SAMSUNG

REFRIGERATOR

FRENCH DOOR REFRIGERATOR

BASIC : RF28HF*
MODEL CODE : RF28HFED***/AA
RF28HFPD***/AA

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

Contents

Contents

- Unplug the appliance before the changing or repairing the electric parts.
  → Be careful the electric shock.
- Always use only the correct replacement parts.
  → Check the model, rated voltage, rated current and running temperature rating.
- When troubleshooting, verify that wiring harnesses are connected securely.
  → Make sure the connectors are not separated when power is supplied.
- Check for visible traces of water on electrical parts.
  → Replace or secure any part that may have come in contact with water.
- Check the status of parts after replacement or troubleshooting.
  → All parts must be reinstalled properly.
- 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.
- The refrigerator should be plugged into a dedicated outlet.
  Make sure the power cord is not damaged, crushed, squeezed or burned.
- If the plug is damaged it should be replaced.
  If the socket is damaged, it should not be used.
- Consumers must not try to repair the refrigerator.
- Nothing should be stored in the refrigerator except food.
  → Drugs requiring precise temperatures should not be stored in the refrigerator.
  → Flammable substances (alcohol, benzene, ether, LP gas, etc.) carry risk of explosion and should not be stored in the refrigerator.

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.*

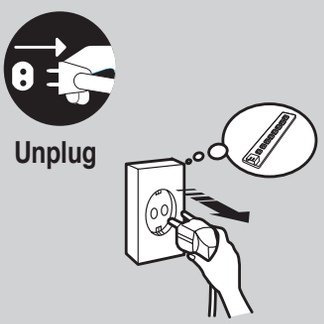
SYMBOLS

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

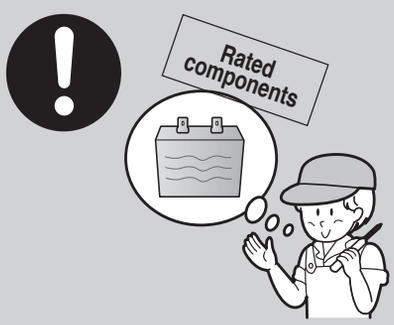
Plug out to exchange the interior lamp.

- *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.

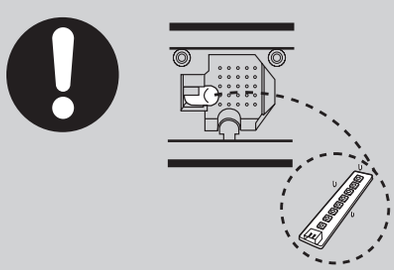
- *Cleaning parts could help prevent fire or shorting.*

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.*



Precautions(Safety Warnings)

❊ *Please let users know following warnings & cautions in detail.*

⚠ Warning & Caution

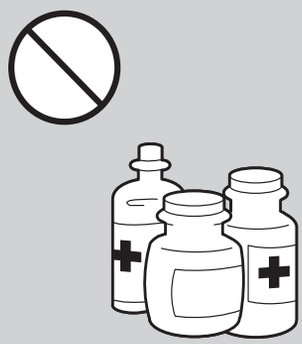
Customers should not store glass bottles of liquid in the freezer section.

- *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.

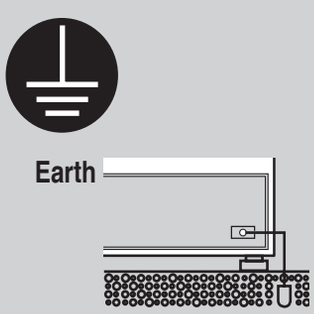
- *Opening or closing the door may cause things to fall down, which may cause injury.*

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.

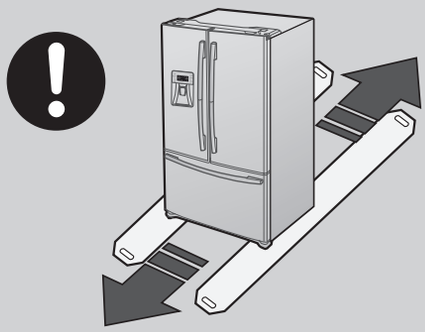
- *An earth ground should be used if there is a risk of high humidity or wetness.*



Precautions(Safety Warnings)

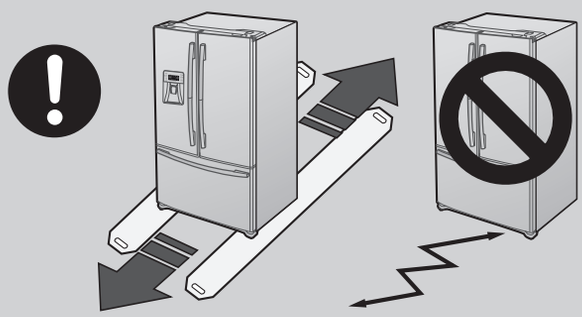
FLOORING

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, or approximately 660lbs(299kg).



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.

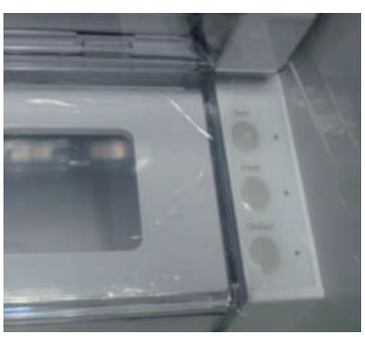


2. Product Specifications

Product Specifications

2-1) Introduction of Main Function

A newly developed SAMSUNG FRENCH DOOR REFRIGERATOR in 2014 has the following characteristics.

	**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.
	**Electronic control from outside of Pantry Cover** • Adjustable temperature control ((around 41˚F(5℃) : Deli / around 38˚F(3℃) : Fresh / around 34˚F(1℃) Chilled) Temperature control from outside of the Pantry : user friendly design helps keep foods fresh for longer
	**Ice and Water Dispenser** • The ice and water dispenser provides ice and cold water at any time.

Product Specifications

	**Secure Auto Close Door System** • Secure Auto Close Door System • Cool tight doors • Energy saving • Preventing sweat on fridge doors
	**Easy Handle System** • Ez–open Freezer Door • Ergonomic Door Design – The freezer door is more user–friendly. So, it comes as much convenient.
	**Drawer** • The dimension of the right–side drawer is 6:4 (H x W) with the shelf being raised. So, the right–side drawer can be pulled out with the left door closed.

Product Specifications

2-2) Specifications

ELECTRICAL SPECIFICATIONS

Defrost Control	From 12 to 30hrs(comp. run time)
Thermo Bimetal Protector	140˚F(60˚C)(off) 104˚F(40˚C)(on)
Defrost Thermistor(502AT)	50˚F(10˚C)(off)
Electrical Rating	AC115V 60Hz 11.6 Amps
Maximum Current Leakage	0.25 mA
Maximum Ground Path Resistance	0.1 Ohm
Energy Consumption	535KWh/year

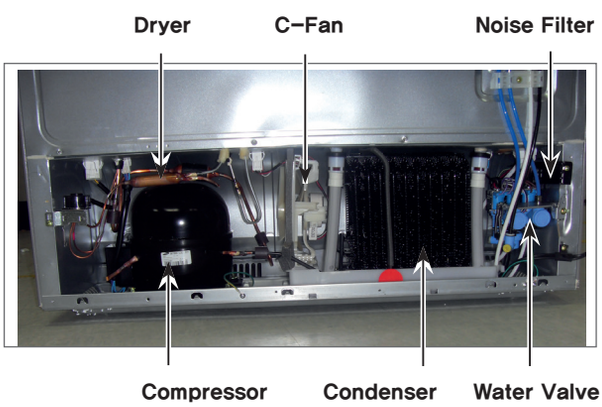
NO LOAD PERFORMANCE

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

REFRIGERATION SYSTEM

efrigerant Charge (R-134a)	5.64 oz(160g)
Compressor(MKV190C-L2B)	1314 Btu/hr(0.385 kw)
Compressor Oil	Freol α 15c
R Capillary tube(Dia, Length)	0.032 " ,118 " (0.82mm, 3,500mm)

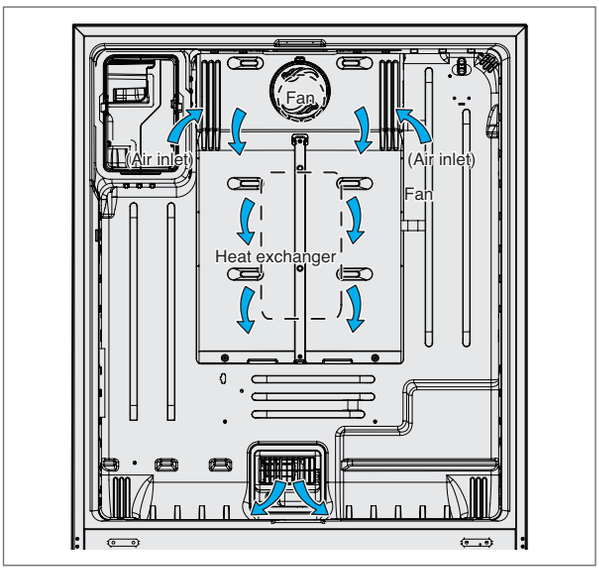
〈RF28HFED*〉



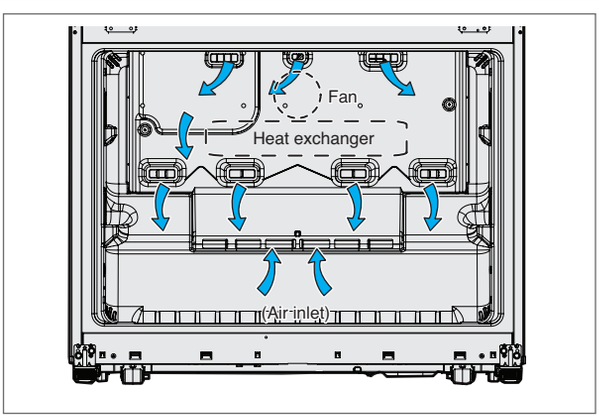
INSTALLATION

Clearance must be provided for air circulation	
AT TOP	1 " (25mm)
AT SIDES	1 " (25mm)
AT REAR	2" (50mm)

REFRIGERATOR

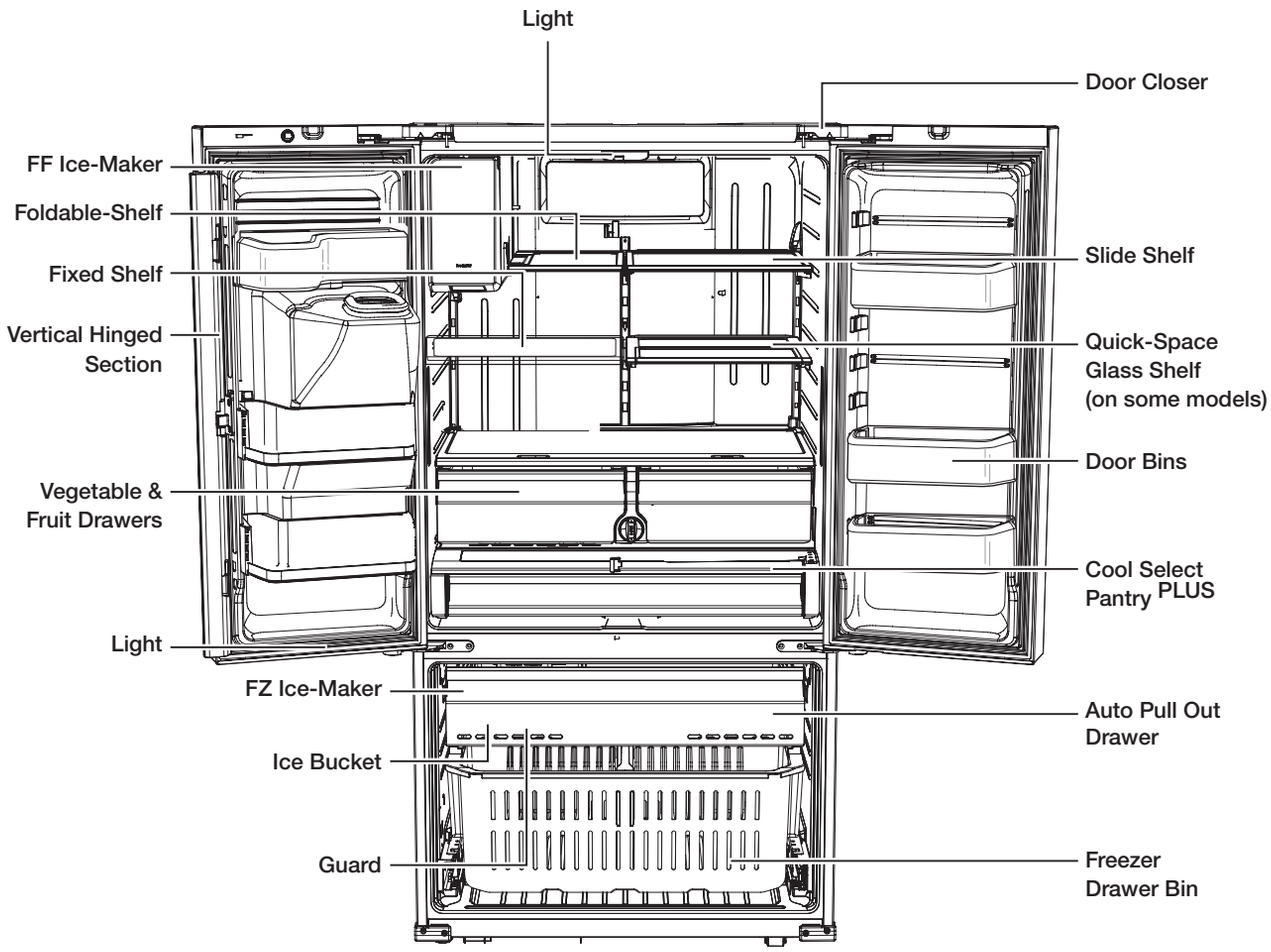


FREEZER



Product Specifications

2-3) Interior Views



Product Specifications

2-4) Model Specification

ITEM			SPEC	SAMSUNG
				RF28HFED*
Appearance				
Product Zone			Cooling Tech	Twin Cooling
			Door Shape	Contour
			Special Room	Cool Select Pantry
Performance	Cooling Speed(Min)	F-Room	250 ↓	202
		R-Room	270 ↓	220
	89.6 (32℃)	F-Room	-26℃ ↓	-31.9
		R-Room	2℃ ↓	-0.1
	109.4 (43℃)	F-Room	-18℃ ↓	-24.7
		R-Room	5℃ ↓	1.0
	Temperature Distribution (Fridge)	F-Room	2.0 ↓	0.3
		R-Room	2.0 ↓	1.0
	Run Time	N-N	90 ↓	73.5
Noise	Sound Power Level		46dB ↓	45.5
	Sound Pressure Level		45dB ↓	44.6

Product Specifications

ITEM	Model		RF28HF**
			Ice & Water Dispenser
External size	W		35 6/8 Inch (908mm)
	D	On Cabinet	29 Inch (738mm)
		W/O Handle	33 1/2 Inch (851mm)
		With Handle	36 Inch (913mm)
	H	W/O Hinge Cap	68 7/8 Inch (1749mm)
		With Hinge Cap	70 Inch (1777mm)
Net Capacity	Total		29.1 Cu.ft (824.0 ℓ)
	Freezer		8.8 Cu.ft (249.2 ℓ)
	Refrigerator		20.3 Cu.ft (574.8 ℓ)
Efficiency of Volume			68.04%
Weight	Set		326.3 Pounds (148 kg)
	Packing		352.8 Pounds (160 kg)
Packing	Width		38 5/8 Inch (980mm)
	Depth		36 1/8 Inch (918mm)
	Height		76 5/8 Inch (1946mm)
Compressor			Reciprocate
Rated voltage and Frequency			AC 115 V / 60 Hz
Refrigerant			R-134a
Foaming Agent			C-Pentane
Refrigerant Input Amount			2.29 oz (65g)
Type Refrigerator			Indirect Cooling Method Refrigerator
Motor Rated Consumption Power			120 W
Electric Heater Rated Consumption Power			489.8 W (MONO : RF23HCEDB*), 491.8 W (TIM : RF23HCEDT*)

Product Specifications

Items				Specification	
Model				MKV190CL2B/E01	
Components for Freezer	Compressor		Model	NC4EVA5ALM/E01 / MKV190CL2B/E01	
			Starting type	BLDC	
			Oil Charge	FREOL α – 15c	
	Evaporator		Freezer	SPLIT FIN TYPE	
			Refrigerator	SPLIT FIN TYPE	
	Condenser			Forced and Natural Convection Type	
	Dryer			Molecular shieve XH–9	
	Capillary tube (Dia x Length)			R:0.032" (0.082mm x 3500mm)	
	Refrigerant			R–134a	
Room Temperature Sensor Components	Freezer	Model	Temperature Selection	On(°F)	Off(°F)
		THERMISTOR (F–SENSOR)	–8°F (–23°C)	–5°F (–21°C)	–11°F (–24°C)
			–0°F (–18°C)	3°F (–16°C)	–3°F (–19°C)
			5°F (–15°C)	8°F (–12°C)	2°F (–17°C)
	Refrigerator	Model	Temperature Selection	On(°F)	Off(°F)
		THERMISTOR (R–SENSOR) 502AT	34°F (1°C)	36°F (2°C)	32°F (0°C)
			37°F (3°C)	39°F (4°C)	35°F (2°C)
			44°F (7°C)	46°F (8°C)	42°F (6°C)
Defrost Related Components	Defrost Cycle	First Defrost Cycle (Concurrent defrost of F and R)		6hr ±10min	
		Defrost Cycle (FRE)		12~30hr (vary according to the conditions used)	
		Defrost Cycle (REF)		6~15hr (vary according to the conditions used)	
		Pause time		12 ±1min	
	Defrost Sensor	F Defrost–Sensor	Model	THERMISTOR (502AT)	
			SPEC	5.0 kΩ at 77°F(25°C)	
		R Defrost–Sensor	Model	THERMISTOR (502AT)	
			SPEC	5.0 kΩ at 77°F(25°C)	
	Bimetal	F Bimetal–thermo Protector	Rated	AC 125V 6A	
			Operating temperature	Off : 140°F(60°C) / On : 104°F(40°C)	
		R Bimetal–thermo Protector	Rated	AC 125V, 6A	
			Operating temperature	Off : 140°F (60°C) / On : 104°F (40°C)	

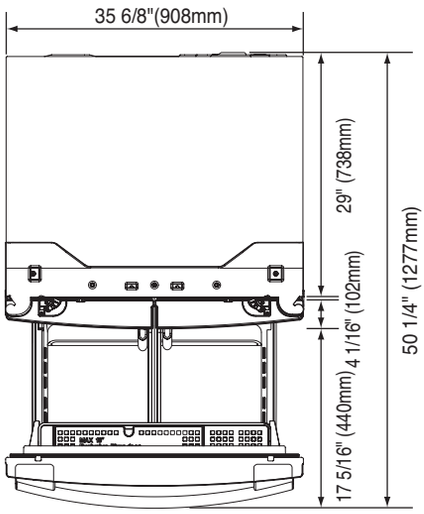
Product Specifications

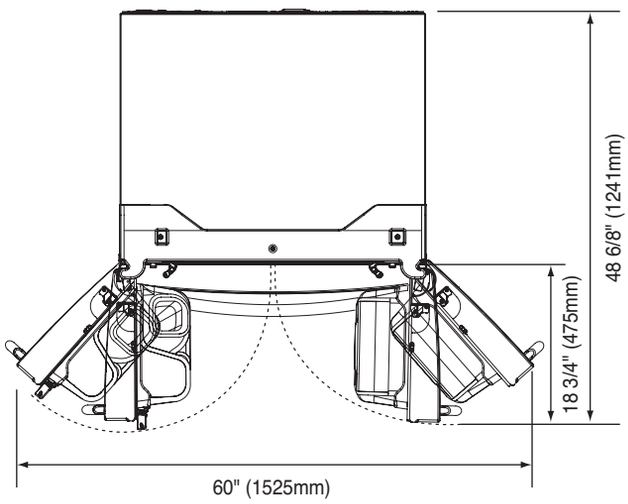
Items			Specification	
Model			MKV190CL2B/E01	
Electric Components	Defrost Heater(FRE)	Heated at F Defrost	AC120V, 230W	
	Defrost Heater(REF)	Heated at R Defrost	AC120V, 100W	
	Heater-Ice Maker		AC120V, 141W	
	DISPENSER Heater	Interlock with French Heater	AC 230V, 2.5W	
	FRENCH Heater	-	AC120V, 12W	
	Heater Water Pipe	R-ROOM	DC12V, 2.3W	
		F-ROOM (TIM)	DC12V, 2W	
	Heater Ice room	-	DC12V, 2W	
	Bimetal thermo for Preventing Overheating of Refrigerator Lamp		AC 125V 6A / Off : 60 ℃, On : 40 ℃	
	Over Load Relay	Model	4TM308RFBYY-82	4TM445PHBYY-82
		Temp.ON	156.2± 16.2°F(69± 9℃)	257±41°F(125±5℃)
		Temp.OFF	257± 9°F(125± 5℃)	156.2°F(69±9℃)
	Rated Voltage		AC 115V/60Hz	
	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		AC120V, 102W / ISG-3240SSJ	
	Geared Motor (ICE MAKER)		DC12V / GSP-24RW-001F	
	Geared Motor (DISPENSER)		AC120V, 3.5W / MVCD18AR19	
	Motor DAMPER		DC12V / NSBY001TK1	
	Lamp LED (FRE)		DC 12V / 85 ~ 130mA	
	Lamp LED (REF)		DC 12V, 85~130mA DC 12V, 40~80mA	
	Lamp LED (VEG)		DC 12V / 95~145mA	
	Door Switch	FRE	DC 200V 1.5A / MS-406-SS-01 (1EA)	
		REF	DC200V 1.5A / MS-406-SS-01 (2EA)	
		REF (ICE ROOM)	125VAC 5A, 250VAC 2.5A	
	Power Cord		AC125V, 15A	
	Earth Screw		STS304	

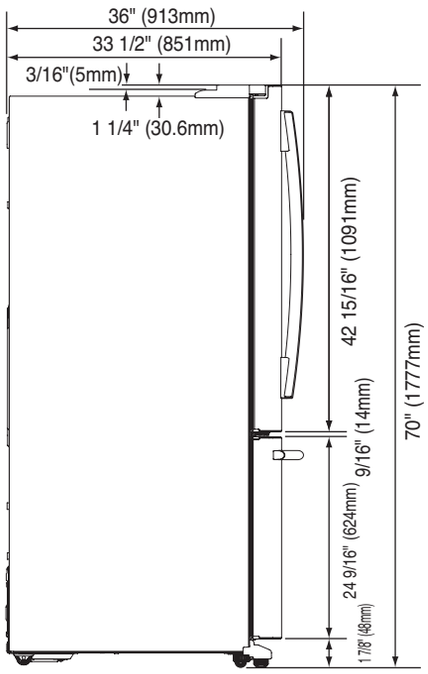
Product Specifications

2-5) Dimensions of Refrigerator (Inches)

Model : RF28HF**







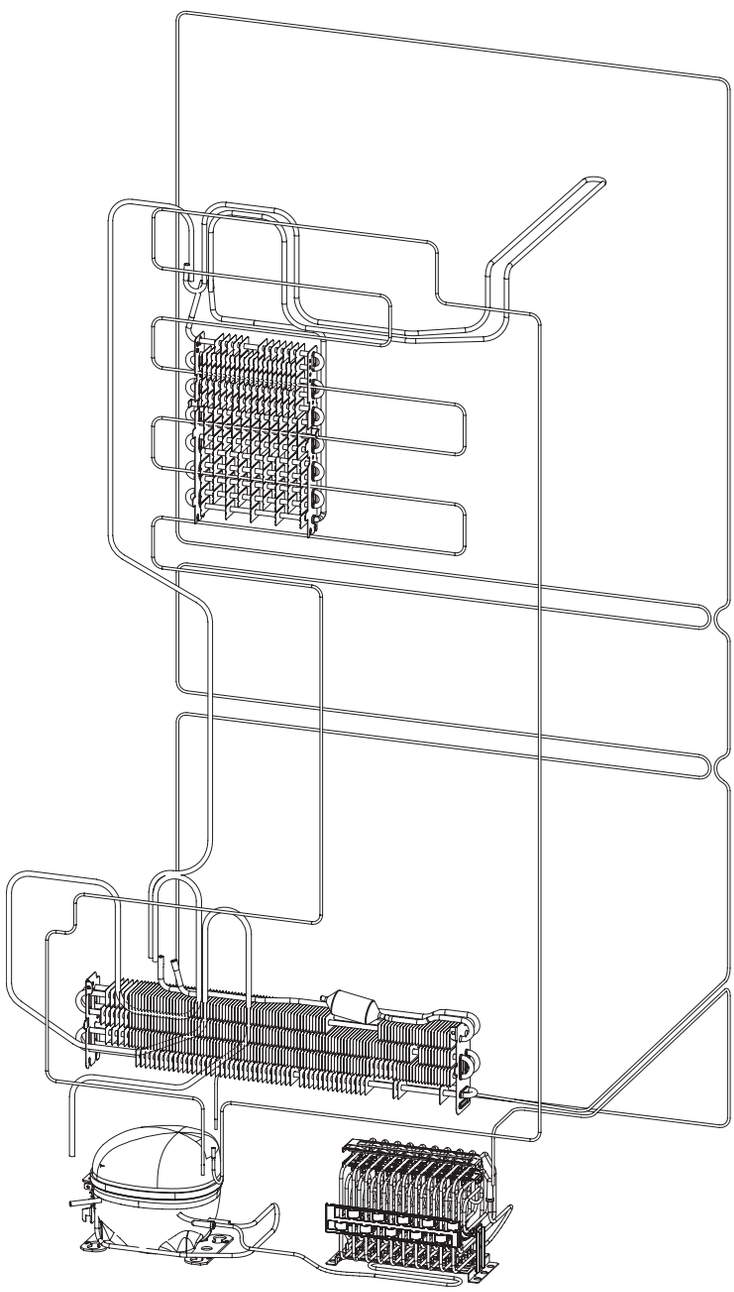
Product Specifications

2-6) Optional Material Specification

	Part Name	Part Code	AMOUNT
	ASSY-PACKING SUB	DA99-03490L	1
	LED LAMP REF	DA97-12606A	1
	LED LAMP CASE-VEG R, L	DA41-00519S	1
	LED LAMP REF(SIDE)	DA41-00519Q	2
	LED LAMP FRE	DA41-00676G	1

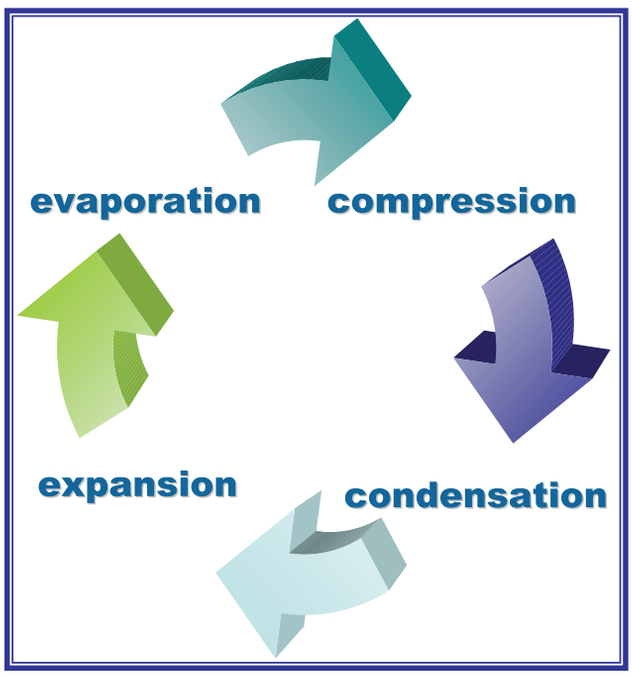
2-7) Refrigerant Route in Refrigeration cycle

