SAMSUNG

REFRIGERATOR

BOTTOM MOUNT FREEZER

MODEL NAME : RFG298HD*
RFG297HD*
RFG296HD*
RFG29PHD*
RFG29THD*

SERVICE Manual

REFRIGERATOR

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For the latest parts information, Please access to our service web site
(• North America : http://service.samsungportal.com)

WARNING

IMPORTANT SAFETY NOTICE

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

SAMSUNG ELECTRONICS AMERICA, INC.
Technical Service Guide

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1. PRECAUTIONS(SAFETY WARNINGS)

- Unplug the appliance before the changing or repairing the electric parts.
  ···› Be careful the electric shock.

- When exchanging the parts, use the correct parts.
  ···› Check the model name, rating voltage, rating current, running temperature symbols.

- When troubleshooting, connect firmly the types of harness.
  ···› Make not to be separated when some power is imposed.

- Check the traces of water infiltration at the electric parts.
  ···› If there is a trace of water infiltration, exchange or tape the parts.

- Check the assemble status of parts after troubleshooting.
  ···› It must be in the same assembled state when compared with the state before disassembly.

- Check the use circumstance of refrigerator.
  ···› If the refrigerator is installed at the place that is damp or wet, or status of installation is unstable, change the installation place.

- Ground the refrigerator properly
  ···› Particularly, Be sure to earth when there is a risk of an electric leakage by humidity or wetness.

- Do not use multi plugs in a plug socket at the same time.
  Check if the power cord and socket is damaged, pressed, squeezed, or fired.

- If the plug or plug socket is damaged, repair or exchange it immediately.

- Do not allow consumers to repair the appliance by themselves.

- Do not store other materials except the foods.
  ···› Drugs or scientific materials : difficult to keep precise temperature.
  ···› The inflammables(alcohol, benzene, ether, LP gas, butane gas etc.) : have risk of explosion.

PRECAUTIONS(SAFETY WARNINGS)

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

CAUTION/WARNING SYMBOLS DISPLAYED

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

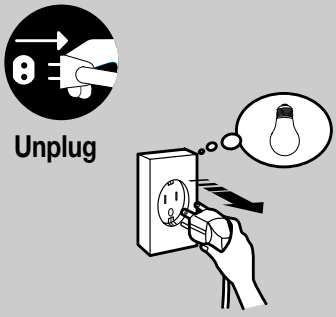
SYMBOLS

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

Warning & Caution

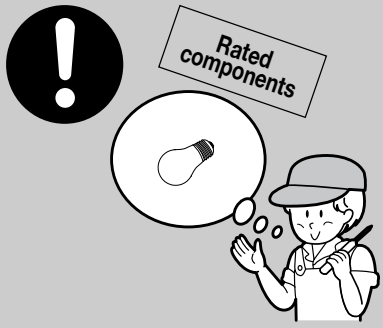
Plug out to exchange the interior lamp.

- ***It may cause electric shock.***



Use the rated components on the replacement.

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



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

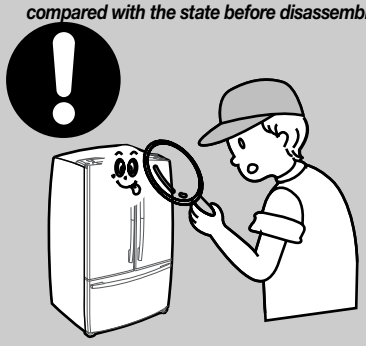
- ***Bundle tightly wires in order not to be detached by the external force and then not to be wetted.***

On repair, remove completely dust or other things of housing parts, harness parts, and check parts.

- ***Cleaning may prevent the possible fire by tracking or short.***

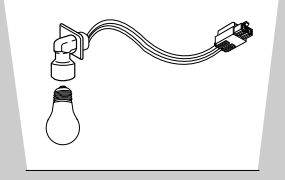
After repair, check the assembled state of components.

- ***It must be in the same assembled state when compared with the state before disassembly.***



Check if there is any trace indicating the permeation of water.

- ***If there is that kind of trace, change the related components or do the necessary treatment such as taping using the insulating tape.***



PRECAUTIONS(SAFETY WARNINGS)

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

⚠ Warning & Caution

Do not allow users to put bottles or kinds of glass in the freezer.

- *Freezing of the contents may inflict a wound.*

Do not allow users to store narrow and lengthy bottles or foods in a small multi-purpose room.

- *It may hurt you when refrigerator door is opened and closed resulting in falling stuff down.*

Do not allow users to store pharmaceutical products, scientific materials, etc., in the refrigerator.

- *The products which need precise temperature control should not be stored in the refrigerator.*

Do not allow users to plug several appliances into the same power receptable.

- *May cause abnormal generation of heat or fire.*

Do not allow users to disassemble, repair or alter.

- *It may cause fire or abnormal operation which leads to injury.*

Do not allow users to bend the power cord with excessive force or do not have the power cord pressed by heavy article.

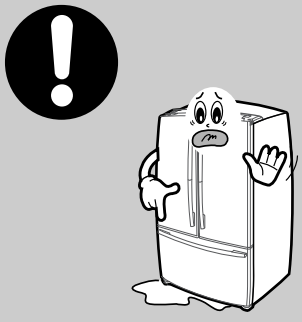
- *May cause fire.*

Do not allow users to store articles on the product.

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

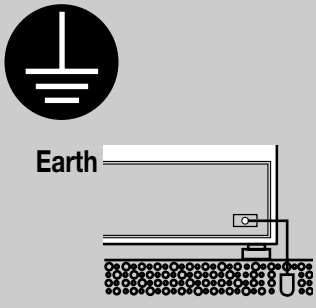
Do not allow users to install the refrigerator in the wet place or the place where water splashes.

- *Deterioration of insulation of electric parts may cause electric shock or fire.*



Make sure of the earth.

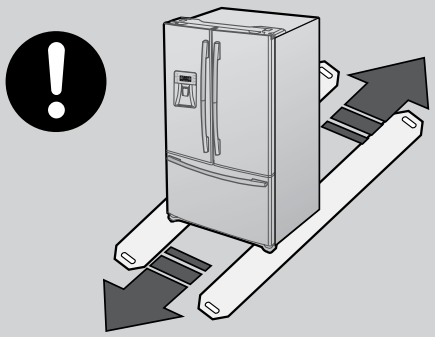
- *Be sure the product is properly grounded.*



PRECAUTIONS(SAFETY WARNINGS)

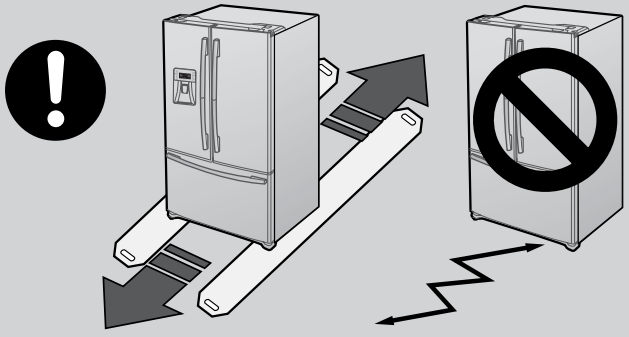
FLOORING

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.



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2. PRODUCT SPECIFICATIONS

2-1) Introduction of Main Function

- **A newly developed SAMSUNG bottom mount freezer in 2008 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(RFG297HD* / RFG298HD*)** • Adjustable temperature control ((around 41℉(5℃) : Deli / around 38℉(3℃) : Fresh / around 34℉(1℃) Chilled) Temperature control from outside of the Pantry : user friendly design helps keep foods fresh for longer
	**16" Pizza Corner** • Can be used for 16" pizza if the flap is turned up
	**One Lever Dispenser** • One lever dispeser can be get ice or water easily
	**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

PRODUCT SPECIFICATIONS

	**Easy Handle** • The freezer door is more user-friendly. So, it comes as much convenient.
	**Slim Water Filtration System** • Slim water filter is placed between crispers for changing filter conveniently without removing items from Refrigerator.
	**Dual Ice Maker** • 9 cubes ice-Maker(Refrigerator) • 7 cubes ice-Maker(Freezer) FOR RFG298HD* / RFG296HD*/RFG29THD*

PRODUCT SPECIFICATIONS

2-2) Specifications

ELECTRICAL SPECIFICATIONS

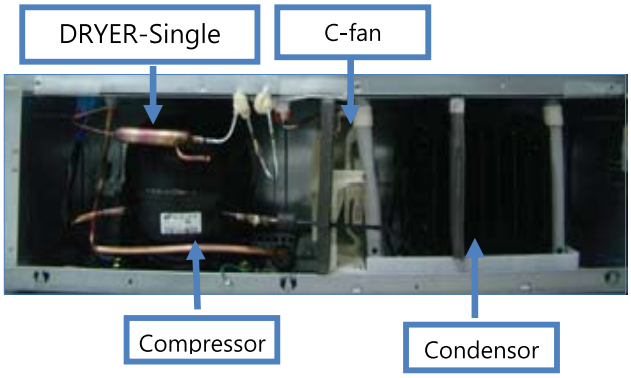
Defrost Control ····· From 12 to 30hrs(comp. run time)
Thermo Bimetal Protector·····140°F(60°C)(off) 104°F(40°C)(on)
Defrost Thermistor(502AT) ····· 50°F(10°C)(off)
Electrical Rating ····· AC115V 60Hz 11.6 Amps
Maximum Current Leakage ····· 0.25 mA
Maximum Ground Path Resistance ····· 0.1 Ohm
Energy Consumption····· 516kWh/year

NO LOAD PERFORMANCE

Ambient Temperature	70°F(21°C)	90°F(32°C)
Refrigerator,°F ·····	34°F(1°C)~46°F(8°C)	34°F(1°C)~4°F8°C)
Freezer,°F ·····	-8°F(-22°C)~8°F(-13°C)	-8°F(-22°C)~8°F(-13°C)
Run Time,% ·····	< 40	< 60

REFRIGERATION SYSTEM

Refrigerant Charge (R134a)·····5.64 oz(160g)
Compressor(BK190C-L2C) ·····1314 Btu/hr(0.385kw)
Compressor oil ····· Freol 5 ∝ 15c
R Capillary tube(Dia, Length) ····· 0.032",118"**(0.82mm,3500mm)**

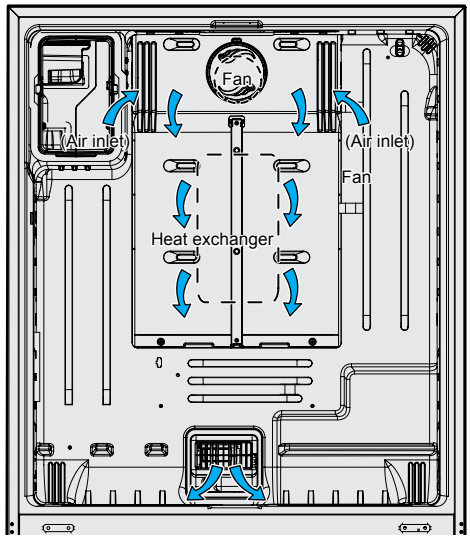


INSTALLATION

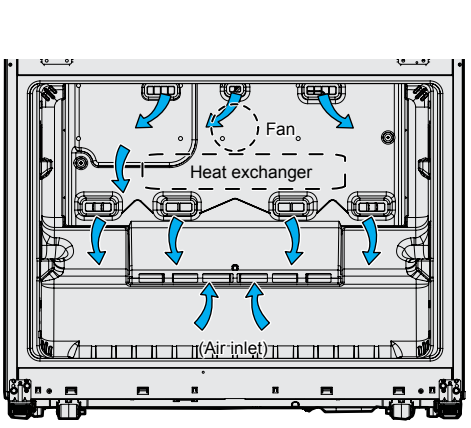
Clearance must be provided for air circulation
·····

AT TOP ····· 1"**(25mm)**
AT SIDES····· 1"**(25mm)**
AT REAR 2"**(50mm)**

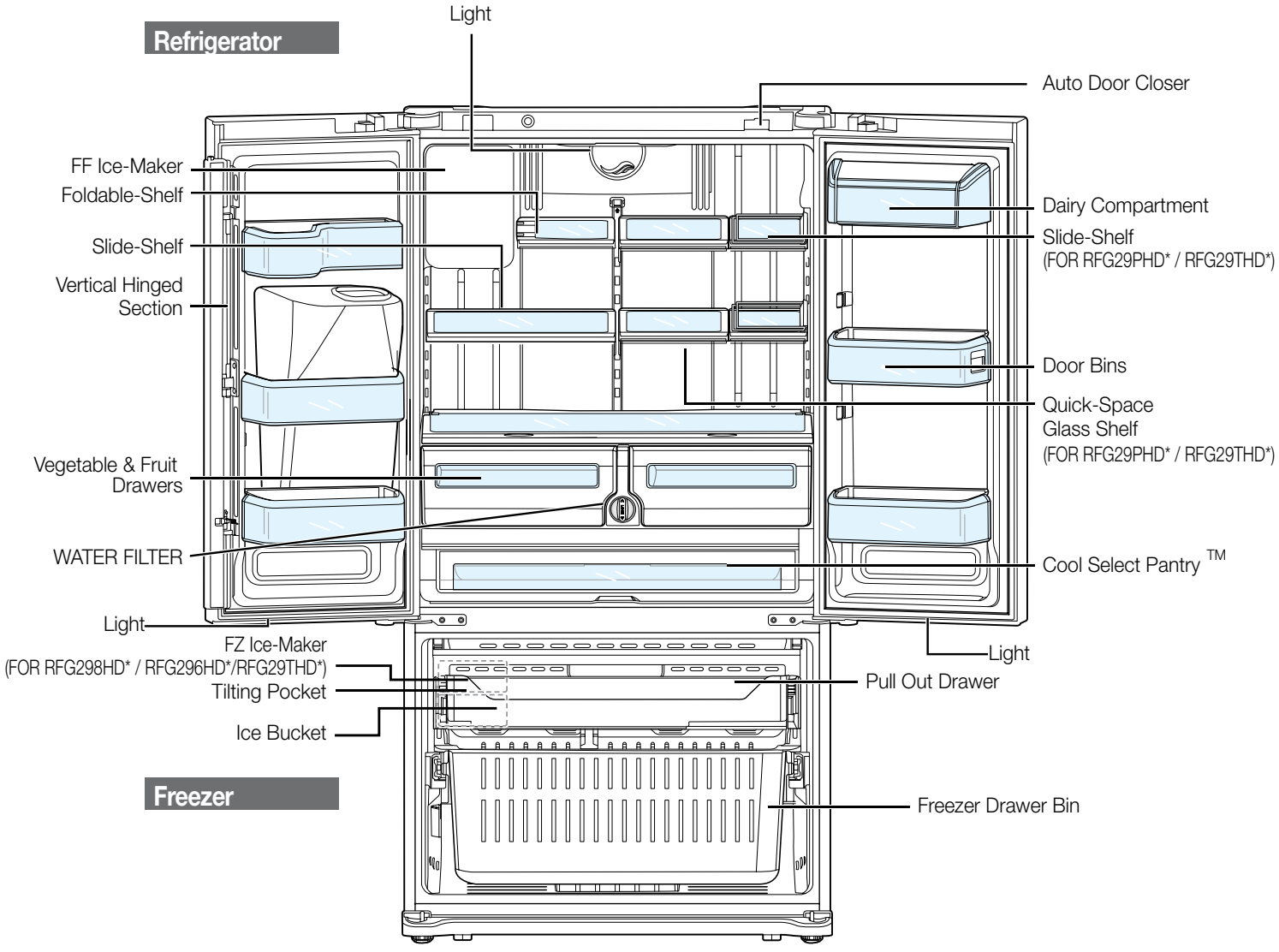
Refrigerator



Freezer



2-3) Interior Views



PRODUCT SPECIFICATIONS

2-4) Model Specification & Specification Chart

ITEM	Model		RFG298HD***	RFG297HD***	RFG296HD***	RFG29PHD***	RFG29THD***
			ICE&WATER DISPENSER WITH PANTRY& TWIN ICE	ICE&WATER DISPENSER WITH PANTRY	ICE&WATER DISPENSER WITH TWIN ICE	ICE&WATER DISPENSER WITH PANTRY	ICE&WATER DISPENSER WITH PANTRY& TWIN ICE
External size	W		35 6/8 Inch (908mm)	35 6/8 Inch (908mm)	35 6/8 Inch (908mm)	35 6/8 Inch (908mm)	35 6/8 Inch (908mm)
	D	On Cabinet	29 1/4 Inch (744mm)	29 1/4 Inch (744mm)	29 1/4 Inch (744mm)	29 1/4 Inch (744mm)	29 1/4 Inch (744mm)
		W/O Handle	33 1/8 Inch (842mm)	33 1/8 Inch (842mm)	33 1/8 Inch (842mm)	33 1/8 Inch (842mm)	33 1/8 Inch (842mm)
		With Handle	35 5/8 Inch (904mm)	35 5/8 Inch (904mm)	35 5/8 Inch (904mm)	35 5/8 Inch (904mm)	35 5/8 Inch (904mm)
	H	W/O Hinge Cap	68 1/2 Inch (1740mm)	68 1/2 Inch (1740mm)	68 1/2 Inch (1740mm)	68 1/2 Inch (1740mm)	68 1/2 Inch (1740mm)
		With Hinge Cap	69 6/8 Inch (1774mm)	69 6/8 Inch (1774mm)	69 6/8 Inch (1774mm)	69 6/8 Inch (1774mm)	69 6/8 Inch (1774mm)
Net Capacity	Total		28.5(805.9ℓ)	28.5(806.6ℓ)	28.5(805.9ℓ)	28.4(805.1ℓ)	28.4(804.4ℓ)
	Freezer		8.7(246.3ℓ)	8.7(247.0ℓ)	8.7(246.3ℓ)	8.7(247.0ℓ)	8.7(246.3ℓ)
	Refrigerator		19.8(559.6ℓ)	19.8(559.6ℓ)	19.8(559.6ℓ)	19.7(558.1ℓ)	19.7(558.1ℓ)
Efficiency of Volume			55.40%	55.40%	55.40%	55.40%	55.40%
Weight	Set		146kg(321.9lbs)	146kg(321.9lbs)	146kg(321.9lbs)	147kg(324.1lbs)	148kg(326.3lbs)
	Packing		162kg(357.1lbs)	161kg(354.9lbs)	161kg(354.9lbs)	162kg(357.1lbs)	163kg(359.4lbs)
Packing	Width		38 5/8 (980mm)	38 5/8 (980mm)	38 5/8 (980mm)	38 5/8 (980mm)	38 5/8 (980mm)
	Depth		36 2/8 (920mm)	36 2/8 (920mm)	36 2/8 (920mm)	36 2/8 (920mm)	36 2/8 (920mm)
	Height		75 6/8 (1925mm)	75 6/8 (1925mm)	75 6/8 (1925mm)	75 6/8 (1925mm)	75 6/8 (1925mm)
Compressor			RECIPROCATE	RECIPROCATE	RECIPROCATE	RECIPROCATE	RECIPROCATE
Rated Frequency and Frequency			AC 115V/60Hz	AC 115V/60Hz	AC 115V/60Hz	AC 115V/60Hz	AC 115V/60Hz
Refrigerant			R134a	R134a	R134a	R134a	R134a
Foaming Agent			C-PENTANE	C-PENTANE	C-PENTANE	C-PENTANE	C-PENTANE
Refrigerant Input Amount			5.29 oz (160g)	5.29 oz (160g)	5.29 oz (160g)	5.29 oz (160g)	5.29 oz (160g)
Type Refrigerator			INDIRECT COOLING METHOD REFRIGERATOR	INDIRECT COOLING METHOD REFRIGERATOR	INDIRECT COOLING METHOD REFRIGERATOR	INDIRECT COOLING METHOD REFRIGERATOR	INDIRECT COOLING METHOD REFRIGERATOR
Motor Rated Consumption Power			140W	140W	140W	140W	140W
Electric Heater Rated Consumption Power			340W	340W	340W	340W	340W

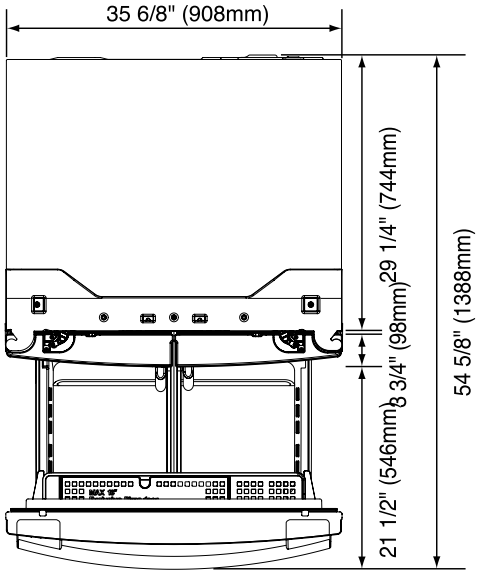
PRODUCT SPECIFICATIONS

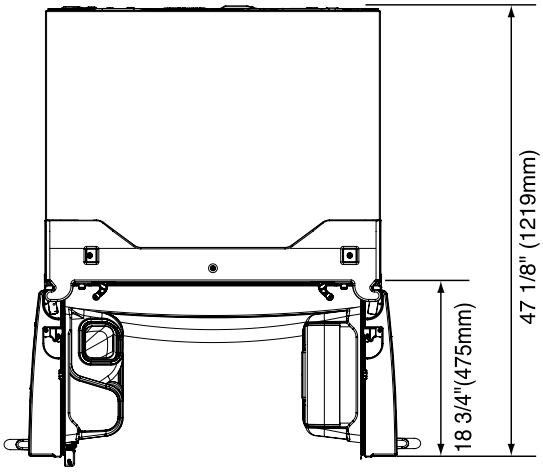
Items				Specification	
Model				RFG298HD* / RFG297HD* / RFG296HD*/RFG29PHD* / RFG29THD*	
Components for Freezer	Compressor		Model	MKV190CL2B/E01	
			Starting type	BLDC	
			Oil Charge	FREOL α - 15c	
	Evaporator		Freezer	SPLIT FIN TYPE	
			Refrigerator	SPLIT FIN TYPE	
	Condenser			Forced and Natural Convection Type	
	Dryer			Molecular shieve XH-9	
	Capillary tube(Dia x Length)			R : 0.032"(0.082mm X 3500mm)	
	Refrigerant			R134a	
Room Temperature Sensor Components	Freezer	Model	Temperature Selection	ON(℉)	OFF(℉)
		THERMISTOR (F-SENSOR) 502AT	-14℉(-26℃)	-11℉(-24℃)	-17℉(-27℃)
			-2℉(-19℃)	1℉(-17℃)	-5℉(-21℃)
			8℉(-13℃)	11℉(-12℃)	5℉(-15℃)
	Refrigerator	Model	Temperature Selection	ON(℉)	OFF(℉)
		THERMISTOR (R-SENSOR) 502AT	34℉(1℃)	36℉(2℃)	32℉(0℃)
			38℉(3℃)	40℉(4℃)	36℉(2℃)
			46℉(8℃)	48℉(9℃)	44℉(7℃)
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 ㏀ at 77℉(25℃)	
		R Defrost-Sensor	Model	THERMISTOR (502AT)	
			SPEC	5.0 ㏀ at 77℉(25℃)	
	Bimetal	F Bimetal-thermo Protector	Rated	AC 125V, 6A	
			Operating temperature	Off : 140℉(60℃) / On : 104℉(40℃)	
		R Bimetal-thermo Protector	Rated	AC 125V, 6A	
			Operating temperature	Off : 140℉(60℃) / On : 104℉(40℃)	

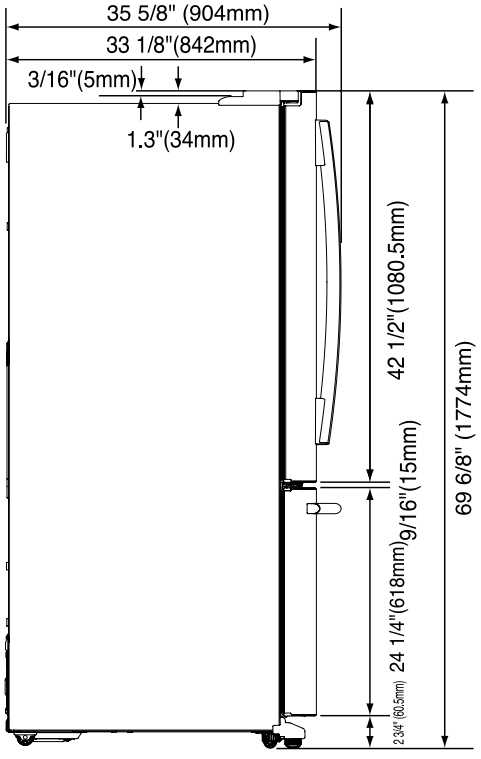
PRODUCT SPECIFICATIONS

Items			Specification
Model			RFG298HD* / RFG297HD* / RFG296HD*/RFG29PHD* / RFG29THD*
Electric Components	Defrost Heater(FRE)	Heated at F Defrost	AC 120V, 240W
	Defrost Heater(REF)	Heated at R Defrost	AC 120V, 120W
	DISPENSER Heater	Interlock with French Heater	AC 120V, 2.5W
	FRENCH Heater	-	AC115V, 8W
	ICE Duct Heater	Interlock with Defrost Heater (FRE)	AC115V, 4W
	Water Tank Heater	-	DC 12V, 2W
	Bimetal thermo for Preventing Overheating of Refrigerator Lamp		AC125V 6A / AC250V 3A Off: 140℉(60℃)/ On : 104℉(40℃)
	Over Load Relay	Model	4TM445PHBYY-82
		Temp.ON	156.2± 16.2℉(69± 9℃)
		Temp.OFF	257± 9℉(125± 5℃)
	Rated Voltage		AC 115V/ 60Hz
	Motor-BLDC(FRE)		DC12V / DREP5020LC
	Motor BLDC(ICE ROOM)		DC12V / DREP5020LB
	Motor-BLDC(REF)		DC12V / DREP5020LC
	Motor-BLDC(CIRCUIT)		DC12V / DRCP5030LA
	Motor-DAMPER(PANTRY)		DC12V / NSBY001TD1
	Lamp LED (FRE)		DC 12V, 45~75mA
	Lamp LED (REF)		DC 12V, 290~380mA
	Lamp LED (VEG)		DC 12V, 95~145mA
	Door Switch	FRE	AC 125V 1.5A (1EA)
		REF	DC200V 1.5A / MS-406-SS-01(2EA)
		REF(ICE ROOM)	125V/5A, EMB816
	Power Cord		AC125V 15A
	Earth Screw		BSBN (BRASS SCREW)

