .
		• Inspect parts measurements and check visually.

6. Condensation and ice formation.	1) Ice in freeezer compartment.
	- External air inflow.— Bushing installed incorrectly.
	- Door opens but not closes.
	  - Weak door closing power.
	  - Stopper malfunction.
	  - Door sag.
	  - Food hinders door closing.
	- Gap around gasket. — Contraction, distortion, loose, door twisted, corner not fully inserted.
	- Food vapor. — Storing hot food. — Unsealed food.
	
	2) Condensation in the refrigerator compartment.
	- Door opens but not closes.
	  - Insufficient closing.
	  - Door sag.
	  - Food hinders door closing.
	- Gasket gap.
	
	3) Condensation on liner foam.
	- Cool air leak and transmitted.
	  - Not fully filled.
	  - Top table part.
	  - Out plate Ref/Lower part.
	  - Flange gap. — Not sealed.
	  - Gasket gap.	

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK

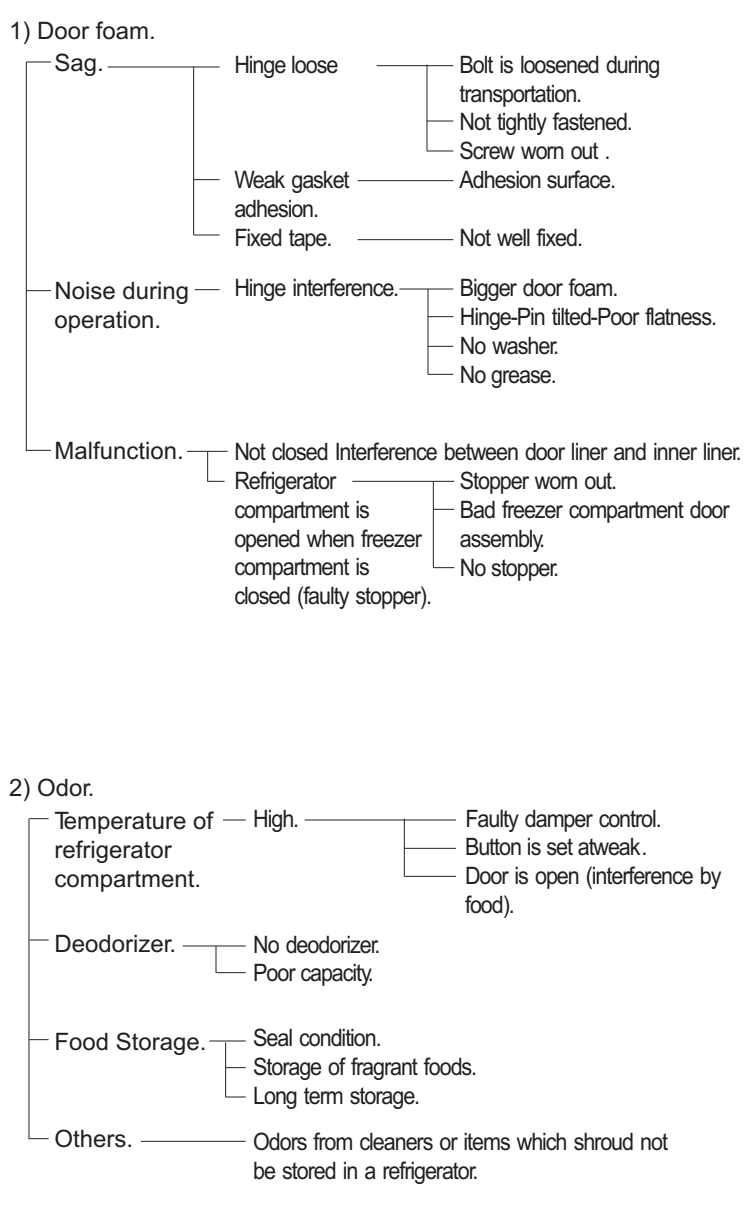
6. Condensation and ice formation.	4) Condensation on door.
	- Condensation on the duct door. - Duct door heater is cut.
	- Condensation on the dispense recess.
	  - Recess Heater is cut.
	  - Duct door is open. / Foreign material clogging.
	- Condensation on the door surface.
	  - Not fully filled.
	  - Surface.
	  - Cormer.
	  - Liquid shortage.
	  - Liquid leak.
	  - Adiabatics liquid contraction.
	- Condensation on the gasket surface.
	  - Bad wing adhesion.
	  - Wing sag(lower part).
	  - Door liner shape mismatch.
	  - Corner.
	  - Too much notch.
	  - Broken.
	  - Home Bar heater is cut.
	
	5) Water on the floor.
	- Condensation in the refrigerator compartment.
	- Defrosted water overflows. — Clogged discharging hose.
	- Discharging hose location. — Evaporation tray located at wrong place.
	- Tray drip.
	  - Damaged.
	  - Breaks, holes.
	  - Small Capacity.
	- Position of drain.	

7. Sounds	1) Compressor compartment operating sounds.
	- Compressor sound inserted.
	  - Sound from machine itself.
	  - Sound from vibration.
	  - Restrainer.
	  - Bushing seat.
	  - Too hard.
	  - Distorted.
	  - Aged.
	  - Burnt.
	  - Stopper.
	  - Bad Stopper assembly.
	  - Not fit (inner diameter of stopper).
	  - Tilted.
	  - Not
	  - Compressor base not connected.
	  - Bad welding compressor stand(fallen).
	  - Foreign materials in the compressor compartment.
	- COMBO sound — Chattering sound.
	  Insulation paper vibration.
	- Capacitor noise.
	  Pipe sound.
	  - Pipe contacts each other. .- Narrow interval.
	  - No vibration damper.
	  - Damping Bushing-Q.
	  - Damping Bushing-S.
	  - Capillary tube unattached.	

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK

7. Sounds	1) Compressor compartment operating sounds.
	- Transformer sound.
	  - Its own fault. - Core gap.
	  - Bad connection. - Correct screw connection.
	- Drip tray vibration sound.
	  - Bad assembly.
	  - Distortion.
	  - Foreign materials inside.
	- Back cover machine sound.
	  - Bad connection.
	  - Partly damaged.
	- Condenser drain sound.
	  - Not connected.
	  - Bad pipe caulking.
	2) Freezer compartment sounds.
	- Fan motor sound.
	  - Normal operating sound.
	  - Vibration sound.
	  - Aged rubber seat.
	  - Bad torque for assembling motor bracket.
	- Sounds from fan contact.
	  - Fan guide contact.
	  - Shroud burr contact.
	  - Damping evaporator contact.
	  - Residual frost contact.
	  - Damaged heater cord.
	  - Narrow evaporator interval.
	- Unbalance fan sounds.
	  - Unbalance.
	  - Surface machining conditions.
	  - Fan distortion.
	  - Misshappen.
	  - Burr.
	  - Ice on the fan. - Air intake (opposite to motor bushing assembly.)
	- Motor shaft contact sounds.
	  - Supporter disorted.
	  - Tilted during motor assembly.
	- Resonance.
	- Evaporator noise.
	  - Evaporator pipe contact. - No damping evaporator.
	  - Sound from refrigerant. - Stainless steel pipe shape in accumulator.
	  - Sound from fin evaporator and pipe during expansion and contraction.
	3) Bowls and bottles make contact on top shelf.
	4) Refrigerator roof contact.
	5) Refrigerator side contact.
	6) Insufficient lubricants on door hinge.	

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK
8. Faulty lamp (freezer and refrigerator compartment).	1) Lamp problem. — Filament blows out.; Glass is broken. 2) Bad lamp assembly. — Not inserted.; Loosened by vibration. 3) Bad lamp socket. Disconnection. — Bad soldering.; Bad rivet contact. Short. — Water penetration. — Low water level in tray. Bad elasticity of contact. Bad contact(corrosion). 4) Door switch. — Defective.; Refrigerator and freezer switches are reversed.; Travlel distance.; Bad connection.; Bad terminal contact.; Adiabatics liquid leak..	
9. Faulty internal voltage (short).	1) Lead wire is damaged. Wire damage when assembling Bracket Cover. Outlet burr in the bottom plate. Pressed by cord heater. lead wire, evaporator pipe. 2) Exposed terminal. Compressor Compartment terminal. - Touching other components. Freezer compartment terminal. - Touching evaporator pipe. 3) Faulty parts. Transformer. — Coil contacts cover.; Welded terminal parts contact cover. Compressor. — Bad coil insulation. Plate heater. Melting fuse. — Sealing is broken. — Moisture penetration. Cord heater. — Pipe damaged. — Moisture penetration.; Bad sealing. Sheath heater.	• Connect conduction and non-conduction parts and check with tester. Conduction: NG. Resistance° : OK.

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK
10. Structure, appearance, and others.		

2. FAULTS

2-1. Power

Problems	Causes	Checks	Measures	Remarks
No power on outlet.	**- Power cord cut.** **- Faulty connector insertion.** **- Faulty connection between plug and adapter.**	**- Check the voltage with tester.** **- Check visually.** **- Check visually.**	**-Replace the components.** **-Reconnect the connecting parts.** **-Reconnect the connecting parts.**	
Fuse blows out.	**- Short circuit by wrong connection** **- Low voltage products are connected to high voltage.** **- Short circuit by insects.** **- Electricity leakage.** **- High voltage.** **- Short circuit of components (tracking due to moisture and dust penetration).**	**- Check the fuse with tester or visually.** **- Check the input volt are with tester (between power cord and products).** **- Check the resistance of power cord with tester (if it is 0 it is shorted).**	**- Find and remove the cause of problem (ex. short, high voltage, low voltage).** **- Replace with rated fuse.**	**Replace with rated fuse after confirming its specification.** **If fuse blowns out frequently, confirm the cause and prevent.**

2-2. Compressor

Problems	Causes	Checks	Measures	Remarks
Compressor doesn't operate	- Faulty PTC - Faulty OLP	- Check that PTC model its ok, then check continuity between terminals 2 and 5 of PTC. - Check that OLP model its ok, then check continuity between terminals of OLP	- If model its incorrect replace it. - If there isn't continuity replace it.	PTC Model: PTHTM 6R8MB OLP Model: 4TM419TFBYY
	- Compressor doesn't work	- If compressor assembly parts are normal (capacitor, PTC, OLP), apply power directly to the compressor to force operation.  Apply nominal voltage between compressor pin.	- During forced operation: - Operates: Check other parts. - Not operate: Replace the frozen compressor with new one, weld, evacuate and recharge refrigerant. *Refer to weld repair procedures.	

2-3. Temperature

Problems	Causes	Checks	Measures	Remarks
High temperature in the freezer compartment.	Poor cool air circulation due to faulty fan motor.	- Lock — Check resistance with a tester. 0Ω: short. ∞Ω : cut. - Rotate rotor manually and check rotation. - Wire is cut. - Bad terminal contact: Check terminal visually. - Fan constraint. - Fan shroud contact: Confirm visually. - Fan icing: Confirm visually.	- Replace fan motor. - Reconnect and reinsert. - Maintain clearance and remove ice (Repair and/or replace shroud if fan is constrained by shroud deformation).	
	Faulty fan motor due to faulty door switch operation.	- Iced button (faulty) operation: Press button to check - Faulty button pressure and contact: Press button to check operation. - Door cannot press door switch button: Check visually.	- Confirm icing causes and repair. - Replace door switch. - Door sag: fix door. - Door liner bent:replace door or attach sheets.	
	Bad radiation conditions in compressor compartment.	- Check the clearance between the refrigerator and wall (50 mm in minimum). - Check dust on the grill in compressor compartment. - Check dust on the condenser coils.	- Keep clearance between refrigerator and walls (minimum 50mm). - Remove dust and contaminants from grill for easy heat radiation. - Remove the dust with vacuum cleaner from the coils condenser while the refrigerator is off.	- The fan may be broken if cleaning performs while the refrigerator is on.

2-4. Cooling

Problems	Causes	Checks	Measures	Remarks
High temperature in the freezer compartment.	Refrigerant leak.	Check sequence 1. Check the welded parts of the drier inlet and outlet and drier auxiliary in the compressor compartment (high pressure side). 2. Check the end of compressor sealing pipe (low pressure side). 3. Check silver soldered parts. (Cu + Fe / Fe + Fe). 4. Check bending area of wire condenser pipe in compressor compartment (cracks can happen during bending). 5. Check other parts (compressor compartment and evaporators in freezer compartment).	Weld the leaking part, recharge the refrigerant.	Drier must be replaced.
	Shortage of refrigerant.	Check frost formation on the surface of evaporator in the freezer compartment. - If the frost forms evenly on the surface, it is OK. - If it does not, it is not good.	- Find out the leaking area, repair, evacuate, and recharge the refrigerant. - No leaking, remove the remaining refrigerant, and recharge new refrigerant.	Drier must be replaced.

Problems	Causes	Checks	Measures	Remarks
High temperature in the freezer compartment.	Cycle pipe is clogged.	Check sequence. 1. Check temperature of condenser manually. If it is warm, OK. If it is not, compressor discharging joints might be clogged. 2. Manually check whether hot line pipe is warm. If it is warm, OK. If it is not, condenser outlet weld joints might be colgged.	- Heat up compressor discharging weld joints with touch, disconnect the pipes, and check the clogging. Remove the causes of clogging, weld, evacuate, and recharge the refrigerant. - If it's warm, OK. If it's not, condenser discharging line weld joints might be clogged. Disconnect with torch, remove the causes, evacuate, and recharge seal refrigerant.	Direr must be replaced.
	Leak at loop pipe weld joint (discharge) in compressor.	Check sequence. 1. Manually check whether condenser is warm, It is not warm and the frost forms partly on the evaporator in the freezer compartment.	Replace the compressor, weld, evacuate, and recharge refrigerant.	Drier must be replaced.
	Faulty cooling fan in the compressor compartment.	Check sequence. 1. Check cooling fan operation. 2. Check that cooling fan is disconnected from the motor.	- Replace if motor does not operate. - If fan is disconnected, check fan damage and reassemble it. Refer to fan motor disassembly and assembly sequence.	

2-5. Defrosting failure

Problems	Causes	Checks	Measures	Remarks
No defrosting.	Heater does not generate heat as the heating wire is cut or the circuit is shorted. 1) Heating wire is damaged when inserting into the evaporator. 2) Lead wire of heater is cut. 3) Heating wire at lead wire contacts is cut.	1. Check the resistance of heater. 0Ω: Short. ∞Ω : Cut. Tens to thousands Ω : OK. 2. Check the resistance between housing terminal and heater surface. 0Ω: Short. ∞Ω : Cut. Tens to thousands Ω: Short.	Heating wire is short and wire is cut. • Parts replacement: Refer to parts explanations.	Seal the lead wire with insulation tape and heat shrink tube if the cut lead wire is accessible to repair.
	Suction tube and discharge orifice: 1. Impurities. 2. Ice.	1. Confirm foreign materials. In case of ice, insert the copper line through the hole to check. 2. Put hot water into the drain (check drains outside).	1) Push out impurities by inserting copper wire. (Turn off more than 3 hours and pour in hot water if frost is severe.) 2) Put in hot water to melt down frost. 3) Check the water outlet. 4) Push the heater plate to suction duct manually and assemble the disconnected parts.	
	Gap between Suction duct and Heater plate (Ice in the gap).	1. Confirm in the Suction duct.	1) Turn off the power, confirm impurities and ice in the gap, and supply hot water until the ice in the gap melts down. 2) Push the Heater plate to drain bottom with hand and assemble the disconnected parts.	
	Wrong heater rating (or wrong assembly).	1. Check heater label. 2. Confirm the capacity after substituting the resistance value into the formula. $P=\frac{V^2}{R}$ (V: Rated voltage of user country) (R: Resistance of tester[Ω]) Compare P and lavel capacity. Tolerance: ±7%	Faults:replace. - How to replace : Refer to main parts.	

Problems	Causes	Checks	Measures	Remarks
No defrosting	Melting fuse blows. 1) Lead wire is cut. 2) Bad soldering.	- Check melting fuse with tester. - If 0Ω: OK. If ∞Ω : wire is cut.	Faullty parts: parts replacement. - Check wire color when maeasuring resistance with a tester.	
	Ice in the Suction duct. 1) Icing by foreign materials in the duct. 2) Icing by cool air inflow through the gap of heater plate. 3) Icing by the gap of heater plate.	1. Check the inner duct with mirror. 2. Check by inserting soft copper wire into the duct (soft and thin copper not to impair heating wire).	1) Turn power off. 2) Raise the front side (door side), support the front side legs, and let the ice melt naturally. (If power is on, melt the frost by forced defrosting.) 3) Reassemble the heater plate.	
	Bad cool air inflow and discharge, and bad defrosting due to faulty contact and insertion (bad connector insertion into housing of heater, melting, fuse, and motor fan).	1. Turn on power, open or close the door, check that motor fan operates (If it operates, motor fan is OK). 2. Disconnect parts in the refrigerator compartment, check the connection around the housing visually, defrost, and confirm heat generation on the heater. Do not put hands on the sheath heater. 3. Check the parts which have faults described in 1 & 2 (mechanical model: disconnect thermostat from the assembly).	1) Check the faulty connector of housing and reassemble wrongly assembled parts. 2) If the parts are damaged, remove the parts and replace it with a new one.	

2-6. Icing

Problems	Causes	Checks	Measures	Remarks
Icing in the refrigerator compartment. - Damper icing. - Pipe icing. - Discharging pipe icing.	1) Bad circulation of cool air. - Clogged intake port in the refrigerator compartment. - Sealing is not good. - Too much food is stored and clogs the discharge port. - Bad defrosting.	- Check the food is stored properly (check discharge and intake port are clogged). - Check icing on the surface of baffle and cool air path (pipe) after dissembling the container box. - Check icing at intake ports of freezer and refrigerator compartment.	- Be acquainted with how to use. - Sealing on connecting parts. - Check the damper and replace it if it has defects. - Check defrost. (After forced defrosting, check ice in the evaporator and pipes.)	- Check the defrost related parts if problem is caused by faulty defrosting.
	2) Faulty door or refrigerator compartment. - Faulty gasket. - Faulty assembly.	- Check gasket attached conditions. - Check door assembly conditions.	- Correct the gasket attachment conditions and replace it. - Door assembly and replacement.	- Replacement should be done when it cannot be repaired.
	3) Overcooling in the refrigerator compartment. - Faulty damper in the refrigerator compartment. - Faulty MICOM (faulty sensor)	- Check refrigerator compartment is overcooled (when button pressed on weak). - Check parts are faulty.	- Replace faulty parts.	
	4) Bad defrosting - Heater wire is cut. - Defective defrost sensor. - Defrosing cycle.	- Check frost on the evaporator after dissembling shroud and fan grille. - Check ice on intake port of freezer and refrigerator compartment.	- Check parts related to defrosting. - Check defrosting. (Check ice on the evaporator and pipe.)	- Moisture does not freeze on the evaporator but can be sucked into the refrigerator, where it condenses and freezes. This interferes with cold air circulation and sublimation of the ice.
	5) Customers are not familiar with this machine. - Door opens. - High temperature, high moisture, and high load.	- Check food interferes with door closing. - Check ice on the ceilings.	- Be acquainted with how to use.	

Problem	Cause	Check	Measure	Remarks
Ice in the freezer compartment. - Surface of fan grille. - Wall of freezer compartment. - Cool air discharging port. - Basket(rack) area. - Food surface. - Icing in the shute.	1) Bad cooling air circulation. - Intake port is clogged in the freezer compartment. - Discharging port is Clogged. - Too much food is stored. - Bad defrosting.	- Check food storage conditions visually.(Check clogging at intake and discharging port of cooling air.) - Check food occupation ratio in volume (Less than 75%). - Check frost on the evaporator after dissembling shroud and fan grille. - Check icing at intake port of refrigerator compartment.	- Be acquainted with how to use. - Check defrost (Check ice on the evaporator and pipes after forced defrosting).	- Check the parts related to defrosting if the problem is caused by the faulty defrosting.
	2) Bad freezer compartment door - Faulty gasket - Faulty assembly	- Check gasket attachment conditions. - Check door assembly conditions.	- Correct the gasket attachement conditions and replace it. - Door assembly and replacement.	- Replace when it can not be repaired.
	3) Over freezing in the freezer compartment. - Faulty MICOM.	- Refrigerator operates pull down. (Check if it is operated intermittently) - The Temperature of freezer compartment is satisfactory, but over freezing happens in the refrigerator compartment even though the notch is set at **weak**.	-Replace defective parts.	
	4) Bad defrosting. - Heater wire is cut. - Faulty defrost sensor. - Defrosting cycle	- Check frost on the evaporator after dissembling shroud and grille. - Check ice on the intake port in the refrigerator compartment.	- Check parts related to defrosting. - Check defrosting. Check ice on the evaporator and pipes after forced defrosting.	
	5) User is not familiar with how to use. - Door opens. - High moisture food water is stored.	- Check food holds door open. - Check ice on the ice tray.	- Be acquainted with how to use.	

2-7. Sound

Problems	Causes	Checks	Measures	Remarks
Hiss sound	1. Loud sound of compressor operation.	1.1 Check the level of the refrigerator. 1.2 Check the bushing seat conditions (sagging and aging).	1) Maintain horizontal level. 2) Replace bushing and seat if they are sagged and aged. 3) Touch the piping at various place along its route. Install a damper at the point where your tuch reduces the noise. 4) Avoid pipe interference. 5) Replace defective fan and fan motor. 6) Adjust fan to be in the center of the fan guide. 7) Leave a clearance between interfering parts and seal gaps in the structures. 8) Reassemble the parts which make sound. 9) Leave a clearance if evaporator pipes and suction pipe touch freezer shroud.	
	2. Pipes resonate sound which is connected to the compressor.	2.1 Check the level of pipes connected to the compressor and their interference. 2.2 Check bushing inserting conditions in pipes. 2.3 Touch pipes with hands or screw -driver (check the change of sound).		
	3. Fan operation sound in the freezer compartment.	3.1 Check fan insertion depth and blade damage. 3.2 Check the interference with structures. 3.3 Check fan motor. 3.4 Check fan motor bushing insertion and aging conditions.		
	4. Fan operation sound in the compressor compartment.	4.1 Same as fan confirmation in the refrigerator. 4.2 Check drip tray leg insertion. 4.3 Check the screw fastening conditions at condenser and drip tray.		