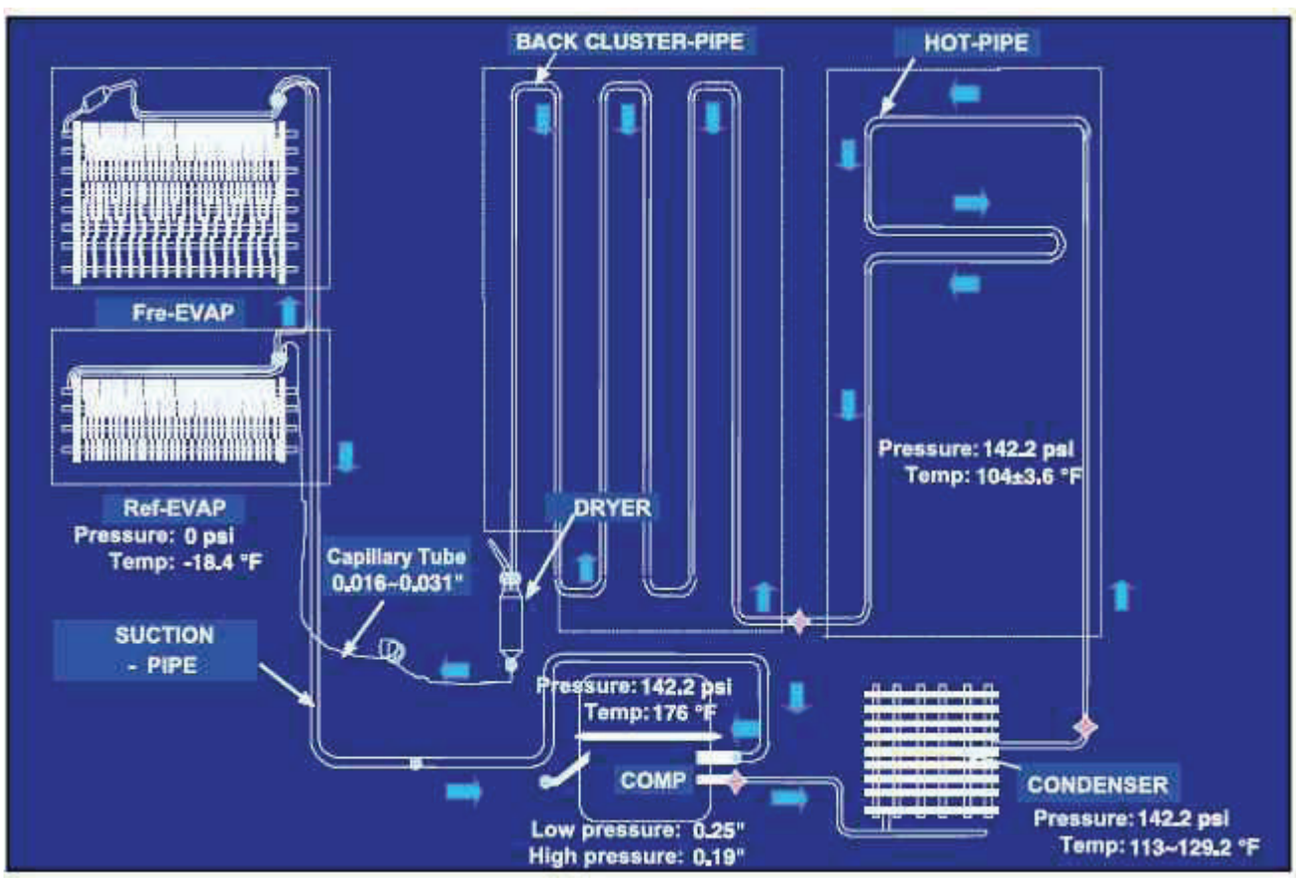
Compressor → Condenser → Hot Pipe
→ Back Cluster Pipe → Dryer → Capillary Tube → Refrigerator Evaporator
→ ICE Pipe → Freezer Evaporator → Suction Pipe → Compressor



Product Specifications

2-7-1. PRINCIPLE OF FREEZEER





2-7-2. Operation theory of refrigeration cycle components

■ Condenser

1) Role: A device which radiates heat to the outside of the refrigerator. As this heat is dispersed, the high temperature/ high pressure vapor refrigerant changes to a liquid state.

2) Types

A. Air-cooling Type : Condense air by circulating naturally or manually.

1) Natural Convection Type : Used for the household refrigerator which has small condensing capacity. (No Fan)

2) Manual Convection Type : Circulate air manually by FAN-Motor (Large capacity)

B. Water-cooling Type : Make cooling water pass through the pipe in the condenser (Large capacity)

※ Location

① CLUSTER heat-radiating type : All Pipes effective for radiating heat are formed in the right/left, and front side of refrigerator with hard urethanes and radiate heat through the whole surfaces of cabinet to ambient air.

② Install the condenser on the outside of the product. (An old model)

③ Make them cluster at the lower part of product and radiate heat manually by fan.

※ Radiate condensed potential heat up to liquefy completely and make change the state without changing the gas temperature itself.

※ Pipe thickness

① Low pressure: 6.3mm ② High pressure : 4.7mm ③ Capillary : About 0.4-0.8mm

※ Condenser length (Based on 300ℓ): 26.5 M

① Assistance : 5 M ② HOT-PIPE: 6.6 M ③ CLUSTER-PIPE: 4.17 M

■ Capillary

1. Role: A device which makes low temperature and pressure refrigerant by reducing the pressure the normal temperature / high pressure liquid refrigerant condensed from condenser, and supply it to the evaporator.

A. To evaporate more lower temperature in case of evaporation.

B. It flows to the evaporator without back flowing to condenser, if compressor stops, and the difference of pressure between high pressure and low pressure is small so it is easy to operate the compressor again.

2. Outline

A. Thickness : About 0.4-0.8ßÆ

B. Length : It is changeable to low temperature and pressure (10->5ß∏/ß≤) depends on the 2M of thin and long copper pipe wall resistance.

■ Evaporator

1. Role: As the low pressure liquid refrigerant flowed from capillary absorbs heat inside of the refrigerator, it becomes low pressure gas and refrigerate the foods.
2. Theory: The low pressure refrigerant flowed to evaporator operates cooling which takes ambient evaporated potential heat with maintaining the evaporation up to evaporate completely.
3. Types of Evaporator

   A. ROLL-BOND Evaporator ⋯› Direct Cooling ONE-DOOR Type

   ☞ Rolled and adhere the 2 aluminum plate and then make refrigerant passage.

   B. PIN-PIPE Type ⋯› Indirect cooling TWO-DOOR Type

   ☞ a small aluminum plate on the aluminum pipe to increase the cooling effect.

■ Compressor

1. Role: It operates same as pump which pull out the subterranean water. It inhales the low temperature and pressure refrigerant gas (flowed out) from evaporator and make high temperature and pressure refrigerant liquid in the compressor and send it to the condenser.
2. Type of Condenser

   a. Back-and-forth motion type: A method that pistol makes back-and-forth motion through shaft and cylinder of motor rotation and compresses.
   ※ Used for household refrigerant

   b. Rotary Type: A method that inhales the refrigerant gas through the gap between the outside of rotor electric attached on the shaft and the inside of cylinder and compresses.

   c. Centrifugal Type
3. Please insert the explanation of inverter comp operation theory.

■ Dryer

1. Role: Absorb the moisture from the refrigerant that refrigeration cycle circulates and eliminate the foreign substance.
2. Structure: If even some moisture is included refrigerant is impossible to circulate by freezing the small capillary outlet, so silica gel or molecular sieve is (included and) sealed to absorb the internal moisture, and install a minute net to eliminate the foreign substance.

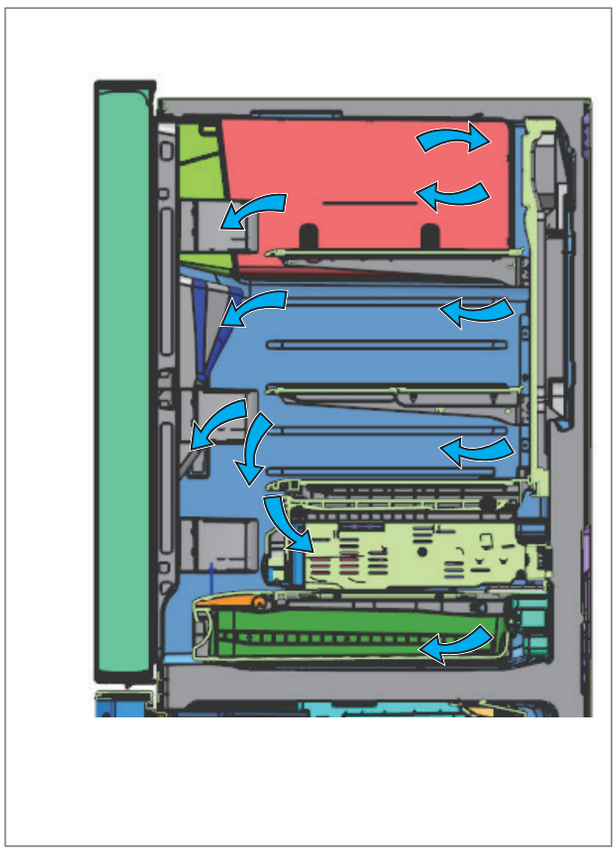
2-7-3. Refrigeration Cycle Type

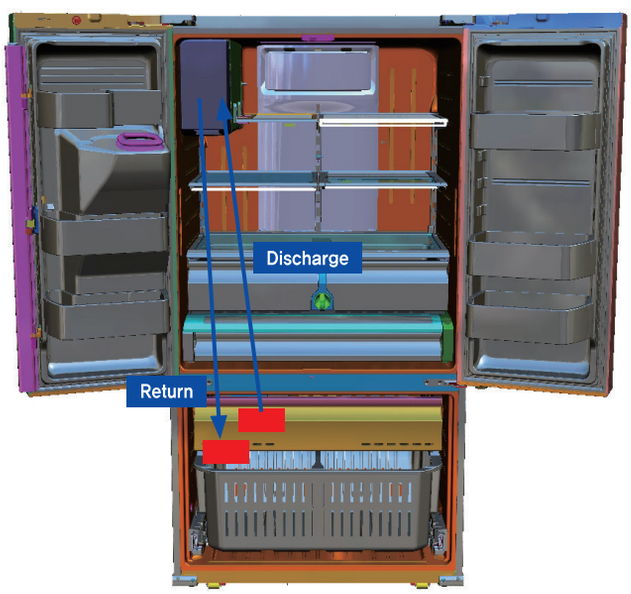
TDM Cycle

Compressor → Condenser → Hot Pipe
→ Back Cluster Pipe → Dryer → Capillary Tube → Refrigerator Evaporator
→ ICE Pipe → Freezer Evaporator → Suction Pipe → Compressor

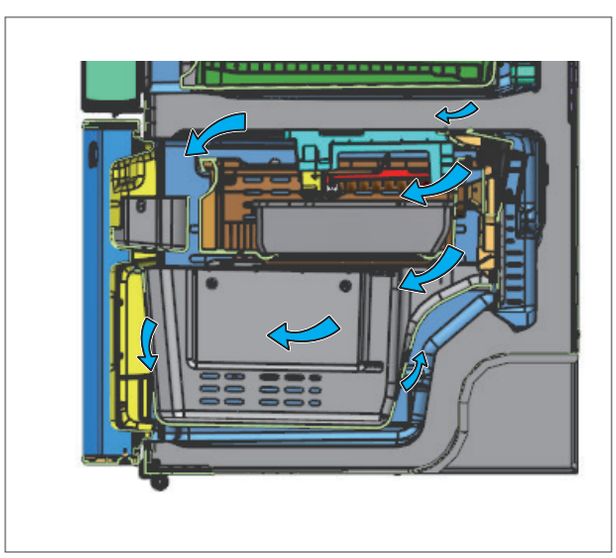
2-8) Cooling Air Circulation

Refrigerator





Freezer



3. Disassembly and Reassembly

Disassembly and Reassembly

3-1) PRECAUTION

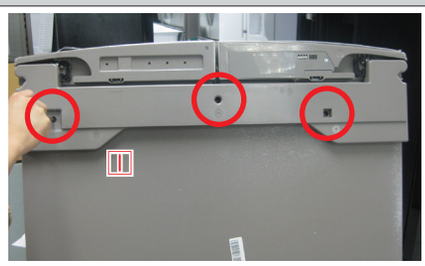
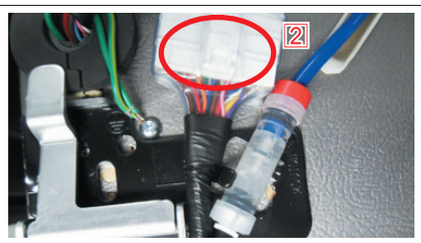
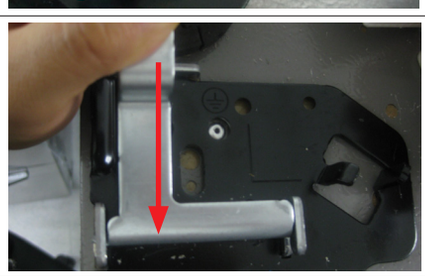
- Unplug the refrigerator before cleaning and making repairs.
- Do not dissemble or repair the refrigerator by yourself.
  - It may cause risk of causing a fire, malfunction and/or personal injury.
- Remove any foreign matter or dust from the power plug pins.
  - Otherwise there is a risk of fire.
- 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.
- 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.

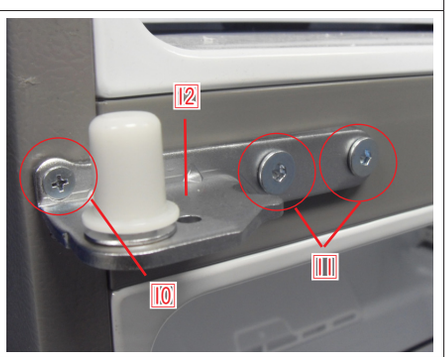
- Required Tools

IMAGE	ITEM	USE
	Phillips Head Driver	Use for assembling and disassembling of screw
	Flat Head Driver	Use for assembling and disassembling of HomeBar, Dispenser, Deli Cartessen Box, Main PBA etc...
	Hex Wrench Ø0.08 "	Use for assembling and disassembling of Handle
	Socket Wrench Ø0.4 "	Use for assembling and disassembling of Door Hinge

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. Remove the 3 hex head bolts (7) attatched to the upper left and right door hinges with a Wrench (0.4 "). With a Philips head screwdriver, remove the ground screw (8) attatched to the upper left and right door hinges. Remove the upper left and right door hinges (9).	 
	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.	
	6. With a Philips head screwdriver, remove the screw (⑩) attatched to the lower left and right door hinges. With a wrench(0.4 "), remove the 2 flat head screws (⑪) attatched to the lower left and right door hinges. Remove the lower left and right door hinges (⑫).	

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.	

Disassembly and Reassembly

3-4) Door Handle Freezer & Flex zone

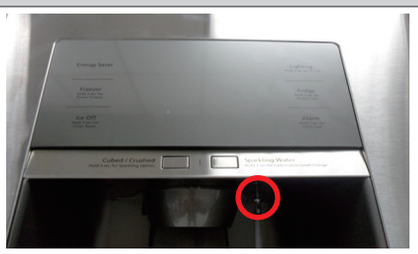
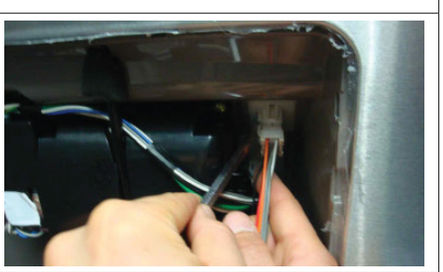
Part Name	How To Do	Descriptive Picture
Door Handle Freezer	1. Loosen the Set Screw situated at the bottom right of the appliance about 0.1in by using Hex wrench.	
	2. Pull the Set handle out by moving it to the right side. CAUTION Be careful not to scratch or break the parts	 

3-5) Refrigerator Light

Part Name	How To Do	Descriptive Picture
Refrigerator Light	1. Loosen the Set Screw situated at the bottom right of the appliance about 0.1in by using Hex wrench.	
	2. Remove the screws. And separate Case Lamp.	
	3. Separate the LED housing.	
	4. Remove the LED from the Case.	

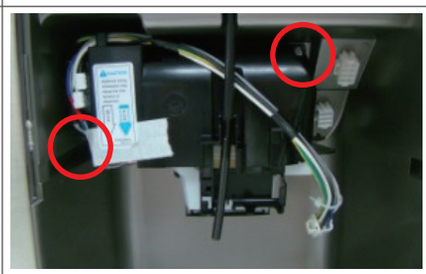
Disassembly and Reassembly

3-6) Cover-Display & Water-Dispenser

Part Name	How To Do	Descriptive Picture
Cover-Display	1. Remove a screw under the display cover.	
	2. Remove the display cover by pulling it up. Put the thumbs on the surface door and hold the bottom of the Display Panel with four fingers. And then, pull out the Display Panel as shown in the photo to remove it. CAUTION Take care not to break the Locking Tabs.	
	3. Disengage the housing connect of display cover.	

Disassembly and Reassembly

3-7) Water-Dispenser

Part Name	How To Do	Descriptive Picture
Water-Dispenser	1. Disengage the Housing Connector by pushing a flat-blade screwdriver.	
	2. Remove 2 screws of the Case Ice Route Assy.	
	3. Pull the Case Ice Route Assy.	
	4. Assembly shall be in order from the disassembly. Make sure to fix the hose to the Case Ice Route before assembling the Display.	
	5. When assembling Cover-Display, first insert it from upper side and then assemble to bottom side. Otherwise, the hook can be broken.	

3-8) Glass Shelf

Part Name	How To Do	Descriptive Picture
Glass Shelf	1. Remove the shelf by lifting the front part of the shelf up and pulling it out.	

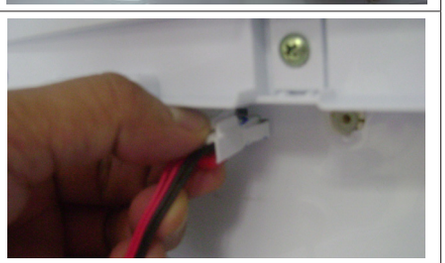
3-9) Foldable Glass Shelf

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

Disassembly and Reassembly

3-10) Vegetable & Fruit Drawers Shelf

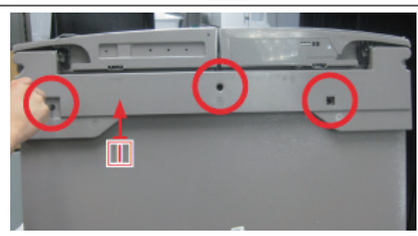
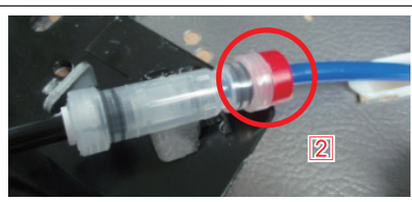
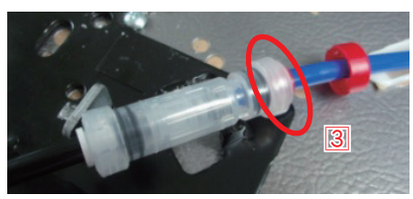
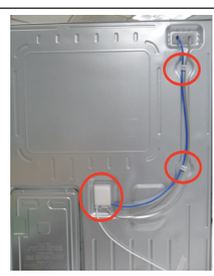
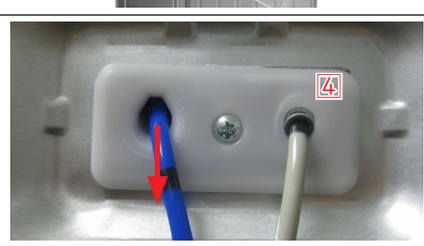
Part Name	How To Do	Descriptive Picture
Vegetable & Fruit Drawers Shelf	1. Remove the vegetable & fruit drawer by pulling the roller part and lifting it up.	
	2. Remove the vegetable & fruit drawer shelf by pulling it out. (Refer to the picture)	

Part Name	How To Do	Descriptive Picture
Vegetable & Fruit LED LAMP	1. Pull out the Cover LED with a flat head screwdriver.	
	2. Pull out the Case LED with a flat head screwdriver.	
	3. Disengage the housing connector.	

3-11) Cool Select Pantry

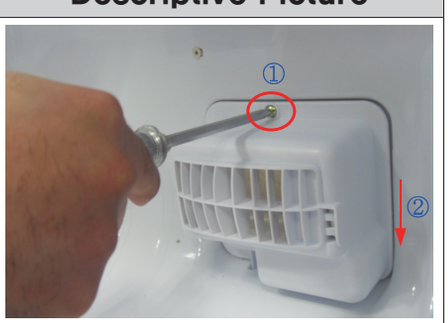
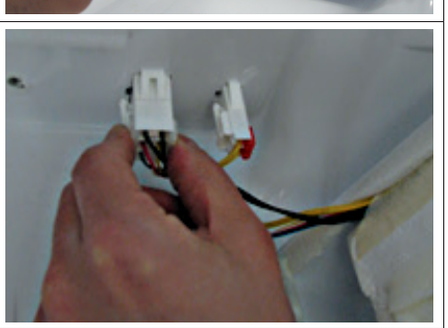
Part Name	How To Do	Descriptive Picture
Cool Select Pantry	1. Remove the cool select pantry by pulling the roller part and lifting it up.	
Cool Select Pantry Cover	1. Remove the cool select pantry cover by lifting up the left part of the cover and pulling it.	
Cool Select Pantry Shelf	1. Remove the cool 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.	
	2. Disconnect the housing connector from the internal rail part. (Refer to the picture)	

3-12) 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. Lift and pull the Case Water Filter out.	

3-13) Motor Damper

Part Name	How To Do	Descriptive Picture
Motor Damper	1. Remove the cool select pantry. Remove the screw of motor damper part and than push the motor damper down.	
	2. Disengage 2 housing connectors from the rear motor damper. (Refer to the picture)	

3-14) 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.

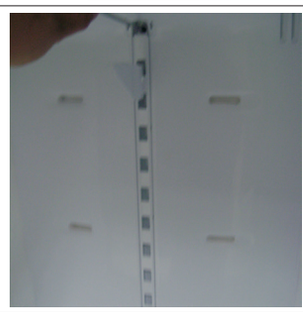
3-15) Gallon Door Bin

Part Name	How To Do	Descriptive Picture
Gallon Door Bin	1. Remove the gallon door bin by lifting it up. (Refer to the picture)	

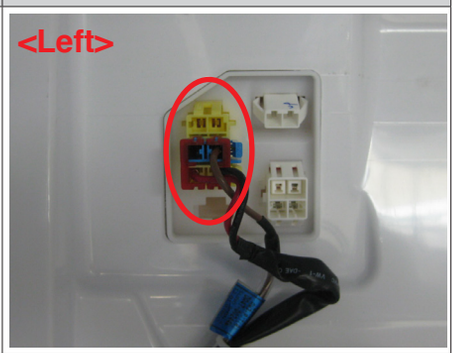
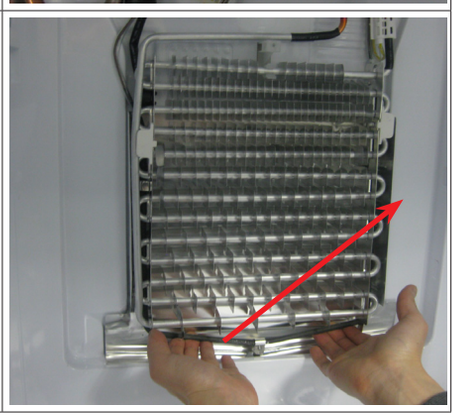
3-16) Vertical Hinged Section

Part Name	How To Do	Descriptive Picture
Vertical Hinged Section	1. Remove 2 screw caps with a flat-blade(-) screwdriver. (Refer to the picture)	
	2. Unscrew 2 screws.	
	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)	

3-17) 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.	

3-18) Evaporator In Refrigerator

Part Name	How To Do	Descriptive Picture
Evaporator In Refrigerator	1. Disconnect the housing connector part on left side. CAUTION Before doing the above, make sure that the unit is unplugged.	
	2. Disconnect the housing connector on right side.	
	3. Remove the evaporator by moving it up while holding both of bottom sides.	

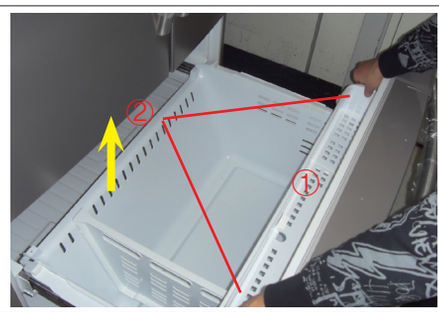
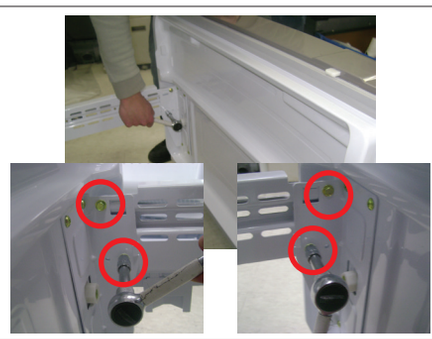
Disassembly and Reassembly

3-19) Super Extended Drawer

Part Name	How To Do	Descriptive Picture
Super Extended Drawer	1. Slide the drawer in as much as possible.	
	2. Lift the drawer up.	
	3. Remove the drawer by lifting the bottom part of drawer bin and pulling it out.	

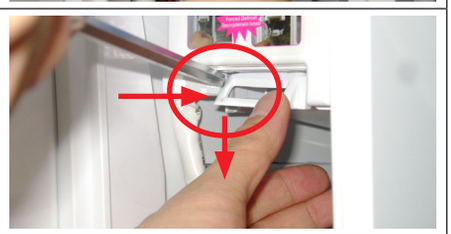
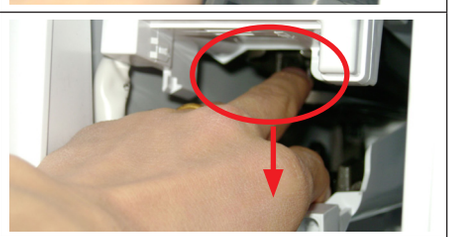
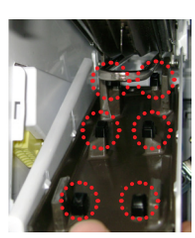
Disassembly and Reassembly

3-20) Freezer Door

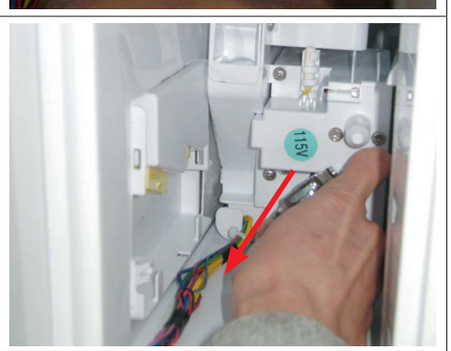
Part Name	How To Do	Descriptive Picture
Freezer Door	1. Take out the upper drawer by lifting it up.	
	2. Remove the tilting Pocket (①) by pulling the both brackets (②) upward at the same time.	
	3. Take out the lower basket (③) by lifting the basket up from rail system. CAUTION The box may get scratch on its side by getting twisted left and right when disassembling the drawer box.	
	4. Unscrew 4 bolts. (2 bolts each on the both sides)	
	5. Lift up the freezer door from the rails.	