2-5)Dimensions of Refrigerator (Inches)





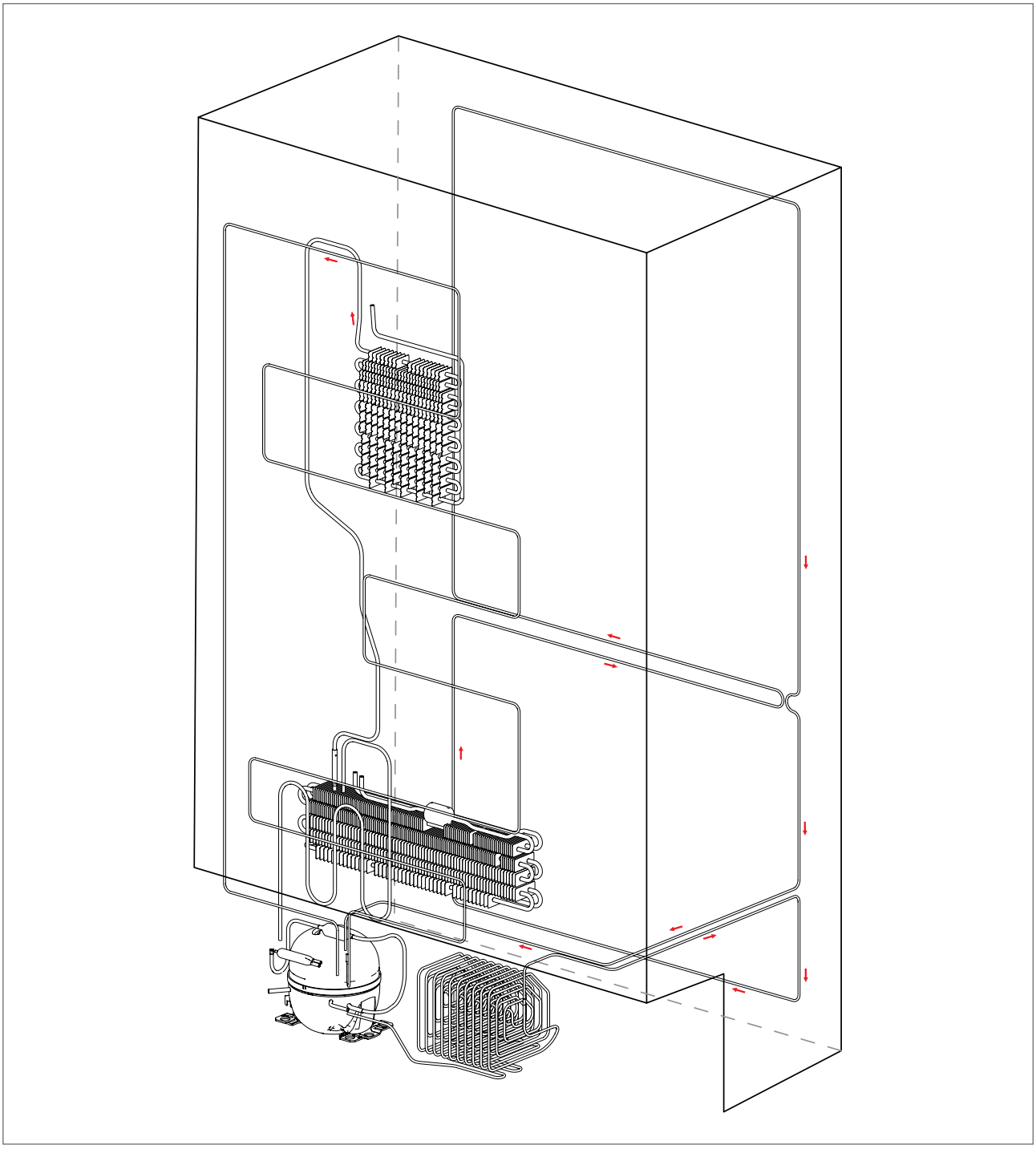


2-6) Optional Material Specification

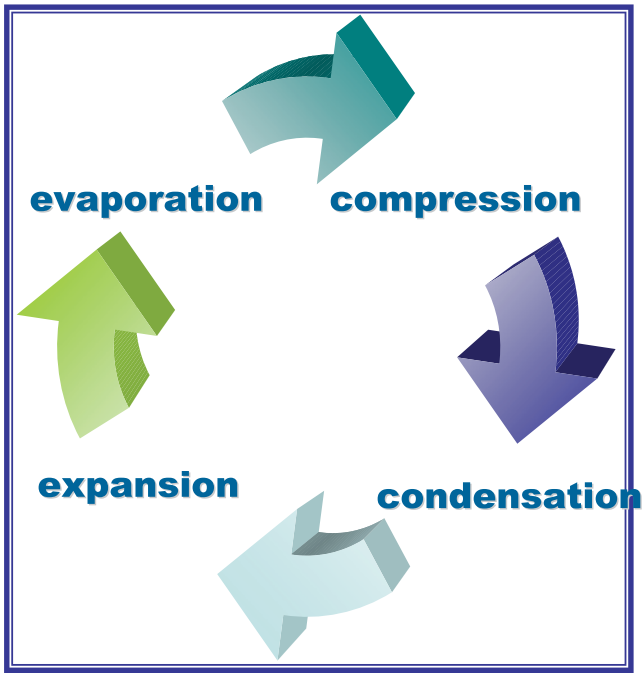
	Part Name	Part Code	AMOUNT
	FILTER WATER-ASSY	DA29-00020B	1
	ASSY-PACKING SUB	DA99-00240S	1
	LED LAMP REF	DA96-00398J	1
	LED LAMP CASE-VEG R, L	DA47-00519S	2
	LED LAMP FRE	DA41-00519X	2

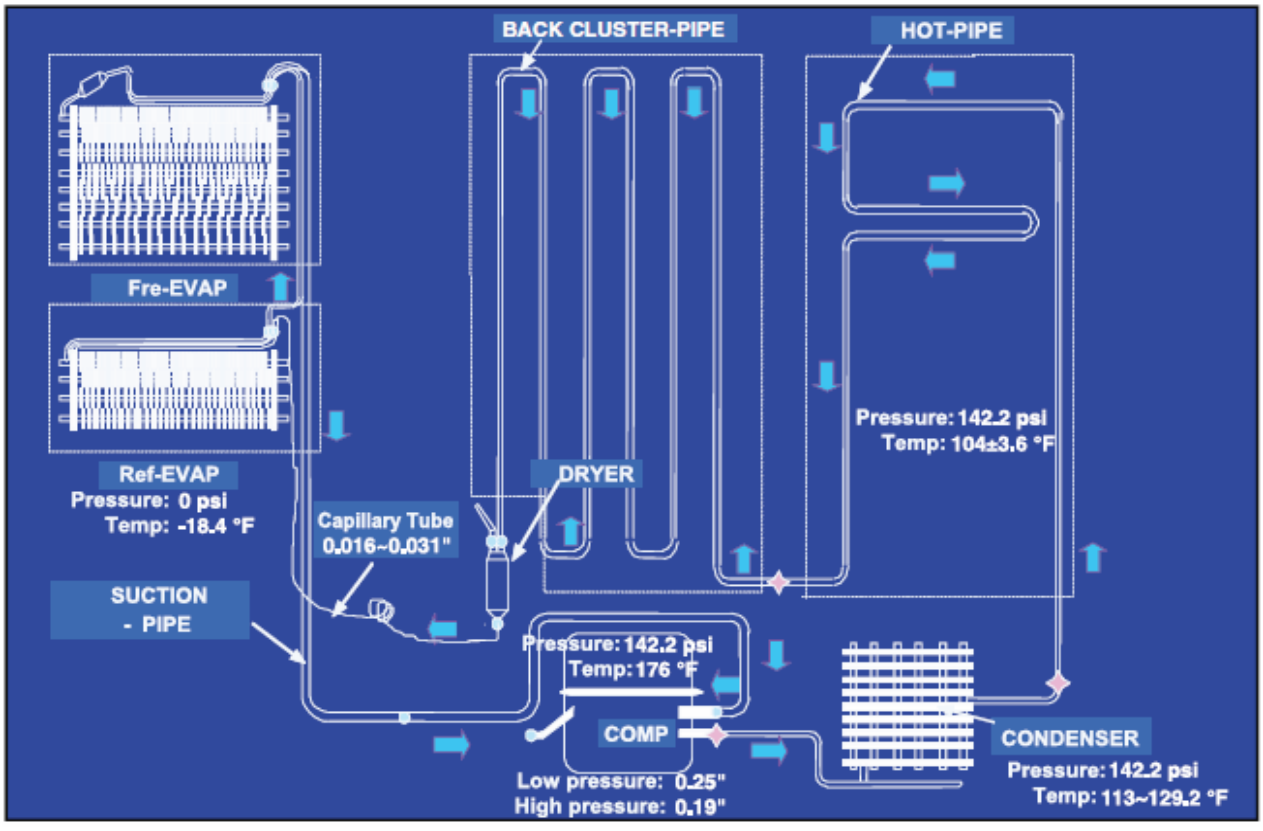
2-7) Refrigerant Route in Refrigeration cycle

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



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 (water/air) to make liquid state for the high temperature / high pressure gas refrigerant discharged from compressor

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.

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.

2-7-3. Operation theory of refrigeration cycle components

■ 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.

2-7-4. Operation theory of refrigeration cycle components

※. Influence of moisture

① Moisture precipitation - Blocked by ice

② Refrigerant and reaction

③ Life reduction of oil

④ Acceleration of oxidization

⑤ Copper plating phenomenon

⑥ Gas dissolution by the interaction of synthetic insulating material (insulator)

※. Influence of foreign substance

① Increase of condensed temperature.

② Increase of temperature.

③ Decrease of cooling efficiency

④ Shorten the life by friction between oil and foreign substance in the compressor.

■ Accumulator

1. Role : To send a pure refrigerant gas to compressor by removing completely the refrigerant liquid from evaporator.

※ If a refrigerant liquid go into the compressor, overload is occurred.

2-7-5. Refrigeration Cycle Type

TDM Cycle

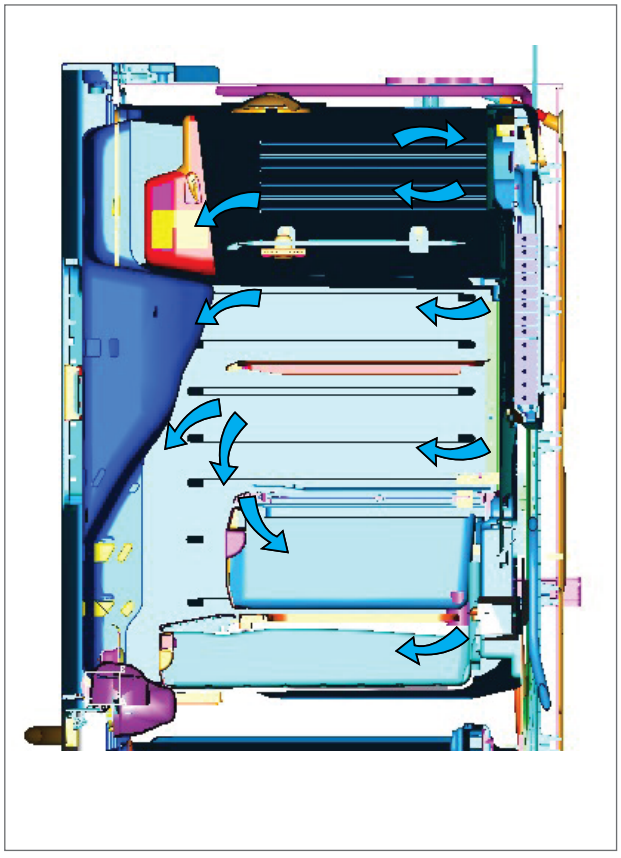
Compressor → Condenser → Fre Hot Pipe → Flex Hot-pipe → Ref Hot-pipe → Back Cluster Pipe → Dryer → Capillary Tube → Refrigerator Evaporator → Freezer Evaporator → Suction Pipe → Compressor

HM Cycle

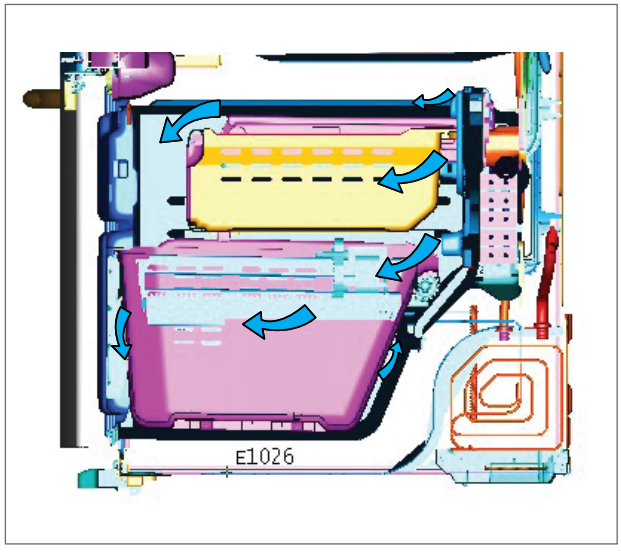
Compressor → Sub-Condenser → Hot Pipe
Dryer → Capillary Tube → Refrigerator Evaporator
Freezer Evaporator → Suction Pipe → Compressor

2-8) Cooling Air Circulation

Refrigerator



Freezer



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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.

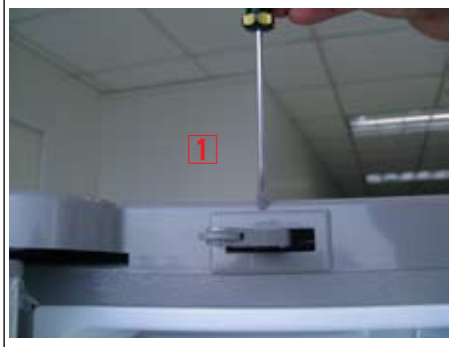
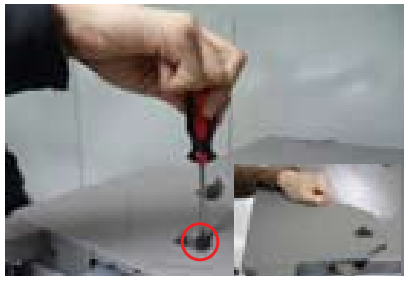
- Required Tools

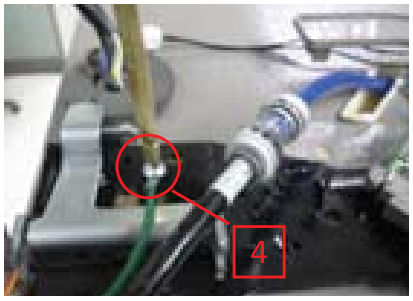
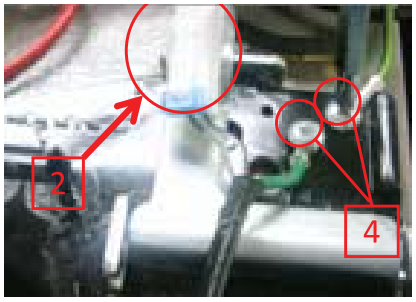
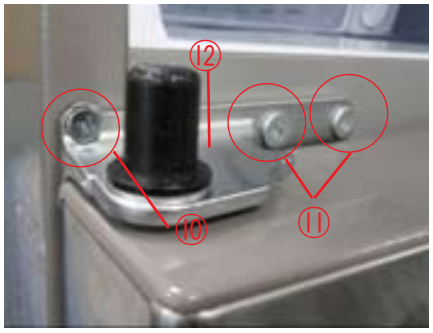
IMAGE	ITEM	USE
	Phillips Head Driver	Use for assembling and disassembling of screw
	Flat Head Driver	Use for assembling and disassembling of HomeBar, Dispenser, Deli Cartessen Box, Main PBA etc...
	Hex Wrench ∮ 2mm	Use for assembling and disassembling of Handle
	Socket Wrench ∮ 10mm	Use for assembling and disassembling of Door Hinge

- Water whitening phenomenon

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

3-2) Refrigerator Door

Part Name	How To Do	Descriptive Picture
Refrigerator Door	1. Open the door to be replaced, disassemble Cap Top Table (1) with (-) driver, and close the door. CAUTION Be careful not to scratch or break the parts	
	2. Remove the screw holding down the Cover Hinge and Cover Hinge Separate by holding the handle and lifting upward.	
	3. Disconnect the LED housing (2) and Electrical housing connector 3) located above the upper door hinge. To disconnect the connector more easily, press the end of the hook and pull connector. CAUTION Before doing the above, make sure that the unit is plugged out.	 

Part Name	How To Do	Descriptive Picture
Refrigerator Door	4-1. **Left door hinge** With a Philips head screwdriver, remove the ground screw. (4)	
	4-2. **Right door hinge** At first, disconnect the LED housing (2) and With a Philips head screwdriver, remove the ground screws. (4)	
	5. Lift the door straightly up to remove.	
	6. With a Philips head screwdriver, remove the two screws (⑩) attatched to the lower left and right door hinges. With a wrench(10mm), 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 Freezer

Part Name	How To Do	Descriptive Picture
Door Handle Freezer	1. Set HANDLE to FIXER HANDLE.	
	2. Insert HANDLE to FIXER HANDLE.	
	3. Insert bolt to FIXER HANDLE using range and lock.	 

3-4) Refrigerator Light

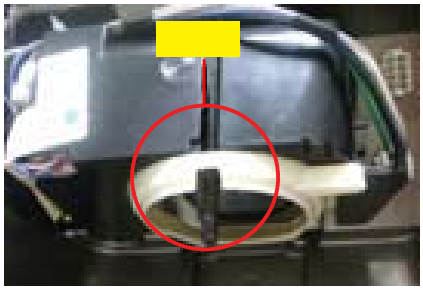
Part Name	How To Do	Descriptive Picture
Refrigerator Light	1. Remove the lamp cover by pushing a flat-blade screwdriver Into the hooks behind and pull them out. CAUTION Be careful not to scratch or break the parts CAUTION Before doing the above, make sure that the unit is plugged out.	
	2. Remove the screws. And separate the LED panel.	

3-5) 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.	
	3. Disengage the housing connect of display cover.	

3-6) Water-Dispenser

Part Name	How To Do	Descriptive Picture
Water-Dispenser	1. Disengage the Housing Connectors by pushing a Glat-blade screwdriver.	
	2. Remove 2 screws of the Case Ice Route Assy.	
	3. Pull the Case Ice Route Assy.	

Part Name	How To Do	Descriptive Picture
Water-Dispenser	1. Assembly shall be in order from the disassembly. Case-Ice and Route shall be assembled inside of hose. Otherwise, assemble cannot be accomplished.	
	2. When assembling Cover-Display, first insert it from leftside and then assemble to rightside. Otherwise, the hook can be broken.	

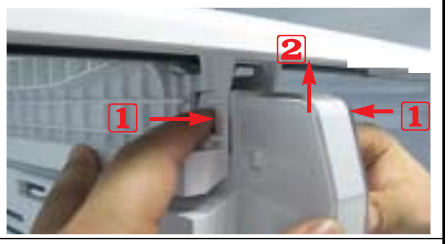
3-7) Glass Shelf

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

3-8) Foldable Glass Shelf

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

3-9) Vegetable & Fruit Drawers Shelf

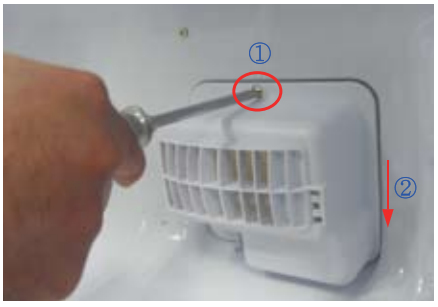
Part Name	How To Do	Descriptive Picture
Vegetable & Fruit Drawers Shelf	1. Remove the vegetable & fruit drawer by pulling the roller part and lifting it up.	
	2. Lift up the vegetable & fruit shelf slightly with the both side of snap-fits are pressed. (Refer to the picture)	
	3. Remove the vegetable & fruit drawer shelf by pulling it out. (Refer to the picture)	

Part Name	How To Do	Descriptive Picture
Vegetable & Fruit LED LAMP	1. Remove 1 screw	
	2. Disengage the housing connector.	

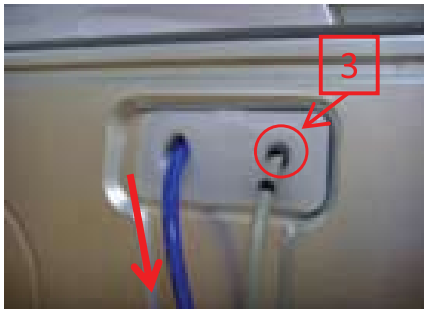
3-10) Cool Select Pantry

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 the central part of the cover while pushing it to the left.	
Cool Select Pantry Shelf	1. Remove the cool select pantry shelf by lifting the front part of the shelf while pulling it.	

3-11) 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)	

3-12) Case Water Filter

Part Name	How To Do	Descriptive Picture
Case Water Filter	Before disassembling the Case Water Filter take out water filter and drawers and shelves locates on the Case Water Filter. (Refer to the "Vegetable & Fruit Shelf")	
	1. a. Disconnect the 3 Housing(1) b. Tube Fitting Separate Water Tube while pressing (2).	 
	2. a. Pull the Water blue hose out. b. Push the Tube Fitting (3) and pull the Water GRAY hose out.	
	3. Push the by hand slightly.	

3-13) Water Filter (Assembly & Disassembly)

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

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

3-14) 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)	

3-15) Vertical Hinged Section

Part Name	How To Do	Descriptive Picture
Vertical Hinged Section	1. Unscrew 2 screws.	
	2. Disengage the internal housing connector of the vertical hinge.	
	3. Remove the vertical hinged section by lifting the vertical hinge up. (Refer to the picture)	

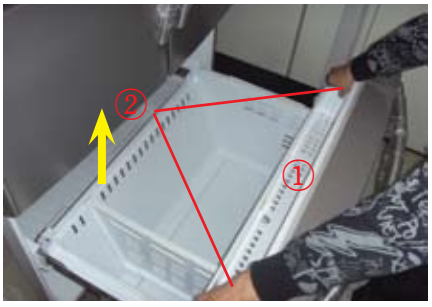
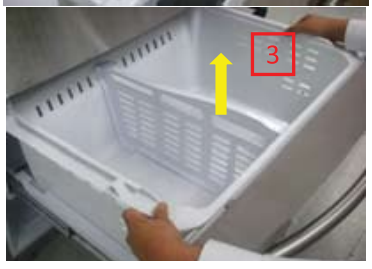
3-16) Evaporator Cover In Refrigerator

Part Name	How To Do	Descriptive Picture
Evaporator Cover In Refrigerator	1. Remove the angle cap with a flat-blade screwdriver. (Refer to the picture)	
	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 3 housing connectors. (Refer to the picture)	

3-17) Evaporator In Refrigerator

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

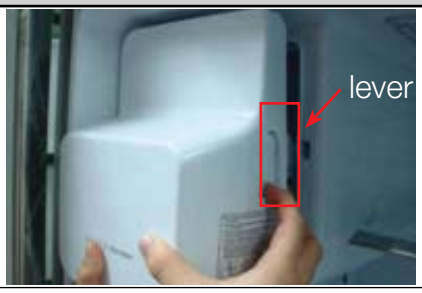
3-18) Freezer Door

Part Name	How To Do	Descriptive Picture
Freezer Door	1. Pull the drawer open to full extension.	
	2. Remove the tilting Pocket(①) by pulling the both brackets(②) upward at the same time.	
	3. Take ot the Auto pull out drawer (②) and Freezer guard(③) 3 by lifting up from rail system.	 
	4. Unscrew 2 bolts. (1 bolt each on the both sides)	 
	5. Lifting up the freezer door, remove the freezer door from the rail.	

3-19) Pull Out Drawer

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

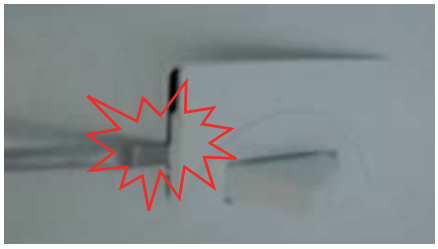
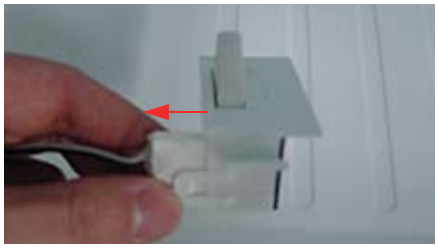
3-20) Ice-Maker

Part Name	How To Do	Descriptive Picture
Ice Maker	1. Pull the lever forward and take out the ice bucket.	
	2. Remove 1 screw of the Cover.	
	3. Disassemble the cover with a flat-blade(-) screwdriver and pull it out.	
	4. Disengage the 2 housing connectors.	
	5. Push the hook and pull the Ice-Maker out.	
	6. To disassemble, push the tab and pull the Case-Auger and the motor out.	

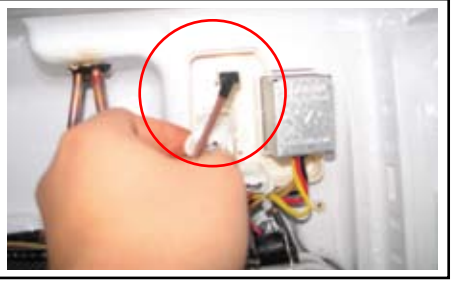
3-21) Freezer Light

Part Name	How To Do	Descriptive Picture
Freezer Light	1. Remove the cover Freezer lamp(②)like the way disassembling the Flex zone lamp.	
	2. Disengage the housing.	

