SAMSUNG

REFRIGERATOR

FRENCH DOOR SHOWCASE REFRIGERATOR

MODEL NAME : RF23R6*

MODEL CODE : RF23R6301**/AA
RF23R6201**/AA
RF23R6201**/ED
RF23R6201**/AZ
RF23R6201**/BZ

SERVICE Manual

REFRIGERATOR

CONTENTS

WARNING

IMPORTANT SAFETY NOTICE

The service guide is for service men with adequate backgrounds of electrical, electronic, and mechanical experience. Any attempt to repair a major appliance may result in personal injury and property damage. The manufacturer or dealer cannot be responsible for the interpretation of this information.

SAMSUNG ELECTRONICS AMERICA, INC.
Technical Service Guide

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1. PRECAUTIONS(SAFETY WARNINGS)

- **Unplug the appliance before the changing or repairing the electric parts.**
  → Be careful the electric shock.
- **When exchanging the parts, use the correct parts.**
  → Check the model name, rating voltage, rating current, running temperature symbols.
- **When troubleshooting, connect firmly the types of harness.**
  → Make not to be separated when some power is imposed.
- **Check the traces of water infiltration at the electric parts.**
  → If there is a trace of water infiltration, exchange or tape the parts.
- **Check the assemble status of parts after troubleshooting.**
  → It must be in the same assembled state when compared with the state before disassembly.
- **Check the use circumstance of refrigerator.**
  → If the refrigerator is installed at the place that is damp or wet,
  or status of installation is unstable, change the installation place.
- **Ground the refrigerator properly**
  → Particularly, Be sure to earth when there is a risk of an electric leakage by humidity or wetness.
- **Do not use multi plugs in a plug socket at the same time.**
  Check if the power cord and socket is damaged, pressed, squeezed, or fired.
  → If the plug or plug socket is damaged, repair or exchange it immediately.
- **Do not allow consumers to repair the appliance by themselves.**
- **Do not store other materials except the foods.**
  → Drugs or scientific materials : difficult to keep precise temperature.
  → The inflammables(alcohol, benzene, ether, LP gas, butane gas etc.): have risk of explosion.

PRECAUTIONS(SAFETY WARNINGS)

Read all instructions before repairing the product and follow the instructions in order to prevent danger or property damage.
Plug out and remove all the items in regrigerator prior to repair.

CAUTION/WARNING SYMBOLS DISPLAYED

Warning	Indicates that a danger of death or serious injury exists.
Caution	Indicates that a risk of personal injury or material damage exists.

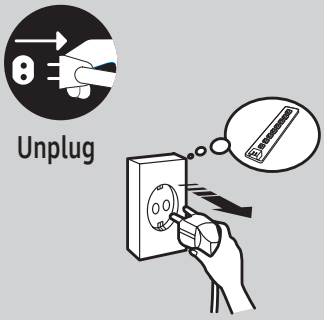
SYMBOLS

means “Prohibited”.
means “Do not disassemble”.
means “No contact”.
means ”Warning or Caution”.
means “Unplug the unit before preforming service”
means “Earth or Ground”.

Warning & Caution

Plug out to exchange the interior lamp.

• It may cause electric shock.



Use the rated components on the replacement.

• Check the correct model, rated voltage, rated current, operating temperature and so on.

On repair, make sure that the wires such as harness are bundled tightly.

• Wiring harnesses should be connected tightly and kept dry.
• Bundle tightly wires in order not to be detached by the external force and then not to be wetted.

On repair, make sure that all parts and wires are free of dust and debris.

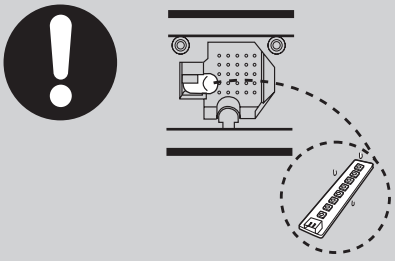
• Cleaning parts could help prevent fire or shorting.

Check the status of parts after replacement or troubleshooting.

• All parts must be reinstalled properly.

Check for visible traces of water on electrical parts..

• Replace or secure any part that may have come in contact with water.



❉ Please let users know following warnings & cautions in detail.

Warning & Caution

Customers should not store glass bottles of liquid in the freezer section.

- Frozen bottles could explode and cause injury.

Customers should not store narrow or long bottles or food in a small door shelf.

- These items could fall when the door is opened, causing injury tot he customer.

Drugs requiring precise temperatures should not be stored in the refrigerator.

The refrigerator should be plugged into a dedicated outlet.

- Multiple plugs in the outlet could cause excessive heat or fire.

Consumers must not try to repair the refrigerator.

- Electrical and mechanical parts could injure the consumer.

Make sure the power cord is not damaged or crushed.

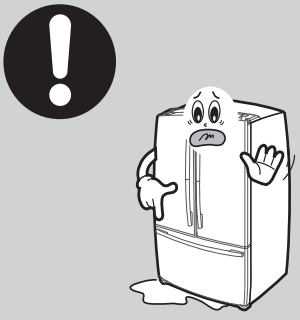
- A damaged cord could cause excessive heat or fire.

Customers should not store articles on the product.

- Opening or closing the door may cause things to fall down, which may cause injury.

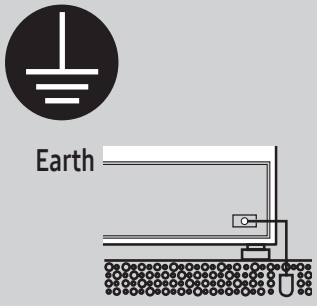
Check the location where the refrigerator will be used.

- If the refrigerator will be used in a damp or wet space, or if installation will be unstable, the unit should be relocated.



The refrigerator must be grounded properly.

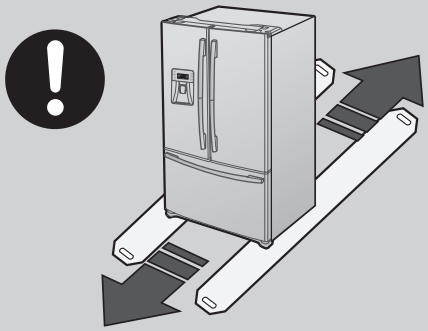
- An earth ground should be used if there is a risk of high humidity or wetness.



PRECAUTIONS(SAFETY WARNINGS)

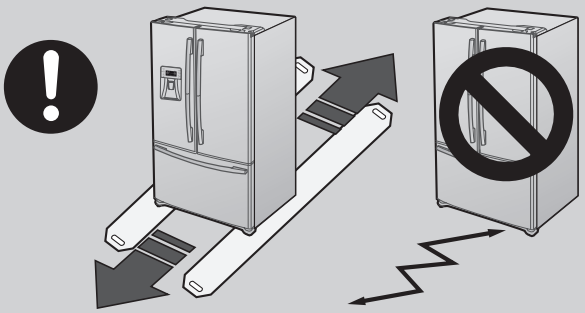
FLOORING

For proper installation, this refrigerator must be placed on a level surface of hard material that is the same height as the rest of the flooring.
This surface should be strong enough to support a fully loaded refrigerator.



MOVING

Protect the finish of the flooring. Cut a large section of the cardboard carton and place under the refrigerator where you are working.
When moving, be sure to pull the unit straight out and push back in straight.



2-1) Introduction of Main Function

	**Surround Multi Flow** • Uniform cooling for each shelf and even in corner in fresh food compartment by centerpositioned fan and duct with multiple flow effluences.
	**Twin Cooling System** • The refrigerator and the freezer have two evaporators. Given this independent system, the freezer and the refrigerator are cooled individually as required and are, therefore, more efficient. Food odor from the refrigerator does not affect food in the freezer due to separate air flow circulation.
	**Secure Auto Close Door System** • Secure Auto Close Door System • Cool tight doors • Energy saving • Preventing sweat on fridge doors

PRODUCT SPECIFICATIONS

▶ Changing Items

Item	Details	New Model
Slim Water Filtration System	Slim water filter is placed between crispers for changing filter conveniently without removing items from Refrigerator.	
Internal Display	The display change more wider and apply Blue LED lighting. And Touch Sensor Lighting make the refrigerator graceful.	
Independent One lever Dispenser	One lever for ice and water.	

2-2) Specifications

ELECTRICAL SPECIFICATIONS

Defrost Control	From 12 to 22 hrs(comp. run time)
Thermo Bimetal Protector	140°F(60°C)(off) 104°F(40°C)(on)
Defrost Thermistor (502AT)	F: 50°F(10°C)(off) R: 59°F(15°C)(off)
Electrical Rating AC115V 60Hz	AC115V 60Hz / 230V50Hz
Maximum Current Leakage	0.25 mA
Maximum Ground Path Resistance	0.1 Ohm

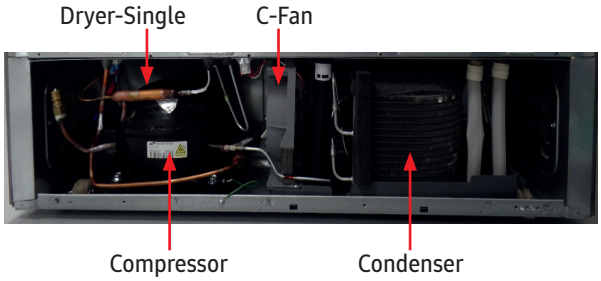
NO LOAD PERFORMANCE

Ambient Temperature	70°F(21°C)	90°F(32°C)
Refrigerator	44°F(7°C)	34°F(1°C)
Freezer	5°F(-15°C)	-8°F(-23°C)
Run Time,%	< 40	< 80

REFRIGERATION SYSTEM

Refrigerant R600a	2.46oz (70g)
NF54M7151AN/E01 BTU/hr (0.372kw)	1270
Compressor oil	(mineral 5 250cc)

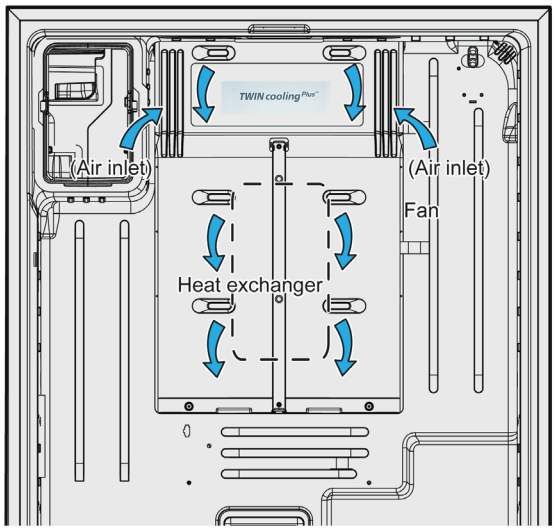
<Israel Model (/ML)>



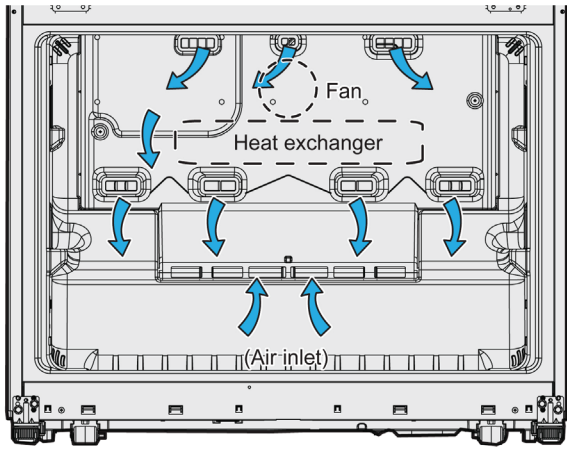
INSTALLATION

Clearance must be provided for air circulation	
AT TOP	2" (50mm)
AT SIDES	3¾"(95mm)
AT REAR	2" (50mm)

REFRIGERATOR



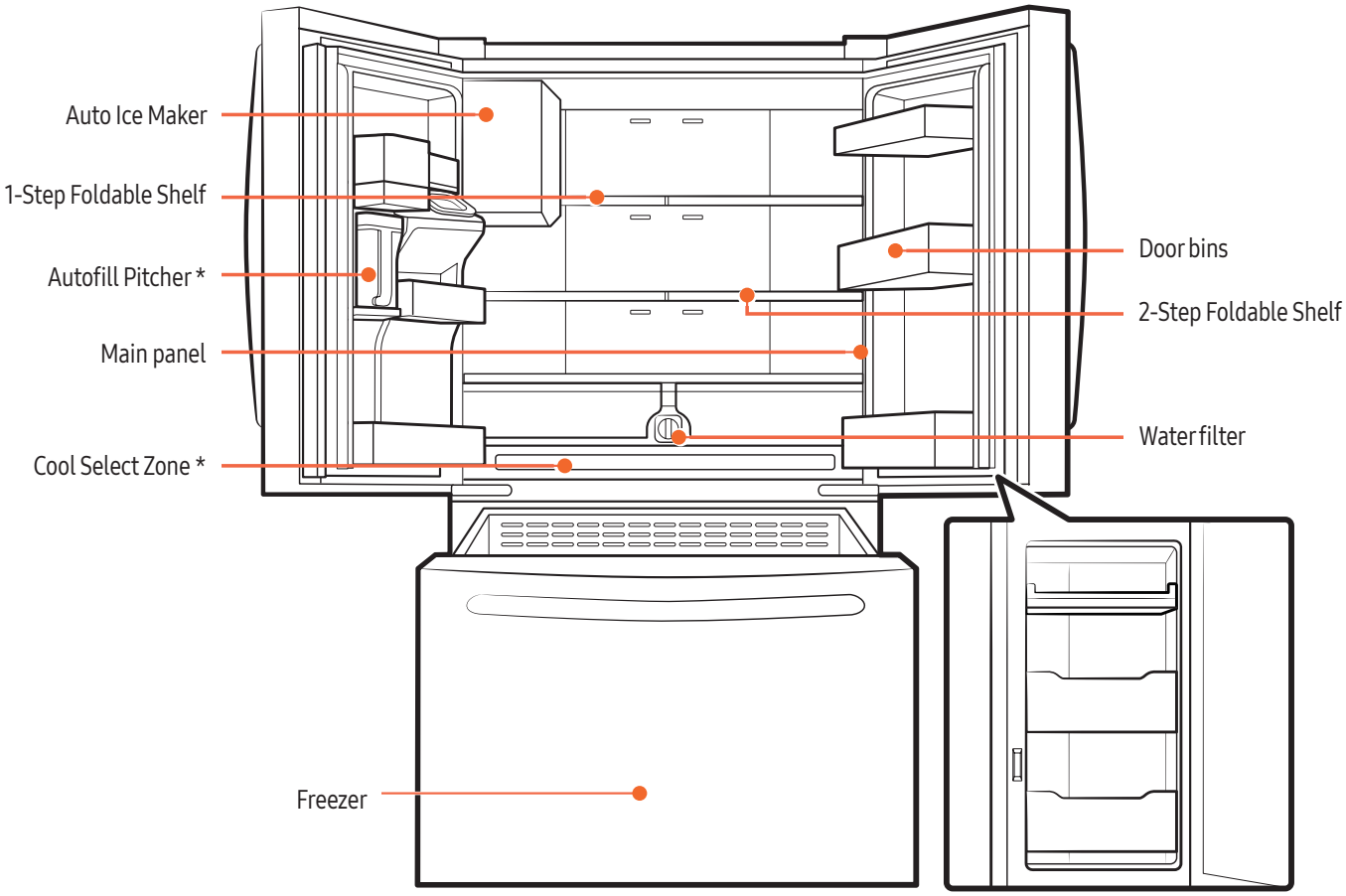
FREEZER



PRODUCT SPECIFICATIONS

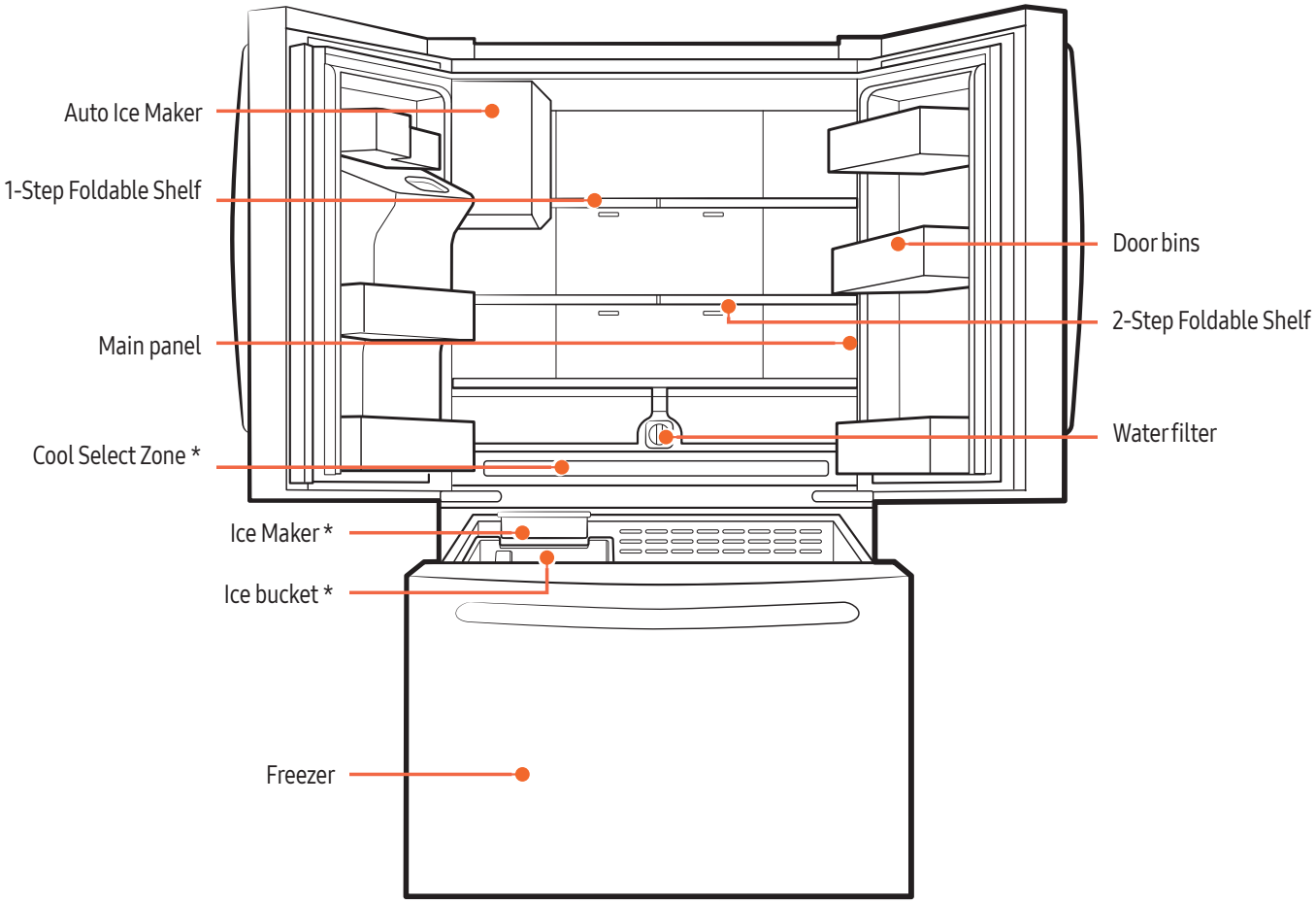
2-3) Interior Views

■ RF23R63* (Autofill & Show Case)



* applicable models only

■ RF23R62* (Ice & Water Dispenser)



* applicable models only

PRODUCT SPECIFICATIONS

2-4) Model Specification &Specification Chart

ITEM	Model		RF23R63*	RF23R62*
			Autofill & Show Case	Ice & Water Dispenser
External size	W		35 6/8 Inch (908mm)	
	D	On Cabinet	24 Inch (613mm)	
		W/O Hand:e	28 1/2 Inch (726mm)	
		With Handle	31 Inch (788mm)	
	H	W/O Hinge Cap	68 7/8 Inch (1749mm)	
		With Hinge Cap	70 Inch (1777mm)	
Net	Total		22.5 Cu.ft (637.5 ℓ)	637.1.0ℓ
Capacity	Freezer		6.87 Cu.ft (194.7 ℓ)	
	Refrigerator		15.63 Cu.ft (442.8 ℓ)	444.6ℓ
Efficiency of Volume			60%	
Weight	Set		326.3 Pounds (148 kg)	326.3 Pounds (148 kg)
	Packing		350.5 Pounds (159 kg)	352.8 Pounds (160 kg)
Packing	Width		38 1/4 Inch (972mm)	
	Depth		31 3/16 Inch (792mm)	
	Height		76 Inch (1931mm)	
Compressor			Reciprocate	
Rated Frequency and Frequency			AC 115 V / 60 Hz (/AA-North America)	
			AC 230 V / 50 Hz (/ML-Israel)	
Refrigerant			R600a	
Foaming Agent			C-Pentane	
Refrigerant Input Amount			2.46oz (70g)	
Type Refrigerator			Indirect Cooling Method Refrigerator	
Motor Rated Consumption Power			120W	
Electric Heater Rated Consumption Power			507.8W	

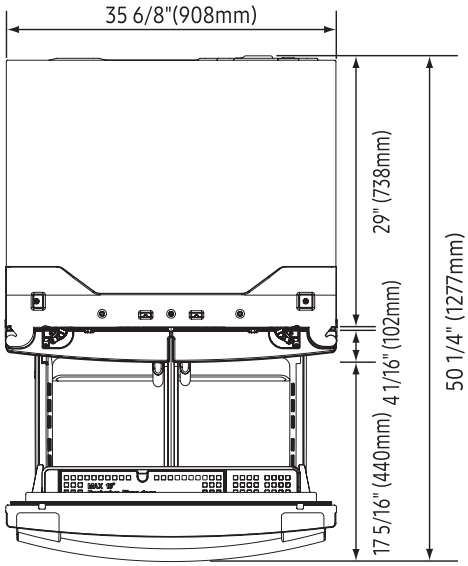
PRODUCT SPECIFICATIONS

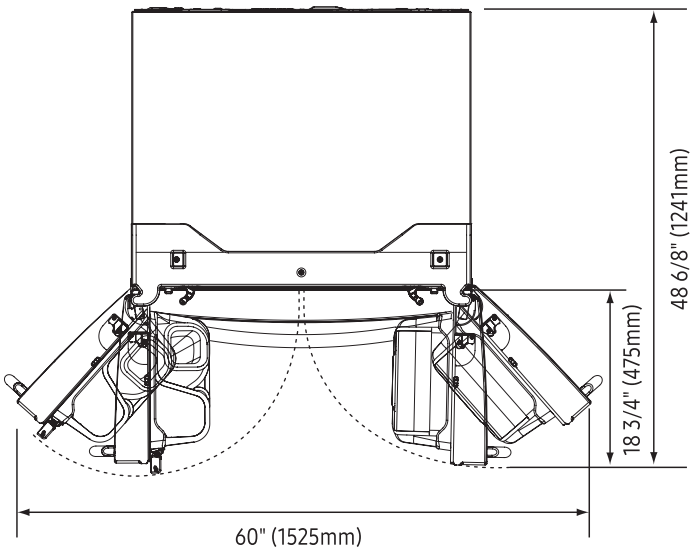
Items				Specification
				RF23R*
Components for Freezer	Compressor		Model	NF54M7151AN/E01
			Starting type	BLDC
	Condenser			Forced and Natural Convection Type
	Refrigerant			R600a
Room Temperature Sensor Components	Freezer	Model	Temperature Selection	ON(°F)
		THERMISTOR (F-SENSOR) 502AT	-8°F(-22°C)	-5°F(-20°C)
			-2°F(-19°C)	1°F(-17°C)
			8°F(-14°C)	11°F(-12°C)
	Flex	Model	Temperature Selection	ON(°F)
		THERMISTOR (F-SENSOR) 502AT	29°F(-1°C)	32°F(0°C)
			42°F(5°C)	45°F(7°C)
	Refrigerator	Model	Temperature Selection	ON(°F)
		THERMISTOR (R-SENSOR) 502AT	34°F(1°C)	36°F(2°C)
			38°F(3°C)	40°F(4°C)
			46°F(7°C)	48°F(8°C)
Defrost Related Components	Defrost Cycle	First Defrost Cycle (Concurrent defrost of F and R)		6hr ± 10min
		Defrost Cycle(FRE)		12~23hr (vary according to the conditions used)
		Defrost Cycle(REF)		6~11hr (vary according to the conditions used)
		Pause time		12 ±1min
	Defrost Sensor	F/R Defrost-Sensor	Model	THERMISTOR (502AT)
			SPEC	5.0 kΩ at 77°F(25°C)
		F/R Bimetal-thermo Protector	Rated	AC 250V / 3A
			Operating temperature	Off : 140°F(60°C) / On : 104°F(40°C)
		F/R Thermo Fuse- Assy Protector	Rated	AC 250V / 10A
			Operating temperature	110(109)°C Off

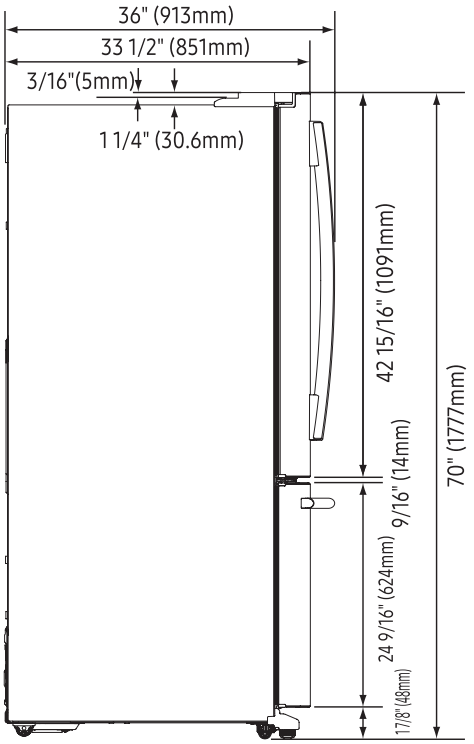
PRODUCT SPECIFICATIONS

Items			Specification
			RF23R*
Electric Components	Defrost Heater(FRE)	Heated at F Defrost	AC 120V, 100W / AC 230V, 100W
	Defrost Heater(REF)	Heated at R Defrost	AC 120V, 100W / AC 230V, 100W
	Heater-Ice Maker		F/S : AC 120V, 141W / AC 230V, 141W C/D : AC 120V, 120W / AC 230V, 120W
	DISPENSER Heater	Interlock with French Heater	AC 120, 2.5W / AC 230V, 2.5W
	FRENCH Heater	-	AC 120V, 12W / AC 230V, 12W
	Heater Water Pipe	-	DC12V, 2.3W
	Heater Ice room	-	DC12V, 2W
	HEATER WATER-PIPE (Only RF23R64*)		DC 12V, 2W
	Bimetal Thermo For Preventing of Refrigerator Heater		AC 250V, 3A Off : 140°F(60°C). On : 104°F(40°C)
	Rated Voltage		AC 230V / 50HZ
	Motor BLDC (FRE)		DC12V, 2.1W / DREP5020LC
	Motor BLDC (REF)		DC12V, 1.92W / 3612JL-04W-S49-G51
	Motor BLDC (CIRCUIT)		DC12V, 1.7W / DRCP8020LA
	Motor BLDC (ICE ROOM)		DC12V, 3.2W / DREP5020LB
	Auger Motor		AC230V, 102W / ISG-3240SSJ
	Geared Motor (ICE MAKER)		DC12V / GSP-24RW-001F
	Geared Motor (DISPENSER)		AC230V, 3.5W / MVCD18AR19
	Motor DAMPER		DC12V / NSBY001TJ1
	Lamp LED(FRE)		DC 12V / 85 ~ 130mA
	Lamp LED(REF)		DC 12V, 506~588mA
	Door Switch	FRE	DC 200V 0.5A / MDCG-4 (1EA)
		REF	DC 200V 0.5A / MDCG-4 (2EA)
		REF (ICE ROOM)	125VAC 5A, 250VAC 2.5A
		Auto Fill	DC 200V 1.5A / MDCG-4 (1EA)
	Power Cord		AC 120V, 15A / AC250V, 16A
	Earth Screw		BSBN (BRASS SCREW)

2-5) Dimensions of Refrigerator (Inches)







2-6) Optional Material Specification

	Part Name	Part Code	AMOUNT
	ASSY-PACKING SUB	DA99-03490L	1
	ASSY INSTALL-ACCESSORY	DA99-03490P	1
	LED LAMP REF	DA97-12606C	1
	ASSY LAMP LED	DA41-00676G	1

3. DISASSEMBLY AND REASSEMBLY

3-1) PRECAUTION

- **Unplug the refrigerator before cleaning and making repairs.**
- **Remove any foreign matter or dust from the power plug pins.**
  - Otherwise there is a risk of fire.
- **Do not use a cord that shows cracks or abrasion damage along its length or at either end.**
- **Do not plug several appliances into the same multiple power board. The refrigerator should always be plugged into its own individual electrical which has a voltage rating that matched the rating plate.**
  - This provides the best performance and also prevents overloading house wiring circuits, which could cause a fire hazard from overheated wires.
- **Do not install the refrigerator in a damp place or place where it may come in contact with water.**
  - Deteriorated insulation of electrical parts may cause an electric shock or fire.
- **The refrigerator must be grounded.**
  - You must ground the refrigerator to prevent any power leakages or electric shocks caused by current leakage from the refrigerator.
- **Do not put bottles or glass containers in the freezer.**
  - When the contents freeze, the glass may break and cause personal injury.
- **Do not store volatile or flammable substances in the refrigerator.**
  - The storage of benzene, thinner, alcohol, ether, LP gas and other such products may cause explosions.