Problems	Causes	Checks	Measures	Remarks
Vibration sound. Clack.	1. Vibration of shelves and foods in the refrigerator. 2. Pipes interference and capillary tube touching in the compressor. compartment. 3. Compressor stopper vibration. 4. Moving wheel vibration. 5. Other structure and parts vibration.	1-1. Remove and replace the shelves in the refrigerator 1-2. Check light food and container on the shelves. 2-1. Touch pipes in the compressor compartment with hands. 2-2. Check capillary tube touches cover back. 3-1. Check compressor stopper Vibration. 4-1. Check vibration of front and rear moving wheels. 5-1. Touch other structures and parts.	1) Reassemble the vibrating parts and insert foam or cushion where vibration is severe. 2) Leave a clearance where parts interfere with each other. 3) Reduce vibration with bushing and restrainer if it is severe. (especially compressor and pipe). 4) Replace compressor stopper if it vibrates severely.	
Irregular sound. Click .	1. It is caused by heat expansion and contraction of evaporator, shelves, and pipes in the refrigerator.	1-1 Check time and place of sound sources.	1) Explain the principles of refrigeration and that the temperature difference between operation and defrosting can make sounds. 2) If evaporator pipe contacts with other structures, leave a clearance between them (freezer shroud or inner case).	

Problems	Causes	Checks	Measures	Remarks
Sound Popping (almost the same as animals crying sound).	It happens when refrigerant expands at the end of capillary tube.	- Check the sound of refrigerant at the initial installation. - Check the sound when the refrigerator starts operation after forced defrosting. - Check the restrainer attachment conditions on the evaporator and capillary tube weld joints.	- Check the restrainer attached on the evaporator and capillary tube weld joints and attach another restrainer. - If it is continuous and servere, insert capillary tube again (depth 15±3mm) - Fasten the capillary tube to suction pipes or detach in the compressor compartment. - Explain the principles of freezing cycles.	
Water boiling or flowing sound.	It happens when refrigerant passes orifice in accumulator internal pipes by the pressure difference between condenser and evaporator.	- Check the sound when compressor is turned on. - Check the sound when compressor is turned off.	- Explain the principles of freezing cycles and refrigerant flowing phenomenon by internal pressure difference. - If sound is servere, wrap the accumulator with foam and restrainer.	
Sound of whistle when door closes.	When door closes, the internal pressure of the refrigerator decreases sharply below atomosphere and sucks air into the refrigerator, making the whistle sound.	- Check the sound by opening and closing the refrigerator or freezer doors.	- Broaden the cap of discharge hose for defrosting in the compressor compartment. - Seal the gap with sealant between out and inner cases of hinge in door.	

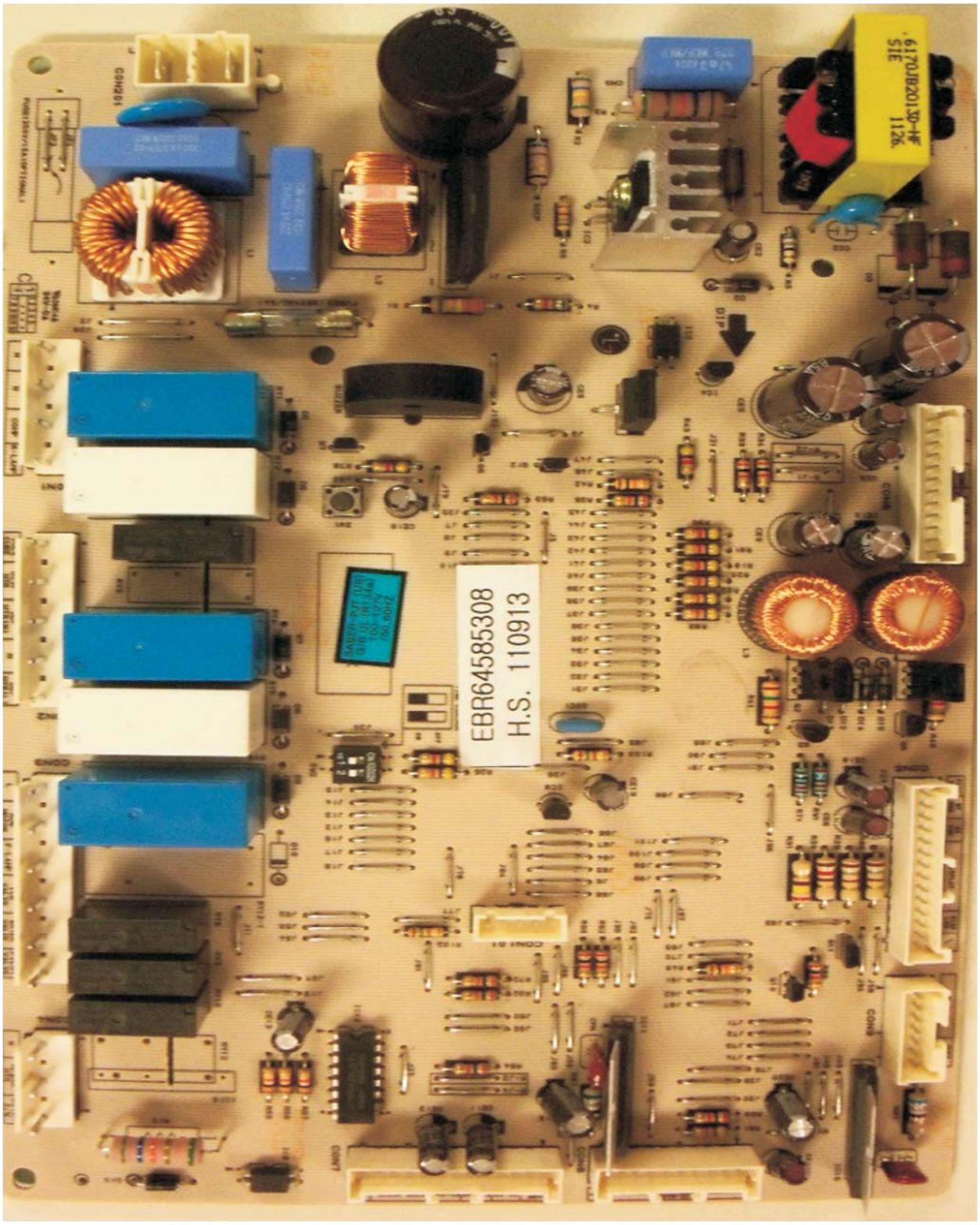
2-8. Odor

Problems	Causes	Checks	Measures	Remarks
Food Odor.	Food (garlic, kimchi, etc)	- Check the food is not wrapped. - Check the shelves or inner wall are stained with food juice. - Be sure food is securely covered with plastic wrap. - Chedk food cleanliness.	- Dry the deodorizer in a sunny place with adequate ventilation. - Store the food in the closed container instead of vinyl wraps. - Clean the refrigerator and set button at **strong**.	
Plastic Odor.	Odors of mixed food and plastic odors.	- Check wet food is wrapped with plastic bowl and bag. - It happens in the new refrigerator.	- Clean the refrigerator. - Persuade customers not to use plastic bag or wraps with wet food or odorous foods.	
Odor from the deodorizer.	Odor from the old deodorizer.	- Check the deodorizer odors.	- Dry the deodorizer with dryer and then in the shiny and windy place. - Remove and replace the deodorants.	*Deodorizer : option

2-9. MICOM

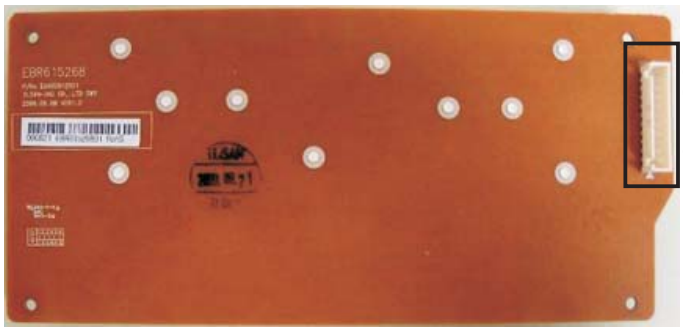
1. PCB Picture – Main PCB

EBR64585308
(2010.01~)



1. PCB Picture - Display PCB & Sub PCB

Display PCB
EBR615268



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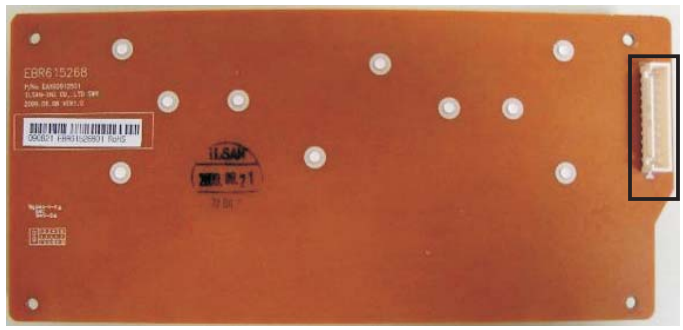

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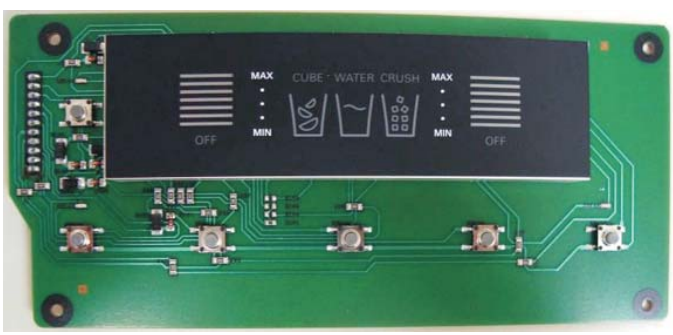
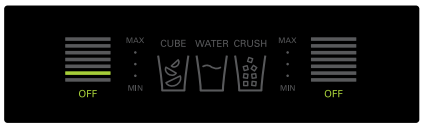
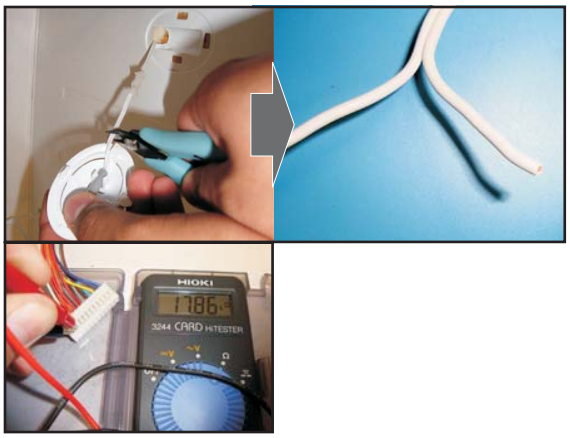


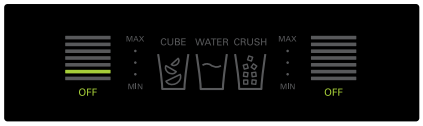
2. Troubleshooting With Error Display

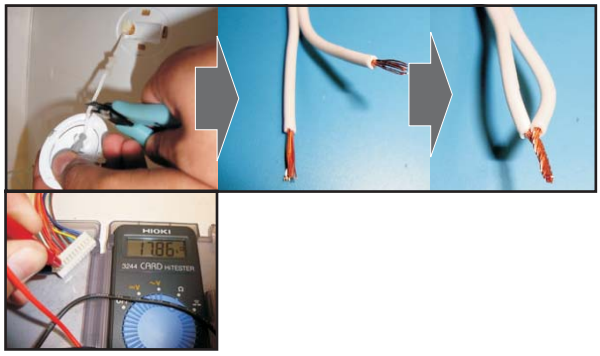
1) Abnormal Freezer Sensor Error



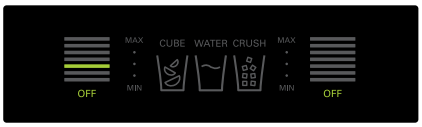
NO.	CHECKING FLOW	RESULT & SERVICE ACTION
1	Check for a loose connection in CON6 	<table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Firmly plugged</td><td>Go to Step 2</td></tr><tr><td>Loose</td><td>Plug firmly, then check again. Problem persist? Yes: Go to Step 2 No: Explain to Customer</td></tr></table>
2	Unplug connector and check between **White to White** as is shown in the picture. 	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td>0 Ω</td><td>Short</td><td>Go to Step 3</td></tr><tr><td>OFF</td><td>Open</td><td>Go to Step 4</td></tr><tr><td>Other</td><td>Normal</td><td>Check the Temperature and Resistance (Temperature Chart #1) Go to Step 6</td></tr></table> Temperatures when unit is energized (Refer to Temperature Chart #1)
3	1) Remove the Cover Sensor. 2) Cut Sensor and check resistance value. 	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td>0 Ω</td><td>Short</td><td>Replace Product</td></tr><tr><td>OFF</td><td>Open</td><td>Change the sensor</td></tr></table>

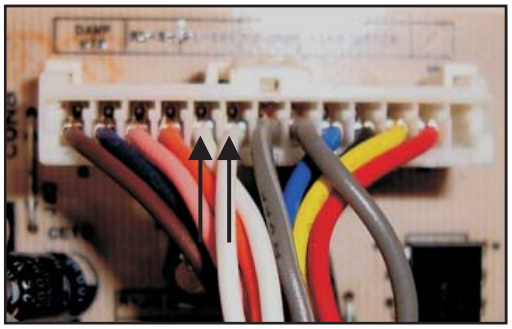
1) Abnormal Freezer Sensor Error



NO.	CHECKING FLOW	RESULT & SERVICE ACTION
4	1) Remove the Cover sensor. 2) Cut sensor and stripe terminals. 3) Make a short in striped terminals. 4) Maker measurement. 	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td>0 Ω</td><td>Short</td><td>Change the sensor</td></tr><tr><td>OFF</td><td>Open</td><td>Replace Product</td></tr></table>
5	1) Reconnect CON 6. 2) Reset Refrigerator. 3) Execute DISPLAY CHECK MODE 4) All LED's on?	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td rowspan="2">YES</td><td>Normal</td><td>Explain to costumer</td></tr><tr><td>Same</td><td>Replace Main PCB</td></tr><tr><td>ERROR</td><td>Different</td><td>Proceed acord the displayed error</td></tr></table>
6	Resistance Values are according to Temperature Chart table?	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td>YES</td><td>Normal Sensor</td><td>Replace Main PCB</td></tr><tr><td>NO</td><td>Abnormal Sensor</td><td>Replace Sensor</td></tr></table>

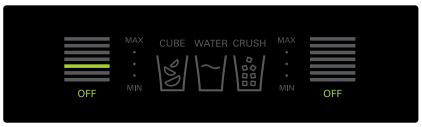
2) Abnormal Refrigerator Sensor Error (1)

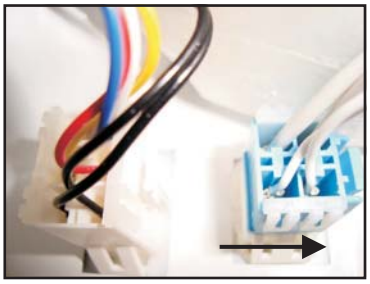


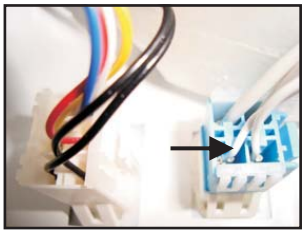
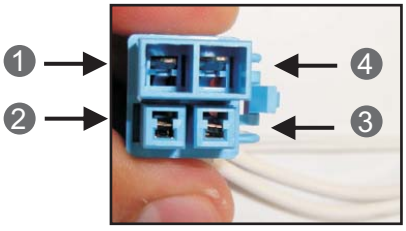
<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>1</td><td>Check for a loose connection in CON7
  </td><td><table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Firmly plugged</td><td>Go to Step 2</td></tr><tr><td>Loose</td><td>Plug firmly, then check again.
Problem persist?
Yes: Go to Step 2
No: Explain to Customer</td></tr></table></td></tr>
<tr><td>2</td><td>Unplug connector and check between White to White as is shown in the picture.
  </td><td><table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td>0 Ω</td><td>Short</td><td rowspan="2">Go to Step 3</td></tr><tr><td>OFF</td><td>Open</td></tr><tr><td>Other</td><td>Normal</td><td>Check the Temperature and Resistance (Temperature Chart #2)
Go to Step 7</td></tr></table></td></tr>
<tr><td>3</td><td>1) Remove the Control Box in Refrigerator sensor.
 
2) Check for any loose connection.
 
3) Turn on the Refrigerator.</td><td>Connectors must be firmly .connected, and wires don’t be have any damage.

Next Action: Go to Step 4.</td></tr>
</table>

2) Abnormal Refrigerator Sensor Error (1)

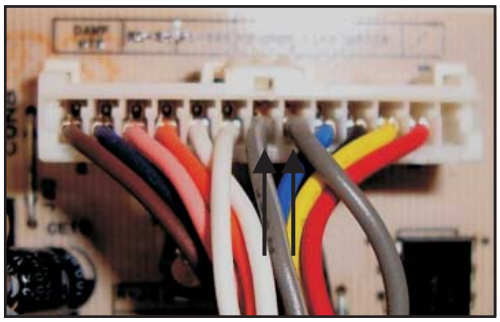
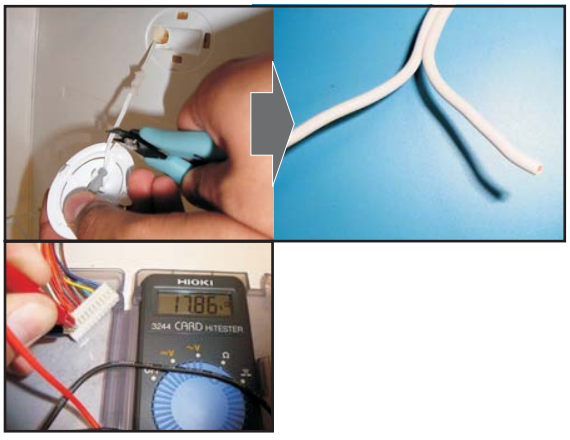


<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>4</td><td>Unplug connector of Control Box.
  </td><td>Go to Step 5.</td></tr>
<tr><td>5</td><td>Unplug connector in CON 7 and check between White to White as is shown in the picture.
 

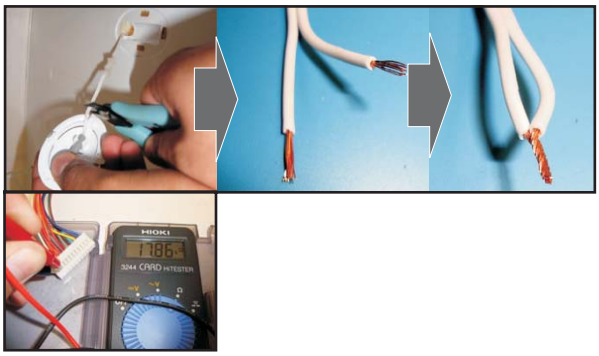
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td>0 Ω</td><td>Short</td><td>Replace Product</td></tr>
<tr><td>OFF</td><td>Open</td><td>Go to Step 6</td></tr>
</table></td></tr>
<tr><td>6</td><td>1) Remove the Control Box in Refrigerator sensor.
 
Check resistance value between ❶ and ❹ .
 

<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td>0 Ω</td><td>Short</td><td rowspan="2">Replace Control Box Assembly or sensor (if possible).</td></tr>
<tr><td>OFF</td><td>Open</td></tr>
<tr><td>Other</td><td>Normal</td><td>Check the Temperature and Resistance (Temperature Chart #2) Go to Step 7</td></tr>
</table></td></tr>
<tr><td>7</td><td>Resistance Values are according to Temperature Chart table?</td><td>
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td>YES</td><td>Normal Sensor</td><td>Replace Main PCB</td></tr>
<tr><td>NO</td><td>Abnormal Sensor</td><td>Replace Sensor</td></tr>
</table></td></tr>
</table>

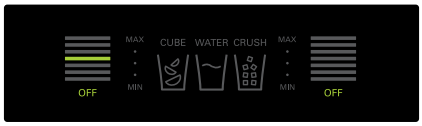
3) Abnormal Refrigerator Sensor Error (2)

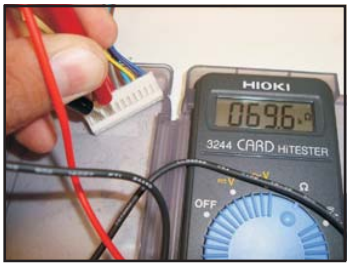
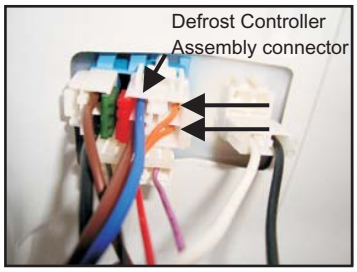
NO.	CHECKING FLOW	RESULT & SERVICE ACTION
1	Check for a loose connection. 	<table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Firmly plugged</td><td>Go to Step 2</td></tr><tr><td>Loose</td><td>Plug firmly, then check again. Problem persist? Yes: Go to Step 2 No: Explain to Customer</td></tr></table>
2	Unplug connector in CON 7 and check between **Gray to Gray** as is shown in the picture. 	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td>0 Ω</td><td>Short</td><td>Go to Step 3</td></tr><tr><td>OFF</td><td>Open</td><td>Go to Step 4</td></tr><tr><td>Other</td><td>Normal</td><td>Check the Temperature and Resistance (Temperature Chart #2) Go to Step 6</td></tr></table>
3	1) Remove Cover sensor. 2) Cut sensor and check resistance value. 	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td>0 Ω</td><td>Short</td><td>Replace Product</td></tr><tr><td>OFF</td><td>Open</td><td>Change Sensor</td></tr></table>

3) Abnormal Refrigerator Sensor Error (2)

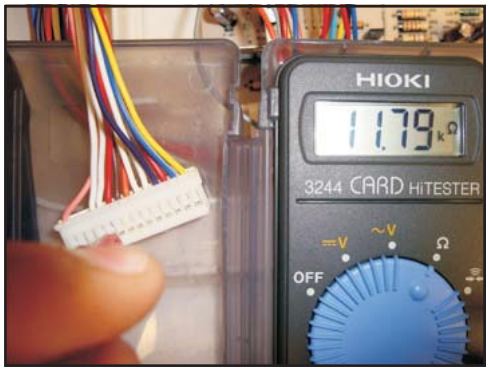
NO.	CHECKING FLOW	RESULT & SERVICE ACTION
4	1) Remove the Cover sensor. 2) Cut sensor and stripe terminals. 3) Make a short in striped terminals. 4) Maker measurement. 	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td>0 Ω</td><td>Short</td><td>Change the sensor</td></tr><tr><td>OFF</td><td>Open</td><td>Replace Product</td></tr></table>
5	1) Reconnect CON 7. 2) Reset Refrigerator. 3) Execute DISPLAY CHECK MODE 4) All LED's on?	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td rowspan="2">YES</td><td>Normal</td><td>Explain to costumer</td></tr><tr><td>Same</td><td>Replace Main PCB</td></tr><tr><td>ERROR</td><td>Different</td><td>Proceed acord the displayed error</td></tr></table>
6	Resistance Values are according to Temperature Chart table?	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td>YES</td><td>Normal Sensor</td><td>Replace Main PCB</td></tr><tr><td>NO</td><td>Abnormal Sensor</td><td>Replace Sensor</td></tr></table>

4) Abnormal Defrost Sensor Error

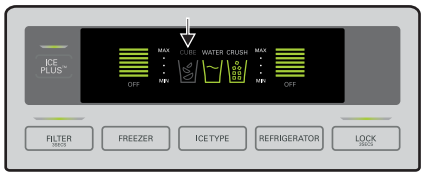


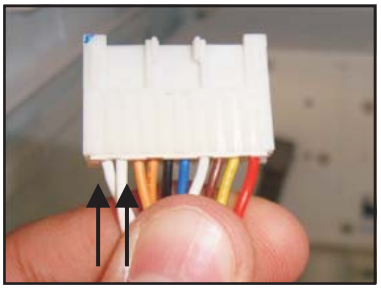
<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>1</td><td>Remove cover PCB, then, check for loose connection in CON6.
  </td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Firmly plugged</td><td>Go to Step 2</td></tr>
<tr><td>Loose</td><td>Plug firmly, then check again.
Problem persist?
Yes: Go to Step 2
No: Explain to Customer</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Unplug connector and check between Orange to Orange as is shown in the picture.
 