3-22) Door Switch In Freezer

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

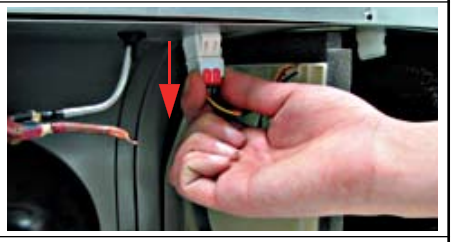
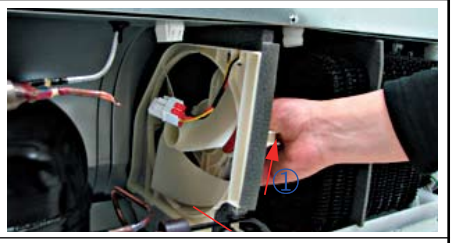
3-23) Evaporator Cover In Freezer

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

3-24) Evaporator In Freezer

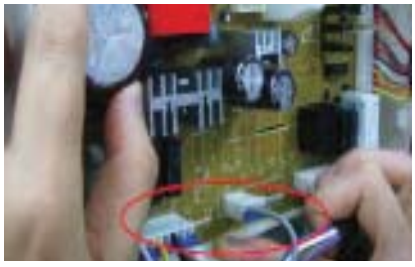
Part Name	How To Do	Descriptive Picture
Evaporator In Freezer	1. Remove the housing cover by pushing both lateral sides of housing cover part and pulling it out. Remove the housing connector part.	 
	2. Remove the evaporator by pulling the lower part of the evaporator while lifting it up.	

3-25) Machine Compartment

Part Name	How To Do	Descriptive Picture
Motor Fan	1. Unscrew 3 screws of cover compressor.	
	2. Disengage the housing connector. (Refer to the picture)	
	3. Remove the hooker of support circuit motor by lifting the hooker up and pulling it out.	
	4. Remove the screw with a flat-blade screwdriver. (Refer to the picture)	
	5. Remove the motor fan by pulling the fan out while graping the motor part. (Refer to the picture)	
	6. Unscrew 2 screws fixed in the motor.	
	7. Remove the hook of the motor cover with a flat-blade (-) screwdriver and then remove the motor.	

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)	

3-26) Electric Box

Part Name	How To Do	Descriptive Picture
PBA Main	1. Remove the ground screw 8 attached to the upper left and right door hinges with a phillps screwdriver(+)	
	2. Disengage all housing connectors from the main PCB.	
	3. Remove the main PCB by pushing the lower part of the hook down.	
	4. Unscrew 2 PCB fixing screws.	
	5. Remove the main PCB by lifting the upper part of the hook up. (Refer to the picture)	
PBA SMPS	1. Remove the SMCS PCB by lifting the upper part of the hook up.	

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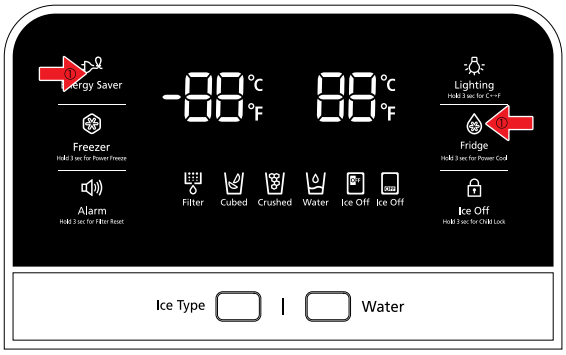
TROUBLESHOOTING

4-1) Function for failure diagnosis

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

- If Energy Saver Key + Fridge 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 operation(Freezer compartment 1) → manual operation(Freezer compartment 2) → manual operation(Freezer compartment 3) → manual defrost of fresh food 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.
- If the test mode is canceled, Recommend the power off and reactivate the refrigerator.

1) Manual operation function



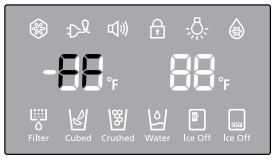
① If Energy Saver Key + Fridge Key are pressed simultaneously for 8 seconds, (displays are all off)
It will be changed to the test mode (manual operation) by pressing any key

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

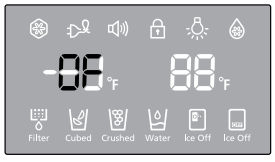
1-2) If any key is pressed once at the manual operation1 status, FF-2 will be displayed.
And if any key is pressed one more time, FF-3 will be displayed. FF-2 and FF-3 means manual operation2 and 3 separately. These 3 functions operate with different RPM of COMP.

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 : 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.

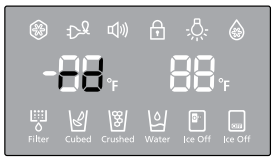
1-5) When the manual operation runs, setting temperature will be selected automatically as below: freezer compartment -8℉.(-22℃), fresh food compartment 32℉(1℃).

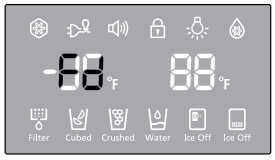
1-6) During manual operation, Power Freeze & Power Cool function will not be worked.
If a function is selected, the power function icon of the selected function will be off automatically after 10 seconds.

1-7) Manual operation can be canceled by turning on the appliance after power off(reset) or choosing the step 3) test cancel mode.

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) Simultaneous manual defrost(fresh food and freezer compartments) function





2-1) If any key is pressed one more time during manual operation(fresh food compartment), "Fd" shows in the display and then manual operation will be canceled at once and fresh food and freezer compartment will be defrosted.

2-2) At this moment, alarm beeps for 3 seconds (0.1 sec ON/ 1 sec OFF) during manual defrost function of fresh food and freezer compartment.

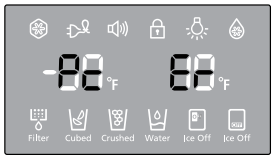
3) Test cancel mode

3-1) During the simultaneous defrosting of fresh food and freezer compartments simultaneously, 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 at the same time and will return to the normal operation. Or, all test functions will be canceled by turning main power OFF and ON.

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 - E” display on the Pantry Room Display will be ON/OFF alternately until the communication error is canceled. (0.5 sec ALL ON, 1.5 sec ALL OFF alternately)

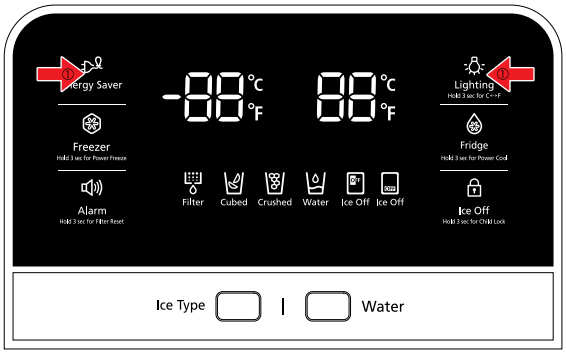
2) Display function when Panel → MAIN MICOM OPTION has error

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

4-1-3. Self-diagnostic function

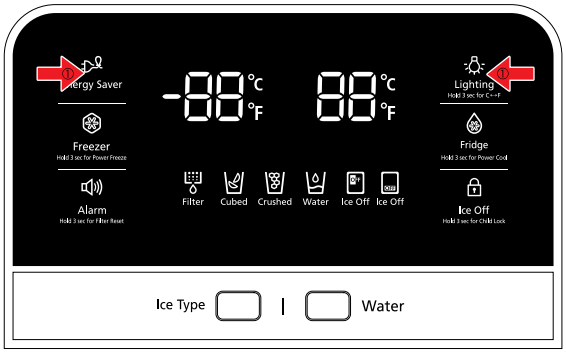
1) Self-diagnostic function in the Initial power ON

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 (Energy Saver Key + Lighting Key) are pressed simultaneously for 8 seconds.
(Return to normal display mode)



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

2) Self-diagnostic function during normal operation



② If Energy Saver Key + Lighting Key are pressed simultaneously for 8 seconds, the error mode by self-diagnosis will be canceled.

2-1) If Energy Saver Key + Lighting 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 Energy Saver Key + Lighting 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

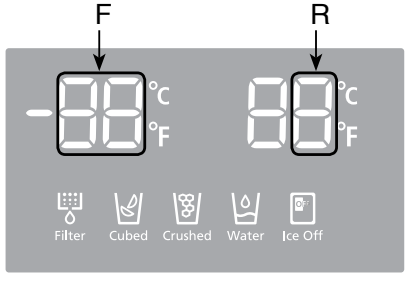
※ R Self-diagnostics check list

LED		Item	Trouble contents	Diagnostic method
F	R			
		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℉(+65℃) or less than -58℉(-50℃)	The voltage of MAIN PCB CN30- “3”↔ N76-”1”: shall be between 4.5V~1.0V
		FF-Sensor Error		The voltage of MAIN PCB CN30- “6”↔ N76-”1”: shall be between 4.5V~1.0V
		FZ-DEF-Sensor Error		The voltage of MAIN PCB CN30- “5”↔ N76-”1”: shall be between 4.5V~1.0V
		FF-DEF-Sensor Error		The voltage of MAIN PCB CN30- “8”↔ N76-”1”: shall be between 4.5V~1.0V
		Ambient-Sensor Error		The voltage of MAIN PCB CN78- “8”↔ CN78-”12”: shall be between 4.5V~1.0V
		PANTRY-Sensor Error		The voltage of MAIN PCB CN78- “9”↔ CN76-”1”: shall be between 4.5V~1.0V
		Humidity-Sensor Error	Separation of sensor housing part, contact error, disconnection, short circuit	The voltage of MAIN PCB CN30- “1”↔ CN30-”7”: shall be between 4.5V~1.0V
		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℉(+65℃) or less than -58℉(-50℃)	The voltage of MAIN PCB CN90- “1”↔ CN90-”7”: shall be between 4.5V~1.0V
		Ice Room Sensor Error		The voltage of MAIN PCB CN78- “10” ↔ CN78 -”1”: shall be between 4.5V~1.0V
		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
		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
		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
		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 ↔ CN70 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)

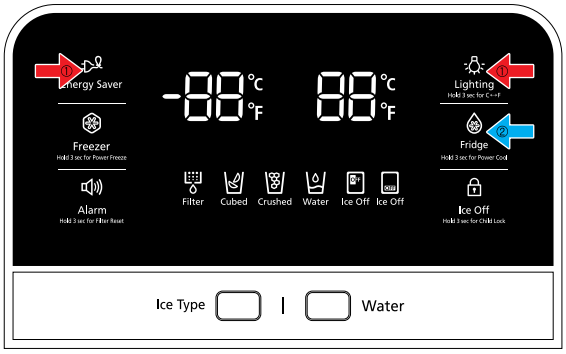
TROUBLESHOOTING

※ R Self-diagnostics check list

LED		Item	Trouble contents	Diagnostic method
F	R			
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)
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.	The voltage of MAIN PCB CN76-"2"(Black) ↔ CN76-"1" (Gray): shall be between 7V~12V
41	bE	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.
81		Comp starting Failure	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	When there is a IPM Fault error	
83		Comp Abnormal current Detection	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	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	When there is a low voltage error	Check the voltage of Resistance of R513 [Short/Open]
86		Comp over voltage	When there is a over voltage error	Check the voltage of Resistance of R501, R505, R509 [Short/Open]

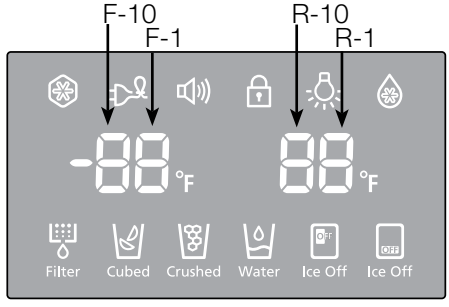


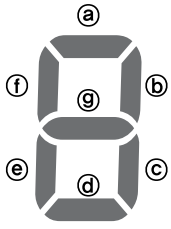
4-1-4. Display function of Load condition



① If Energy Saver Key + Lighting 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 Fridge, load condition mode will be started.

1) If Power Energy Saver Key + Lighting 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 Fridge Key after Energy Saver Key + Lighting 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.

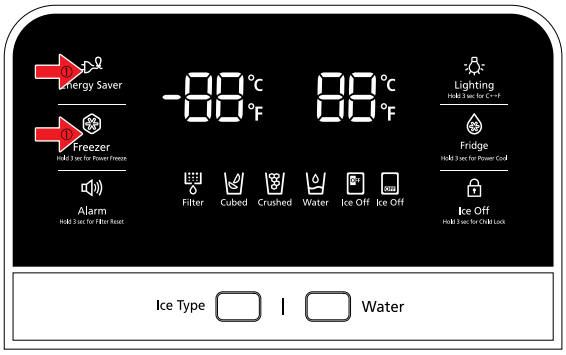




※ R Load mode Check list

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
F-1-ⓔ,ⓕ ALL LED Off	Normal Condition	When ambient temperature is between 73°F(23°C) and 91°F(33°C)
R1-ⓖ	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-10-ⓔ	C-FAN High	When compressor FAN operates with high speed, applicable LED ON.
F-10-ⓕ	C-FAN Low	When compressor FAN operates with low speed, applicable LED ON.
F-10-ⓓ	Ice Room-FAN High	When Ice Room-FAN operates with high speed, applicable LED ON.
F-10-ⓔ	Ice Room-FAN Low	When Ice Room-FAN operates with low speed, applicable LED ON.
F-10-ⓖ	French Heater	When French heater operates, applicable LED ON
R-10-ⓐ	Pantry Room Damper Open	When damper open, applicable LED ON
R-10-ⓓ	Ice maker full	When the Ice Maker's Bucket is full, applicable LED ON in Fre-room
R-10-ⓔ	More Heater	Add to Assy Water Pipe Heater in Fre-room
R-10-ⓕ	Ice maker full	When the Ice Maker's Bucket is full, applicable LED ON in Ref-room

4-1-5. Exhibition mode setting function



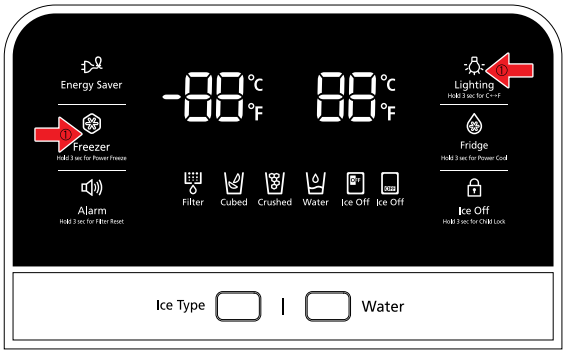
① If Energy Saver Key + Freezer Key are pressed for 5 seconds, Exhibition mode will be started.

1) If Energy Saver Key + Freezer are pressed simultaneously for 5 seconds during normal operation, Exhibition mode will be started with buzzer sound(ding-dong).
2) If above Energy Saver Key + Freezer Key are pressed one more time, Exhibitoin mode will be canceled.
3) If Exhibition mode is selected, blinks "OF-OF" on the temperature setting display of . The panel and it indicates the refrigerator has entered the Cooling Off mode.
4) During Exhibition mode, if fresh food and freezer compartments sensors are higher than 149°F(65℃). Exhibition will be canceled automatically and freezing operation will be returned.
(There is no buzzer sound when the Exhibition mode is canceled by the temperature.)
5) Operation contents of Exhibition Mode
- Display, Fan motor and etc operate normally, not to operate compressor only.
- Defrost is not operated. (including french heater)
- Display function of the initial real temperature is finished.
- Under the condition of Exhibition mode, Exhibition mode will be operated when Power On after Power OFF.

4-1-6. Option setting function

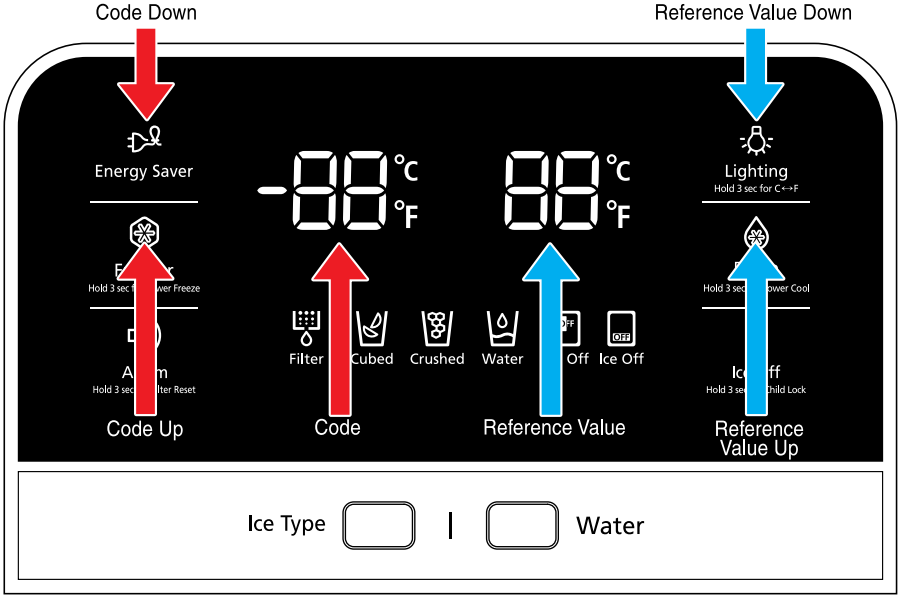
- If Freezer Key+ lighting Key are pressed simultaneously for 12 seconds during normal operation, fresh food and freezer compartments temperature display will be changed to option setting mode.

KEY operation method for changing to option mode



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

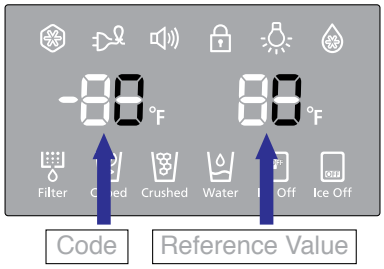
KEY control method after converting to option mode



※ R Key control in option mode

Energy Saver Key	Code Down key
Freezer Key	Code Up key
Lighting key	Reference Value down key
Fridge 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.)



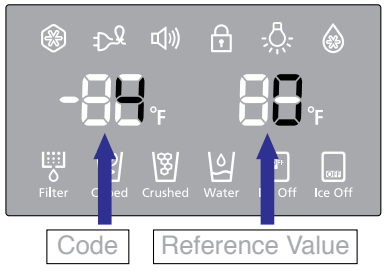
1) For example, if you want to change freezer compartment standard temperature to -4℉(-2°C) by operating option, do as below. This function is for changing the standard temperature.
In -2℉(-19°C) of current temperature of freezer compartment, if you make the temperature lower to -4℉(-2°C) by the option, 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

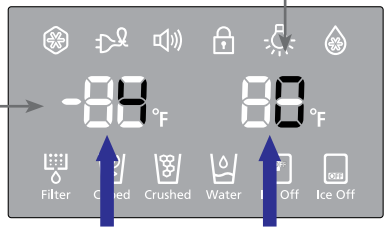
Option setting function exists in the other items.
We will skip the explanation of the other functions by the option because it is associated with refrigerator control function and is not needed at SERVICE.
(Please do not set the other options except above SERVICE Manual.)

4-1-7. Option TABLE

1) Temperature changing table of freezer compartment

Set item	Freezer Temp Shift
MODEL	RFG29*****
Reference	Fridge Room 7-SEG
Value	0

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



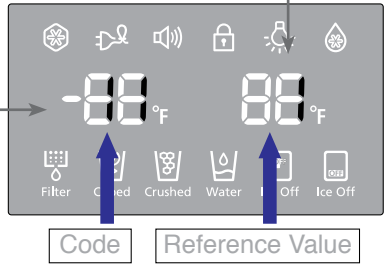
ex) If you want to change the freezer standard temperature to -4℉(-2°C)

2) Temperature changing table of fresh food compartment

Set item	Freezer Temp Shift
MODEL	RFG29*****
Reference	Fridge Room 7-SEG
Value	1

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

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

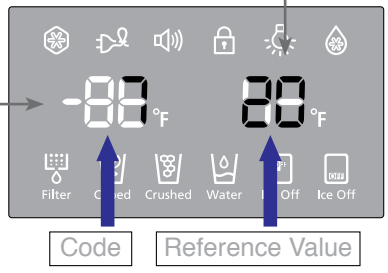


3) Temperature changing table of ICE ROOM compartment .

Set item	ICE ROOM Temp shift
MODEL	RFG29*****
Reference	Fridge Room 7-SEG
Value	20

Setting value	
FZ compartment Code	Temp. compensation
0	8.6℉(-13℃)
1	6.8℉(-14℃)
2	5℉(-15℃)
3	3.2℉(-16℃)
4	1.4℉(-17℃)
5	-0.4℉(-18℃)
6	-2.2℉(-19℃)
7	10.4℉(-12℃)

ex) If you want to change the freezer compartment standard temperature to 10.4℉(-12℃).



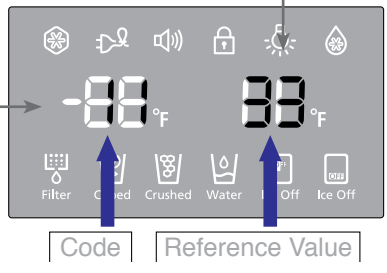
4) Temperature changing table of Pantry Room compartment

- Could change the temperature of Pantry Room in fresh food compartment.

Set item	PANTRY ROOM Temp shift
MODEL	RFG29*****
Reference	Fridge Room 7-SEG
Value	33

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

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



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

DATA1.Temperature table
Resistance value and MICOM port voltage of sensor according to the temperature
SENSOR CHIP : based on PX41C, PX41C, 502AT/ 103**(ICE MAKER SENSOR(MOLD)/FULL UP, 20Kohm
(Actual measurement = value of the table below X 2)

℃	℉	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

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

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				

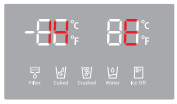
TROUBLESHOOTING

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

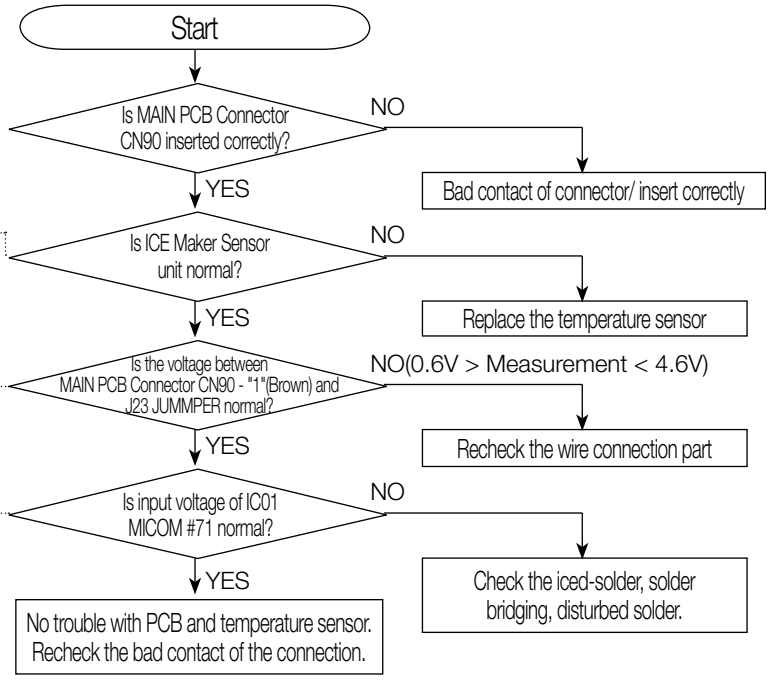
** Measuring point of resistance value according to Sensor **
ICE MAKER: CN90 "1"↔ "7" measuring resistance value ** 0Ω: Short trouble / Ω∞: Open trouble

Refer to circuit diagram in the manual

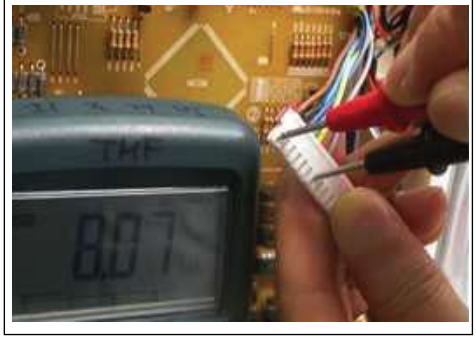
Sensor MICOM/Connector number	
ICE Maker	Connector CN90-"1"(Brown)and J23 JUMMPER PCB typical Ground

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

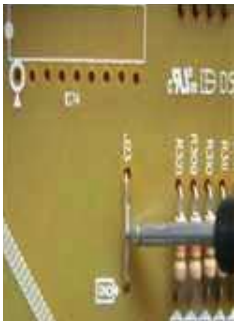


☞ Checking method of ICE Maker Sensor resistance
CN90 "1"(Brown) ↔ "7"(Gray)
- Compare the temperature table after the measure.



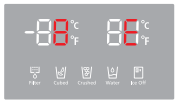
☞ Checking method of ICE Maker Sensor resistance
- Measure the voltage of Resistance R914(IC01 MICOM #71) on PCB or CN90 "1"(Brown) ↔ J23 JUMMPER
- Compare the temperature table after the measure.
  Measuring voltage of CN90-"1"(Brown) ↔ J23 JUMMPER are as below.