- Required Tools

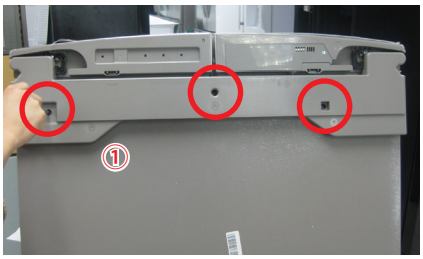
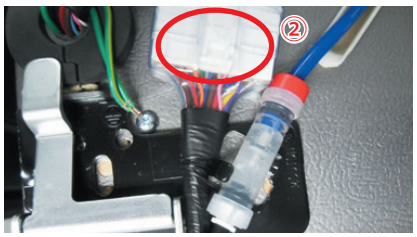
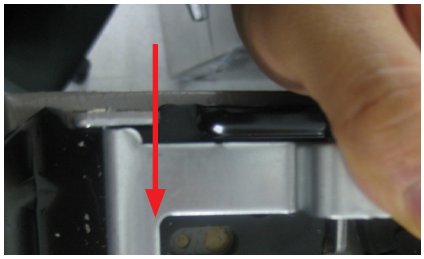
IMAGE	ITEM	USE
	Phillips Head Driver	Use for assembling and disassembling of screw
	Flat Head Driver	Use for assembling and disassembling of HomeBar, Dispenser, Delicatessen Box, Main PBA etc...
	Hex Wrench ø 2mm	Use for assembling and disassembling of Handle
	Socket Wrench ø10mm	Use for assembling and disassembling of Door Hinge

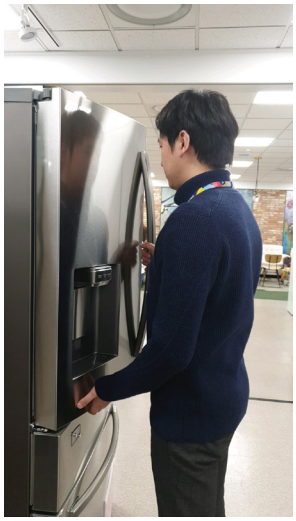
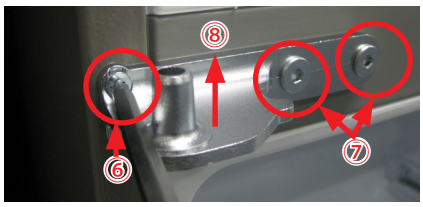
- Water whitening phenomenon

All water provided to refrigerators flows through the core filter which is an alkaline water filter. In this process, the pressure in the water that has flowed out of the filter gets increased, and massive oxygen and nitrogen become saturated. When this water flows out in the air, the pressure plummets and the oxygen and nitrogen get supersaturated so that they turn into gas bubbles. The water could look misty due to these oxygen bubbles. It is not because dust or chemicals, just a few seconds later, it will be clean again.

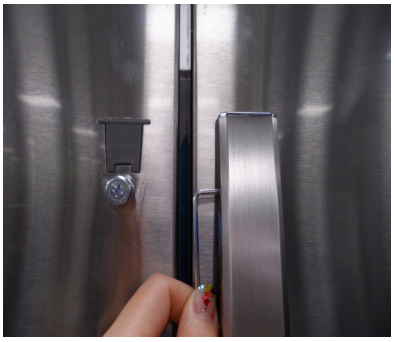
DISASSEMBLY AND REASSEMBLY

3-2) Refrigerator Door

Part Name	How To Do	Descriptive Picture
Refrigerator Door	1. Remove the 3 screws holding down the Top Table and remove the Top Table (①)	
	2. Disconnect the electrical (②) above the upper left door hinge To disconnect the connector (②) more easily, press the end of the hook (③) and pull connector. CAUTION Make sure unit is unplugged.	 
	3. As shown in the picture, Remove water tube from hinge (④) by holding at the both sides of the Tube Fitting and pulling it out. And, remove the Tube Fitting (⑤) by pulling the water hose after pushing in the locking ring tab at the end of the Tube Fitting.	 
	4. After pulling the Hinge Lever, remove the Hinge.	

Part Name	How To Do	Descriptive Picture
Refrigerator Door	5. Lift the door straightly up to remove. CAUTION Be careful not to drop the door.	
	6. Lift the grommet hinge straightly up to remove.	
	7. With a Philips head screwdriver, remove the screw (⑥) attatched to the lower left and right door hinges. With a 0.4in Hex wrench, remove the 2 flat head screws (⑦) Remove the lower left and right door hinges (⑧).	

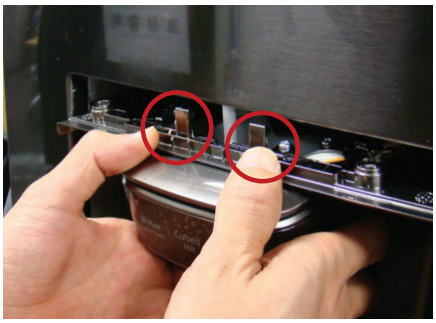
3-3) Door Handle Refrigerator

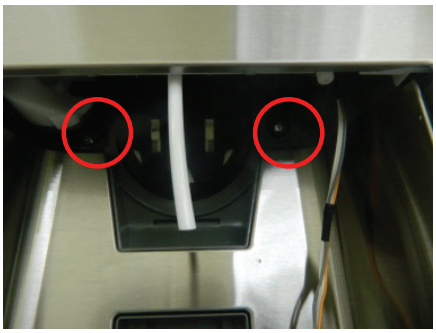
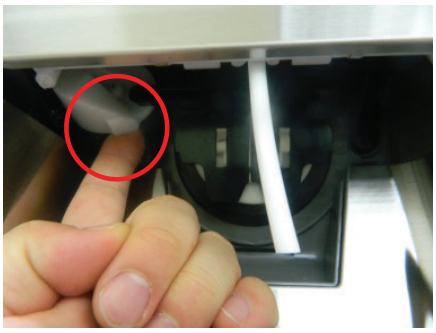
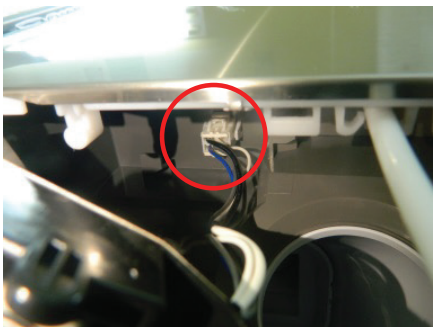
Part Name	How To Do	Descriptive Picture
Door Handle Fridge	1. Loose Set Screw with 0.1in Hex wrench and pull front the handle.	
	2. Remove the cover vinyl of door.	

3-4) Door Handle Freezer

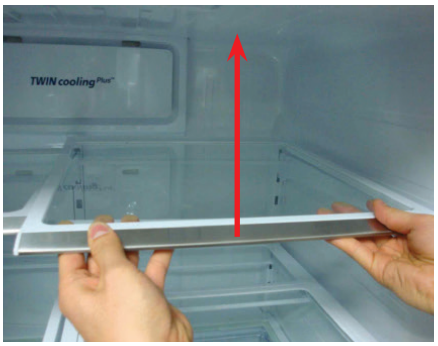
Part Name	How To Do	Descriptive Picture
Door Handle Freezer	1. Loosen the Set Screw situated at the bottom right of the appliance about 0.1in by using Hex wrench.	
	2. Pull the Set handle out by moving it to the right side. CAUTION Be careful not to scratch or break the parts	 

3-5) Lever and Water-Dispenser

Part Name	How To Do	Descriptive Picture
Lever and Water-Dispenser (Disassembly)	1. Put both fingers in the upper of lever. Pull and remover the lever slowly.	
	2. Remove two screws under the Dispenser Display.	
	3. Grasp the top of the dispenser display and pull it down. CAUTION Be careful not to scratch or break the parts	 
	4. Disengage the wiring connector of display cover.	

Part Name	How To Do	Descriptive Picture
Lever and Water-Dispenser (Disassembly)	5. Put both fingers in the upper of lever. Pull and remover the lever slowly.	
	6. Pull to the front direction cam to separate the ASSY CASE ICE ROUTE from dispenser.	
	7. Put gloves and separate the ASSY CASE ICE ROUTE with pulling according to the arrow direction.	
	8. Remove connector.	

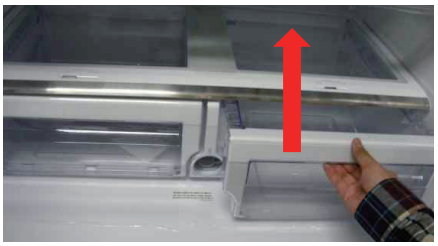
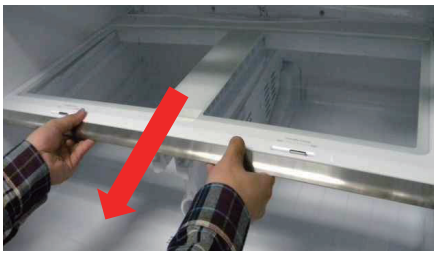
3-6) Glass Shelf

Part Name	How To Do	Descriptive Picture
Glass Shelf	Remove the shelf by lifting the front part of the shelf up and pulling it out.	

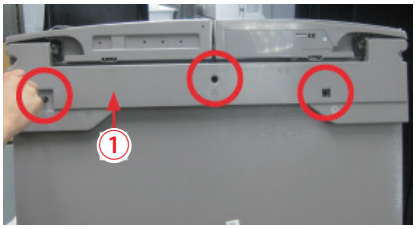
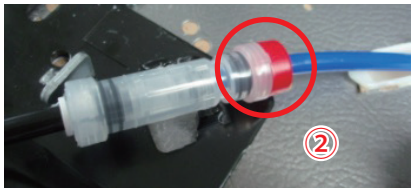
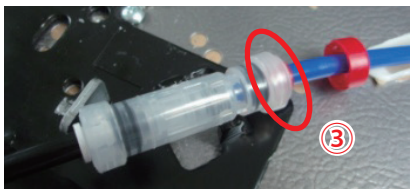
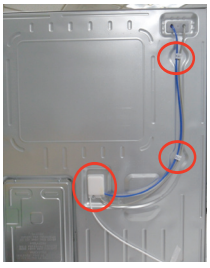
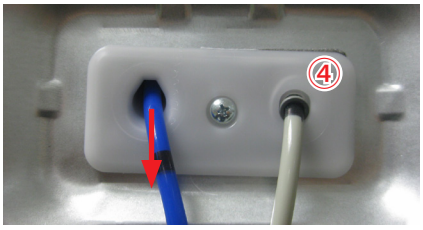
3-7) Foldable Glass Shelf

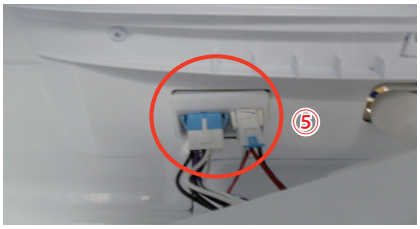
Part Name	How To Do	Descriptive Picture
Foldable Glass Shelf	1. Remove the Cap. 2. Remove 2 screws of the Folderble Glass Shelf.	

3-8) Vegetable & Fruit Drawers Shelf

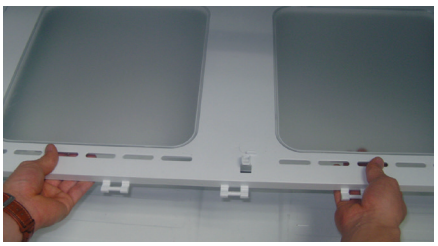
Part Name	How To Do	Descriptive Picture
Vegetable & Fruit Shelf	1. Remove the vegetable & fruit drawer by pulling the roller part and lifting it up.	
	2. While pressing the button on the left of the shelf in txhe picture, lift up the Vegetable & Fruit Drawer Shelf. (Refer to the picture)	
	3. Remove the vegetable & fruit drawer shelf by pulling it out. (Refer to the picture)	

3-9) Case Water Filter

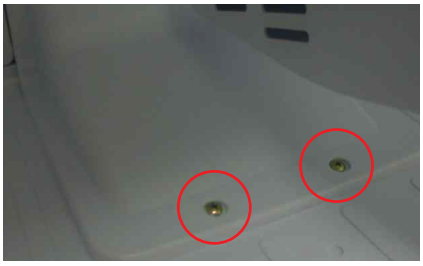
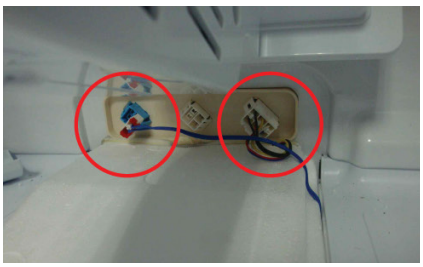
Part Name	How To Do	Descriptive Picture
Case Water Filter	To disassemble the Case Water Filter, remove the water filter and all drawers and shelves.	
	1. Remove the 3 screws holding down the Top Table and remove the Top Table (①).	
	2. a. Remove Cover Tube Fitting (①). b. Remove the Water tube (blue) from the tube fitting by pushing in on the locking ring (②) and pulling out the tube.	 
	3. Remove three screws securing the water tubes.	
	4. a. Pull the Water blue hose out. b. Push the Tube Fitting (④) and pull the grey hose out.	

Part Name	How To Do	Descriptive Picture
Case Water Filter	5. Disconnect the 2 Housing connectors (⑤).	
	6. Remove a screw the case fitler right side.	
	7. Lift and pull the Case Water Filter out.	

3-11) Cool Select Pantry

Part Name	How To Do	Descriptive Picture
Cool Select Pantry	1. Remove the cool select pantry by pulling the roller part and lifting it up.	
Cool Select Pantry Cover	1. Remove the cool select pantry cover by lifting up the left part of the cover and pulling it.	
Cool Select Pantry Shelf	1. Remove the cool select pantry shelf by lifting the front part of the shelf while pulling it.	
Cool Select Pantry Rail	1. Remove the cool select pantry rail by unscrewing the 2 screws and pulling the rail.	

3-12) Motor Damper

Part Name	How To Do	Descriptive Picture
Motor Damper	1. Remove the 2 screws under the. water filter case and take off the cover damper(②).	
	2. Disengage 2 housing connector.	
	3. Take off the Motor Damper by pulling a flat-blade screwdriver .	

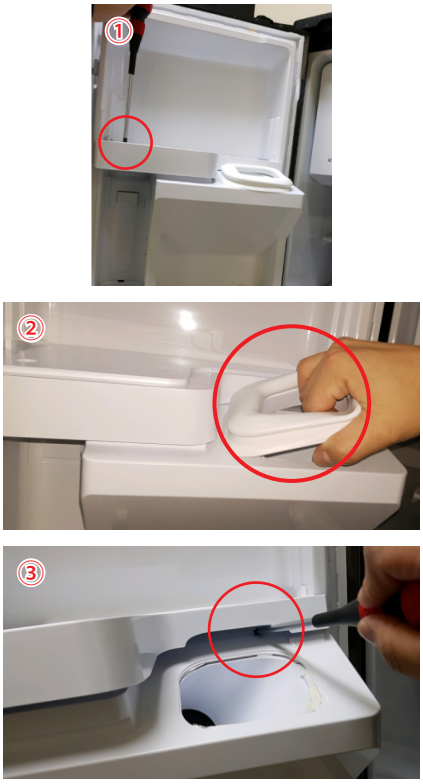
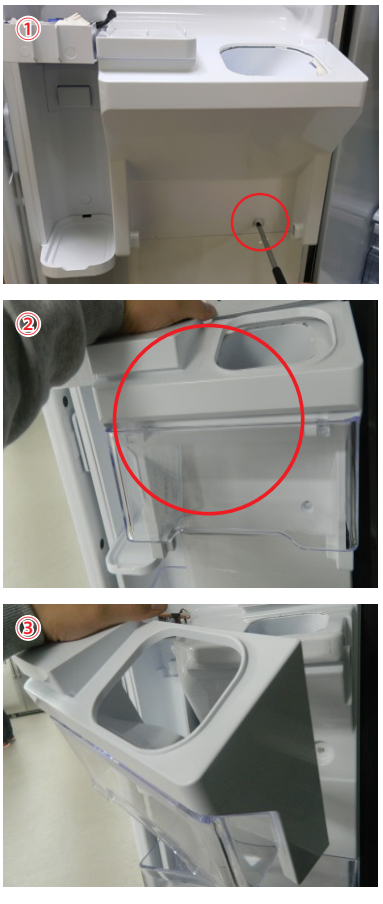
3-13) Water Filter (Assembly & Disassembly)

Part Name	How To Do	Descriptive Picture
Water Filter	1. Turn the water filter count-clockwise. (Refer to the picture)	
	2. Remove the water filter by pulling it. (Refer to the picture)	
	3. Push the water filter directly.	
	4. Turn the water filter clockwise until it locked.	

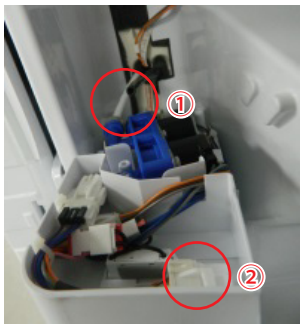
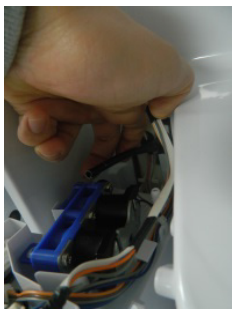
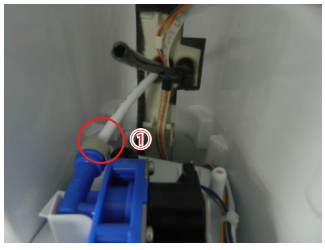
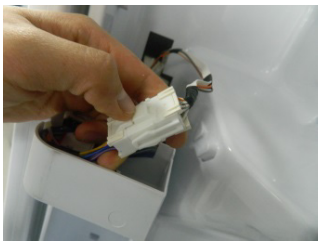
CAUTION

Be sure to flush the dispenser thoroughly (approx. 6 to 7 minutes),
otherwise water may drip from the dispenser. This means that there is still air in the line.

3-14) Auto Fill

<table>
<tr><th>Part Name</th><th>How To Do</th><th>Descriptive Picture</th></tr>
<tr><td rowspan="2">Auto Fill</td><td>1. Separate the Auto Fill Cover Screw.
2. Remove Cap chute ICE.
3. Auto Fill Cover.</td><td>  </td></tr>
<tr><td>1. Remove CASE GUARD Screw
2. Remove CASE GUARD by pulling it forward.</td><td>  </td></tr>
</table>

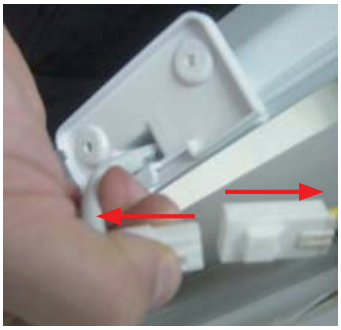
DISASSEMBLY AND REASSEMBLY

Part Name	How To Do	Descriptive Picture
Auto Fill	1. Remove Auto Fill Case Screw. 2. Lift the Auto Fill Case up to release from the jam.	  
	1. Remove the hose by pressing the Collect of Auto Fill DC Valve. 2. Remove Auto Fill Harness.	   

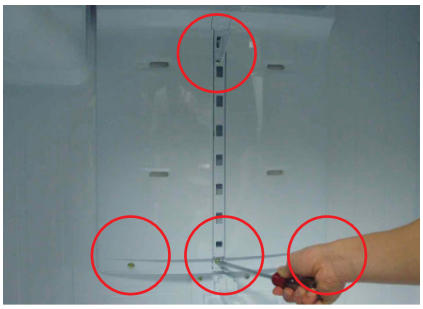
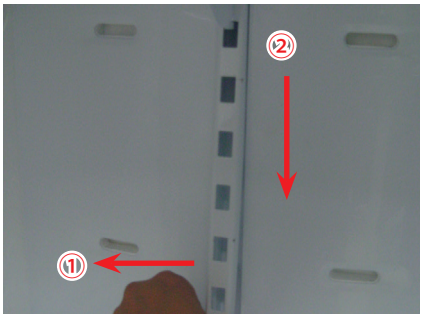
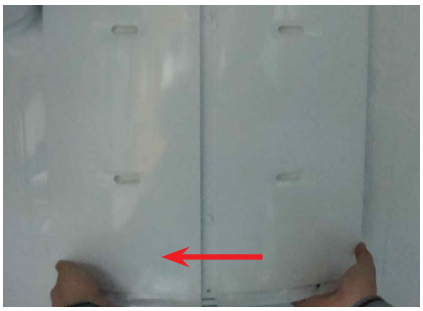
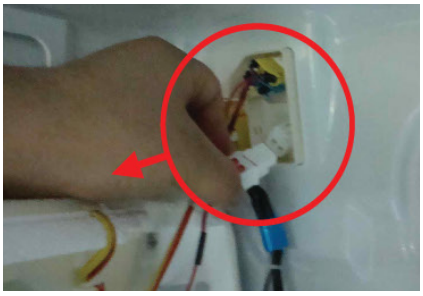
3-15) Vertical Hinged Section

Part Name	How To Do	Descriptive Picture
Vertical Hinged Section	1. Unscrew 2 screws.	

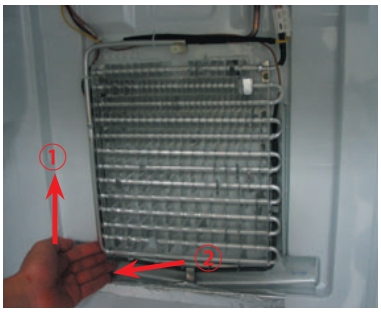
DISASSEMBLY AND REASSEMBLY

Part Name	How To Do	Descriptive Picture
Vertical Hinged Section	3. Disengage the internal housing connector of the vertical hinge.	
	4. Remove the vertical hinged section by lifting the vertical hinge up. (Refer to the picture)	

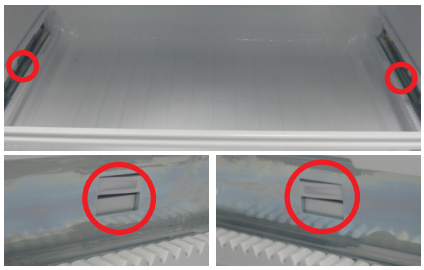
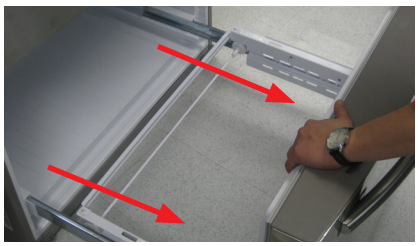
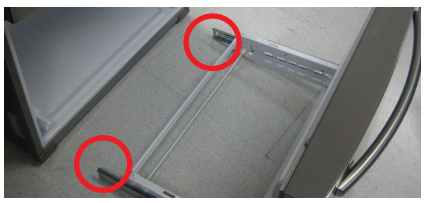
3-16) Evaporator Cover In Refrigerator

Part Name	How To Do	Descriptive Picture
Evaporator Cover In Refrigerator	1. Remove the angle cap with a flat-blade screwdriver. (Refer to the picture) CAUTION Be careful not to scratch or break the parts	
	2. Unscrew 4 screws.	
	3. Remove the the lower part of angle mid by pulling it out and pushing it down. (Refer to the picture)	
	4. Remove the hook by pulling it from the lower part and pushing the cover down. (Refer to the picture)	
	5. Disconnect the 2 housing connectors. (Refer to the picture) CAUTION Continues a work after confirming that fan operation stops.	

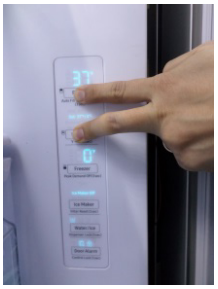
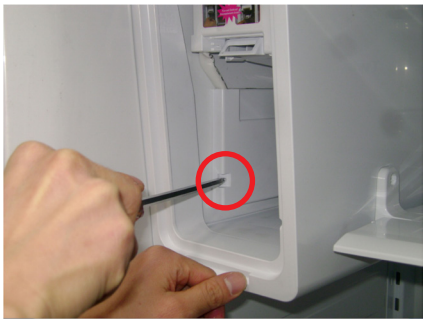
3-17) Evaporator In Refrigerator

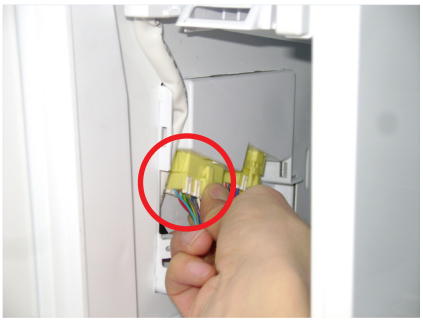
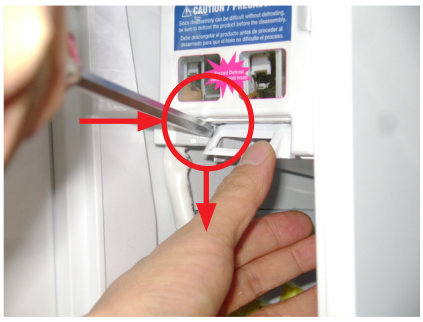
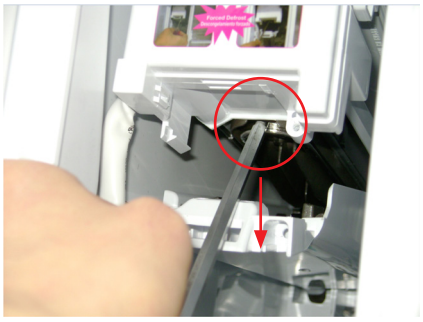
Part Name	How To Do	Descriptive Picture
Evaporator In Refrigerator	1. Disconnect the housing connector part on left side. (Refer to the picture)	
	2. Disconnect the housing connector on right side.	
	3. Remove the evaporator by lifting the bottom side of it up and pulling it out. (Refer to the pi cture)	

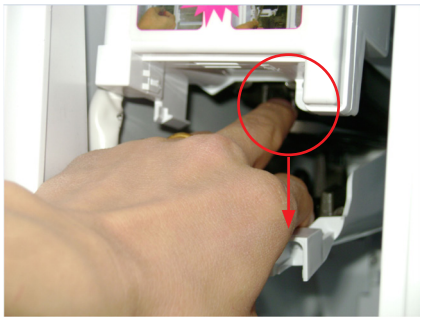
3-18) Freezer Door

Part Name	How To Do	Descriptive Picture
Freezer Door	1. Pull out the Pull Out Drawer by maximum.	
	2. After lifting the Pull Out Drawer up holding both sides, remove it at the rail system.	
	3. After lifting the Freezer Guard up holding both sides, remove it at the rail system. CAUTION The box may get scratch on its side by getting twisted left and right when disassembling the drawer box.	
	4. Press the fixing hook of rail system.	
	5. After holding and pulling out the top of Freezer Door, remove it at the rail system.	
	CAUTION Make sure there is no scratch at the end of Sliding Rail by being dented from the floor.	

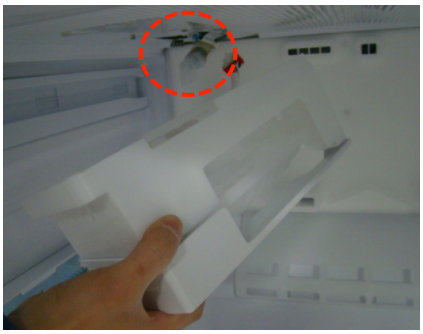
3-19) Ice-Maker

Part Name	How To Do	Descriptive Picture
Ice Maker	1. When pressing the Fridge + Flex zone keys for 8 seconds at the same time, it will proceed to TEST MODE. When you proceed to TEST MODE, press the Flex zone key in Panel to operate TEST KEY.	
	2. Press TEST KEY to change the test function in the order of Manual operation (3600 RPM) → Manual operation (3600 RPM)[OF r]→ manual R defrost [rd]→ manual F/R defrost[Fd]→ cancel (normal operation)→ forced operation. • If the key on the front panel does not operate within 15 seconds of switching to TEST Settings MODE, it is deactivated and switches to the previous DISPLAY mode.	
	3. Lift up the Ice Bucket and pull it out.	
	4. Remove the screw from the Wire Housing Cover.	
	5. Remove the Wire Housing Cover.	

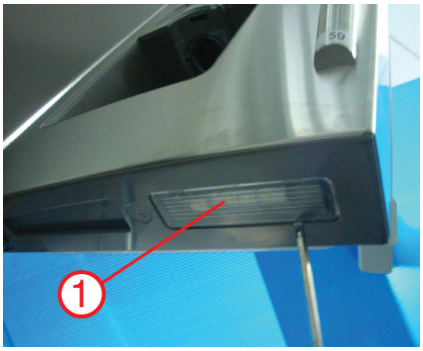
Part Name	How To Do	Descriptive Picture
Ice Maker	6. Disconnect the Ice Maker Housing Connector.	
	7. Remove the screw from the Duct Tray-ice.	
	8. With a flat blade screwdriver, push the duct to the right and remove it from the locking tab. (Refer to the image.)	
	9. With a flat blade screwdriver, pry down on the refrigerant tube to separate it from the bottom of the ice maker. (Refer to the image.)	

Part Name	How To Do	Descriptive Picture
Ice Maker	10. Push down the refrigerant pipe slightly and separate the refrigerant pipe and the Ice Maker Assembly completely.	
	11. While pressing the Hook, pull out the Ice Maker.	
	12. While pushing down the Duct-Tray-Ice, pull out the Ice Maker carefully and remove it. ※ When removing the ice maker, be careful not to damage the grommets on the tray or the refrigerant tube. (Refer to the dotted parts on the right side photo.)	 
	※ If the ice maker is frozen, it can be melt by using the steam heater.	 