Disassembly and Reassembly

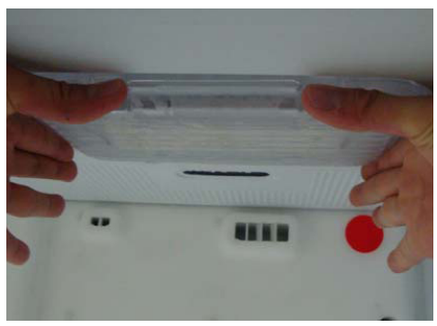
3-21) Ice-Maker

Part Name	How To Do	Descriptive Picture
Ice Maker	1. Remove the screw from the Duct Tray-ice.	
	2. With a flat blade screwdriver, push the duct to the right and remove it from the locking tab. (Refer to the image.)	
	3. 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.)	
	4. Push down the refrigerant pipe slightly and separate the refrigerant pipe and the Ice Maker Assembly completely.	
	5. While pressing the Hook, pull out the Ice Maker.	
	6. 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.)	 

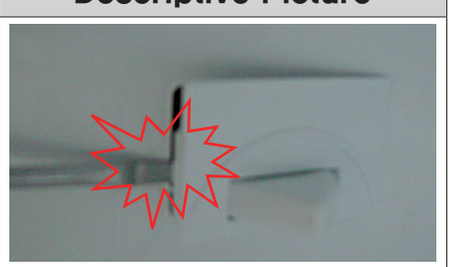
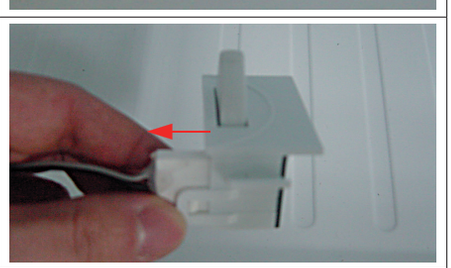
Disassembly and Reassembly

Part Name	How To Do	Descriptive Picture
Ice Maker	If the ice maker is frozen, it can be melt by using the steam heater.	 
Auger Motor Fan	1. Disconnect the FAN–AUGER–ASSY Connector.	
	2. Hold the Hook on the bottom of the FAN–AUGER–ASSY and lift it up to make it free from the Locking Tab.	
	3. While lifting it up, take the FAN–AUGER–ASSY out of the Ice Maker Compartment.	

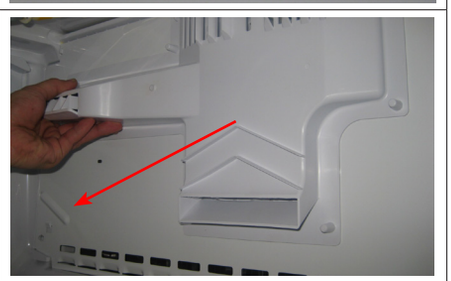
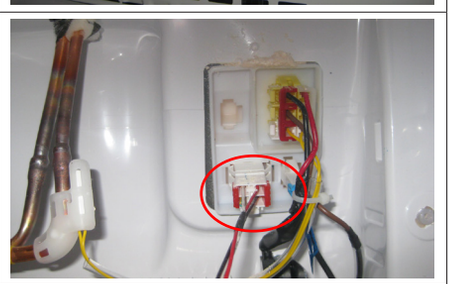
3-22) Freezer Light

Part Name	How To Do	Descriptive Picture
Freezer LED	1. Remove the LED by pulling the LED cover down while pulling the front plane of LED cover.	

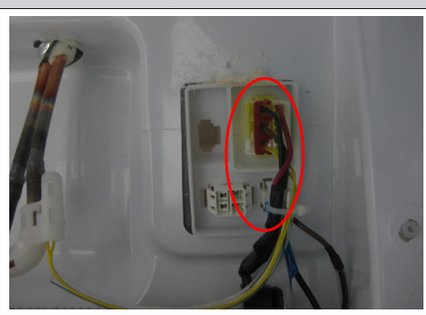
3-23) Door Switch In Freezer

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.	

3-24) Evaporator Cover In Freezer

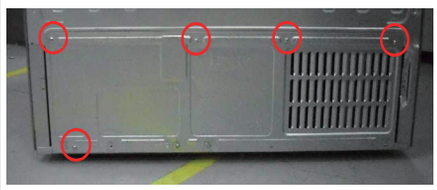
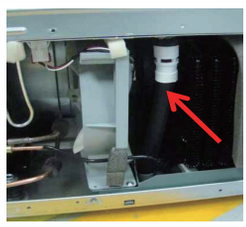
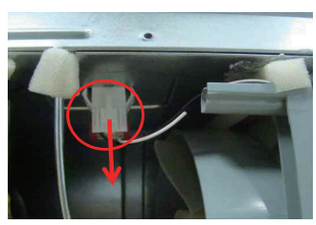
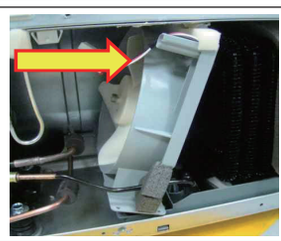
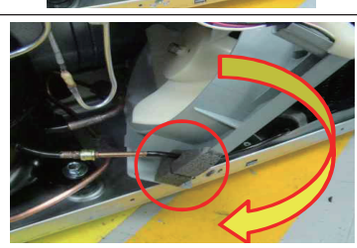
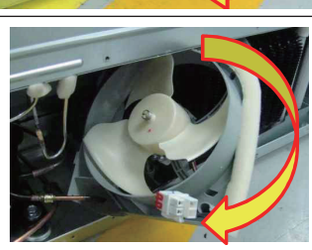
Part Name	How To Do	Descriptive Picture
Evaporator Cover In Freezer	1. Loosen the 4 screws, which fix the Evaporator cover.	
	2. Lift up the evaporator cover.	
	3. Disconnect the housing connector on right and remove the evaporator cover. CAUTION Before doing the above, make sure that the unit is unplugged.	

3-25) Evaporator In Freezer

Part Name	How To Do	Descriptive Picture
Evaporator In Freezer	1. Disconnect the 2 housing connectors on right side. CAUTION Before doing the above, make sure that the unit is unplugged.	
	2. Remove the evaporator by pulling the lower part of the evaporator while lifting it up.	

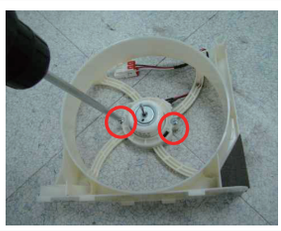
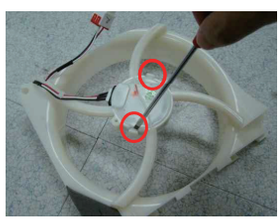
Disassembly and Reassembly

3-26) Comp Cooling Fan

Part Name	How To Do	Descriptive Picture
Comp Cooling Fan	1. Unscrew 5 screws of COVER COMP. CAUTION Be careful not to damage from the inner hole of cover comp.	
	2. Remove the DRAIN HOSE.	
	3. Remove 1 screw.	
	4. Disengage the HOUSING CONNECTOR. (Refer to the picture)	
	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.	

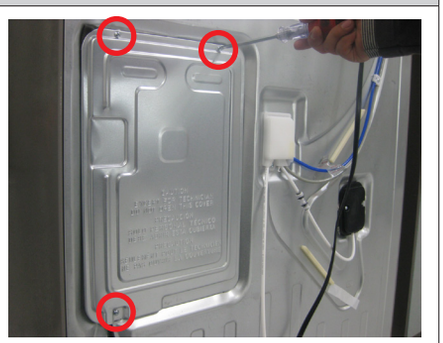
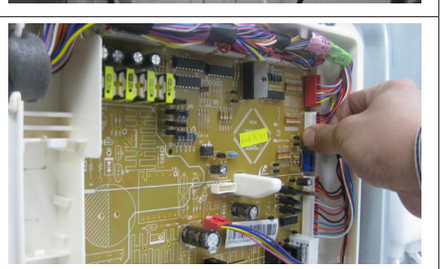
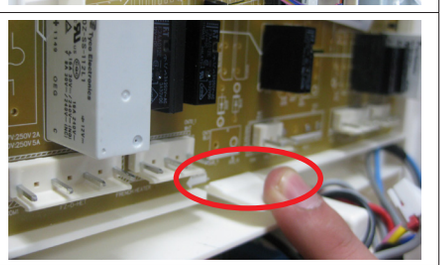
Disassembly and Reassembly

3-27) Comp Cooling Fan Motor

Part Name	How To Do	Descriptive Picture
Comp Cooling Fan Motor	1. Remove the screw with a flat blade screwdriver.	
	2. Remove the motor fan by pulling the fan out while graping the motor part.	
	3. Unscrew 2 screws fixed in the motor.	
	4. Remove the BRACKET MOTOR with a flat blade screwdriver.	
	5. Remove the MOTOR after pulling the BRACKET MOTOR out.	 

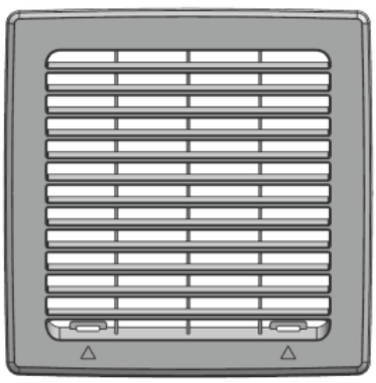
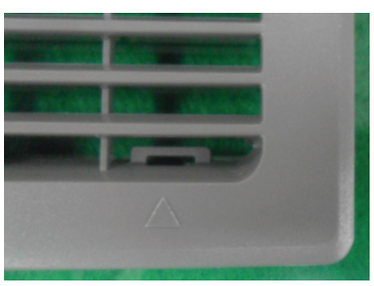
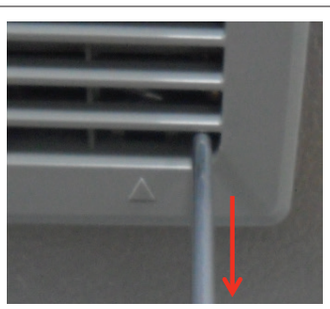
Part Name	How To Do	Descriptive Picture
Relay O/L	1. Disengage the housing connector.	
	2. Remove Cover Relay.	
	3. Remove the relay O/L with a flat–blade screwdriver. (Refer to the picture)	

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)	
PBA Inverter	1. Remove the INVERTER PBA by lifting the upper part of the hook up.	

Disassembly and Reassembly

3-29) Cover-Unit

Part Name	How To Do	Descriptive Picture
Cover-Unit	Supplies : A general hexagonal wrench (Thickness is under 6mm)	 
	1. Check the hook on the mark of "△".	
	2. Inset the wrench to the side of hook on the mark of "△"	
	3. Pull with the arrow direction and remove it.	

4. TROUBLESHOOTING

TROUBLESHOOTING

4-1) Function for failure diagnosis

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

- If Freezer Key + Lighting Key on the front of panel are pressed simultaneously for 8 seconds , it will be changed to the test mode and all displays on the front of panel will be off.
- 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

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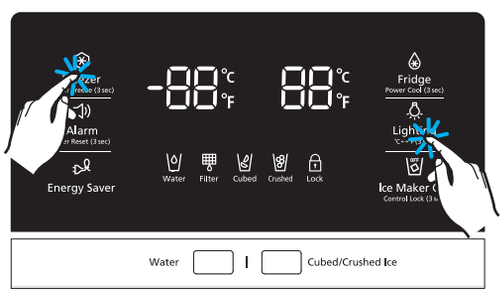

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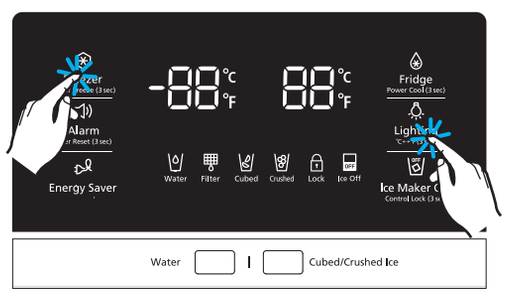
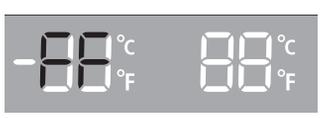


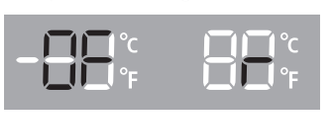
Freezer Key + Lighting Key are pressed simultaneously for 8 seconds, (displays are all off) It will be changed to the test mode (manual operation) by pressing any key.

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)

Compulsion working 1 : 3600RPM



Compulsion working 2 : 3600RPM



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, Freezer Key & 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.

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.

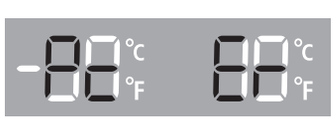
3) Test cancel mode

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. Display function of Communication error

1) Display function when Panel ↔ MAIN MICOM communication has error

1-1) If there is no answer for 10 seconds after the panel micom received the requirement of communication, "Pc - Er" display on the panel PCB will be ON/OFF alternately until the communication error is canceled. (0.5 sec ALL ON, 0.5 sec ALL OFF alternately)



1-2) “Pc - Er” display on the Flex Zone Temp. Display will be ON/OFF alternately until the communication error is canceled. (0.5 sec ALL ON, 0.5 sec ALL OFF alternately)

2) Display function when Panel ↔ MAIN MICOM OPTION has error

2-1) ”OP - Er” code is repeatedly ON/OFF until Option error settles down.

4–1–3. 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 (Freezer Key + Fridge Key) are pressed simultaneously for 8 seconds.
(Return to normal display mode)

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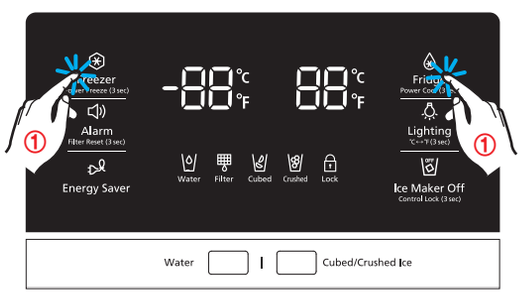

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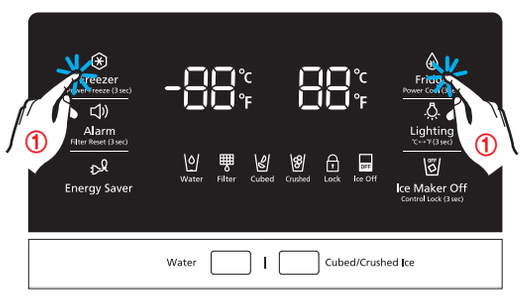

① If Freezer Key + Fridge Key are pressed simultaneously for 8 seconds, the error mode by self-diagnosis will be canceled.

2) Self-diagnostic function during normal operation

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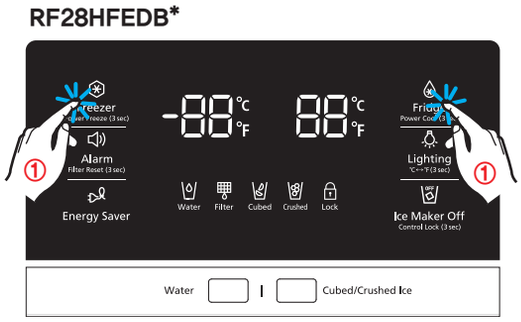

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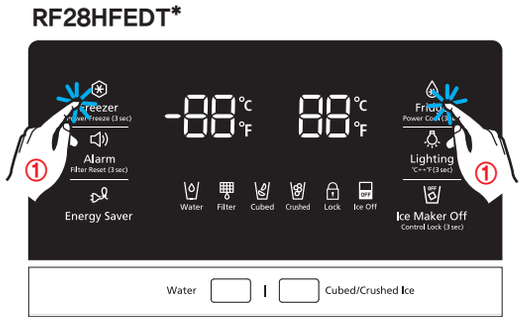


② If Freezer Key + Fridge Key are pressed simultaneously for 8 seconds, the self-diagnosis function will be selected.

2-1) If Freezer Key + Fridge Key are pressed simultaneously for 6 seconds during normal operation, the temperature setting display will operate for 2 seconds (ON/OFF 0.5sec each).
If Freezer Key + Fridge Key are pressed simultaneously for 8 seconds (including above 2 seconds), self-diagnostic function will be selected.
2-2) 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)
2-3) Input by button is not accepted during self-diagnostic function.

TROUBLESHOOTING

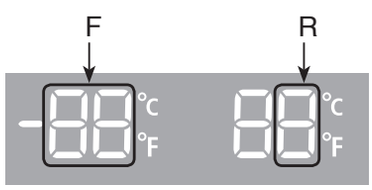
※ R Self-diagnostics check list

LED		Item	Trouble contents	Diagnostic method
F	R			
01		FZ–Sensor Error	Display error : separation of sensor housing part, contact error, disconnection, short circuit. Display error of detecting temperature of sensor : more than 149°F(+65°C) or less than –58°F(–50°C)	When measuring the voltage between the Main PCB CN30–"4" ↔ CN76–"1", it should read between 4.5V∼1.0V.
02		FF–Sensor Error		When measuring the voltage between the Main PCB CN30–"6" ↔ CN76–"1", it should read between 4.6V∼1.0V.
04		FZ–DEF–Sensor Error		The voltage of MAIN PCB CN30– "5"↔ N76–"1": shall be between 4.5V∼1.0V
05		FF–DEF–Sensor Error		When measuring the voltage between the Main PCB CN30–"8" ↔ CN76–"1", it should read between 4.5V∼1.0V.
06		Ambient–Sensor Error		The voltage of MAIN PCB CN78– "8"↔ CN78–"12": shall be between 4.5V∼1.0V
09		PANTRY–Sensor Error		The voltage of MAIN PCB CN30– "9"↔ CN76–" 1": shall be between 4.5V∼1.0V
08		Ice Maker(FZ) Sensor Error	Display error : separation of sensor housing part, contact error, disconnection, short circuit Display error of detecting temperature of sensor: more than 149°F (+65°C) or less than –58°F(–50°C)	The Voltage of MAIN PCB CN90 #8〈–〉#9: Shall be between 4.5v ∼ 1.0v
13		Humidity–Sensor Error	Separation of sensor housing part, contact error, disconnection, short circuit	When measuring the voltage between the Main PCB CN30–"3" ↔ CN76–"1", it should read between 4.5V∼1.0V.
14	0E	Ice Maker(FF) Sensor Error	Display error : separation of sensor housing part, contact error, disconnection, short circuit. Display error of detecting temperature of sensor : more than 149°F(+65°C) or less than –58°F(–50°C)	The voltage of MAIN PCB CN90– "1"↔ CN90–"7": shall be between 4.5V∼1.0V
15		Ice Room Sensor Error		When measuring the voltage between the Main PCB CN78–"10" ↔ CN78–"12", it should read between 4.5V∼1.0V.
21		FZ–FAN Error	Display error during operation of applicable fan motor : Feed back signal line contact error, motor wire separation, motor error	The voltage of MAIN PCB CN76– "3"(Yellow) ↔ CN76–"1"(Gray): shall be between 7V∼12V
22		FF–FAN Error	Display error during operation of applicable fan motor : Feed back signal line contact error, motor wire separation, motor error	The voltage of MAIN PCB CN76– "4"(Orange) ↔ CN76–"1"(Gray): shall be between 7V∼12V
23		C–FAN Error	Display error during operation of applicable fan motor : Feed back signal line contact error, motor wire separation, motor error	The voltage of MAIN PCB CN76– "5"(Sky–blue) ↔ CN76–"1"(Gray): shall be between 7V∼12V
24		FZ–DEF Error	Separation of freezer compartment defrost heater housing part, contact error, disconnection, short circuit or temperature fuse error. Display error : the defrosting does not finish though freezer compartment defrost is heating continuously for more than 80 minutes.	After separating MAIN PCB CN70 wire from PCB, resistance value between CN70 Brown ↔ CN72 Gray 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		FF–DEF Error	Separation of fresh food compartment defrost heater housing part, contact error, disconnection, short circuit or temperature fuse error. Display error : the defrosting does not finish though fresh food compartment defrost is heating continuously for more than 80 minutes.	After separating MAIN PCB CN70 wire from PCB, resistance value between CN70 White ↔ CN70 Gray shall be 120(440) ohm± 7%. (Resistanc e value is varied by input power) 0 ohm : heater short, ∞ ohm : wire/bimetal open (Must power off)
26		Ice Maker(FZ) Function Error	When the Freezer Ice Maker error occurs more than 3 times, the error will be displayed.	After replacing the Ice Maker, check if it operates normal.

TROUBLESHOOTING

※ R Self-diagnostics check list

LED F	LED R	Item	Trouble contents	Diagnostic method
28		Pantry–Damper–Heater Error	Display error when open error is detected by damper heater : separation of Damper Heater housing part, contact error, disconnection, short circuit.	After separating MAIN PCB CN77 wire from PCB, resistance value between Black ↔ Brown wire shall be 135 ohm± 7%. 0 ohm : heater short, ∞ Ohm : wire / bimetal Open.
38		FZ–Ice Pipe Heater Error	The error occurs when there is a wire connector slip–out of the Water Supply Pipe Heater, a contact error or a breakage in the wiring.	When measuring the resistance of the Main PCB CN79 Yellow–Pink wires, it should be within 102Ω ±7%. 0Ω : heater short, ∞Ω : Check for Wire Open or Connector Slip–out
39		Ice Maker(FF) Function Error	Display error when open error is detected by Heater : separation of Ice Pipe Heater housing part, contact error, disconnection, short circuit.	After changing the Ice Maker(R), plug the refrigerator power code again, and check the operation.
40		Ice Room–FAN Error	Display error during operation of applicable fan motor : Feed back signal line contact error rnotor wire separation motor error.	When measuring the voltage between the Main PCB CN76–"2" ↔ CN76–"1", it should read between 7.0V∼12V.
41		Panel ↔ Main Communication Error	Display pc – Er in the panel with alarm : MICOM 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.
61	0E	Water Pipe Heater Error	The Error will be displayed when the Ice Duct Heater is detected as being open due to the followings. – Ice Maker Duct Heater Connector Slip–Out, Contact Defect or Wire–Breakage	The resistance between CN79 ORG and CN51 BRN on the Main PCB shall be within 135Ω ± 7%. And, when the resistance reads 0Ω or ∞Ω, check the followings. 0Ω : Heater Short ∞Ω : Wire–Breakage or Wire Slip–Out
65		FF Ice Bucket Heater Error	The Error will be displayed when the Ice Bucket Heater is detected as being open due to the followings. Ice Bucket Heater Connector Slip–Out, Contact Defect or Wire–Breakage.	The resistance between CN79 ORG and BRN on the Main PCB shall be within 135Ω ±7%. And, when the resistance reads 0Ω or ∞Ω, check the followings. 0Ω : Heater Short ∞Ω : Wire–Breakage or Wire Slip–Out
81		Comp starting Failure Error	When the Compressor fails starting	Check if there is a short between compressor terminals. Check IPM Voltage [Under 13.5V] Check if there is a short between IPM Pins [#1∼33] Check the Compressor and the Cycle
82		IPM Fanlt Error	When there is a IPM Fault error	
83		Comp Abnormal current Detection Error	When ther is abnormal crrunt detected at the Compressor	Check the Compressor connections Check the voltage of Resistance of R308 [0.09Ohm] Check the Compressor and the Cycle
84		Motor Locked Over RPM Error	When there is a Compressor restriction error	Check the voltage of Resistance of R308 [Short/Open] Check the voltage of both of C103 terminals [Unstable Voltage] Check the Compressor and the Cycle
85		Comp under voltage Error	When there is a low voltage error	Check the voltage of Resistance of R513 [Short/Open]
86		Comp over voltage Eroor	When there is a over voltage error	Check the voltage of Resistance of R501, R505, R509 [Short/Open]



4-1-4. Display function of Load condition

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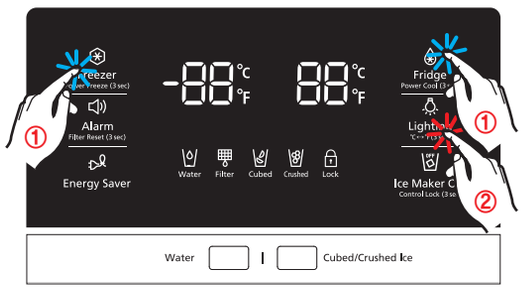
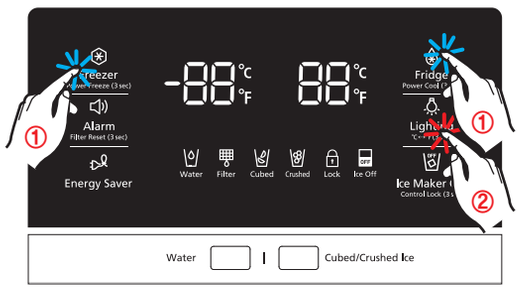
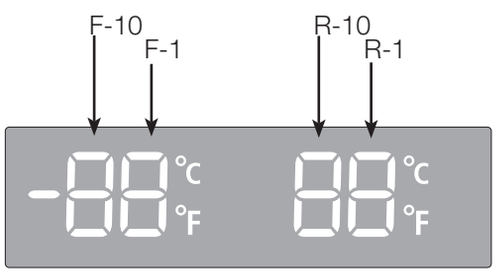


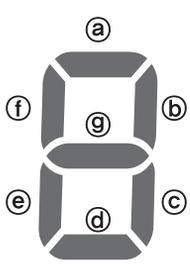
RF28HFEDT*



① If Freezer Key + Fridge Key are pressed simultaneously for 6 seconds, ALL ON/OFF will blink with 0.5interval for 2 seconds.
② If take the finger off from above keys and press Lighting, load condition mode will be started.

1) If Freezer Key + Fridge Key are pressed simultaneously for 6 seconds during normal operation, the temperature setting display of fresh food and freezer compartments will blink ALL ON/OFF with 0.5 for 2 seconds.
2) At this moment, If Lighting Key after Freezer Key + Fridge 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"





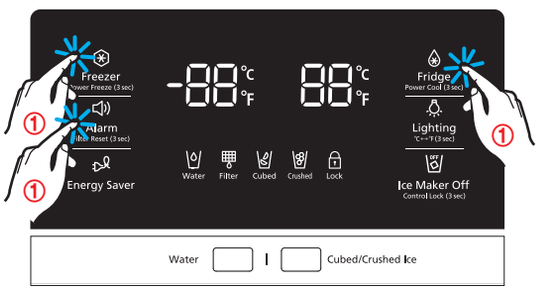
TROUBLESHOOTING

※ Load mode Check list

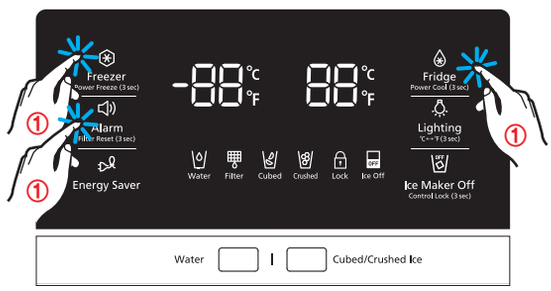
Display LED	Display contents	Operation contents
R–1–ⓐ	R–FAN High	When FF compartment FAN operates with high speed, applicable LED ON
R–1–ⓑ	R–FAN Low	When FF compartment FAN operates with low speed, applicable LED ON
R–1–ⓒ	R–DEF Heater	When FF compartment defrost heater operates, LED ON
R–1–ⓓ	Start Mode	When refrigerator is plugged initially, LED ON
R–1–ⓔ	Overload condition	When ambient temperature is more than 93°F(34°C), LED ON
R–1–ⓕ	Low temperature condition	When ambient temperature is less than 72°F(22°C), LED ON
R–1–ⓔ,ⓕ (ALL LED Off)	Normal Condition	When ambient temperature is between 73°F(23°C) and 91°F(33°C)
R–1–ⓖ	Exhibition Mode	LED ON at the display mode.
F–1–ⓐ	COMP.	When COMP operates, applicable LED ON.
F–1–ⓑ	F–FAN High	When FZ compartment FAN operates with high speed, applicable LED ON.
F–1–ⓒ	F–FAN Low	When FZ compartment FAN operates with low speed, applicable LED ON.
F–1–ⓓ	F–DEF Heater	When FZ compartment defrost heater operates, LED ON
F–1–ⓔ	C–FAN High	When compressor FAN operates with high speed, applicable LED ON.
F–1–ⓕ	C–FAN Low	When compressor FAN operates with low speed, applicable LED ON.
R–10–ⓓ	Ice Room–FAN High	When Ice Room–FAN operates with high speed, applicable LED ON.
R–10–ⓔ	Ice Room–FAN Low	When Ice Room–FAN operates with low speed, applicable LED ON.
R–10–ⓖ	French Heater	When French heater operates, applicable LED ON
F–10–ⓐ	Pantry Room Damper Open	When damper open, applicable LED ON
F–10–ⓓ	Ice maker full	When the Ice Maker's Bucket is full, applicable LED ON in FF–room
F–10–ⓔ	Ice maker full	When the Ice Maker's Bucket is full, applicable LED ON in FZ–room
F–10–ⓕ	More Heater	Add to Assy Water Pipe Heater in Fre–room

4–1–5. Cooling OFF mode setting function

RF28HFEDB*



RF28HFEDT*



① If Freezer Key + Fridge Key + Alarm Key are pressed for 5 seconds, Cooling Off mode will be started.