PCB Typical Ground
J23 JUMMPER



2) ICE Maker(FZ) Sensor has troubled(OPTION,RFG298/296)

ERROR Code



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

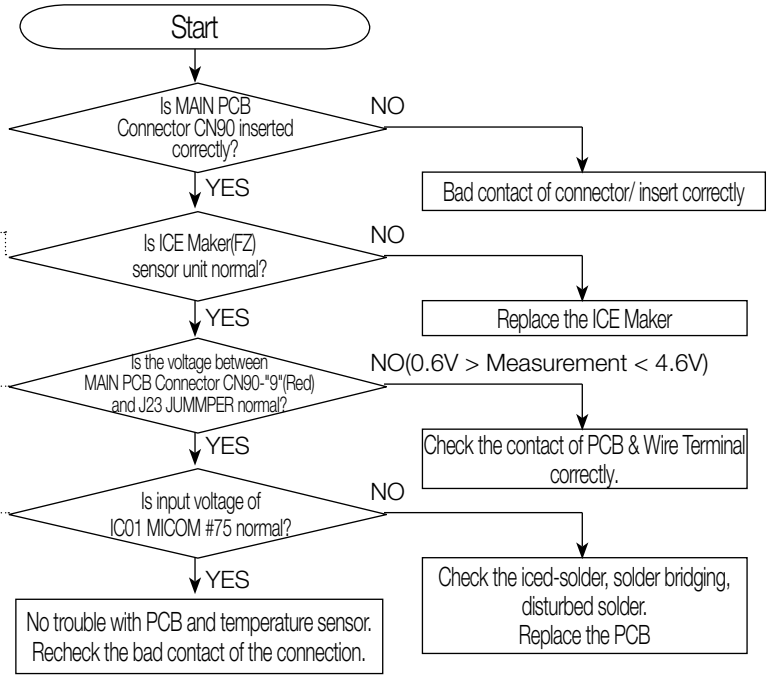
DATA1.
Temperature table

** 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.



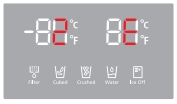
☞ Checking Method of ICE MAKER(R) Senser resistance CN90 "9"(Red) ↔ 8"(White)
- Compare the temperature table after the measure.

☞ 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 Sensor has trouble

ERROR Code



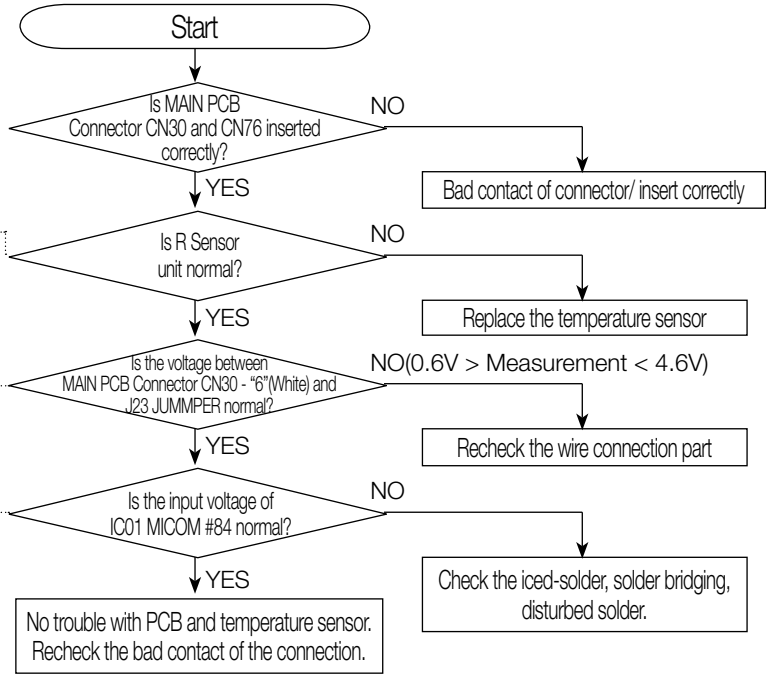
DATA1.
Temperature table

** 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

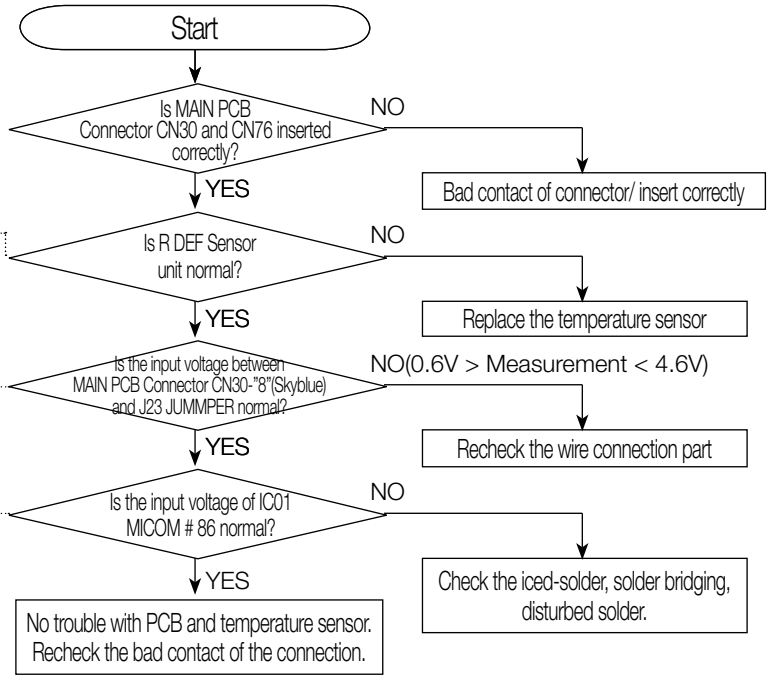
** Measuring point of resistance value according to Sensor **
R-DEF : CN30-"8" ↔ CN76-"1" measuring resistance value
** 0Ω : Short trouble Ω ∞ : Open trouble

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



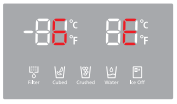
☞ Checking method of R Sensor resistance CN30-"8"(Sky-blue) ↔ CN76-"1"(Gray)
- Compare the temperature table after measurement.

☞ 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

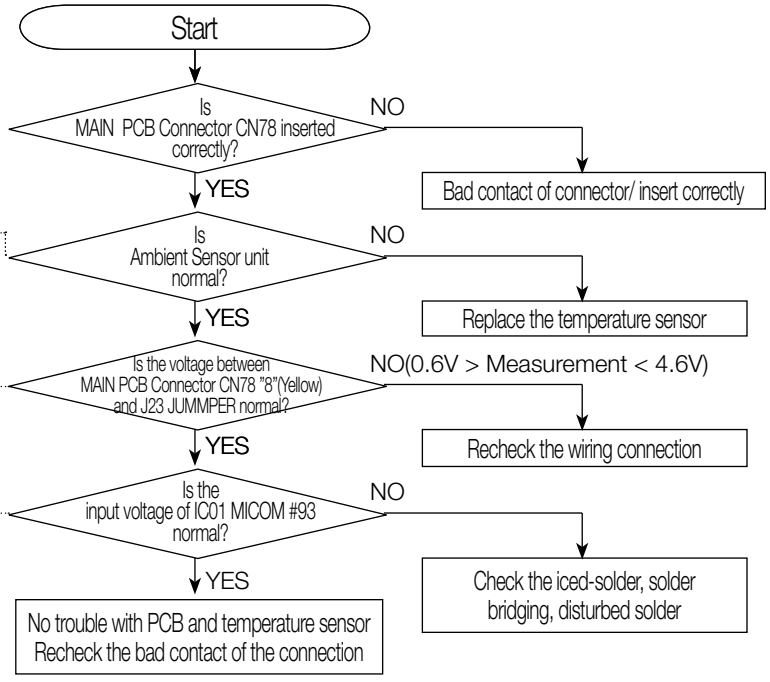
** Measuring point of resistance value according to Sensor **
Ambient : CN78-"8"↔ "12" measuring resistance value
** Placed in the right top table of upper hinge.
** 0Ω : Short trouble / Ω ∞: Open trouble

Refer to circuit diagram in the manual

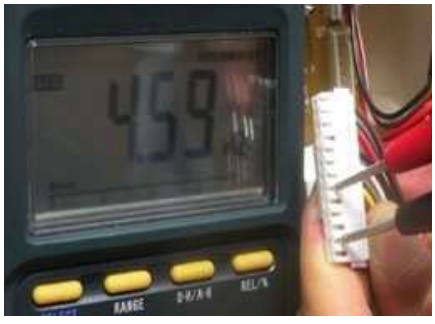
Sensor MICOM/Connector number	
Ambient	Connector CN78-"8"(Yellow) to J23 JUMMPER PCB typical Ground

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

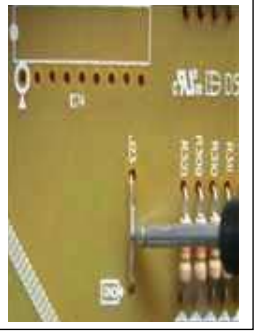


☞ Checking method of Ambient Sensor resistance
CN78-"8"(Yellow) ↔ "12"(Yellow)
- Compare the temperature table after measurement.



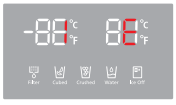
☞ Checking method of Ambient Sensor voltage
- Measure the voltage of Resistance R315(IC01 MICOM #93) on PCB or CN78-"8"(Yellow) ↔ J23 JUMMPER
- Compare the temperature table after measurement.
Measuring voltage of CN78-"8"(Yellow) ↔ J23 JUMMPER are as below

PCB Typical Ground
J23 JUMMPER



6) If F Sensor has trouble

ERROR Code



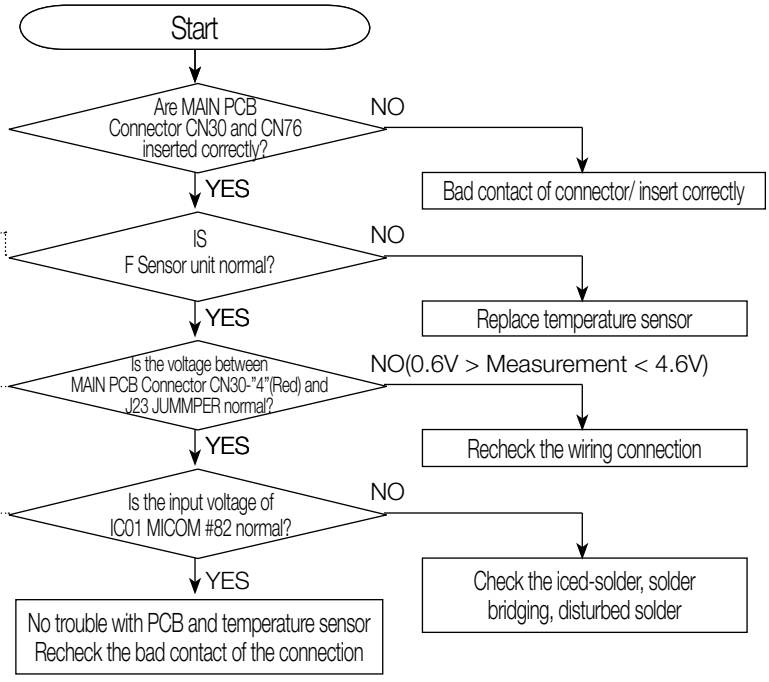
DATA1.
Temperature table

** 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.	

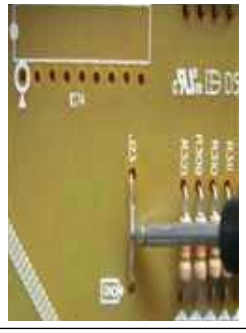
Measuring voltage of IC01 MICOM #82, CN30-"4"(Red) and J23 JUMMPER from PCB typical Ground part are similar.
→ Check the measure on the voltage of Resistance, R309 due to the SMD MICOM



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

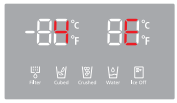
☞ Checking method of F Sensor voltage
- Measure the voltage of Resistanec, R309(IC01 MICOM #82) on PCB or CN30-"4"(Red) ↔J23 JUMMPER
- Compare the temperature table after measurement.
Measuring voltage of CN30-"4"(Red)↔J23 JUMMPER are as below.

PCB Typical Ground
J23 JUMMPER



7) If F DEF Sensor has trouble

ERROR Code



DATA1.
Temperature table

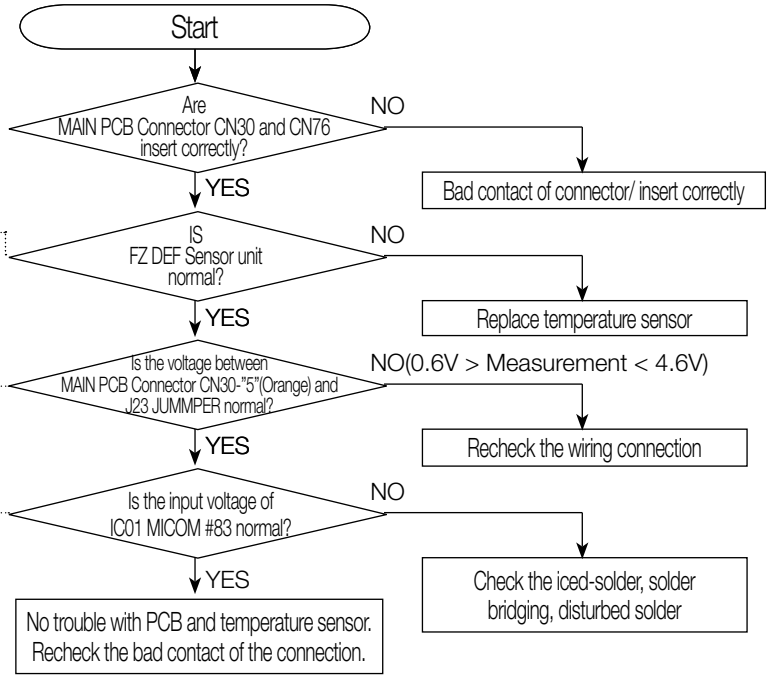
** Measuring point of resistance value according to Sensor **
F-DEF : CCN30-"5" ↔ CN76-"1" measuring resistance value
** 0Ω : Short trouble / Ω∞ : Open trouble

Refer to circuit diagram in the manual

Sensor MICOM/Connector number	
F DEF	Connector CN30-"5"(Orange) to J23 JUMMPER PCB typical Ground

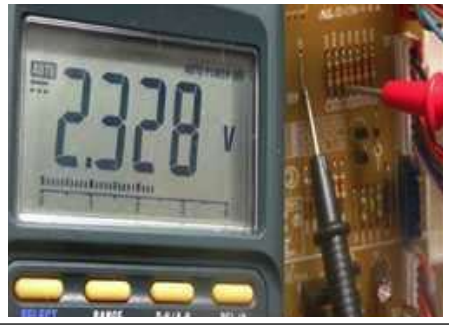
Voltage measured between 4.6V ~ 0.6V.

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

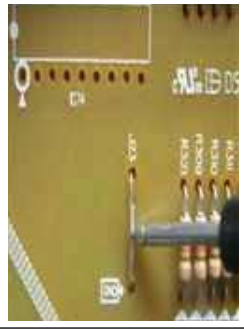


☞ Checking method of F DEF Sensor resistance
CN30-"5"(Orange) ↔ CN76-"1"(Gray)
- Compare the temperature table after measurement.

☞ 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

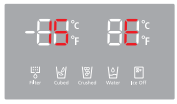


PCB Typical Ground
J23 JUMMPER



8) If Ice Room Sensor has trouble

ERROR Code



DATA1.
Temperature table

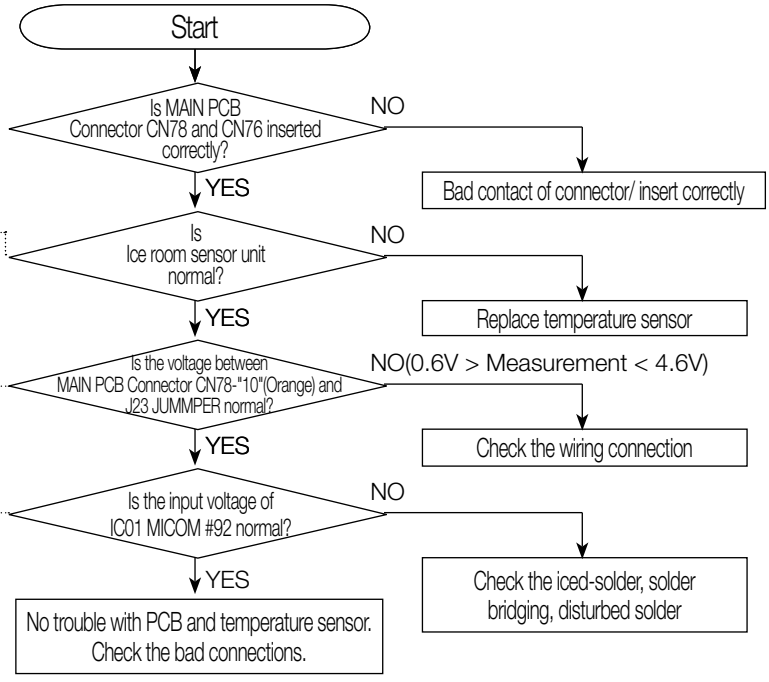
** Measuring point of resistance value according to Sensor **
Ambient : CN78 "10"↔ CN76-"1" Measure the voltage of Resistance value
** 0Ω : Short trouble / Ω ∞: Open trouble

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.

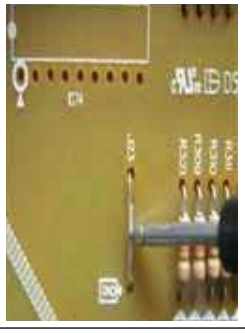
Measuring voltage of IC01 MICOM #92, CN78-"10"(Orange) and J23 JUMMPER from PCB Typical Ground are similar.
→ Check the measure on the voltage of Resistance, R316 due to the SMD MICOM



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

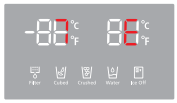
☞Checking Method of Ice Room Sensor Voltage
- Measure the voltage of Resistance, R316(IC01 MICOM #92) on PCB or CN78-"10"(Orange) ↔J23 JUMMPER
- Compare with the temperature table after measurement.
Measured voltage of CN78-"10"(Orange) ↔ J23 JUMMPER are as below

PCB Typical Ground
J23 JUMMPER



9) If PANTRY Sensor has trouble

ERROR Code



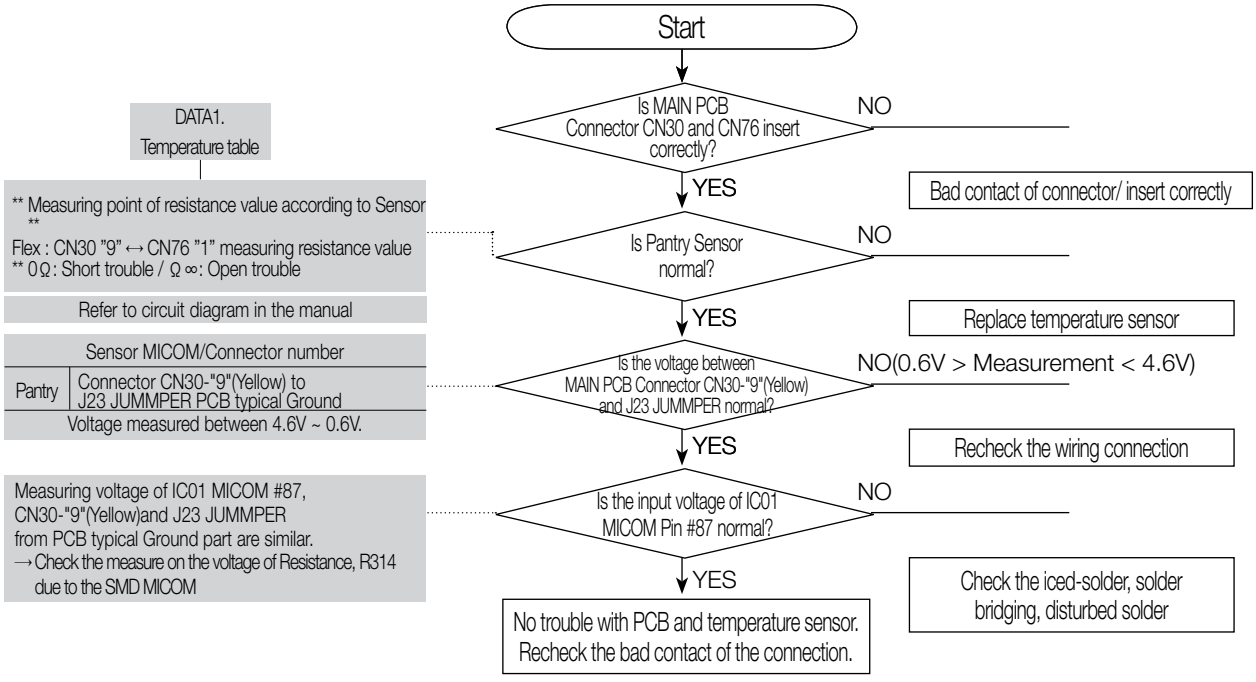
DATA1.
Temperature table

** 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.	

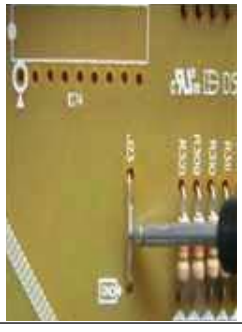
Measuring voltage of IC01 MICOM #87,
CN30-"9"(Yellow)and J23 JUMMPER
from PCB typical Ground part are similar.
→ Check the measure on the voltage of Resistance, R314 due to the SMD MICOM



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

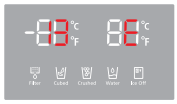
☞ Checking method of PANTRY Sensor resistance CN30-"9"(Yellow) ↔ CN76-"1" (Gray)
- Compare the temperature table after measurement.
Measuring voltage of CN30-"9"(Yellow)↔J23 JUMMPER are as below

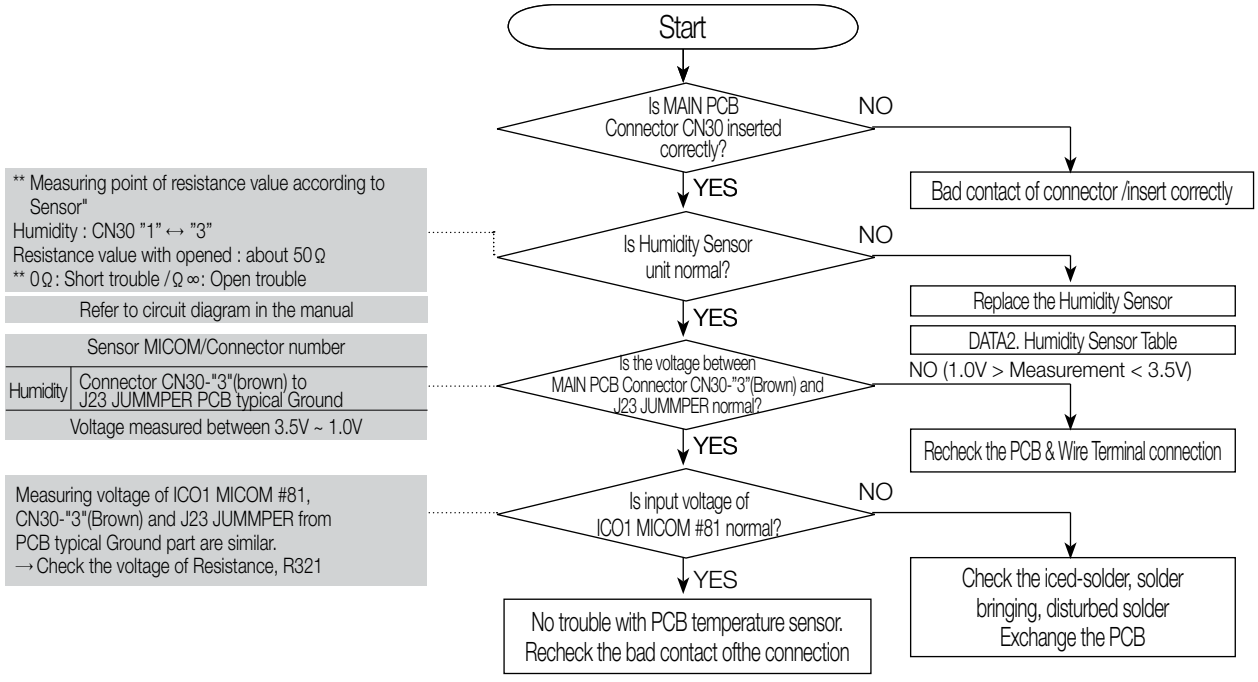
PCB Typical Ground
J23 JUMMPER



10) If Humidity Sensor has trouble

ERROR Code

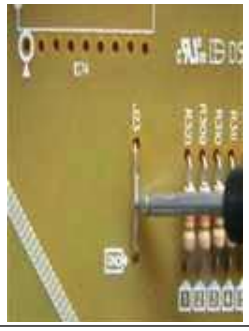




☞ Checking method ofHumidity Sensor resistance
CN30-"3"(Brown) ↔ "1"(Gray)
- Compare the temperature table after the measure.