3-20) FZ ICE MAKER (TIM OPTION)

Part Name	How To Do	Descriptive Picture
FZ ICE MAKER (TIM OPTION)	1. Remove the Drawer, Drawer Bin, Guard from the Freezer.	
	2. Remove the two screw of FZ ICE MAKER and pull it to remove.	
	3. Remove the fixed HOUSING and then remove the ICE MAKER from the freezer.	

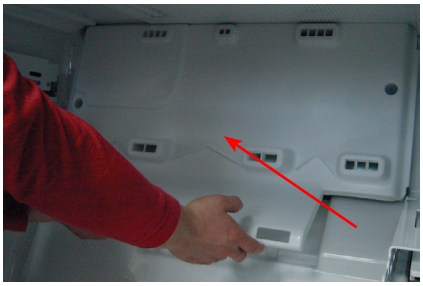
3-21) FREEZER Light

Part Name	How To Do	Descriptive Picture
FREEZER Light	1. Remove the cover FREEZER lamp (①) by a flat-blade screwdriver.	
	2. Disengage the housing.	

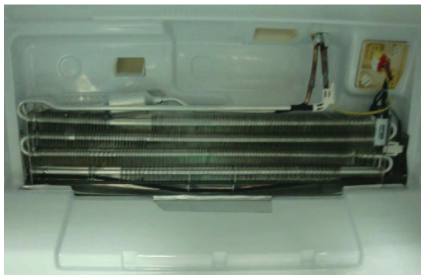
3-22) Door Switch In Freezer

Part Name	How To Do	Descriptive Picture
Door Switch In Freezer	1. Remove the freezer drawer bin by using a flat-blade(-) screwdriver.(Refer to the picture)	
	2. Disconnect the housing connector part.	

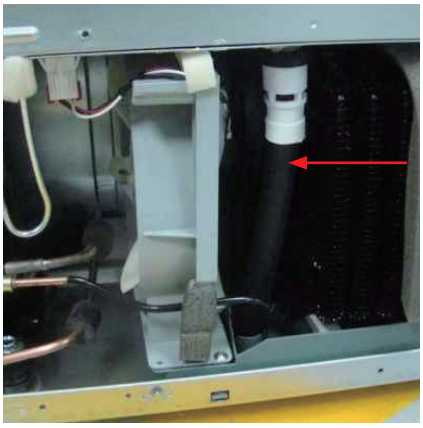
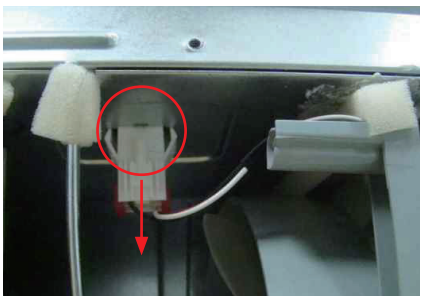
3-23) Evaporator Cover In Freezer

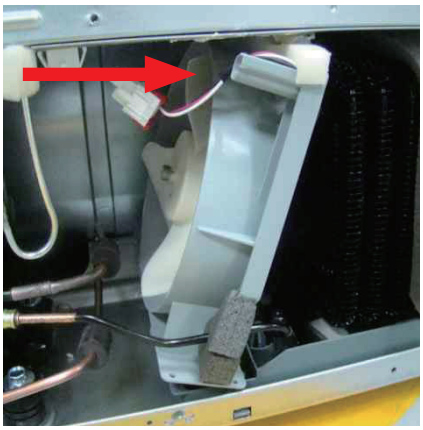
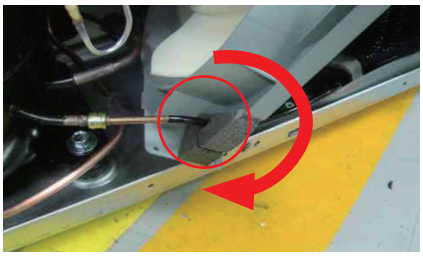
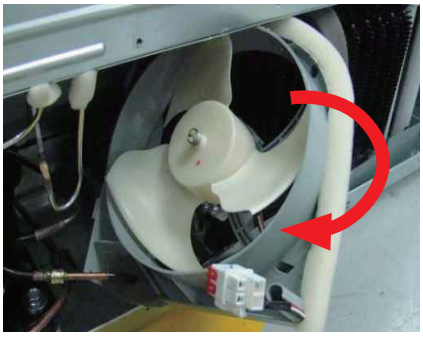
Part Name	How To Do	Descriptive Picture
Evaporator Cover In Freezer	1. Remove the freezer door and freezer drawer by pulling out the drawer and then unscrewing 2 screws.	
	2. Lift up the evaporator cover.	
	3. Disengage the 3 housing connectors and remove the evaporator cover.	

3-24) Evaporator In Freezer

Part Name	How To Do	Descriptive Picture
Evaporator In Freezer	1. Remove the housing connector part left one.	
	2. Remove the evaporator by pulling the lower part of the evaporator while lifting it up.	

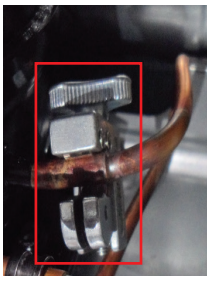
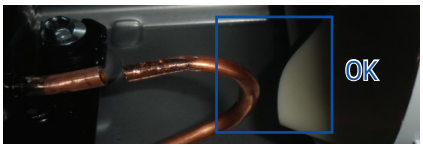
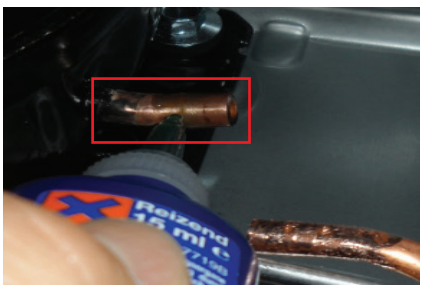
3-25) Comp tCooling Fan

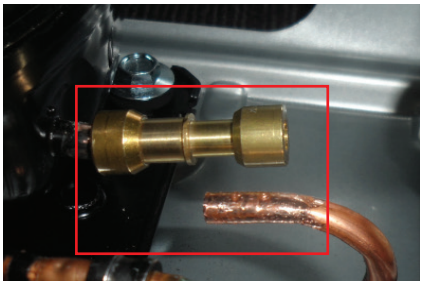
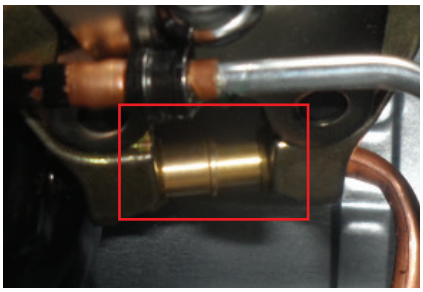
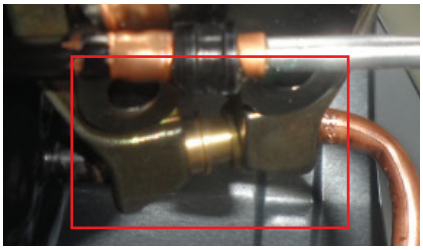
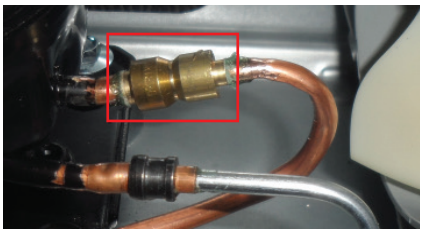
Part Name	How To Do	Descriptive Picture
Comp Cooling Fan	1. Unscrew 7 point of Cover comp	
	2. Remove the DRAIN HOSE.	
	3. Remove 1 screw.	
	4. Disengage the HOUSING CONNECTOR. (Refer to the picture)	

Part Name	How To Do	Descriptive Picture
Comp Cooling Fan	5. Pull it forward and lean against the DRAIN HOSE.	
	6. Rotate it based on the PIPE.	
	7. The FAN is disassembled. / Assembly it in reverse order.	

3-26) COMPRESSOR

WARNING This appliance contains a small amount of isobutane refrigerant (R-600a), a natural gas with high environmental compatibility that is, however, also flammable. When transporting and installing the appliance, care should be taken to ensure that no parts of the refrigerating circuit are damaged.

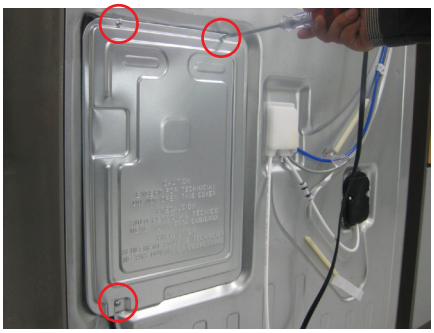
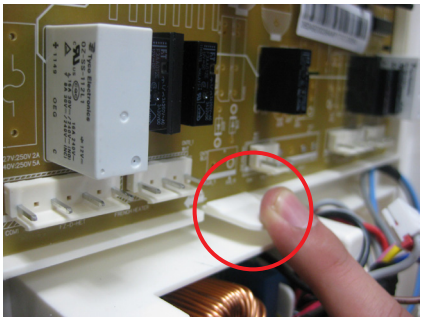
Part Name	How To Do	Descriptive Picture
COMPRESSOR	1. Sand Paper Process - Use the Sand Paper to make the left part of the weld metaled metal smooth. - Use the Sand Paper to make the right part of the welded metal smooth.	
	2. Pipe Cutting Process - Using the pipe cutter, cut both welded parts. (Straight section should be at least 25mm)	 
	3. Connect, Suc. Bending process- Bend Connect, and Suc. to make a straight line with the Comp Pipe. (Make sure Connect, and Suc. do not interrupt the Fan after the Bending process)	 
	4. Check Service Ring specifications of the Pipe.	
	5. Applying Lokprep and connecting the Service Ring_1 - Before applying Lokprep, remove any foreign substances on the pipe surface with Sand Paper- Apply 0.05g of Lokprep onto the Comp Pipe- Insert the Service Ring in the Comp Pipe and fasten it by screwing it 360° 2 times.	

Part Name	How To Do	Descriptive Picture
COMPRESSOR	6. Applying Lokprep and connecting the Service Ring_2 - Apply 0.05g of Lokprep onto the pipe - Insert the service ring into the Connect, Suc. pipe and fasten it by screwing it 360° 2 times.	
	7. Installing manual Lokring Tool - Install manual Lokring Tool on the Service Ring.	
	8. Fastening Service Ring - Press the ring with the Lokring tool. - When fastening, press the ring multiple times slowly untill the ring is fastened in the middle. (DO NOT PRESS IT ONCE TO THE END)	
	9. Check the Service Ring connection status	

3-27) Machine Compartment

Part Name	How To Do	Descriptive Picture
Relay O/L	1. Disengage the housing connector.	
	2. Remove Cover Relay.	
	3. Disassemble Housing Connector from Comp.	

3-28) Electric Box

Part Name	How To Do	Descriptive Picture
PBA Main	1. Remove the 2 screw attached to the upper left and right Case PCB Panel with a phillips screwdriver(+).	
	2. Disengage all housing connectors from the main PCB. CAUTION Before doing the above, make sure that the unit is unplugged.	
	3. Press the lower locking hook down and remove the Main PBA by pulling it out. (Refer to the picture)	

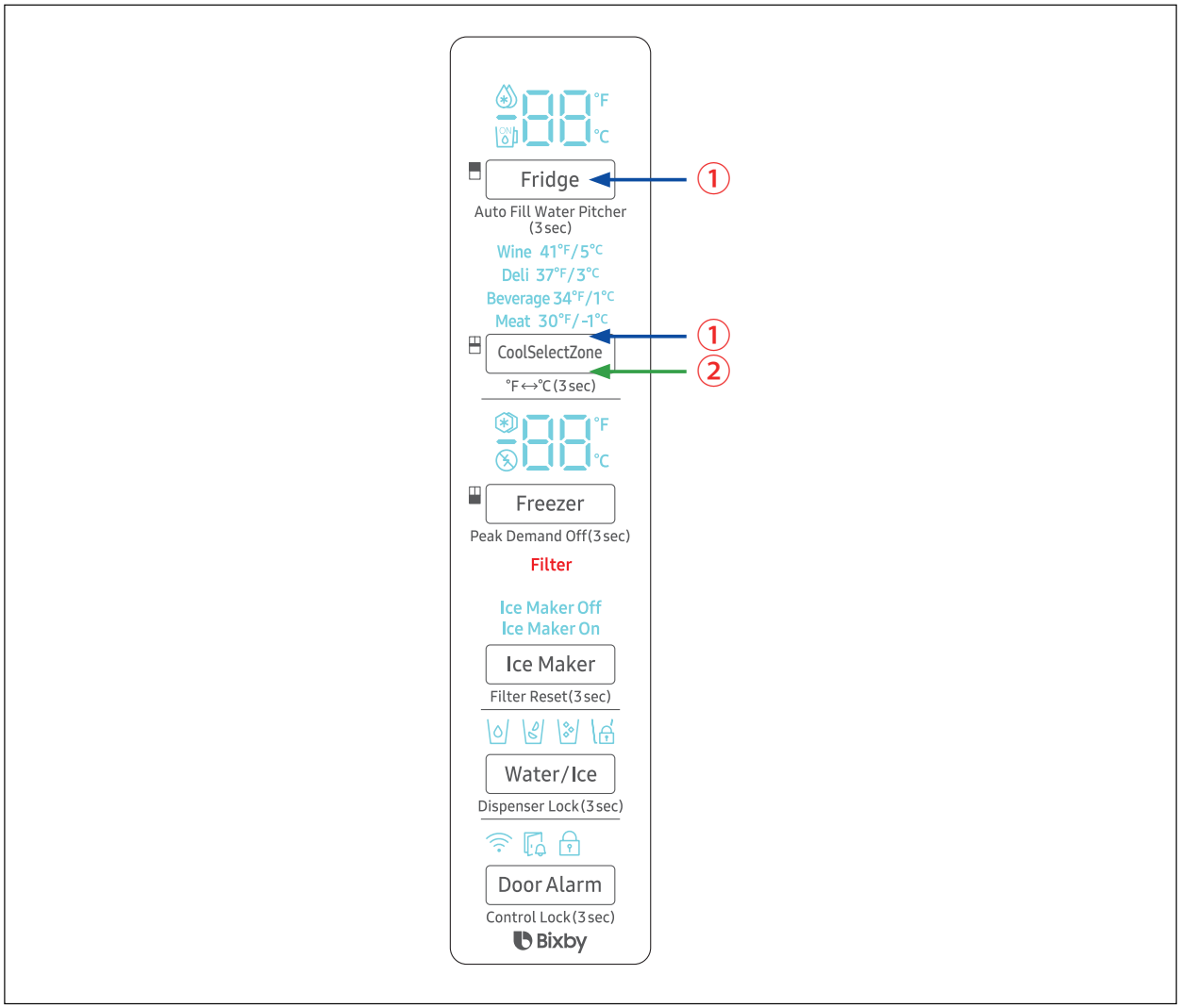
4. TROUBLESHOOTING

4-1) Function for failure diagnosis

4-1-1. Test mode (manual operation / manual defrost function)

- Press the Fridge and CoolSelectZone buttons at the same time for at least 6 seconds. The Control Display will blink with an interval of 0.5 seconds. In that case, you may take your fingers off both buttons and press the CoolSelectZone button to enter the Test Mode.
- If any key on the front of panel is pressed within 15 seconds after the test mode, it will be operated as below sequence : Manual operation1(FF) Manual operation2(OF r) → manual defrost of fresh food compartments(rd) → manual defrost of fresh and freezer compartments(Fd) → cancel(Display all off)
- If any key on the front of panel is not pressed within 15 seconds after the test mode, the test mode will be canceled and it will be returned to previous mode.

1) Manual operation function

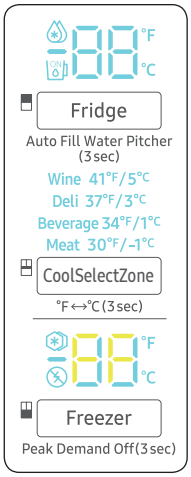


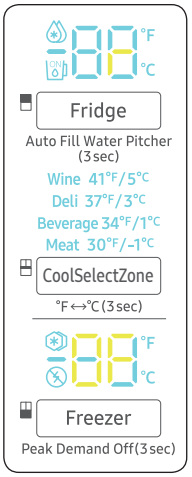
Fridge Key + CoolSelectZone Key are pressed simultaneously for 6 seconds. And the Control Display will blink with an interval of 0.5 seconds. In that case, you may take your fingers off both buttons and press the CoolSelectZone button to enter the Test Mode.

1-1) If any key is pressed once in test mode, blinks "FF" on the display and it indicates the refrigerator has entered the manual operation. At this moment, buzzer beeps as an alarm.

1-2) If any key is pressed once at the manual operation1 status, OF-r will be displayed. FF and OF-r means manual operation 1 and 2 separately. These 2 functions operate with same RPM of COMP.

1-3) If manual operation is selected, compressor will run at once without 7 minutes delay in any mode. If the refrigerator is on the defrost cycle at the moment, defrost will be finished and manual operation will begin. (Be careful if manual operation get started at the moment of compressor off, over load could be occurred)





1-4) If manual operation works, compressor & f-fan operate continuously for 24 hours and fresh food compartment will be controlled by the setting temperature.

1-5) When the manual operation runs, setting temperature will be selected automatically as below:
freezer compartment -8°F (-23°C), fresh food compartment 34°F (1°C).

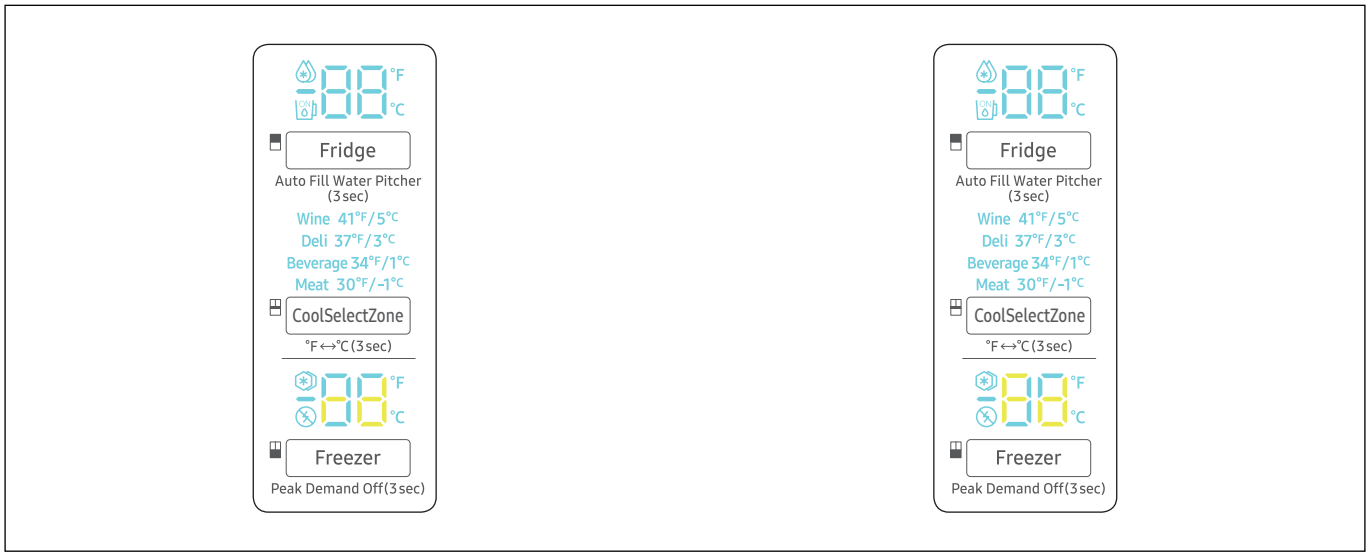
1-6) During manual operation, Power Freezer & Power Cool function will not be work.
If a function is selected, the power function icon of the selected function will be off automatically after 10 seconds.

1-7) Manual operation can be canceled by removing power from the unit, then resupplying power.

1-8) Alarm(0.25 sec ON/ 0.75 sec OFF) will beep continuously until manual operation is completed and there is no function to make the sound stop.

TROUBLESHOOTING

2) Forced Defrost



2-1) When you press any key one more time at Fridge off Forced Operation [OF r], rd lights up on the Display Panel. At this time, the Forcd Operation stops immediately and R-Defrost will be performed at the same time.

2-2) When you press any key one more time at Forced R-Defrost [rd], Fd lights up on the Display Panel. At this time, FR-Defrost will be performed at the same time.

2-3) At this time, it will send out “Beep" sound for 2 seconds and then it will perform Forced F/R Defrost while sending out “0.5 sec On and 0.5 sec Off" sound.

3) Test cancel mode

3-1) During the simultaneous defrosting of fresh food and freezer compartments, if the display panel change to the test mode and test button is pressed one more time, defrosting of fresh food and freezer compartments will be canceled and the unit will return to the normal operation.
Or, all test functions will be canceled by turning main power ON and OFF.

4-1-2. Self-diagnostic function

1) Self-diagnostic function in the Initial power ON

1-1) Micom operates self-diagnostic function to check the temperature sensor condition within 1 second when the refrigerator turned On initially.

1-2) If bad sensor is detected by the self-diagnostic function, the applicable display LED will blink for 0.5 sec. At this moment, there is no beep sound. (Refer to self-diagnostic CHECK LIST)

1-3) Self-diagnostic button is recognized only when the error is displayed by the bad sensor. Display does not operate normally but temperature control will be controlled by the emergency operation.

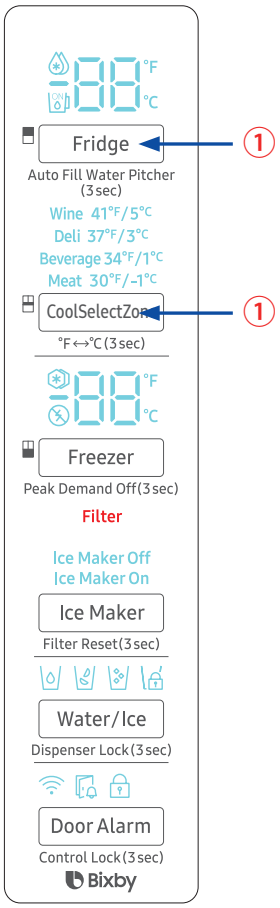
1-4) When the error is detected by self-diagnosis, the error can be canceled automatically if all troubled sensors are corrected or Self-diagnostic function key (Fridge Key + CoolSelectZone Key) are pressed simultaneously for 10 seconds. (Return to normal display mode)

① If Fridge Key + CoolSelectZone Key are pressed simultaneously for 10 seconds, the error mode by self-diagnosis will be canceled.

TROUBLESHOOTING

2) Self-diagnostic function during normal operation

2-1) “oP-Ch" code is repeatedly ON/OFF until Option error settles down.



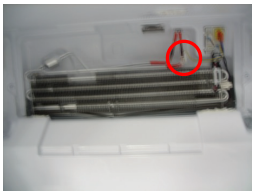
① If Fridge Key + CoolSelectZone Key are pressed simultaneously for 10 seconds, the self-diagnosis function will be selected.

2-2) If Fridge Key + CoolSelectZone Key are pressed simultaneously for 6 seconds during normal operation, the temperature setting display will operate for 4 seconds (ON/OFF 0.5sec each).
If Freezer Fridge Key + CoolSelectZone Key are pressed simultaneously for 10 seconds (including above 4 seconds), selfdiagnostic function will be selected.

2-3) At this moment, self-diagnostic function will be returned with buzzer sound 'ding-dong'.
If there is an error, display of error will be operated for 30 seconds and then return to normal condition whether problem is corrected or not. (Refer to self-diagnosis CHECK LIST)

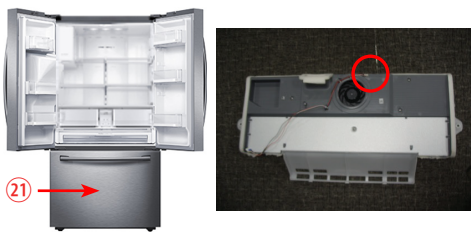
2-4) Input by button is not accepted during self-diagnostic function.

※ R Self-diagnostics check list

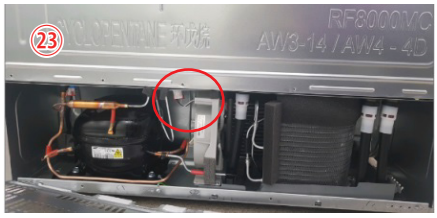
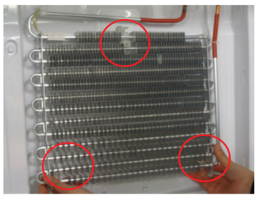
LED		Item	Diagnostic method	Location image
F	R			
01	0C	Freezer Sensor	The voltage of MAIN PCB CN20-"10" ↔ "12": shall be between 4.5V~1.0V	 
02		Fridge Sensor	The voltage of MAIN PCB CN20-"9" ↔ "11": shall be between 4.5V~1.0V	 
04		Freezer compartment defrosting sensor	The voltage of MAIN PCB CN20-"6" ↔ "8": shall be between 4.5V~1.0V	 
09		Fridge compartment defrosting sensor	The voltage of MAIN PCB CN20-"5" ↔ "7": shall be between 4.5V~1.0V	 
06		External air sensor	The voltage of MAIN PCB CN60-"3" ↔ "5": shall be between 4.5V~1.0V	 
07		Pantry room sensor	The voltage of MAIN PCB CN40-"18" ↔ "20": shall be between 4.5V~1.0V	 

TROUBLESHOOTING

※ R Self-diagnostics check list

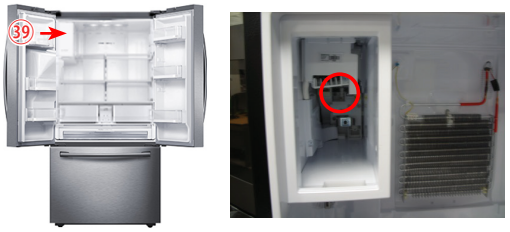
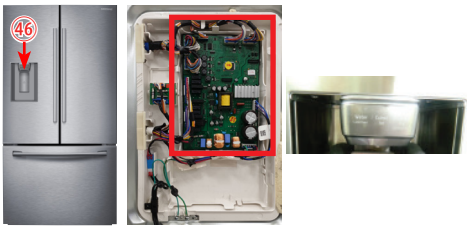
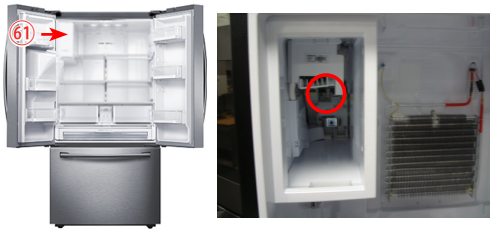
LED		Item	Diagnostic method	Location image
F	R			
H8		Ice Maker (Freezer) Sensor Error	The voltage of MAIN PCB CN90-"11" ↔ "13": shall be between 4.5V~1.0V	
H9		Humidity sensor	The voltage of MAIN PCB CN60-"3" ↔ "7": shall be between 4.5V~1.0V	
H4		Ice Maker (Fridge) Sensor Error	The voltage of MAIN PCB CN90-"14" ↔ "24": shall be between 4.5V~1.0V	
H5		Ice Room Sensor Error	The voltage of MAIN PCB CN90-"2" ↔ "4": shall be between 4.5V~1.0V	
F1		Freezer Fan Error	The voltage of MAIN PCB CN20-"16" ↔ "18": shall be between 7V~12V	
F2		Fridge Fan Error	The voltage of MAIN PCB CN20-"15" ↔ "17": shall be between 7V~12V	

※ R Self-diagnostics check list

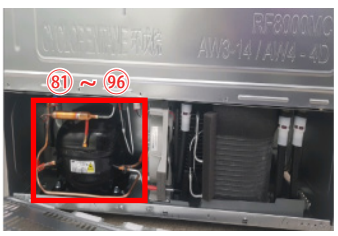
LED		Item	Diagnostic method	Location image
F	R			
23		C-Fan Error	TheThe voltage of MAIN PCB CN40-"11" ↔ "13": shall be between 7V~12V	
24		Freezer Defrosting Error	After separating MAIN PCB CN20 wire from PCB, resistance value between CN20-"6" ↔ CN20-"8" shall be 63(230) ohm ± 7%.(Resistance value is varied by input power) 0 ohm : heater short, ∞ ohm : wire/ bimetal open (Must power off)	 
25		Fridge Defrosting Error	After separating MAIN PCB CN20 wire from PCB, resistance value between CN20-"6" ↔ "8" shall be 120 ohm ± 7%. (Resistance value is varied by input power) 0 ohm : heater short, ∞ ohm : wire/ bimetal open (Must power off)	 
26		Ice Maker (Freezer) Function Error	After changing the Ice Maker(F), plug the refrigerator power code again, and check the operation.	 
27		Pantry ROOM Damper Heater Error	After separating MAIN PCB CN40 wire from PCB, resistance value between CN40-"25" ↔ "27" shall be 135 ohm ± 7%. (Resistance value is varied by input power) 0 ohm : heater short, ∞ ohm : wire/ bimetal open (Must power off)	 
33		Freezer Ice Pipe Heater Error	After separating MAIN PCB CN90 wire from PCB, resistance value between CN90-"1" ↔ "5" shall be 63(230) ohm ± 7%. (Resistance value is varied by input power) 0 ohm : heater short, ∞ ohm : wire/bimetal open (Must power off)	 