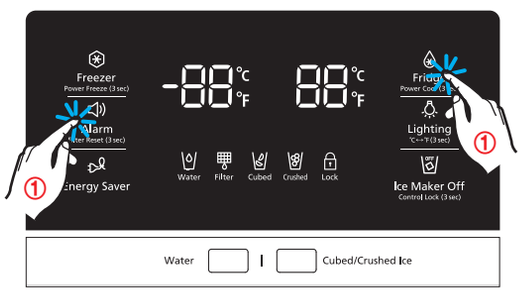
1) If Freezer Key + Fridge Key + Alarm Key are pressed simultaneously for 5 seconds during normal operation, Cooling Off mode will be started with buzzer sound(ding-dong).
2) If above Freezer Key + Fridge Key + Alarm Key are pressed one more time, Cooling Off mode will be canceled.
3) If Cooling Off 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 fresh food and 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.

4–1–6. Option setting function

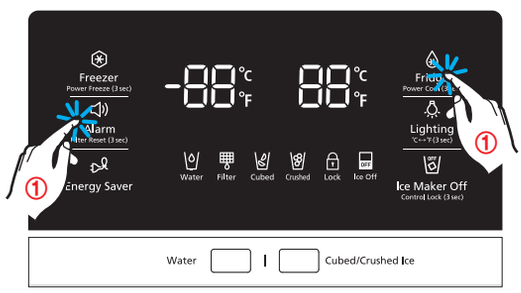
• If Alarm Key + Fridge Key are pressed simultaneously for 12 seconds during normal operation, fresh food and freezer compartments temperature display will be changed to option setting mode.

KEY operation method for changing to option mode

RF28HFEDB*



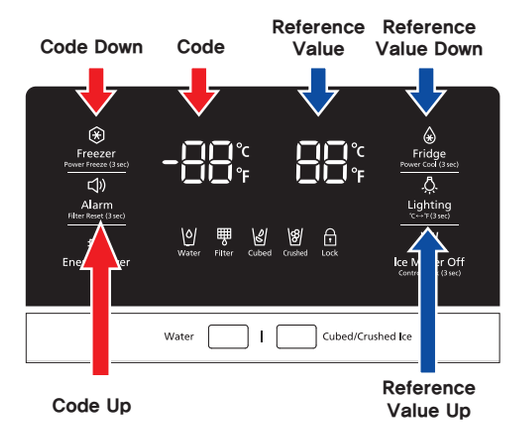
RF28HFEDT*



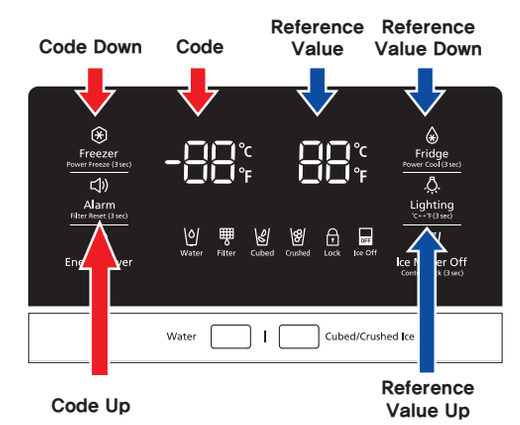
① If Alarm Key + Fridge Key are pressed simultaneously for 12 seconds, option setting mode will be started.

KEY control method after converting to option mode

RF28HFEDB*



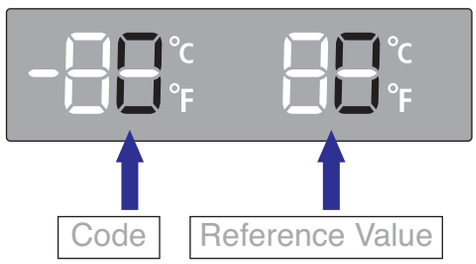
RF28HFEDT*



※ Key control in option mode

Freezer Key	Code Down key
Alarm Key	Code Up key
Fridge Key	Reference Value down key
Lighting Key	Reference Value Up key

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



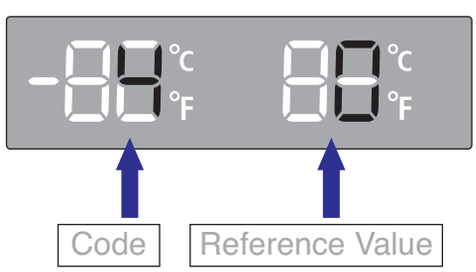
1) For example, if you want to change freezer compartment standard temperature to -4℉(-2°C) by operating option, do as below. This function is for changing the standard temperature.
In -2℉(-19°C) of current temperature of freezer compartment, if you make the temperature lower to -4℉ (-2°C) by the option, the standard temperature would be controlled -6℉(-21°C)
Therefore, if you change the setting of temperature option to -2℉(-19°C) on the panel, the appliance will be operated with -6℉(-21°C). It means that standard temperature is controlled -4℉(-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.
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℉(-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) Option changing method as above is the same as all RFG29** model.
5) 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.
6) 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

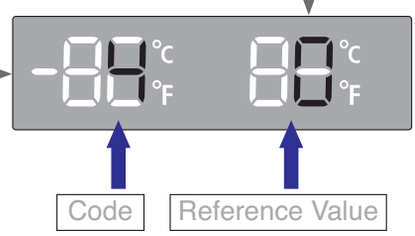
Option setting function exists in the other items.
We will skip the explanation of the other functions by the option because it is associated with refrigerator control function and is not needed at SERVICE.
(Please do not set the other options except above SERVICE Manual.)

4-1-7. Option TABLE

1) Temperature changing table of freezer compartment

Set item	Freezer Temp Shift
MODEL	RF28HF*
Reference	Fridge Room 7-SEG
Value	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)

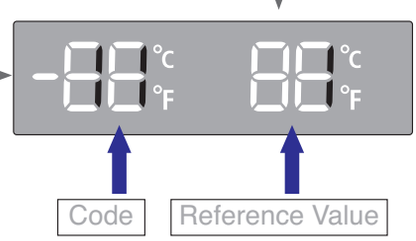


2) Temperature changing table of fresh food compartment

Set item	Freezer Temp Shift
MODEL	RF28HF*
Reference	Fridge Room 7-SEG
Value	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)

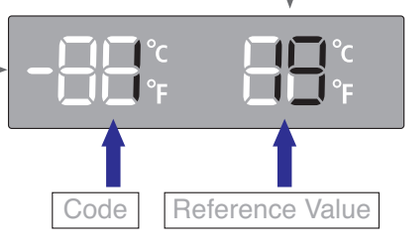
ex) If you want to change the freezer compartment standard temperature to 4°F(2°C)



3) Operation rate changing table of dispenser heater

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

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



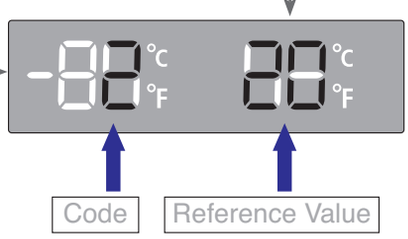
Code Reference Value

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

4) Temperature changing table of Pantry/Room

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



Code Reference Value

ex) If you want to change the mid drawer room temperature to -2°F(-1.0°C)

5) Temperature changing table of ICE ROOM compartment

Set item	Freezer Temp Shift
MODEL	RF28HF*
Reference	Fridge Room 7-SEG
Value	34

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

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)

℃	℉	Voltage	Resistance	℃	℉	Voltage	Resistance	℃	℉	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	17142	39	102.2	1.183	3098	84	183.2	0.375	810

DATA2. Humidity Sensor table
- Voltage output table @23°…, 5Vdc --- HTG3515CH/HTG3535CH
RH(Temperature compensate) = RH (Relative Humidity) + (Temp(°C) °© 23°C) x 0.05

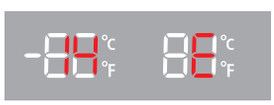
℃	℉	Voltage	Resistance	℃	℉	Voltage	Resistance	℃	℉	Voltage	Resistance
0	909	186	744	46	2246	460	1839	92	3452	706	2827
1	943	193	772	47	2272	465	1861	93	3478	712	2848
2	977	200	800	48	2298	470	1882	94	3504	717	2870
3	1010	207	827	49	2324	475	1903	95	3530	722	2891
4	1043	213	854	50	2350	481	1925	96	3566	730	2920
5	1076	220	881	51	2376	486	1946	97	3595	735	2944
6	1109	227	908	52	2402	491	1967	98	3624	741	2968
7	1141	233	935	53	2428	497	1989	99	3653	747	2992
8	1173	240	961	54	2454	502	2010	100	3683	754	3016
9	1205	247	987	55	2480	507	2031				
10	1235	253	1011	56	2505	513	2052				
11	1266	259	1037	57	2530	518	2072				
12	1297	265	1062	58	2555	523	2093				
13	1328	272	1088	59	2580	528	2113				
14	1359	278	1113	60	2605	533	2133				
15	1390	284	1138	61	2630	538	2154				
16	1420	291	1163	62	2655	543	2174				
17	1450	297	1188	63	2680	548	2195				
18	1480	303	1212	64	2705	553	2215				
19	1510	309	1237	65	2730	559	2236				
20	1540	315	1261	66	2756	564	2257				
21	1569	321	1285	67	2782	569	2278				
22	1598	327	1309	68	2808	575	2300				
23	1627	333	1333	69	2834	580	2321				
24	1656	339	1356	70	2860	585	2342				
25	1685	345	1380	71	2886	590	2364				
26	1713	350	1403	72	2912	596	2385				
27	1741	356	1426	73	2938	601	2406				
28	1769	362	1449	74	2964	606	2428				
29	1797	368	1472	75	2990	612	2449				
30	1825	373	1495	76	3017	617	2471				
31	1852	379	1517	77	3044	623	2493				
32	1879	384	1539	78	3071	628	2515				
33	1906	390	1561	79	3098	634	2537				
34	1933	395	1583	80	3125	639	2559				
35	1960	401	1605	81	3152	645	2581				
36	1986	406	1627	82	3179	650	2604				
37	2012	412	1648	83	3206	656	2626				
38	2038	417	1669	84	3233	661	2648				
39	2064	422	1690	85	3260	667	2670				
40	2090	428	1712	86	3288	673	2693				
41	2116	433	1733	87	3316	678	2716				
42	2142	438	1754	88	3344	684	2739				
43	2168	444	1776	89	3372	690	2762				
44	2194	449	1797	90	3400	696	2785				
45	2220	454	1818	91	3426	701	2806				

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

ERROR Code



DATA1.
Temperature table

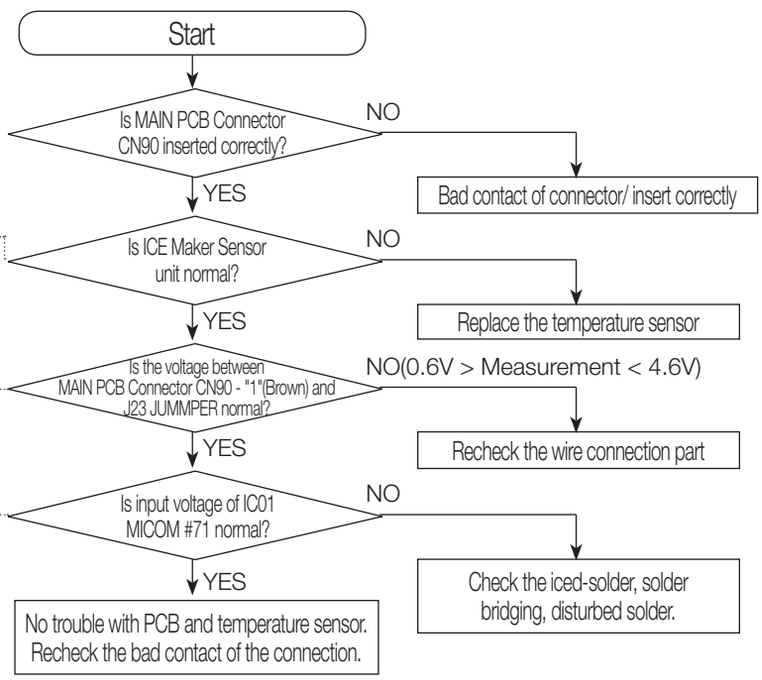
** Measuring point of resistance value according to Sensor **
ICE MAKER: CN90 "1"↔ "7" measuring resistance value ** 0Ω: Short trouble / Ω∞: Open trouble

Refer to circuit diagram in the manual

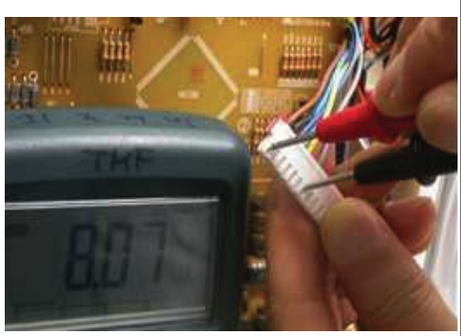
Sensor MICOM/Connector number	
ICE Maker	Connector CN90-"1"(Brown)and J23 JUMMPER PCB typical Ground

Voltage measured between 4.6V ~ 0.6V.

Measuring voltage of IC01 MICOM #71, CN90 - "1" (Brown) and J23 JUMMPER from PCB typical Ground part are similar.
→ Check the measure on the voltage of Resistance, R914 DUE to the SMD MICOM



☞ Checking method of ICE Maker Sensor resistance
CN90 "1"(Brown) ↔ "7"(Gray)
- Compare the temperature table after the measure.

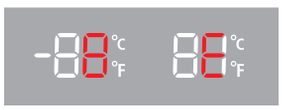


☞ Checking method of ICE Maker Sensor resistance
- Measure the voltage of Resistance R914(IC01 MICOM #71) on PCB or CN90 "1"(Brown) ↔ J23 JUMMPER
- Compare the temperature table after the measure.
  Measuring voltage of CN90-"1"(Brown) ↔ J23 JUMMPER are as below.

PCB Typical Ground
J23 JUMMPER

2) ICE Maker(FZ) Sensor has troubled

ERROR Code



– This refrigerator has Dual Ice Maker, so controlled two Ice Makers.

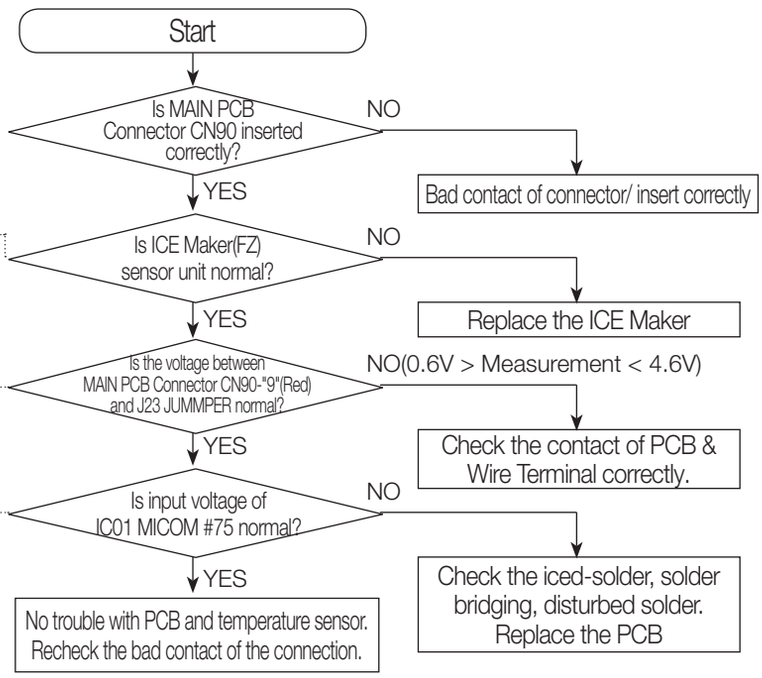
DATA1.
Temperature table

** Measuring point of resistance value according to Sensor **
ICE MAKER(FZ) : CN90 9 ↔ 8 measuring resistance value
** 0Ω : Short trouble / Ω ∞ : Open trouble

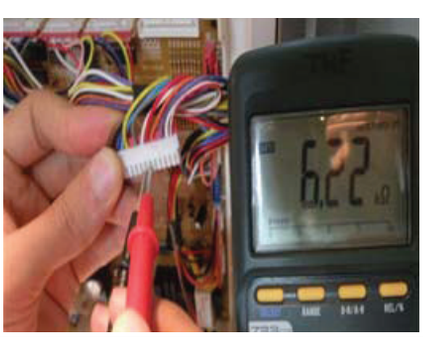
Refer to circuit diagram in the manual

Sensor MICOM/Connector number	
ICE Maker(F)	Connector CN90-"9"(Red) and J23 JUMMPER PCB common Ground
Voltage measured between 4.6V ~ 0.6V.	

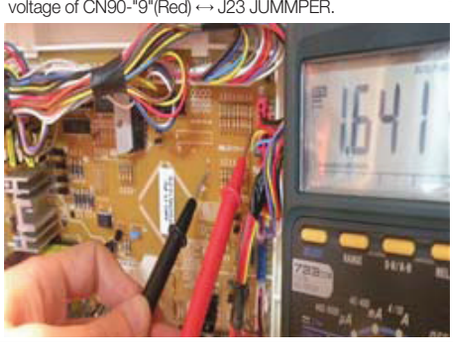
Measuring voltage of IC01 MICOM #75, CN90-"9"(Red) and J23 JUMMPER PCB typical Ground part are similar.
→ Check the measure on the Resistance R904 due to the SMD MICOM.



☞ Checking Method of ICE MAKER(R) Senser resistance CN90 "9"(Red) ↔ 8"(White)
- Compare the temperature table after the measure.



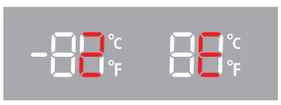
☞ Checking method of ICE Maker Seneor
- Measure the voltage of Resistance R904(IC01 MICOM #75) or CN90-"9"(Red) ↔ J23 JUMMPER.
- Compare the temperature table after the measure. Measuring voltage of CN90-"9"(Red) ↔ J23 JUMMPER.



typical PCB Ground
J23 JUMMPER

3) If R DEF Sensor has trouble

ERROR Code



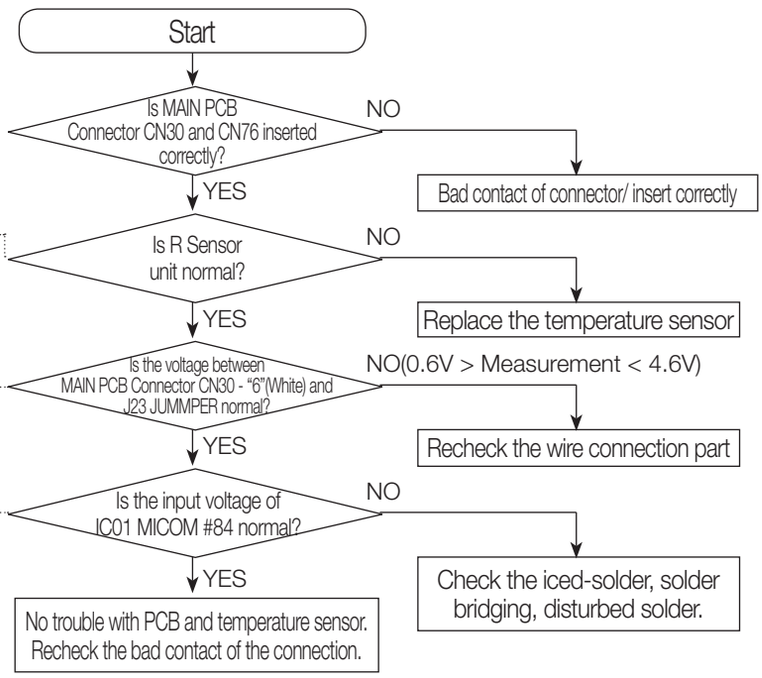
DATA1.
Temperature table

** Measuring point of resistance value according to Sensor **
R : CN30 - "6" ↔ CN76-"1" measuring resistance value
** 0Ω : Short trouble / Ω ∞: Open trouble

Refer to circuit diagram in the manual

Sensor MICOM/Connector number	
R	Connector CN30 - "6"(White) to J23 JUMMPER PCB typical Ground
Voltage measured between 4.6V ~ 0.6V.	

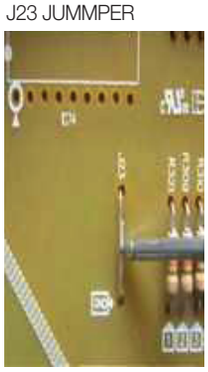
Measuring voltage IC01 MICOM #84, CN30 - "6"(White) and J23 JUMMPER from PCB typical Ground part are similar.
→ Check the measure on the voltage of Resistance, R311 due to the SMD MICOM



☞ Checking method of R Sensor resistance
CN30 - "6"(White) ↔ CN76-"1"(Gray) Compare the temperature table after measurment.

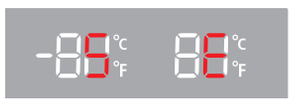
☞ Checking method of R Sensor resistance
- Measure the voltage of Resistance R311(IC01 MICOM #84) on PCB or CN30 - "6"(White) ↔ J23 JUMMPER
- Compare the temperature table after measurement.
Measuring voltage of CN30 - "6"(White) ↔ J23 JUMMPER are as below.

PCB Typical Ground
J23 JUMMPER



4) If R DEF Sensor has trouble

ERROR Code



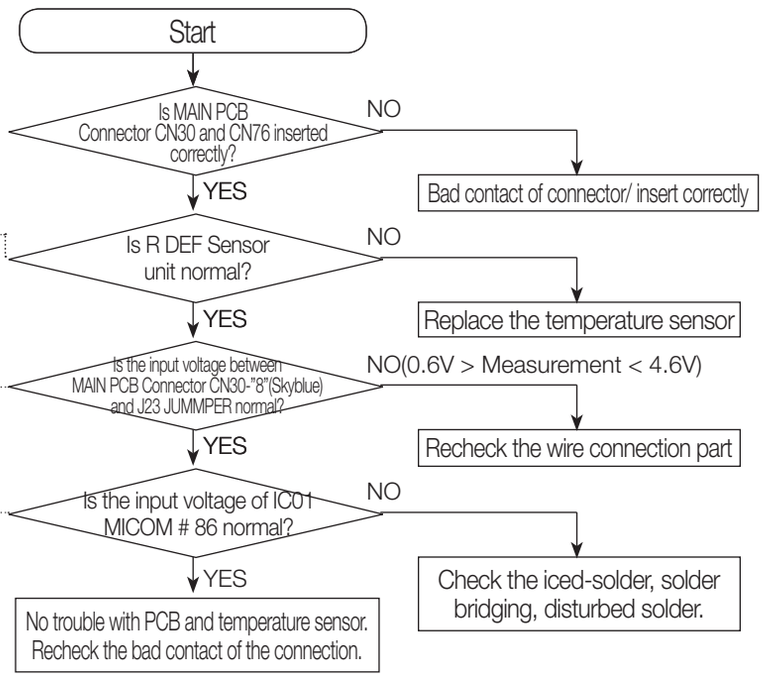
DATA1.
Temperature table

** Measuring point of resistance value according to Sensor **
R-DEF : CN30-"8" ↔ CN76-"1" measuring resistance value
** 0Ω : Short trouble Ω ∞ : Open trouble

Refer to circuit diagram in the manual

Sensor MICOM/Connector Number	
R DEF	Connector CN30-"8"(Sky-blue) and J23 JUMMPER PCB typical Ground
Voltage measured between 4.6V ~ 0.6V.	

Measuring voltage of IC01 MICOM #86 CN30-"8"(Sky-blue) and J23 JUMMPER from PCB typical Ground part are similar.
→ Check the measure on the voltage of Resistance R313 due to the SMD MICOM



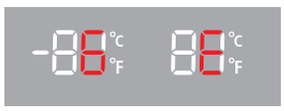
☞ Checking method of R Sensor resistance CN30-"8"(Sky-blue) ↔ CN76-"1"(Gray)
- Compare the temperature table after measurement.

☞ Checking method of R DEF Sensor resistance
- Measure the voltage of Resistance R313(IC01 MICOM #86) on PCB or CN30-"8"(Sky-blue) ↔ J23 JUMMPER
- Compare the temperature table after measurement.
Measuring voltage of CN30-"8"(Sky-blue) ↔ J23 JUMMPER are as below.

PCB Typical Ground
J23 JUMMPER

5) If Ambient Sensor has trouble

ERROR Code



DATA1.
Temperature table

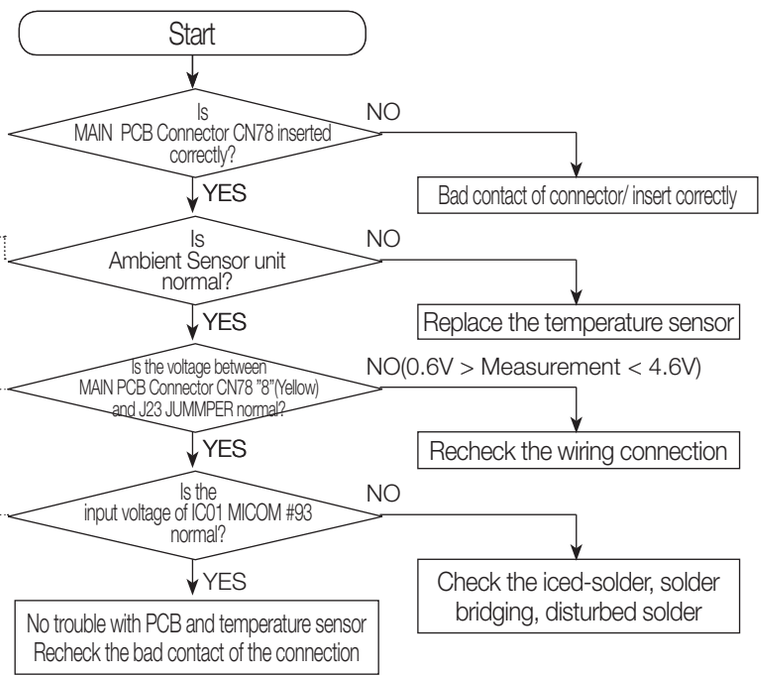
** Measuring point of resistance value according to Sensor **
Ambient : CN78-"8"↔ "12" measuring resistance value
** Placed in the right top table of upper hinge.
** 0Ω: Short trouble / Ω ∞: Open trouble

Refer to circuit diagram in the manual

Sensor MICOM/Connector number	
Ambient	Connector CN78-"8"(Yellow) to J23 JUMMPER PCB typical Ground

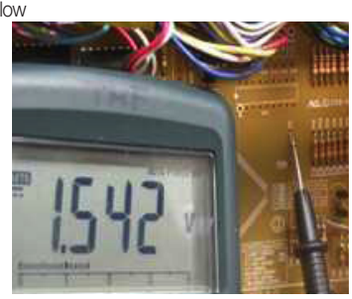
Voltage measured between 4.6V ~ 0.6V.