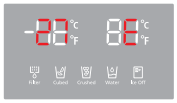
☞ Checking method ofHumidity Sensor voltage.
- Measure the voltage of Resistance, R321(IC01 MICOM #81) on PCB or CN30-"3"(Brown) ↔ J23 JUMMPER
- Compare the temperature table after the measure.
Measuring voltage of CN30-"3"(Brown) ↔ J23 JUMMPER are below

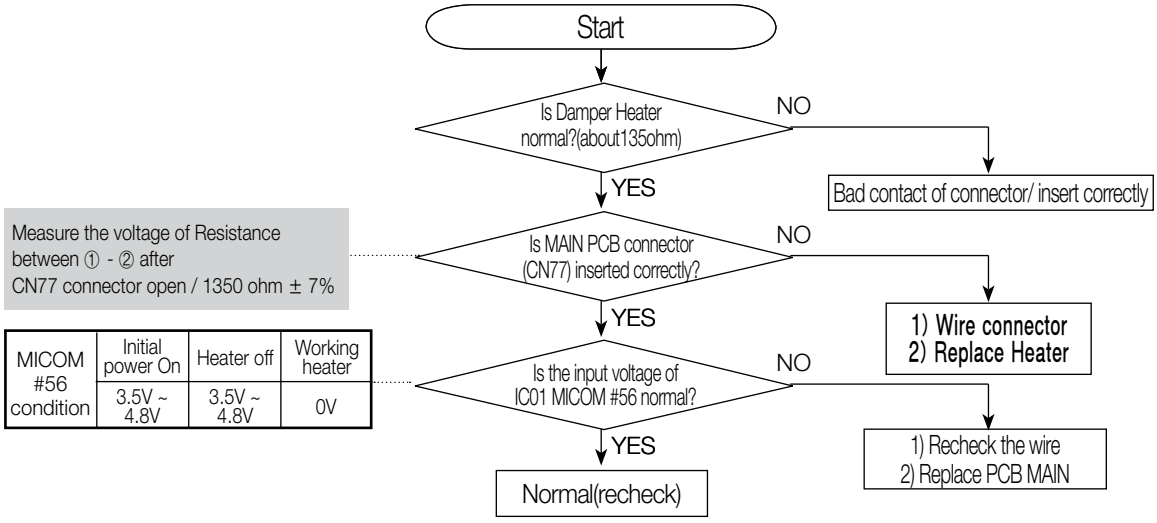
PCB Typical Ground
J23 JUMMPER



11) PANTRY Room Damper Heater has trouble(OPTION)

ERROR Code

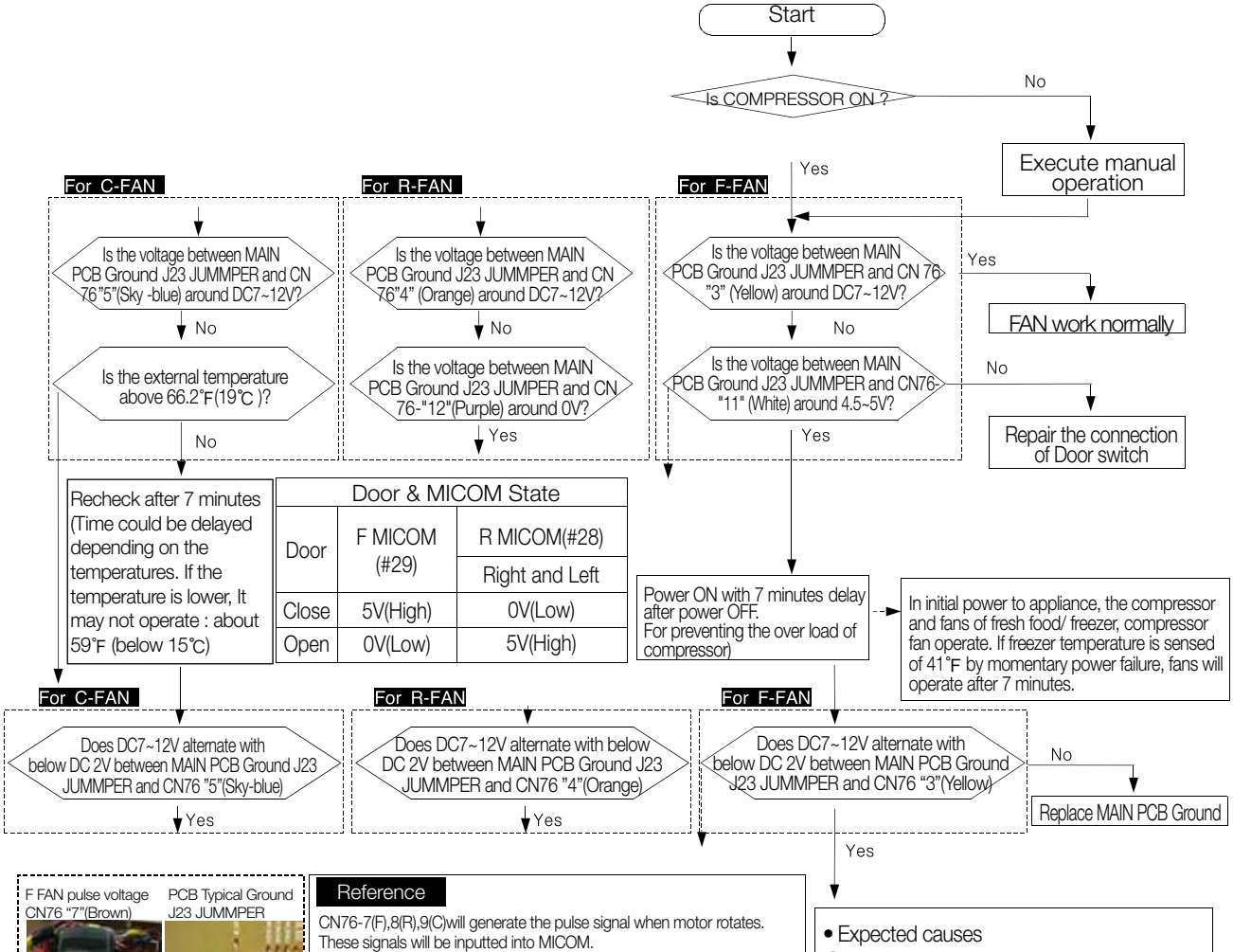




☞ Checking method of Flex Zone Room Damper resistance CN77-"1"(Black) ↔ "2"(Brown)
** Ω ∞: Open (wire disconnection, heater disconnection) trouble / 0Ω: Short trouble

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

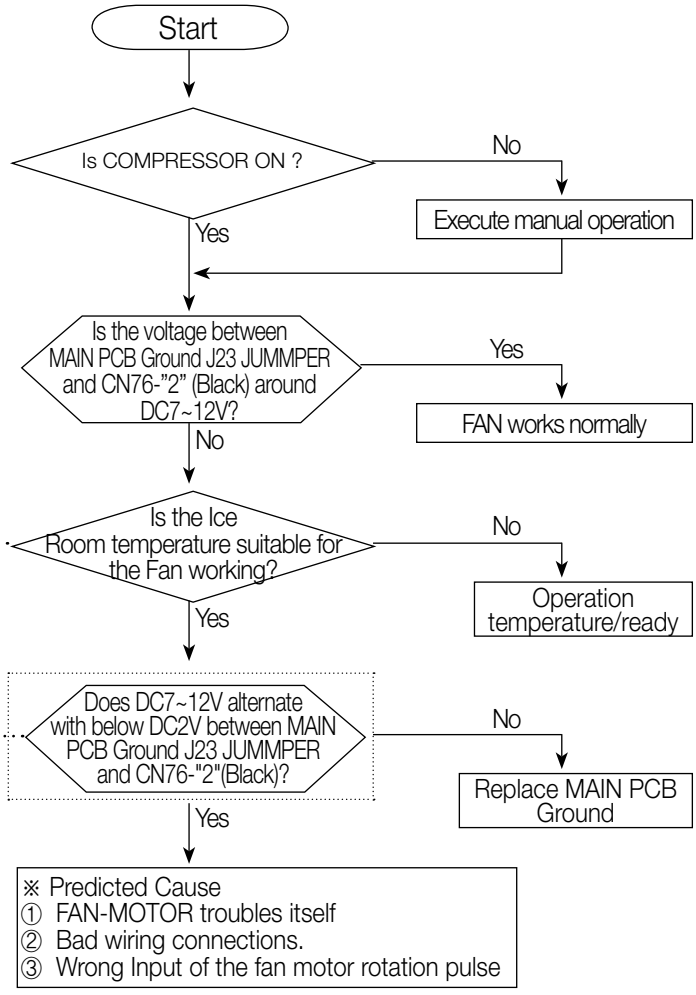
3) C-FAN

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

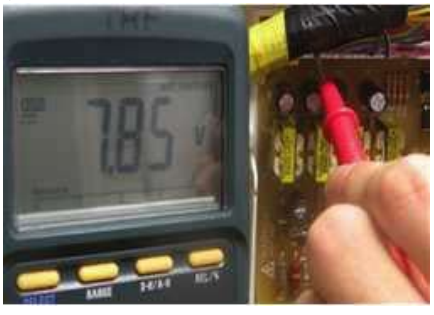
The voltage is variable due to pulse signal but measured about 2~3V with the Multi-Meter.

☞ 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



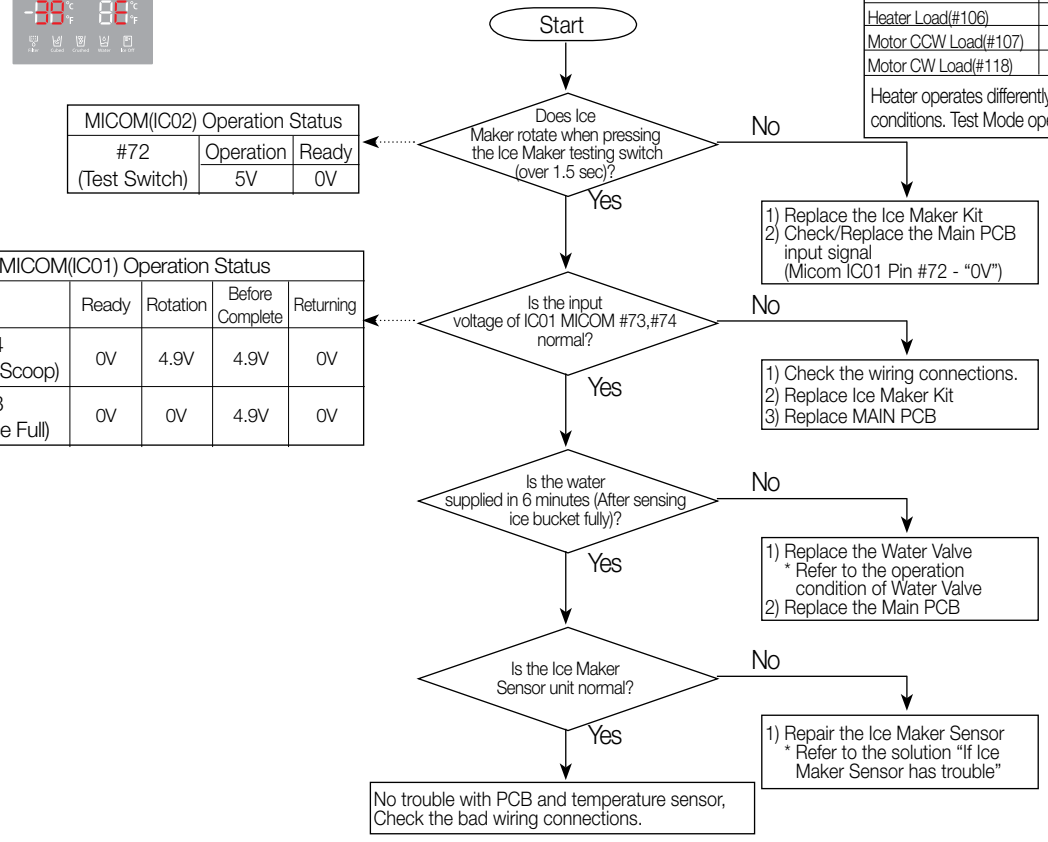
PCB Typical Ground J23 JUMMPER

4-2-4. If Ice Maker(R) does not operate

1. Water is automatically supplied to the Ice Maker depending on temperature & time condition and Ice Maker Dispenses cubed or crushed ice.
2. Power is applied to the one end of wires. Be careful when disassembling and shall refer to its exploded diagram in any case.
3. Ice Maker operation shall be checked after pressing the Ice Maker testing switch. (Fridge Ice Maker) It is not possible to check when the power is disengaged.
4. We recommend that TWO PEOPLE check the PCB and Ice Maker because they are located at front and rear side each.
5. Be careful! The Ice Maker Heater can cause personal injury like burn.

Displays ERROR Code

Operating Condition when motor rotates Operating Status of Micom(IC01)		
	Ready	Operation
Heater Load(#106)	0V	5V
Motor CCW Load(#107)	0V	5V
Motor CW Load(#118)	0V	5V
Heater operates differently according to the conditions. Test Mode operation will be 30 sec.		



MICOM(IC02) Operation Status		
#72 (Test Switch)	Operation	Ready
	5V	0V

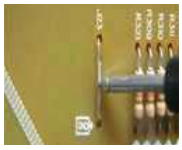
MICOM(IC01) Operation Status				
	Ready	Rotation	Before Complete	Returning
#74 (Blade Ice Scoop)	0V	4.9V	4.9V	0V
#73 (Guide Ice Full)	0V	0V	4.9V	0V

☞ Checking Method of ICE Maker Voltage
With PCB Typical Ground J23 JUMMPER and
1) Test Switch operation (press selected) : CN90-"2"(Black) shall be DC 0V.
Test Switch ready ; CN90-"2"(Black) shall be less than DC 5V.

1)Test Switch operating

1)Test Switch ready

PCB Typical Ground J23 JUMMPER



☞ Checking Method of ICE Maker Voltage
With PCB Typical Ground J23 JUMMPER and
2) IC02 MICOM #74 voltage ; Ready(0V) → Rotate (4.9V) → Before complete(4.9V) → Return(0V)
* MICOM #74 voltage is same as Connector CN90-"4"(Sky Bule)
3) IC02 MICOM #73 voltage ; Ready(0V) → Rotate (0V) → Before complete(4.9V) → Return(0V)
* MICOM #73 voltage is same as Connector CN90-"3"(Blue)

☞ Check the ICE Maker Heater & Motor Resistance

1) Measuring the Ice Maker Heater resistance values
CN70-1-"3"(Black) ⟷ CN70-"7"(Gray)

Resistance value : 91(365)Ohm±30%

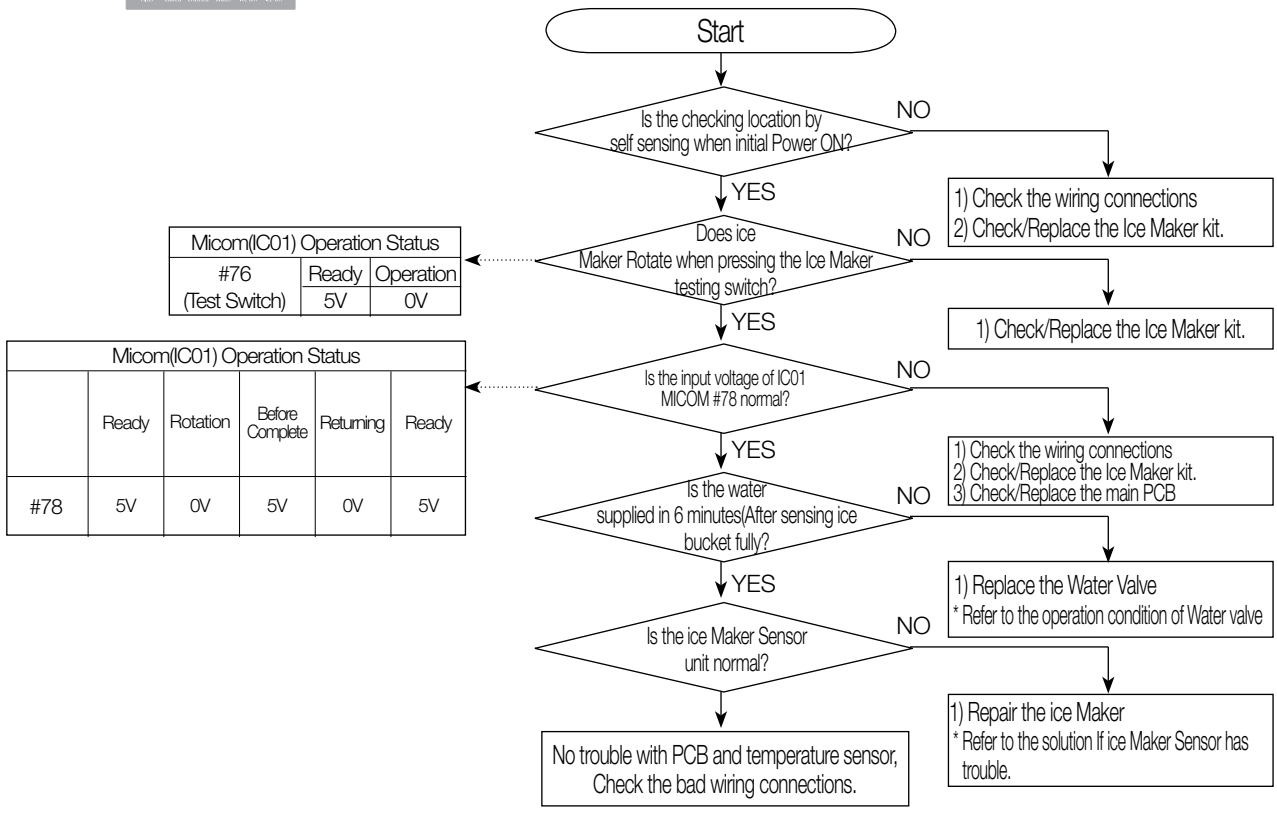
2) Measuring the Ice Maker Motor resistance values
CW : CN73_1-"5"(Brown) ⟷ CN70-"5"(Red)
CCW : CN73_1-"7"(White) ⟷ CN70-"5"(Red)

Resistance value : 5.2KOhm±30%

4-2-5. ICE MAKER(FZ) does not operate (OPTION,RFG298/296)

1. Water is automatically supplied to the Ice Maker depending on temperature & time condition and Ice Maker Dispenses cubed or crushed ice.
2. Power is applied to the one end of wires. Be careful when disassembling and shall refer to its exploded diagram in any case.
3. Ice Maker operation shall be checked after pressing the Ice Maker testing switch. (Freezer Ice Maker) It is not possible to check when the power is disengaged.
4. We recommend that TWO PEOPLE check the PCB and Ice Maker because they are located at front and rear side each.

ERROR Code



Micom(IC01) Operation Status		
#76 (Test Switch)	Ready	Operation
	5V	0V

Micom(IC01) Operation Status					
	Ready	Rotation	Before Complete	Returning	Ready
#78	5V	0V	5V	0V	5V

☞ Checking Method of ICE Maker Voltage With PCB Typical Ground J23 JUMMPER
1) Test Switch operation(press selected) ; CN90-"10"(Orange) shall be DC 0V.
Test Switch ready ; CN90-"10"(Orange) Shall be less than DC 5V.

1) Test Switch operating

1) Test Switch ready

typical PCB Ground J23 JUMMPER

☞ Checking Method of ICE Maker Voltage With PCB Typical Ground J23 JUMMPER
2) IC01 MICOM #78 voltage ; Ready(0V) → Rotate(0V) → Before complete(5V) → Return(0V) → Ready(5V)
* MICOM #78 voltage is same as Connector CN90-"12"(Purple)

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

R DEF ERROR

F DEF ERROR

Start

Are the all deforst heater normal?

No → Check the bimetal, heater disconnection, wiring connection etc.

Yes

Is defrost sensor by self-diagnostic normal?

Reference to the manual "Self-Diagnostic"

No → Refer to self-diagnostic function in the manual

Replace the applicable sensor

Yes

Is the temperature of defrost sensor lower than 53.6℉(12℃)?

**Measuring point of resistance value according to sensor **
F-DEF : CCN30-"5" ↔ CN76-"1" measuring resistance value
R-DEF : CN30-"8" ↔ CN76-"1" measuring resistance value
** 0Ω : Short trouble / Ω ∞ : Open trouble

No → manual operation for a certain time

Yes

Manual defrosting of fresh food and freezer compartments operate simultaneously.

If Energy Saver + Fridge Key are pressed simultaneously for 8 seconds and then select any key, 3rd test mode(manual defrosting) will be operated.

Measuring point of resistance value according to heater
F-DEF : CN70 "3"(Brown) ↔ CN70 "7" (Gray) measuring resistance value(63 ohm ± 7%)
R-DEF : CN70 "1"(White) ↔ CN70 "7"(Gray) measuring resistance value(120 ohm ± 7%)
** 0Ω : Short trouble / Ω ∞ : Open(bimetal, heater) trouble

Resistance value of sensor according to temperature

86℉(30℃)	4.22kΩ
68℉(20℃)	6.05kΩ
50℉(10℃)	8.87kΩ
32℉(0℃)	13.29kΩ
14℉-10℃)	20.42kΩ
-4℉-20℃)	32.23kΩ
-22℉(-30℃)	52.41kΩ

If you need the temperature with detail, refer to DATA1. temperature table

Is power applied to each defrost heaters?

No

Yes

Does the system return to cooling operation after heating for specified time?

No → Recheck the applicable sensor.

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

Yes → Normal

Is connection terminal of MAIN PCB part normal?

No → Repair connection terminal

Yes

Check bimetal, heater itself, disconnection etc.

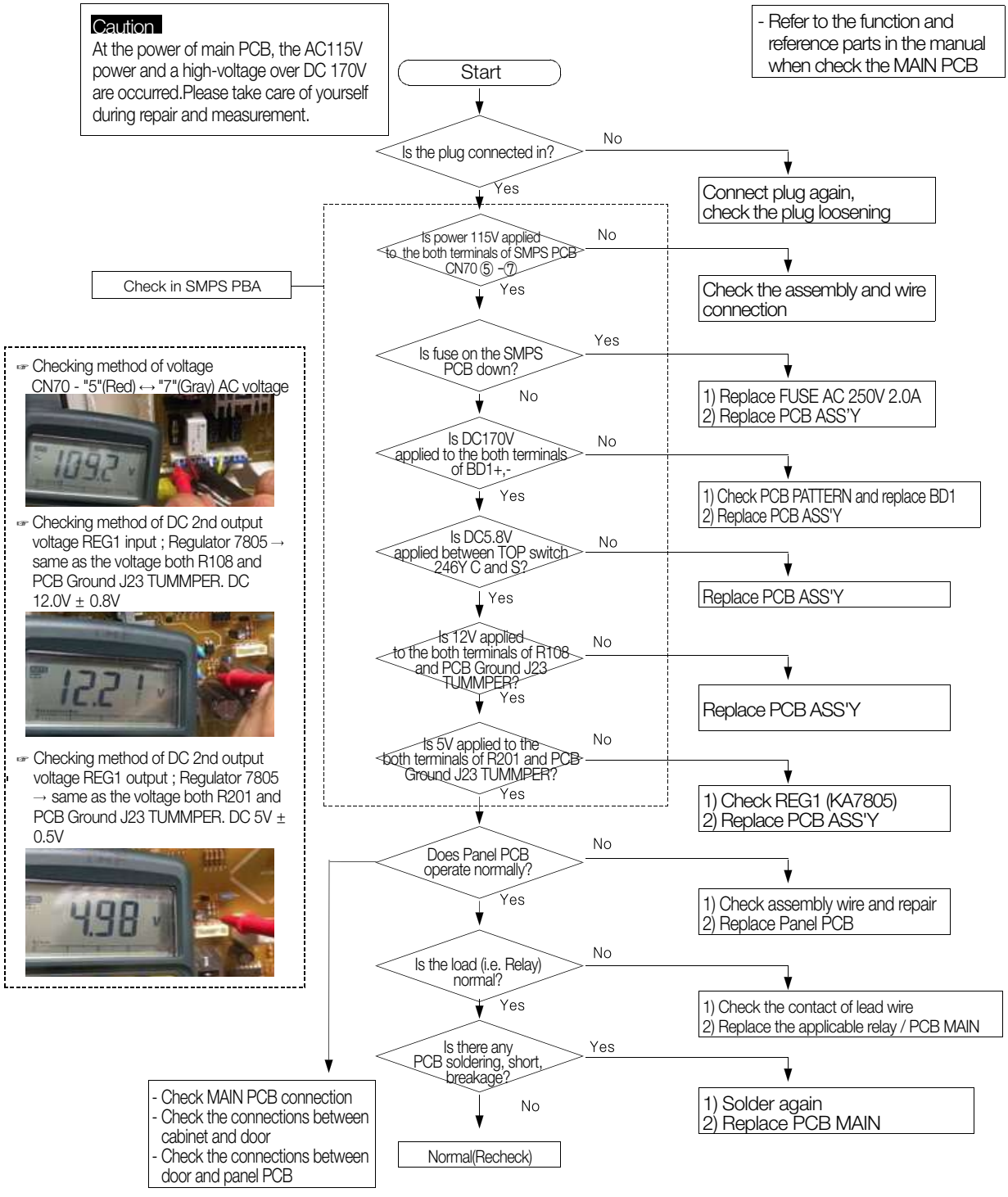
Replace failure Relay or replace PCB ASS'Y

☞ Checking method of F,R DEF Heater resistance value
CN70-"3"(Brown) ↔ CN70 "7"(Gray)
CN70-"1"(White) ↔ CN70 "7"(Gray)
- Recheck if resistance values are different after the test