TROUBLESHOOTING

※ R Self-diagnostics check list

LED		Item	Diagnostic method	Location image
F	R			
39		Ice Maker (Fridge) Function Error	After changing the Ice Maker(R), plug the refrigerator power code again, and check the operation.	
40		Ice Room Fam Error	The voltage of MAIN PCB CN20-"22" ↔ "24: shall be between 7V~12V	
41		Main ↔ Panel Communication Error	Actually, If there is not a problem, it is desirable to replace Main and Panel PCB With the oscilloscope after a cable problem confirming.	
44		Main ↔ Inverter Communication Error	Actually, If there is not a problem, it is desirable to replace Main and Inverter PCB With the oscilloscope after a cable problem confirming.	
46	8C	IO Expander Communication Error	It is desirable to replace Main PBA.	
49		Main ↔ Dispenser Panel Communication Error	Actually, If there is not a problem, it is desirable to replace Main and Dispenser Panel PCB With the oscilloscope after a cable problem confirming.	
52		Main ↔ Wifi module Communication Error	After separating MAIN PCB CN90 wire from PCB, resistance value between CN90-"1" ↔ "5" shall be 63(230) ohm ± 7%. (Resistance value is varied by input power) 0 ohm : heater short, ∞ ohm : wire/bimetal open (Must power off)	
61		Fridge Ice Duct Heater Error	After separating MAIN PCB CN20 wire from PCB, resistance value between CN20-"21" ↔ "23" shall be 63(230) ohm ± 7%. (Resistance value is varied by input power) 0 ohm : heater short, ∞ ohm : wire/ bimetal open (Must power off)	

※ R Self-diagnostics check list

LED		Item	Diagnostic method	Location image
F	R			
88		Fridge Ice Room Heater Error	After separating MAIN PCB CN20 wire from PCB, resistance value between CN20-"19" ↔ "23" shall be 135 ohm ± 7%. (Resistance value is varied by input power) 0 ohm : heater short, ∞ ohm : wire/ bimetal open (Must power off)	
81		The Freezer compartment abnormal high-temperature indicator blinks	Check if the door has been open for a long time or if hot food has been stored in the compartment. If the reason for the error is removed, the error code disappears after a pre-determined period of time.	
82		The Fridge compartment abnormal high-temperature indicator blinks		
83	8C	The Flex-Zone compartment abnormal high-temperature indicator blinks		
86		AUTO FILL Infuser Overflow Error	Check voltage of MAIN PCB CN90-"11" ↔ "13" - 0V ~ 4.5V : Water overflow - 4.5V ~ 5V : No problem	
87		Comp start failure error	Check if there is a short between compressor terminals. Check IPM Voltage [Under13.5V] Check if there is a short between IPM Pins [#1~33] Check the soldering status of the inverter PCB. (Check if any parts have short-circuited). Check the Compressor and the Cycle.	 
88		Comp IPM Fault Error		

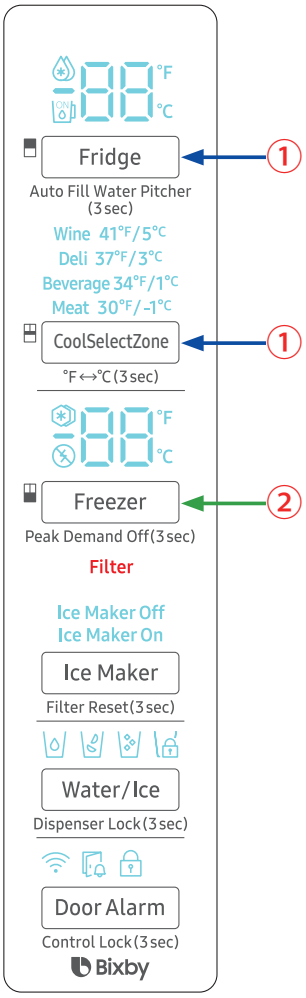
TROUBLESHOOTING

※ R Self-diagnostics check list

LED		Item	Diagnostic method	Location image
F	R			
89		Comp location detection error	Check the Compressor connections . Check the voltage of Resistance of R2 [0.09Ohm] Check the soldering status of the MAIN PCB. (Check if any parts have short-circuited) Check the Compressor and the Cycle.	
84		Comp motor constraint error	Compressor locking Error. Check the Compressor and the Cycle. Check the compressor wire connections.	
85	8C	Comp low voltage error	Check the input voltage. - AC 60V (Input Power AC110~127V) - AC 106V (Input Power AC 220~240V) Check PCB bottom side soldering state.	
86		Comp over voltage error	Check the input voltage. - AC 155V (Input Power AC110~127V) - AC 310V (Input Power AC 220~240V) Check PCB bottom side soldering state.	
98		Comp IPM Shut Down Error	Check the soldering status of the inverter PCB. (Check if any parts have short-circuited). Check if the DC 15V output is less than 13.5V. Check the Comp and Cycle.	

4-1-3. Display function of Load condition

1) Display function of Load condition



① If Fridge Key and CoolSelectZone Key are pressed simultaneously for 6 seconds, ALL ON/OFF will blink with 0.5interval for 4 seconds.

② If take the finger off from above keys and press Freezer Key, load condition mode will be started.

1) If Fridge Key and CoolSelectZone Key are pressed simultaneously for 6 seconds during normal operation, the temperature setting display of fresh food and Fridge compartments will blink ALL ON/OFF with 0.5 for 4 seconds.

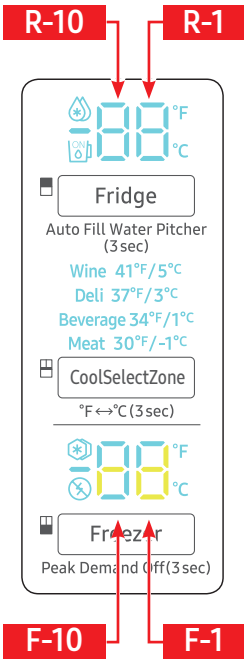
2) At this moment, If Freezer Key after Fridge Key and CoolSelectZone Key is pressed, load condition display mode will be returned with alarm. At LED all on state, only load condition display will blink ON/OFF with 0.5 seconds interval.

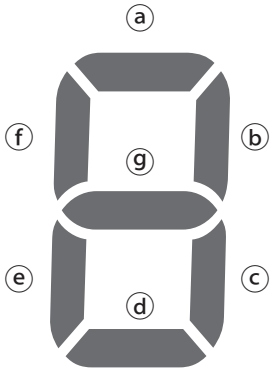
3) Load condition display mode shows the load that micom signal is outputting. However, It means that micom signal is outputting, it does not mean whether load is operating or not. That is to say that though load operation is displayed, load could not be operated by actual load error or PCB relay error etc. (This function would be applied at A/S.)

4) Load condition display function will maintain for 30 seconds and then normal condition will be returned automatically.

5) Load condition display is as below. Only the load control LED will blink with 0.5interval in "Display LED"

TROUBLESHOOTING

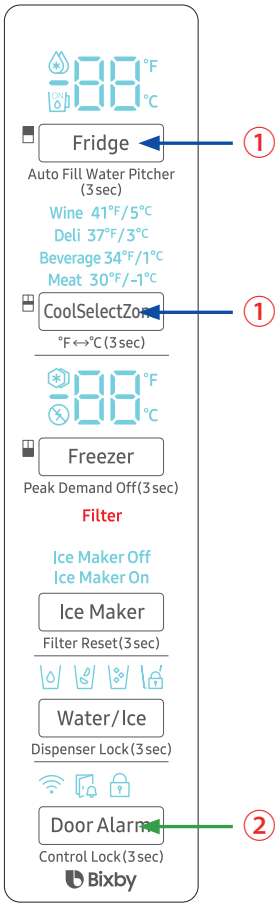




※ Load mode Check list

No.	Part	Display (LED)	Description
1	R-FAN HIGHEST	R-1 "a","b"	In the case of the R-FAN HIGHEST operation, the corresponding LED is blinked
2	R-FAN HIGH	R-1 "a"	In the case of the R-FAN HIGH operation, the corresponding LED is blinked
3	R-FAN LOW	R-1 "b"	In the case of the R-FAN LOW operation, the corresponding LED is blinked
4	R compartment defrost heater	R-1 "c"	In the case of the R compartment defrost heater operation, the corresponding LED is blinked
5	Showcase Door heater	R-1 "d"	In the case of the Showcase Door heater operation, the corresponding LED is blinked
6	High Temperature	R-1 "e"	If the external air temperature is 34℃ or higher, the corresponding LED is blinked
7	Low Temperature	R-1 "f"	If the external air temperature is 21℃ or less, the corresponding LED is blinked
8	Normal Temperature	R-1 "e","f"	If the external air temperature is within the range of 22℃ ~ 33℃, the corresponding LED is blinked
9	Demo Mode	R-1 "g"	In the case of the Demo mode operation, the corresponding LED is blinked
10	Damper Open	R-10 "a"	In the case of the Flex(CoolSelect) damper opened, the corresponding LED is blinked
11	Ice Room Heater	R-10 “b”	In the case of the Ice Room Heater operation, the corresponding LED is blinked
12	IceMaker Heater	R-10 "c"	In the case of the IceMaker's heater operation, the corresponding LED is blinked
13	Full Ice	R-10 “d”	In the case of the Ice maker's bucket is full,, the corresponding LED is blinked
14	AUTO FILL BOTTLE SENSOR	R-10 “g”	In the case of the "Auto Fill Infuser" bottle sensor detected bottle, the corresponding LED is blinked
15	Comp.	F-1 "a"	In the case of the Comp. operation, the corresponding LED is blinked
16	F-FAN HIGHEST	F-1 "b","c"	In the case of the F-FAN HIGHEST operation, the corresponding LED is blinked
17	F-FAN HIGH	F-1 "b"	In the case of the F-FAN HIGH operation, the corresponding LED is blinked
18	F-FAN LOW	F-1 "c"	In the case of the F-FAN LOW operation, the corresponding LED is blinked
19	F compartment defrost heater	F-1 "d"	In the case of the F compartment defrost heater operation, the corresponding LED is blinked
20	C-FAN HIGHEST	F-1 "e","f"	In the case of the C-FAN HIGHEST operation, the corresponding LED is blinked
21	C-FAN HIGH	F-1 "e"	In the case of the C-FAN HIGH operation, the corresponding LED is blinked
22	C-FAN LOW	F-1 "f"	In the case of the C-FAN LOW operation, the corresponding LED is blinked
23	AUTO FILL FULL WATER SENSOR	F-10 "a"	In the case of the "Auto Fill Infuser" water sensor detected water, the corresponding LED is blinked
24	F(I-F) Valve	F-10 "b"	In the case of the F-Valve Opend, the corresponding LED is blinked
25	R Valve	F-10 "C"	In the case of the R-Valve Opend, the corresponding LED is blinked
26	I-FAN HIGHEST	F-10 "d", "e"	In the case of the I-FAN HIGHEST operation, the corresponding LED is blinked
27	I-FAN HIGH	F-10 "d"	In the case of the I-FAN HIGH operation, the corresponding LED is blinked
28	I-FAN LOW	F-10 "e"	In the case of the I-FAN LOW operation, the corresponding LED is blinked
29	French Heater	F-10 "g"	In the case of the French heater operation, the corresponding LED is blinked
30	Ice Drain Heater	F-10 “f”	In the case of the Ice Drain Heater operation, the corresponding LED is blinked.
31	Wifi Status	WI-FI Icon	Not connected to the IP sharer (AP) or the Internet: Off
			Router(AP) connected: On
			Internet connected: On

4-1-4. DEMO MODE 1 : Cooling OFF Mode setting function (North America model)



① Press the Fridge and CoolSelectZone buttons at the same time for at least 6 seconds. The Control Display will blink with an interval of 0.5 seconds. In that case, you may take your fingers off both buttons and press the DoorAlarm button to enter the Cooling Off Mode.

1) Cooling Off mode will be started with buzzer sound(ding-dong).

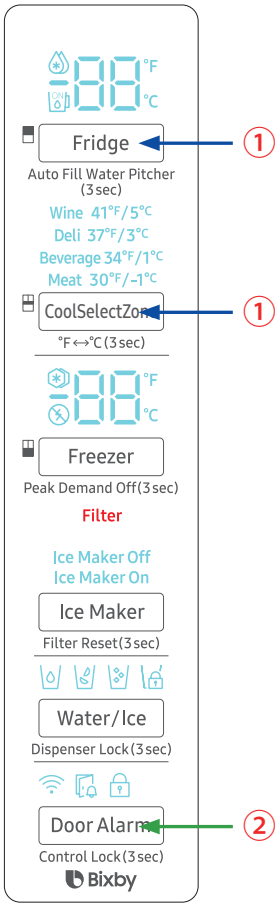
2) If the cooling off mode key is pressed once more time during the cooling off operation,

3) If Cooling Off mode is selected, blinks "O-FF" on the temperature setting display of the panel and it indicates the refrigerator has entered the Cooling Off mode.

4) During Cooling Off mode, if Fridge or Freezer compartments sensors are higher than 149°F (65°C) Cooling Off mode will be canceled automatically and freezing operation will be returned.
(There is no buzzer sound when the Cooling Off mode is canceled by the temperature)

5) Operation contents of Cooling Off mode
- Display, Fan motor and etc operate normally, not to operate compressor only.
- Defrost is not operated. (including french heater)
- Display function of the initial real temperature is finished.
- Under the condition of Cooling Off mode, Cooling Off mode will be operated when Power On after Power OFF.

DEMO MODE 2 : Exhibition Mode setting function (All regions except for North America)



① Pess the Fridge and CoolSelectZone buttons at the same time for at least 6 seconds. The Control Display will blink with an interval of 0.5 seconds.
In that case, you may take your fingers off both buttons and press the DoorAlarm button to enter the Exhibition Mode.

1) Exhibition Mode will be started with buzzer sound(ding-dong).

2) If the Exhibition mode key is pressed once more time during the cooling off operation, Exhibition Mode will be canceled.

3) If Exhibition mode is selected, displays "on" or "oF" for 5 seconds on the temperature setting display of the panel and it indicates the refrigerator has entered or exited the Exhibition mode. After 5 seconds, the display panel will work normally.

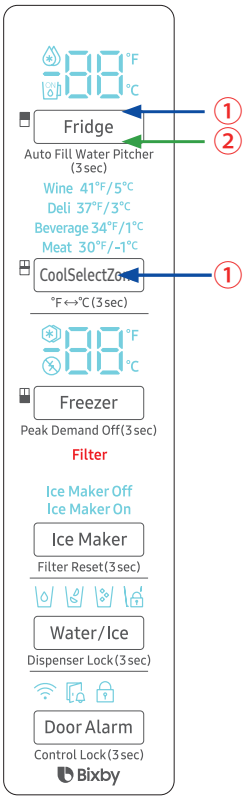
4) During Exhibition mode, if fridge or freezer compartments sensors are higher than 149°F (65°C) Exhibition mode will be canceled automatically and freezing operation will be returned.
(There is no buzzer sound when the Exhibition mode is canceled by the temperature.)

5) Operation contents of Exhibition mode.
- Display, Fan motor and etc operate normally, not to operate compressor only.
- Defrost is not operated. (including french heater)
- Display function of the initial real temperature is finished.
- Under the condition of Exhibition mode, Exhibition mode will be canceled when Power On after Power OFF.

4-1-5. Option setting function

- Press the Fridge and CoolSelectZone buttons at the same time for at least 6 seconds.
  The Control Display will blink with an interval of 0.5 seconds. In that case, you may take your fingers off both buttons and press the Fridge button to enter the Option Setting Mode.

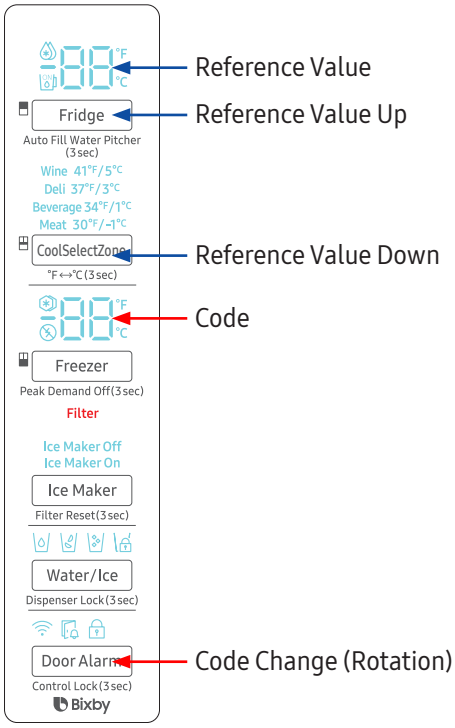
KEY operation method for changing to option mode



① Press the Fridge and CoolSelectZone buttons simultaneously for 6 seconds. All On/Off will blink with 0.5sec interval 4seconds.

② If take the finger off from above keys and press Fridge Key, Option setting mode will be started.

KEY control method after converting to option mode

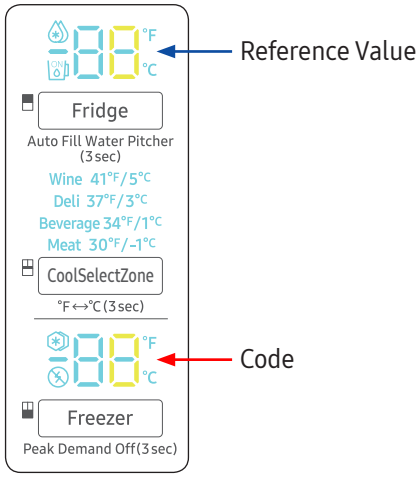


※ Key control in option mode

Door Alarm Key	Code Change Key(Rotation)
CoolSelectZone Key	Reference Value down key
Fridge Key	Reference Value Up key

TROUBLESHOOTING

• If the display changes to option setting mode, all displays will be off except freezer and fridge compartments temperature display as below. (Fridge and freezer compartments case will be explained only because all options are operated with the same method according to the option table.)



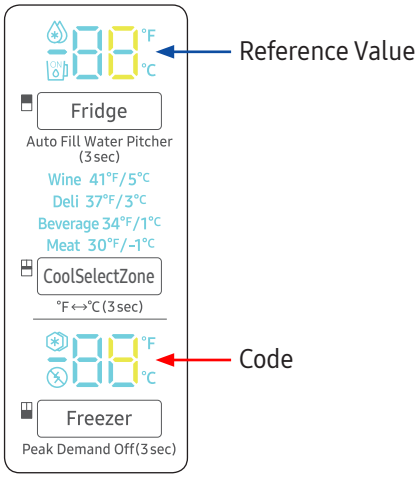
1) For example, if you want to change freezer compartment standard temperature to -4°F(-2°C) by operating option, do as below. This function is for changing the standard temperature.
In -2°F(-19°C) of current temperature of freezer compartment, if you make the temperature lower to -4°F (-2°C) by the option, the standard temperature would be controlled -6°F(-21°C) Therefore, if you change the setting of temperature option to -2°F(-19°C) on the panel, the appliance will be operated with -6°F(-21°C). It means that standard temperature is controlled -4°F(-2°C) less than setting temperature in the display.

Note

Basically, all the data in option has cleared from the factory.
Therefore, almost all setting value are "0".
But, some setting values could be changed for the purpose of improving performmance.
NOTE You need to check the product manual and/or specification.

2) After changing to the option mode, fresh food compartment "0" , freezer compartment "0" will be displayed.
(Basically fresh food compartment "0", freezer "0" would be set at shipping process, but setting value could be changed for the purpose of improving product at mass producing process.)
- If fresh food compartment "0" shows only, temperature reference value of freezer compartment will be set and current freezer compartment temperature code will be displayed on the freezer temperature display.

3) If freezer compartment "4" is set as below freezer compartment code after fresh food compartment "0 is set, standard temperature of freezer compartment will be lower than -4°F(-2.0°C).
(Refer to the picture "changing the freezer compartment temperature")



: If you wait for 20 seconds after completing the setting, MICOM will save the setting value to the EEPROM and normal display will be returned and the option setting mode will be canceled.

4) By the same method as above, it is possible to control the fresh food compartment temperature, water supply, ice-maker harvest temperature/time, defrost return time, hysteresis by temperature, notch gap by temperature etc.

5) Option function is set in the EEPROM at shipping process in the factory.
You would better not to change the option of your own.
Completing the setting is that option function return to normal display after 20 seconds. Do not turn off the appliance before returning to the normal display mode.

Note

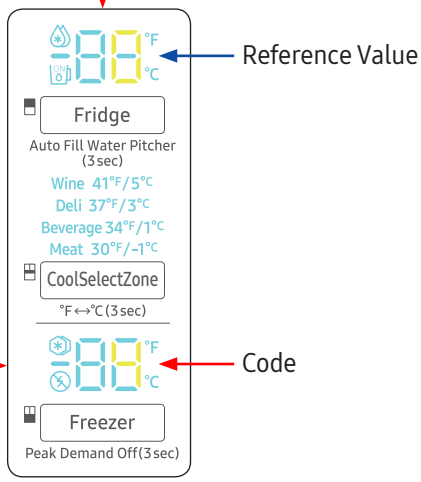
Option setting function exists in the other items.
We will skip the explanation of the other functions by the option because it is associated with refrigerator control function and is not needed at SERVICE.
(Please do not set the other options except above SERVICE Manual.)

4-1-6. Option TABLE

1) Temperature changing table of freezer compartment

Set item	Freezer Temp Shift
Reference Value	Fridge Room 7-SEG
	0

Setting value FZ compartment Code	Temp. compensation
0	0°F(0.0°C)
1	-1°F (-0.5°C)
2	-2°F (-1.0°C)
3	-3°F (-1.5°C)
4	-4°F (-2.0°C)
5	-5°F (-2.5°C)
6	-6°F (-3.0°C)
7	-7°F (-3.5°C)
8	+1°F (+0.5°C)
9	+2°F (+1.0°C)
10	+3°F (+1.5°C)
11	+4°F (+2.0°C)
12	+5°F (+2.5°C)
13	+6°F (+3.0°C)
14	+7°F (+3.5°C)
15	+8°F (+4.0°C)

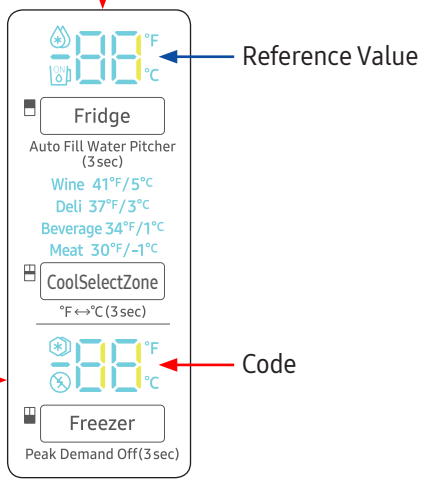


ex) If you want to change the freezer standard temperature to -4°F(-2°C)

2) Temperature changing table of fresh food compartment

Set item	fresh food Temp Shift
Reference Value	Fridge Room 7-SEG
	1

Setting value FZ compartment Code	Temp. compensation
0	0°F (0.0°C)
1	-1°F (-0.5°C)
2	-2°F (-1.0°C)
3	-3°F (-1.5°C)
4	-4°F (-2.0°C)
5	-5°F (-2.5°C)
6	-6°F (-3.0°C)
7	-7°F (-3.5°C)
8	+1°F (+0.5°C)
9	+2°F (+1.0°C)
10	+3°F (+1.5°C)
11	+4°F (+2.0°C)
12	+5°F (+2.5°C)
13	+6°F (+3.0°C)
14	+7°F (+3.5°C)
15	+8°F (+4.0°C)

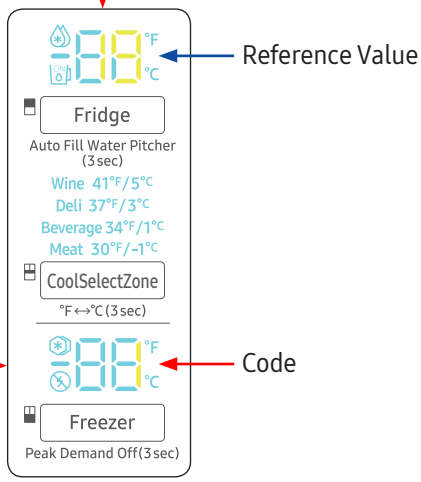


ex) If you want to change the fresh food compartment standard temperature to 4°F(2°C)

3) Operation rate changing table of dispenser heater

Set item	Dispenser Heater Rate
Reference Value	Fridge Room 7-SEG
	19

Setting value FZ compartment Code	Rate change
0	+0.0%
1	+ 20% operation (up to 100%)

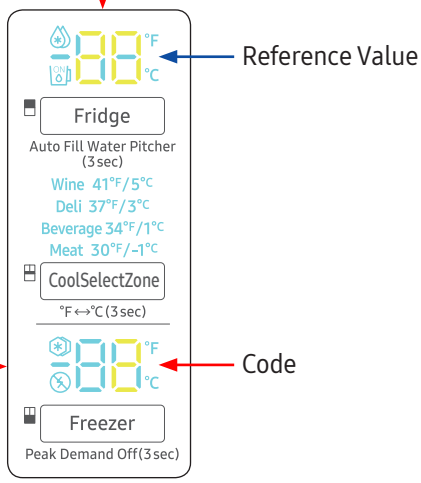


ex) If you want to change the dispenser heater operation rate to +20%

4) Temperature changing table of Pantry/Mid Drawer Room

Set item	Pantry/Mid Drawer Room Temp Shift
Reference Value	Fridge Room 7-SEG
	20

Setting value FZ compartment Code	Temp. compensation
0	0°F (0.0°C)
1	-1°F (-0.5°C)
2	-2°F (-1.0°C)
3	-3°F (-1.5°C)
4	-4°F (-2.0°C)
5	+1°F (+0.5°C)
6	+2°F (+1.0°C)
7	+3°F (+1.5°C)



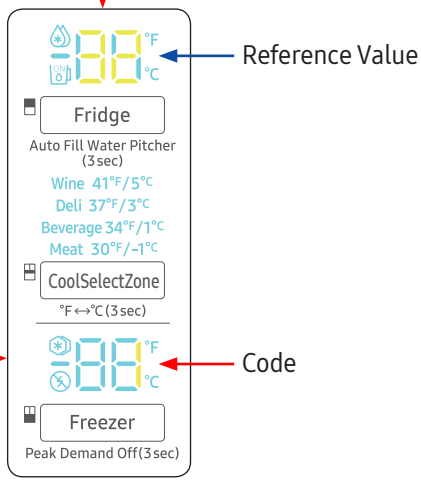
ex) If you want to change the mid drawer room temperature to -2°F(-1°C)

TROUBLESHOOTING

5) Amount of water supply to ice tray

Set item	Amount of Water Supply
Reference Value	Fridge Room 7-SEG
	32

Setting value FZ compartment Code	Amount of water supply
0	setting value
1	Setting value + 10cc
2	-
3	-
4	-
5	-
6	-
7	-

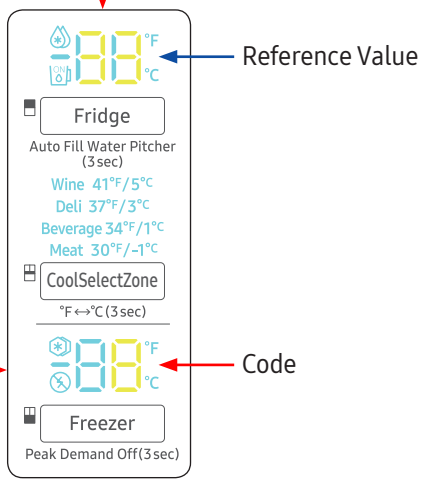


ex) If you want to change the amount of water supply to ice tray to Setting value + 10cc

6) Time changing table of ice maker dropping standby time

Set item	Ice Maker Standby Time
Reference Value	Fridge Room 7-SEG
	33

Setting value FZ compartment Code	Temp. compensation
0	14 min.
1	13 min.
2	12 min.
3	11 min.
4	10 min.
5	15 min.
6	16 min.
7	17 min.
8	18 min.
9	19 min.
10	20 min.
11	21 min.
12	22 min.
13	23 min.
14	24 min.
15	25 min.

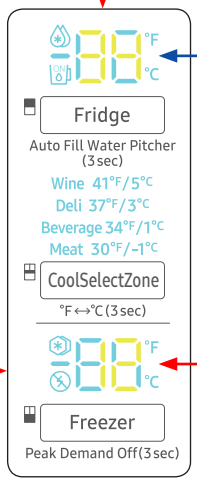


ex) If you want to change the ice maker dropping standby time to 18 minutes.