Measuring voltage of IC01 MICOM #93 CN78-"8"(Yellow) and J23 JUMMPER from PCB typical Ground part are similar.
→ Check the measure on the voltage of Resistance, R315 due to the SMD MICOM

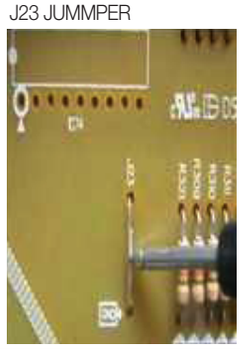


☞ Checking method of Ambient Sensor resistance
CN78-"8"(Yellow) ↔ "12"(Yellow)
- Compare the temperature table after measurement.

☞ Checking method of Ambient Sensor voltage
- Measure the voltage of Resistance R315(IC01 MICOM #93) on PCB or CN78-"8"(Yellow) ↔ J23 JUMMPER
- Compare the temperature table after measurement.
Measuring voltage of CN78-"8"(Yellow) ↔ J23 JUMMPER are as below

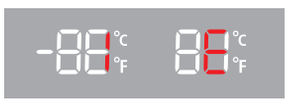


PCB Typical Ground
J23 JUMMPER



6) If F Sensor has trouble

ERROR Code



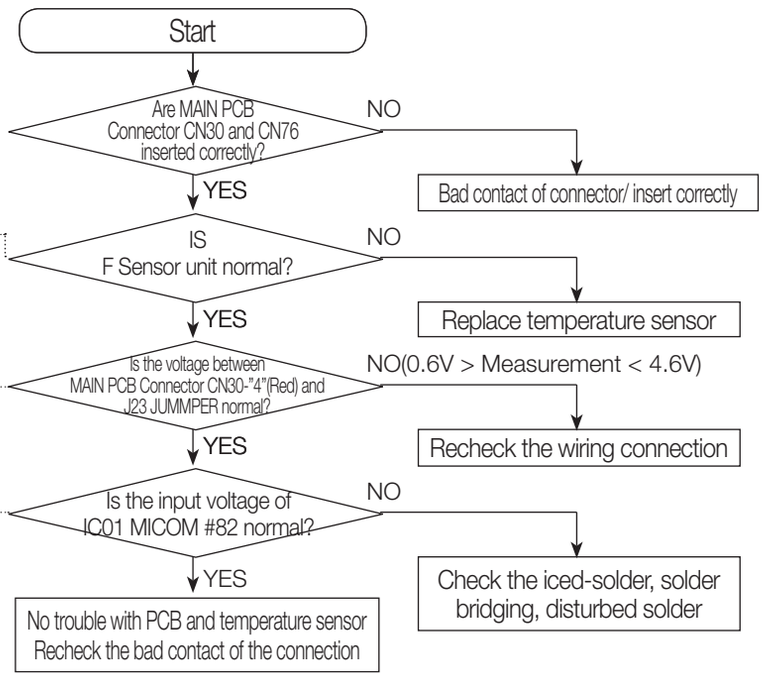
DATA1.
Temperature table

** Measuring point of resistance value according to Sensor **
F : CN30-"4" ↔ CN76-"1" measuring resistance value
** 0Ω : Short trouble / Ω∞ : Open trouble

Refer to circuit diagram in the manual

Sensor MICOM/Connector number	
F	Connector CN30-"4"(Red) to J23 JUMMPER PCB typical Ground
Voltage measured between 4.6V ~ 0.6V.	

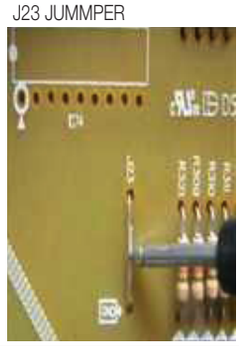
Measuring voltage of IC01 MICOM #82, CN30-"4"(Red) and J23 JUMMPER from PCB typical Ground part are similar.
→ Check the measure on the voltage of Resistance, R309 due to the SMD MICOM



☞ Checking method of F Sensor resistance CN30-"4"(Red) ↔ CN76-"1"(Gray)
- Compare the temperature table after measurement.

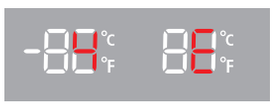
☞ Checking method of F Sensor voltage
- Measure the voltage of Resistanec, R309(IC01 MICOM #82) on PCB or CN30-"4"(Red) ↔J23 JUMMPER
- Compare the temperature table after measurement.
Measuring voltage of CN30-"4"(Red)↔J23 JUMMPER are as below.

PCB Typical Ground
J23 JUMMPER



7) If F DEF Sensor has trouble

ERROR Code



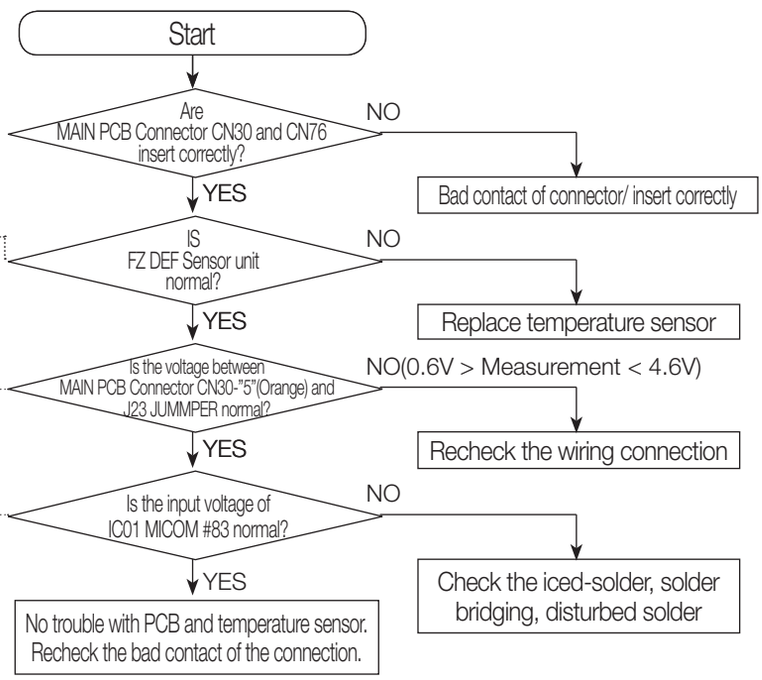
DATA1.
Temperature table

** Measuring point of resistance value according to Sensor **
F-DEF : CCN30-"5" ↔ CN76-"1" measuring resistance value
** 0Ω: Short trouble / Ω∞: Open trouble

Refer to circuit diagram in the manual

Sensor MICOM/Connector number	
F DEF	Connector CN30-"5"(Orange) to J23 JUMMPER PCB typical Ground
Voltage measured between 4.6V ~ 0.6V.	

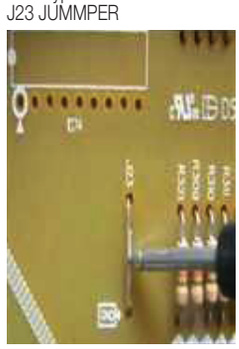
Measuring voltage of IC01 MICOM #83, CN30-"5"(Orange) and J23 JUMMPER from PCB typical Ground part are similar.
→ Check the measure on the voltage of Resistance, R310 due to the SMD MICOM



☞ Checking method of F DEF Sensor resistance
CN30-"5"(Orange) ↔ CN76-"1"(Gray)
- Compare the temperature table after measurement.

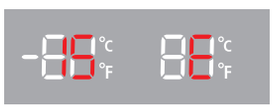
☞ Checking method of F DEF Sensor voltage
- Measure the voltage of Resistance, R310(IC01 MICOM #83) on PCB or CN30-"5"(Orange) ↔ J23 JUMMPER
- Compare the temperature table after measurement.
Measuring voltage of CN30-"5"(Orange) ↔ J23 JUMMPER are as below

PCB Typical Ground
J23 JUMMPER



8) If Ice Room Sensor has trouble

ERROR Code



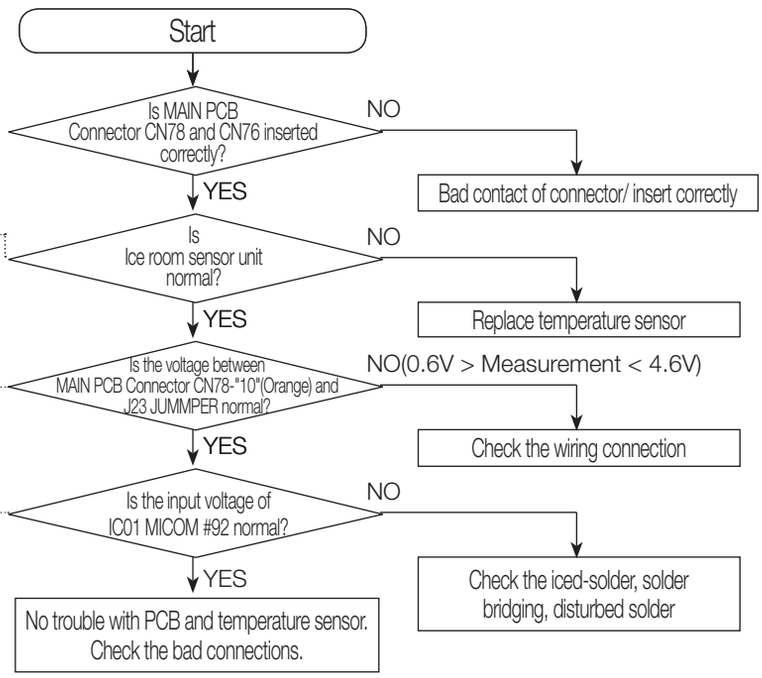
DATA1.
Temperature table

** Measuring point of resistance value according to Sensor **
Ambient : CN78 "10"↔ CN76-"1" Measure the voltage of Resistance value
** 0Ω : Short trouble / Ω ∞ : Open trouble

Refer to the circuit diagram in this manual

Sensor MICOM/Connector number	
Ice Room	Connector CN78-"10"(Orange) and J23 JUMMPER from PCB Typical Ground
Voltage measured between 4.6V ~ 0.6V.	

Measuring voltage of IC01 MICOM #92, CN78-"10"(Orange) and J23 JUMMPER from PCB Typical Ground are similar.
→ Check the measure on the voltage of Resistance, R316 due to the SMD MICOM



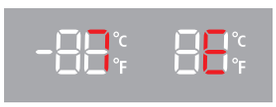
☞Checking Mehod of Ice Room Sensor voltage
CN78-"10"(Orange)↔ CN76-"1" (Gray)
- Compare with the temperature table after measurement.

☞Checking Method of Ice Room Sensor Voltage
- Measure the voltage of Resistance, R316(IC01 MICOM #92) on PCB or CN78-"10"(Orange) ↔J23 JUMMPER
- Compare with the temperature table after measurement.
Measured voltage of CN78-"10"(Orange) ↔ J23 JUMMPER are as below

PCB Typical Ground
J23 JUMMPER

9) If PANTRY Sensor has trouble

ERROR Code



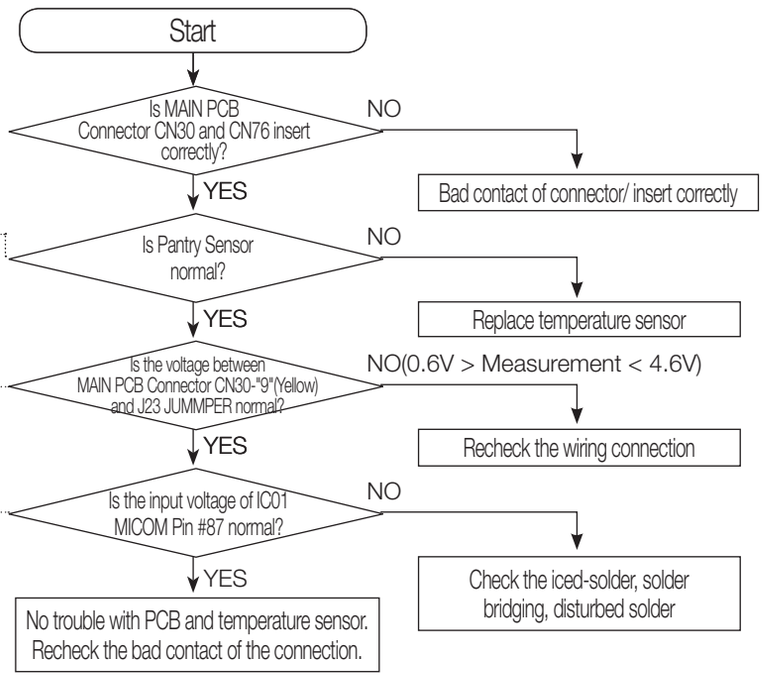
DATA1.
Temperature table

** Measuring point of resistance value according to Sensor **
Flex : CN30 "9" ↔ CN76 "1" measuring resistance value
** 0Ω : Short trouble / Ω ∞: Open trouble

Refer to circuit diagram in the manual

Sensor MICOM/Connector number	
Pantry	Connector CN30-"9"(Yellow) to J23 JUMMPER PCB typical Ground
Voltage measured between 4.6V ~ 0.6V.	

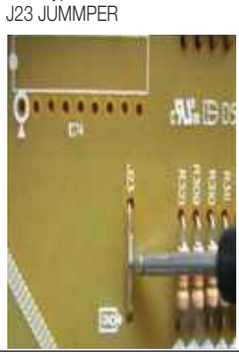
Measuring voltage of IC01 MICOM #87, CN30-"9"(Yellow)and J23 JUMMPER from PCB typical Ground part are similar.
→Check the measure on the voltage of Resistance, R314 due to the SMD MICOM



☞ Checking method of PANTRY Sensor resistance CN30-"9"(Yellow) ↔ CN76-"1" (Gray)
- Compare the temperature table after measurement.

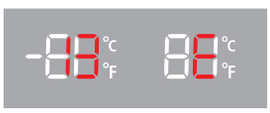
☞ Checking method of PANTRY Sensor resistance CN30-"9"(Yellow) ↔ CN76-"1" (Gray)
- Compare the temperature table after measurement.
Measuring voltage of CN30-"9"(Yellow)↔J23 JUMMPER are as below

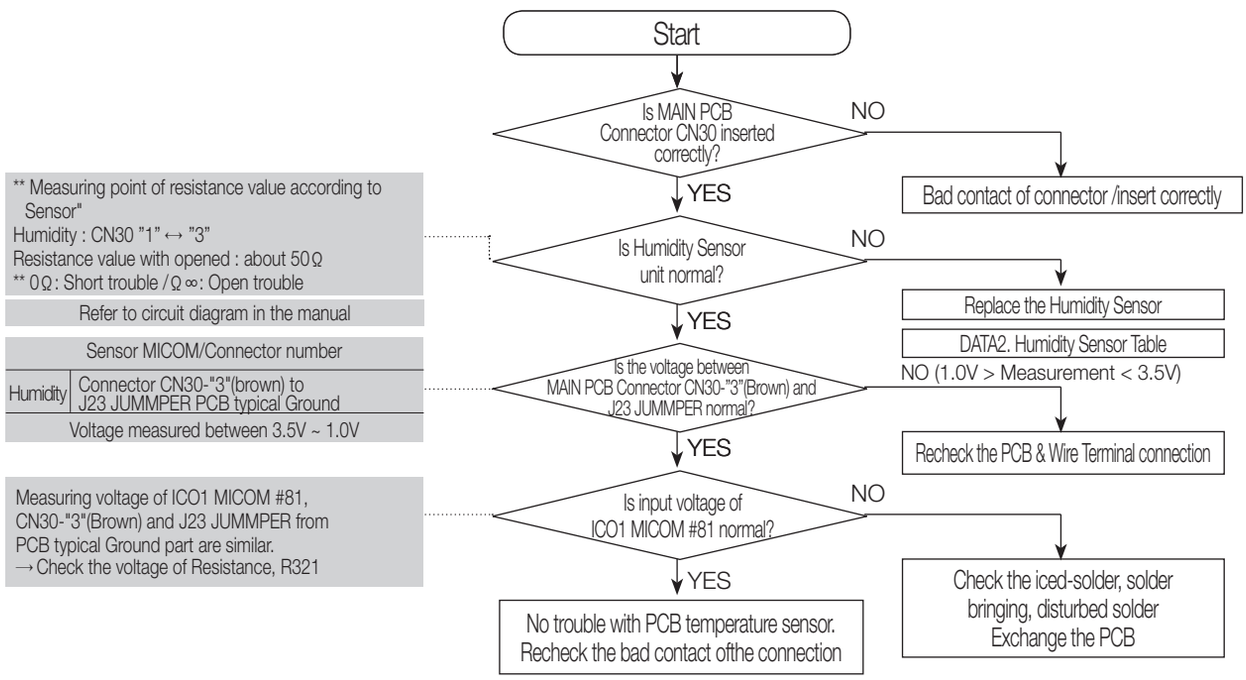
PCB Typical Ground
J23 JUMMPER



10) If Humidity Sensor has trouble

ERROR Code

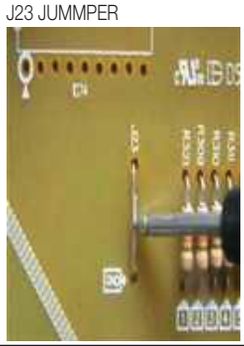




☞ Checking method ofHumidity Sensor resistance
CN30-"3"(Brown) ↔ "1"(Gray)
- Compare the temperature table after the measure.

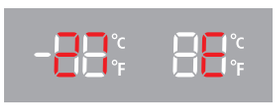
☞ Checking method ofHumidity Sensor voltage.
- Measure the voltage of Resistance, R321(IC01 MICOM #81) on PCB or CN30-"3"(Brown) ⟷ J23 JUMMPER
- Compare the temperature table after the measure.
Measuring voltage of CN30-"3"(Brown) ⟷ J23 JUMMPER are below

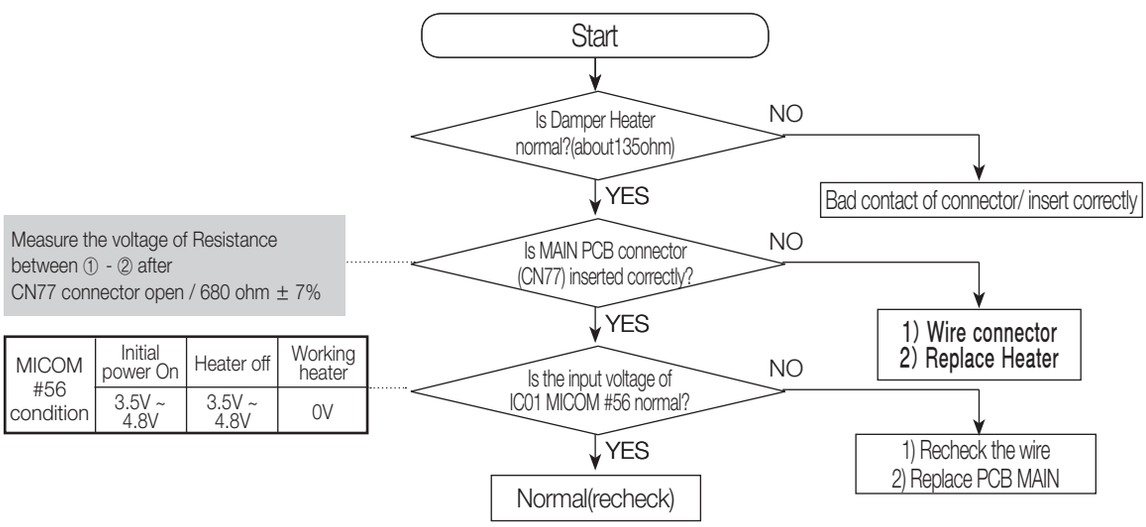
PCB Typical Ground
J23 JUMMPER



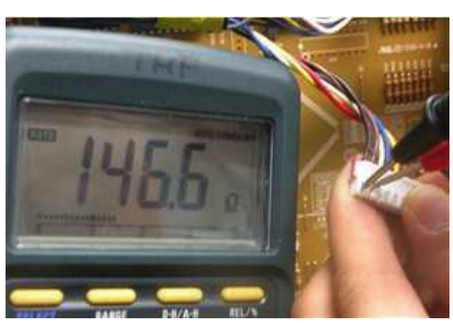
11) PANTRY Room Damper Heater has trouble(OPTION)

ERROR Code



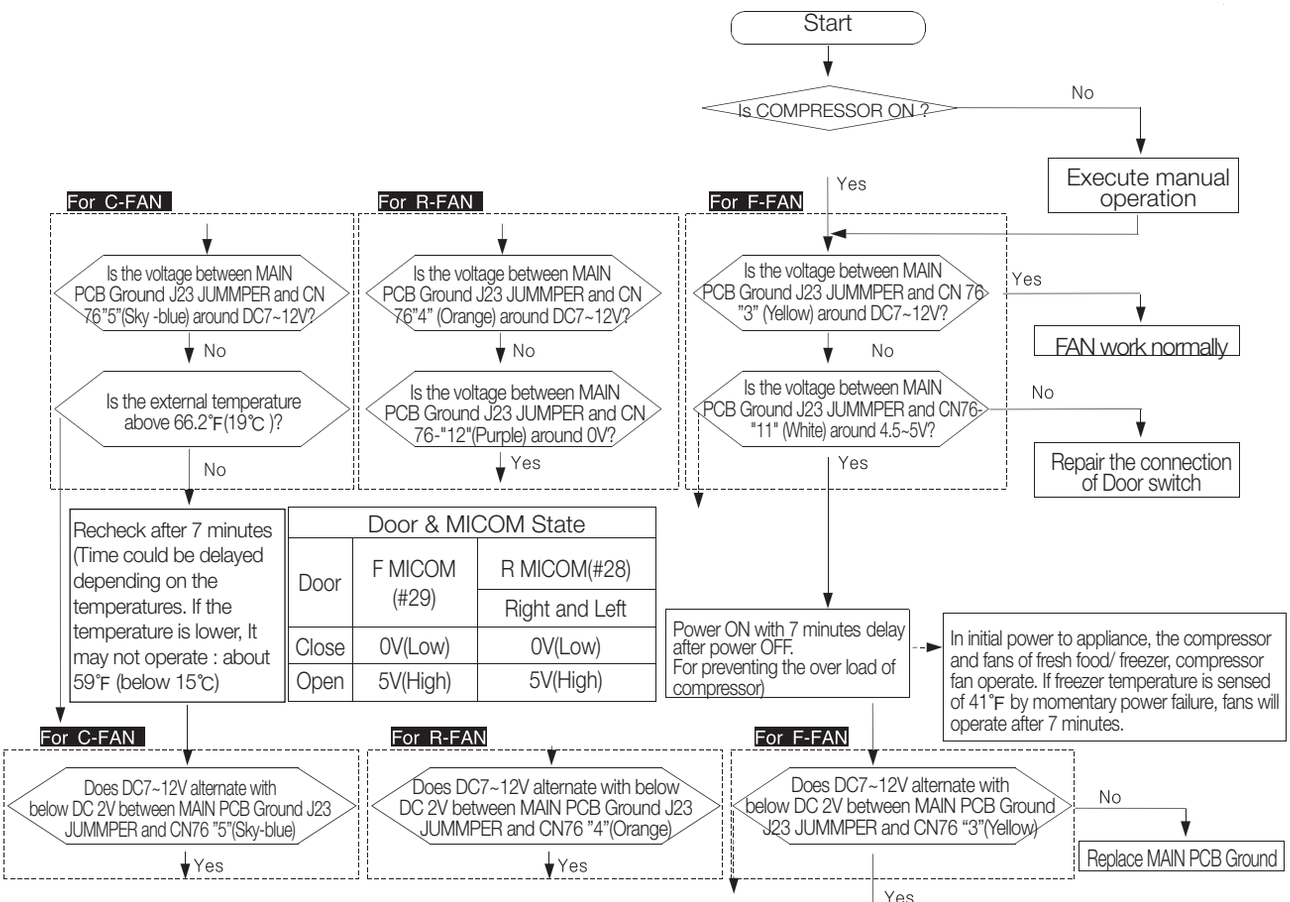


☞ Checking method of Flex Zone Room Damper resistance CN77-"1"(Black) ↔ "2"(Brown)
** Ω ∞: Open (wire disconnection, heater disconnection) trouble / 0Ω: Short trouble



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 after 1 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 CN76 "7"(Brown)

PCB Typical Ground J23 JUMMPER

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

Reference

CN76-7(F),8(R),9(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 ON 10 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 after 10 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

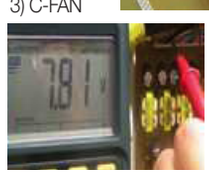
The voltage between PCB typical Ground J23 JUMMPER and
F FAN ; CN76 "3"(Yellow) shall be less than DC 7~12V.
R FAN ; CN76 "4"(Orange) shall be less than DC 7~12V.
C FAN ; CN76 "5"(Sky-blue) shall be less than DC 7~12V.
- Recheck if resistance values are different after measuring.

PCB Typical Ground J23 JUMMPER

1) F-FAN

2) R-FAN

3) C-FAN

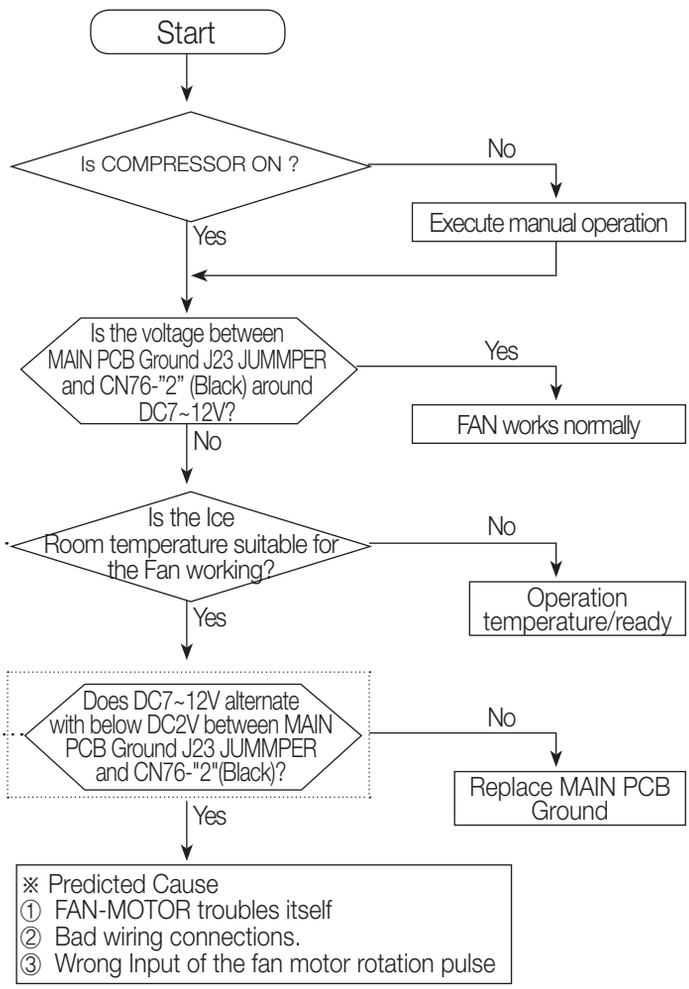


4–2–3. If ICE Room Fan does not operate

- 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℃.
- If it exceeds 0℃, 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℃/75%
- Notch : 2℉/38℉(-19.0℃/3.3℃)
  Initial full of ice bucket capacity : 794 g, 58ea



Ice Room control temperature	
Ice ON	8.6℉(-13℃)
Ice OFF	26.6℉(-3℃)

Reference

CN76 "6" 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 after 10 minutes.
This function is against the case that motor movement would be restrained by foreign matters like ice.