</td><td>
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td>0 Ω</td><td>Short</td><td rowspan="2">Go to Step 3</td></tr>
<tr><td>OFF</td><td>Open</td></tr>
<tr><td>Other</td><td>Normal</td><td>Check the Temperature and Resistance (Temperature Chart #2)</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>In Freezer compartment, unplug Defrost controller assembly, then, check resistance value between Orange to Orange.
 
</td><td>
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td>0 Ω</td><td>Short</td><td rowspan="2">Replace Defrost controller assembly, then, explain to customer.</td></tr>
<tr><td>OFF</td><td>Open</td></tr>
<tr><td>Other</td><td>Normal</td><td>Plug Defrost controller assembly, then, go to step 4.</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Unplug connector CON 6 from Main PCB and check between Orange to Orange as is shown in the picture.
 
</td><td>
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td>0 Ω</td><td>Short</td><td rowspan="2">Replace Product</td></tr>
<tr><td>OFF</td><td>Open</td></tr>
<tr><td>Other</td><td>Normal</td><td>Replace Main PCB</td></tr>
</table>
</td></tr>
</table>

5) Abnormal Room Temperature Sensor Error

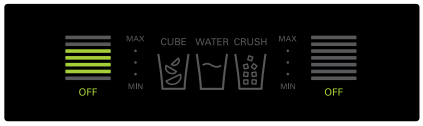
NO.	CHECKING FLOW	RESULT & SERVICE ACTION
1	Check for a loose connection in CON5. 	<table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Firmly plugged</td><td>Go to Step 2</td></tr><tr><td>Loose</td><td>Plug firmly, then check again. Problem persist? Yes: Go to Step 2 No: Explain to Customer</td></tr></table>
2	Unplug connector in CON 5 and check between **White to White** as is shown in the picture. 	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td>0 Ω</td><td>Short</td><td>Change the sensor</td></tr><tr><td>OFF</td><td>Open</td><td>Replace Product</td></tr><tr><td>Other</td><td>Normal</td><td>Check the Temperature and Resistance (Temperature Chart #3)</td></tr></table>

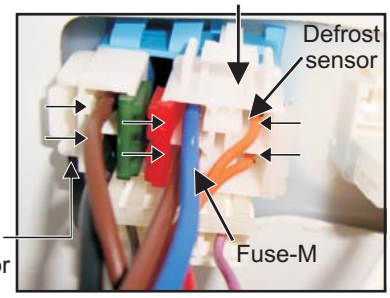
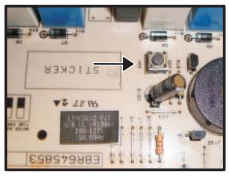
6) Abnormal Ice maker Temperature Sensor Error

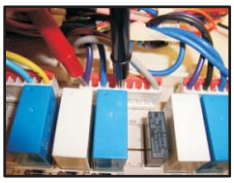
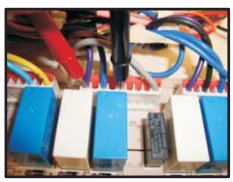


NO.	CHECKING FLOW	RESULT & SERVICE ACTION
1	Check for a loose connection in CON8 on Main PCB. 	<table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Firmly plugged</td><td>Go to Step 2</td></tr><tr><td>Loose</td><td>Plug firmly, then check again. Problem persist? Yes: Go to Step 2 No: Explain to Customer</td></tr></table>
2	In Freezer compartment remove Tray ice, remove screw of Ice maker unit, quit Ice maker from holders and check for any loose connection. 	<table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Firmly plugged</td><td>Go to Step 3</td></tr><tr><td>Loose</td><td>Plug firmly, then check again. Problem persist? Yes: Go to Step 3 No: Explain to Customer</td></tr></table>
3	In the Main PCB, unplug CON8 and check between **Gray to Gray** as is shown in the picture. 	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td>0 Ω</td><td>Short</td><td rowspan="2">Plug CON 8, then, go to Step 4</td></tr><tr><td>OFF</td><td>Open</td></tr><tr><td>Other</td><td>Normal</td><td>Replace Main PCB</td></tr></table>
4	Unplug Ice maker unit and check value between **White to White.** 	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td>0 Ω</td><td>Short</td><td rowspan="2">Replace Ice Maker unit</td></tr><tr><td>OFF</td><td>Open</td></tr><tr><td>Other</td><td>Normal</td><td>Replace product</td></tr></table>

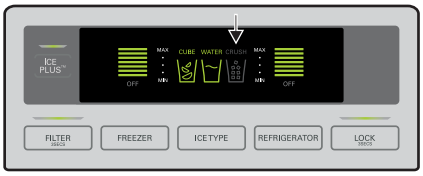
7) Abnormal Defrost Error

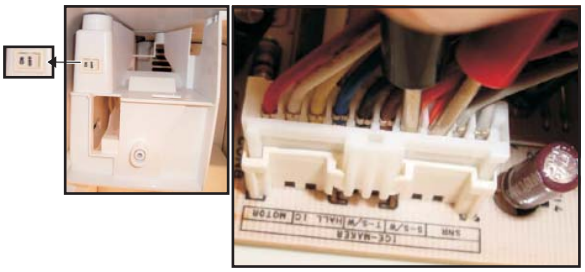
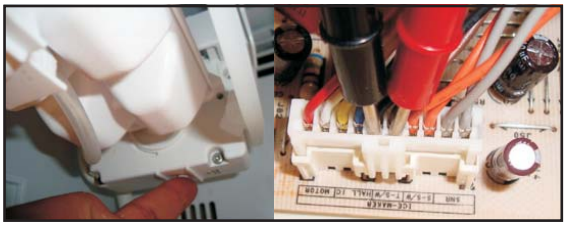


<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>1</td><td>Check the Door Gasket for any abnormality.</td><td rowspan="2"><table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td rowspan="2">Fuse-M</td><td>0 Ω</td><td>Go to Step 3</td></tr><tr><td>OFF</td><td>Change Defrost Controller Assy</td></tr><tr><td rowspan="2">Defrost Heater</td><td>48~54 Ω</td><td>Go to Step 3</td></tr><tr><td>Other</td><td>Change Defrost Controller Assy</td></tr><tr><td rowspan="2">Desfrost Sensor</td><td>0 Ω</td><td>Go to Step 3</td></tr><tr><td>OFF</td><td>Change Defrost Controller Assy</td></tr></table></td></tr>
<tr><td>2</td><td>Unplug the product, remove Grille Fan assy, and check the Defrost Control Part.
 
Defrost Controller Assy connector
 
</td></tr>
<tr><td>3</td><td>Reset Refrigerator, then, enter to TEST MODE 2 (Press twice TEST S/W on Main PCB.
  </td><td> 

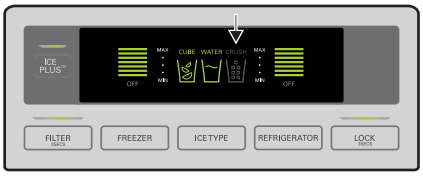
All LED's ON</td></tr>
<tr><td>4</td><td>Check Voltage between Purple to Brown wires in CON 2.
  </td><td><table><tr><th>Result</th><th>Service Action</th></tr><tr><td>110~127 V</td><td>Go to Step 5</td></tr><tr><td>0 V</td><td>Replace Main PCB</td></tr></table></td></tr>
<tr><td>5</td><td>Release TEST MODE 2 (Press once TEST S/W on Main PCB)</td><td> 
</td></tr>
<tr><td>6</td><td>Check Voltage between Purple to Brown wires in CON 2.
  </td><td><table><tr><th>Result</th><th>Service Action</th></tr><tr><td>0 V</td><td>Explain to customer</td></tr><tr><td>110~127 V</td><td>Replace Main PCB</td></tr></table></td></tr>
</table>

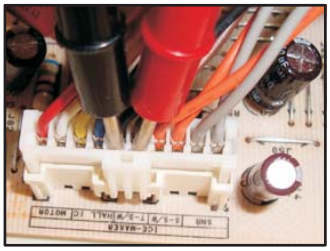
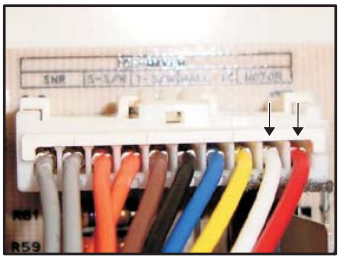
8) Abnormal Ice maker Unit Error



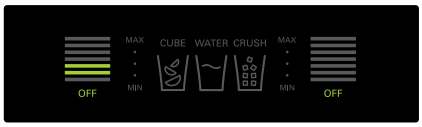
NO.	CHECKING FLOW	RESULT & SERVICE ACTION
1	Remove Cover PCB, then check for any loose connection in CON 8. 	<table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Firmly plugged</td><td>Go to Step 2</td></tr><tr><td>Loose</td><td>Plug firmly, then check again. Problem persist? Yes: Go to Step 2 No: Explain to Customer</td></tr></table>
2	Remove Tray ice, remove screw of Ice maker unit, quit Ice maker from holders and check for any loose connection. 	<table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Firmly plugged</td><td>Go to Step 3</td></tr><tr><td>Loose</td><td>Plug firmly, then check again. Problem persist? Yes: Go to Step 3 No: Explain to Customer</td></tr></table>
3	Check Voltage from Ice maker S/W in CON 8. 	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td rowspan="3">ON</td><td>5V</td><td>Replace Ice maker unit</td></tr><tr><td>0V</td><td>Go to Step 4</td></tr><tr><td>Other</td><td>Replace Main PCB</td></tr><tr><td rowspan="3">OFF</td><td>5V</td><td>Go to Step 4</td></tr><tr><td>0V</td><td>Replace Ice maker unit</td></tr><tr><td>Other</td><td>Replace Main PCB</td></tr></table>
4	Check Voltage from Ice maker TEST S/W in CON 8. Press the TEST S/W of Ice maker unit for 3 seconds, permit finish Test Cycle before press again. 	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td rowspan="3">ON</td><td>5V</td><td>Replace Ice maker unit</td></tr><tr><td>0V</td><td>Go to Step 5</td></tr><tr><td>Other</td><td>Replace Main PCB</td></tr><tr><td rowspan="3">OFF</td><td>5V</td><td>Go to Step 5</td></tr><tr><td>0V</td><td>Replace Ice maker unit</td></tr><tr><td>Other</td><td>Replace Main PCB</td></tr></table>

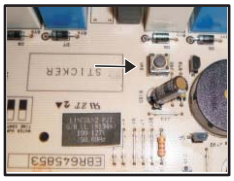
8) Abnormal Ice maker Unit Error



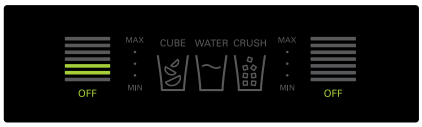
NO.	CHECKING FLOW	RESULT & SERVICE ACTION
5	Check HALL IC signal in CON 8 Press Ice maker TEST S/W for 3 seconds. Check the change between 0V and 5V in HALL IC signal during Test period. 	<table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Signal Change (0V→5V→0V→...)</td><td>Go to Step 6</td></tr><tr><td>No change (Still in 0V or 5V)</td><td>Replace Ice maker unit</td></tr><tr><td>Other</td><td>Replace Main PCB</td></tr></table>
6	Check Motor Signal in CON 8. Press Ice maker TEST S/W for 3 seconds. Check the Voltage changes in motor signal during Test period. It must change from positive voltage to negative voltage during the Test. 	<table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Voltage inversion</td><td>Go to Step 6</td></tr><tr><td>No voltage inversion</td><td>Replace Main PCB</td></tr></table>
7	Check the movements in Ice maker unit. Press Ice maker TEST S/W for 3 seconds. Check the rotation of motor and the movement of arm.	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td>Movement is present in Motor and Arm</td><td>Normal</td><td>Explain to costumer</td></tr><tr><td>No movement present in Motor and Arm</td><td>Abnormal</td><td>Replace Ice maker unit</td></tr></table>

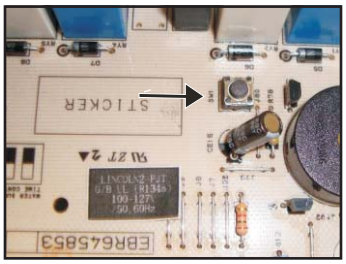
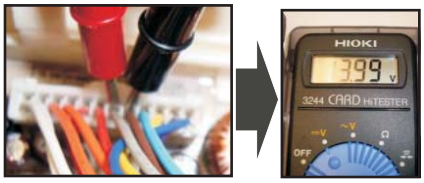
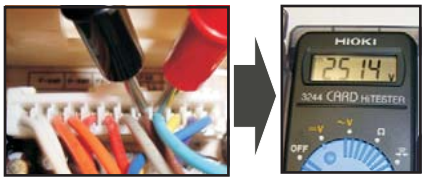
9) Abnormal Cooling Fan Error



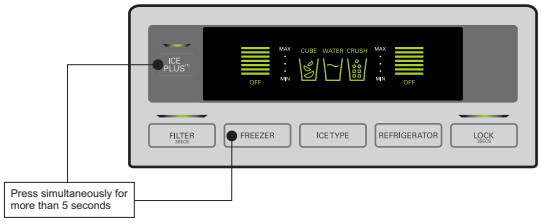
NO.	CHECKING FLOW	RESULT & SERVICE ACTION
1	Turn Off the product.	
2	Remove Cover Machin Room, and check the movement of Cooling Fan Motor manually, feel the rotation condition, then proceed. 	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td>Tight Movement</td><td>Abnormal</td><td>Replace the Cooling Fan Motor, then turn on the product and verify the result. Problem persist? YES: Go to Step 5 NO: Explain to the customer</td></tr><tr><td>Free movement</td><td>Normal</td><td>Go to Step 3</td></tr></table>
3	1) Turn On the product. 2) Remove Cover PCB, then press TEST S/W on Main PCB to enter to TEST MODE 1.  3) Check the Fan rotation. NOTE: If error code is displayed, Fan won't operates. Air flow direction 	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td>Air Flow</td><td>Normal</td><td>Go to Step 4</td></tr><tr><td>No Air Flow</td><td>Abnormal</td><td>Go to Step 5</td></tr></table>
4	Check Motor rotation (air flow) is continuous for more than 3 minutes. NOTE: If error is detected, Fan Motor will try to work 4 or 5 times. ON ➡ OFF ➡ ON ➡ OFF ➡ ON ➡ ... ➡ OFF 15s 10s 15s 10s 15s	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td>Continuous</td><td>Normal</td><td>Explain to the customer</td></tr><tr><td>Intermittent</td><td>Abnormal</td><td>Go to Step 5</td></tr></table>

9) Abnormal Cooling Fan Error

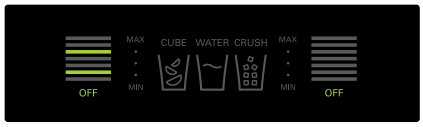


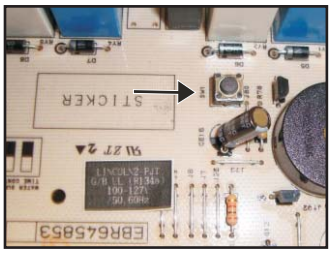
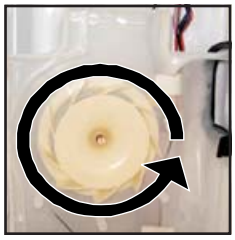
<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>5</td><td>1) Reset product.
2) Enter to TEST MODE 1 (press once TEST S/W on Main PCB)
 
3) Remove Cover PCB.
4) Check voltage in CON 6 as shown in the pictures.</td><td>
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td>(a) ~ (b)</td><td>Normal</td><td>Change Main PCB</td></tr>
<tr><td>(b) ~ (c)</td><td>Abnormal</td><td>Change Motor</td></tr>
</table>
(a) ~ (b)
 
(b) ~ (c)
 
</td></tr>
<tr><td>6</td><td>Disconnect Motor connector, and check status of plated terminals.

Terminals contact surface must be free of rust and dirt. Also, the terminals red with a T.P.A., Motor wire must not have any damage.</td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Wire damage,rust, dirt, TPA absences.</td><td>Change Main PCB</td></tr>
<tr><td>Normal appearance</td><td>Go to Step 7</td></tr>
</table>
</td></tr>
<tr><td>7</td><td>Reset the product.

After 3 minutes execute DISPLAY CHECK MODE, check the result.
 
</td><td>
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td>All Display LED’s are turned ON</td><td>Normal</td><td>Explain to the customer</td></tr>
<tr><td>Cooling Fan Error Code appears</td><td>Abnormal</td><td>Replace Cooling Fan Motor</td></tr>
</table>
</td></tr>
</table>

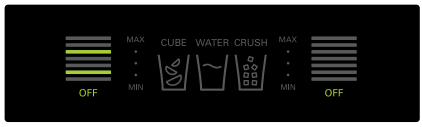
10) Abnormal Freezer Fan Error

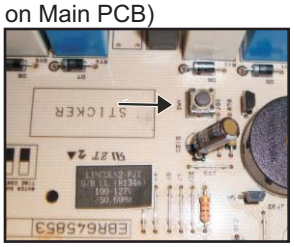
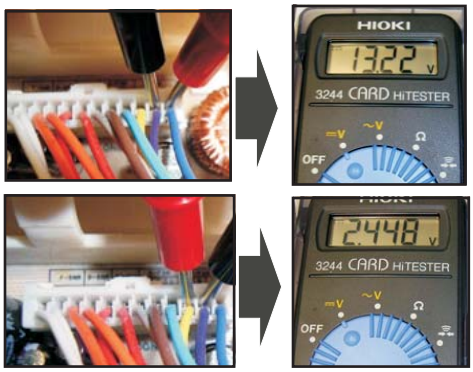


<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>1</td><td>Turn Off the product.</td><td></td></tr>
<tr><td>2</td><td>Remove Grille Fan Assembly, and check the movement of Freezer Fan Motor manually, feel the rotation condition, then proceed.
  </td><td>
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td>Tight Movement</td><td>Abnormal</td><td>Replace the Freezer Fan Motor, then turn on the product and verify the result.
Problem persist?
YES: Go to Step 5
NO: Explain to the customer</td></tr>
<tr><td>Free movement</td><td>Normal</td><td>Go to Step 3</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>1) Turn On the product.
2) Remove Cover PCB, then press TEST S/W on Main PCB to enter to TEST MODE 1.
3) Check the Fan rotation.
NOTE: If error code is displayed, Fan won’t operates.
  </td><td>
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td>Air Flow</td><td>Normal</td><td>Go to Step 4</td></tr>
<tr><td>No Air Flow</td><td>Abnormal</td><td>Go to Step 5</td></tr>
</table>

</td></tr>
<tr><td>4</td><td>Check Motor rotation (air flow) is continuous for more than 3 minutes.
NOTE: If error is detected, Fan Motor will try to work 4 or 5 times.

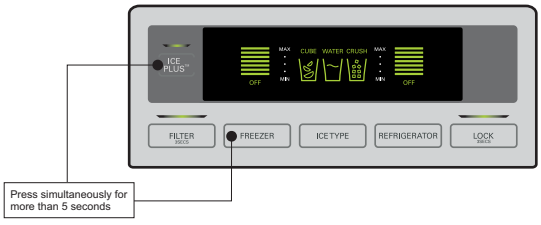
ON ➡ OFF ➡ ON ➡ OFF ➡ ON ➡ ... ➡ OFF
15s 10s 15s 10s 15s</td><td>
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td>Continuous</td><td>Normal</td><td>Explain to the customer</td></tr>
<tr><td>Intermittent</td><td>Abnormal</td><td>Go to Step 5</td></tr>
</table>
</td></tr>
</table>

10) Abnormal Freezer Fan Error



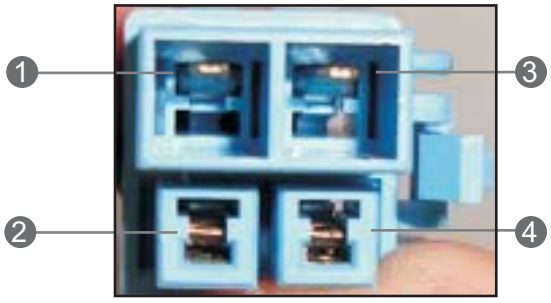
<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>5</td><td>1) Reset product.
2) Remove Cover PCB.
3) Enter to TEST MODE 1 (press once TEST S/W on Main PCB)
 
4) Check voltage in CON 6 as shown in the pictures.</td><td><table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td>(a) ~ (b)</td><td>Below 10V</td><td>Change Main PCB</td></tr><tr><td>(b) ~ (c)</td><td>0V or 5V</td><td>Go to Step 6</td></tr></table>(a) ~ (b)
  </td></tr>
<tr><td>6</td><td>Disconnect Motor connector, and check status of plated terminals.