7) Temperature changing table of ice room

Set item	Ice Room Temp Shift
Reference Value	Fridge Room 7-SEG
	34

Setting value FZ compartment Code	Temp. compensation
0	0°F(0.0°C)
1	-1°F (-0.5°C)
2	-2°F (-1.0°C)
3	-3°F (-1.5°C)
4	-4°F (-2.0°C)
5	-5°F (-2.5°C)
6	-6°F (-3.0°C)
7	-7°F (-3.5°C)
8	+1°F (+0.5°C)
9	+2°F (+1.0°C)
10	+3°F (+1.5°C)
11	+4°F (+2.0°C)
12	+5°F (+2.5°C)
13	+6°F (+3.0°C)
14	+7°F (+3.5°C)
15	+8°F (+4.0°C)

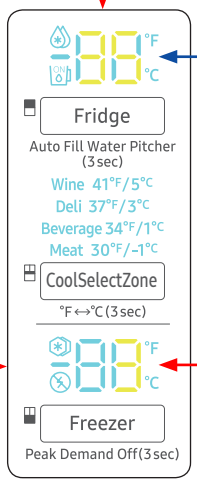


ex) If you want to change the ice room standard temperature to +5°F(+2.5°C)

8) Temperature changing table of Ice Maker Dropping Temperature

Set item	Ice Maker Dropping Temperature
Reference Value	Fridge Room 7-SEG
	35

Setting value FZ compartment Code	Temp. compensation
0	-13 °C
1	-12 °C
2	-11 °C
3	-10 °C
4	-14 °C
5	-15 °C
6	-16 °C
7	-17 °C



ex) If you want to change the mid drawer room temperature to -2°F (-1.5°C)

4-2) Diagnostic method according to the trouble symptom(Flow Chart)

DATA1.Temperature table

Resistance value and MICOM port voltage of sensor according to the temperature
SENSOR CHIP : based on PX41C, PX41C, 502AT/103**(ICE MAKER SENSOR(MOLD)/FULL UP, 20Kohm
(Actual measurement = value of the table below X 2)

°C	°F	Voltage	Resistance	°C	°F	Voltage	Resistance	°C	°F	Voltage	Resistance
-50	-58	4.694	153319	-5	23	3.107	16419	40	104	1.153	2997
-49	-56.2	4.677	144794	-4	24.8	3.057	15731	41	105.8	1.124	2899
-48	-54.4	4.659	136798	-3	26.6	3.006	15076	42	107.6	1.095	2805
-47	-52.6	4.641	129294	-2	28.4	2.955	14452	43	109.4	1.068	2714
-46	-50.8	4.622	122248	-1	30.2	2.904	13857	44	111.2	1.040	2627
-45	-49	4.602	115631	0	32	2.853	13290	45	113	1.014	2543
-44	-47.2	4.581	109413	1	33.8	2.802	12749	46	114.8	0.988	2462
-43	-45.4	4.560	103569	2	35.6	2.751	12233	47	116.6	0.963	2384
-42	-43.6	4.537	98073	3	37.4	2.700	11741	48	118.4	0.938	2309
-41	-41.8	4.514	92903	4	39.2	2.649	11271	49	120.2	0.914	2237
-40	-40	4.490	88037	5	41	2.599	10823	50	122	0.891	2167
-39	-38.2	4.465	83456	6	42.8	2.548	10395	51	123.8	0.868	2100
-38	-36.4	4.439	79142	7	44.6	2.498	9986	52	125.6	0.846	2036
-37	-34.6	4.412	75077	8	46.4	2.449	9596	53	127.4	0.824	1973
-36	-32.8	4.385	71246	9	48.2	2.399	9223	54	129.2	0.803	1913
-35	-31	4.356	67634	10	50	2.350	8867	55	131	0.783	1855
-34	-29.2	4.326	64227	11	51.8	2.301	8526	56	132.8	0.762	1799
-33	-27.4	4.296	61012	12	53.6	2.253	8200	57	134.6	0.743	1745
-32	-25.6	4.264	57977	13	55.4	2.205	7888	58	136.4	0.724	1693
-31	-23.8	4.232	55112	14	57.2	2.158	7590	59	138.2	0.706	1642
-30	-22	4.199	52406	15	59	2.111	7305	60	140	0.688	1594
-29	-20.2	4.165	49848	16	60.8	2.064	7032	61	141.8	0.670	1547
-28	-18.4	4.129	47431	17	62.6	2.019	6771	62	143.6	0.653	1502
-27	-16.6	4.093	45146	18	64.4	1.974	6521	63	145.4	0.636	1458
-26	-14.8	4.056	42984	19	66.2	1.929	6281	64	147.2	0.620	1416
-25	-13	4.018	40938	20	68	1.885	6052	65	149	0.604	1375
-24	-11.2	3.980	39002	21	69.8	1.842	5832	66	150.8	0.589	1335
-23	-9.4	3.940	37169	22	71.6	1.799	5621	67	152.6	0.574	1297
-22	-7.6	3.899	35433	23	73.4	1.757	5419	68	154.4	0.560	1260
-21	-5.8	3.858	33788	24	75.2	1.716	5225	69	156.2	0.546	1225
-20	-4	3.816	32230	25	77	1.675	5039	70	158	0.532	1190
-19	-2.2	3.773	30752	26	78.8	1.636	4861	71	159.8	0.519	1157
-18	-0.4	3.729	29350	27	80.6	1.596	4690	72	161.6	0.506	1125
-17	1.4	3.685	28021	28	82.4	1.558	4526	73	163.4	0.493	1093
-16	3.2	3.640	26760	29	84.2	1.520	4369	74	165.2	0.481	1063
-15	5	3.594	25562	30	86	1.483	4218	75	167	0.469	1034
-14	6.8	3.548	24425	31	87.8	1.447	4072	76	168.8	0.457	1006
-13	8.6	3.501	23345	32	89.6	1.412	3933	77	170.6	0.446	978
-12	10.4	3.453	22320	33	91.4	1.377	3799	78	172.4	0.435	952
-11	12.2	3.405	21345	34	93.2	1.343	3670	79	174.2	0.424	926
-10	14	3.356	20418	35	95	1.309	3547	80	176	0.414	902
-9	15.8	3.307	19537	36	96.8	1.277	3428	81	177.8	0.404	877
-8	17.6	3.258	18698	37	98.6	1.253	3344	82	179.6	0.394	854
-7	19.4	3.208	17901	38	100.4	1.213	3204	83	181.4	0.384	832
-6	21.2	3.158	1714	39	102.2	1.183	3098	84	183.2	0.375	810

DATA2. Humidity Sensor table

- Voltage output table @23°..., 5Vdc --- HTG3515CH/HTG3535C

$$RH[\%RH] = -\frac{19.7}{0.54} + \frac{100}{0.54} \cdot \frac{V_{RH}}{V_{DD}}$$

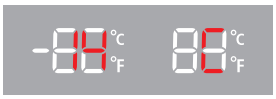
RH(%)	Output(mV)	RH(%)	Output(mV)	RH(%)	Output(mV)
0	985	34	1903	68	2821
1	1012	35	1930	69	2848
2	1039	36	1957	70	2875
3	1066	37	1984	71	2902
4	1093	38	2011	72	2929
5	1120	39	2038	73	2956
6	1147	40	2065	74	2983
7	1174	41	2092	75	3010
8	1201	42	2119	76	3037
9	1228	43	2146	77	3064
10	1255	44	2173	78	3091
11	1282	45	2200	79	3118
12	1309	46	2227	80	3145
13	1336	47	2254	81	3172
14	1363	48	2281	82	3199
15	1390	49	2308	83	3226
16	1417	50	2335	84	3253
17	1444	51	2362	85	3280
18	1471	52	2389	86	3307
19	1498	53	2416	87	3334
20	1525	54	2443	88	3361
21	1552	55	2470	89	3388
22	1579	56	2497	90	3415
23	1606	57	2524	91	3442
24	1633	58	2551	92	3469
25	1660	59	2578	93	3496
26	1687	60	2605	94	3523
27	1714	61	2632	95	3550
28	1741	62	2659	96	3577
29	1768	63	2686	97	3604
30	1795	64	2713	98	3631
31	1822	65	2740	99	3658
32	1849	66	2767	100	3685
33	1876	67	2794		

4-2-1. If the trouble is detected by self-diagnosis

- The error of sensor will be displayed on the front of display. when the error of sensor is detected at initial power ON, the appliance will not operated and display of abnormal sensor part will blink.
- The appliance will not stop operating when the error of sensor is detected during operation of the appliance.
  But normal freezing might be not operated if the appliance is operated by the emergency operation mode. You would better to check the appliance according to the self-diagnosis of the manual.

1) If ICE Maker(R) Sensor has troubled (check the other sensors in the same procedure)

ERROR Code



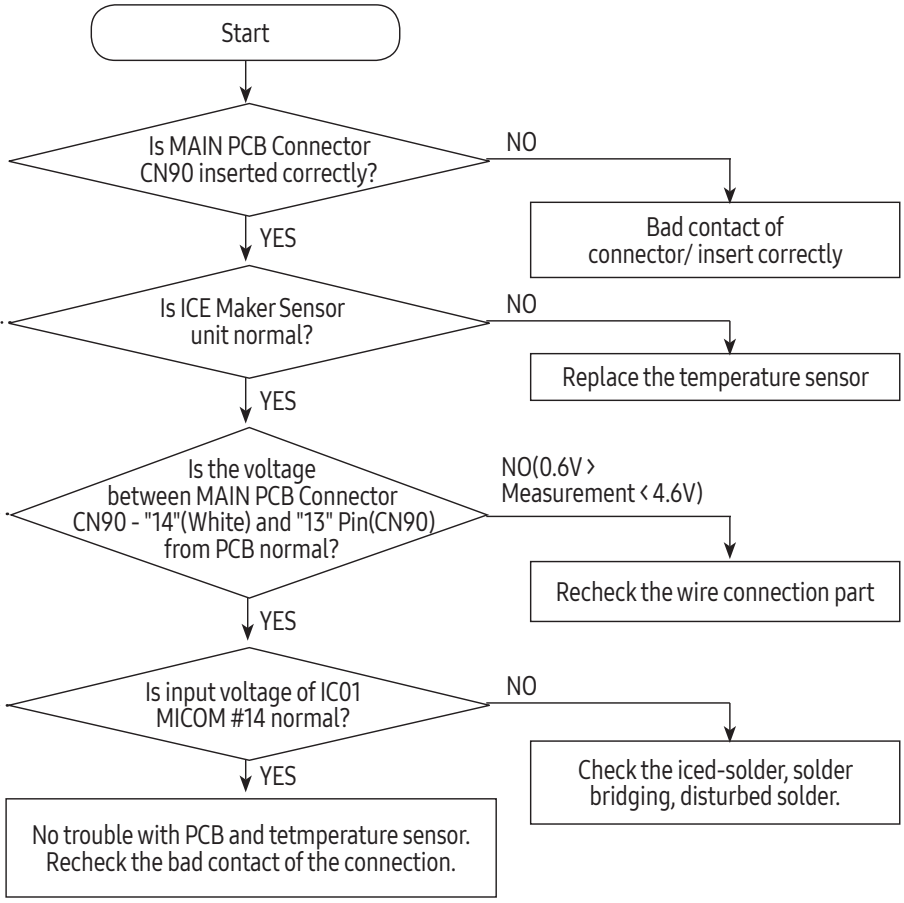
DATA1.
Temperature table

** Measuring point of resistance value according to Sensor **
ICE MAKER(R): (R) CN90 "14" ↔ "24", (F) CN90 "11" ↔ "13" measuring resistance value
ICE Room: CN90 "2" ↔ "4" measuring resistance value
** 0Ω: Short trouble / Ω∞: Open trouble

Refer to circuit diagram in the manual

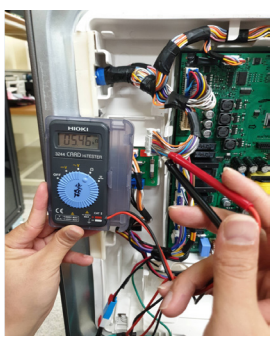
Sensor MICOM/Connector number	
ICE Maker	R : Connector CN90-"14"(WHT) and "13" Pin(CN90) from PCB typical Ground F : Connector CN90-"11"(WHT) and "13" Pin(CN90) from PCB typical Ground
ICE Room	Connector CN90-"2"(GRY) and "13" Pin(CN90) from PCB typical Ground
Voltage measured between 4.6V ~ 0.6V.	

ICE Maker : Measuring voltage of IC01 MICOM #14, CN90-"14"(WHT) and "13" Pin(CN90) from PCB typical Ground part are similar.
→ Check the measure on the voltage of Resistance, R925 DUE to the SMD MICOM
ICE Room : Measuring voltage of IC01 MICOM #11, CN90-"2"(GRY) and "13" Pin(CN90) from PCB typical Ground part are similar.
→ Check the measure on the voltage of Resistance, R919 DUE to the SMD MICOM



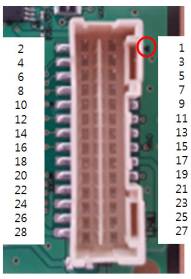
ICE Maker
☞ Checking method of ICE Maker Sensor resistance
CN90 "14"(FLAT WHT) ↔ "24"(FLAT WHT)- Compare the temperature table after the measure.

ICE Room
☞ Checking method of ICE Room Sensor resistance
CN90 "2"(GRY) ↔ "4"(YEL)- Compare the temperature table after the measure.



☞ **Checking method of ICE Maker Sensor resistance**
- Measure the voltage of Resistance
  ICE Maker : R925(IC01 MICOM #14) on PCB or CN90 "14"(WHT) and "13" Pin(CN90) from PCB
  ICE Room : R919(IC01 MICOM #11) on PCB or CN90-"2"(GRY) and "13" Pin(CN90) from PCB
- Compare the temperature table after the measure. Measuring voltage of
  ICE Maker : CN90-"14"(White) and "13" Pin(CN90) from PCB
  ICE Room : CN90-"2"(GRY) and "13" Pin(CN90) from PCB

PIN Number



2) If R Sensor has trouble (check the other sensors in the same procedure)

ERROR Code

DATA1.
Temperature table

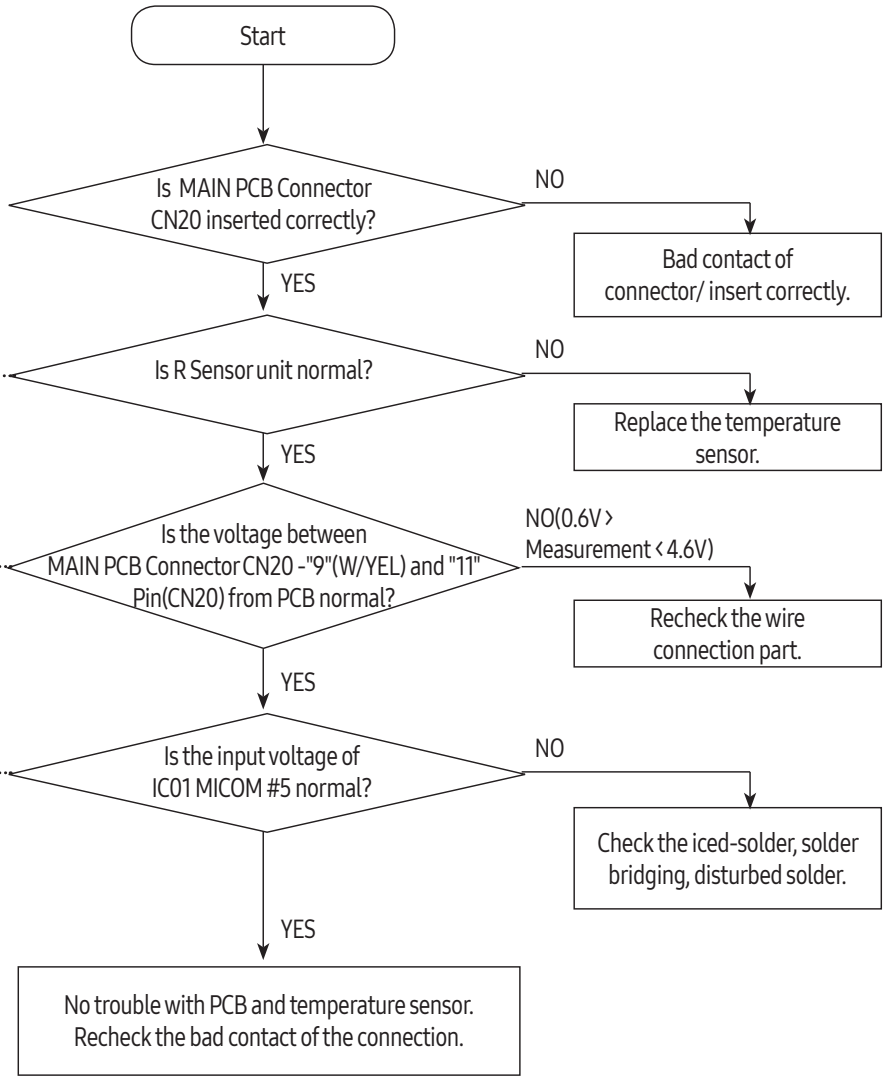
** Measuring point of resistance value according to Sensor **
R : CN20 - "9" ↔ "7"
R-DEF : CN20 - "5" ↔ "7"
F : CN20 - "10" ↔ "12"
F-DEF : CN20 - "6" ↔ "8"
Pantry : CN40 - "18" ↔ "20"
Ambient : CN60 - "5" ↔ "16"
measuring resistance value
** 0Ω: Short trouble /Ω∞: Open trouble

Refer to circuit diagram in the manual

Sensor MICOM/Connector number	
R	Connector CN20 -"9"(W/YEL) and "11" Pin(CN20) from PCB typical Ground
R-DEF	Connector CN20 -"5"(YEL) and "7" Pin(CN20) from PCB typical Ground
F	Connector CN20 – "10"(YEL) and "12" Pin(CN20) from PCB typical Ground
F-DEF	Connector CN20 – "6"(BLU) and "8" Pin(CN20) from PCB typical Ground
Pantry	Connector CN40 – "18"(W/YEL) and "20" Pin(CN40) from PCB typical Ground
Ambient	Connector CN60 – "5"(W/BLU) and "16" Pin(CN60) from PCB typical Ground
Voltage measured between 4.6V ~ 0.6V.	

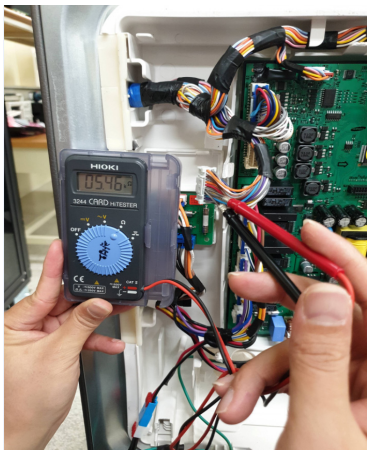
☞ **Checking method of ICE Maker/ICE Room Sensor resistance**

Measuring voltage
R : IC01 MICOM #5, CN20 -"9"(W/YEL) and "11" Pin(CN20)
R-DEF : IC01 MICOM #3, CN20 -"5"(YEL) and "7" Pin(CN20)
F : IC01 MICOM #7, CN20 – "10"(YEL) and "12" Pin(CN20)
F-DEF : IC01 MICOM #6, CN20 – "6"(BLU) and "8" Pin(CN20)
Pantry : IC01 MICOM #2, CN40 – "18"(W/YEL) and "20" Pin(CN40)
Ambient : IC01 MICOM #12, CN60 – "5"(W/BLU) and "16" Pin(CN60)
from PCB typical Ground part are similar.
→ Check the measure on the voltage of Resistance, R210(R), R209(R-DEF), R224(F), R223(F-DEF), R427(Mid), R228(Ambient) due to the SMD MICOM



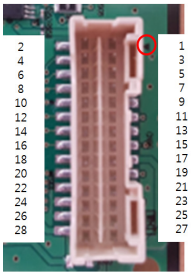
2) If R Sensor has trouble (check the other sensors in the same procedure) (cont.)

☞ **Checking method of R Sensor resistance**
R :CN20 - "9"(W/YEL) ↔ "11"(WHT)
R-DEF : CN20 - "5"(YEL) ↔ "7"(GRN)
F : CN20 - "10"(YEL) ↔ "12"(YEL)
F-DEF : CN20 - "6"(BLU) ↔ "8"(W/GRY)
Pantry : CN40 - "18"(W/YEL) ↔ "20"(GRY)
Ambient : CN60 - "5"(W/BLU) ↔ "16"(FLAT_WHT)
Compare the temperature table after measurment.



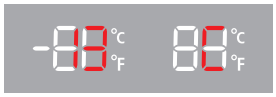
☞ **Checking method of Sensor resistance**
- Measure the voltage of Resistance
R : R210(IC01 MICOM #5) on PCB or CN20 "9"(W/YEL) and "11" Pin(CN20) from PCB
R-DEF : R209(IC01 MICOM #3) on PCB or CN20 -"5"(YEL) and "7" Pin(CN20) from PCB
F : R224(IC01 MICOM #7) on PCB or CN20 – "10"(YEL) and "12" Pin(CN20) from PCB
F-DEF : R223(IC01 MICOM #6) on PCB or CN20 – "6"(BLU) and "8" Pin(CN20) from PCB
Pantry : R427(IC01 MICOM #2) on PCB or CN40 – "18"(W/YEL) and "20" Pin(CN40) from PCB
Ambient : R228(IC01 MICOM #12) on PCB or CN60 – "5"(W/BLU) and "16" Pin(CN60) from PCB
- Compare the temperature table after the measure. Measuring voltage of
R : R210(IC01 MICOM #5) on PCB or CN20 "9"(W/YEL) and "11" Pin(CN20)
R-DEF : R209(IC01 MICOM #3) on PCB or CN20 -"5"(YEL) and "7" Pin(CN20)
F : R224(IC01 MICOM #7) on PCB or CN20 – "10"(YEL) and "12" Pin(CN20)
F-DEF : R223(IC01 MICOM #6) on PCB or CN20 – "6"(BLU) and "8" Pin(CN20)
Pantry : R427(IC01 MICOM #2) on PCB or CN40 – "18"(W/YEL) and "20" Pin(CN40)
Ambient : R228(IC01 MICOM #12) on PCB or CN60 – "5"(W/BLU) and "16" Pin(CN60) from PCB are as below.

PIN Number



3) If Humidity Sensor has trouble

ERROR Code

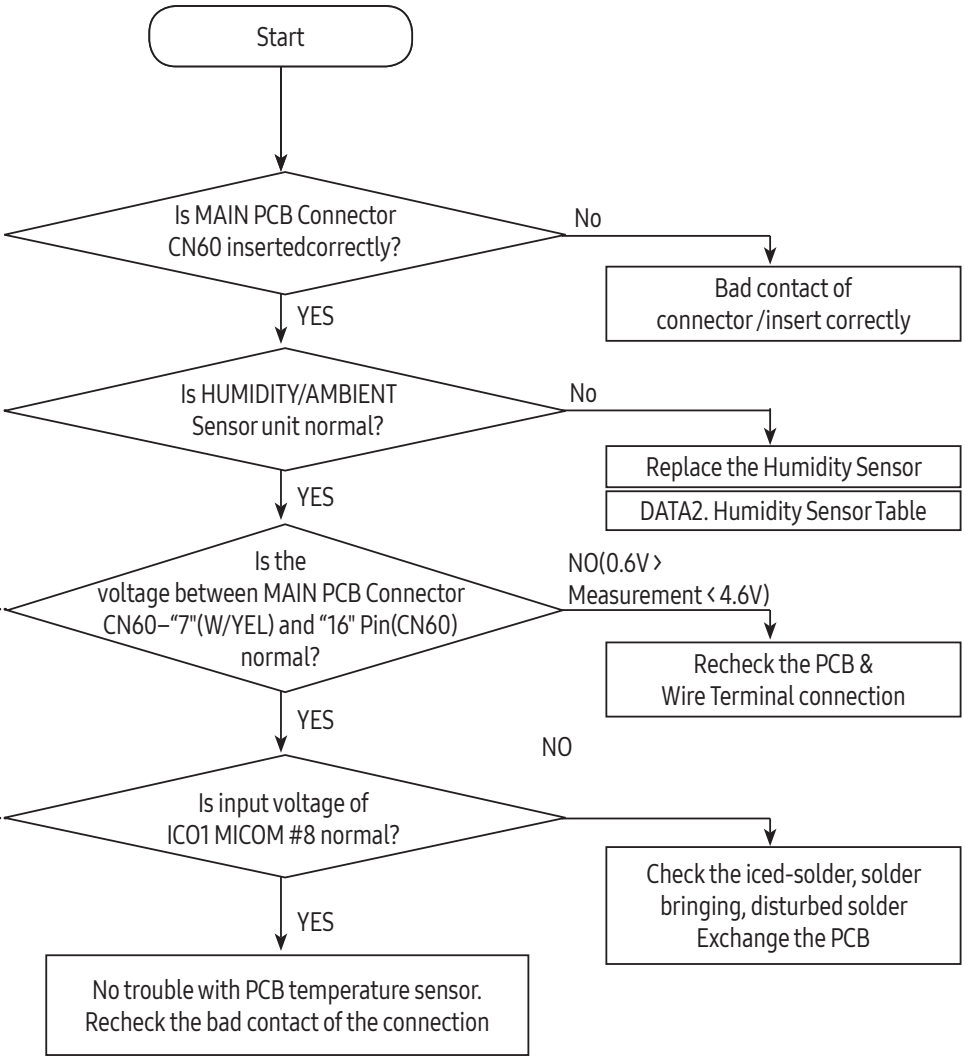


** Measuring point of resistance value according to Sensor"
Humidity : CN60 - "7" ↔ "16"
Resistance value with opened : about 50Ω
** 0Ω: Short trouble /Ω∞: Open trouble

Refer to circuit diagram in the manual

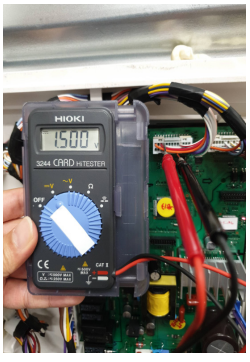
Sensor MICOM/Connector number	
Humidity	Connector CN60 – "7"(W/YEL) and "16" Pin(CN60) from PCB typical Ground
Voltage measured between 4.6V ~ 0.6V.	

Measuring voltage of ICO1 MICOM #8, CN60 – "7"(W/YEL) and "16" Pin(CN60) from PCB typical Ground part are similar.
→ Check the voltage of Resistance, R218

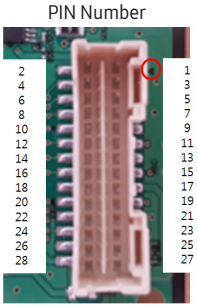


☞ **Checking method ofHumidity Sensor resistance**
CN60 - "7"(W/YEL) ↔ "16"(FLAT_WHT)
- Compare the temperature table after the measure.

☞ **Checking method of Sensor resistance**
- Measure the voltage of Resistance, R218(IC01 MICOM #8) on PCB or CN60 – "7"(W/YEL) and "16" Pin(CN60) from PCB are as below.
- Compare the temperature table after the measure.
Measuring voltage of R218(IC01 MICOM #8) on PCB or CN60 – "7"(W/YEL) and "16" Pin(CN60) from PCB are as below.

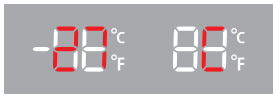


PIN Number



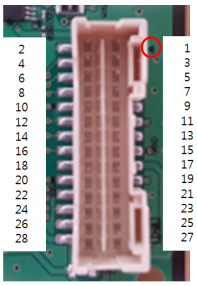
4) Pantry Drawer Room Damper Heater has trouble (OPTION)

ERROR Code



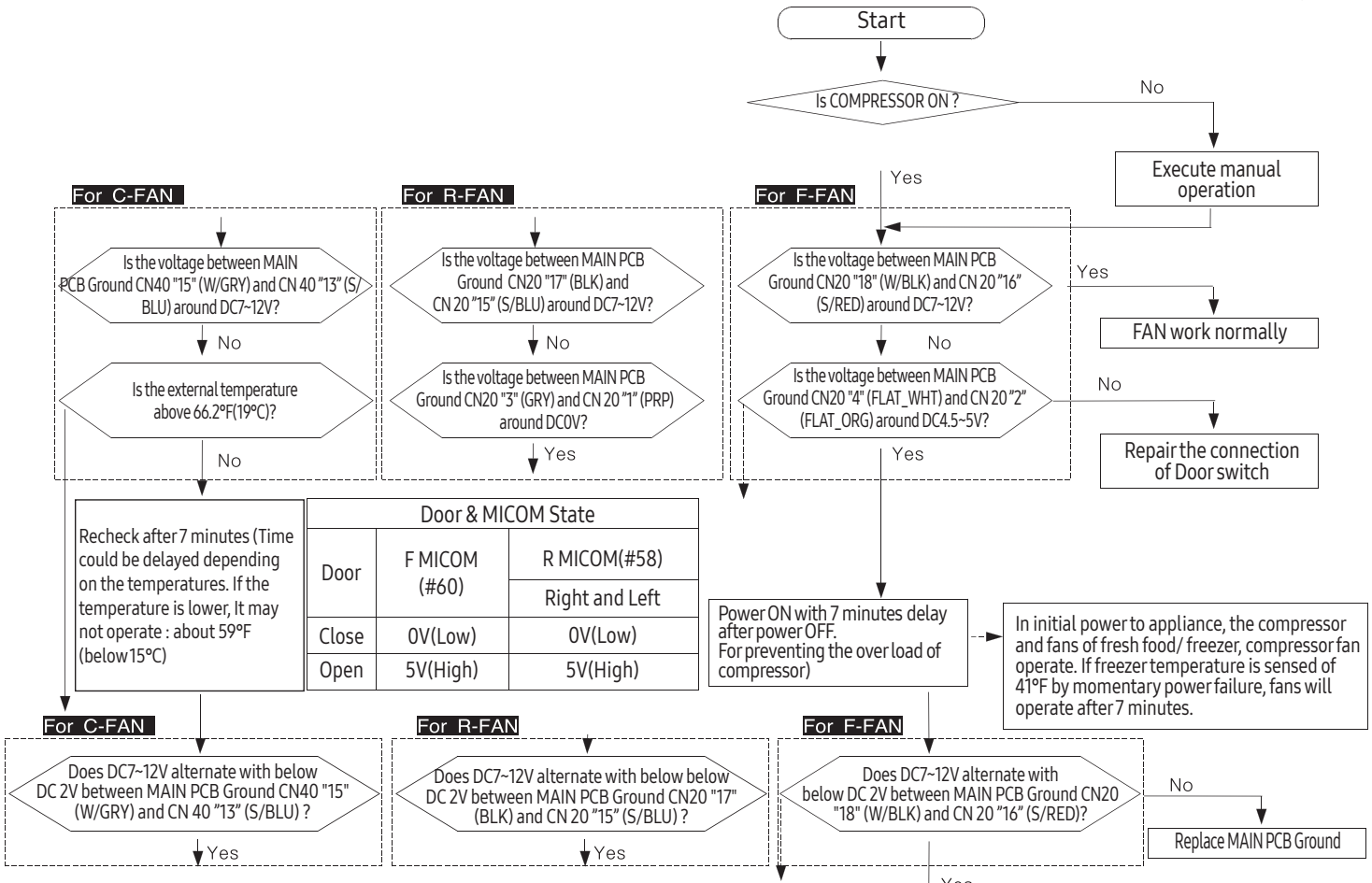
☞ Checking method of Pantry Room Damper resistance
CN40-"25"(Brown) ↔ "27"(Black)
** Ω∞: Open (wire disconnection, heater disconnection) trouble / 0Ω: Short trouble

PIN Number



4-2-2. If FAN does not operate

The refrigerator of this model has BLDC FAN motor. BLDC motor is driven by DC 7~12V.
On the normal condition of COMP ON, it operates together with F-FAN motor. If door is opened and closed once at a high ambient temperature, it will be operated after1 minute delay. Therefore, you are advised not to taken it for an error.
If there is a trouble, you should select the self-diagnostic function to check the trouble before power off.