FAN pulse voltage CN76-"6"(Pink)

PCB Typical Ground J23 JUMMPER

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

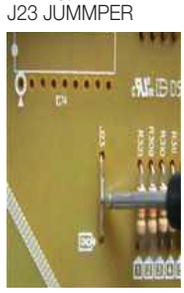
☞ Display for checking the self-diagnostic function

Ice Room FAN ERROR

☞ Checking method of Ice Room FAN Motor Voltage with the voltage between Ice Room FAN ; CN76-"1"(Gry) shall be less than DC 7~12V.
- Ice Room FAN Motor Voltage shall be less than DC 7~12V.

1) Ice Room - FAN

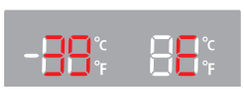
PCB Typical Ground J23 JUMMPER



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 (#74)	0V	5V
Heater Load (#118)	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 (over 1.5 sec)?

Micom(IC01) Operation Status		
#7 (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 #7 – "0V")

Yes

Input Voltage of IC01 MICOM #73 is normal?

Micom(IC01) Operation Status				
	Standby	Rotation	Before finishing	Completed
#73 (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

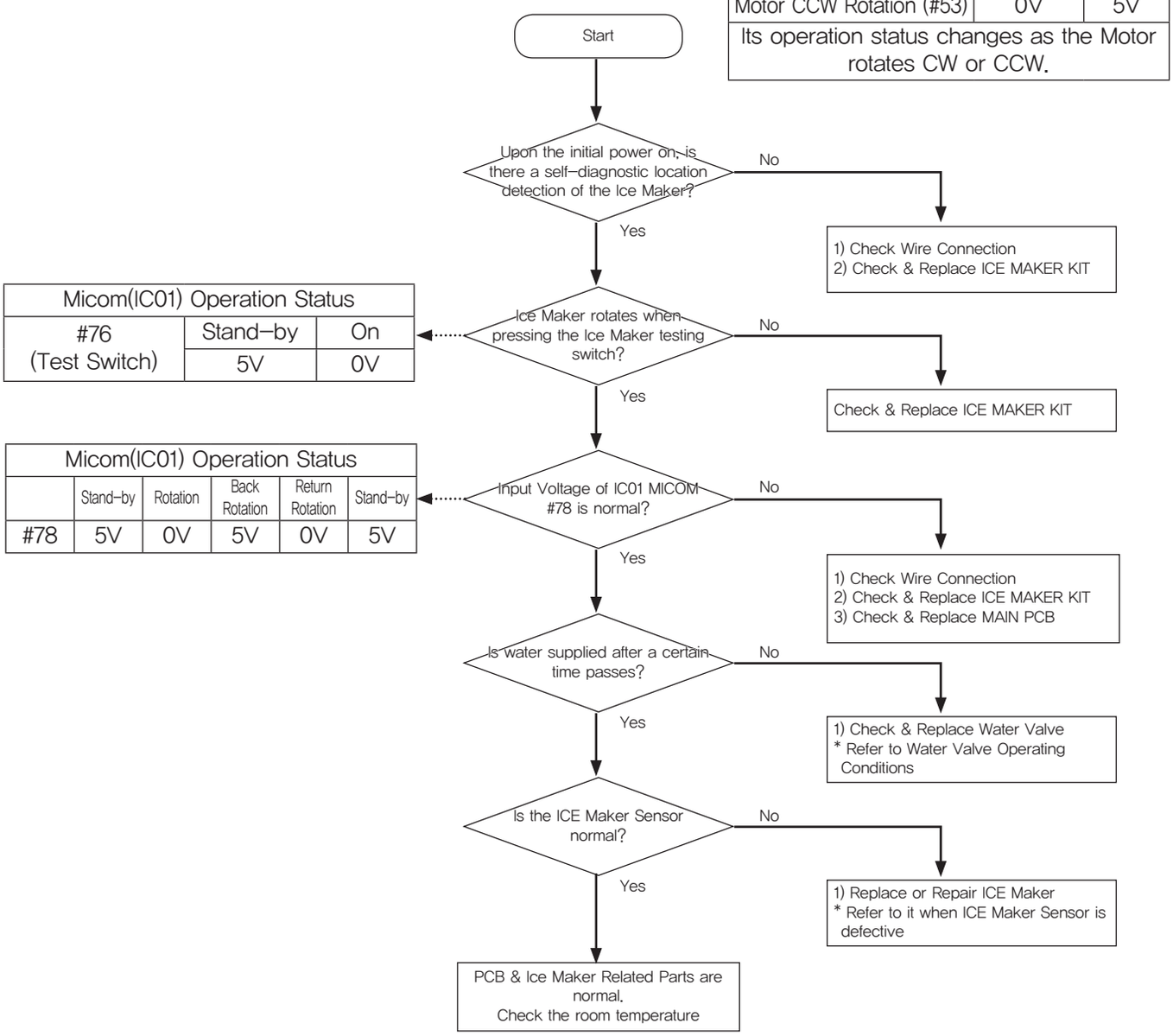
PCB & Ice Maker Related Parts are normal.
Check all the Wire Connections again.

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.

ERROR Code

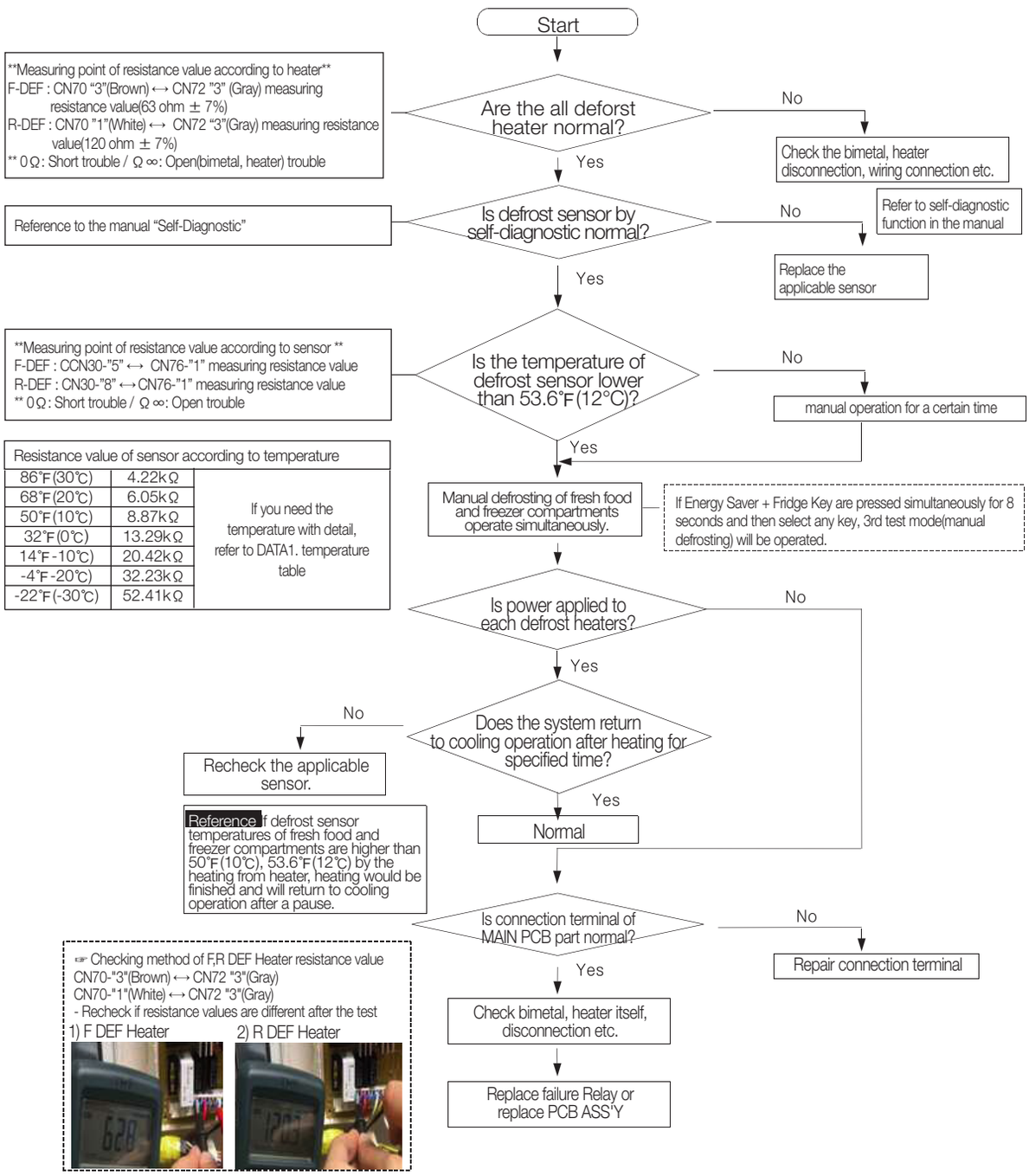
Opration Condition while Motor is rotating Micom(IC01) Operation Status		
	Stand–by	On
Motor CW Rotation (#54)	0V	5V
Motor CCW Rotation (#53)	0V	5V
Its operation status changes as the Motor rotates CW or CCW.		



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

R DEF ERROR

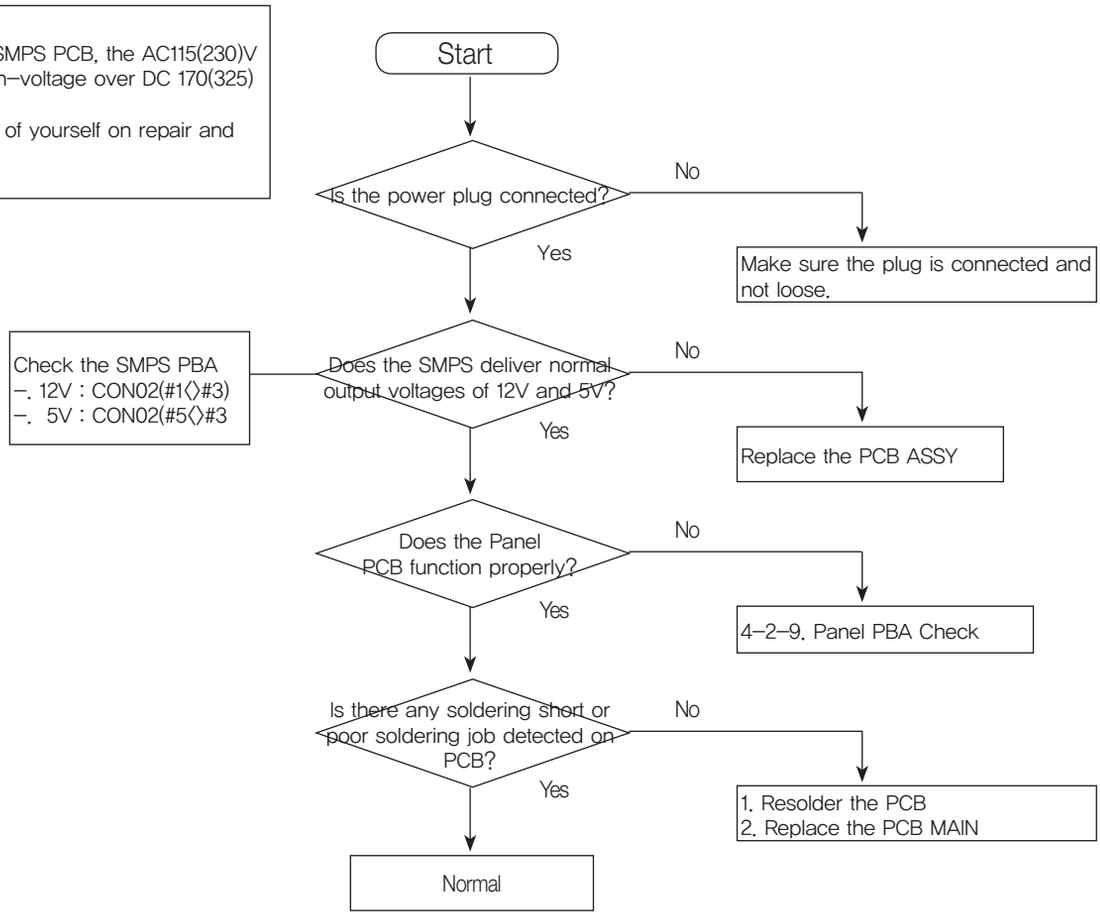
F DEF ERROR



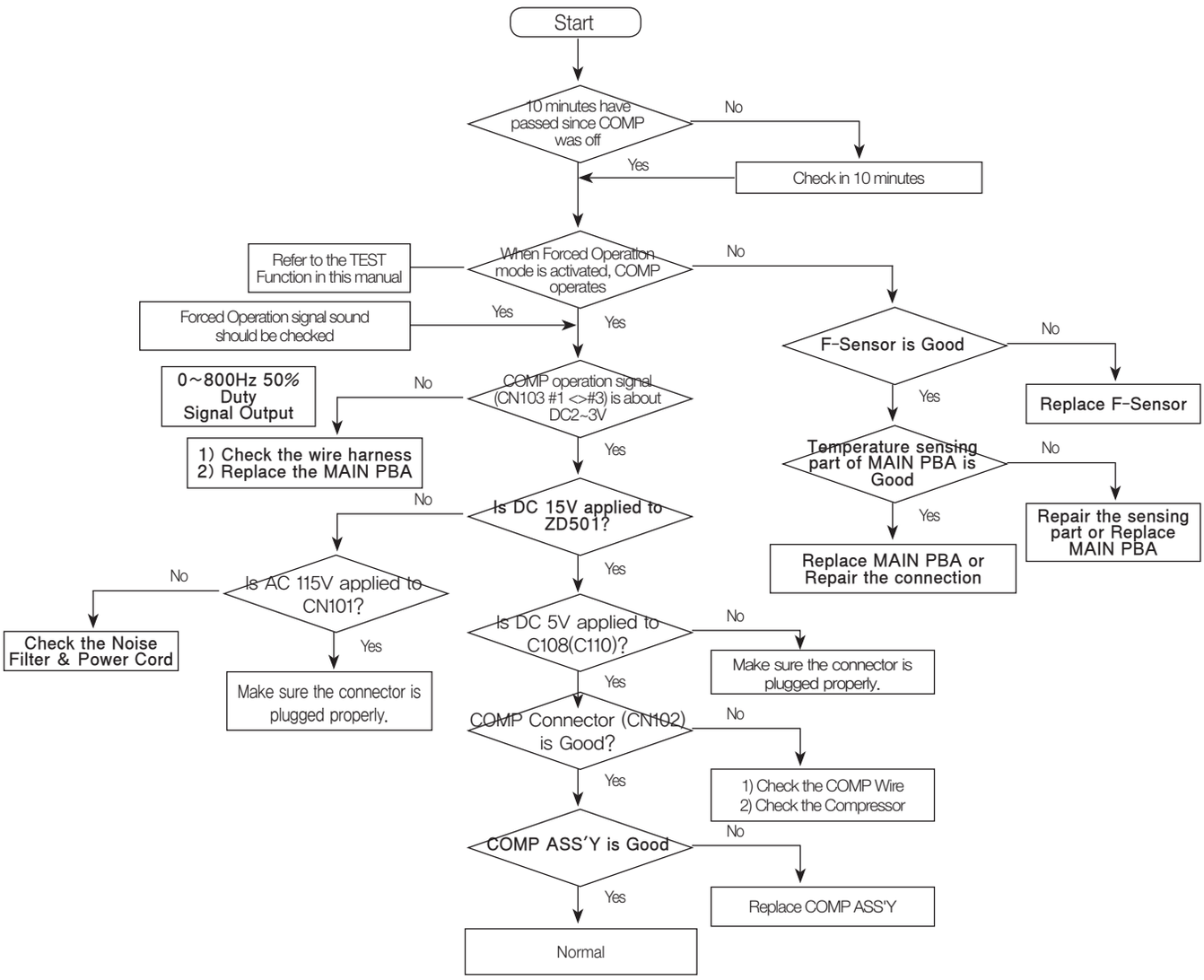
4-2-7. When Power is not applied

Caution

At the power of SMPS PCB, the AC115(230)V power and a high-voltage over DC 170(325) V are occurred.
Please take care of yourself on repair and measurement.

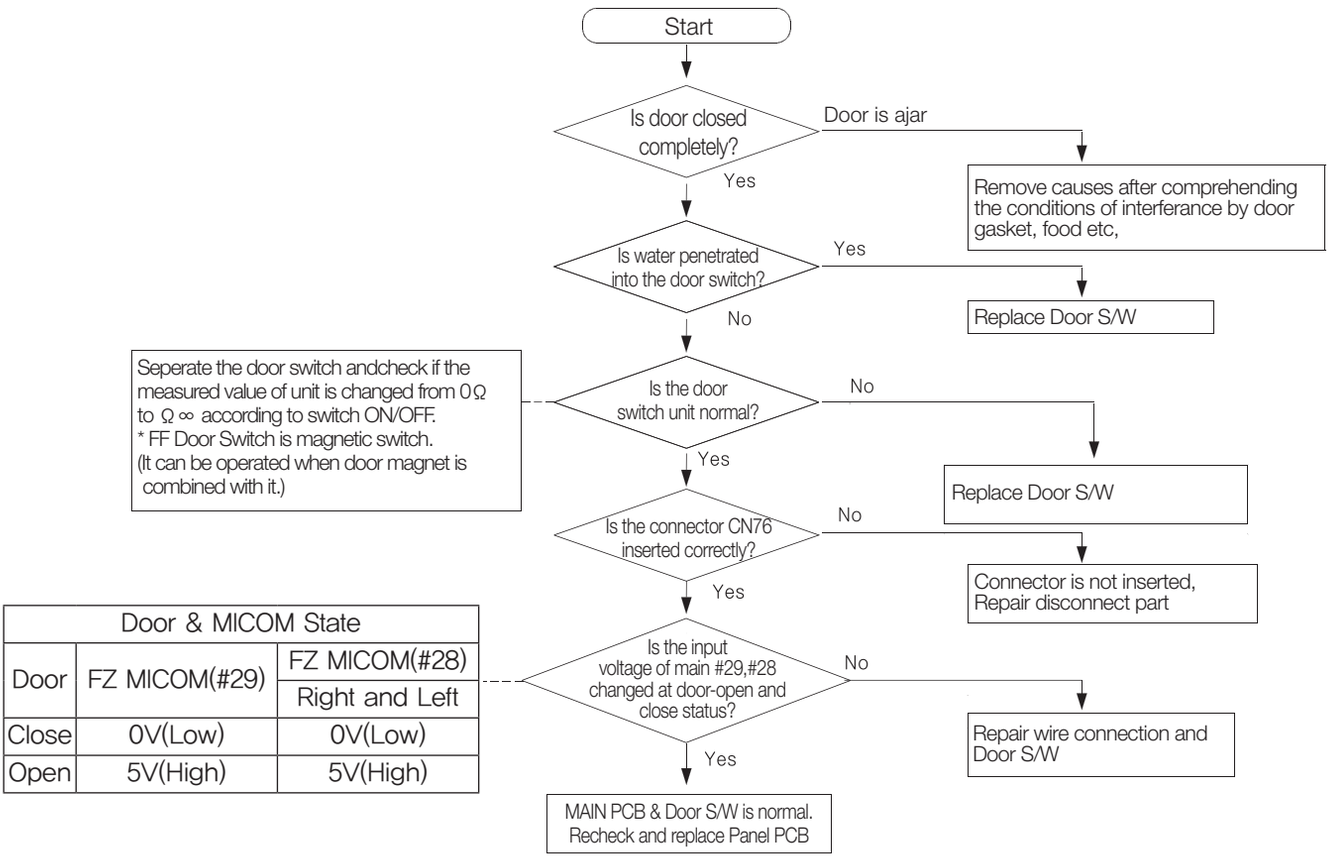


4-2-8. When Compressor does not run (Inverter COMP.)



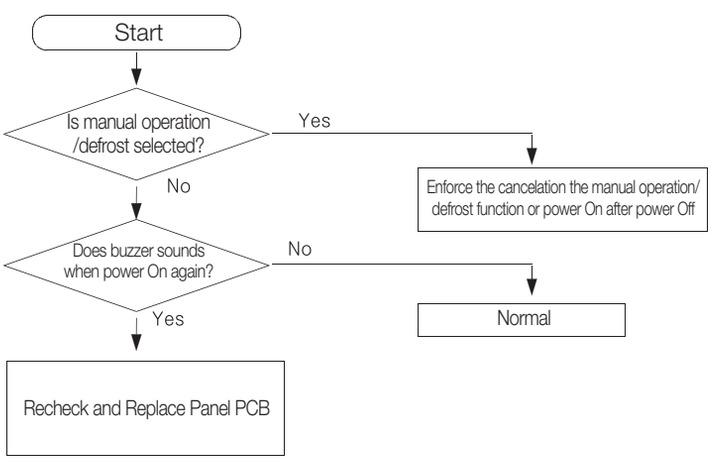
4-2-9. When alarm sounds continuously without stop(related with buzzer sound)

① If 'ding-dong'sound continuously



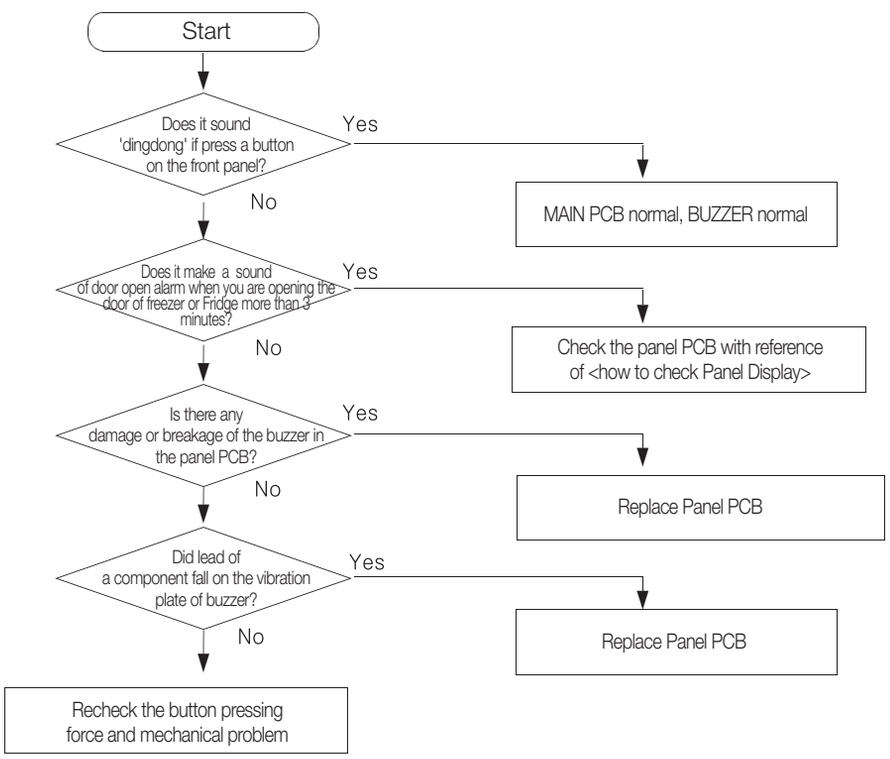
Door & MICOM State		
Door	FZ MICOM(#29)	FZ MICOM(#28) Right and Left
Close	0V(Low)	0V(Low)
Open	5V(High)	5V(High)

② If 'beep-beep' sounds continuously



③ If buzzer does not sound

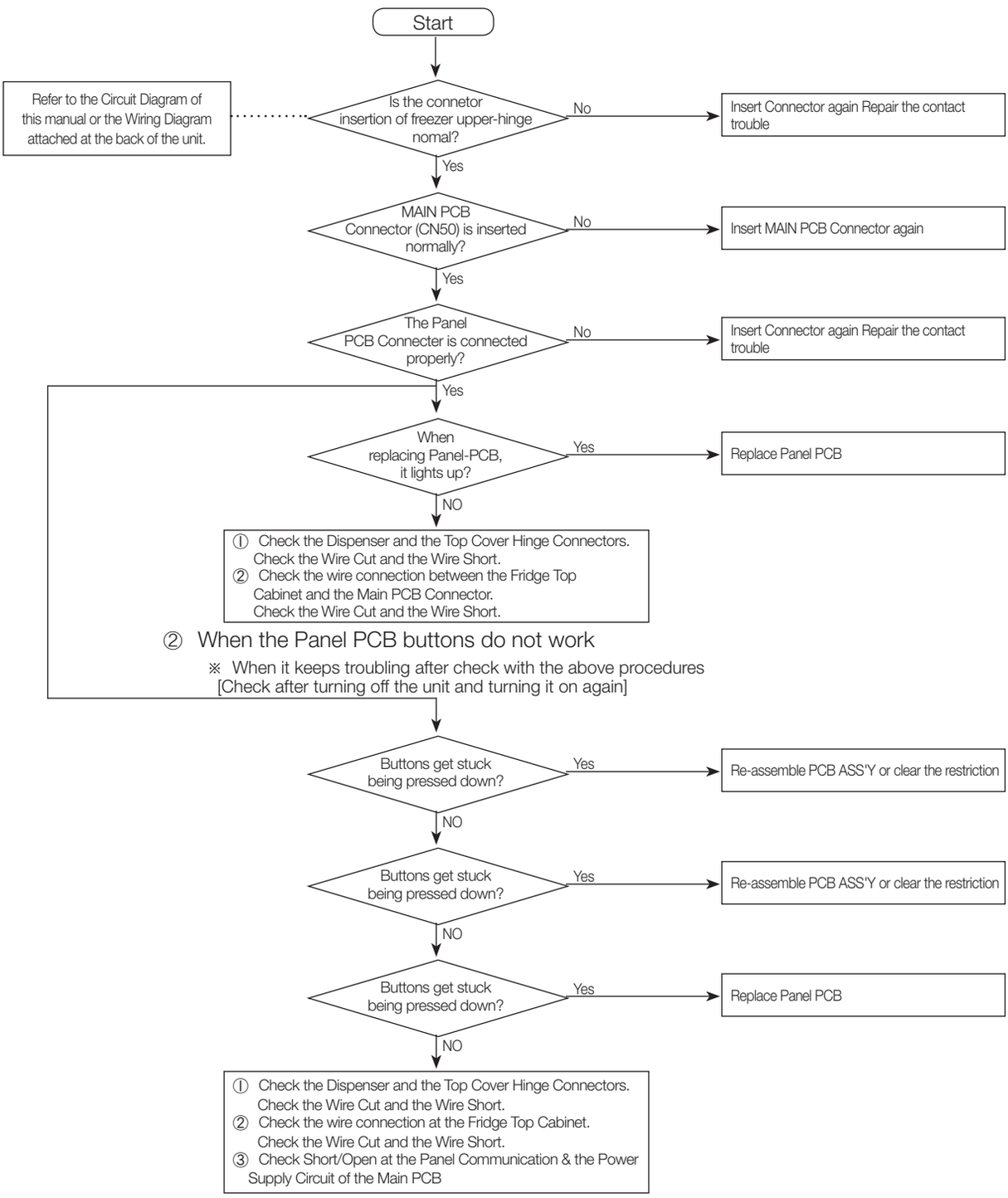
Buzzer is installed on the panel PCB in this model.
If buzzer does not sound even though the button is pressed, manual operation is started and door is opened, it should separate panel PCB and check the breakage of buzzer and bad soldering.
It is very hard to repair the panel PCB because it consists of SMD assemblies.
It is recommended to replace PCB assembly when the failure associated with panel is occurred except the minor error such as switch pressing error, surface peeling off and so on.