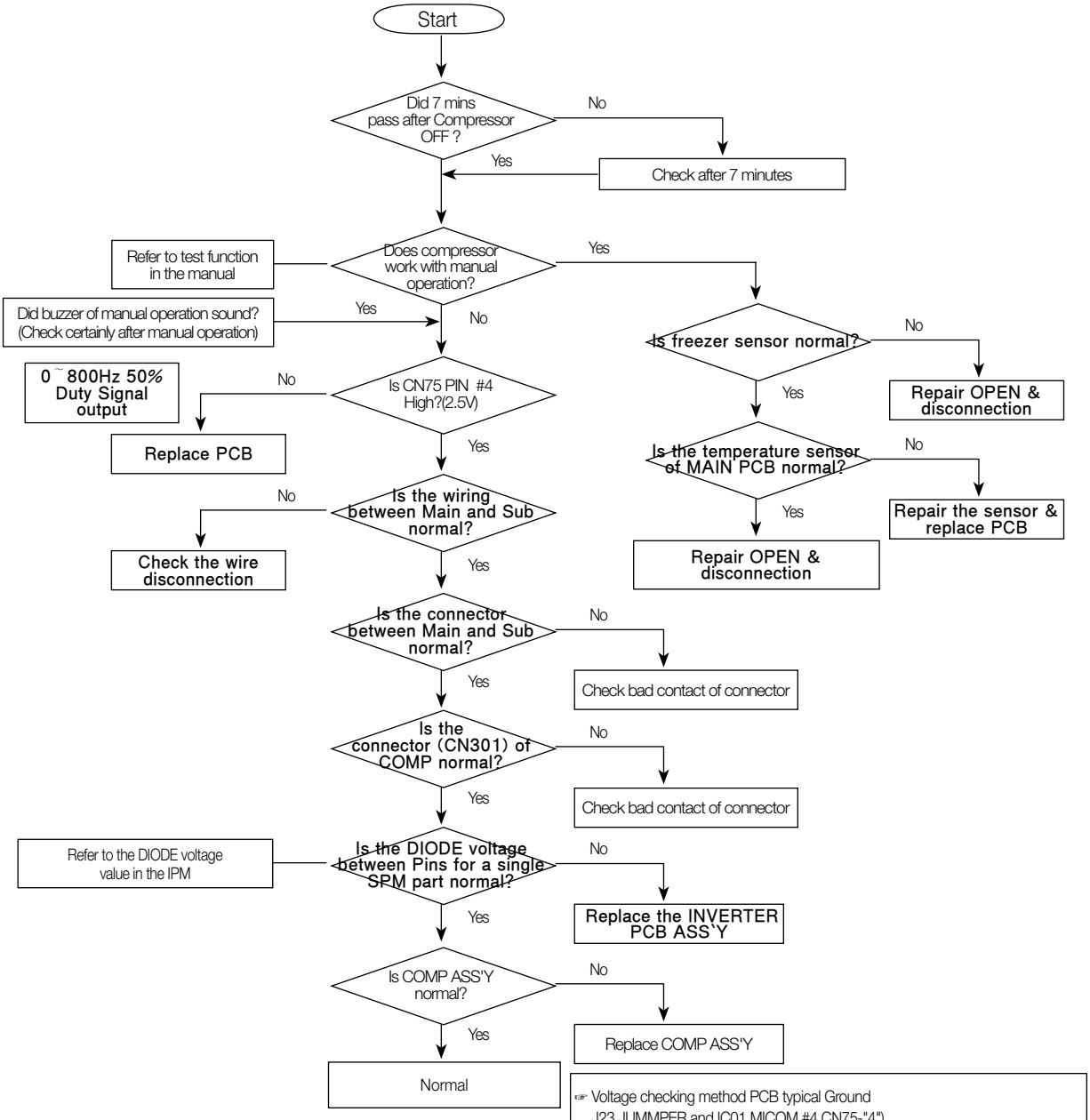
1) F DEF Heater

2) R DEF Heater

4-2-7. If Power is not supplied

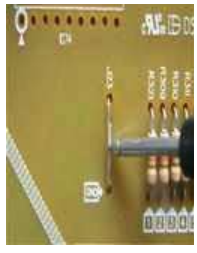


4-2-8. If compressor does not operate



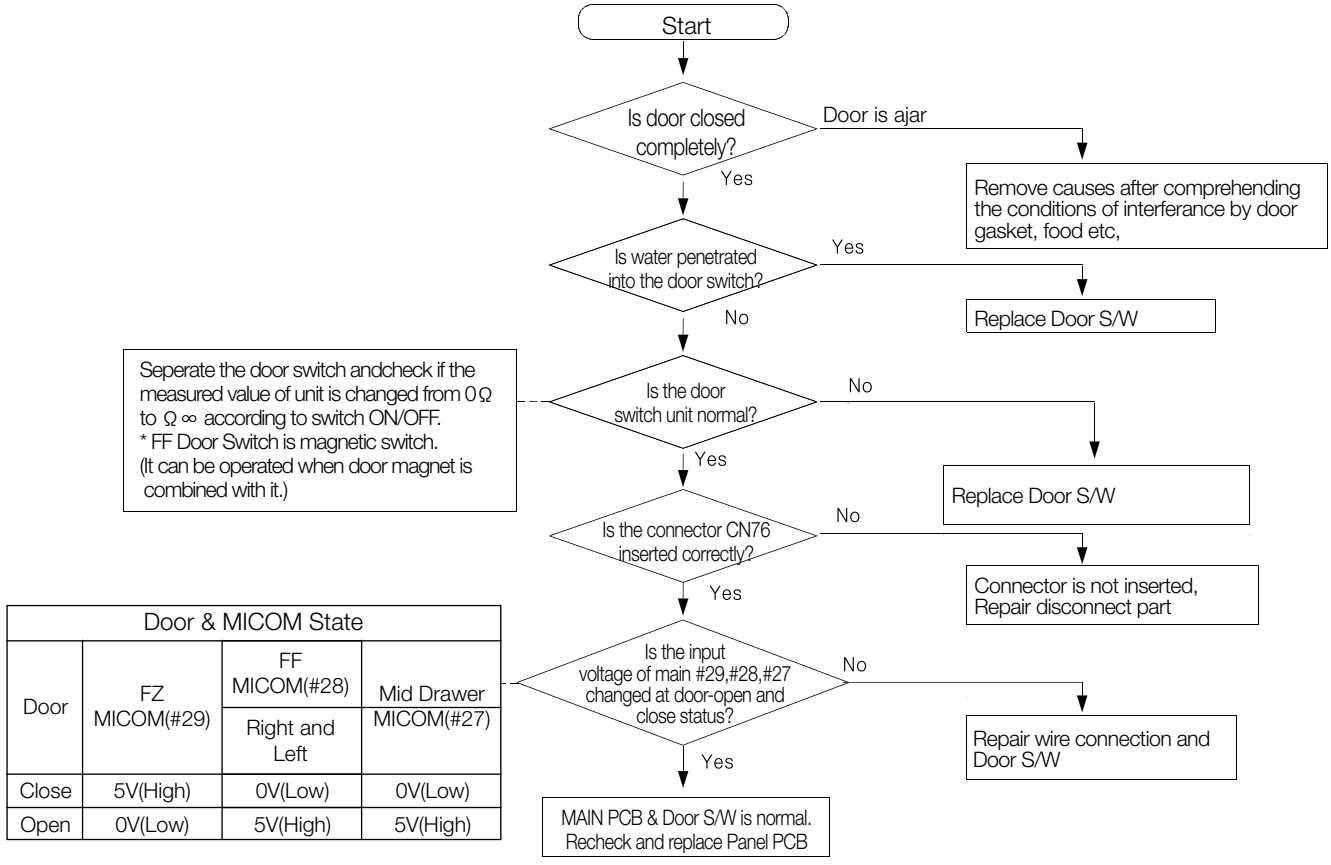
☞ Voltage checking method PCB typical Ground J23 JUMMPER and IC01 MICOM #4 CN75-"4")
: Square wave voltage ⟶ 2~3V measured by multi - meter When COMP operates

PCB Typical Ground J23 JUMMPER



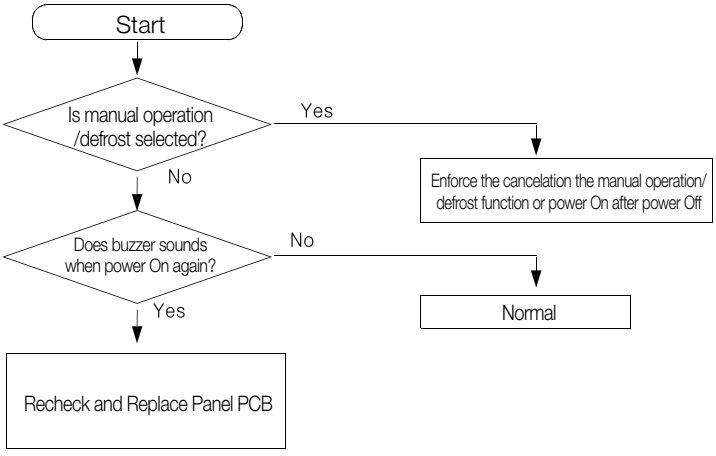
4-2-9. When alarm sounds continuously without stop(related with buzzer sound)

① If 'ding-dong'sound continuously



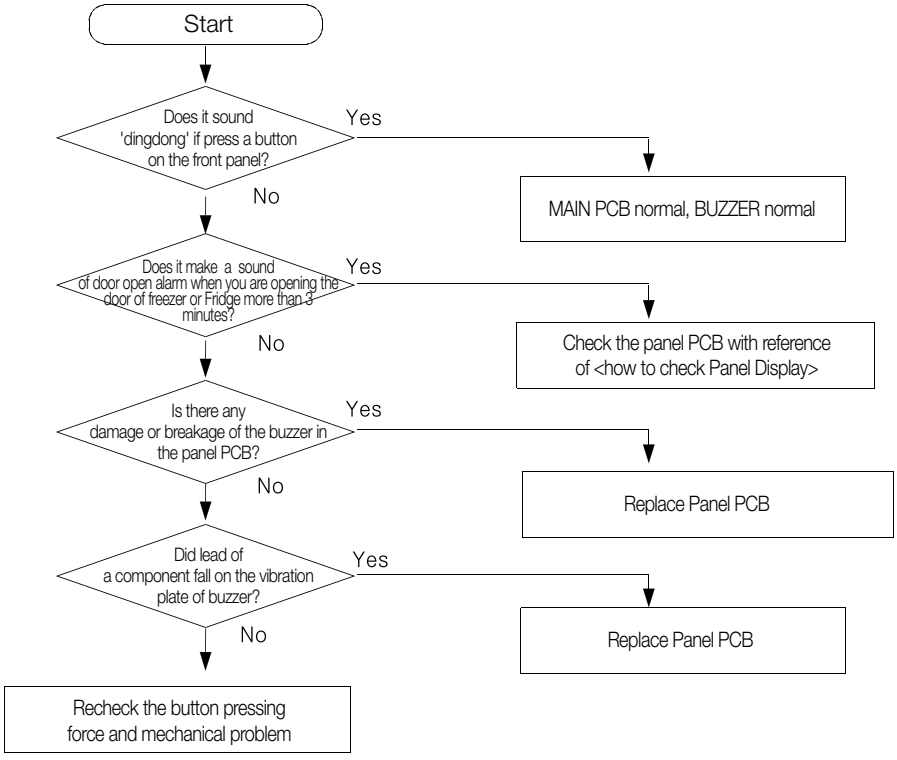
Door & MICOM State			
Door	FZ MICOM(#29)	FF MICOM(#28) Right and Left	Mid Drawer MICOM(#27)
Close	5V(High)	0V(Low)	0V(Low)
Open	0V(Low)	5V(High)	5V(High)

② If 'beep-beep' sounds continuously



③ If buzzer does not sound

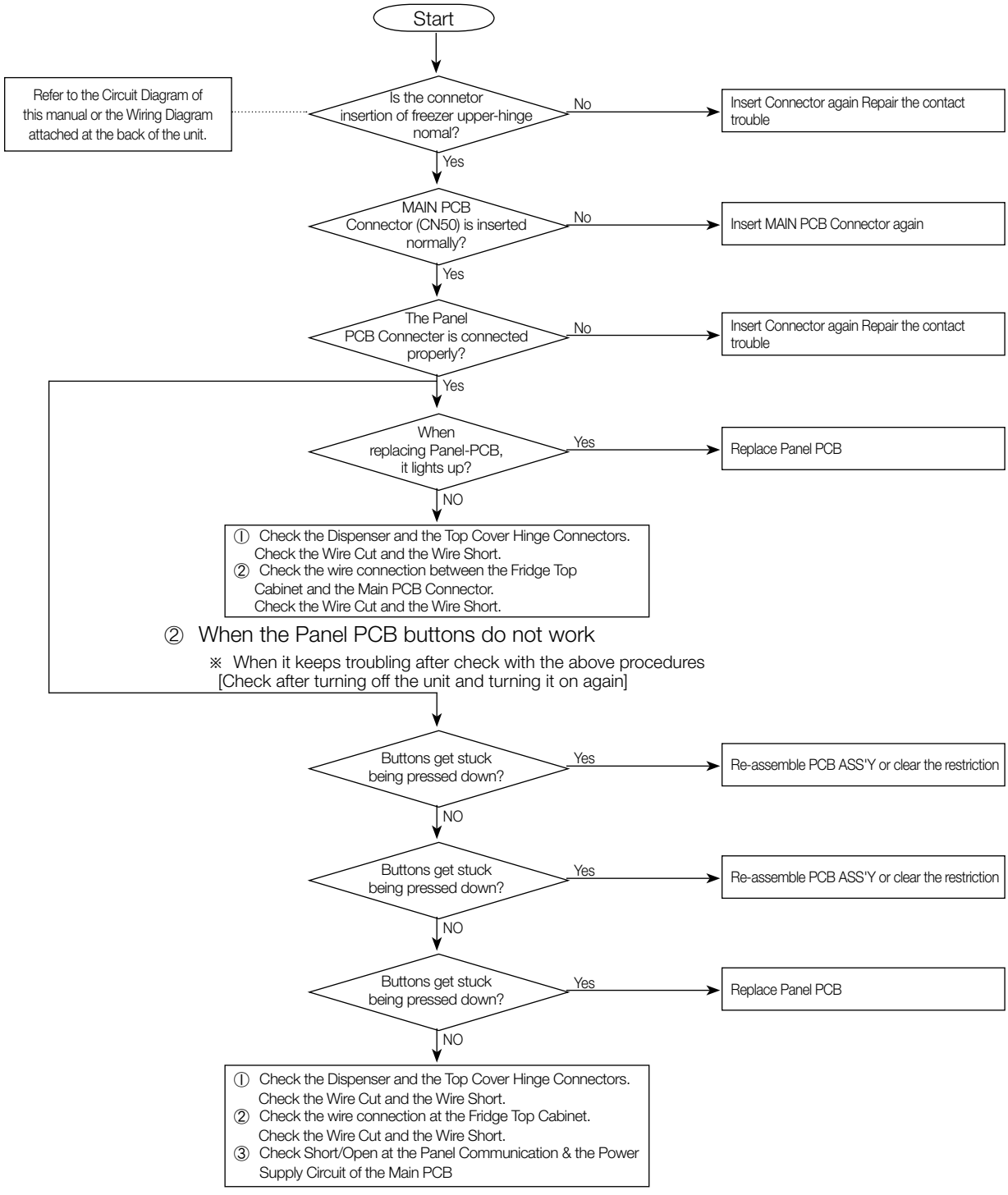
Buzzer is installed on the panel PCB in this model.
If buzzer does not sound even though the button is pressed, manual operation is started and door is opened, it should separate panel PCB and check the breakage of buzzer and bad soldering.
It is very hard to repair the panel PCB because it consists 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.



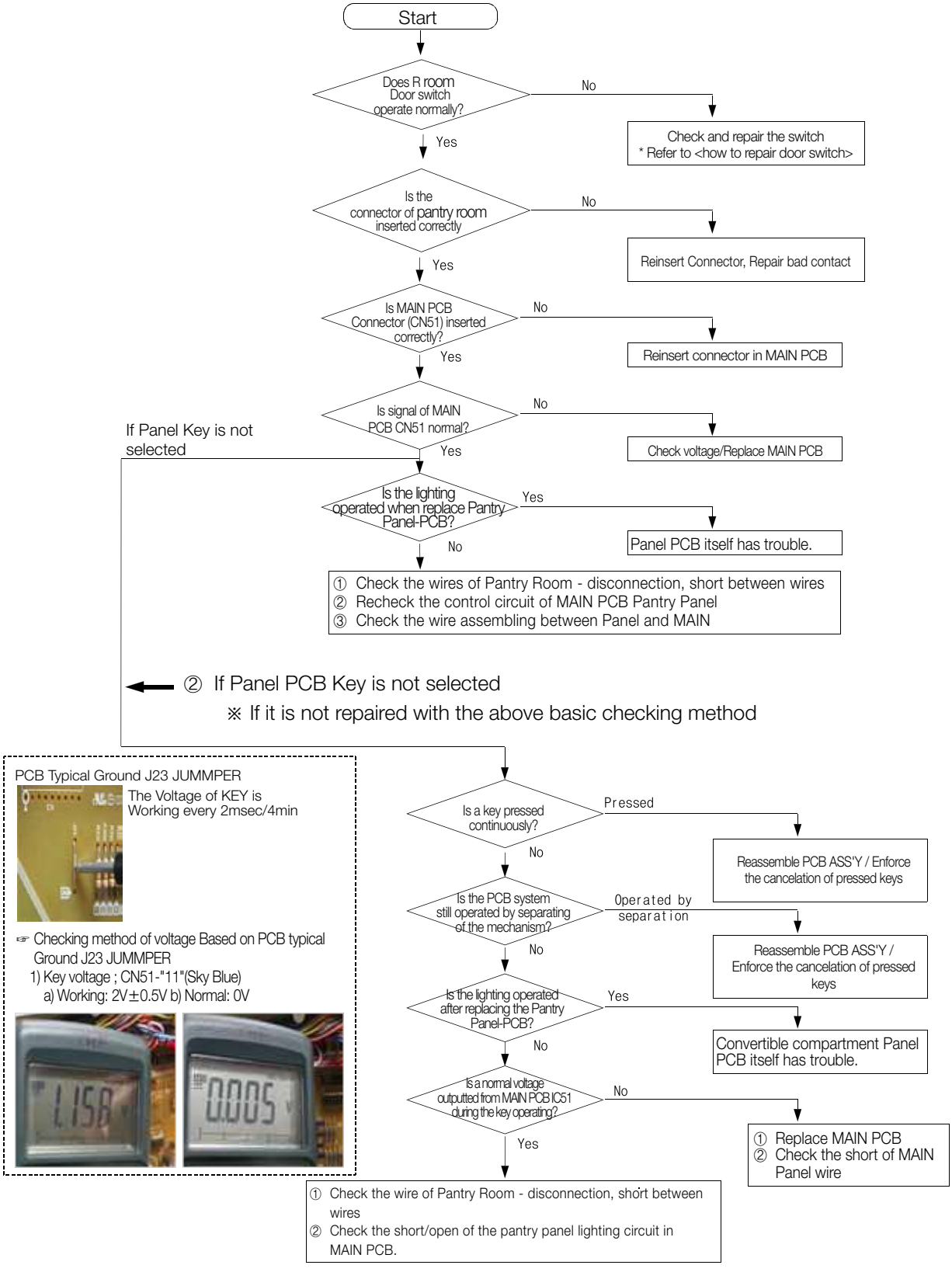
② When the Panel PCB buttons do not work

※ 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

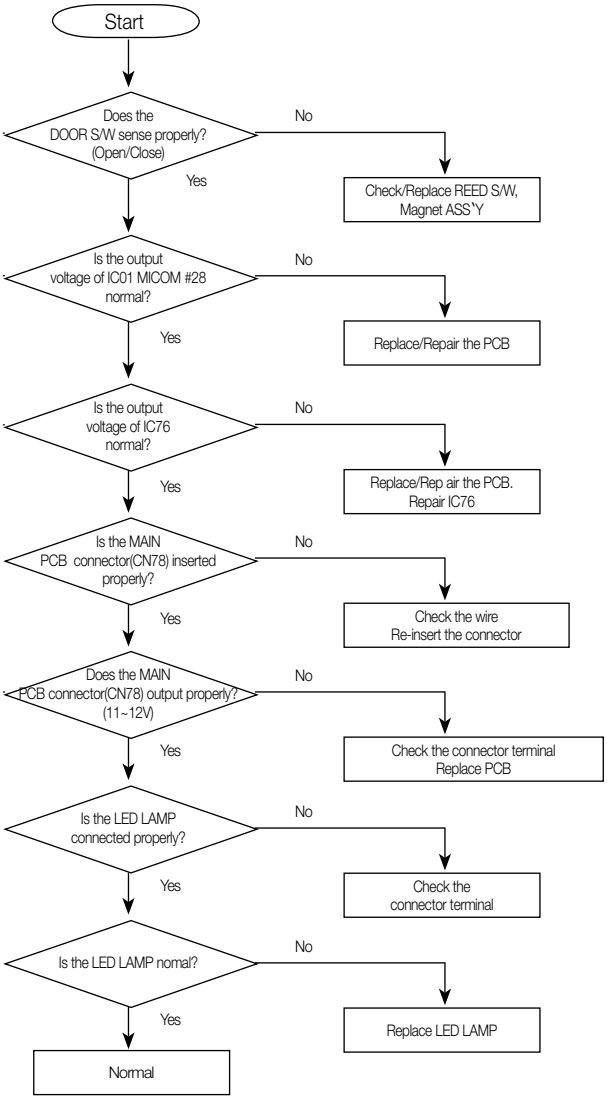
When controlling the regrigerator light with Regulator(12V) : LED LAMP
⟶ Applying to the F/R Room compartment (Option)

* 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)	5V (High)
Open	5V (High)	0V (Low)

IC76(R)/IC77(F) State	
Micom	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.

2) Ice Water(R) Valve (OPTION,RFG298/296)

PCB Typical Ground J23 JUMMPER

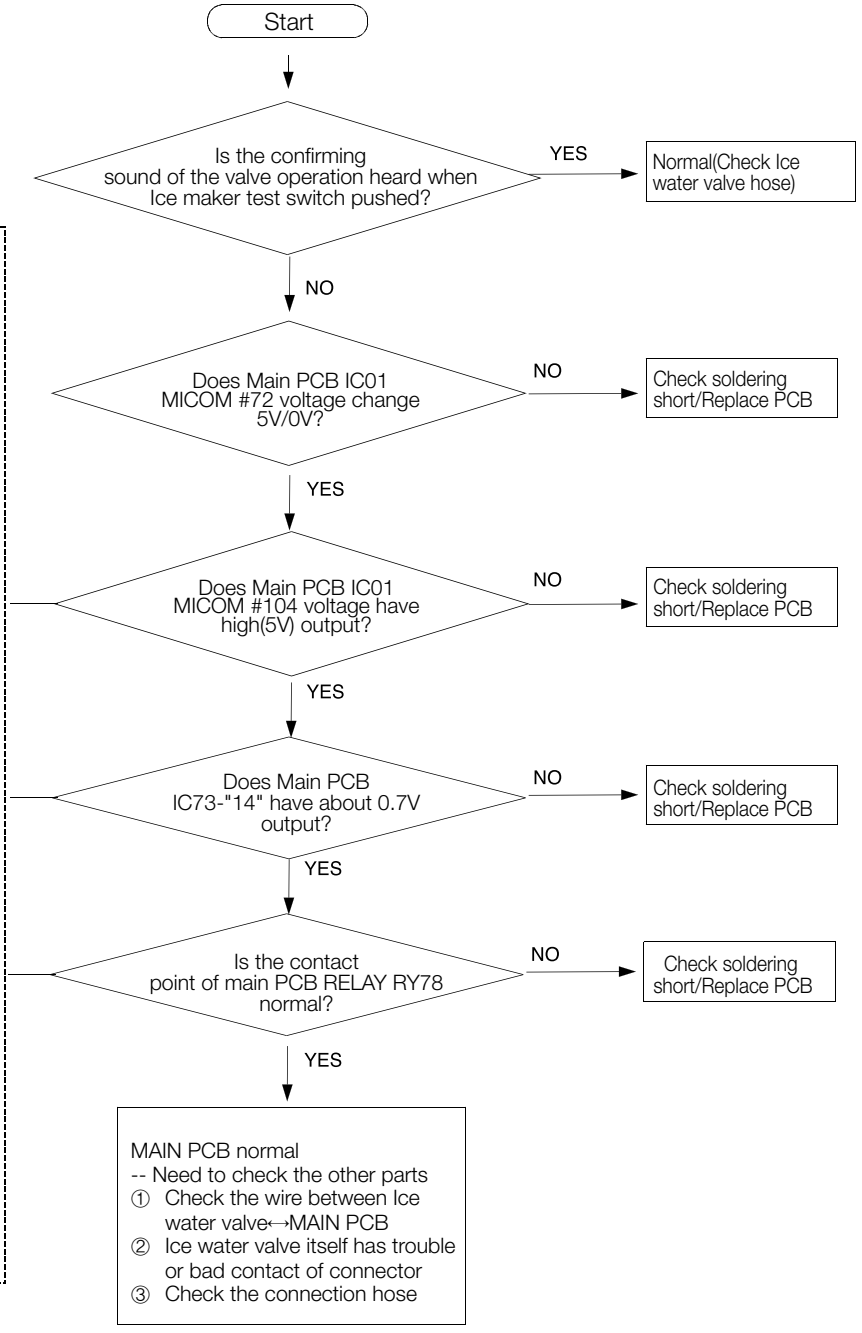
☞ Checking method of voltage Based on PCB typical Ground J23 JUMMPER

1) Check the voltage of IC73-"5"(same voltage as IC01 "104")
- ICE Water valve waiting (about 0V)

Based on PCB typical Ground J23 JUMMPER

2) IC73-"14" 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 (OPTION,RFG298/296)

Typical PCB Ground J23 JUMMPER

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

1) Check the voltage of IC75 #7(same voltage as IC01 #116)

- ICE Water valve operating (about 5V±0.5V)

Based on PCB typical Ground J23 JUMMPER

2) IC75 #12 voltage

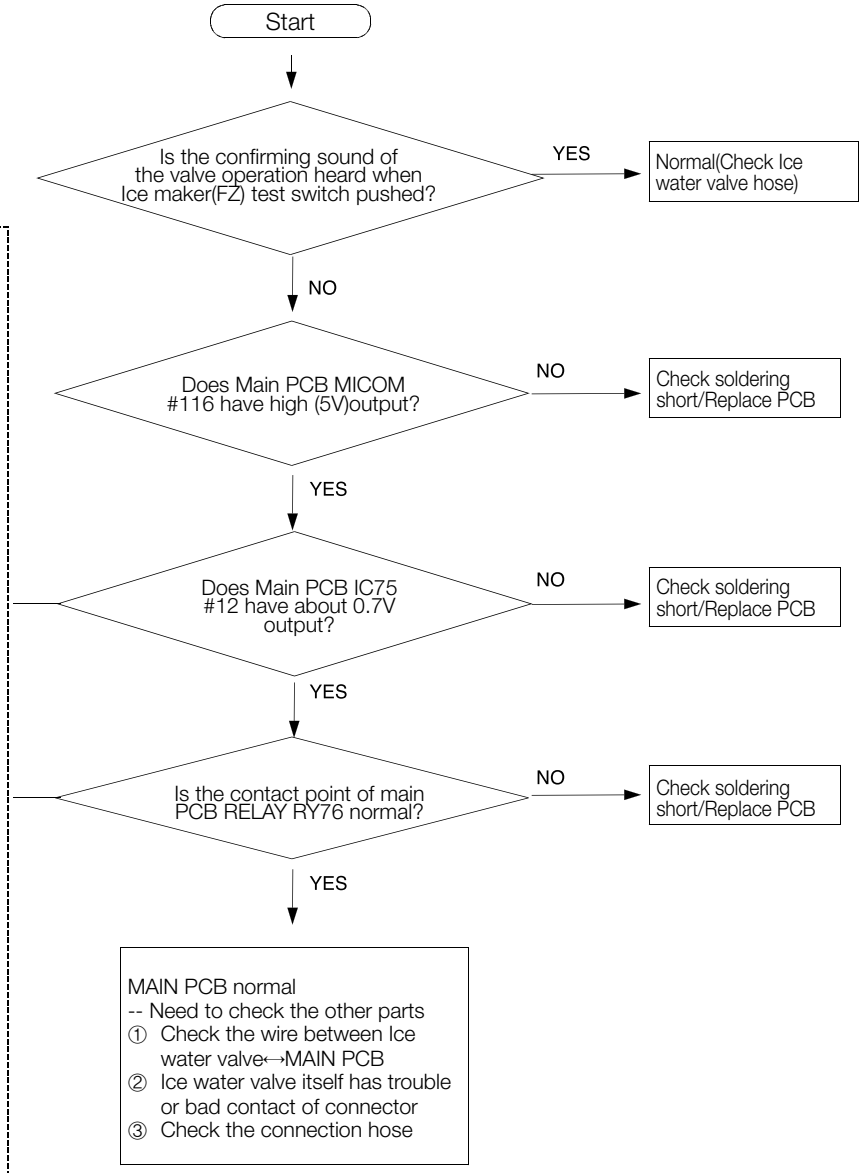
- ICE Water valve Waiting (about 13V±0.8V)
- ICE Water valve operating (about 0.7V±0.5V)