F FAN pulse voltage CN20 "14"(PNK)

The voltage measured around 2~3V with multi-meter though the voltage is very weak because of pulse signal

Reference

CN20-13(R), 14(F), CN40-11(C)will generate the pulse signal when motor rotates. These signals will be inputted into MICOM.
Unless signals are not inputted during motor operating, will be ON10 seconds after fan Off. But if signals are not still entered, the above operation will restart four times more. If signals are not entered continuously, the motor will be restarted after10 Minutes. This function is effective when the normal operation of motor would be restrained by foreign matters such as ice.

• Expected causes

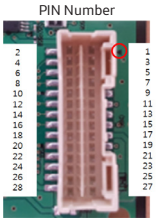
① Check that if FAN-MOTOR has failure itself.
② Check that if wiring connection has bad contact.
③ Check the input of the fan motor rotation pulse when motor fan operates.

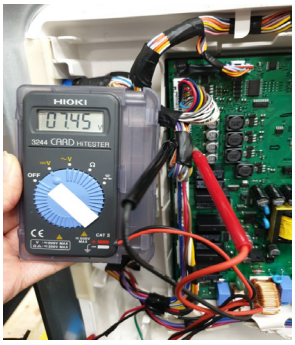
☞ **Display for checking the self-diagnostic function**

R FAN ERROR (Option)	F FAN ERROR	C FAN ERROR
-22 88	-2E 88	-23 88

The voltage between PCB typical Ground CN20 "17" Pin and
F FAN : CN20 "16" (S/RED) shall be less than DC 7~12V.
R FAN : CN20 "15" (S/BLU) shall be less than DC 7~12V.
C FAN : CN 40 "13" (S/BLU) shall be less than DC 7~12V.
- Recheck if resistance values are different after measuring.

PIN Number



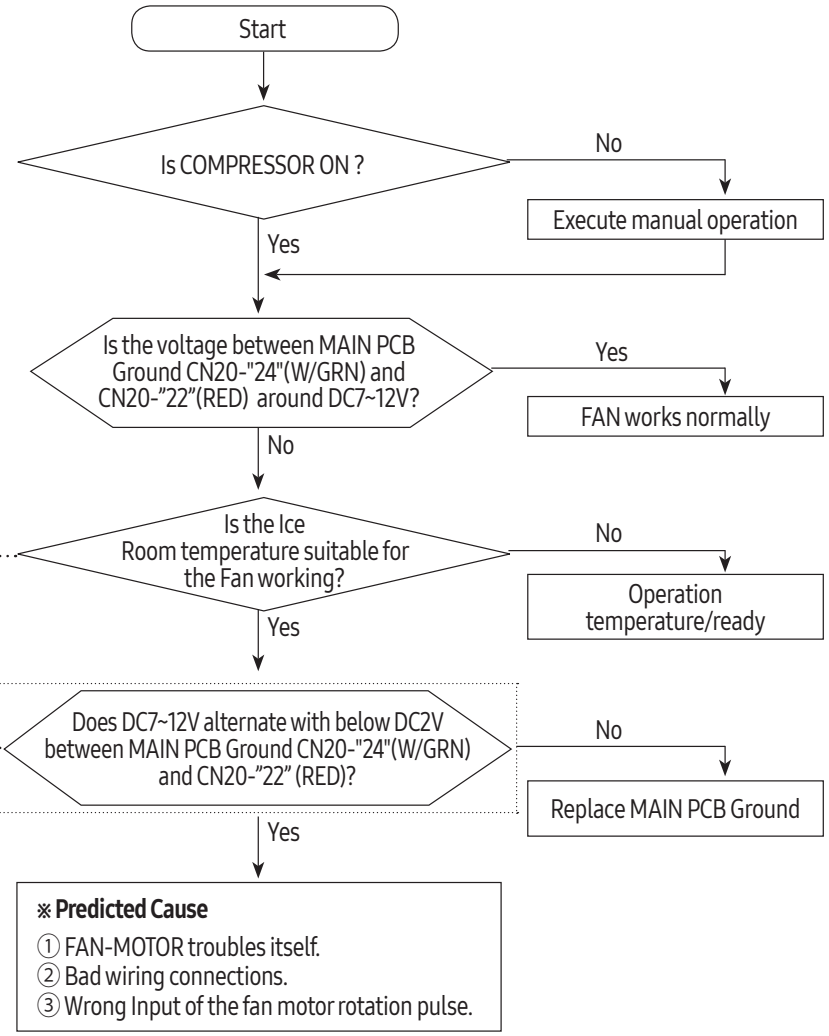


4-2-3. If ICE Room Fan does not operate

This refrigerator has BLDC FAN motor. BLDC motor is driven by DC7~12V.
When COMP ON, normally operates with F-FAN motor.
If there is any trouble, you should select the self-diagnostic function to check the trouble before power off.

- When pressing the ICE TEST S/W for a certain period of time (over 1.5sec), the function is accomplished. After beginning of TEST mode, Ice maker heater turns on for initial 2 minutes, if the ice making temperature is below 0°C.
- If it exceeds 0°C, Ice maker heater turns on for initial 30 seconds.
- After Ice maker heater turns on for 30 seconds, it turns off and then Ice maker motor turns on.
- As the Ice maker motor turns on, TEST MODE COUNT operates. (6 minutes count)

Condition
- Ambient temperature : 32°C/75%
- Notch : 2°F/38°F(-19.0°C/3.3°C)
  Initial full of ice bucket capacity : 794 g, 58ea



Ice Room control temperature	
Ice ON	8.6°F(-13°C)
Ice OF	26.6°F(-3°C)

Reference

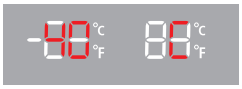
CN20 "20" will generate the pulse signal when motor rotates.
These signals will be input into MICOM.
Unless signals are not input during motor operating, will be ON 10seconds after fan OFF. But if signals are not still taken, the above operation will be retried four times more. If signals are not taken continuously, the motor will be restarted after10 minutes.
This function is against the case that motor movement would be restrained by foreign matters like ice.

FAN pulse voltage CN20-"20"(WHT/PURPLE)

The voltage is variable due to pulse signal but measured about 2~3V with the Multi-Meter.

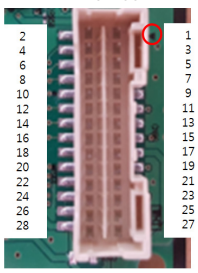
☞ **Display for checking the self-diagnostic function**

Ice Room FAN ERROR



☞ **Checking method of Ice Room FAN Motor Voltage with the voltage between Ice Room FAN : CN20-"24"(W/GRN) and CN20-"22"(RED) shall be less than DC 7~12V.**

PIN Number



4-2-4. When ICE MAKER(FF) does not operate

1. Water will be automatically supplied to the Ice Maker depending on temperature & time conditions, and ice will be produced to dispense.
2. Power is applied to one end of the wires. So, make sure to refer to its Exploded View whenever doing the disassembly.
3. The operation of the Ice Maker shall be done after pressing the Ice Maker Test Button.
   (Fridge Ice Maker) It is not possible to check when the power is off.
4. Since both of the PCB and the Ice Maker are located at the front and the back each other, make sure to have two people check them.
5. It may cause burn when the Ice Maker Heater heats up. So, please take an extra caution.
6. The Ice Maker has a counter-clockwise rotation function. So, its counter-clockwise rotation is normal.

Displays ERROR Code

Opration Condition while Motor is rotating Micom(IC01) Operation Status		
	Stand-by	On
Motor Load (IC01 #21)	0V	5V
Heater Load (EX01 #10)	0V	5V
Heater operates differently according to the conditions. Test Mode operation will be 30 sec.		

Start

Ice Maker rotates when pressing the Ice Maker testing switch (over1.5 sec)?

Micom(IC01) Operation Status		
#90 (Test Switch)	Stand-by	On
	5V	0V

No

1) Check & Replace ICE MAKER KIT.
2) Check Main PCB Input Signal & Replace it.
(Micom IC01 Pin #90 - "0V")

Yes

Input Voltage of IC01 MICOM #22 is normal?

Micom(IC01) Operation Status				
	Standby	Rotation	Before finishing	Completed
#22 (Blade Ice Scoop)	0V	4.9V	4.9V	0V

No

1) Check Wire Connection.
2) Check & Replace ICE MAKER KIT.
3) Check & Replace MAIN PCB.

Yes

Is the water supplied in 6 minutes (After detecting the full bucket and its horizontality)?

Ice maker Operation Status
Home → Motor CCW Rotation → Motor CW Rotation → Water Supply → Normal ('Ding Dong' Sound)

No

1) Check & Replace Water Valve.
* Refer to Water Valve Operating Conditions.
2) Check & Replace Main PCB.

Yes

Is the ICE Maker Sensor normal?

No

1) Check & Repair ICE Maker Sensor.
* Refer to it when ICE Maker Sensor is defective.

Yes

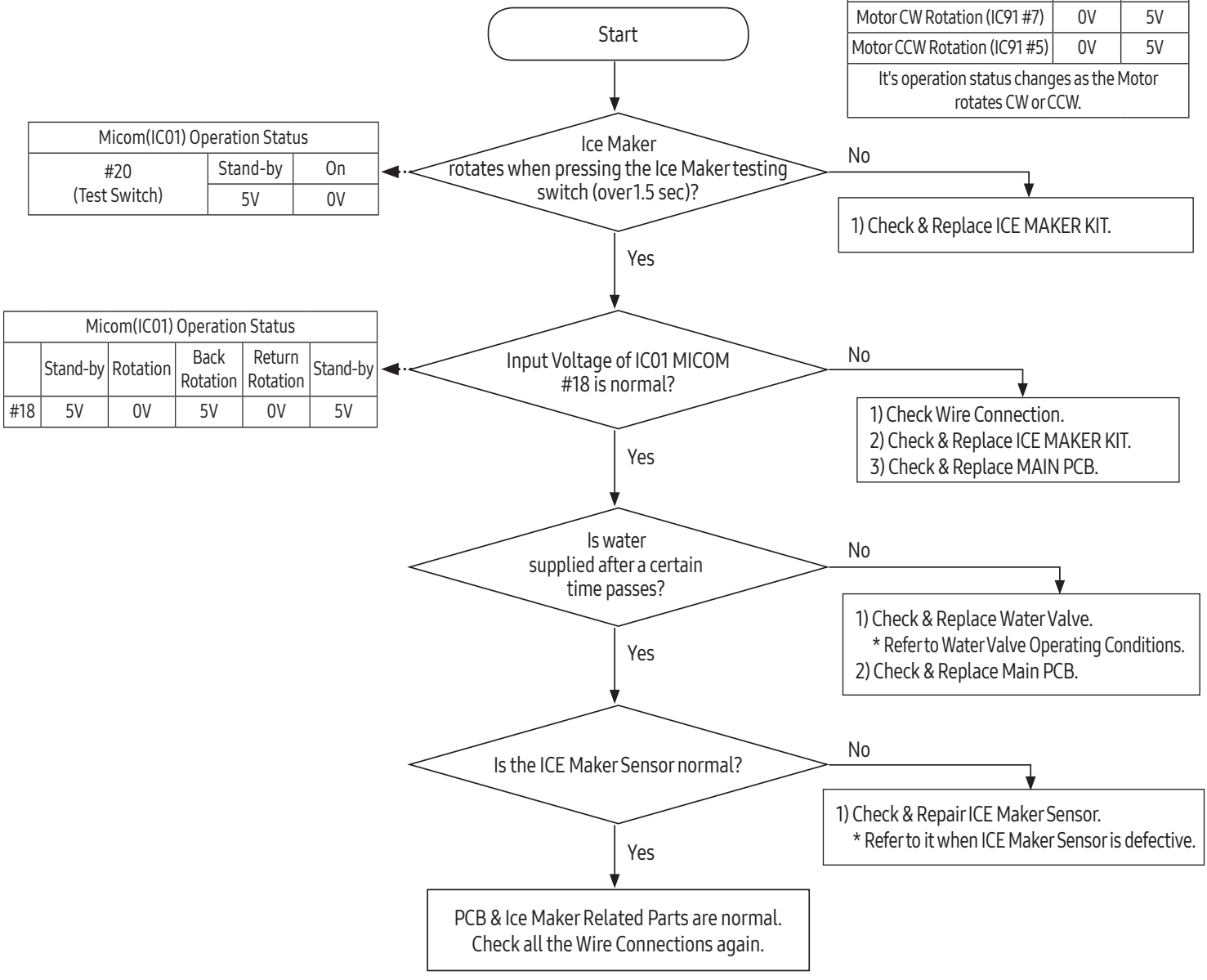
PCB & Ice Maker Related Parts are normal.
Check all the Wire Connections again.

4-2-5. When ICE MAKER(FZ) does not operate

1. Water will be automatically supplied to the Ice Maker depending on temperature & time conditions, and ice will be produced to dispense.
2. Power is applied to one end of the wires. So, make sure to refer to its Exploded View whenever doing the disassembly.
3. The operation of the Ice Maker shall be done after pressing the Ice Maker Test Button. (Freezer Ice Maker) It is not possible to check when the power is off.
4. Since both of the PCB and the Ice Maker are located at the front and the back each other, make sure to have two people check them.

Displays ERROR Code

Opration Condition while Motor is rotating Micom(IC01) Operation Status		
	Stand-by	On
Motor CW Rotation (IC91 #7)	0V	5V
Motor CCW Rotation (IC91 #5)	0V	5V
It's operation status changes as the Motor rotates CW or CCW.		

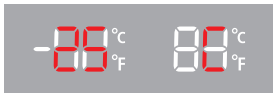


Micom(IC01) Operation Status		
#20 (Test Switch)	Stand-by	On
	5V	0V

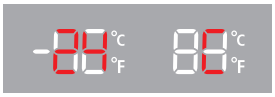
Micom(IC01) Operation Status					
	Stand-by	Rotation	Back Rotation	Return Rotation	Stand-by
#18	5V	0V	5V	0V	5V

4-2-6. If defrost does not operate (F,R DEF Heater)

R DEF ERROR



F DEF ERROR



****Measuring point of resistance value according to heater****
F-DEF : CN70 "5"(BRN) ↔ CN71_1 "5" (BLK) measuring resistance value(63 ohm ± 7%)
R-DEF : CN70 "3"(WHT) ↔ CN71_1 "5" (BLK) measuring resistance value(120 ohm ± 7%)
**** 0Ω : Short trouble / Ω∞: Open(bimetal, heater) trouble**

Reference to the manual "Self-Diagnostic"

****Measuring point of resistance value according to sensor****
F-DEF : CN20 - "6" ↔ "8" measuring resistance value
R-DEF : CN20 - "5" ↔ "7" measuring resistance value
**** 0Ω : Short trouble /Ω∞: Open trouble**

Resistance value of sensor according to temperature		
86°F(30°C)	4.22kΩ	If you need the temperature with detail, refer to DATA1. temperature table
68°F(20°C)	6.05kΩ	
50°F(10°C)	8.87kΩ	
32°F(0°C)	13.29kΩ	
14°F-10°C)	20.42kΩ	
-4°F-20°C)	32.23kΩ	
-22°F(-30°C)	52.41kΩ	

Start

Are the all deforst heater normal?
- No → Check the bimetal, heater disconnection, wiring connection etc.
- Yes ↓

Is defrost sensor by self-diagnostic normal?
- No → Refer to self-diagnostic function in the manual → Replace the applicable sensor
- Yes ↓

Is the temperature of defrost sensor lower than 53.6°F (12°C)?
- No → manual operation for a certain time
- Yes ↓

Manual defrosting of fresh food and freezer compartments operate simultaneously.

If Fridge Key + CoolSelectZone Key are pressed simultaneously for 6 seconds and then select CoolSelectZone Key, 3rd test mode (manual defrosting) will be operated.

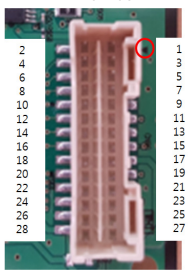
Is power applied to each defrost heaters?
- No → Is connection terminal of MAIN PBA part normal?
  - No → Repair connection terminal
  - Yes → Check bimetal, heater itself, disconnection etc. → Replace failure Relay or replace PBA ASS'Y
- Yes ↓

Does the system return to cooling operation after heating for specified time?
- No → Recheck the applicable sensor.
- Yes → Normal

Reference
If defrost sensor temperatures of fresh food and freezer compartments are higher than 50°F(10°C), 53.6°F(12°C) by the heating from heater, heating would be finished and will return to cooling operation after a pause.

☞ **Checking method of F,R DEF Heater resistance value**
F-DEF : CN70 "5"(BRN) ↔ CN71_1 "5" (BLK)
R-DEF : CN70 "3"(WHT) ↔ CN71_1 "5" (BLK)
- Recheck if resistance values are different after the test

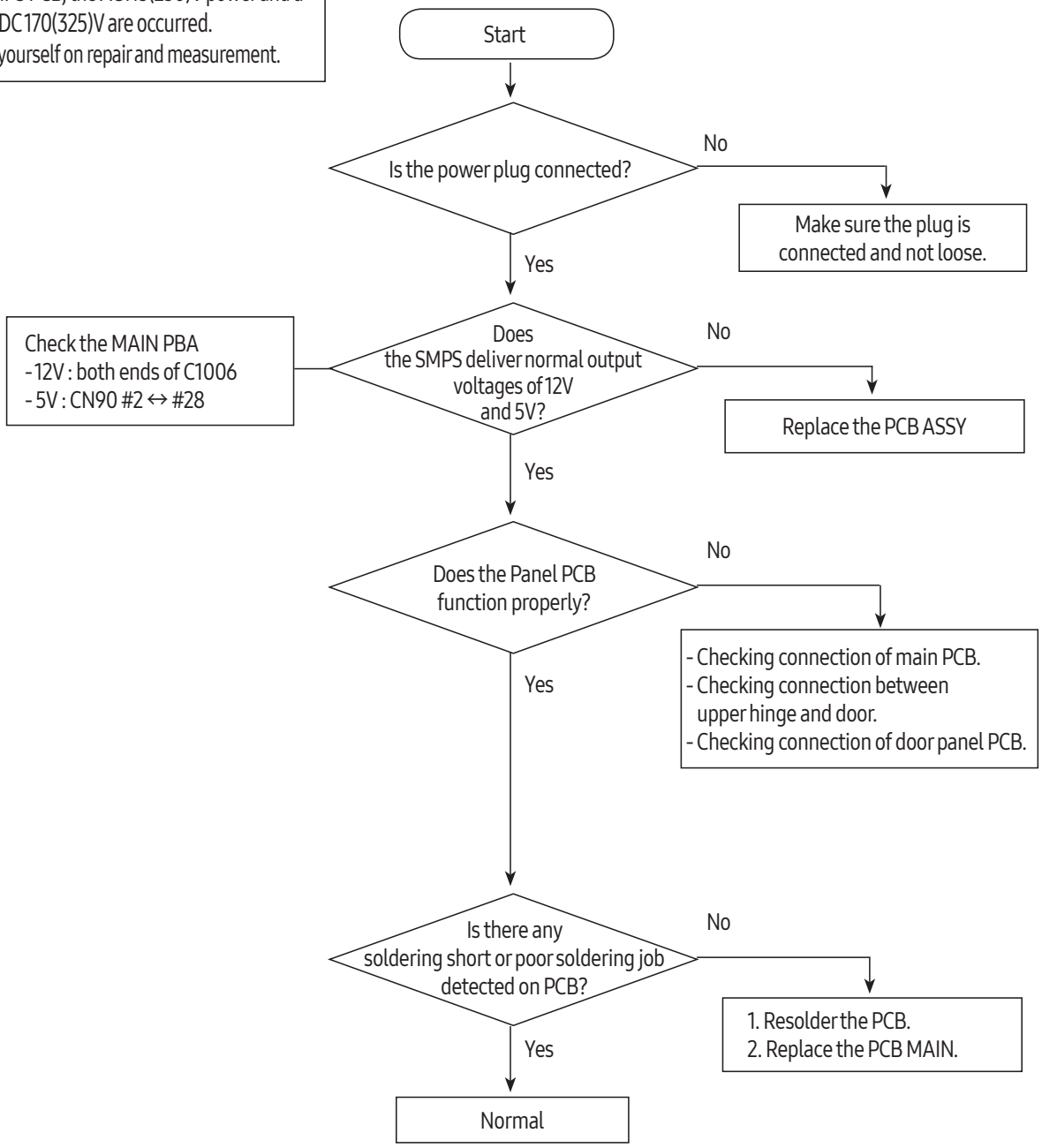
PIN Number



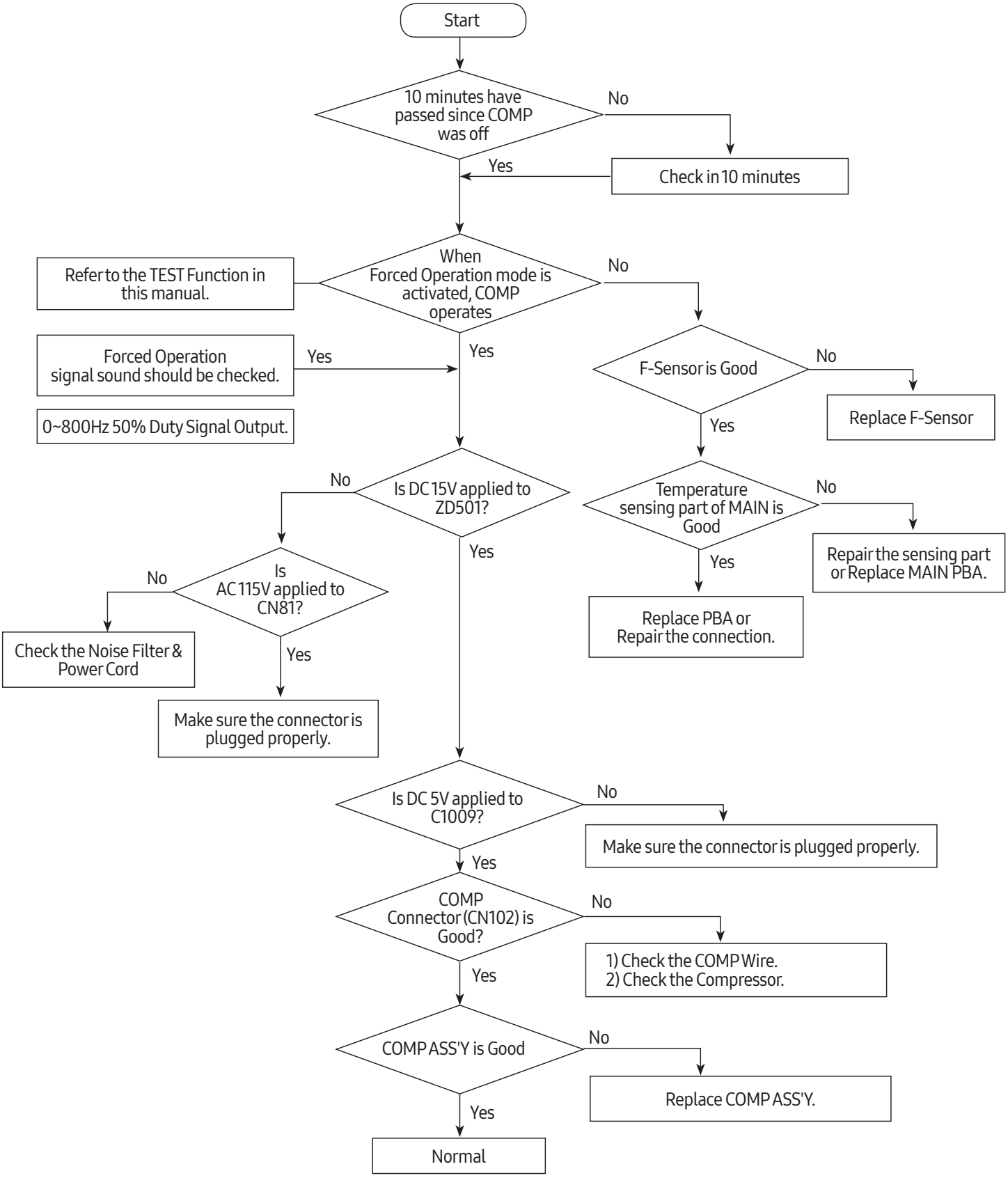
4-2-7. When Power is not applied

Caution

At the power of SMPS PCB, the AC115(230)V power and a high-voltage over DC170(325)V are occurred.
Please take care of yourself on repair and measurement.

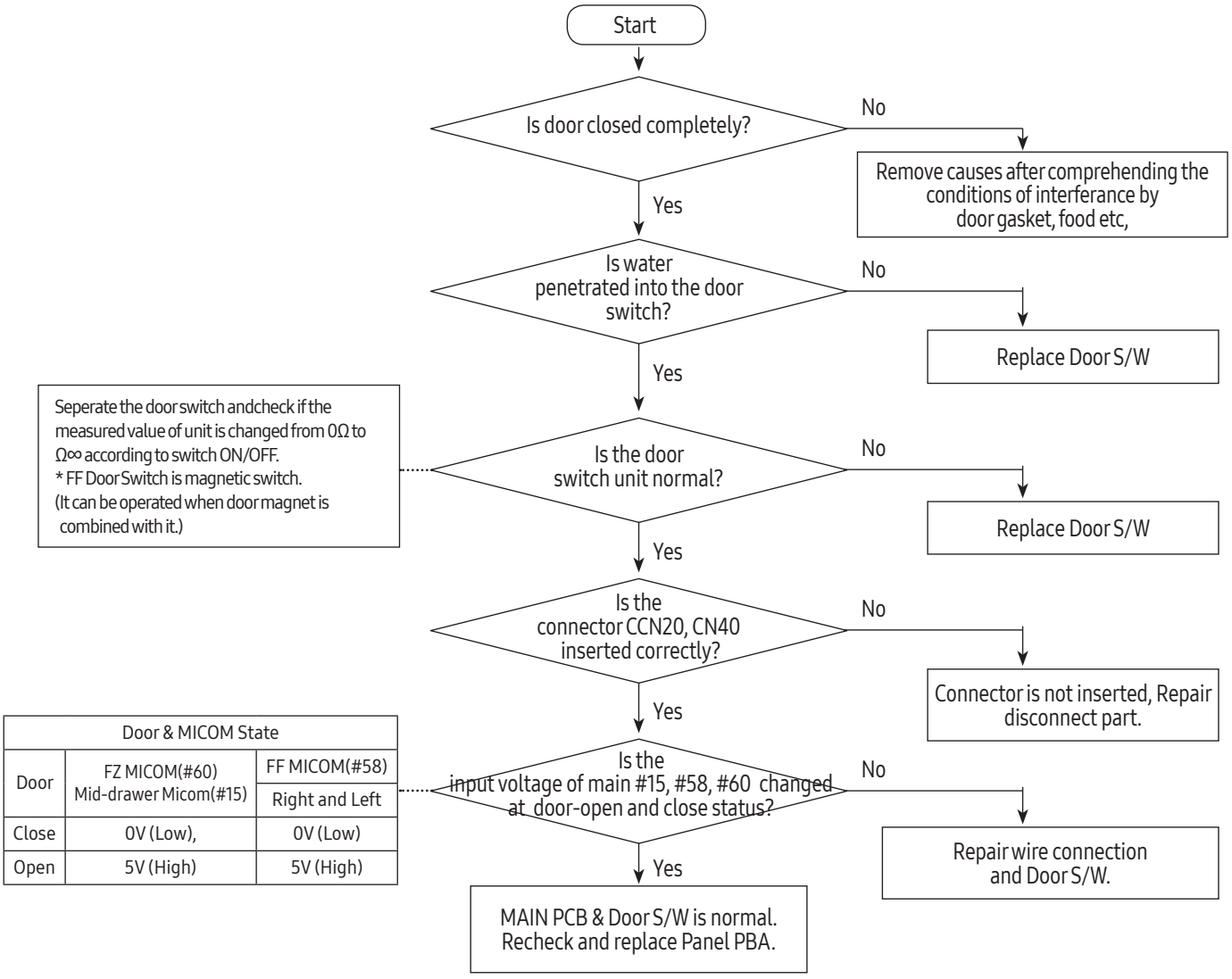


4-2-8. When Compressor does not run (Inverter COMP.)