Terminals contact surface must be free of rust and dirt. Also, the terminals must be assured with a T.P.A., Motor wire must not have any damage.</td><td><table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Wire damage,rust, dirt, TPA absences.</td><td>Replace Motor</td></tr><tr><td>Normal appearance</td><td>Go to Step 7</td></tr></table></td></tr>
<tr><td>7</td><td>Reset the product.

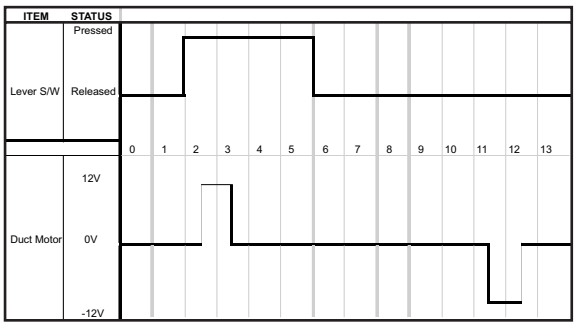
After 3 minutes execute DISPLAY CHECK MODE, check the result.
  </td><td><table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td>All Display LED’s are turned ON</td><td>Normal</td><td>Explain to the customer</td></tr><tr><td>Freezer Fan Error Code appears</td><td>Abnormal</td><td>Replace Freezer Fan Motor</td></tr></table></td></tr>
</table>

2. Troubleshooting With Error Display

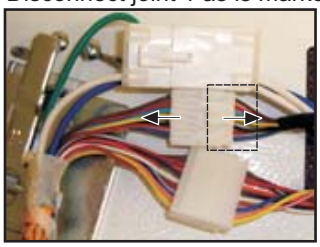
11) Ice Cube Mode is not working

NO.	CHECKING FLOW	RESULT & SERVICE ACTION
1	Check Lever S/W signal in CON 4. 	<table><tr><th colspan="2">Lever S/W</th><th>Service Action</th></tr><tr><td rowspan="2">Pressing</td><td>0 Vac</td><td>Go to Step 2</td></tr><tr><td>Other</td><td>Change PCB</td></tr><tr><td rowspan="2">Not Pressing</td><td>50~70 Vac</td><td>Go to Step 2</td></tr><tr><td>Other</td><td>Change PCB</td></tr></table>
2	Check Auger Motor signal in CON 3 & CON 2. 	<table><tr><th colspan="2">Lever S/W</th><th>Service Action</th></tr><tr><td rowspan="2">Pressing</td><td>110~127 Vac</td><td>Go to Step 3</td></tr><tr><td>Other</td><td>Change PCB</td></tr><tr><td rowspan="2">Not Pressing</td><td>0 Vac</td><td>Go to Step 3</td></tr><tr><td>Other</td><td>Change PCB</td></tr></table>
3	Check Solenoid Cube signal in CON 2. 	<table><tr><th colspan="2">Lever S/W</th><th>Service Action</th></tr><tr><td rowspan="2">Pressing</td><td>110~127 Vac</td><td>Go to Step 4</td></tr><tr><td>Other</td><td>Change PCB</td></tr><tr><td rowspan="2">Not Pressing</td><td>0 Vac</td><td>Go to Step 4</td></tr><tr><td>Other</td><td>Change PCB</td></tr></table>
4	Check impedance in solenoid cube and auger motor signal in CON 2. 	<table><tr><th colspan="2">Lever S/W</th><th>Service Action</th></tr><tr><td rowspan="2">1 to 3</td><td>33 ~43 Ω</td><td>Go to Step 5</td></tr><tr><td>Other</td><td>Replace Solenoid Cube</td></tr><tr><td rowspan="2">2 to 3</td><td>2.88-2.52Ω</td><td>Go to Step 5</td></tr><tr><td>Other</td><td>Repalce auger motor</td></tr></table> 1 to 3  2 to 3 

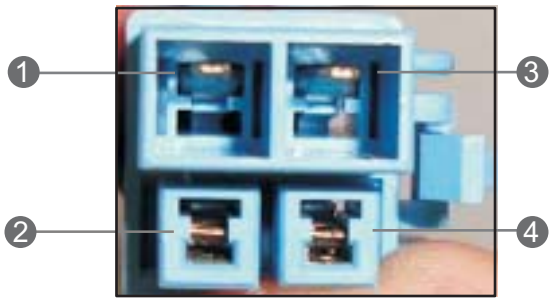
11) Ice Cube Mode is not working

NO.	CHECKING FLOW	RESULT & SERVICE ACTION
5	Remove Cover dispenser, then check for any loose connection in Duct motor. 	<table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Firmly plugged</td><td>Go to Step 6</td></tr><tr><td>Loose</td><td>Plug firmly, then check again. Problem persist? Yes: Go to Step 5 No: Explain to Customer</td></tr></table>
6	Unplug connector from Duct motor and check the resistance value.	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td rowspan="2">❷ to ❸</td><td>9.9 ~12.1 Ω</td><td>Go to Step 7</td></tr><tr><td>Other</td><td>Replace Duct Motor</td></tr></table>
7	Check Duct Motor signal in CON 9.  NOTE: Voltage only will be appreciated during the first second after press lever S/W after release lever S/W voltage to close Duct Motor will be applier. Refer to next diagram. 	<table><tr><th colspan="2">Lever S/W</th><th>Service Action</th></tr><tr><td rowspan="2">Pressing</td><td>+/- 12Vdc</td><td>Go to Step 8</td></tr><tr><td>Other</td><td>Change PCB</td></tr><tr><td rowspan="2">Not Pressing</td><td>Same than pressing voltage, but inverted</td><td>Go to Step 8</td></tr><tr><td>Other</td><td>Change PCB</td></tr></table>

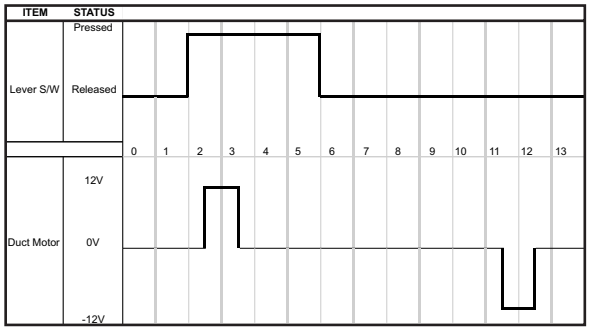
11) Ice Cube Mode is not working

<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>8</td><td>Remove Cover hinge in Freezer Door, and check connection.</td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Firmly plugged</td><td>Go to Step 9</td></tr>
<tr><td>Loose</td><td>Plug firmly, then check again.
Problem persist?
Yes: Go to Step 9
No: Explain to Customer</td></tr>
</table>
</td></tr>
<tr><td>9</td><td>Disconnect joint 1 as is marked in the picture.
  </td><td rowspan="2">
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>0 Ω</td><td>Replace Product</td></tr>
<tr><td>OFF</td><td>Go to Step 10</td></tr>
</table>
</td></tr>
<tr><td>10</td><td>Then check resistance value marked points.
  </td></tr>
<tr><td></td><td>Unplug connector from Duct Motor and check the resistance value in the connector.
  </td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>0 Ω</td><td>Replace Door assembly</td></tr>
<tr><td>OFF</td><td>Explain to customer</td></tr>
</table>
</td></tr>
</table>

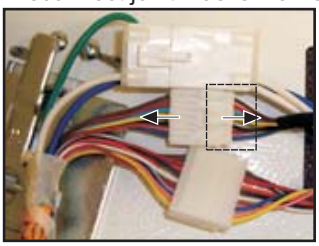
12) Ice Crush Mode is not working

NO.	CHECKING FLOW	RESULT & SERVICE ACTION
1	Check Lever S/W signal in CON 4. 	<table><tr><th colspan="2">Lever S/W</th><th>Service Action</th></tr><tr><td rowspan="2">Pressing</td><td>0 Vac</td><td>Go to Step 2</td></tr><tr><td>Other</td><td>Change PCB</td></tr><tr><td rowspan="2">Not Pressing</td><td>50~70 Vac</td><td>Go to Step 2</td></tr><tr><td>Other</td><td>Change PCB</td></tr></table>
2	Check Auger Motor signal in CON 3 & CON 2. 	<table><tr><th colspan="2">Lever S/W</th><th>Service Action</th></tr><tr><td rowspan="2">Pressing</td><td>110~127 Vac</td><td>Go to Step 3</td></tr><tr><td>Other</td><td>Change PCB</td></tr><tr><td rowspan="2">Not Pressing</td><td>0 Vac</td><td>Go to Step 3</td></tr><tr><td>Other</td><td>Change PCB</td></tr></table>
3	Check impedance in solenoid cube and auger motor signal in CON 2. 	<table><tr><th colspan="2">Lever S/W</th><th>Service Action</th></tr><tr><td rowspan="2">2 to 3</td><td>2.88-3.52Ω</td><td>Go to Step 5</td></tr><tr><td>Other</td><td>Repalce auger motor</td></tr></table> 2 to 3 
4	Remove Cover dispenser, then check for any loose connection in Duct motor. 	<table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Firmly plugged</td><td>Go to Step 5</td></tr><tr><td>Loose</td><td>Plug firmly, then check again. Problem persistΩ Yes: Go to Step 5 No: Explain to Customer</td></tr></table>

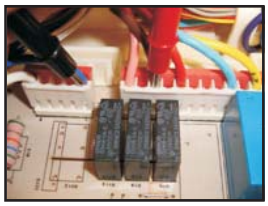
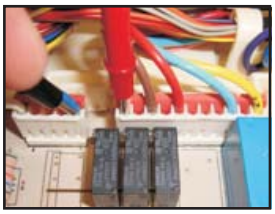
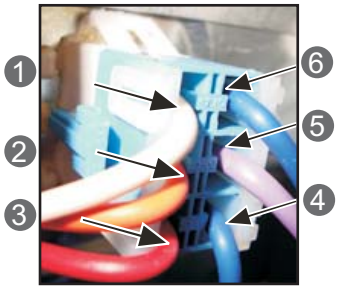
12) Ice Crush Mode is not working

NO.	CHECKING FLOW	RESULT & SERVICE ACTION
5	Unplug connector from Duct motor and check the resistance value. 	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td rowspan="2">2 to 3</td><td>9.9 ~12.1 Ω</td><td>Go to Step 6</td></tr><tr><td>Other</td><td>Replace Duct Motor</td></tr></table>
6	Check Duct Motor signal in CON 9.  NOTE: Voltage only will be appreciated during the first second after press lever S/W after release lever S/W voltage to close Duct Motor will be applier. Refer to next diagram. 	<table><tr><th colspan="2">Lever S/W</th><th>Service Action</th></tr><tr><td rowspan="2">Pressing</td><td>+/- 12Vdc</td><td>Go to Step 7</td></tr><tr><td>Other</td><td>Change PCB</td></tr><tr><td rowspan="2">Not Pressing</td><td>Same than pressing voltage, but inverted</td><td>Go to Step 7</td></tr><tr><td>Other</td><td>Change PCB</td></tr></table>
7	Remove Cover hinge in Freezer Door, and check connection.	<table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Firmly plugged</td><td>Go to Step 8</td></tr><tr><td>Loose</td><td>Plug firmly, then check again. Problem persist? Yes: Go to Step 8 No: Explain to Customer</td></tr></table>

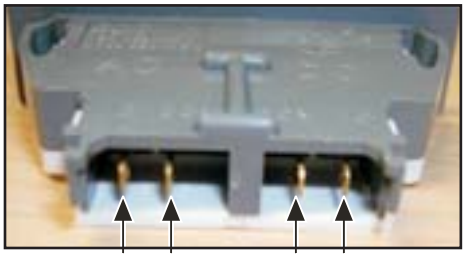
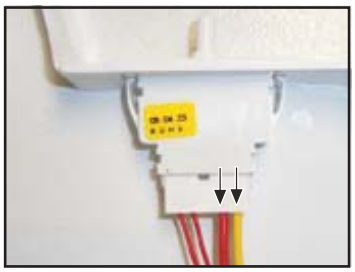
12) Ice Crush Mode is not working

NO.	CHECKING FLOW	RESULT & SERVICE ACTION
8	Disconnect joint 1 as is marked in the picture.  Then check resistance value marked points. 	<table><tr><th>Result</th><th>Service Action</th></tr><tr><td>0 Ω</td><td>Replace Product</td></tr><tr><td>OFF</td><td>Go to Step 9</td></tr></table>
9	Unplug connector from Duct Motor and check the resistance value in the connector. 	<table><tr><th>Result</th><th>Service Action</th></tr><tr><td>0 Ω</td><td>Replace Door assembly</td></tr><tr><td>OFF</td><td>Explain to customer</td></tr></table>

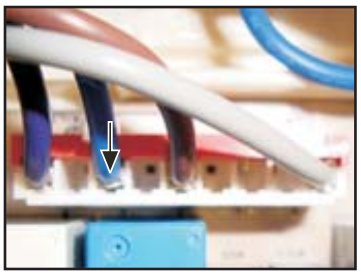
13) Water dispensing mode is not working

<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>1</td><td>Check for loose connections in Main PCB CON 3 & CON 4, also check in Machine Room the Valve Assy connector.
  </td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Firmly plugged</td><td>Go to Step 2</td></tr>
<tr><td>Loose</td><td>Plug firmly, then check again.
Problem persist?
Yes: Go to Step 2
No: Explain to Customer</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Check Lever S/W signal in CON 4.
  </td><td>
<table>
<tr><th colspan="2">Lever S/W</th><th>Service Action</th></tr>
<tr><td rowspan="2">Pressing</td><td>0 Vac</td><td>Go to Step 3</td></tr>
<tr><td>Other</td><td>Change PCB</td></tr>
<tr><td rowspan="2">Not Pressing</td><td>50~70 Vac</td><td>Go to Step 3</td></tr>
<tr><td>Other</td><td>Change PCB</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Check Water Valve signal in CON 3 & CON 4.
  </td><td>
<table>
<tr><th colspan="2">Lever S/W</th><th>Service Action</th></tr>
<tr><td rowspan="2">Pressing</td><td>110~127 Vac</td><td>Go to Step 4</td></tr>
<tr><td>Other</td><td>Change PCB</td></tr>
<tr><td rowspan="2">Not Pressing</td><td>0 Vac</td><td>Go to Step 4</td></tr>
<tr><td>Other</td><td>Change PCB</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Check Pilot Valve signal in CON 3 & CON 4
  </td><td>
<table>
<tr><th colspan="2">Lever S/W</th><th>Service Action</th></tr>
<tr><td rowspan="2">Pressing</td><td>110~127 Vac</td><td>Go to Step 5</td></tr>
<tr><td>Other</td><td>Change PCB</td></tr>
<tr><td rowspan="2">Not Pressing</td><td>0 Vac</td><td>Go to Step 5</td></tr>
<tr><td>Other</td><td>Change PCB</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>Check impedance of Water Valve & Pilot Valve.
 
</td><td>
<table>
<tr><th colspan="2">Lever S/W</th><th>Service Action</th></tr>
<tr><td rowspan="2">1 to 6</td><td>33 ~43 Ω</td><td>Explain to costumer</td></tr>
<tr><td>Other</td><td>Replace Valve Assembly</td></tr>
<tr><td rowspan="2">2 to 3</td><td>2.88-3.52Ω</td><td>Explain to costumer</td></tr>
<tr><td>Other</td><td>Replace Valve Aseembly</td></tr>
</table>
</td></tr>
</table>

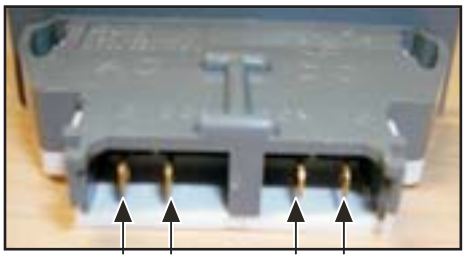
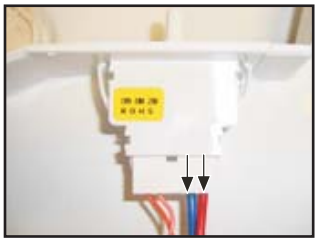
14) Freezer Lamp is not working

<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>1</td><td>Check the Freezer Door S/W activating movement.</td><td>
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td>Tight movement</td><td>Abnormal</td><td>Change Door S/W</td></tr>
<tr><td>Free movement</td><td>Normal</td><td>Go to Step 2</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Check for any loose connection in Freezer Door S/W.
  </td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Firmly plugged</td><td>Go to Step 3</td></tr>
<tr><td>Loose</td><td>Plug firmly, then check again.
Problem persist?
Yes: Go to Step 3
No: Explain to Customer</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Unplug connector from Door S/W, then check between terminals.
 
AC Part DC Part</td><td>
<table>
<tr><th colspan="2">Lever S/W</th><th>Service Action</th></tr>
<tr><td rowspan="2">Released</td><td>0 Ω</td><td>Go to Step 4</td></tr>
<tr><td>Other</td><td>Replace Door S/W</td></tr>
<tr><td rowspan="2">Pressed</td><td>OFF</td><td>Go to Step 4</td></tr>
<tr><td>Other</td><td>Replace Door S/W</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Reconnect Door S/W and check voltage.
 
AC Part</td><td>
<table>
<tr><th colspan="2">Lever S/W</th><th>Service Action</th></tr>
<tr><td rowspan="2">Released</td><td>0~5 Vac</td><td>Go to Step 4</td></tr>
<tr><td>Other</td><td>Replace Door S/W</td></tr>
<tr><td rowspan="3">Pressed</td><td>110~127 Vac</td><td>Explain to customer (NOTE: Lamp must be OFF)</td></tr>
<tr><td>0~5 Vac</td><td>Go to Step 6</td></tr>
<tr><td>Other</td><td>Go to Step 5</td></tr>
</table>
</td></tr>
</table>

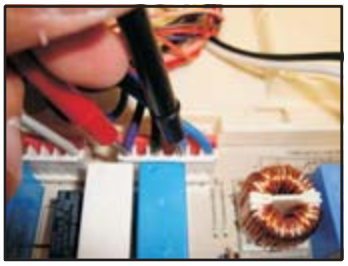
14) Freezer Lamp is not working

<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>5</td><td>1) Press and hold Freezer Door S/W.
2) Replace Lamp Bulb by a new piece.
3) Release Door S/W.
4) Check the result.</td><td><table><tr><th>Result</th><th>Service Action</th></tr><tr><td>ON</td><td>Explain to customer</td></tr><tr><td>OFF</td><td>Go to Step 6</td></tr></table></td></tr>
<tr><td>6</td><td>Remove Cover PCB, then, check voltage from Main PCB in CON 2 & CON 3.
 
CON 3
Place Test Point (+) in yellow wire (LIVE)
 
CON 2
Place Test Point (-) in blue wire (NEUTRAL)</td><td><table><tr><th>Result</th><th>Service Action</th></tr><tr><td>0 ~ 5 Vac</td><td>Replace Main PCB</td></tr><tr><td>110 ~ 127 Vac</td><td>Replace Product</td></tr></table></td></tr>
</table>

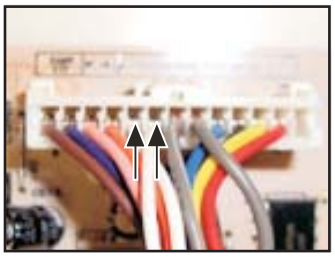
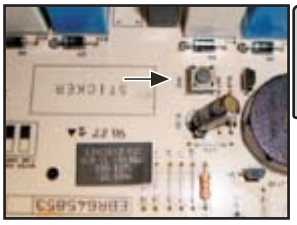
15) Refrigerator Lamp is not working

<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>1</td><td>Reset Refrigerator.</td><td></td></tr>
<tr><td>2</td><td>Check the Refrigerator Door S/W activating movement.</td><td>
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td>Tight movement</td><td>Abnormal</td><td>Change Door S/W</td></tr>
<tr><td>Free movement</td><td>Normal</td><td>Go to Step 2</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Check for any loose connection in Refrigerator Door S/W.
  </td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Firmly plugged</td><td>Go to Step 4</td></tr>
<tr><td>Loose</td><td>Plug firmly, then check again.
Problem persist?
Yes: Go to Step 4
No: Explain to Customer</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Unplug connector from Door S/W, then check between terminals.
 
AC Part DC Part</td><td>
<table>
<tr><th colspan="2">Lever S/W</th><th>Service Action</th></tr>
<tr><td rowspan="2">Released</td><td>0 Ω</td><td>Go to Step 5</td></tr>
<tr><td>Other</td><td>Replace Door S/W</td></tr>
<tr><td rowspan="2">Pressed</td><td>OFF</td><td>Go to Step 5</td></tr>
<tr><td>Other</td><td>Replace Door S/W</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>Reconnect Door S/W and check voltage.
 