4–2–10. When the Panel PCB 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.



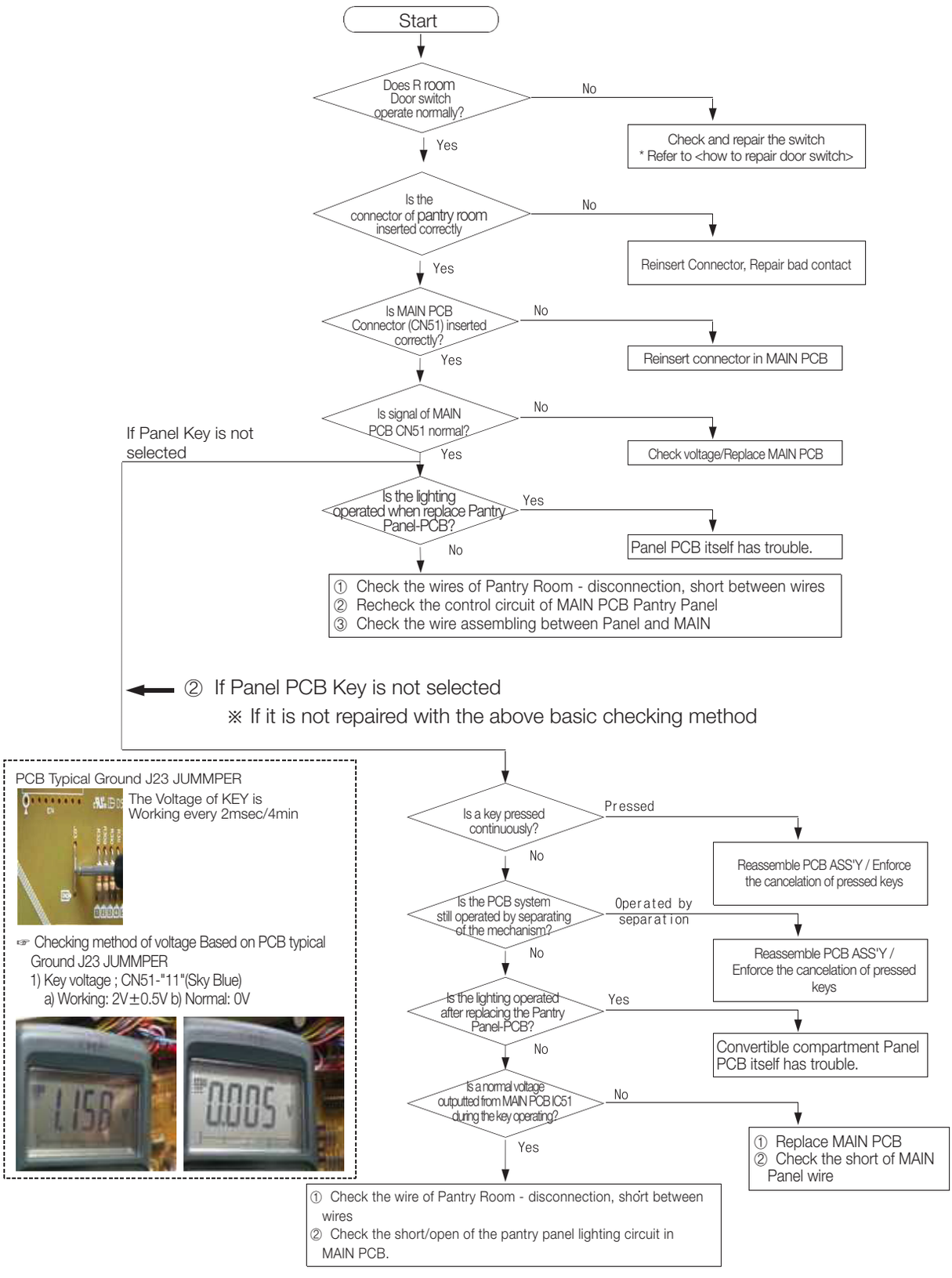
② When the Panel PCB buttons do not work

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

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.]

4-2-11. If Pantry Panel PCB is not working normally

You should check the display after door opening because the display of this model operates only when the fresh food compartment door is opened.



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

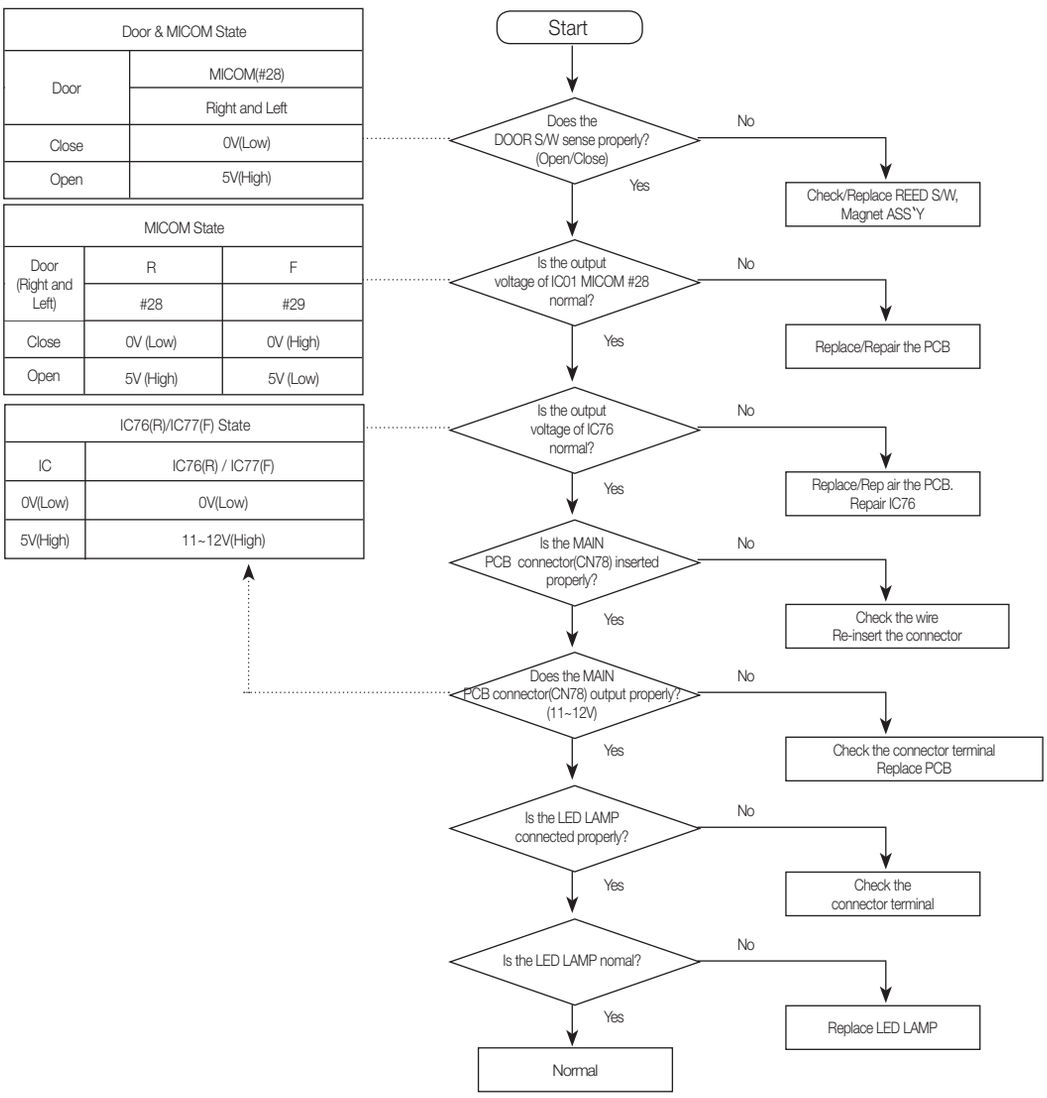
When controlling the regrigerator light with Regulator(12V) : LED LAMP
→ Applying to the F/R Room compartment (Option)

* 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(#28)
	Right and Left
Close	0V(Low)
Open	5V(High)

MICOM State		
Door (Right and Left)	R	F
	#28	#29
Close	0V (Low)	0V (High)
Open	5V (High)	5V (Low)

IC76(R)/IC77(F) State	
IC	IC76(R) / IC77(F)
0V(Low)	0V(Low)
5V(High)	11~12V(High)



1) Measuring output voltage
- Measuring the voltage of PCB typical Ground J23 JUMMPER and IC76 voltage(CN78-"3"(Red)/R LED), IC77 voltage (CN78-"1"(Brown)/F LED)

R LED Lamp ON

R LED Lamp OF

Checking method of Door switch voltage.
- Measuring voltage of CN76-"12"(Purple) ↔ PCB typical Ground J23 JUMMPER

Close

Open

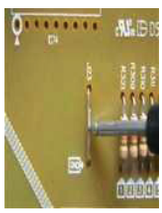
PCB Typical Ground J23 JUMMPER

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(R) Valve

PCB Typical Ground J23 JUMMPER



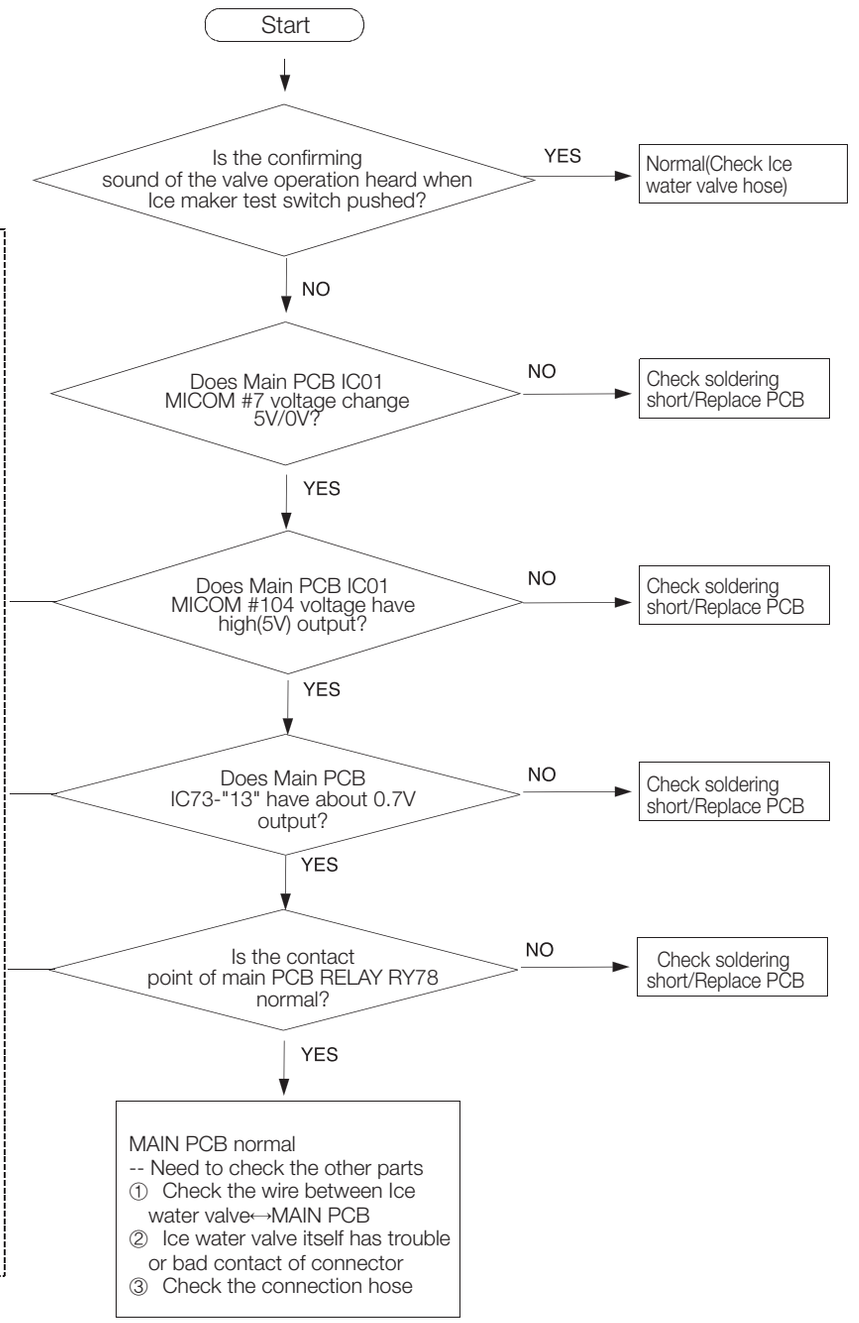
☞ Checking method of voltage Based on PCB typical Ground J23 JUMMPER

1) Check the voltage of IC73-"4"(same voltage as IC01 "104")
- ICE Water valve waiting (about 0V)

Based on PCB typical Ground J23 JUMMPER

2) IC73-"13" voltage
- 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)
=> For checking the Relay RY78 operating.
CN70-"5"(Red) ↔ CN73_1-"1"(Purple)
- ICE Water valve waiting (about AC 0V)



2) Ice Water(F) Valve

Typical PCB Ground J23 JUMMPER

☞ Checking method of voltage Based on PCB typical Ground J23 JUMMPER

1) Check the voltage of IC75 -"6"(same voltage as IC01 #116)
- ICE Water valve operating (about 5V±0.5V)

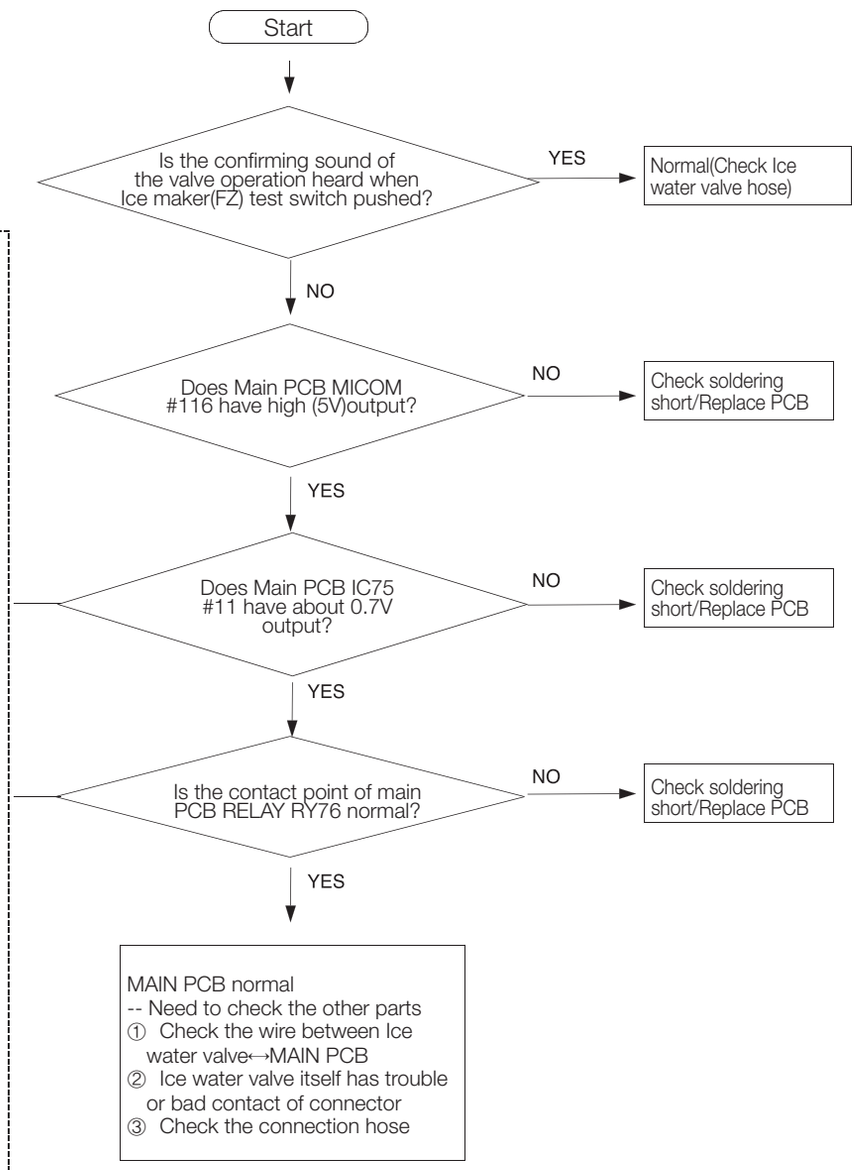
Based on PCB typical Ground J23 JUMMPER

2) IC75 -"11" voltage
- ICE Water valve Waiting (about 13V±0.8V)
- ICE Water valve operating (about 0.7V±0.5V)

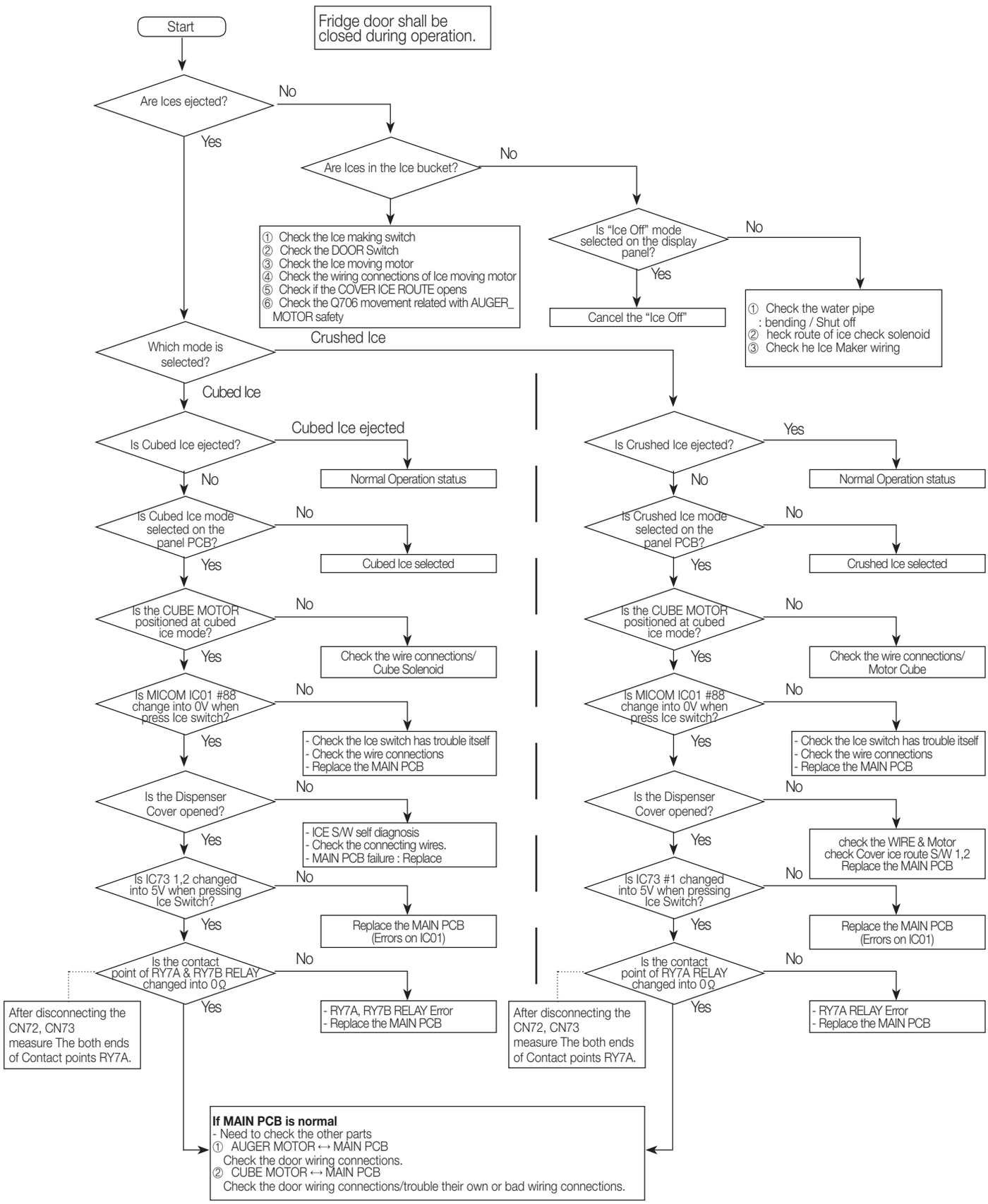
3) Check the voltage of Fridge Ice Water(F) Valve operating(AC voltage)

=> For checking the Relay RY76
CN70-"5"(Red) ↔ CN72-"1"(Brown)
- ICE Water valve waiting (about AC 0V)

- ICE Water valve operating (about AC 115V± 20%)



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.
CN70 -"5" (Red) ↔ CN73_1 -"3" (Blue)
** 0Ω: Short trouble / Ω∞: Open trouble

Start

Does GEARED MOTOR work properly?
- No → Replace the MOTOR
- Yes ↓

Is Cubed or Crushed Ice mode selected on the LED PANEL?
- No → Cubed or Crushed Ice is selected on the LED PANEL PCB
- Yes ↓

Is the DISPENSER switch selected?
- No → Select the DISPENSER switch
- Yes ↓

Does the wiring at the both sides of motor connected properly?
- No → Check the WIRE
- Yes ↓

When the MOTOR rotates.

Is the AC input voltage applied to the both ends of the motor?
- Yes → Check the MOTOR/Check any interference on MOTOR rotation
- No ↓

① Check CN73_1-"3" Connector / Re-connect
② Check the short/open for the SSR75 of Cover Ice Motor on Main PCB.
③ Check the voltage of Resistance of parallel Connector CN73 -"3", CN70 -"5"
(Definitely plug out prior to repair)

Is the sensing SWITCH connection normal?
- No → Check/Repair the Housing connector
- Yes ↓

Is the switch pressed area normal when motor rotates?
- No → Check/Repair the Motor Rotation pressing area
- Yes ↓

Are the voltage J23 JUMMPER and CN50-"9", "10" normal?
- Yes → Normal
- No ↓

Operating Condition of Dispenser Open/Close
CN50 - Switch 1,2 Operating

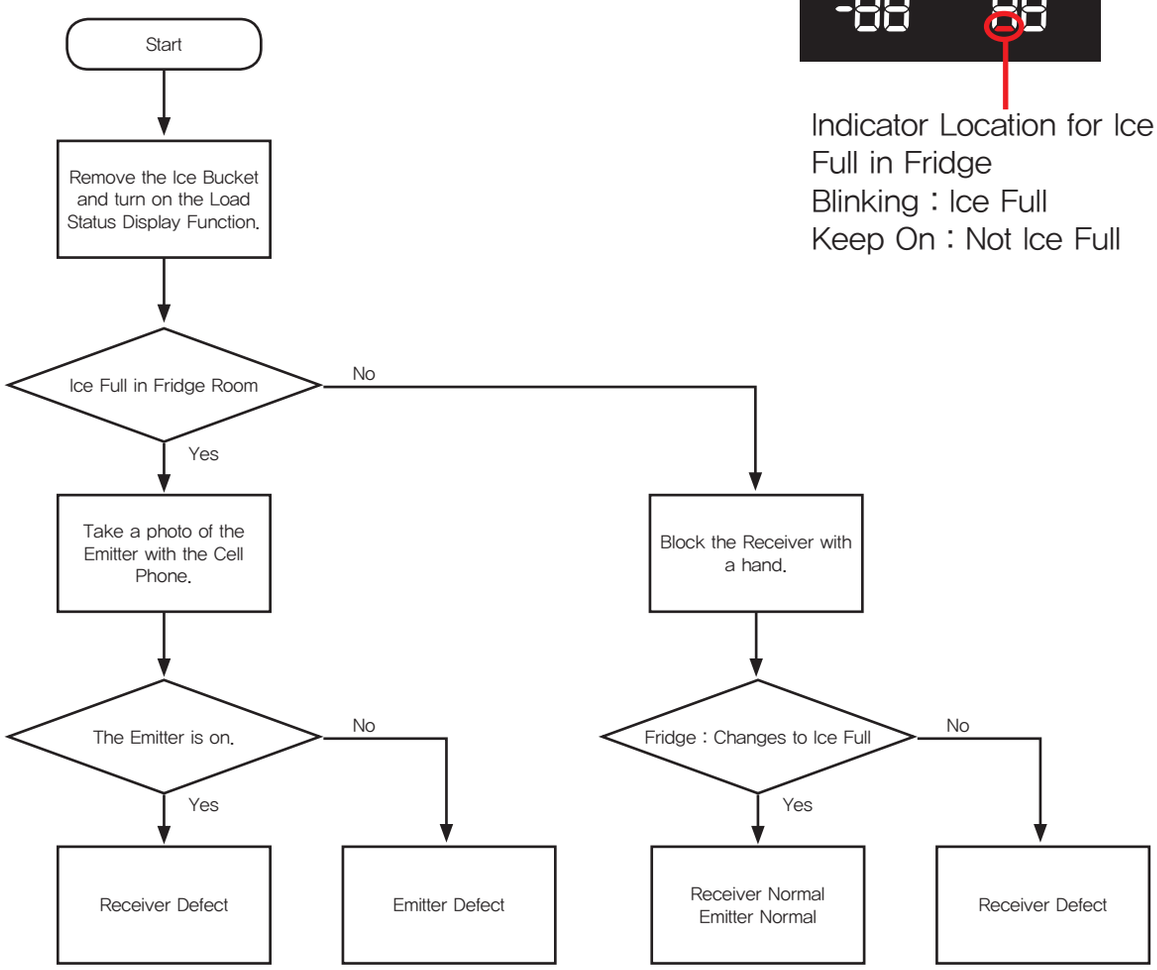
	Close	ing	Open
Ice Route Switch 1 CN50 - "9" (Purple)	0V	5V	0V
Ice Route Switch 2 CN50 - "10" (White)	0V	5V	0V

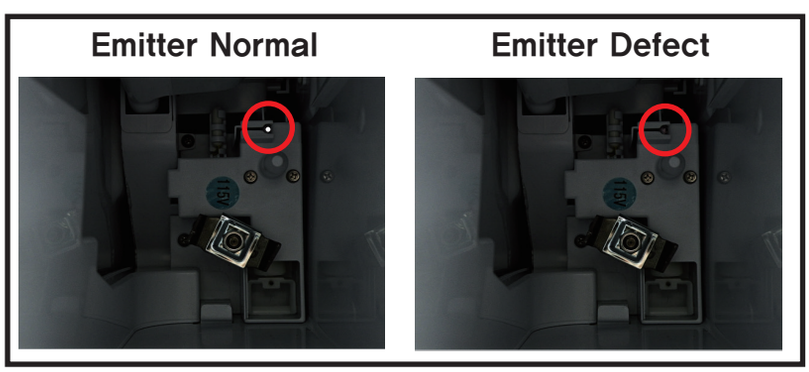
① Main PCB - Check the wire OPEN/SHORT between the Cover Ice Motor Rotation sensing switches.
② Check the Short of Cover Ice Motor Control Circuit SSR75 in the MAIN PCB.
③ Replace the MAIN PCB or the Dispenser Cover Motor.

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 14E, 15E or 39E being displayed.)
2. Proceed with the Fridge Door being open and the Ice Bucket being removed.