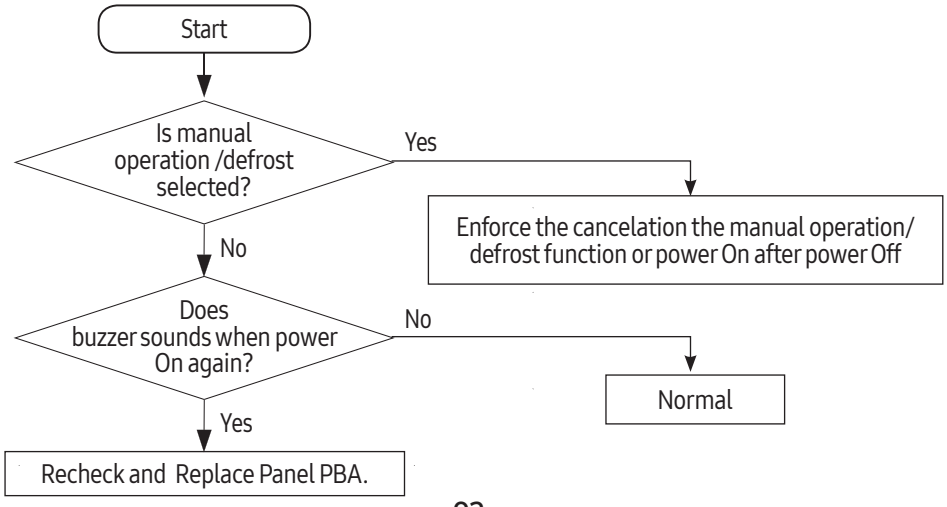


4-2-9. When alarm sounds continuously without stop(related with buzzer sound)

① If 'diring-diring' sound continuously

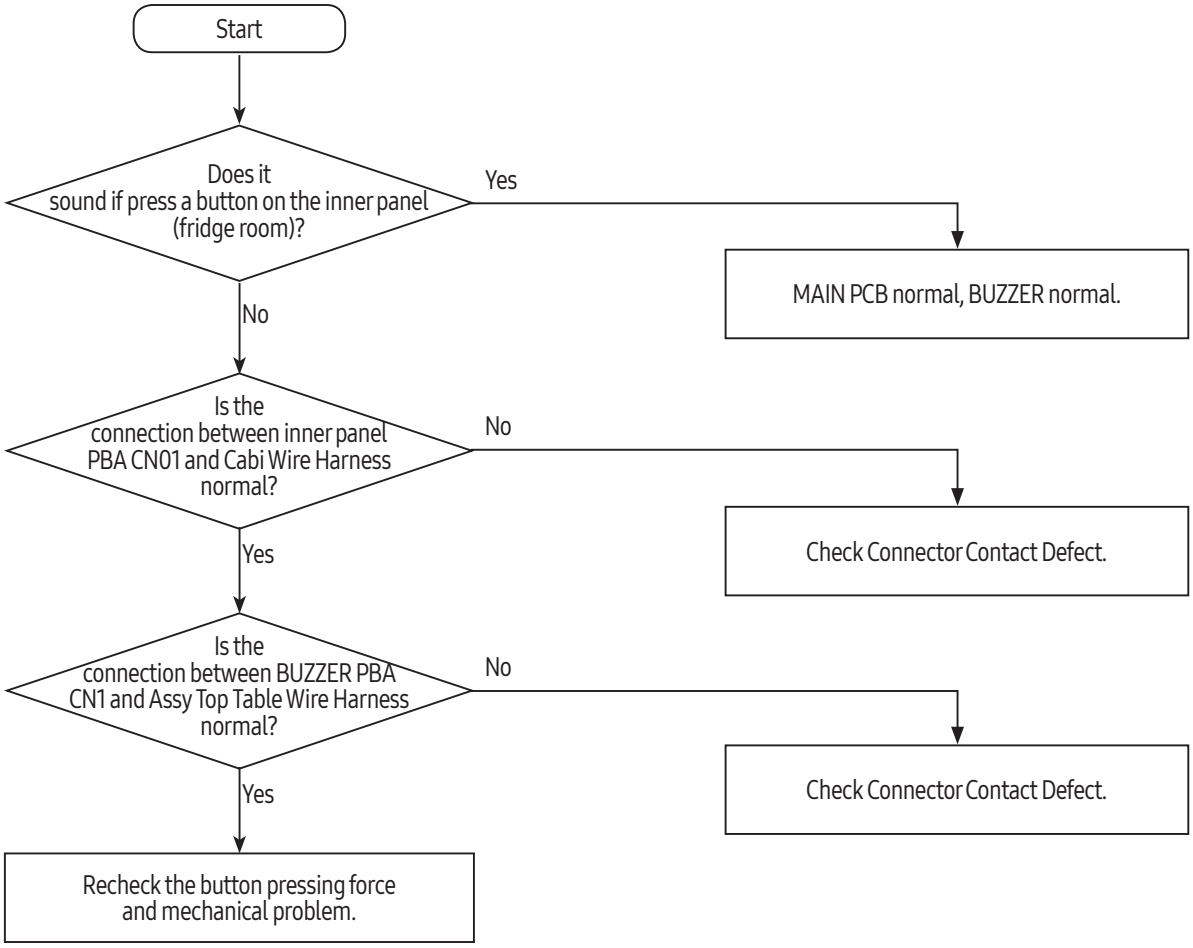


② If 'beep-beep' sounds conttinuously



③ If buzzer does not sound

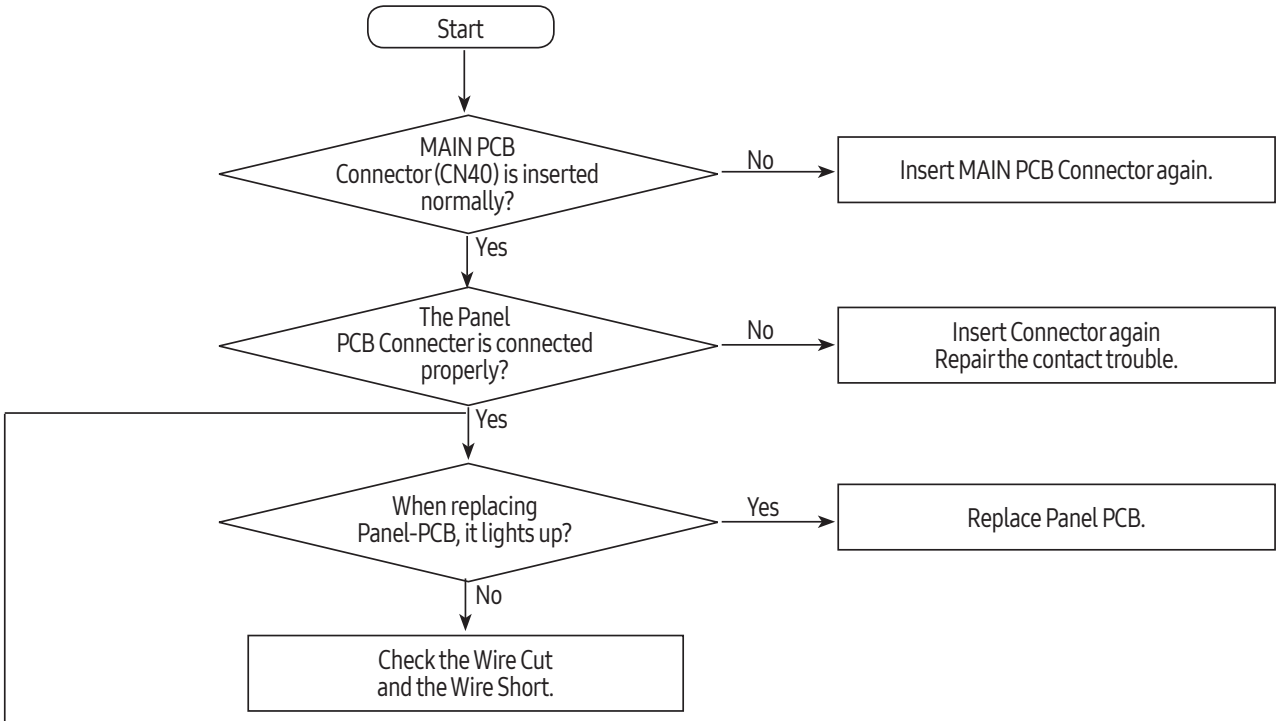
Buzzer is installed on the Assy Top Table in this model.



4-2-10. When the Inner Panel PBA does not operate normally

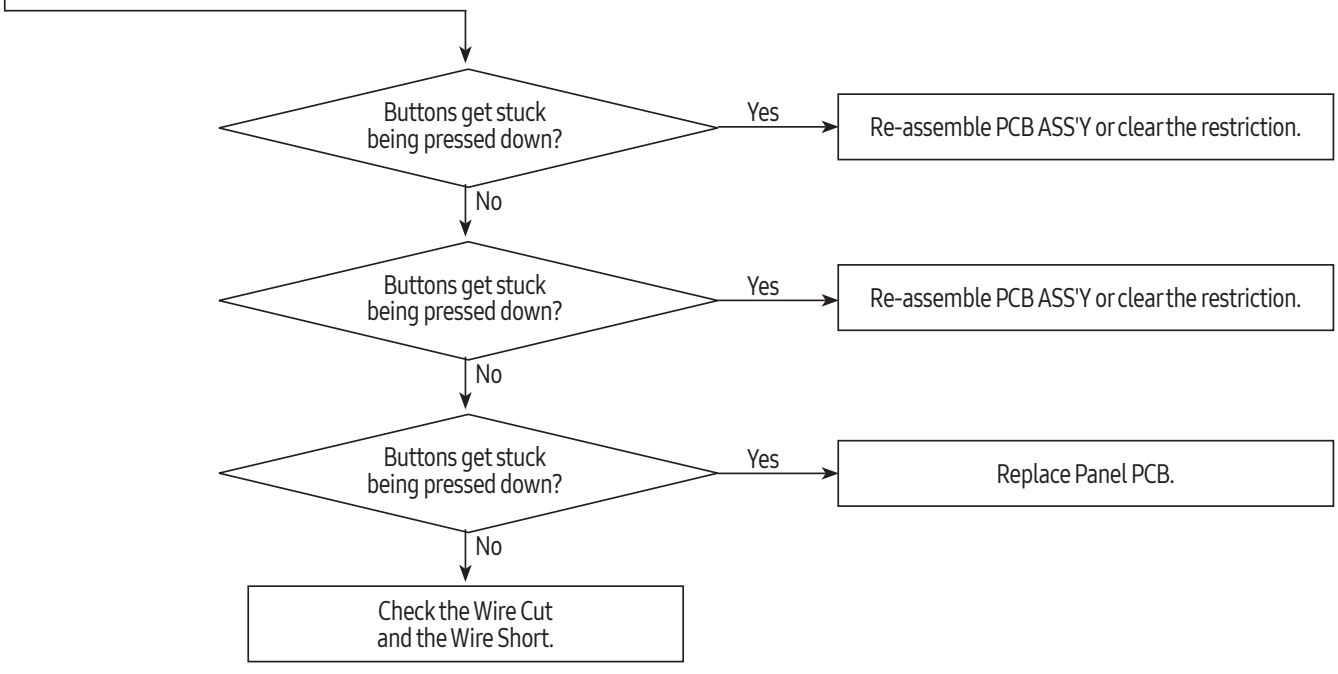
① When the entire or a certain section of the Panel PCB does not light up

There is a MICOM embedded in the Panel PCB. So, take care when doing repairs.
And, except the Solder Touch, replace the PCB.



② When the Panel PCB buttons do not work.

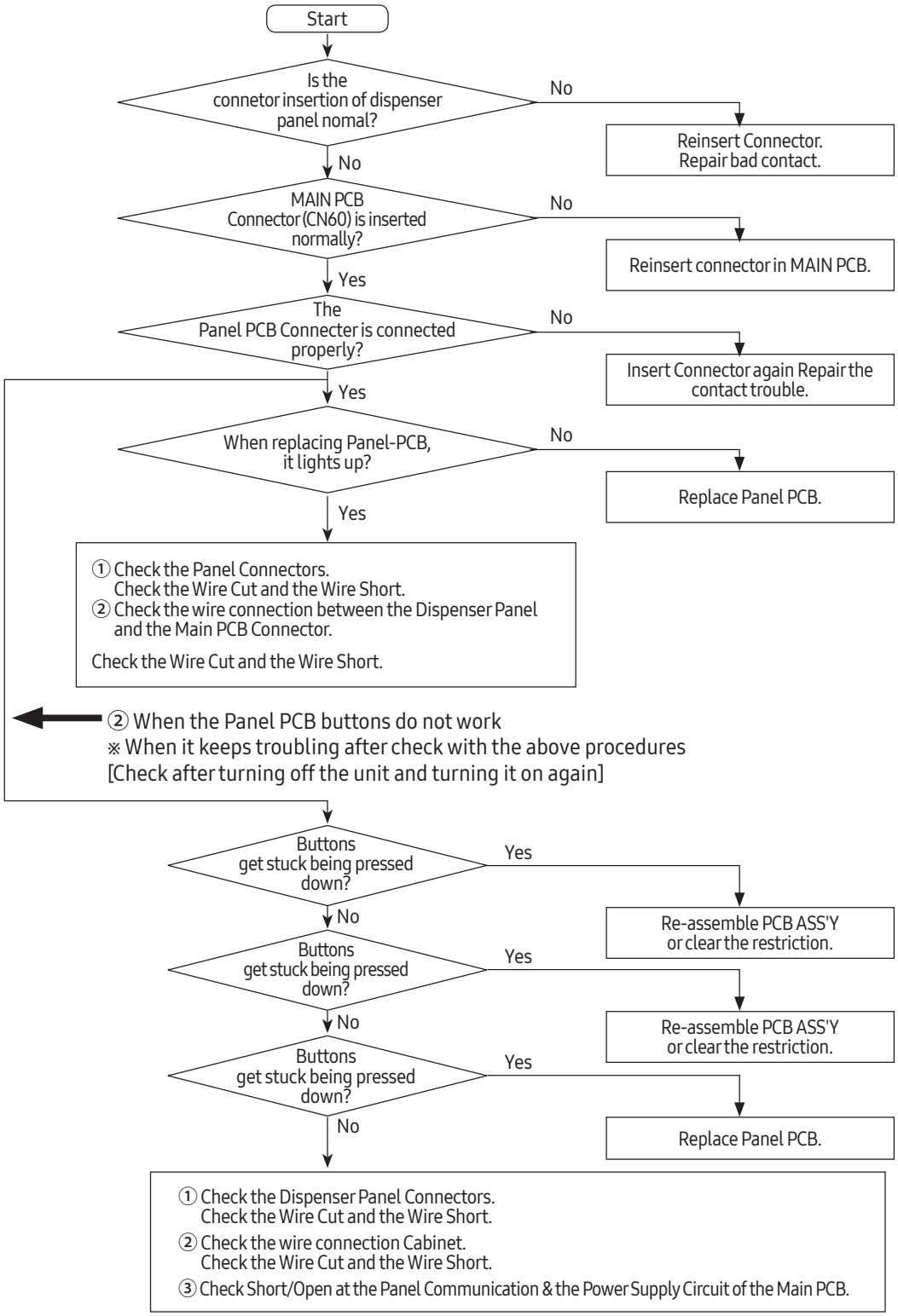
※ When it keeps troubling after check with the above procedures.
[Check after turning off the unit and turning it on again.]



4-2-11. When the Dispenser Panel PBA does not operate normally

① When the entire or a certain section of the Panel PCB does not light up

There is a MICOM embedded in the Dispenser Panel PCB. So, take care when doing repairs.
And, except the Solder Touch, replace the PCB.



Since all Touch is used for the Panel PCB Switch, be sure to turn off the unit and turn it on again after doing a repair.
[It is to adjust the sensitivity of the Touch Panel.]

4-2-12. When refrigerator ROOM Lamp does not light up

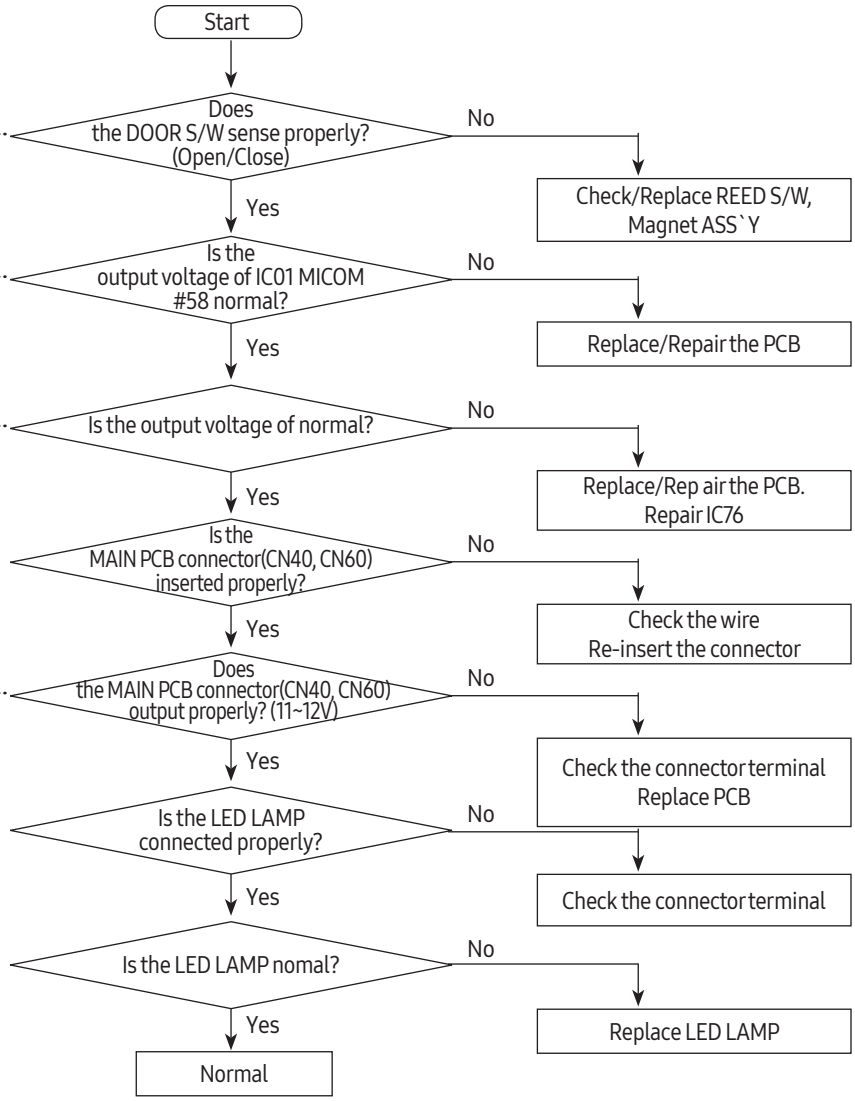
When controlling the regrigerator light with Regulator(12V) : LED LAMP
→ Applying to the F/R Room compartment (Option)

* If the Vegetable Lamp does not work properly, check the R compartment LED Lamp because it is connected with the R compartment LED Lamp in parallel. Refer to the circuit diagram to repair.

Door & MICOM State	
Door	MICOM(#58)
	Right and Left
Close	0V (Low)
Open	5V (High)

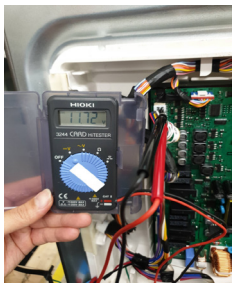
MICOM State		
Door	FF	FZ
	#58	#60(#15)
Close	0V (Low)	0V (Low)
Open	5V (High)	5V (High)

Q408(R)/Q404(F)/State	
IC	Q408(R)/Q404(F)
0V (Low)	0V(Low)
5V (High)	11~12V(High)

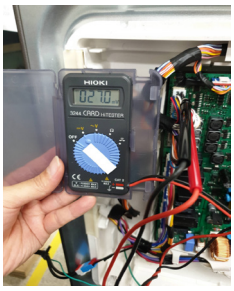


1) Measuring output voltage
- F LED : CN40 "10"(W/RED) and CN40 "12"(GRY)
- R LED : CN40 "26"(RED) and CN40 "28"(GRY)

R LED Lamp ON



R LED Lamp OF

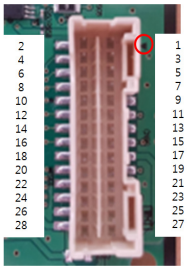


- F Door : CN20 "2"(FLAT_ORG) and CN20 "4"(FLAT_WHT)
- R Door : CN20 "1"(PRP) and CN20 "3"(GRY)

Close

Open

PIN Number

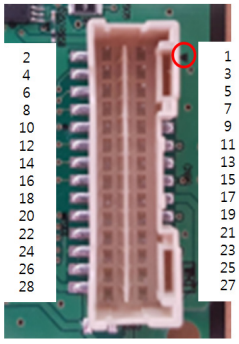


4-2-13. If ICE Water is not supplied

1. Please shut the water supplying prior to repair.
2. Power is applied to the one end of wires. Be careful when disassembling not to get an electric shock.

1) Ice Water(FF) Valve

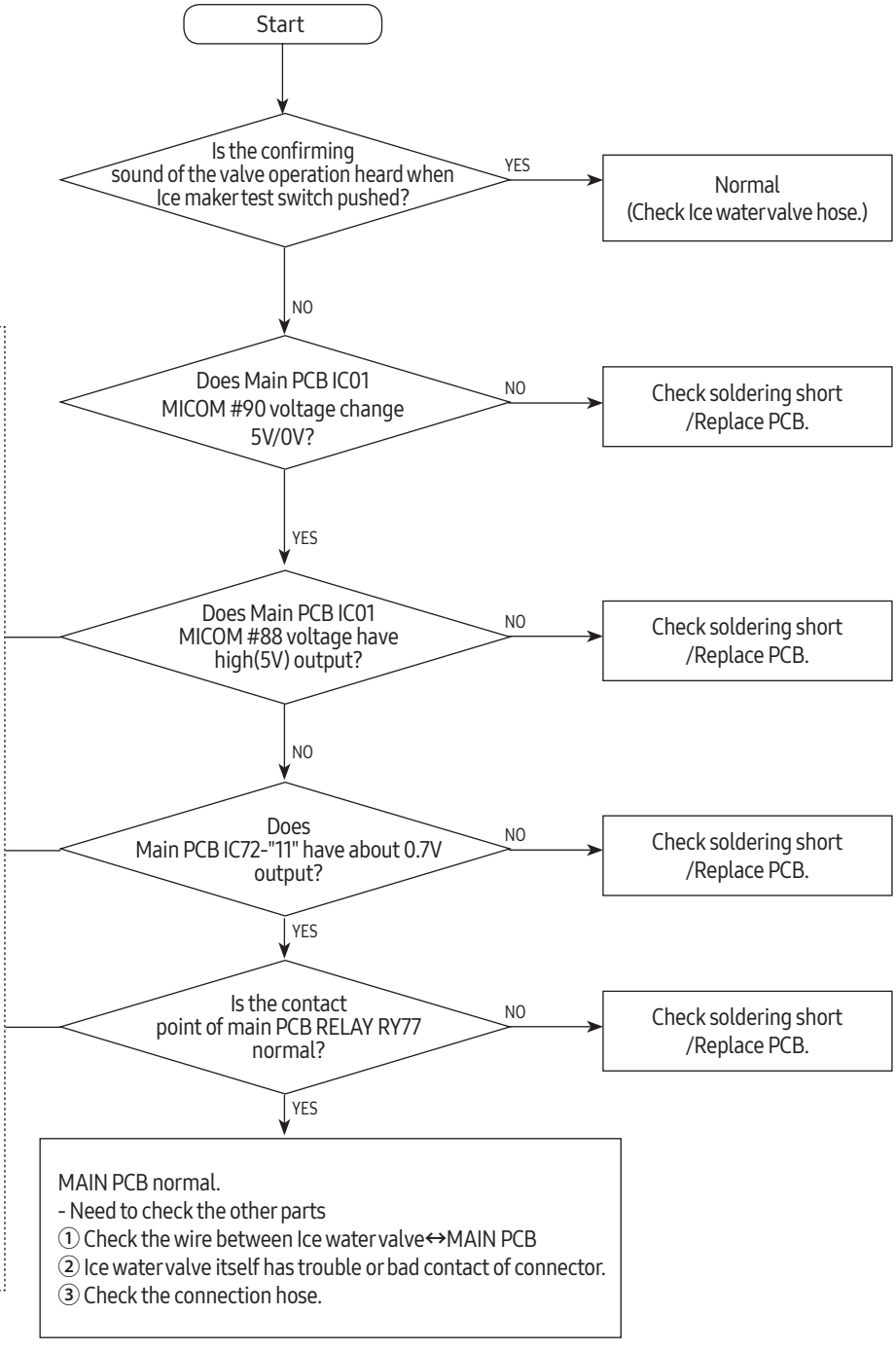
PIN Number



☞ Checking method of voltage Based on
1) Check the voltage of IC72-"6" ↔ IC72-"8" (same voltage as IC01 "#88)
- ICE Water valve waiting (about 0V)

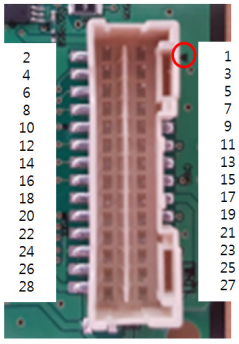
2) IC72-"11" ↔ IC72-"8"
- ICE Water valve Waiting (about 12V±0.8V)
- ICE Water valve Operating (about 0.7V±0.5V)

3) Check the voltage of Water Valve operating (AC voltage)
=> The Relay RY77 operating.CN71-"5" ↔ CN71_1-"5"
- ICE Water valve waiting (about AC 0V)



2) Ice Water(FZ) Valve

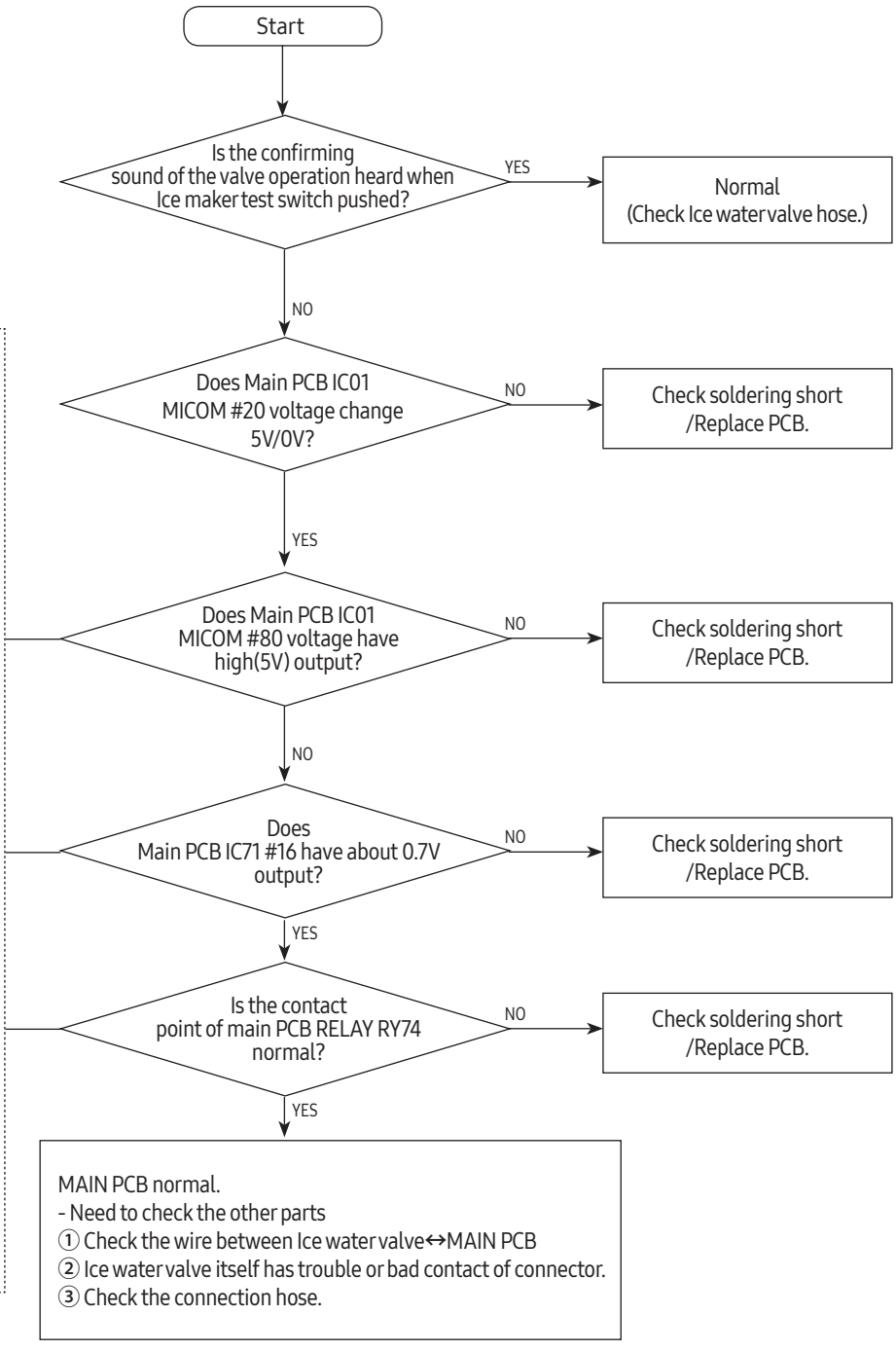
PIN Number



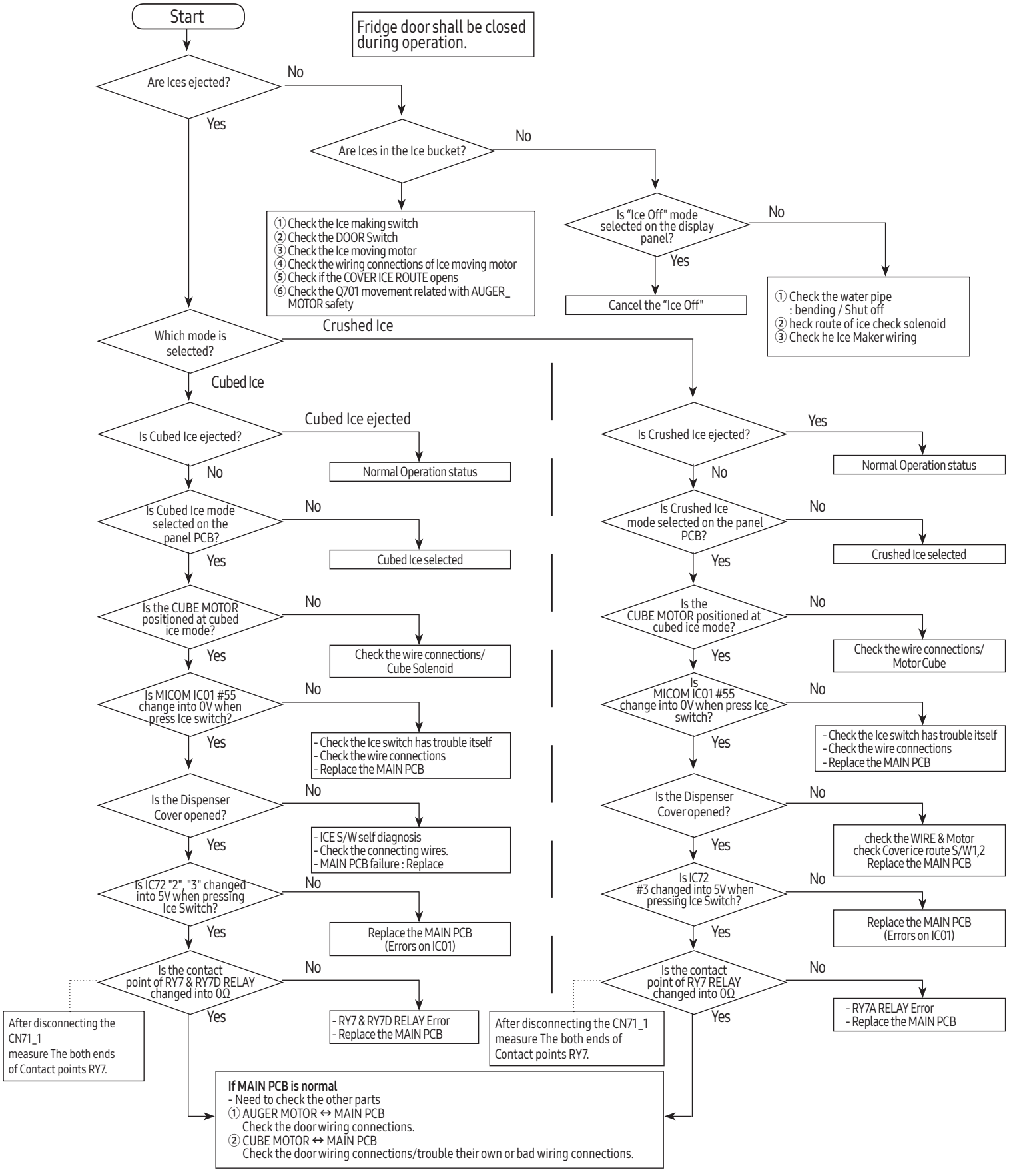
☞ Checking method of voltage Based on
1) Check the voltage of IC71-"1" ↔ "8"
(same voltage as IC01 "#20)
- ICE Water valve waiting (about 0V)