AC Part</td><td>
<table>
<tr><th colspan="2">Lever S/W</th><th colspan="2">Service Action</th></tr>
<tr><td rowspan="3">Released</td><td rowspan="3">0~5 Vac</td><td>Lamps</td><td>Action</td></tr>
<tr><td>ON</td><td>Go to Step 5</td></tr>
<tr><td>OFF</td><td>Replace Door S/W</td></tr>
<tr><td rowspan="5">Pressed</td><td>Other</td><td colspan="2">Go to Step 6</td></tr>
<tr><td>110~127 Vac</td><td colspan="2">Explain to customer (NOTE: Lamp must be OFF)</td></tr>
<tr><td>0~5 Vac</td><td colspan="2">Go to Step 6</td></tr>
<tr><td>Other</td><td colspan="2">Go to Step 5</td></tr>
</table>
</td></tr>
</table>

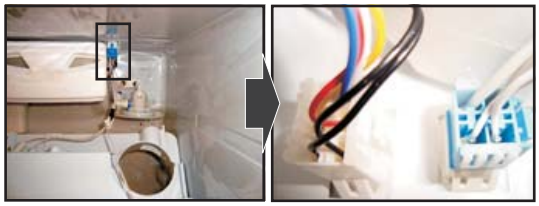
15) Refrigerator Lamp is not working

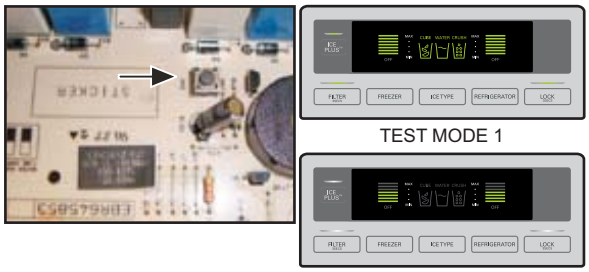
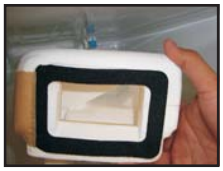
<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>1</td><td>Identify the problem. Which lamp bulb is failingΩ</td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Upper</td><td>Go to Step 7</td></tr>
<tr><td>Lower</td><td>Replace Lamp Bulb</td></tr>
<tr><td>Both</td><td>Go to Step 8</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Remove Refrigerator Control Box, then check for any loose connection.
  </td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Firmly plugged</td><td>Go to Step 8</td></tr>
<tr><td>Loose</td><td>Plug firmly, then check again.
Problem persist?
Yes: Go to Step 8
No: Explain to Customer</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Remove Cover PCB, then, check voltage in Main
  </td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>0 ~ 5 Vac</td><td>Go to Step 9</td></tr>
<tr><td>110 ~ 127 Vac</td><td>Replace Main PCB</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>1) Press and hold refrigerator Door S/W.
2) Replace lower Lamp Bulb by a new piece.
3) Release Door S/W.
4) Check the result.</td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>ON</td><td>Replace the Lamp Bulb remaining by a new piece</td></tr>
<tr><td>OFF</td><td>Replace product</td></tr>
</table>
</td></tr>
</table>

16) Poor Cooling in Refrigerator section

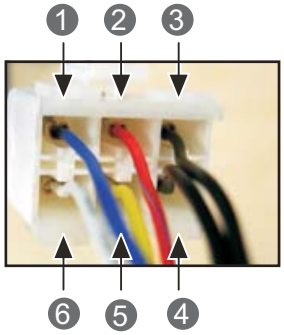
<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>1</td><td>Check the conditions of gasket in refrigerator door (gaps, damage, deformed).</td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Ok</td><td>Go to Step 2</td></tr>
<tr><td>Abnormal</td><td>Fix up (if possible) or change the Gasket</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Check the sensor resistance value in CON 7.
  </td><td>Refer to temperature chart for Refrigerator Sensor.
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Ok</td><td>Go to Step 3</td></tr>
<tr><td>Abnormal</td><td>Check section “3” Abnormal Refrigerator Sensor</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Reset product, then, enter to TEST MODE 1 (Press once).
 
 
ALL LED ON</td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Entered</td><td>Go to Step 4</td></tr>
<tr><td>Not entered</td><td>Execute DISPLAY CHECK MODE, check the result and match with related error</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>1) Open freezer door.
2) Press manually the freezer door S/W.
3) Check the air flow.
  </td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Air flow</td><td>Go to Step 5</td></tr>
<tr><td>No Air flow</td><td>Go to Step 6</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>1) Open freezer door.
2) Press manually the refrigerator door S/W, wait 10 seconds.
3) Check the air flow.
  </td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Air flow</td><td>Go to Step 8</td></tr>
<tr><td>No Air flow</td><td>Go to Step 7</td></tr>
</table>
</td></tr>
</table>

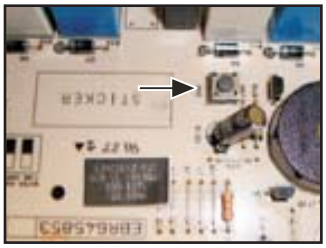
16) Poor Cooling in Refrigerator section

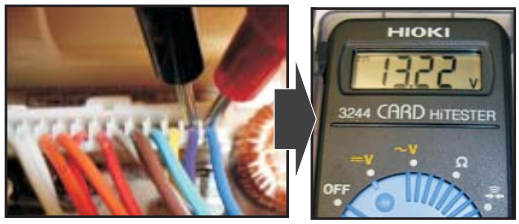
<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>6</td><td>1) Turn Off the refrigerator.
2) Remove Grille Fan assembly, and check the movement of Freezer Fan Motor manually, feel the rotation condition, then proceed.
  </td><td><table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Tight movement</td><td>Replace Freezer Fan Motor</td></tr><tr><td>Free movement</td><td>Go to Step 7</td></tr></table></td></tr>
<tr><td>7</td><td>1) Remove Control Box in refrigerator sensor.
 
2) Check for any loose connection.
 
3) Turn On the refrigerator.</td><td>Connector must be firmly connected, and wires don’t be have any damage.

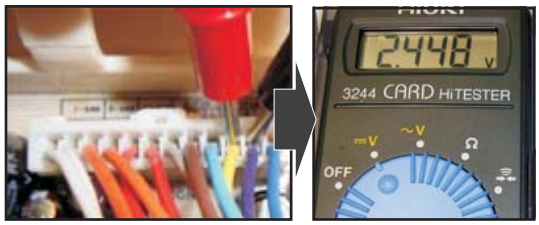
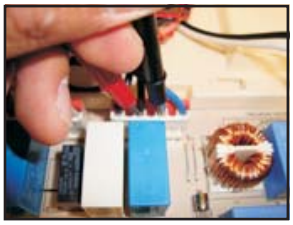
Next action. Go to Step 8.</td></tr>
<tr><td>8</td><td>Remove the EPS duct carefully (without disconnect). Look for damper baffle and check the movement by entering to TEST MODE 1 (Press once) and TEST MODE 2 (Press once again).
 
TEST MODE 1
TEST MODE 2</td><td><table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td rowspan="2">TEST MODE 1</td><td>Open</td><td>Go to Step 10</td></tr><tr><td>Not works</td><td>Go to Step 9</td></tr><tr><td rowspan="2">TEST MODE 1</td><td>Close</td><td>Go to Step 10</td></tr><tr><td>Not works</td><td>Go to Step 9</td></tr></table> 
TEST MODE 1
Damper OPEN
 
TEST MODE 2
Damper CLOSE</td></tr>
</table>

16) Poor Cooling in Refrigerator section

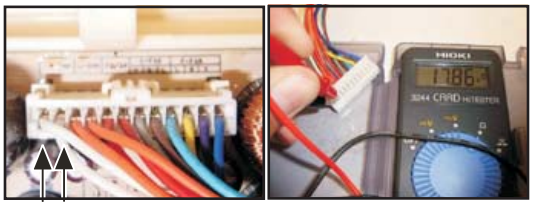
<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>9</td><td>1) Unplug Damper Motor
2) Check the Damper Motor impedance.
 

<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td rowspan="2">1 ~ 6</td><td>369 ~ 451Ω</td><td>Change PCB</td></tr>
<tr><td>Other</td><td>Change Damper</td></tr>
<tr><td rowspan="2">2 ~ 5</td><td>369 ~ 451Ω</td><td>Change PCB</td></tr>
<tr><td>Other</td><td>Change Damper</td></tr>
<tr><td rowspan="2">3 ~ 4</td><td>129.6~158.4Ω</td><td>Change PCB</td></tr>
<tr><td>Other</td><td>Change Damper</td></tr>
</table></td></tr>
<tr><td>10</td><td>1) Reset product.
2) Enter to TEST MODE 1 (press once TEST S/W on Main PCB).
 

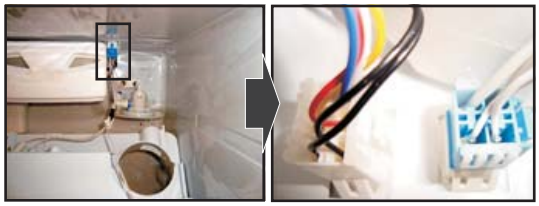
3) Check Voltage in CON 6 as shown in the pictures.</td><td><table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td rowspan="2">a ~ b</td><td>Below 10 V</td><td>Change Main PCB</td></tr>
<tr><td>Other</td><td>Go to Step 11</td></tr>
<tr><td rowspan="2">b ~ c</td><td>0V or 5V</td><td>Change Fan Motor</td></tr>
<tr><td>Other</td><td>Go to Step 11</td></tr>
</table>
a ~ b
 

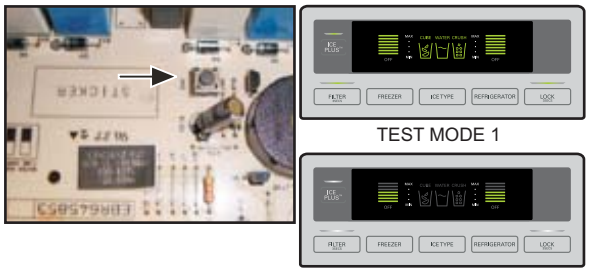
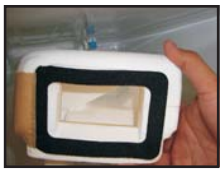
b ~ c
 
</td></tr>
<tr><td>11</td><td>1) Reset the refrigerator.
2) Enter to TEST MODE 1 (Press TEST S/W once).
3) Check Voltage in CON 1.
4) Enter to TEST MODE 2 (Press TEST S/W once again).
5) Check Voltage in CON 1.
6) Proceed with the action.
  </td><td><table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td rowspan="2">TEST MODE 1</td><td>110~127Vac</td><td>Bad compressor, Refrigerant leakage, tube obstruction, etc. (Please refer to cycle troubleshooting)</td></tr>
<tr><td>Other</td><td>Change Main PCB</td></tr>
<tr><td rowspan="2">TEST MODE 2</td><td>0~5 Vac</td><td>Bad compressor, Refrigerant leakage, tube obstruction, etc. (Please refer to cycle troubleshooting)</td></tr>
<tr><td>Other</td><td>Change Main PCB</td></tr>
</table></td></tr>
</table>

17) Poor Cooling in Freezer section

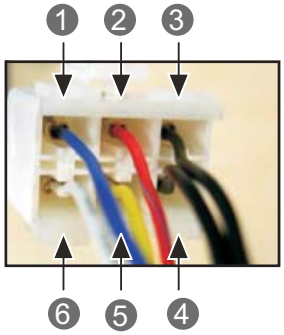
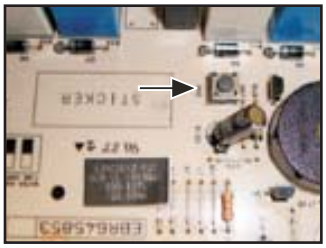
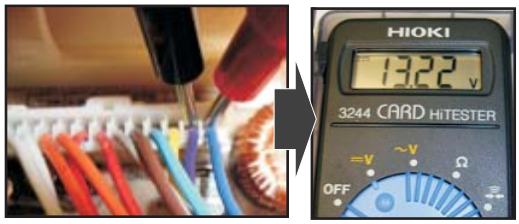
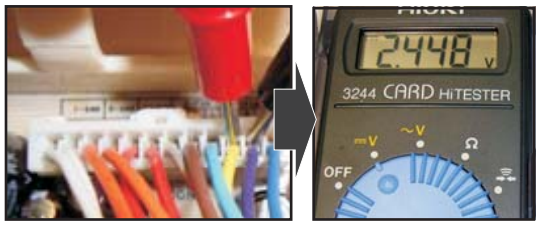
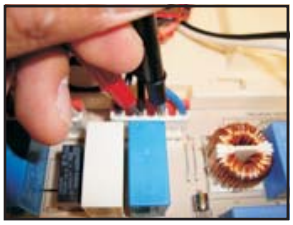
<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>1</td><td>Check the conditions of gasket in freezer door (gaps, damage, deformed).</td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Ok</td><td>Go to Step 2</td></tr>
<tr><td>Abnormal</td><td>Fix up (if possible) or change the Gasket</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Check the sensor resistance value in CON 6.
  </td><td>Refer to temperature chart for Refrigerator Sensor.
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Ok</td><td>Go to Step 3</td></tr>
<tr><td>Abnormal</td><td>Check section “3” Abnormal Freezer Sensor</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Reset product, then, enter to TEST MODE 1 (Press once).
 
ALL LED ON</td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Entered</td><td>Go to Step 4</td></tr>
<tr><td>Not entered</td><td>Execute DISPLAY CHECK MODE, check the result and match with related error</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>1) Open freezer door.
2) Press manually the freezer door S/W.
3) Check the air flow.
  </td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Air flow</td><td>Go to Step 5</td></tr>
<tr><td>No Air flow</td><td>Go to Step 6</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>1) Enter to TEST MODE 2.
2) Open freezer door.
3) Press manually the freezer door S/W.
4) Check the air flow.</td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Air flow</td><td>Go to Step 10</td></tr>
<tr><td>No Air flow</td><td>Go to Step 6</td></tr>
</table>
</td></tr>
</table>

17) Poor Cooling in Freezer section

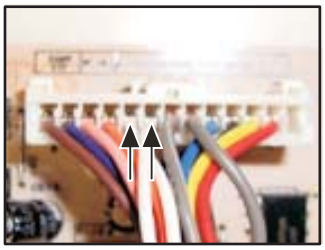
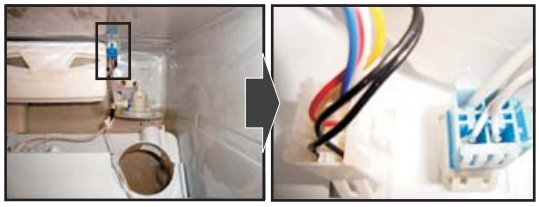
<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>6</td><td>1) Turn Off the refrigerator.
2) Remove Grille Fan assembly, and check the movement of Freezer Fan Motor manually, feel the rotation condition, then proceed.
  </td><td><table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Tight movement</td><td>Replace Freezer Fan Motor</td></tr><tr><td>Free movement</td><td>Go to Step 7</td></tr></table></td></tr>
<tr><td>7</td><td>1) Remove Control Box in refrigerator sensor.
 
2) Check for any loose connection.
 
3) Turn On the refrigerator.</td><td>Connector must be firmly connected, and wires don’t be have any damage.

Next action. Go to Step 8.</td></tr>
<tr><td>8</td><td>Remove the EPS duct carefully (without disconnect). Look for damper baffle and check the movement by entering to TEST MODE 1 (Press once) and TEST MODE 2 (Press once again).
 
TEST MODE 1
TEST MODE 2</td><td><table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td rowspan="2">TEST MODE 1</td><td>Open</td><td>Go to Step 10</td></tr><tr><td>Not works</td><td>Go to Step 9</td></tr><tr><td rowspan="2">TEST MODE 2</td><td>Close</td><td>Go to Step 10</td></tr><tr><td>Not works</td><td>Go to Step 9</td></tr></table> 
TEST MODE 1
Damper OPEN
 
TEST MODE 2
Damper CLOSE</td></tr>
</table>

17) Poor Cooling in Freezer section

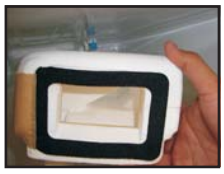
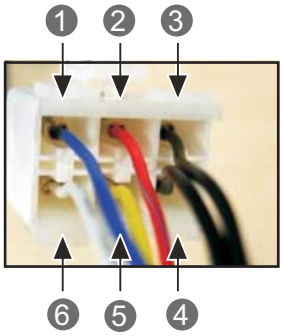
NO.	CHECKING FLOW	RESULT & SERVICE ACTION
9	1) Unplug Damper Motor 2) Check the Damper Motor impedance.  	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td rowspan="2">1 ~ 6</td><td>369 ~ 451Ω</td><td>Change PCB</td></tr><tr><td>Other</td><td>Change Damper</td></tr><tr><td rowspan="2">2 ~ 5</td><td>369 ~ 451Ω</td><td>Change PCB</td></tr><tr><td>Other</td><td>Change Damper</td></tr><tr><td rowspan="2">3 ~ 4</td><td>129.6~158.4Ω</td><td>Change PCB</td></tr><tr><td>Other</td><td>Change Damper</td></tr></table>
10	1) Reset product. 2) Enter to TEST MODE 1 (press once TEST S/W on Main PCB).  3) Check Voltage in CON 6 as shown in the pictures.	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td rowspan="2">a ~ b</td><td>Below 10 V</td><td>Change Main PCB</td></tr><tr><td>Other</td><td>Go to Step 11</td></tr><tr><td rowspan="2">b ~ c</td><td>0V or 5V</td><td>Change Fan Motor</td></tr><tr><td>Other</td><td>Go to Step 11</td></tr></table> a ~ b  b ~ c 
11	1) Reset the refrigerator. 2) Enter to TEST MODE 1 (Press TEST S/W once). 3) Check Voltage in CON 1. 4) Enter to TEST MODE 2 (Press TEST S/W once again). 5) Check Voltage in CON 1. 6) Proceed with the action. 	<table><tr><th colspan="2">Result</th><th>Service Action</th></tr><tr><td rowspan="2">TEST MODE 1</td><td>110~127Vac</td><td>Bad compressor, Refrigerant leakage, tube obstruction, etc. (Please refer to cycle troubleshooting)</td></tr><tr><td>Other</td><td>Change Main PCB</td></tr><tr><td rowspan="2">TEST MODE 2</td><td>0~5 Vac</td><td>Bad compressor, Refrigerant leakage, tube obstruction, etc. (Please refer to cycle troubleshooting)</td></tr><tr><td>Other</td><td>Change Main PCB</td></tr></table>

18) Over cooling in Refrigerator section

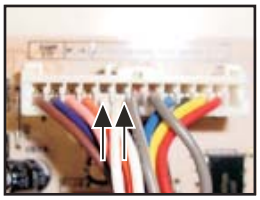
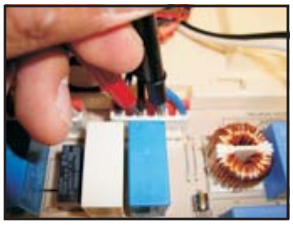
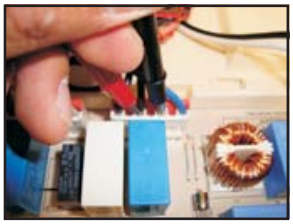
<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>1</td><td>Check the sensor resistance value in CON 7.
  </td><td>Refer to Temperature chart for Refrigerator Sensor.
<table><tr><th>Result</th><th>Service Action</th></tr><tr><td>OK</td><td>Go to Step 2</td></tr><tr><td>Abnormal</td><td>Check Section 3 Abnormal Refrigerator Sensor</td></tr></table></td></tr>
<tr><td>2</td><td>Enter to TEST MODE 1 (Press once the TEST S/W in Main PCB).</td><td>Go to Step 3</td></tr>
<tr><td>3</td><td>1) Open Refrigerator door.
2) Press manually the refrigerator door S/W, wait 10 seconds.
3) Check the air flow.
  </td><td><table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Air flow</td><td>Go to Step 4</td></tr><tr><td>No Air flow</td><td>Go to Step 6</td></tr></table></td></tr>
<tr><td>4</td><td>Enter to TEST MODE 2 (Press once the TEST S/W in Main PCB).</td><td>Go to Step 5</td></tr>
<tr><td>5</td><td>1) Open Refrigerator door.
2) Press manually the refrigerator door S/W.
3) Check the air flow.</td><td><table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Air flow</td><td>Go to Step 6</td></tr><tr><td>No Air flow</td><td>Go to Step 10</td></tr></table></td></tr>
<tr><td>6</td><td>Turn Off the refrigerator.</td><td>Go to Step 7</td></tr>
<tr><td>7</td><td>1) Remove Control Box in refrigerator sensor.
 
2) Check for any loose connection.
 
3) Turn On the refrigerator.</td><td>Connectors must be firmly connected, and wires don’t be have any damage.

Next action: Go to Step 8.</td></tr>
</table>

18) Over cooling in Refrigerator section

<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>8</td><td>Remove the EPS duct carefully (without disconnect). Look for damper baffle and check the movement by entering to TEST MODE 1 (Press once) and TEST MODE 2 (Press once again).
 
 
TEST MODE 1
 
TEST MODE 2</td><td>
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td rowspan="2">TEST MODE 1</td><td>Open</td><td>Normal</td></tr>
<tr><td>Not works</td><td>Go to Step 9</td></tr>
<tr><td rowspan="2">TEST MODE 2</td><td>Close</td><td>Normal</td></tr>
<tr><td>Not works</td><td>Go to Step 9</td></tr>
</table>

TEST MODE 1
Damper OPEN
 
TEST MODE 2
Damper CLOSE
</td></tr>
<tr><td>9</td><td>1) Unplug Damper Motor.
2) Check the Damper Motor impedance.
 