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

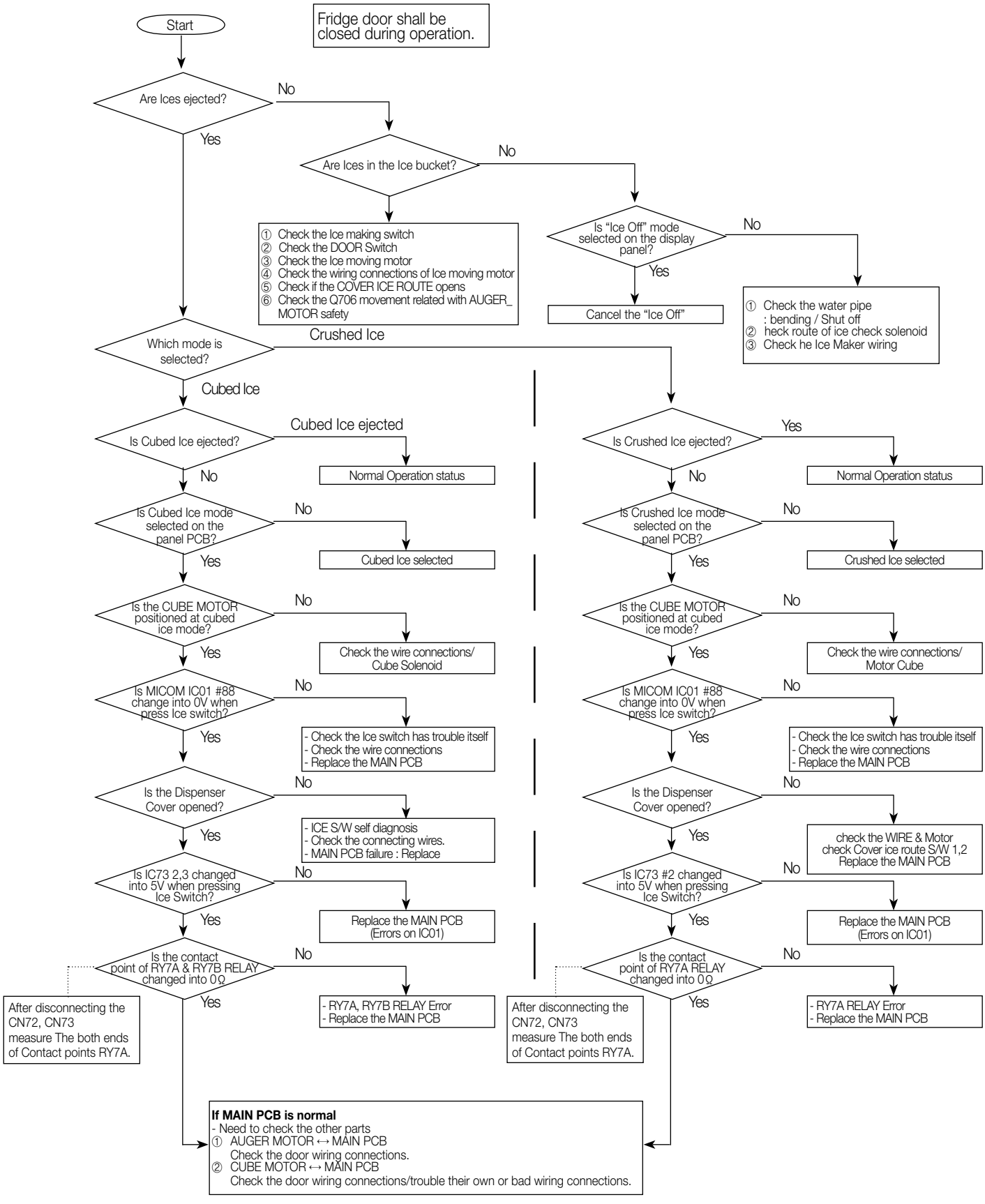
=> For checking the Relay RY76
CN70-"5"(Red) ↔ CN72-"1"(Brown)

- 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(Geared 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

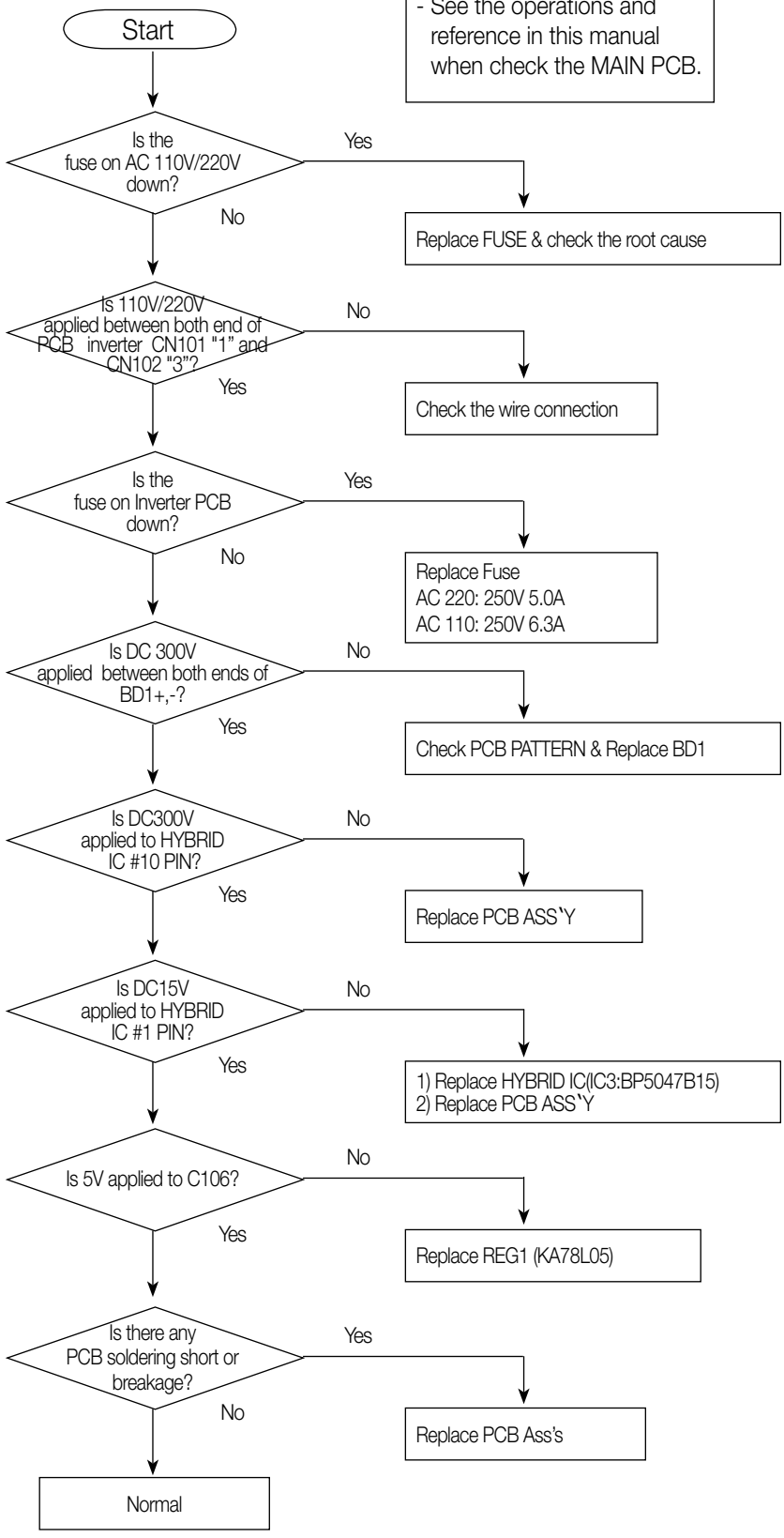
① Main PCB - Check the wire OPEN/SHORT between the Cover Ice Motor Rotation sensing switches.
② Check the Short of Cover Ice Motor Control Circuit SSR75 in the MAIN PCB.
③ Replace the MAIN PCB or the Dispenser Cover Motor.

4-2-16. If Inverter PCB Power is not supplied

Caution

At the INVERTER PCB Power, AC 110V/220V power and over DC 300V of high-voltage are applied. Please take care of yourself when repair and measure.

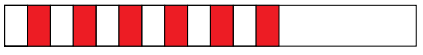
- See the operations and reference in this manual when check the MAIN PCB.



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

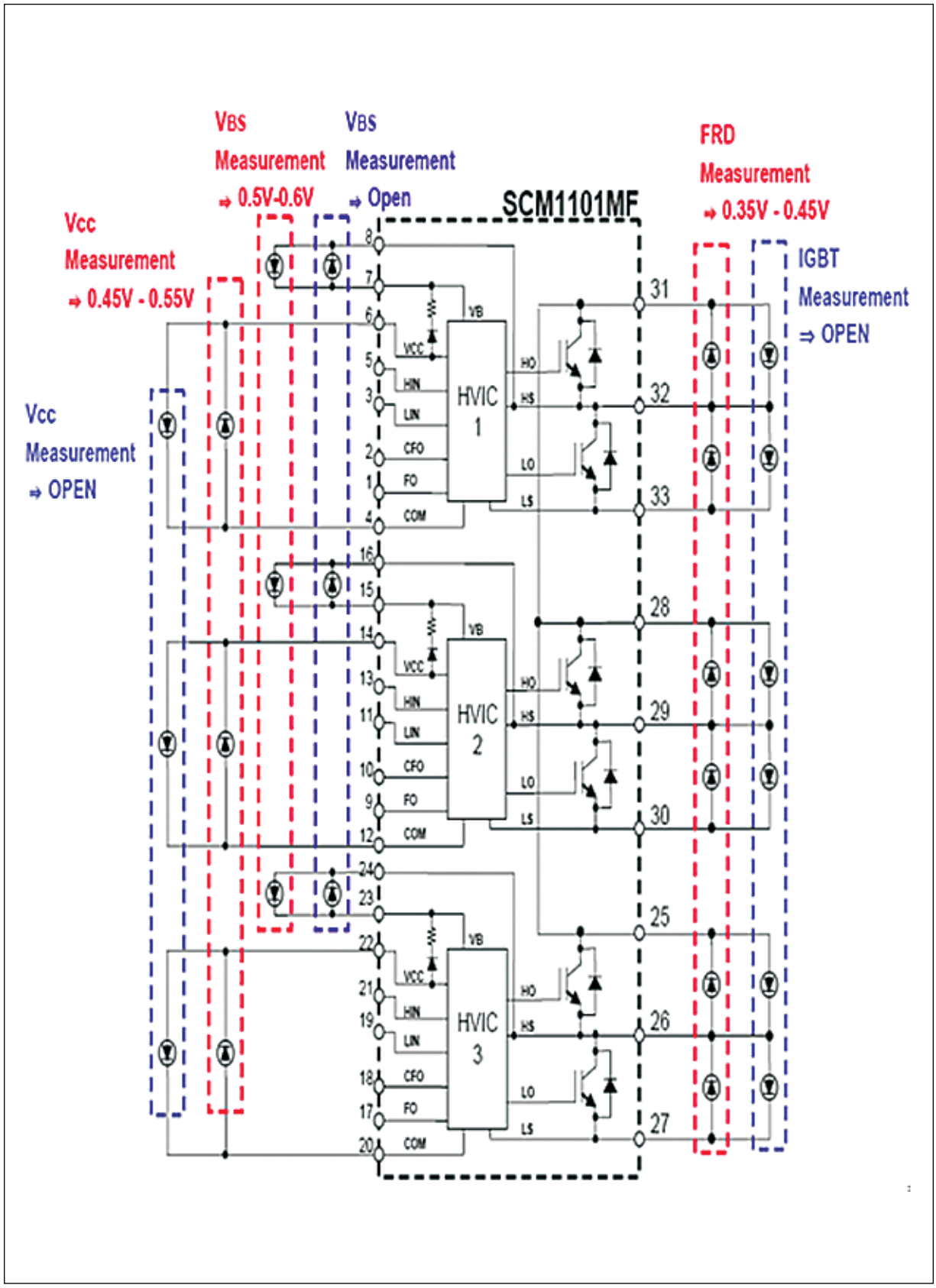
If Failure Condition is detected during compressor is operating, immediately stop Compressor operating and stand by 5 minutes. During this 5 minutes, RPM command signal is not available. It means, even if available RPM command signal is applied to the compressor, it does not work and keep standing by.

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(CN301) 2. Short among IPM Pins(No, #1~33)
	SPM Fault	3. Drop the IPM operating Voltage under DC 13.5V 4. Other cases, cjeck the COMP, cycle, etc.
	Abnormal Current Detection	1. Open the COMP wire(CN301) 2. Bad condition of R 308(ex. Bad soldering) 3. Other cases, cjeck the COMP, cycle, etc.
	Motor Locked / Over RPM	1. Operating the locked rotor COMP with in 5 second. 2. Operating the COMP under 1000RPM more than 5secod. 3. Short the shunt resistor between leads. 4. Occur the huge change of input voltage in a moment 5. Other cases, check the COMP, cycle,etc.
	Under Voltage	1. Drop the input voltage under AC 53V 2. Short resistor R513(DC link resistor)
	Over Voltage	1. Increase the input voltage over AC 154V 2. Short resistor among R501, R505 and R509 (DC link resistor)

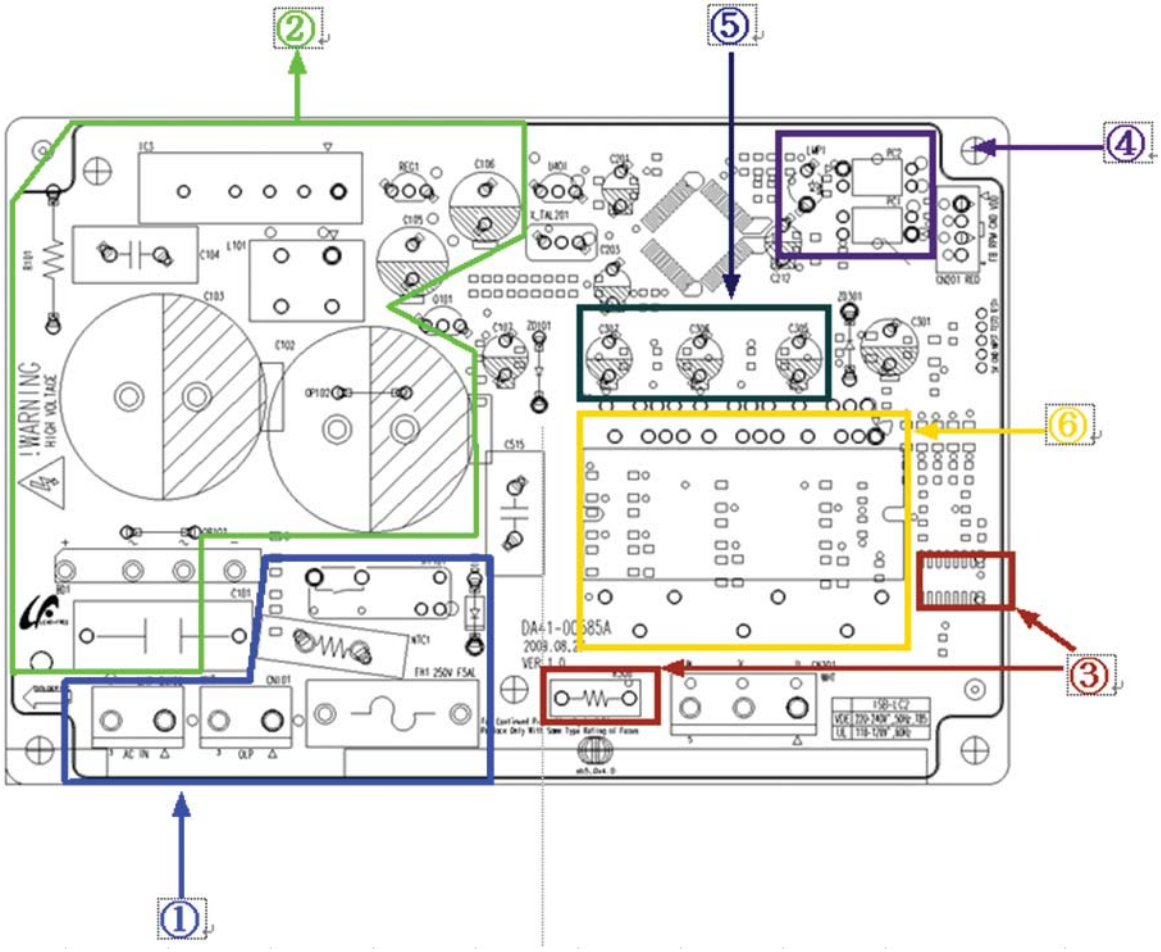
LED blinking frequency depending on protecting functions

IPM FREEWHEELING DIODE VOLTAGE VALUE



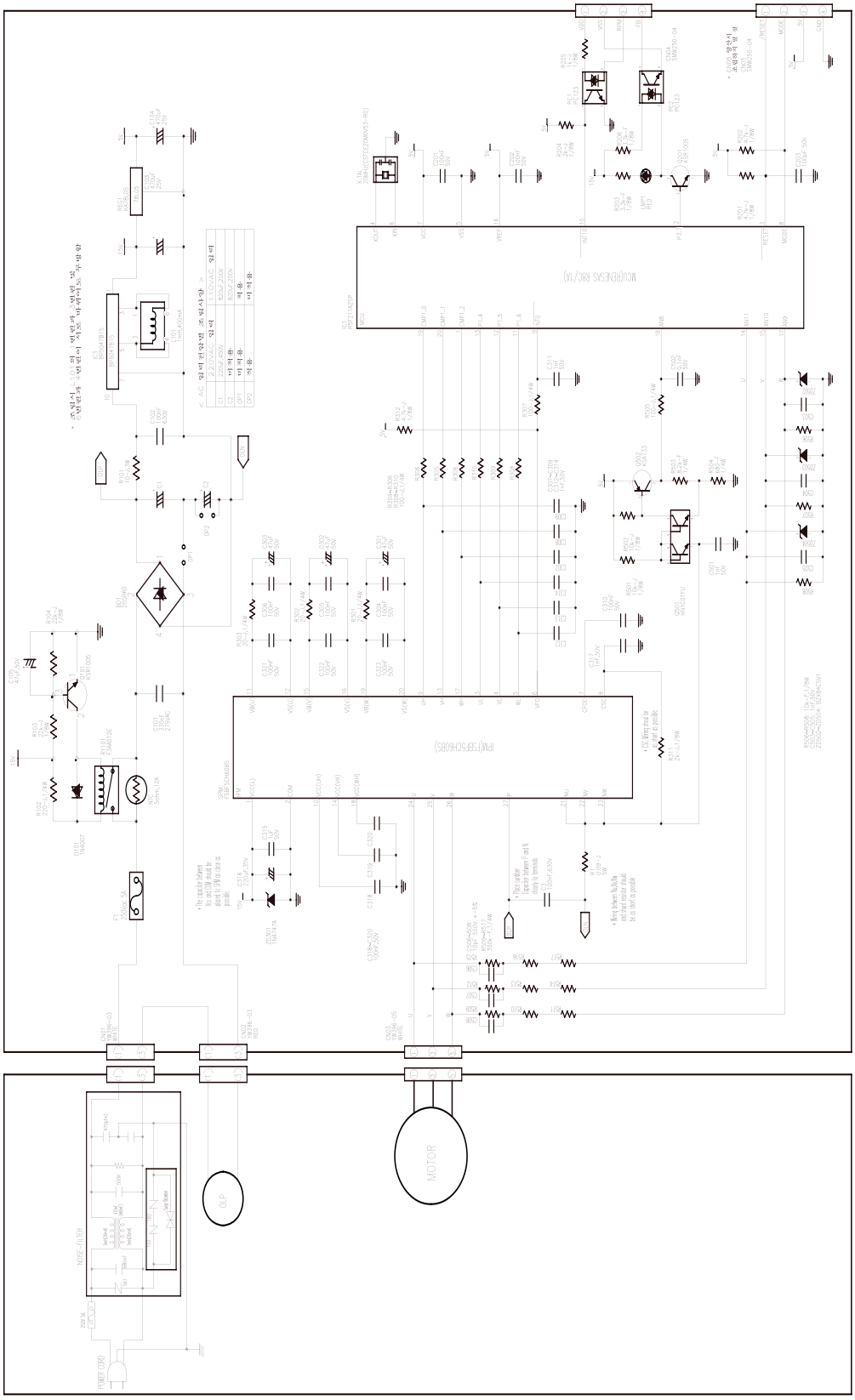
TROUBLESHOOTING

INVERTER CONTROLLER BOARD Connector Location



1. Inrush Current protecting area : It prevents an instant inrush of current generated in condenser when plug in.
2. PCB Power Source : Power source (HYBRID IC). It supplied DC15V and 5V to MICOM.
3. Location sensing resistance area : It senses motor location through the current detected.
4. Current sensing area : It senses the current from the SHUNT resistance and controls PWM DUTY.
5. COMP operating SIGNAL area : It receives COMP operating signal from MAIN PCB and conduct it.
6. BOOTSTRAP live part : Charging circuit that 1GBT of SPM can On/Off securely.