2) IC71-"16" ↔ "8"
- ICE Water valve Waiting (about 12V±0.8V)
- ICE Water valve Operating (about 0.7V±0.5V)

3) Check the voltage of Water Valve operating (AC voltage)
=> The Relay RY74 operating. CN70_1-"3" ↔ CN70-"7"
- ICE Water valve waiting (about AC 0V)



4-2-14. If Cubed or Crushed Ice is not supplied



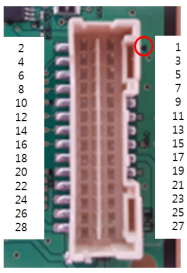
4-2-15. If Cover Ice Route Motor(Geard Motor) is not working normally

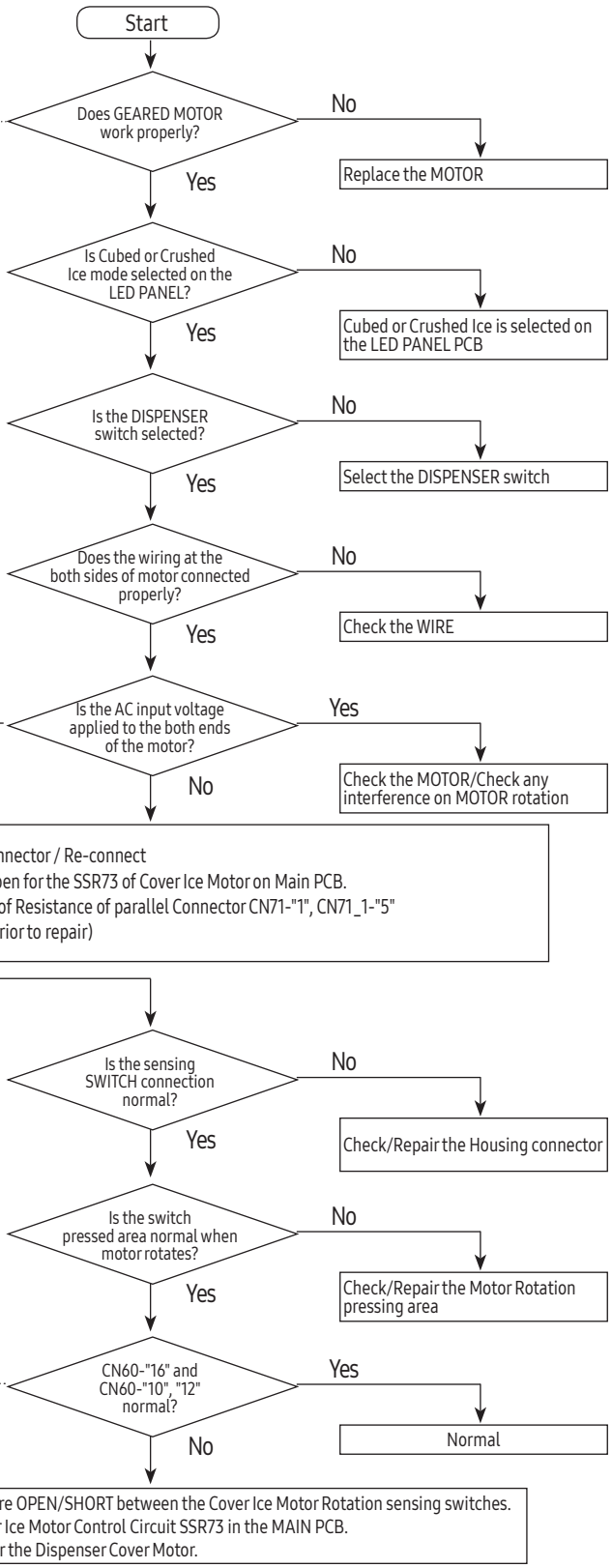
Caution

1. When replacing the Cover Ice Motor, pull out the plug to avoid an electric shock.
2. Be careful! When disassemble the Cover Ice Motor, spring can jumped out and may cause personal injury.
3. Motor will rotate continuously when the Motor Switch is not sensed.

☞ **Checking Mehod of Cover Ice Route Motor Resistance**
(Make sure to work after Power Off) the voltage of Resistance is variable according to the input voltage.
CN71-"1"(BLU) ↔ CN71_1-"5"(BLK)
** 0Ω: Short trouble / Ω∞: Open trouble

PIN Number



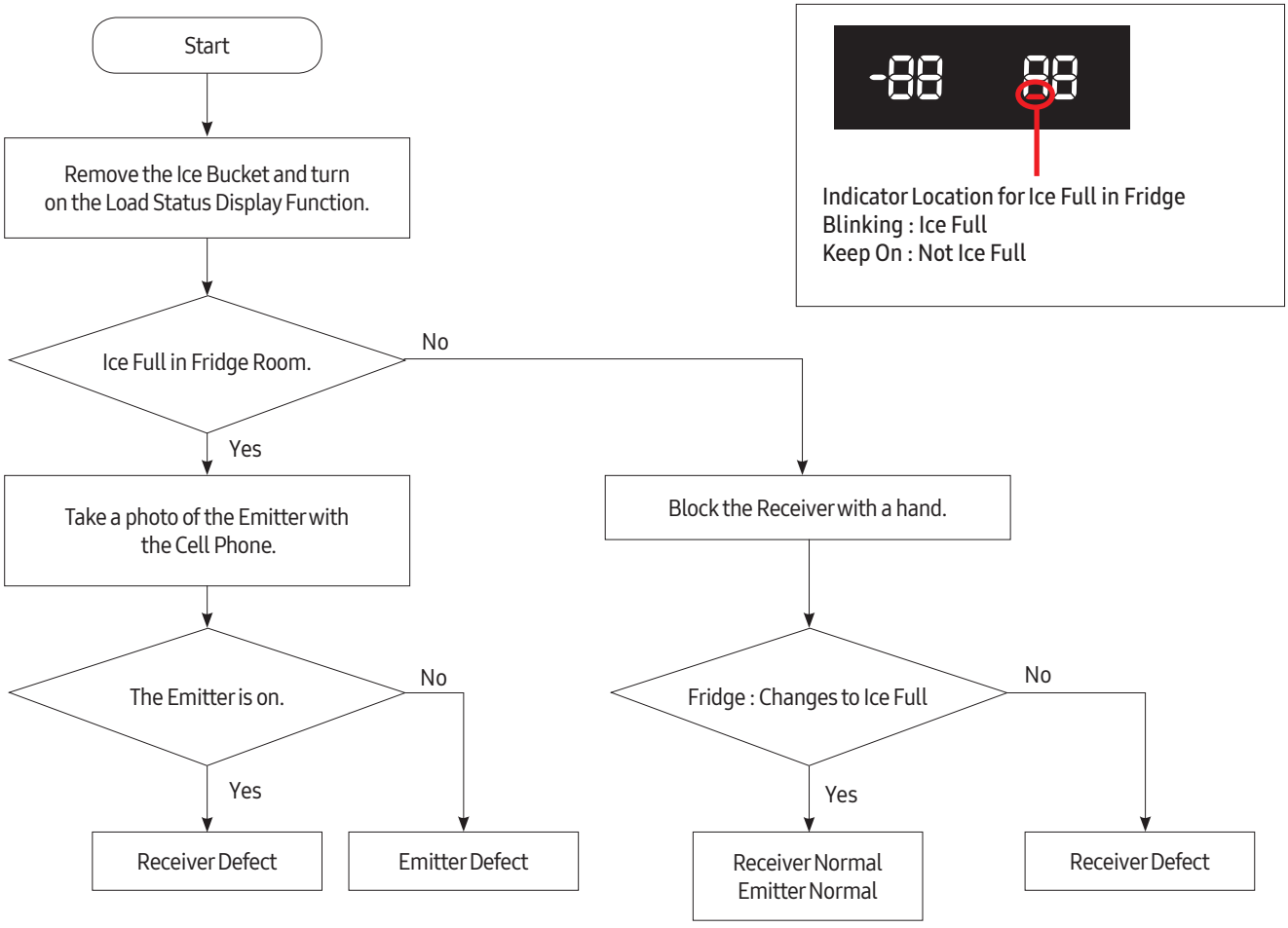


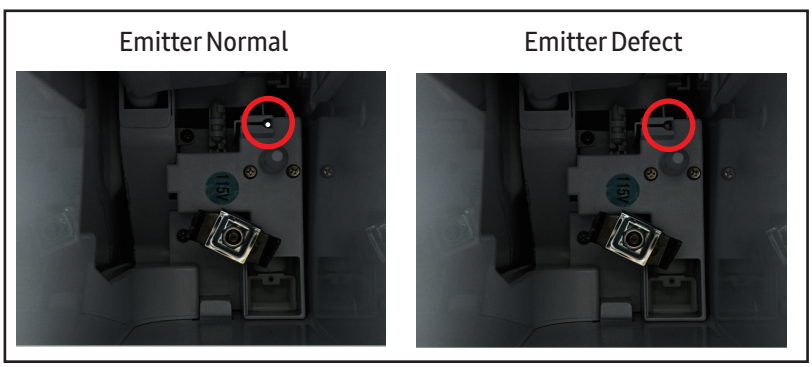
Operating Condition of Dispenser Open/Close
CN60 - Switch 1,2 Operating

	Close	ing	Open
Ice Route Switch 1 CN60-"12"(Purple)	0V	5V	0V
Ice Route Switch 2 CN60-"10"(WHT)	0V	5V	0V

4-2-16. IR Sensor Trouble-Shooting

1. When the IR sensor is defective, ice is not produced even if there is no Ice Maker Error, Ice Maker Sensor Error or the Ice Maker Function Error.
   (When turning on the Self Diagnosis Function, it does not produce ice even if there is no 14C, 15C or 39C being displayed.)
2. Proceed with the Fridge Door being open and the Ice Bucket being removed.





4-2-17. LED blinking frequency depending on protecting functions

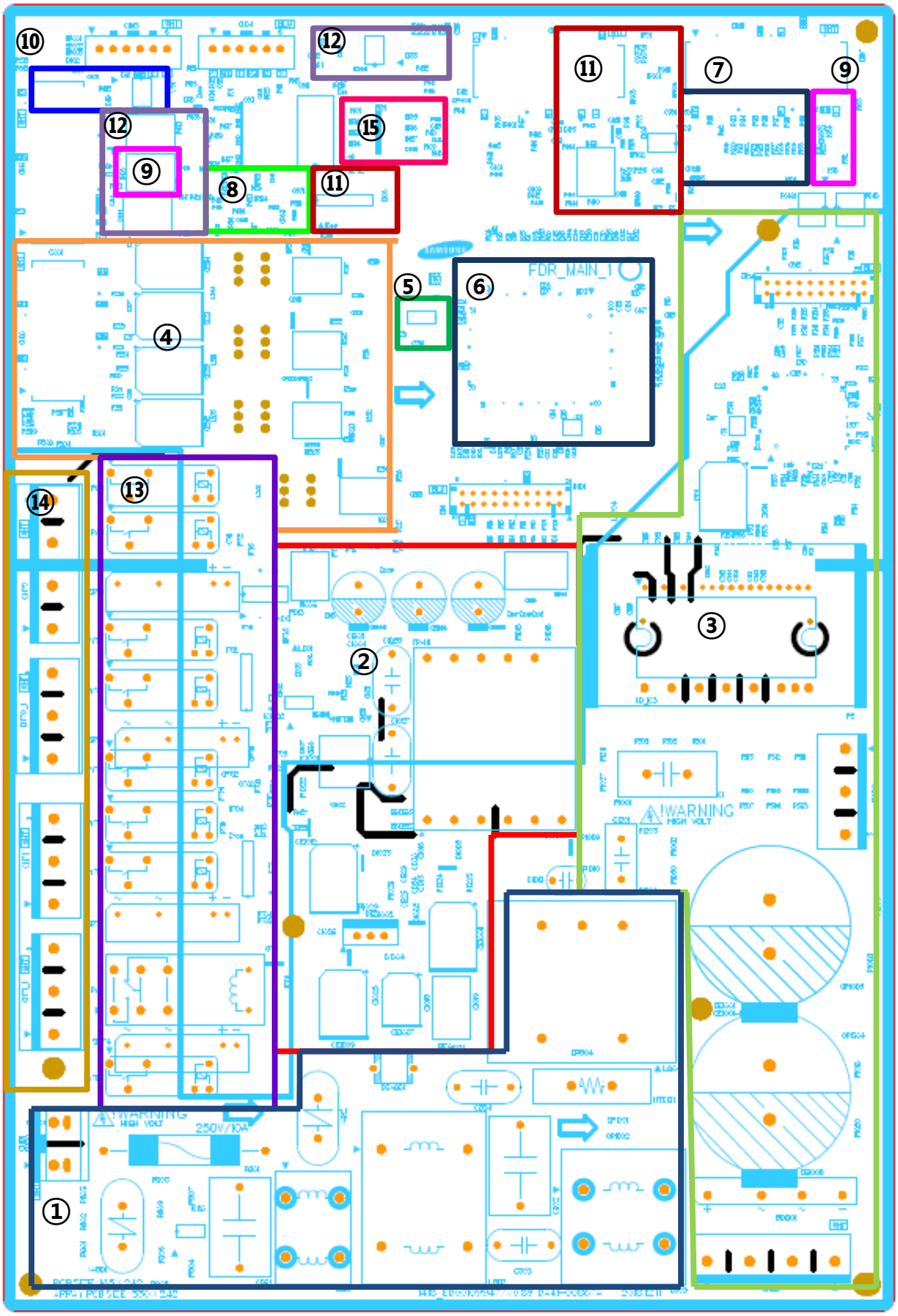
If Failure Condition is detected during compressor is operating, immediately stop Compressor operating and stand by 5 minutes. During this 5 minutes, RPM command signal is not available. It means, even if available RPM command signal is applied to the compressor, it does not work and keep standing by.

Blinking time is 1 second and dwell time is 2 seconds.

LED Blinking Frequency	Protecting Functions	Remarks
	Normal Operation	N/A
	Starting Failure	1. Short between COMP U,V, and W phase(CN04) 2. Short among IPM Pins(No. #1 ~ 26) 3. Drop the IPM operating Voltage under DC 13.5V 4. Other cases, check the COMP, cycle, etc.
	IPM Fault	
	Abnormal Current Detection	1. Open the COMP wire(CN04) 2. Bad condition of R1(ex. Bad soldering.) 3. Other cases, check the COMP, cycle, etc.
	Motor Locked / Over RPM	1. Operating the locked rotor COMP within 5 second. 2. Operating the COMP under 1000 RPM more than 5 second. 3. Occur the huge change of input voltage in a moment 4. Other cases, check the COMP, cycle, etc.
	Under Voltage	1. Drop the input voltage under AC 53V 2. Short resistor R312(DC link resistor)
	Over Voltage	1. Increase the input voltage over AC 155V 2. Short resistor among R309, R310 and R311. (DC link resistor)

LED blinking frequency depending on protecting functions.

5-1) PBA Layout with part position



PCB DIAGRAM

1. EMI FILTER part

2. DC 15V, 12V, 5V, GND supplied from SMPS PCB

3. Inverter circuit part
   -.COMP Driving / Feedback Circuit
   -.BOOTSTRAP Charger : It is an independent power circuit for the driving of the IMP High-Phase IGBT.
   -. Current Pickup Circuit : It pickups the currents taken by the Shunt resistance and does the PWM DUTY control.

4. FAN MOTOR control part : To supply the power from 7V ~ 12V according to the motor types. (F,R,C,ICE)

5. EEPROM : Save and record every kinds of data.

6. Micom : control the regrigerator Ceramic resonator : generate the basic frequency of Micom operation.
   Reset IC : make Micom reset if input voltage of Micom is detected less than the specified voltage

7. Operate ICE-MAKER, supply power to MOTOR, and sense the variation of switch.

8. Main Micom ↔ Panel Micom serial communication circuit - Dispenser option input part (Water & Cover Ice route switch)

9. Auto Fill control part.

10. Control Mid drawer Room damper & Damper heater

11. Water Tank Heater Controls (also controls other options)

12. LED LAMP Control Circuit (F,R, MID room Lamp)

13. Relay parts that controls AC load and receives Micom operating signal through Sink IC.

14. Connector with AC load

15. Diode option setting area

5-2) Connector Layout with part position (Main Board)

CN40
2. INNER PANEL TX
4. INNER PANEL RX
6. +12V
8. GND
10, 12. FZ ROOM LAMP, GND
11. C-FAN FEEDBACK
13, 15. C-FAN SIGNAL, GND
17, 19. DAMPER B, B'
18, 20. PANTRY ROOM SENSOR, GND
21, 23 DAMPER A', A
22, 24. AUTO FILL VALVE, GND
25, 27. DAMPER H/T, +12V
26, 28. FF ROOM LAMP, GND

CN04
1. WI-FI RX
2. GND
3. WI-FI TX
4. WI-FI RESET
5, +12V
6. +5V

CN60
1. +5V
3. GND
5. AMBIENT SENSOR
7. HUMIDITY SENSOR
8. ICE&WATER S/W
10. COVER ICE ROUTE S/W2
12. COVER ICE ROUTE S/W1
16. GND
18. +12V
20. DISPENSER PANEL RX
22. DISPENSER PANEL TX
24, 26. DISPENSER VALVE, GND

CN90 - Twin Ice Maker Option
1. 12V
2, 4. GND, ICE ROOM SENSOR
5. DRAIN HEATER
6. MOTOR DRIVER(INA, FF)
7. EJECT MOTOR CW (FZ)
8. MOTOR DRIVER(Ys2B, FF)
9. EJECT MOTOR CCW(FZ)
10. MOTOR DRIVER(INB, FF)
11, 13. EJECTING SENSOR, GND
12. IR SENSOR (FF)
14. EJECTING SENSOR(FF)
15. ICE MAKER TEST S/W (FZ)
16. ICE MAKER TEST S/W (FF)
17. +5V
18. +12V
19. HALL IC OUT SIGNAL (FZ)
20. HALL IC OUT SIGNAL (FF)
21. GND
22. +5V
23, 25. FLOW SENSOR, GND
24, 26. GND, GND
27. +5V
28. +5V

CN20
1, 3. FF DOOR S/W, GND
2, 4. FZ DOOR S/W, GND
5, 7. FF-DEF SENSOR, GND
6, 8. FZ-DEF SENSOR, GND
9, 11. FF SENSOR, GND
10, 12. FZ SENSOR, GND
13. FF-FAN FEEDBACK
14. FZ-FAN FEEDBACK
15, 17. FF-FAN SIGNAL, GND
16, 18. FZ-FAN SIGNAL, GND
19. ICE ROOM HEATER
20. ICE ROOM-FAN FEEDBACK
21. ICE PIPE HEATER
22, 24. ICE ROOM-FAN SIGNAL, GND
23. +12V

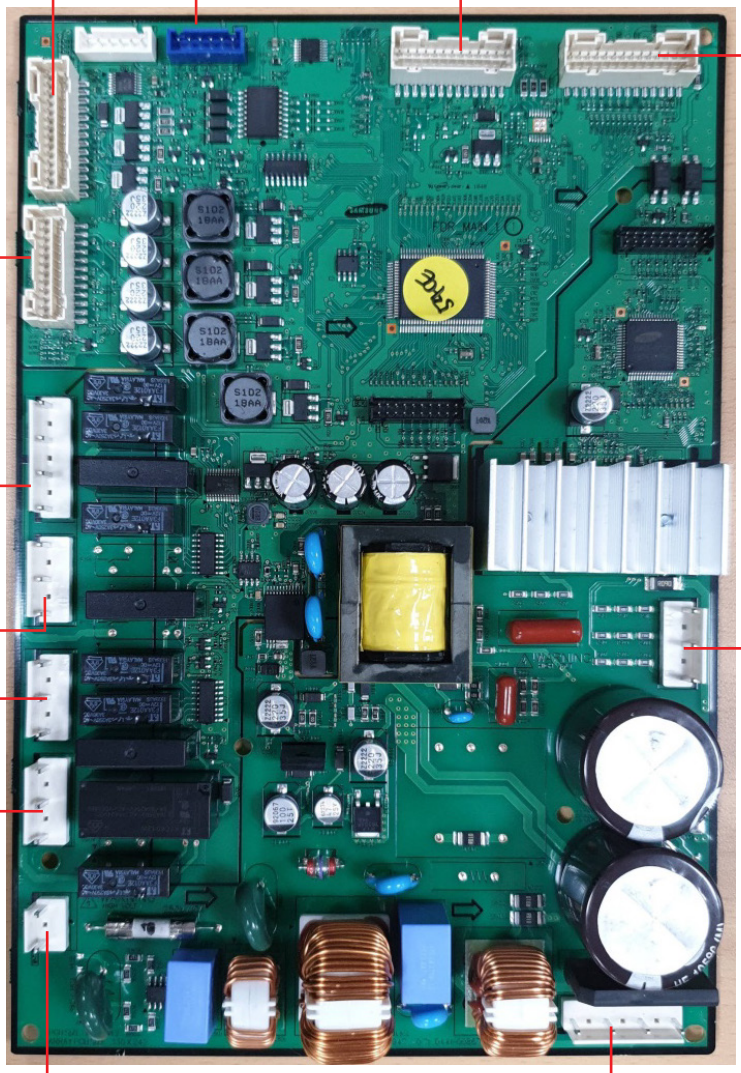
CN90 - - Auto Fill Option
2, 4. GND, ICE ROOM SENSOR
6. MOTOR DRIVER(INA, FF)
8. MOTOR DRIVER(Ys2B, FF)
10. MOTOR DRIVER(INB, FF)
11, 13. OVER FLOW S/W, GND
12. IR SENSOR (FF)
14. EJECTING SENSOR(FF)
15AUTOFILL WATER BOX S/W
16. ICE MAKER TEST S/W (FF)
17. +5V
18. +12V
19. WATER SENSOR
20. HALL IC OUT SIGNAL (FF)
21. GND
22. +5V
23, 25. FLOW SENSOR, GND
24, 26. GND, GND
27. +5V
28. +5V

CN70
1. FRENCH/DISPENSER HEATER
3. FF-DEF HEATER
5. FZ-DEF HEATER
7. COM2

CN70_1
1.FDSR-HEATER
3. ICE/WATER SOL-VALVE(FZ)
5. ICE MAKER HEATER

CN71
1. ICE COVER ROUTE G-MOTOR
3. WATER SOL-VALVE
5. ICE/WATER SOL-VALVE(FF)

CN71_1
1. CUBE-MOTOR
3. AUGER-MOTOR
5. COM1

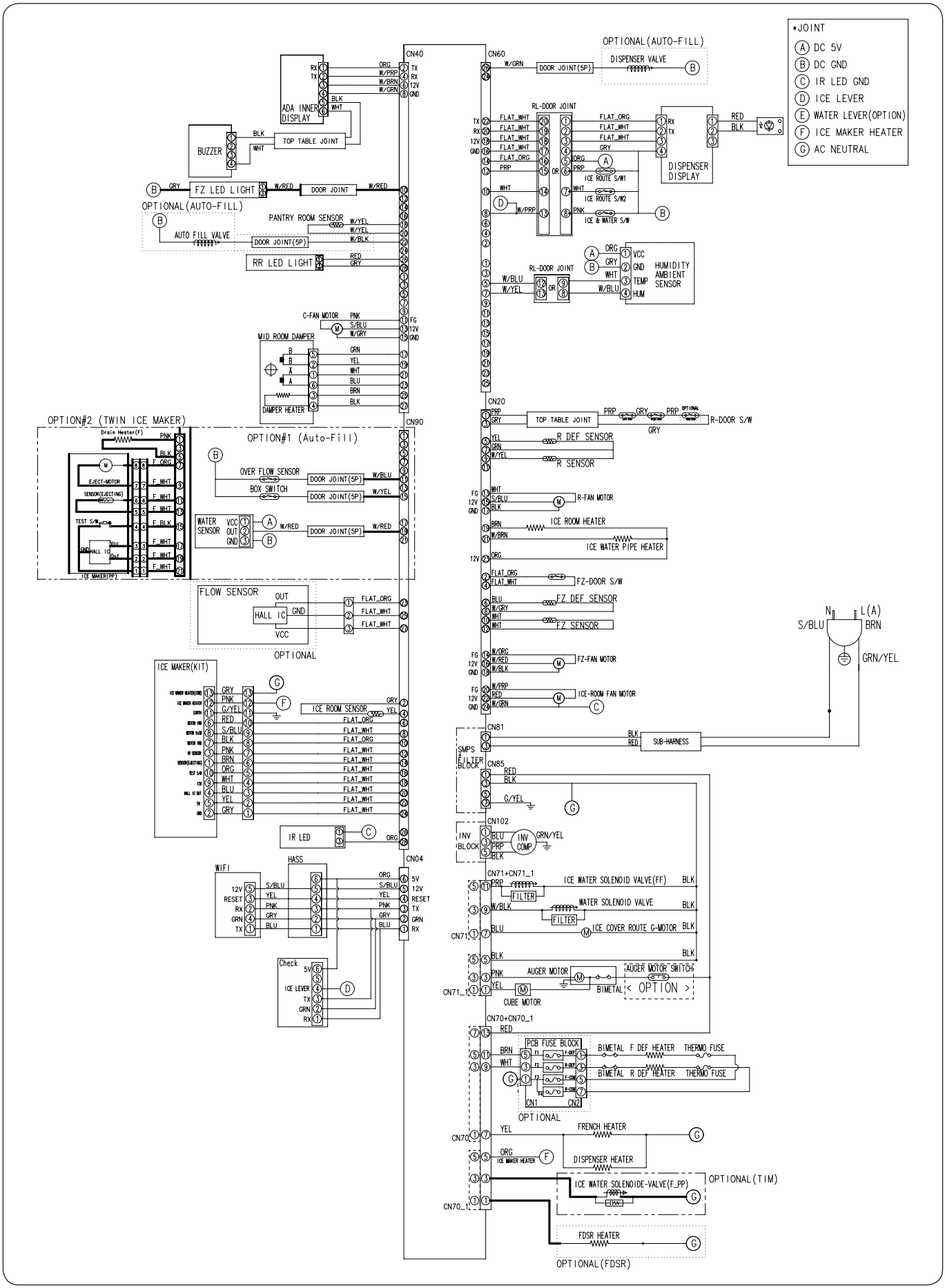


CN85
1. COM1
3. COM2

CN85
1. COM2
3. COM1
5. EARTH

CN102
1. COMP U
2. COMP V
3. COMP W

6. WIRING DIAGRAM



7-1) Whole block diagram