</td><td>
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td rowspan="2">1 ~ 6</td><td>369 ~ 451Ω</td><td>Change PCB</td></tr>
<tr><td>Other</td><td>Change Damper</td></tr>
<tr><td rowspan="2">2 ~ 5</td><td>369 ~ 451Ω</td><td>Change PCB</td></tr>
<tr><td>Other</td><td>Change Damper</td></tr>
<tr><td rowspan="2">3 ~ 4</td><td>129.6~158.4Ω</td><td>Change PCB</td></tr>
<tr><td>Other</td><td>Change Damper</td></tr>
</table>
</td></tr>
</table>

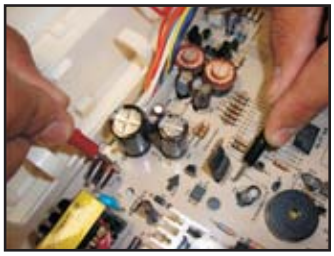
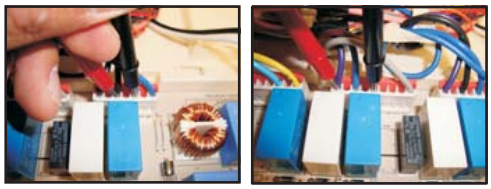
19) Over cooling in Freezer section

<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>1</td><td>Check the sensor resistance value in CON 7.
  </td><td>Refer to temperature chart for Refrigerator Sensor.<table><tr><th>Result</th><th>Service Action</th></tr><tr><td>Ok</td><td>Go to Step 2</td></tr><tr><td>Abnormal</td><td>Check Section 3, Abnormal Freezer Sensor.</td></tr></table></td></tr>
<tr><td>2</td><td>Enter to TEST MODE 1 (Press once the TEST S/W in Main PCB)</td><td>Go to Step 3</td></tr>
<tr><td>3</td><td>Remove Cover PCB, then, check voltage in CON 1 as is shown in the picture.
  </td><td><table><tr><th>Result</th><th>Service Action</th></tr><tr><td>110 ~ 127 Vac</td><td>Normal</td></tr><tr><td>Other</td><td>Change PCB</td></tr></table></td></tr>
<tr><td>4</td><td>Enter to TEST MODE 2 (Press again the TEST S/W in Main PCB)</td><td>Go to Step 5</td></tr>
<tr><td>5</td><td>Check Voltage in CON 1 as is shown in the picture.
  </td><td><table><tr><th>Result</th><th>Service Action</th></tr><tr><td>0 ~ 5 Vac</td><td>Normal</td></tr><tr><td>Other</td><td>Change PCB</td></tr></table></td></tr>
</table>

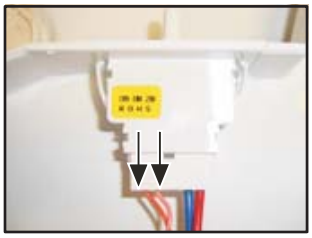
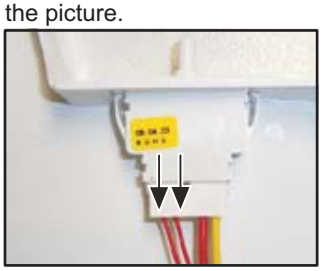
20) Refrigerator apparently doesn't work

<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>1</td><td>Lamps are working?</td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>YES</td><td>Go to Step 2</td></tr>
<tr><td>NO</td><td>Go to Step 4</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Refrigerator and Freezer notch indicator are in OFF position?</td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>YES</td><td>Go to Step 3</td></tr>
<tr><td>NO</td><td>Refer to Poor Cooling section</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Open the refrigerator door, then, in Display press “ULTRA ICE” key and “REF TEMP” key simultaneously for more than 5 seconds. Wait some minutes and check the operation of refrigerator.</td><td>
<table>
<tr><th>Is now cooling?</th><th>Service Action</th></tr>
<tr><td>YES</td><td>Normal, explain to the costumer</td></tr>
<tr><td>NO</td><td>Refer to Poor Cooling section</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Remove Cover PCB, then, check voltage in CON 201 as is shown in the picture.
  </td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>110 ~ 127 Vac</td><td>Go to Step 5</td></tr>
<tr><td>0 ~ 5 Vac</td><td>Replace Powercord</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>Check Voltage at Bridge Diode (BD1) input, as is shown in the picture. Take this measurement with caution.
  </td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>110 ~ 127 Vac</td><td>Go to Step 6</td></tr>
<tr><td>0 ~ 5 Vac</td><td>Replace Main PCB</td></tr>
</table>
</td></tr>
</table>

20) Refrigerator apparently doesn't work

<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>6</td><td>Check voltage signals of 12 Vdc and 16 Vdc.
 
16 V signal
 
12 V signal</td><td>
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td rowspan="2">16V signal</td><td>15.5~16.5 Vdc</td><td>Go to test 12V signal</td></tr>
<tr><td>Other</td><td>Replace PCB</td></tr>
<tr><td rowspan="2">12V signal</td><td>11.7~ 12.3 Vdc</td><td>go to Step 7</td></tr>
<tr><td>Other</td><td>Replace PCB</td></tr>
</table>
</td></tr>
<tr><td>7</td><td>Check 5 V signal voltage.
  </td><td>
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td rowspan="2">16V signal</td><td>4.75~5.25 Vdc</td><td>Normal, go to Step 8</td></tr>
<tr><td>Other</td><td>Replace PCB</td></tr>
</table>
</td></tr>
<tr><td>8</td><td>Execute Test Modes anc check voltages in CON 1 and CON 2 as is shown in the pictures.
 
CON 1 CON 2
NOTE: If refrigerator is not starting to cooling after some minutes, refer to Poor Cooling section.</td><td>
<table>
<tr><th colspan="3">Result</th><th>Service Action</th></tr>
<tr><td rowspan="4">TEST MODE 1</td><td rowspan="2">CON 1</td><td>110~127Vac</td><td>Normal</td></tr>
<tr><td>Other</td><td>Replace PCB</td></tr>
<tr><td rowspan="2">CON 2</td><td>0~5 Vac</td><td>Normal</td></tr>
<tr><td>Other</td><td>Replace PCB</td></tr>
<tr><td rowspan="4">TEST MODE 2</td><td rowspan="2">CON 1</td><td>0~5 Vac</td><td>Normal</td></tr>
<tr><td>Other</td><td>Replace PCB</td></tr>
<tr><td rowspan="2">CON 2</td><td>110~127Vac</td><td>Normal</td></tr>
<tr><td>Other</td><td>Replace PCB</td></tr>
</table>
</td></tr>
</table>

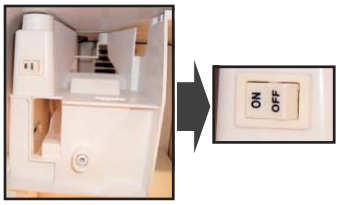
21) Door open alarm never stops

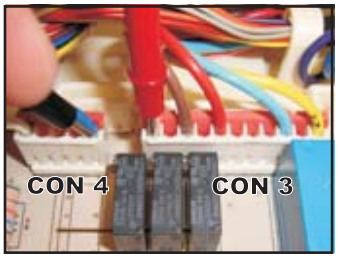
<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>1</td><td>Open refrigerator door, then, check manually the door S/W movement.</td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Tight movement</td><td>Replace Door S/W</td></tr>
<tr><td>Free movement</td><td>Go to Step 2</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Remove cover hinge in refrigerator door, check the measurement in Door S/W DC part as is shown in the picture.
  </td><td>
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td rowspan="2">Pressed</td><td>5 Vdc</td><td>Check in released mode</td></tr>
<tr><td>Other</td><td>Replace PCB</td></tr>
<tr><td rowspan="2">Released</td><td>0 Vdc</td><td>Go to Step 3</td></tr>
<tr><td>Other</td><td>Replace PCB</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Open freezer door, then, check manually the door S/W movement.</td><td>
<table>
<tr><th>Result</th><th>Service Action</th></tr>
<tr><td>Tight movement</td><td>Replace Door S/W</td></tr>
<tr><td>Free movement</td><td>Go to Step 4</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Remove cover hinge in freezer door, check the measurement in Door S/W DC part as is shown in the picture.
  </td><td>
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td rowspan="2">Pressed</td><td>5 Vdc</td><td>Check in released mode</td></tr>
<tr><td>Other</td><td>Replace PCB</td></tr>
<tr><td rowspan="2">Released</td><td>0 Vdc</td><td>Go to Step 6</td></tr>
<tr><td>Other</td><td>Replace PCB</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>If problem persist, disconnect from Main PCB CON 6 and CON 7, then, disconnect from both door S/W. Proceed to check resistance value in the mentioned measurement points.

Check the result.

Else, explain to customer.</td><td>
<table>
<tr><th colspan="2">Result</th><th>Service Action</th></tr>
<tr><td rowspan="2">R-Door S/W connector</td><td>0Ω</td><td>Replace product</td></tr>
<tr><td>OFF</td><td>Replace PCB</td></tr>
<tr><td rowspan="2">F-Door S/W connector</td><td>0Ω</td><td>Replace product</td></tr>
<tr><td>OFF</td><td>Replace PCB</td></tr>
</table>
</td></tr>
</table>

22) Refrigerator is not dispensing ice

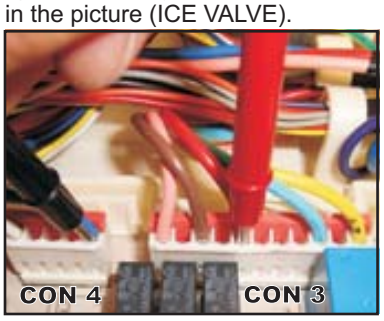
<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>1</td><td>Check for Ice maker power S/W status.
 
</td><td><table><tr><th>Result</th><th>Service Action</th></tr><tr><td>ON</td><td>Go to Step 2</td></tr><tr><td>OFF</td><td>Turn ON,
explain to customer</td></tr></table></td></tr>
<tr><td>2</td><td>Check the water supply connection to outlet.</td><td><table><tr><th>Result</th><th>Service Action</th></tr><tr><td>OK</td><td>Go to Step 3</td></tr><tr><td>Without Supply</td><td>Fix problem,
explain to customer</td></tr></table></td></tr>
<tr><td>3</td><td>Check cube / Crush mode function.

NOTE: Refer to section 11 and 12 about
Ice Cube / Crush nor working.</td><td><table><tr><th>Result</th><th>Service Action</th></tr><tr><td>OK</td><td>Go to Step 4</td></tr><tr><td>Abnormality</td><td>Fix problem,
explain to customer</td></tr></table></td></tr>
<tr><td>4</td><td>1) Remove Cover PCB.
2) Check voltage in CON 3 and CON 4 as is shown in the picture (PILOT VALVE).
 

3) Execute TEST MODE in Ice maker as is shown in the picture (NOTE: Be sure to locate a recipient below ice maker in order to catch the water supplied in test mode) water supply will be activated at the end of Test cycle.
 

4) Check the result.</td><td><table><tr><th>Result</th><th>Service Action</th></tr><tr><td>110~127 Vac</td><td>Go to Step 5</td></tr><tr><td>Other</td><td>Replace Main PCB</td></tr></table></td></tr>
</table>

22) Refrigerator is not dispensing ice

<table>
<tr><th>NO.</th><th>CHECKING FLOW</th><th>RESULT & SERVICE ACTION</th></tr>
<tr><td>5</td><td>1) Check voltage in CON 3 and CON 4 as is shown in the picture (ICE VALVE).
 

3) Execute TEST MODE in Ice maker as is shown in the picture (NOTE: Be sure to locate a recipient below ice maker in order to catch the water supplied in test mode) water supply will be activated at the end of Test cycle.
 

4) Check the result.</td><td><table><tr><th>Result</th><th>Service Action</th></tr><tr><td>110~127 Vac</td><td>Go to Step 5</td></tr><tr><td>Other</td><td>Replace Main PCB</td></tr></table></td></tr>
<tr><td>6</td><td>In previous 2 steps, at the end of Test mode, water was supplied?</td><td><table><tr><th>Result</th><th>Service Action</th></tr><tr><td>YES</td><td>Normal, explain to customer</td></tr><tr><td>NO</td><td>Replace Valve assembly</td></tr></table></td></tr>
</table>

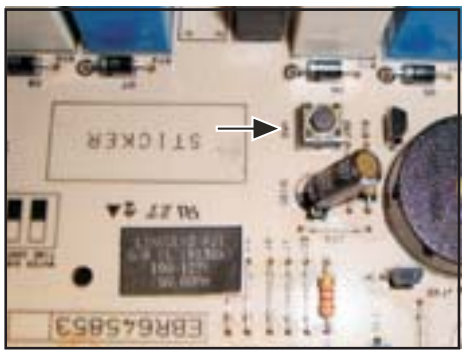
4. Appendix

23) Entering to the Test Mode

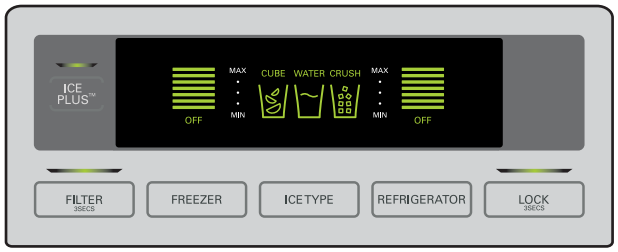
How to make TEST MODE

TEST MODE 1

If refrigerator is in NORMAL MODE, press once TEST S/W in Main PCB.



TEST S/W on Main PCB

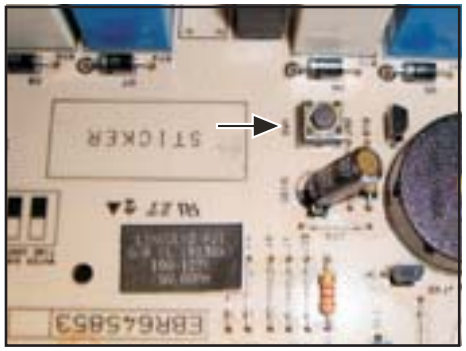


Display Response in TEST MODE 1

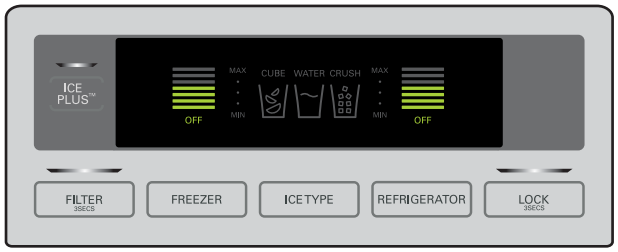
If any error is present, you can not enter to TEST MODE.

TEST MODE 2

If refrigerator is in NORMAL MODE, press twice TEST S/W in Main PCB, is you are in TEST MODE 1, press again.

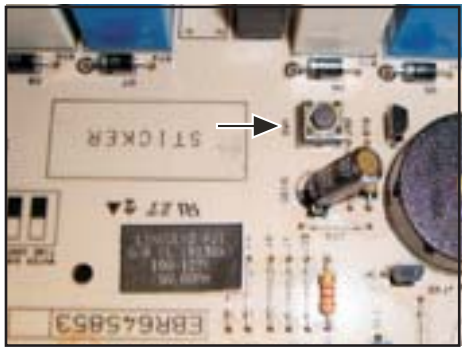


TEST S/W on Main PCB



Display Response in TEST MODE 2

To exit from TEST MODE 2, press TEST S/W once.



TEST S/W on Main PCB

Display Returns to Normal Operation

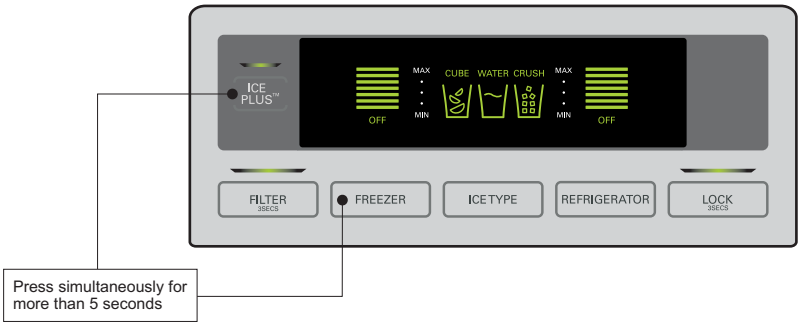
23) Entering to the Test Mode

How to make DISPLAY CHECK MODE

In order to check hidden error codes, or Display functionality.

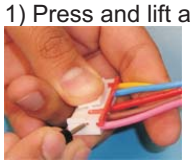
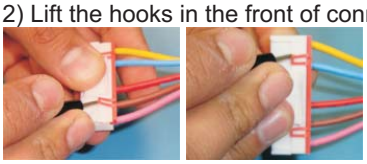
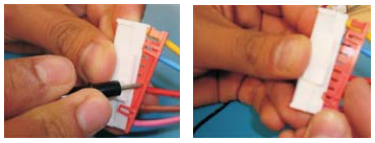
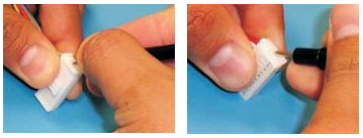
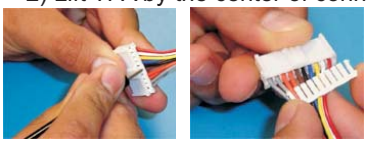
To enter to this mode, press simultaneously “ULTRA ICE” button and “FRZ TEMP” button for more than 5 seconds.

If no are errors detected, all LED’s will be turned ON, otherwise, error code will be displayed.



24) Removing TPA’s (Terminal Position Assurance)

How to remove TPA’s

AC TPA	DC TPA
1) Press and lift a lateral clip.  2) Lift the hooks in the front of connector.  3) Press and lift the remaining clip.  4) Lift TPA by the center of connector. 	1) Press and lift the clips located on each side of connector.  2) Lift TPA by the center of connector. 

NOTE: After make measurements, be sure that TPA was assembled in connector.

25) Temperature Charts

Temperature Chart #1

Temperature	Resistance KΩ	Voltage
-40°F / (-40°C)	73.29	4.10
-31°F / (-35°C)	53.63	3.84
-22°F / (-30°C)	39.66	3.55
-13°F / (-25°C)	29.62	3.23
-4°F / (-20°C)	22.33	2.90
5°F / (-15°C)	16.99	2.56
14°F / (-10°C)	13.05	2.23
-23°F / (-5 °C)	10.10	1.92
-32°F / (0 °C)	7.88	1.64
41°F / (5 °C)	6.20	1.38
50°F / (10°C)	4.91	1.16
59°F / (15°C)	3.92	0.97
68°F / (20°C)	3.15	0.81
77°F / (25°C)	2.55	0.68
86°F / (30°C)	2.07	0.57
95°F / (35°C)	1.70	0.47
104°F / (40°C)	1.40	0.40

*Apply only for Freezer Sensor

Temperature Chart #2

Temperature	Resistance KΩ	Voltage
-40°F / (-40°C)	225.10	4.48
-31°F / (-35°C)	169.80	4.33
-22°F / (-30°C)	129.30	4.16
-13°F / (-25°C)	99.30	396
-4°F / (-20°C)	76.96	3.73
5°F / (-15°C)	60.13	3.49
14°F / (-10°C)	47.34	3.22
-23°F / (-5 °C)	37.55	2.95
-32°F / (0 °C)	30.00	2.67
41°F / (5 °C)	24.13	2.40
50°F / (10°C)	19.53	2.14
59°F / (15°C)	15.91	1.89
68°F / (20°C)	13.03	1.67
77°F / (25°C)	10.74	1.46
86°F / (30°C)	8.90	1.27
95°F / (35°C)	7.41	1.11
104°F / (40°C)	6.20	0.96

*Apply for Refrigerator sensor (1 and 2), Defrost sensor and Ice maker sensor

Temperature Chart #3

Temperature	Resistance KΩ	Voltage
-40°F / (-40°C)	225.10	4.79
-31°F / (-35°C)	169.80	4.72
-22°F / (-30°C)	129.30	4.64
-13°F / (-25°C)	99.30	4.54
-4°F / (-20°C)	76.96	4.43
5°F / (-15°C)	60.13	4.29
14°F / (-10°C)	47.34	4.13
-23°F / (-5 °C)	37.55	3.95
-32°F / (0 °C)	30.00	3.75
41°F / (5 °C)	24.13	3.54
50°F / (10°C)	19.53	3.31
59°F / (15°C)	15.91	3.07
68°F / (20°C)	13.03	2.83
77°F / (25°C)	10.74	2.59
86°F / (30°C)	8.90	2.35
95°F / (35°C)	7.41	2.13
104°F / (40°C)	6.20	1.91

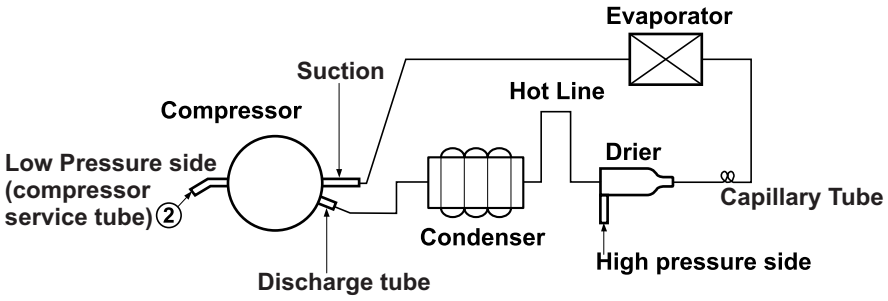
*Apply for Room Temperature sensor

3. SEALED SYSTEM HEAVY REPAIR

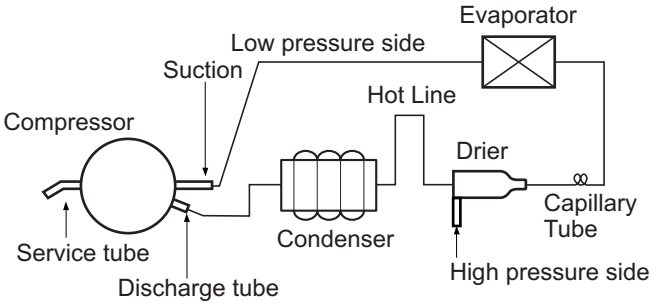
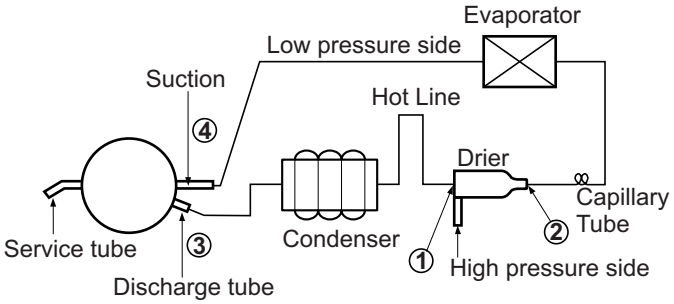
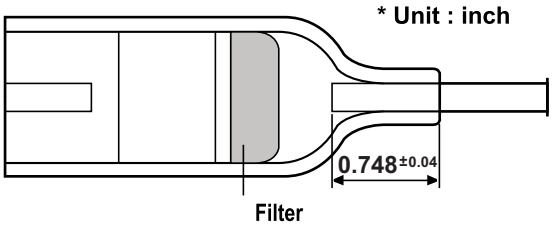
3-1. Summary of heavy repair

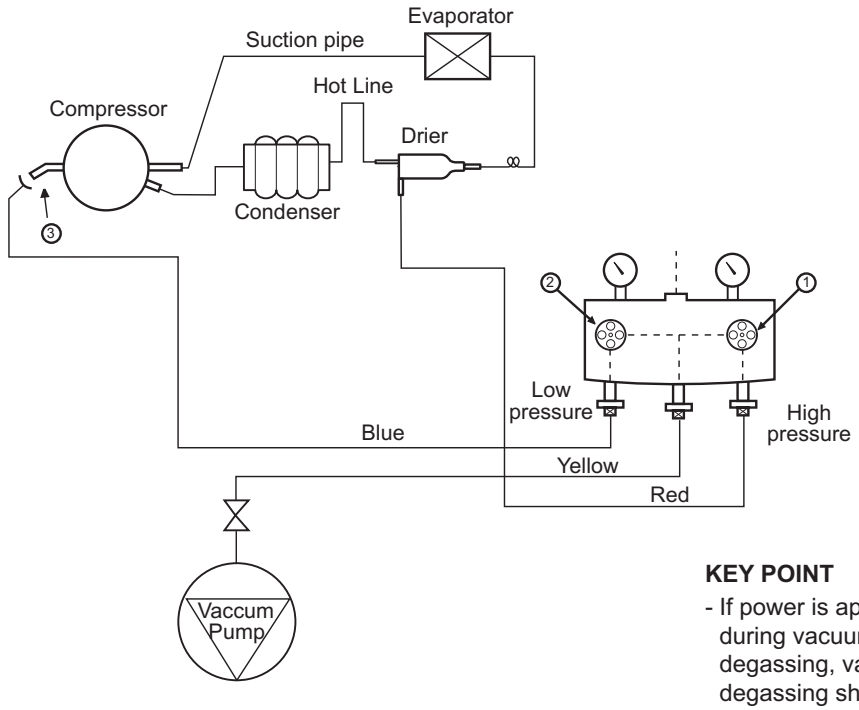
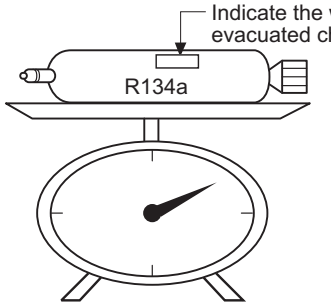
Process	Contents	Tools
Trouble diagnosis		
Remove refrigerant Residuals	- Cut charging pipe ends and discharge refrigerant from drier and compressor.	Filter, side cutters
Parts replacement and welding	- Use R134a oil and refrigerant for compressor and drier - Confirm N_2 sealing and packing conditions 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.	