INVERTER PCB Circuit Diagram



5. PCB DIAGRAM

5-1) PCB LAYOUT WITH PART POSITION ····· 95

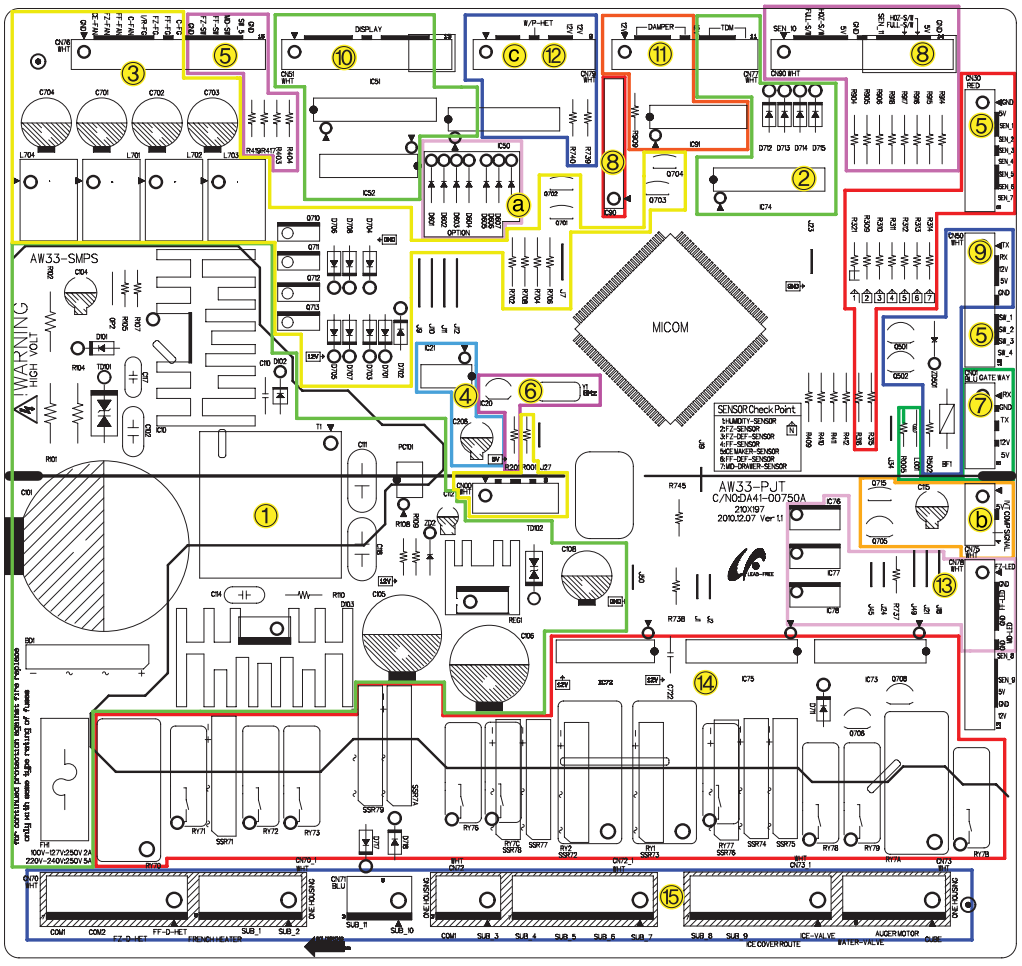
5-2) PCB LAYOUT WITH PART POSITION (SMPS BOARD) ····· 96

5-3) CONNECTOR LAYOUT WITH PART POSITION (MAIN BOARD) ····· 97

5-4) CONNECTOR LAYOUT WITH PART POSITION (SMPS BOARD) ····· 98

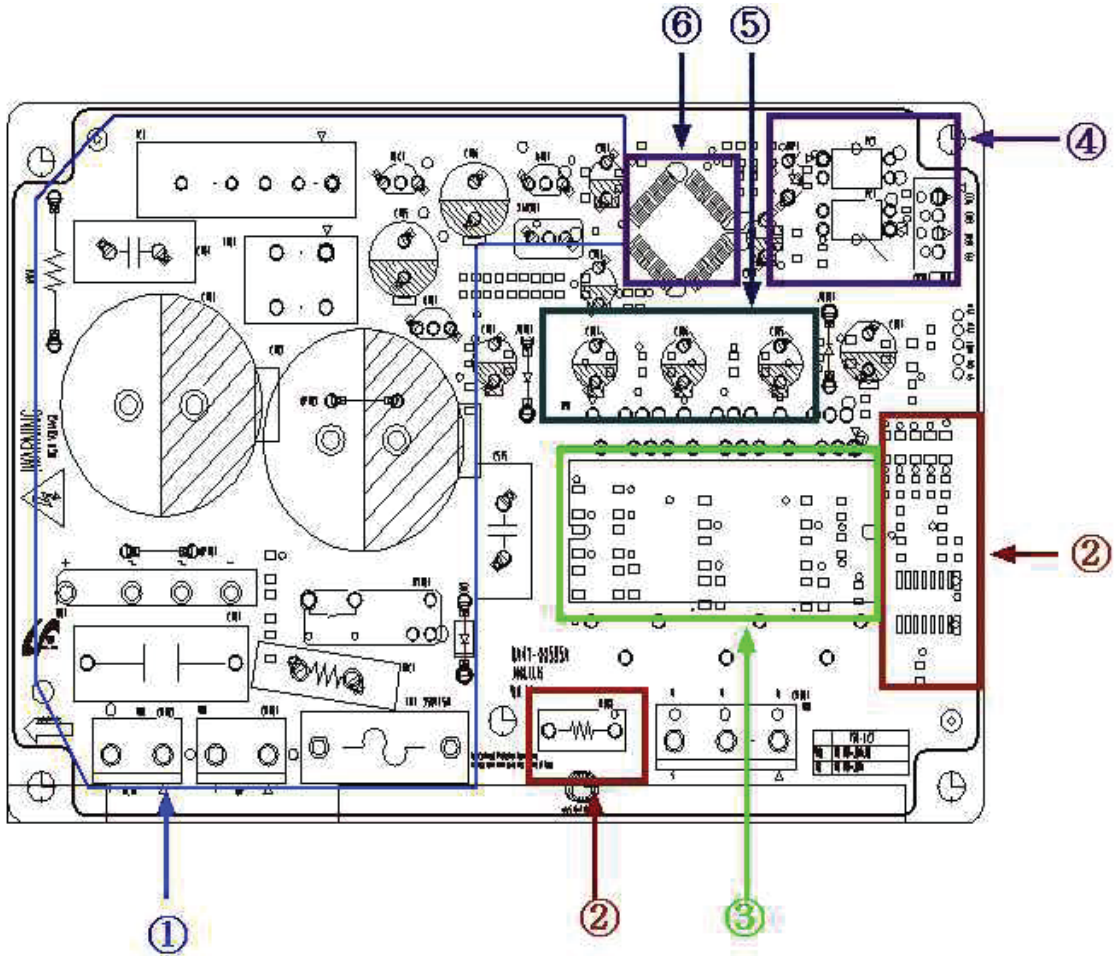
PCB DIAGRAM

5-1) PCB Layout with part position



1. DC12V, 5V, GND supplied from SMPS PCB
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. PANTRY Room display control part : display LED, detect KEY state.
11. Control PANTRY 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

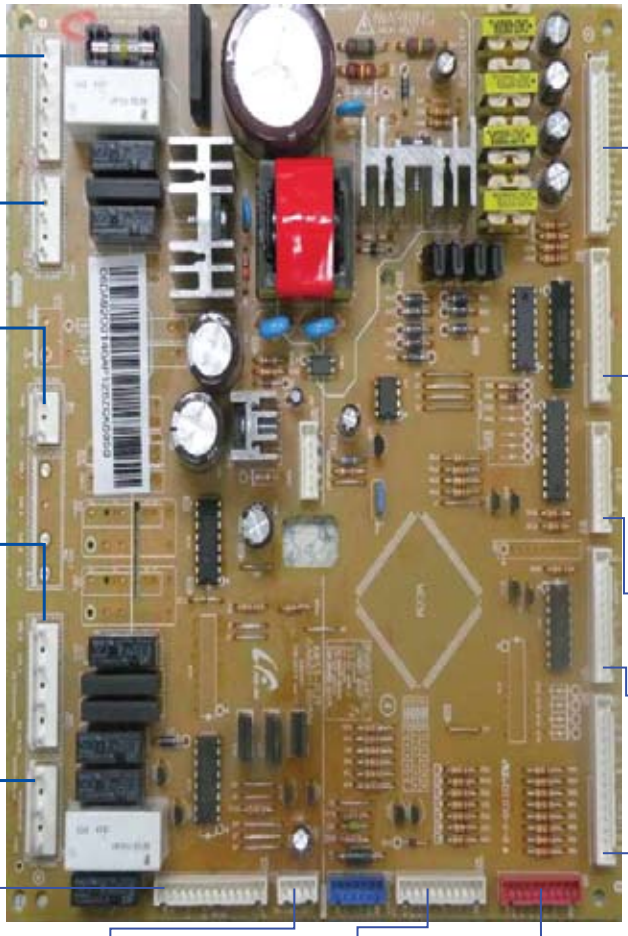
5-2) PCB Layout with part position (Inverter Board)



1. Power supply : The power supply circuit makes the non-isolated 15V and 5V voltage source for the IPM drive circuit and the MCU
2. Current detection circuit:The current detection circuit is to detect the DC Link current by sensing the voltage of the shunt resistor.
3. IPM(SCM1101M)
4. Comp drive command circuit : The comp drive command circuit is to transfer the extemal command signal to the MCU
5. IPM Bootstrap circuit : The ipm bootstrap circuit make the floated 15V voltage source for the high-side IGBT drive circuit of the IPM
6. MICOM

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

5-3-1. RF4267H***



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 : Open
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 : ICE MAKER MOTOR(CW)
⑦ : ICE MAKER MOTOR(CCW)

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&WATER Switch
⑧ : Open
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 : ICE MAKER DEF-Sensor
⑧ : FF-DEF-Sensor
⑨ : Pantry Room Sensor

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 : Open
⑭ : Open
⑮ : Open

CN51 – Pantry Room Display
① : Open
② : Open
③~⑦ :
⑧~⑩ : Open
⑪ : Pantry Room Switch
⑫ : ICE MAKER(FZ) MOTOR CW
⑬ : ICE MAKER(FZ) MOTOR CCW

CN79
① : +5V
② : GND
③ : Flow Sensor Out
④ ~ ⑨ : Open

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

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

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

①VDD
②VSS
③RPM
④FB

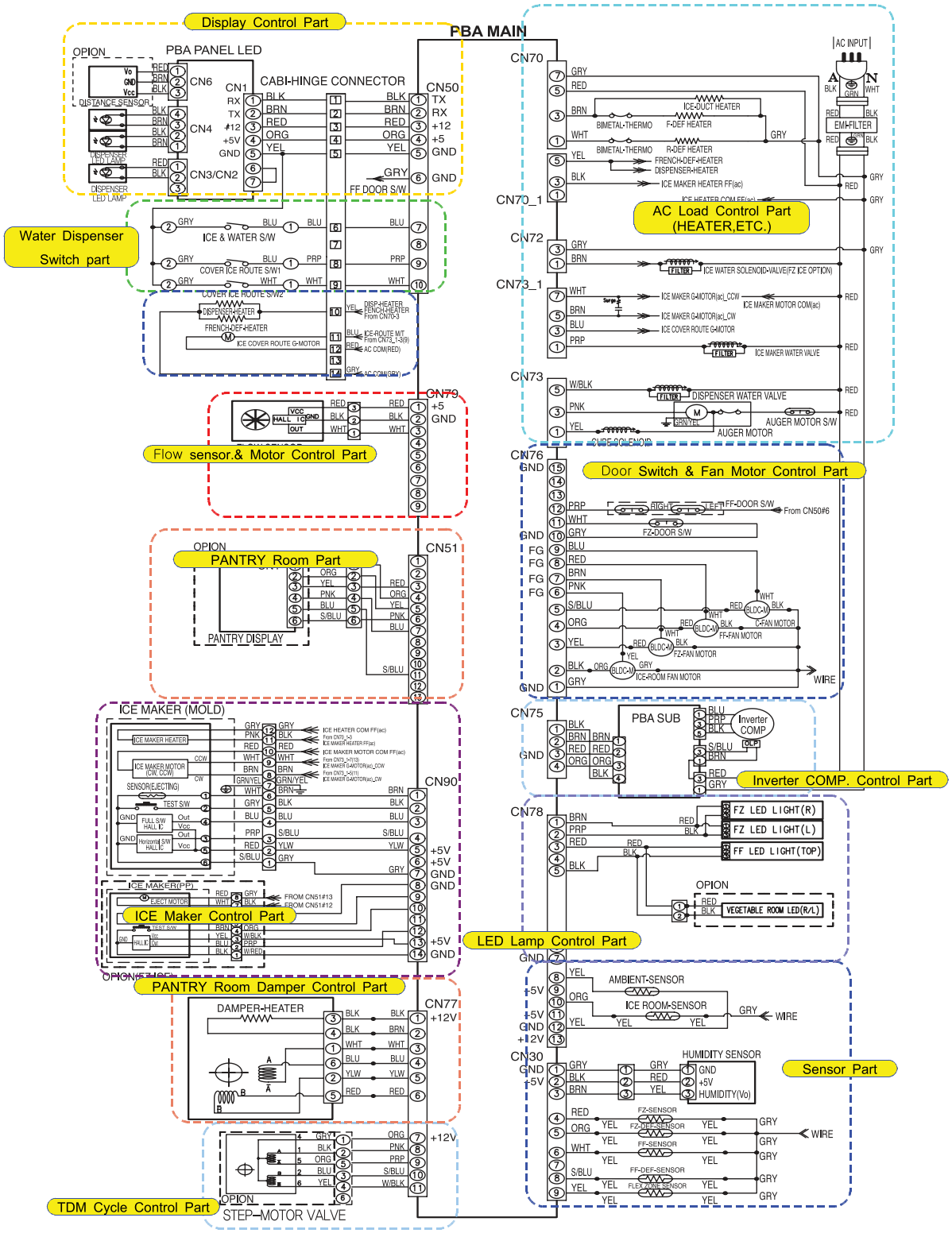
POWER (220V) OLP ①U ②V ③W

①VDD
②VSS
③RPM
④FB

POWER (110V) OLP ①U ②V ③W

6. WIRING DIAGRAM

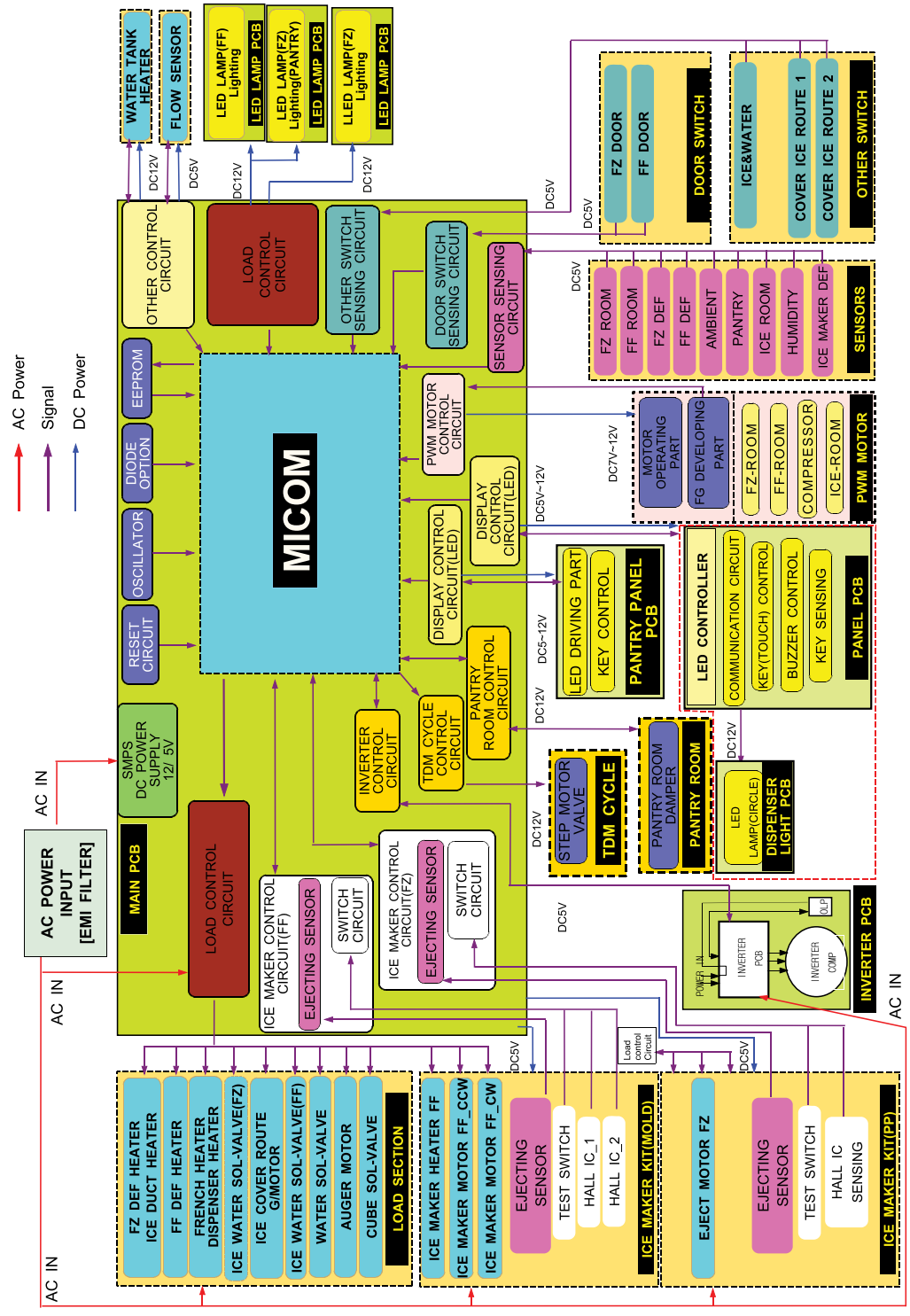
6-1) Model : RFG298**



7. SCHEMATIC DIAGRAM

7-1) Whole block diagram

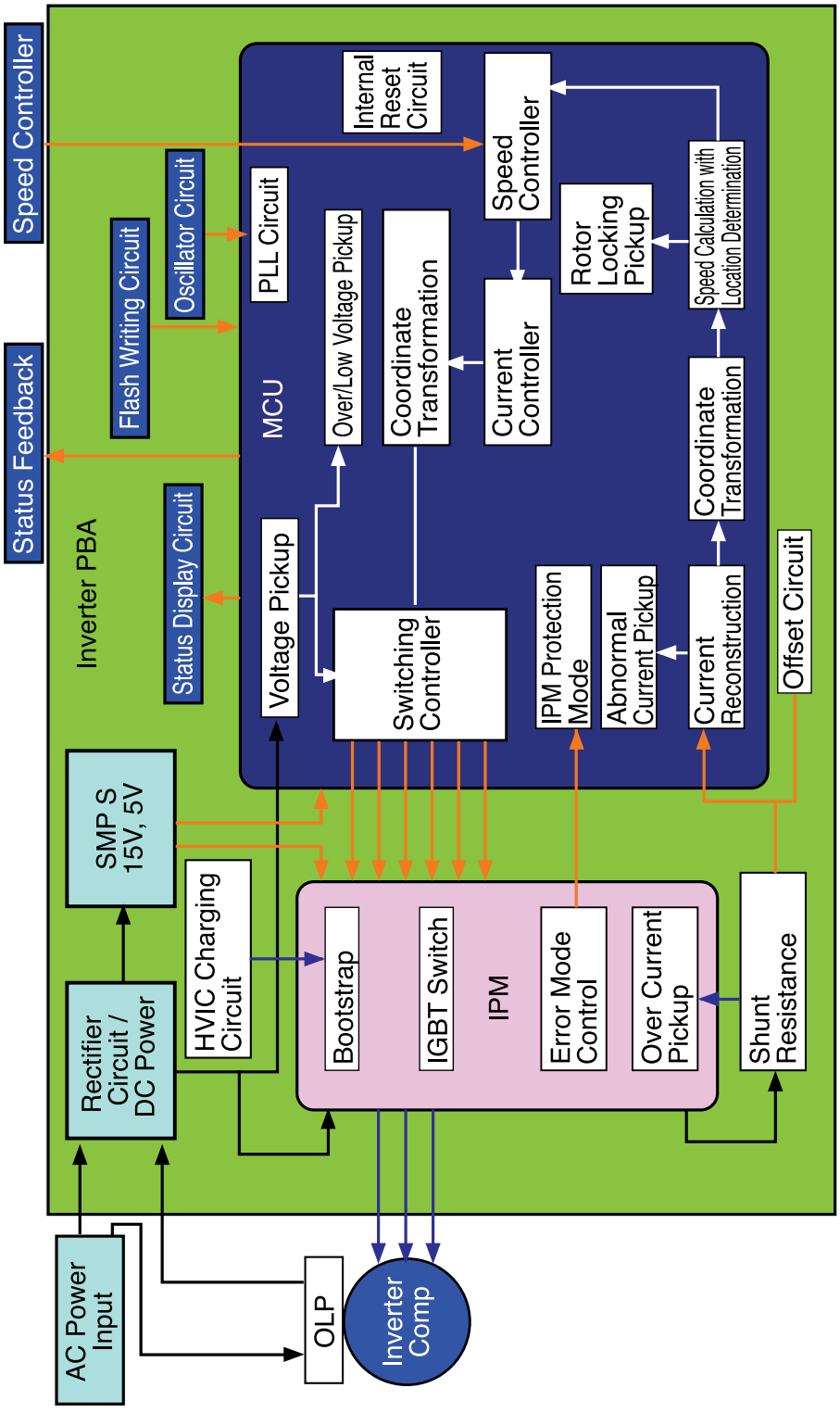
6-1. MODEL : RFG298**



7. SCHEMATIC DIAGRAM

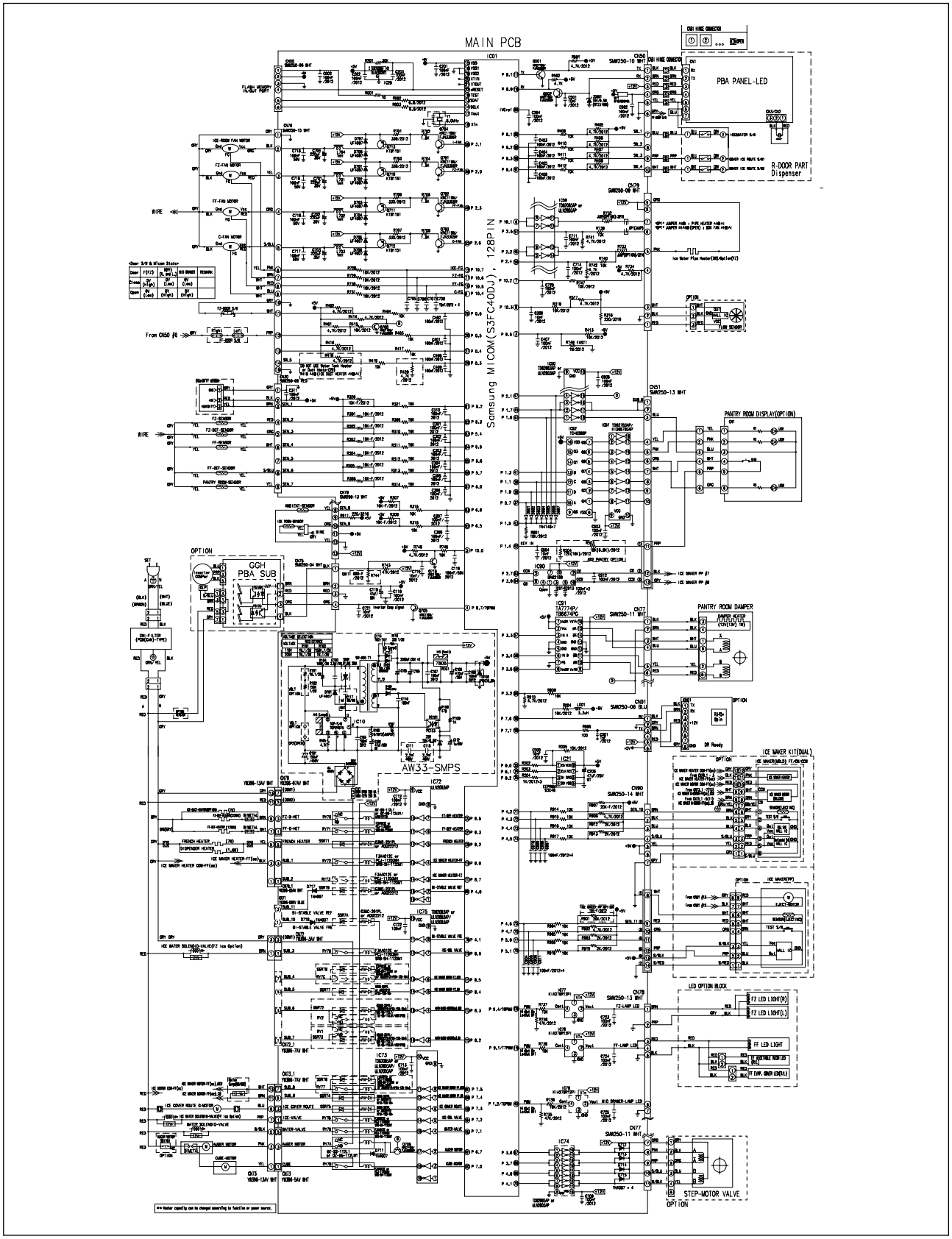
7-2) Whole block diagram

7-2. MODEL : RFG298**

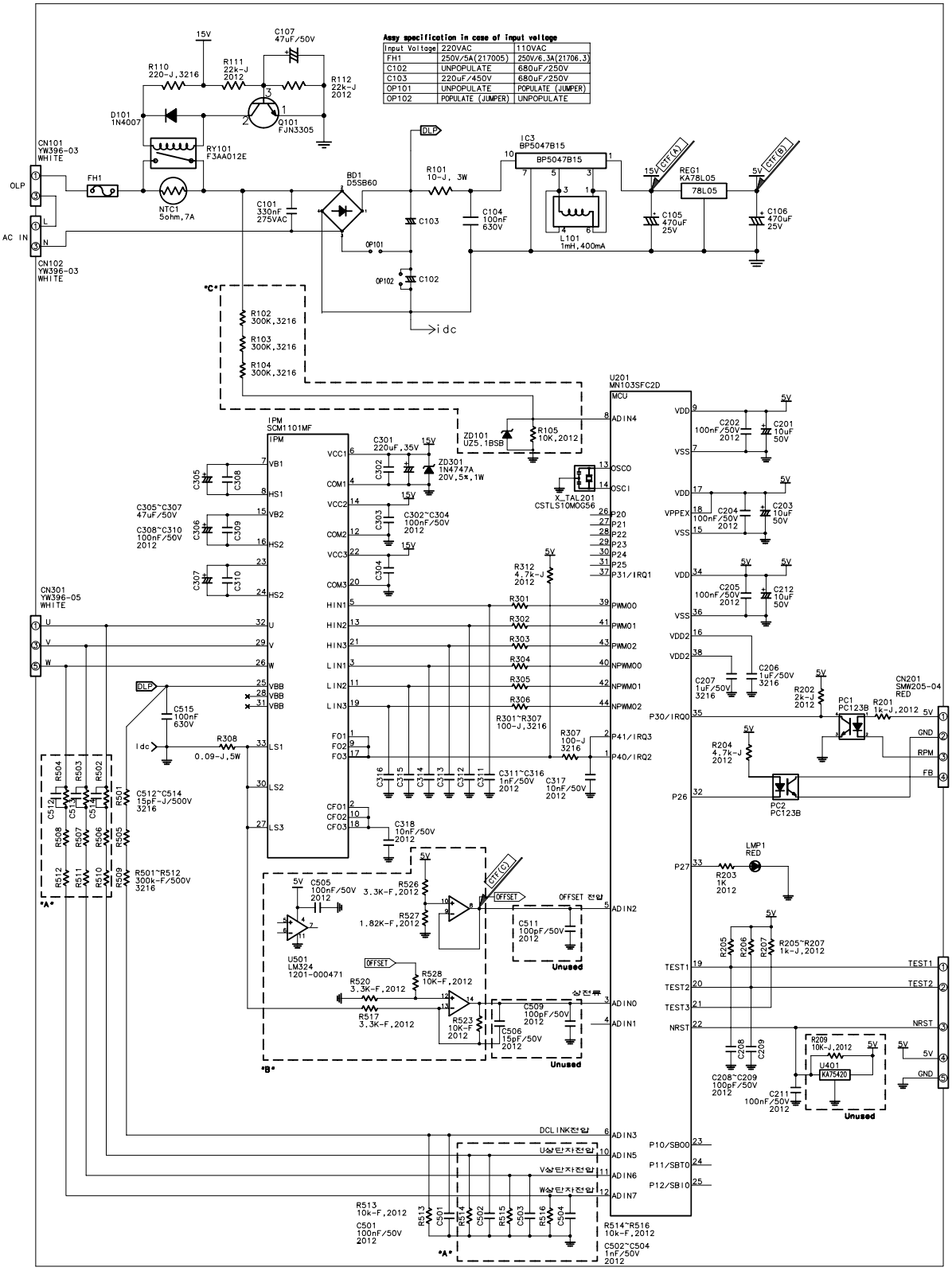


7-3) CIRCUIT DIAGRAM

7-3-1. Main



7-3-2. INVERTER



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