Indicator Location for Ice Full in Fridge
Blinking : Ice Full
Keep On : Not Ice Full

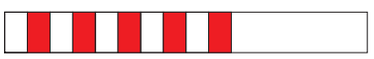




4-2-17. LED blinking frequency depending on protecting functions

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.

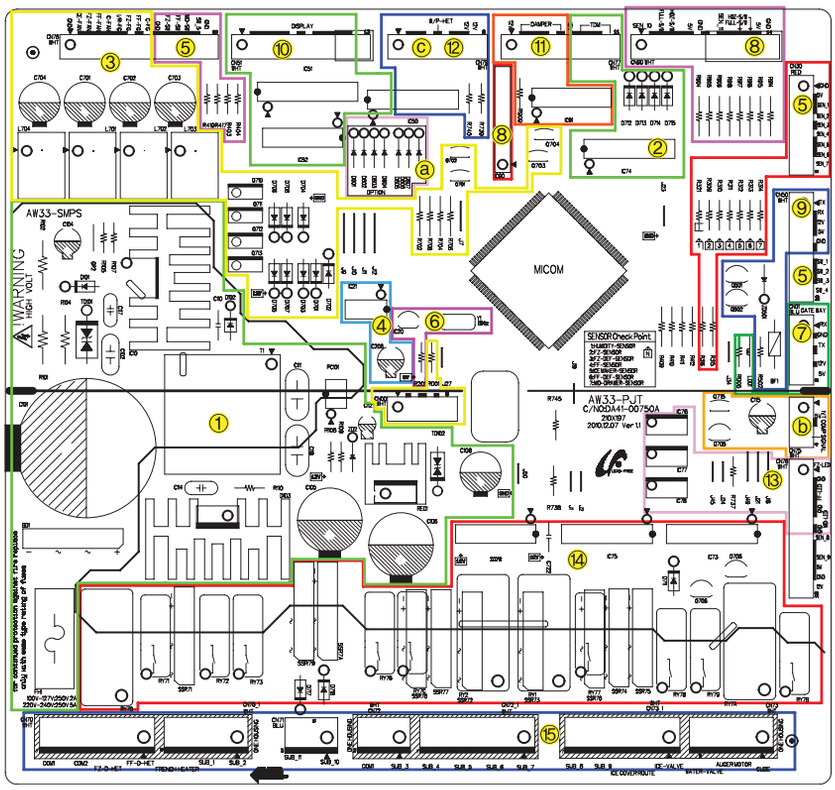
LED Blinking Frequency	Protecting Functions	Remarks
	Normal Operation	N/A
	Starting Failure	1. Short between COMP U,V, and W phase(CN102) 2. Short among IPM Pins(No. #1 ~ 26) 3. Drop the IPM operating Voltage under DC 13.5V 4. Other cases, check the COMP, cycle, etc.
	IPM Fault	
	Abnormal Current Detection	1. Open the COMP wire(CN102) 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 R525 (DC link resistor)
	Over Voltage	1. Increase the input voltage over AC 155V 2. Short resistor among R522, R523 and R524 (DC link resistor)

LED blinking frequency depending on protecting functions
If the same blinking, After 5 minutes, Follow the Remarks

5. PCB DIAGRAM

PCB DIAGRAM

5-1) PBA Layout with part position

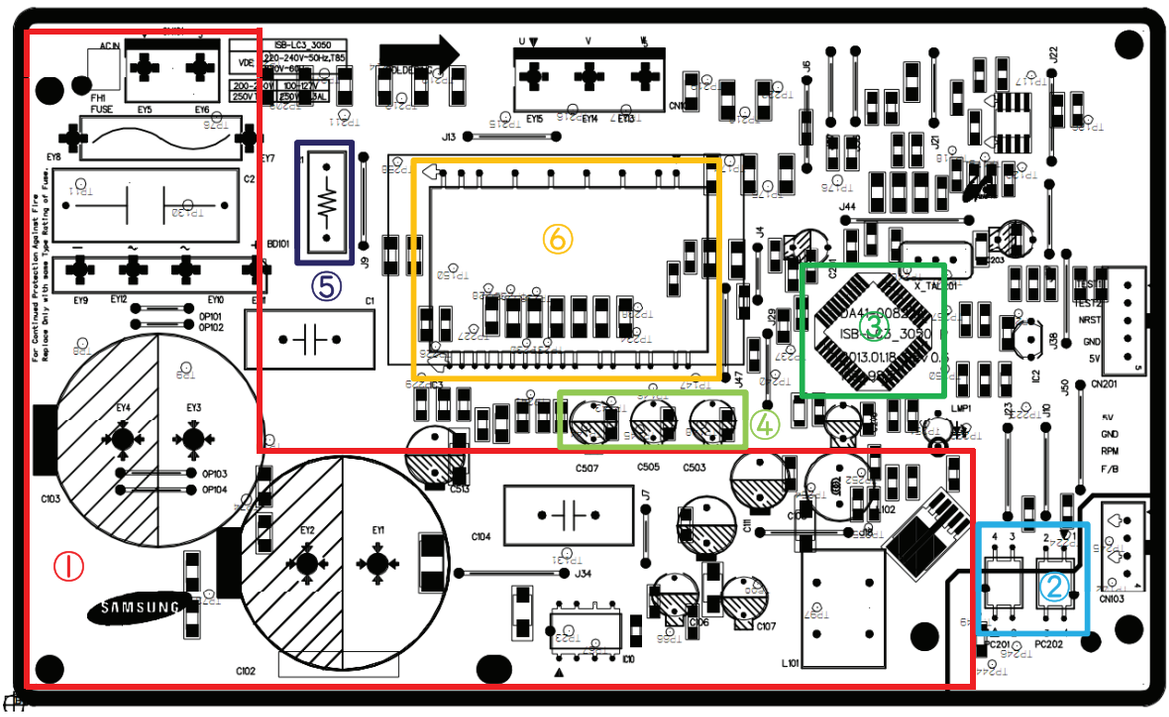


1. DC12V, 5V, GND supplied from SMPS PCB (Not Used)
2. Circuit for controlling Step-Valve (3-Way Valve) * Option
3. FAN MOTOR control part : To supply the power from 8.3V ~ 12V according to the motor types. (F,R,C,ICE)
4. EEPROM : Save and record every kinds of data.
5. Transmit inputted signals from every sensor into MICOM after eliminate the noise.
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. PLC input/output
   - PLC (Power Line communication) * Option (PLC module is not inserted unless specified occasion)
8. Operate ICE-MAKER, supply power to MOTOR, and sense the variation of switch.
9. Main Micom ↔ Panel Micom serial communication circuit - Dispenser option input part (Water & Cover Ice route switch)
10. Mid drawer Room display control part : display LED, detect KEY state.
11. Control Mid drawer Room damper & Damper heater
12. Water Tank Heater Controls (also controls other options)
13. LED LAMP Control Circuit (F,R room Lamp)
14. Relay parts that controls AC load and receives Micom operating signal through Sink IC.
15. Connector with AC load

    a. Diode option setting area
    b. Inverter COMP controlling signal
    c. Flow Sensor controlling signal

PCB DIAGRAM

5-2) PBA Layout with part position (Inverter Board)

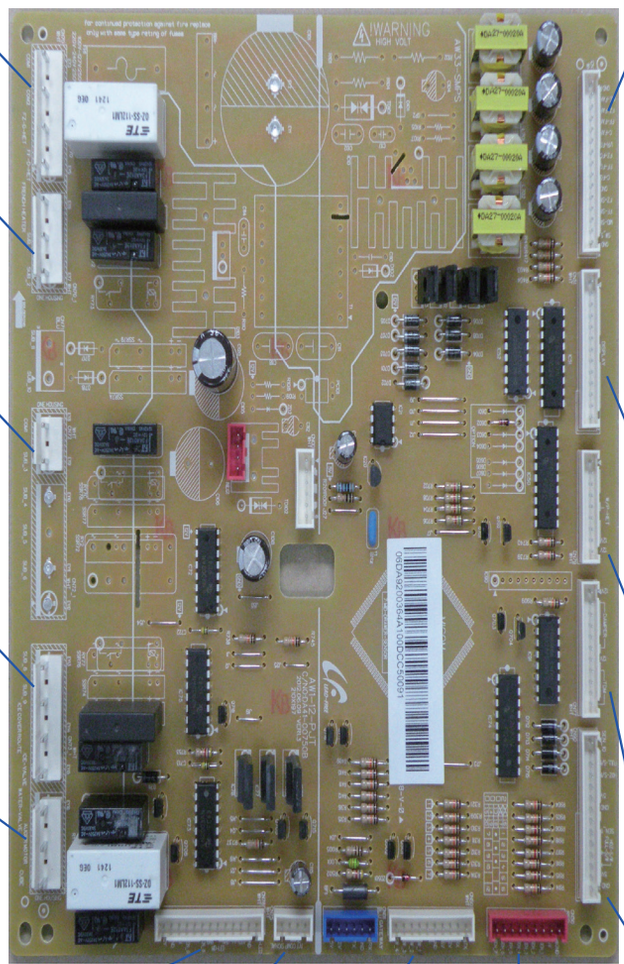


1. PCB Power Supply : From the AC Input Voltage(115V), it supplies DC 15V and 5V to the Inverter circuit for the Compressor control.
2. COMP Driving / Feedback Circuit
   It receives the COMP operation signals from the Main PBA and feedbacks the inverter errors to the Main PBA.
3. Micom (MN103SFC2D)
4. BOOTSTRAP Charger : It is an independent power circuit for the driving of the IMP High-Phase IGBT.
5. Current Pickup Circuit : It pickups the currents taken by the Shunt resistance and does the PWM DUTY control.
6. IPM (FNB40560)

PCB DIAGRAM

5-3) Connector Layout with part position (Main Board)

5-3-1. RF28HF**



CN70 - AC LOAD
① : FF-DEF-HEATER
③ : FZ-DEF-HEATER
ICE DUCT HEATER
⑤ : COMMON2 LINE(L)
⑦ : COMMON1 LINE(N)

CN70_1 - AC LOAD
① : Main Valve
③ : ICE MAKER HEATER(FF)
⑤ : FRENCH-HEATER
DISPENSER-HEATER

CN72 - AC LOAD
① : OPEN
③ : COMMON1 LINE(N)

CN73_1 - AC LOAD
① : ICE WATER
SOLENOIDE VALVE(FF)
③ : ICE COVER ROUTE
⑤ : Open
⑦ : Open

CN73 - AC LOAD
① : CUBE SOLENOIDE
VALVE
③ : AUGER MOTOR
⑤ : WATER SOLENOIDE
VALVE

CN78 – LAMP(LED)/Sensor
① : FZ LAMP(LED)
② : GND
③ : FF LAMP(LED)
④ : Open
⑤ : GND
⑥ : Open
⑦ : Open
⑧ : AMBIENT Sensor
⑨ : Open
⑩ : ICE ROOM Sensor
⑪ : +5V
⑫ : GND
⑬ : +12V

CN75 – Inverter
① : COMP. SIGNAL INPUT
② : +5V
③ : GND
④ : COMP. SIGNAL OUTPUT

CN50
① : LED PANEL TX
② : LED PANEL RX
③ : +12V
④ : +5V
⑤, ⑥ : GND
⑦ : ICE Switch
⑧ : WATER Switch
⑨ : ICE Route Switch 1
⑩ : ICE Route Switch 2

CN30 - Sensor
① : GND
② : +5V
③ : Humidity
④ : FZ-Sensor
⑤ : FZ-DEF-Sensor
⑥ : FF-Sensor
⑦ : IR-Sensor
⑧ : FF-DEF-Sensor
⑨ : Pantry Room-Sensor

CN90 - Ice Maker
① : Sensor(FF)
② : Motor Driver INB
③ : Horizontal Switch
④ : Motor Driver Vs2B
⑤ : +5V
⑥ : Open
⑦ : GND
⑧ : GND
⑨ : Sensor(FZ)
⑩ : Test Switch(FZ)
⑪ : Motor Driver INA
⑫ : Hall IC Output
⑬ : +5V
⑭ : GND

CN77 - Damper & Valve
①~② : Damper Heater
③~⑥ : Damper Motor
⑦ : +12V
⑧~⑪ : Step Valve (Option)

CN79
① : +5V
② : GND
③ : Flow Sensor Out
④ : Test Switch(FF)
⑤ : Ice Water Pipe Heater(FZ)
⑥ : Open
⑦ : Ice Room Heater
⑧ : +12V
⑨ : +12V

CN51 – MID DRAWER ROOM DISPLAY
① : ICE Pipe Heater(FF) F/B
② : ICE Water Pipe Heater (FF)
③~ ⑦ : Mid Drawer Room LED Driver
⑧~⑩ : OPEN
⑪ : Mid Drawer Room Switch
⑫ : OPEN
⑬ : OPEN

CN76 - BLDC Motor & door Switch
① : GND
② : Ice Room-FAN operation signal
③ : FZ-FAN operation signal
④ : FF-FAN operation signal
⑤ : C-FAN operation signal
⑥ : Ice Room-FAN signal input volt
⑦ : FZ-FAN signal input volt
⑧ : FF-FAN signal input volt
⑨ : C-FAN signal input volt
⑩ : GND
⑪ : FZ-Door Switch
⑫ : FF-Door Switch
⑬ : Mid DRAWER-DOOR Switch
⑭ : Open
⑮ : Open

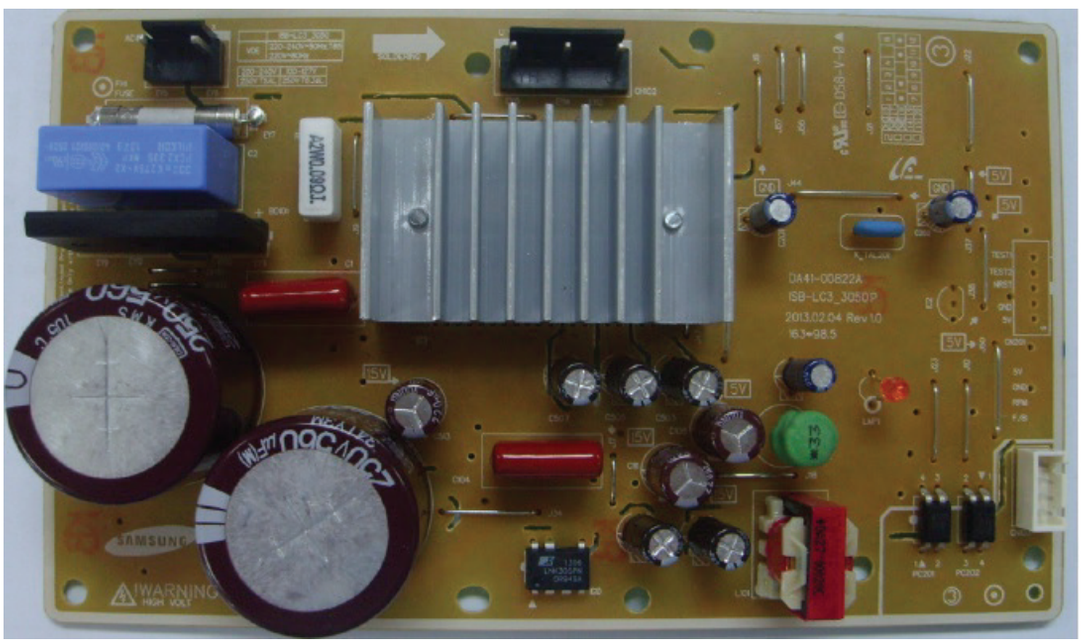
PCB DIAGRAM

5-4) Connector Layout with part position (Inverter Board)

5-4-1. RF28HF**

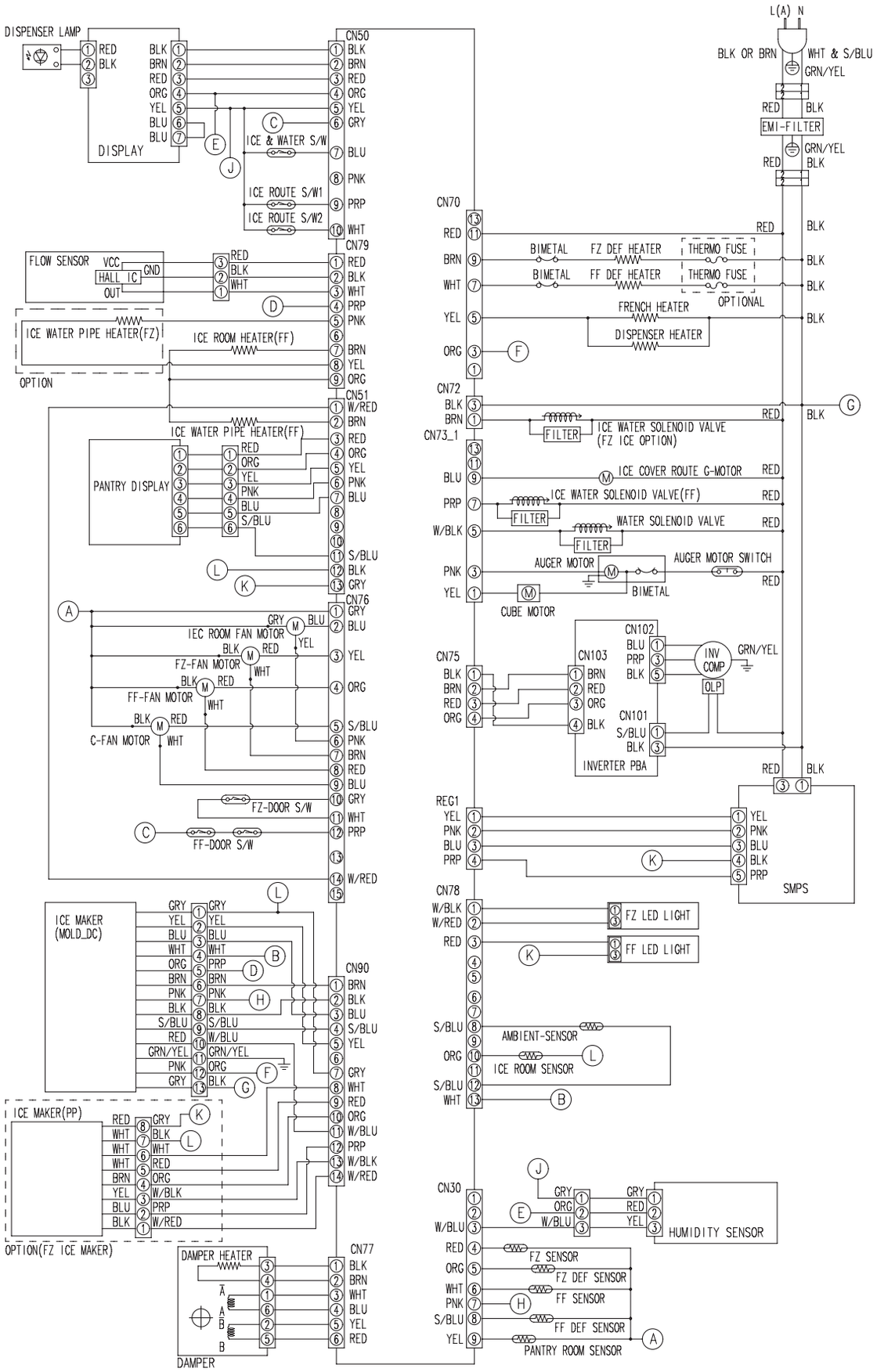
AC 115V

COMP



① : DC 5V
② : GND
③ : COMP. RPM
④ : COMP. Feedback

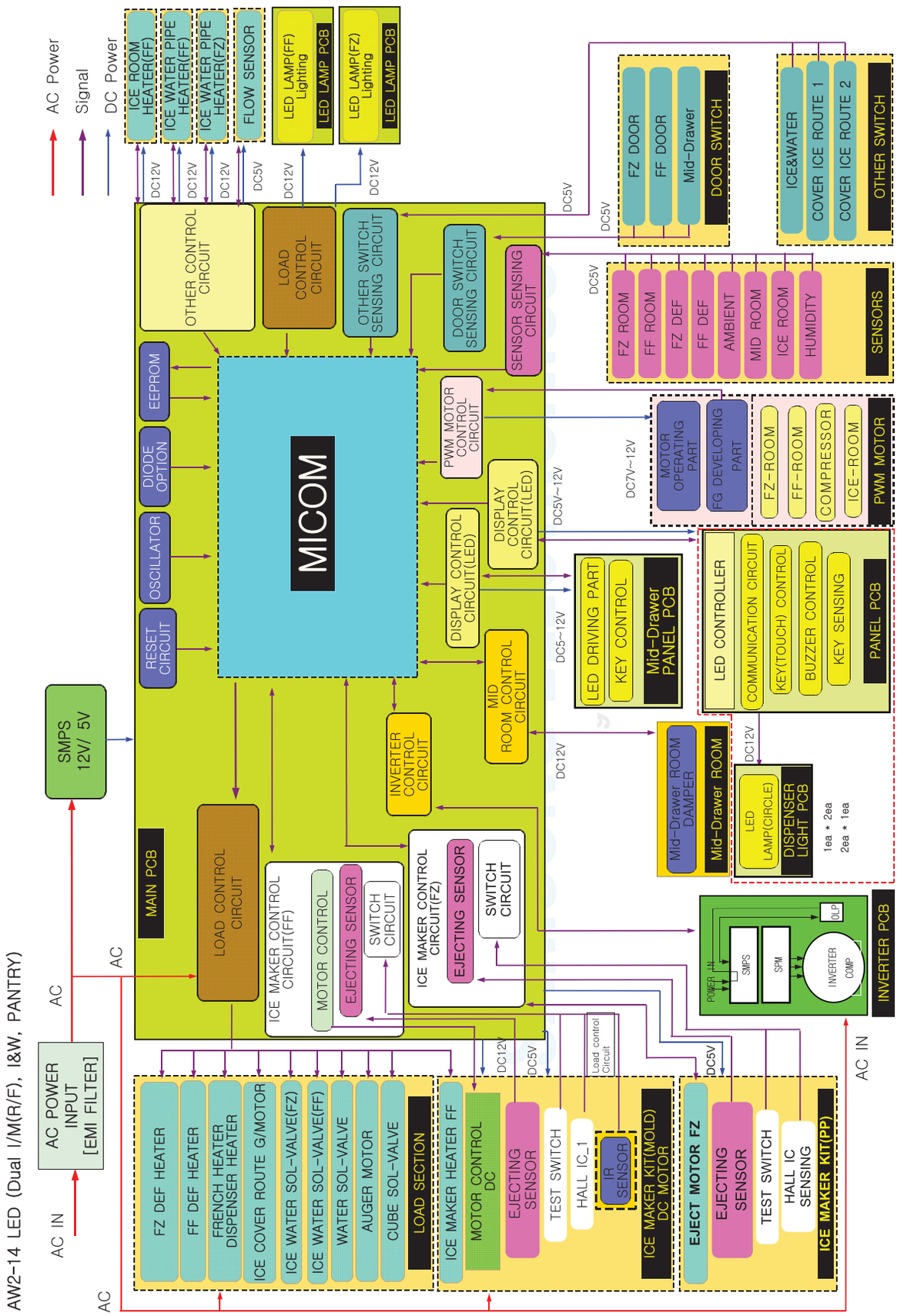
6-1) Model : RF28HF**



7. Block Diagram

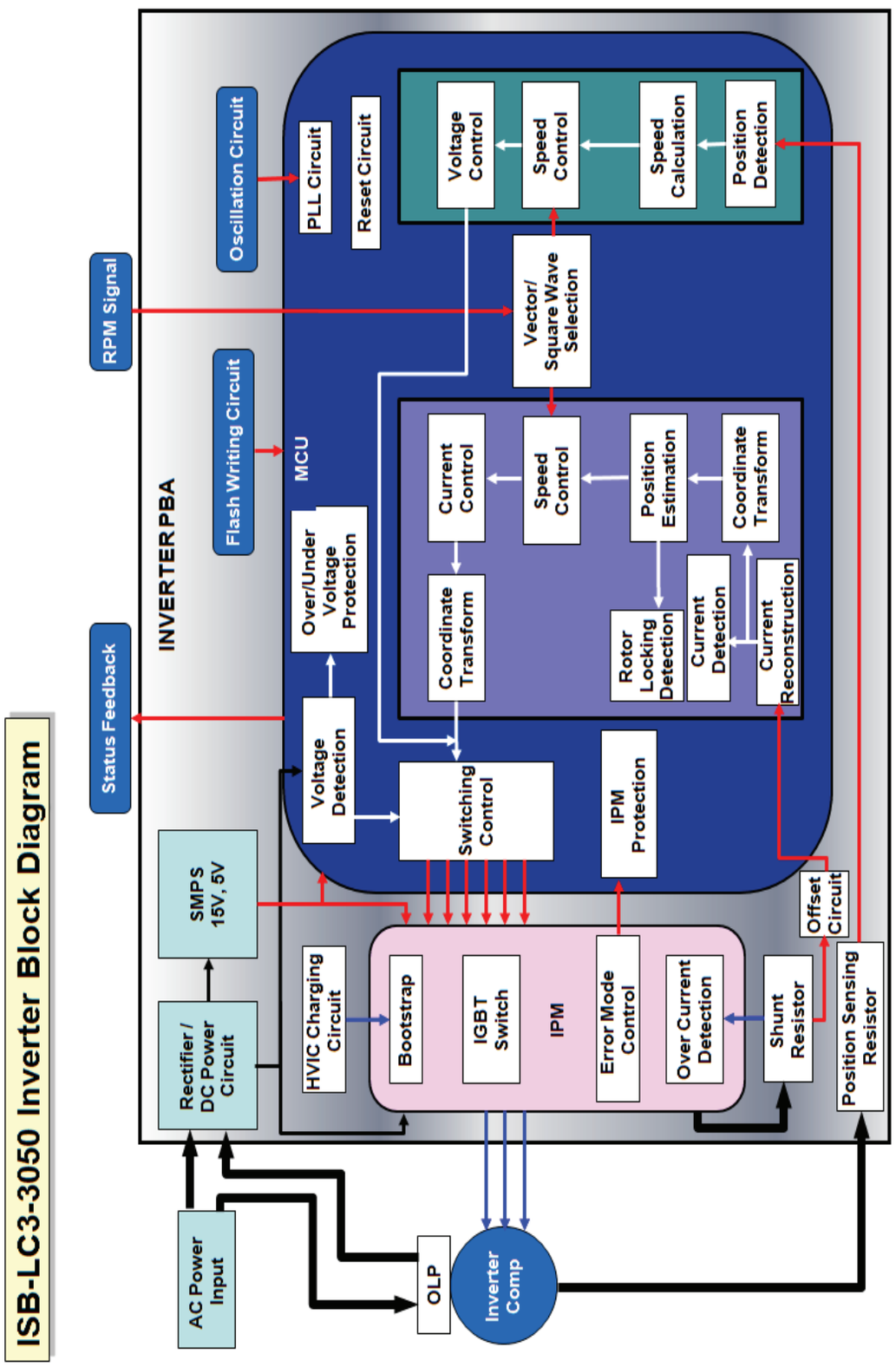
7-1) Whole block diagram

7-1-1. MODEL : RF28HF**



Block Diagram

7-1-2. MODEL : RF28HF**



Digit	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	A	A	1	1	A/1	A/1	A/1	A	A	A	A			
수정안 (냉장고)	제품 Type		용량		년도	Feature1	Feature2	Feature3	Feature4	외관 Color		/	거래선	
Model Code	R	F	3	1	G	M	E	S	B	S	R	/	A	A

	R	F	2	8	H	F	E	D	T	S	R	/	A	A
			2	5		C	P		B	B	C			
										W	W			

H	2014년	F	3Door +F/S	E	Easy Handle	D	Ice&Water Dispenser	T	TIM	SR	Real Stainless
		C	3Door +C/D	P	Energy -up			B	Basic	BC	Empire Black
										WW	Snow White

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