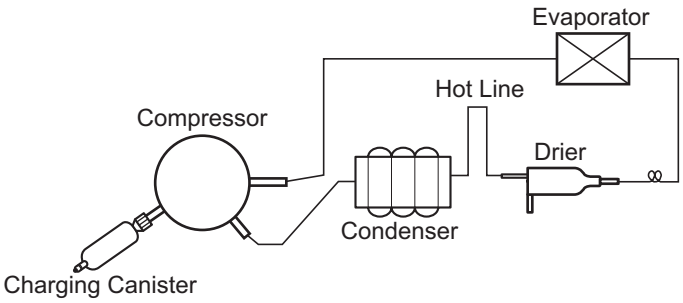
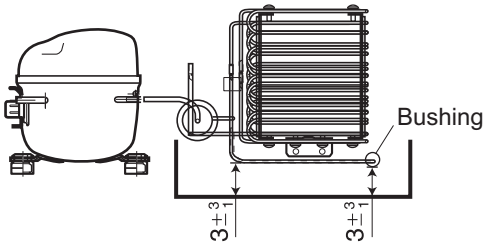
3-2. Precautions During Heavy Repair

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 : 1.42 - 2.85 psi)
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.

3-3. Practical Work For Heavy Repair

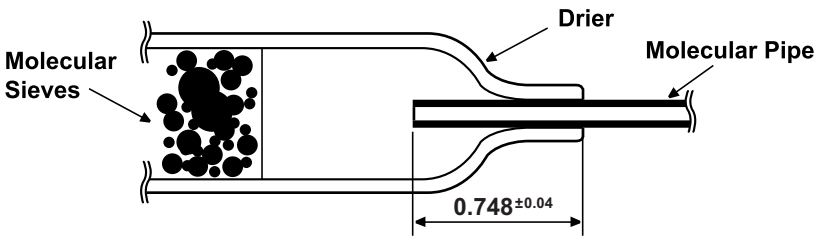
Items	Precautions
1. Removal of residual refrigerant.	 **KEY POINT** Observe the sequence for removal of refrigerant. (If not, compressor oil may leak.) 1) Continue to recover the refrigerant for more than 5 minutes after turning the refrigerator off. 2) Install a piercing type valve on the high pressure 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 performance and reliability of a product. When replacing a drier: After to be assembled drier (weld ① and ② parts) apply nitrogen to high pressure side (0.1~0.2 Kg/cm²) When replacing a compressor: Weld ③ and ④ parts and apply blowing nitrogen to the low pressure side.
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(0.748 ±0.04)on the capillary tube. Insert tube to the mark and weld it

Items	Precautions
4. Vacuum degassing.	 **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. **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 valve①.
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 winer 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 take a gas leakage test on the welded 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. 

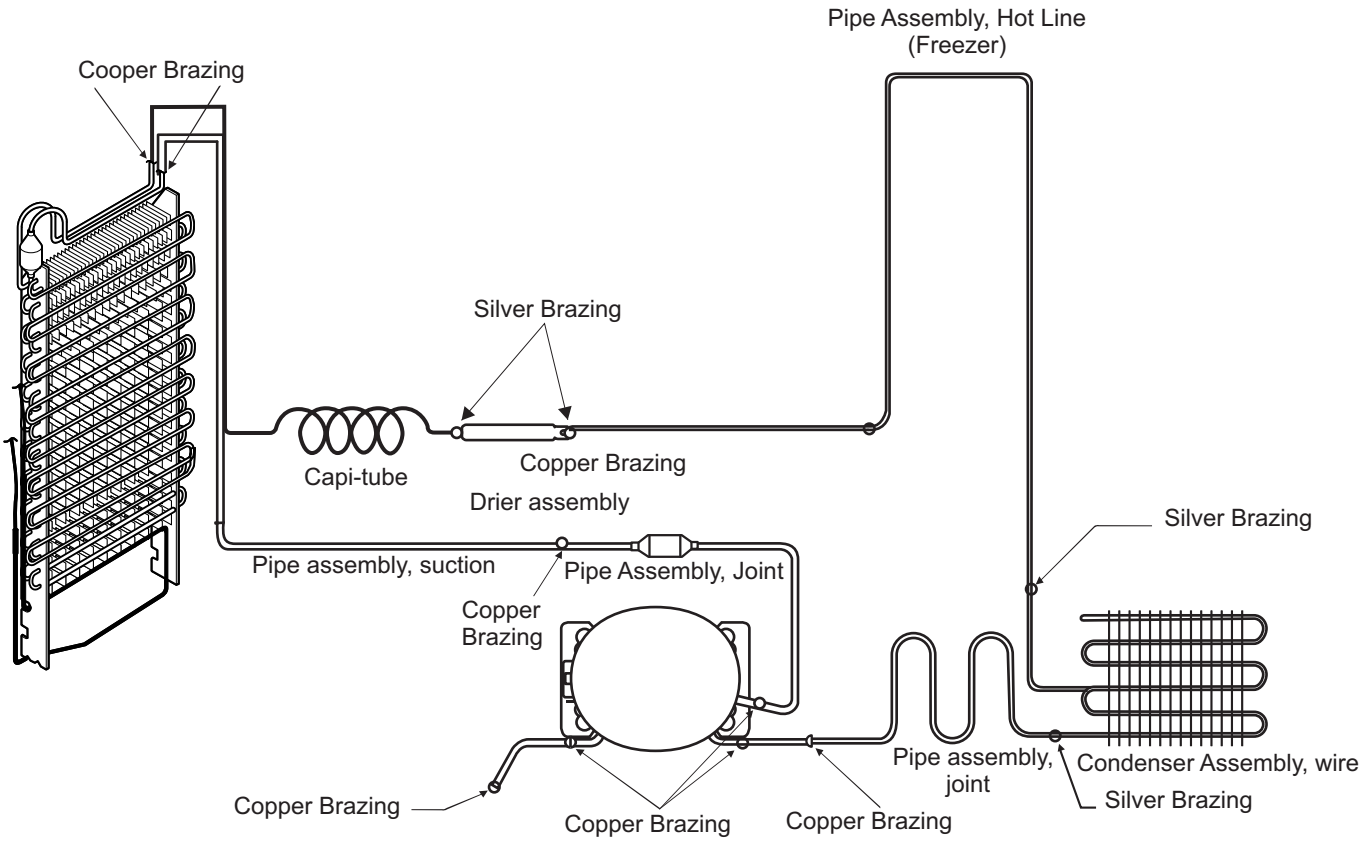
3-4. Standard Regulations For Heavy Repair

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 $0.748^{\pm 0.04}$



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.)

3-5. Brazing Reference Drawings



4. HOW TO DEAL WITH CLAIMS

4-1. Sound

Problems	Checks and Measures
Hiss sounds	**Explain general principles of sounds.** • All refrigerators make noises when they run. The compressor and fan produce sounds. There is a fan in the freezer compartment which blows cool air to freezer and refrigerator compartments. **Hiss** sounds are heard when the air passes through the narrow holes into the freezer and refrigerator compartments. **Cooling Fan sound in the compressor compartment.** • There is a fan on the back of the refrigerator which cools the compressor compartment. If there is a small space between the refrigerator and the wall, the air circulation sounds may be noticeable. **Noise of Compressor.** • This operating sound happens when the compressor compresses the refrigerant. The compressor rotates at 3600 RPM. The sound of compressor Bigger refrigerators make more noise than small ones
Click sounds	**Explain the principles of temperature change.** • The sounds happens when pipes and internal evaporator in the refrigerator compartment expand and contract as the temperature changes during the refrigerator operation. This sound also happens during defrosting, twice a day, when the ice on the evaporator melts.
Clunk sound	**Explain that it comes from the compressor when the refrigerator starts.** • When the refrigerator operates, the piston and motor in the compressor rotate at 3600 RPM. This sound is caused by the vibration of motor and piston when they start and finish their operation. This phenomenon can be compared with that of cars. When an automobile engine starts, it is loud at first but quiets down quickly. When the engine stops, so does the vibration.
Vibration sound	**Check the sound whether it comes from the pipes vibration and friction.** • Insert bushing or leave a space between pipes to avoid the noise. • Fix the fan blade if it is hitting on the shroud • Fix the drip tray if it is loosened. **Sound depends on the installation location.** • Sound becomes louder if the refrigerator is installed on a wooden floor or near a wooden wall. Move it to the another location. • If the refrigerator is not leveled properly, a small vibration can make a loud sound. Please adjust the level of the refrigerator.

Problems	Checks and Measures
Sounds of water flowing	Explain the flow of refrigerant. • When the refrigerator stops, the water flowing sound happens. This sound happens when the liquid or vapor refrigerant flows from the evaporator to compressor.
Click sounds	Explain the characteristics of moving parts. • This noise comes from the MICOM controller's switch on the top of the refrigerator when it is turned on and off.
Noise of Icemaker operation (applicable to model with Icemaker). - Noise produced by ice dropping and hitting ice bin. - Noise from motor sounds Hiss .	Explain the procedure and principles of Icemaker operation. • Automatic Icemaker repeats the cycle of water supplying → Icemaking → ice ejection. When water is supplied, the water supply valve in the machine room makes sounds like Hiss and water flowing also makes sound. When water freezes, clicking sounds are heard. When ice is being ejected, sounds like Hiss produced by a motor to rotate an ice tray and ice dropping and hitting ice bin sounds are also heard.
Noise when supplying water.	Explain the principles of water supplied to dispenser. • When the water supply button in the dispenser is pressed, the water supply valve in the compressor compartment opens and let the water flow to the water tank in the lower part of the refrigerator compartment. The water is dispensed by this pressure. When this happens, motor sound and water flowing sound are heard.
Noise when supplying ice.	Explain the principles of ice supply and procedure of crushed icemaking in a dispenser. • When ice cube button is pressed, ice stored in the ice bin is moved by an auger and dispensed. If crushed ice button is pressed, the ice cube is crushed. When this happens, ice crushing and hitting ice bin sounds are heard.

4-2. Measures for Symptoms on Temperature

Problems	Checks and Measures
Refrigeration is weak.	**Check temperature set in the temperature control knob.** • Refrigerator is generally delivered with the button set at **normal use** (MID). But customer can adjust the temperature set depending on their habit and taste. If you feel the refrigeration is weak, then set the temperature control button at **strong** position. If you adjust the button in the freezer compartment as well, the refrigeration is stronger than adjusting refrigerator only.
The food in the chilled drawer is . not frozen but defrosted	**The chilled drawer does not freeze food.** • Use chilled drawer for storing fresh meat or fish for short periods. For storing for a long periods or freezing food, use a freezer compartment. It is normal that frozen foods thaw above the freezing temperature (in the chilled drawer).
Refrigerator water is not cool.	**Check the water storage location.** • If water is kept in the door rack, move it to a refrigerator shelf. It will then become cooler.
Ice cream softens.	**Explain the characteristics of ice cream.** • The freezing point of ice cream is below -15°C[5°F]. Therefore ice cream may melt if it is stored in the door rack. • Store ice cream in a cold place or set the temperature control button of a freezer at **strong** position.
Refrigeration is too strong.	**Check the position of temperature control button.** • Check if refrigeration is strong in whole area of the refrigerator or partly near the outlet of the cooling air. If it is strong in whole area, set the control button at **weak**. If it is strong only near the outlet of cool air, keep food (especially damp foods and easily frozen foods) away from the outlet.
Vegetables are frozen.	**Check the vegetables storage.** • If vegetables are stored in the refrigerator shelf or chilled drawer instead of vegetable drawer, they will be frozen. Set the control button at **weak**if they are also frozen in the vegetable drawer.
The food stored at inside of the shelf freezes even the control button is set at **MID**.	**Check if food is stored near the outlet of the cooling air.** • The temperature at cooling air outlet is always below the freezing point. Do not store food near the outlet of the cooling air as it block the air circulation. Do not block the outlet. If the outlet of the cooling air is blocked, the refrigerator compartment will not be cooled.

4-3. Odor and Frost

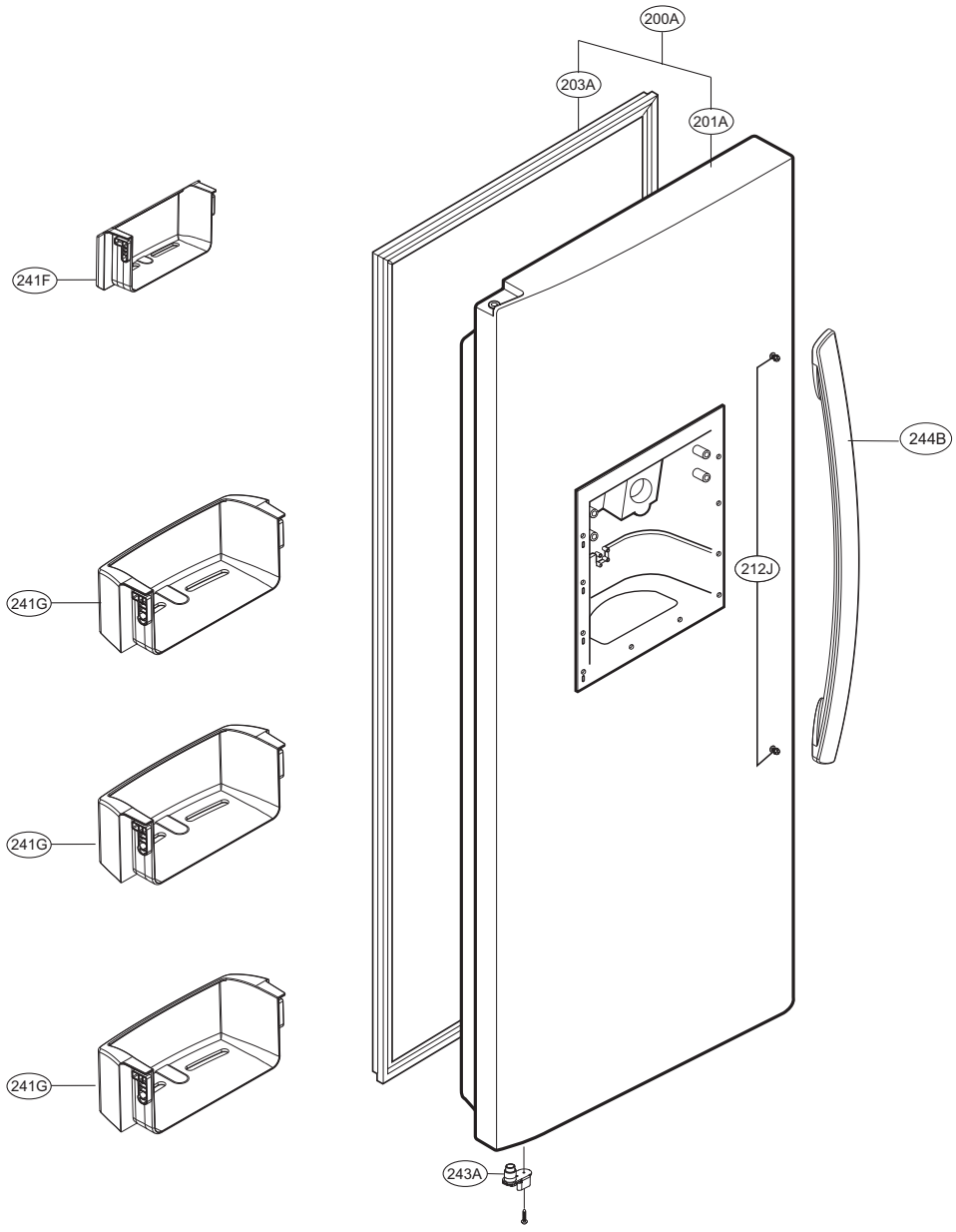
Problems	Checks and Measures
Odor in the refrigerator compartment.	Explain the basic principles of food odor. • Each food has its own particular odor. Therefore it is impossible to prevent or avoid food odor completely when food is stored in the completely sealed refrigerator compartment. The deodorizer can absorb some portions of the odor but not completely. The intensity of odor depends on refrigerator conditions and environments. Check the temperature control button and set at strong. • Clean inside of the refrigerator with detergent and remove moisture. Dry inside the refrigerator by opening the door for about 3 or 4 hours and then set the temperature control button at strong .
Frost in the freezer compartment	Explain the basic principles of frost formation. • The main causes for frosting: - Door was left open. - Air penetration through the gasket - Too frequent door opening. (parties. etc.) - Hot foods are stored before they are cooled down. The temperature of freezer is -19°C[-2.2°F]. if temperature is set at MID. If hot air comes into the refrigerator, fine frost forms as cold air mixes with hot air. If this happens quite often, much frost forms inside of the refrigerator. If the door is left open in Summer, ice may form inside of the refrigerator.
Frost in ice tray.	Explain basic principles of frost formation. • When ice tray with full of water is put into a freezer compartment, the water evaporates. If cool air fan operates, the moisture attached to the jaw (protruded part) of ice mold will freeze and form frost. If warm water was put into the ice mold, the situation will become worse.

4-4. Others

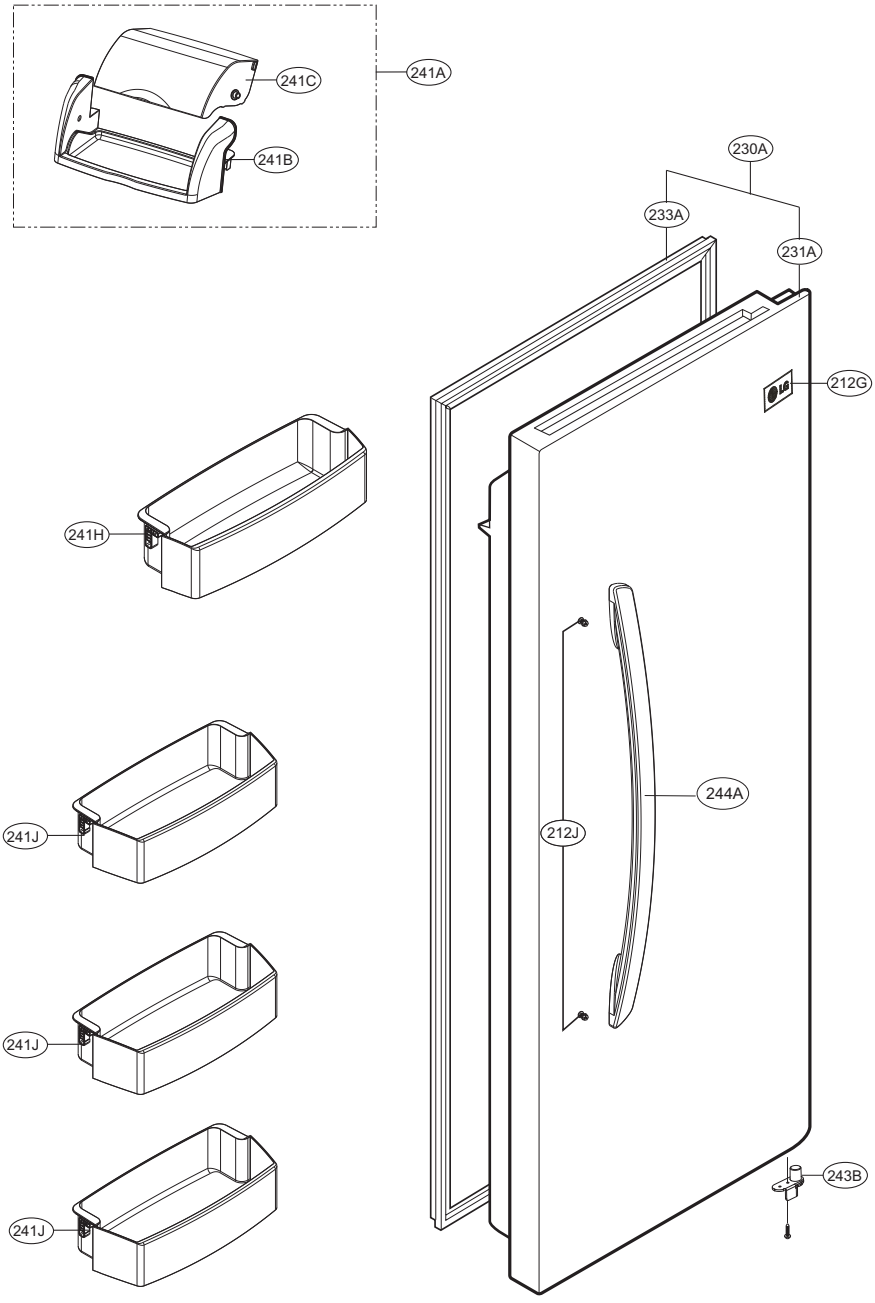
Problems	Checks and Measures
The refrigerator case is hot.	Explain the principles of radiator. • The radiator pipes are installed in the refrigerator case and partition plate between the refrigerator and the freezer compartment in order to prevent condensation formation. Particularly in summer or after installation of refrigerator, it may feel hot but it is normal. If there is not enough space to dissipate heat, it can be hotter due to lack of heat radiation. Please install a refrigerator in a well-ventilated place and leave the clearance between refrigerator and wall:
Small holes in a door liner	Explain that the hole is for releasing gas. • A small hole in the door liner is for releasing gas during insulation materials lining work. With a releasing hole, forming can be easily done .
Electric bills are too much.	Explain that the hole is to allow the air to escape when vacuum forming plastic parts and pumping foam insulation into cavities. **NOTE!** Holes and releasing gas appear to be very crude and would not be acceptable in a manual. There are small holes in the plastic liner of some parts of the refrigerator. These holes allow plastic parts to be injection molded and vacuum formed by allowing air bubbles to be expelled. They also allow foam insulation to be pumped into cavities where air bubbles may build up.
Condensation on the inside wall of the refrigerator compartment and the cover of properly vegetable drawer.	Explain how to store foods • Condensation forms when refrigerator is installed at damp area, door is frequently opened, and wet foods are not stored in the air tight container or wrapped. Be sure to store wet foods in airtight containers or securely covered in plastic wrap.
When is the power connectedΩ	When should the power be connected Ω • You can connect the power immediately after installation. However, if the refrigerator was laid flat before or during installation, you must stand it upright for 6 hours before plugging it in. This allows the refrigerant oils to return to the sump in the compressor. If you operate the refrigerator before the oil has had a chance to settle, you could damage the compressor.
Door does not open properly.	Refrigerator compartment door does not open properly. • When the door is open, warm open air comes into the compartment and is mixed up with cool air. This mixed air shall be compressed and increase the internal pressure when door is closed. This causes the door sticked closely to the refrigerator in a moment. (If the refrigerator is used for a long time, it will open smoothly.) When the refrigerator compartment door is opened and closed, the freezer compartment door moves up and down. • When the refrigerator compartment door is opened and closed, fresh air comes into the freezer compartment and moves up and down the freezer compartment door. Door opens too easily. • There is a magnet in the gasket so it closes securely without a gap. It can be held open easily if something is in the way and obstructs the door's closing A door does not close properly. • If the refrigerator is not properly leveled, the doors will not close easily. Adjust the level using the leveling screws under the front of the refrigerator.

10.EXPLODED VIEW

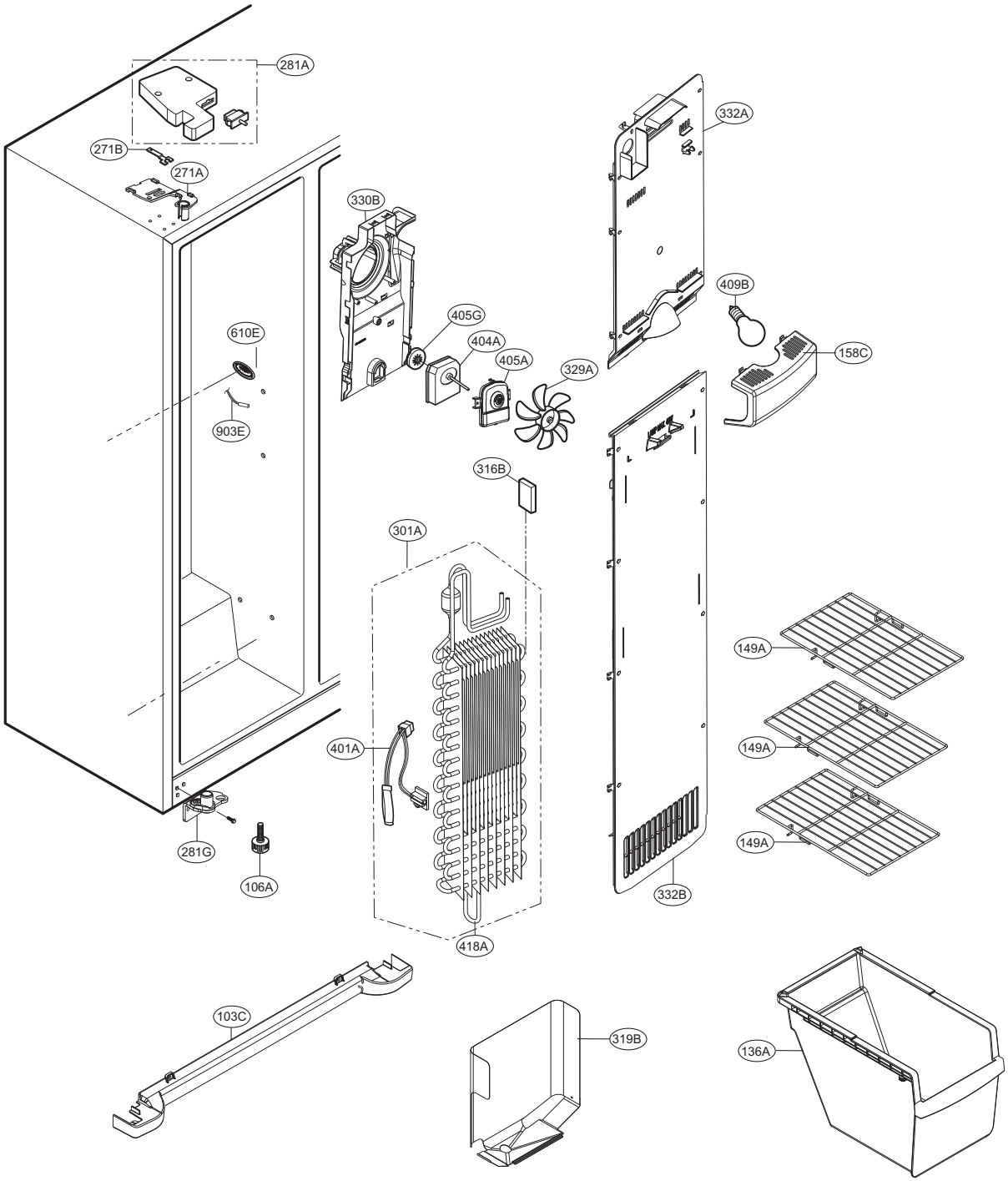
FREEZER DOOR



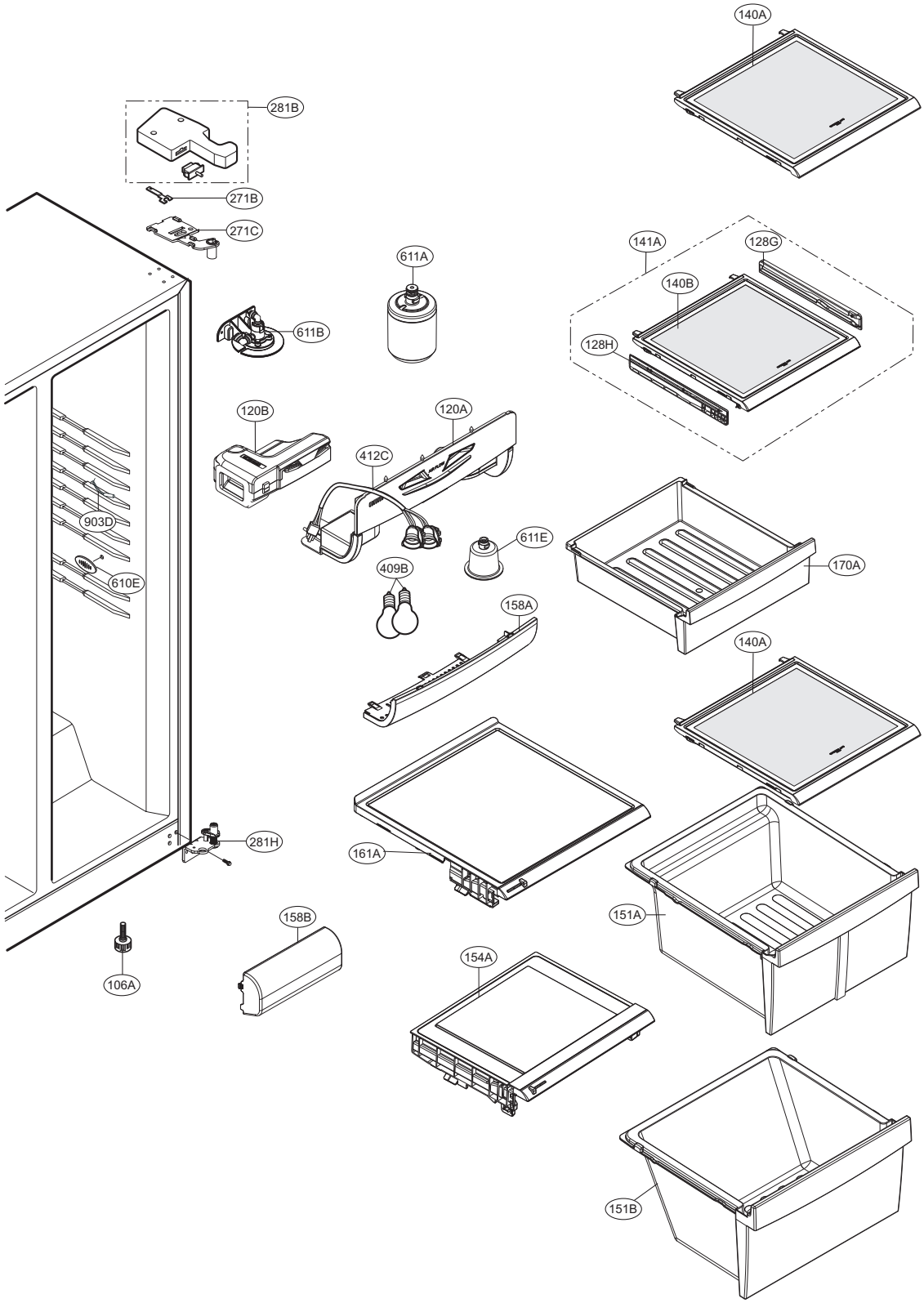
REFRIGERATOR DOOR



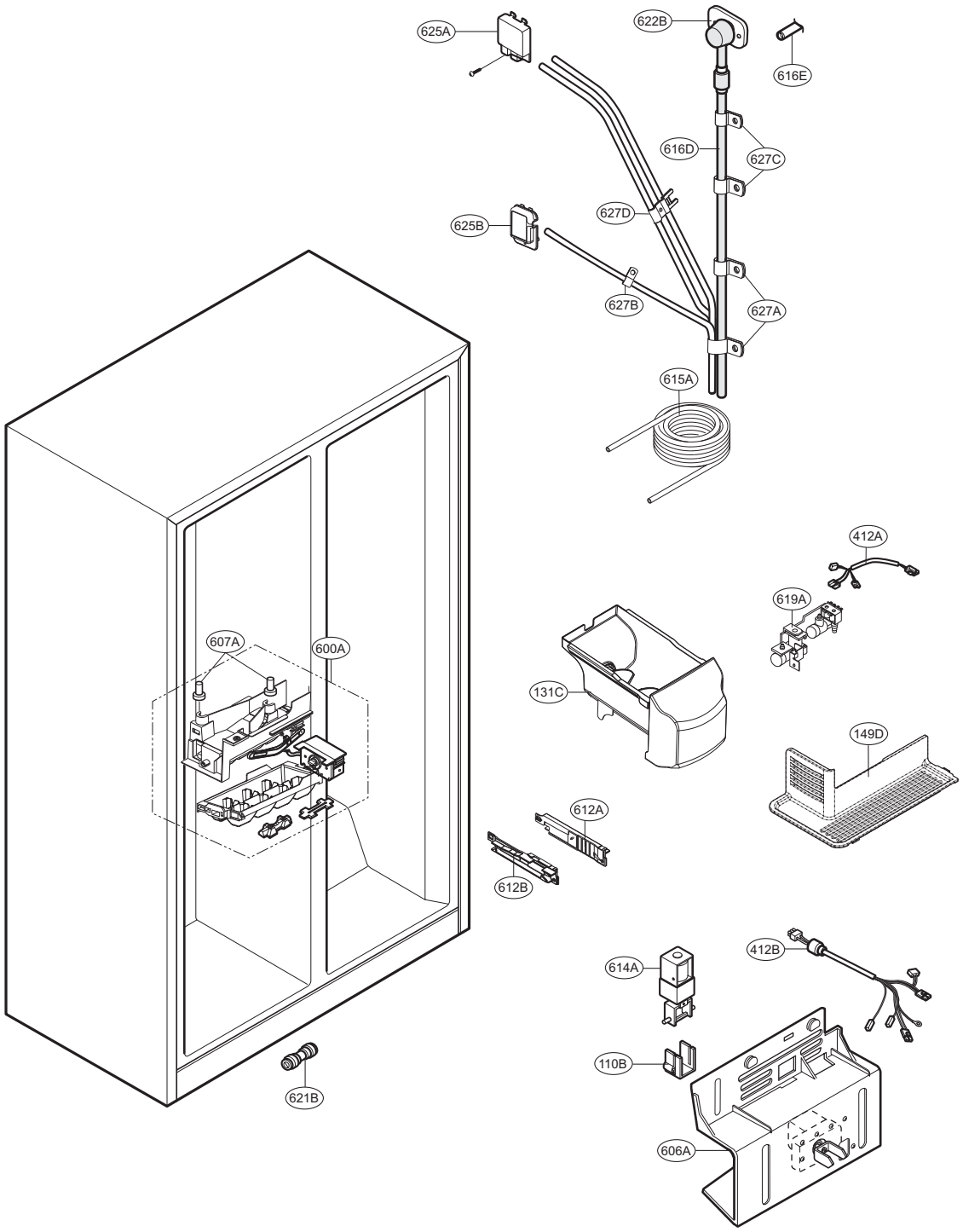
FREEZER COMPARTMENT



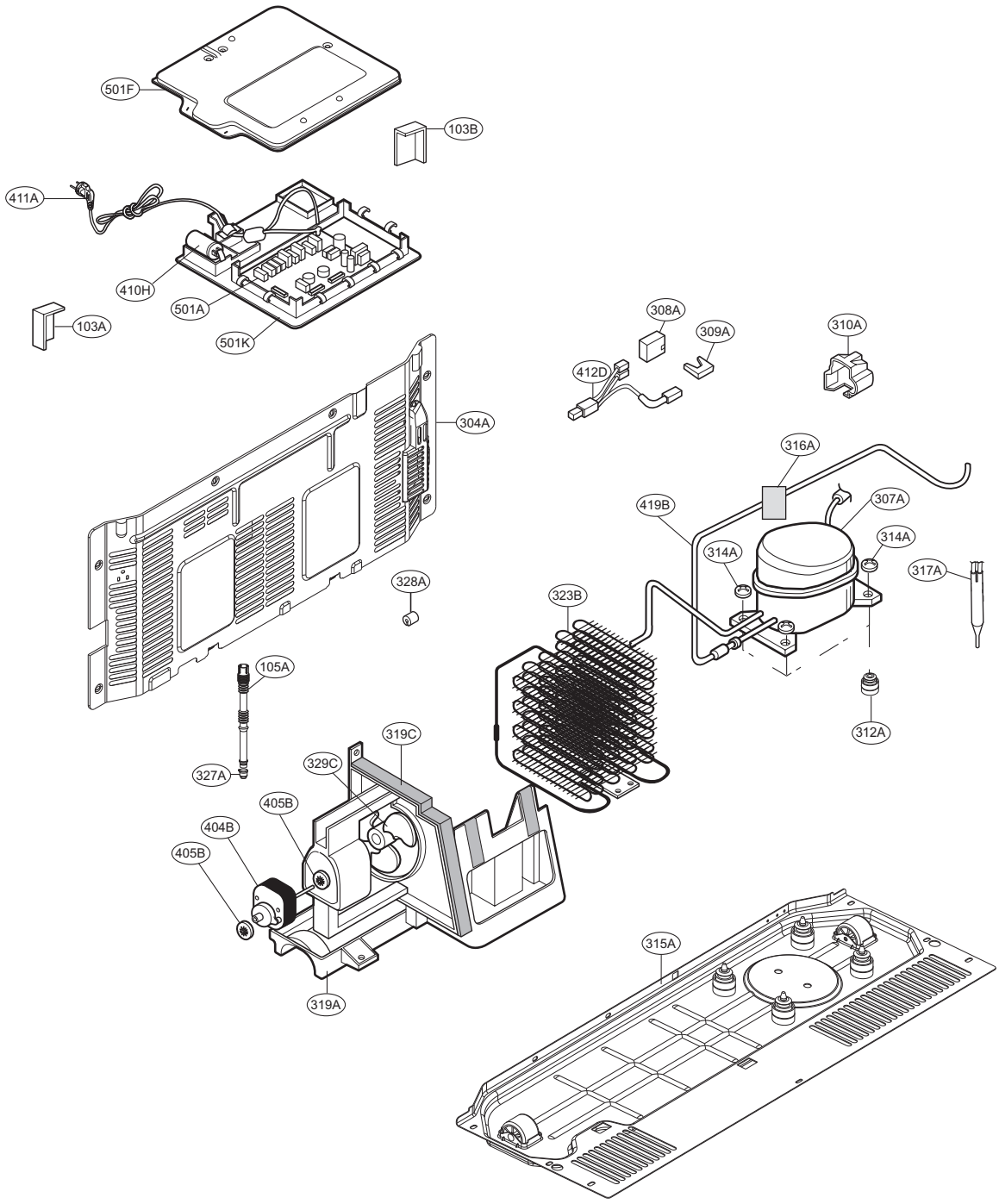
REFRIGERATOR COMPARTMENT



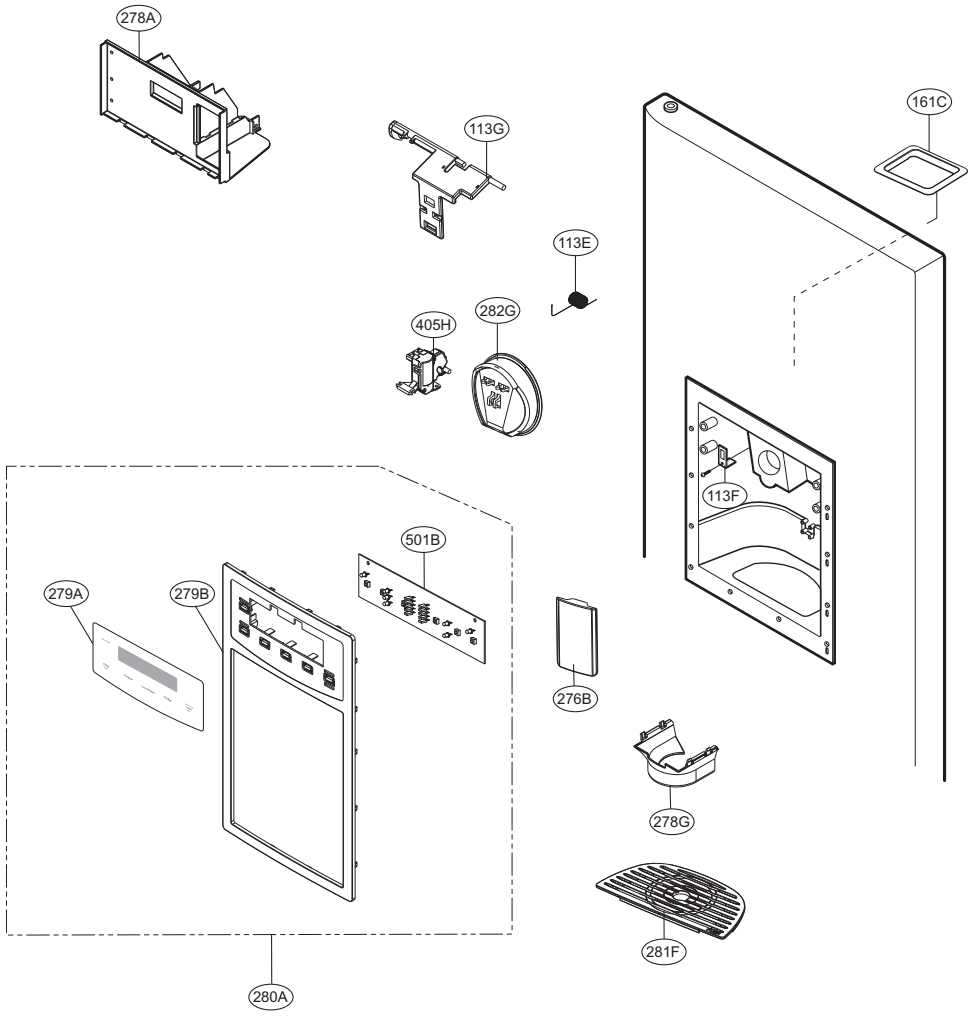
ICE &WATER PARTS



MECHANICAL COMPARTMENT



DISPENSER PARTS



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