LG

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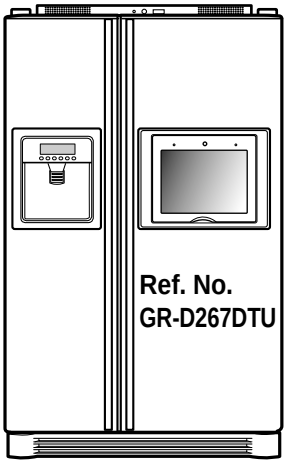
SXS REFRIGERATOR

SERVICE MANUAL

CAUTION

PLEASE READ CAREFULLY THE SAFETY PRECAUTIONS IN THIS BOOK BEFORE SERVICING OR OPERATING THE REFRIGERATOR.



MODEL: LRSPC2661T

COLOR: TITANIUM

CONTENTS

WARNINGS AND PRECAUTIONS FOR SAFETY

Please observe the following safety precautions in order to safely and properly use the refrigerator, to avoid hazards, and prevent accidents during repair.

1. Avoid the risk of electric shock. Disconnect power cord from wall outlet and wait for more than three minutes before replacing PWB parts. Shut off the power whenever replacing and repairing electric components.

2. When connecting power cord, make sure that the power cord has been disconnected from the wall outlet for at least five minutes.

3. Check for damage to the power cord and plug. If the power cord or plug is damaged, it could cause a fire or electric shock.

4. The refrigerator should have its own individual electrical outlet. Overloading any outlet can cause a fire.

5. Please make sure the outlet is properly grounded, particularly in a wet or damp area.

6. Use standard electrical components when replacing parts.

7. Make sure water connection is correctly engaged. Remove dust and foreign materials from the housing and connecting parts.

8. Do not fray, damage, machine, heavily bend, yank, or twist the power cord.

9. Check for evidence of moisture intrusion in the electrical components. Replace the parts or mask them with insulation tape if moisture intrusion is evident.

10. Do not touch the Icemaker with hands or tools to confirm the operation of geared motor.

11. Do not let the customer repair, disassemble, or reconstruct the refrigerator for themselves. Servicing carries the risk of electric shock, fire and other hazards.

12. Do not store hazardous materials such as ether, benzene, alcohol, chemicals, gas, or medicine in the refrigerator.

13. Do not put flower vases, cups, cosmetics, chemicals, etc., or container with fall of liquid on the top of the refrigerator.

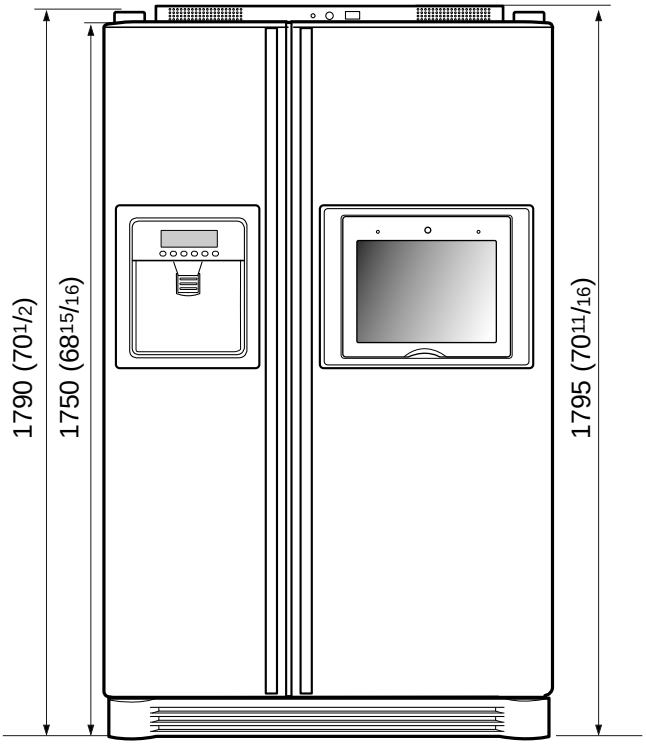
14. Do not put glass bottles full of liquid into the freezer. The contents could freeze and break the glass bottles.

15. When scrapping the refrigerator, please disconnect the door gasket first, and scrap the refrigerator in a location where no children have access.

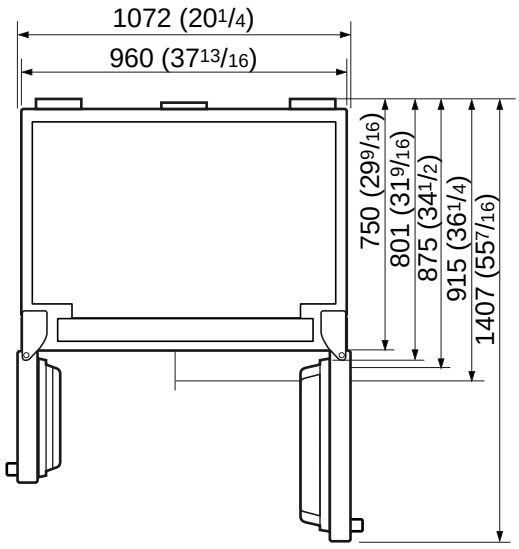
SPECIFICATIONS

ITEMS	SPECIFICATIONS
DIMENSIONS	960(W)x915(D)x1795(H) mm (37 7/8x36 1/4x70 2/3 in.)
NET WEIGHT	169kg (372 1/2 lbs.)
COOLING SYSTEM	Fan Cooling
TEMPERATURE CONTROL	Micom Control
DEFROSTING SYSTEM	Full Automatic
	Heater Defrost
INSULATION	Cyclo-Pentane
COMPRESSOR	PTC Starting Type
EVAPORATOR	Fin Tube Type
CONDENSER	Wire Condenser
REFRIGERANT	R134a (210g) (6 7/8 oz.)
LUBRICATING OIL	FREOL @15G (330 cc)
DRIER	1Ø0.83
CAPILLARY TUBE	MOLECULAR SIEVE XH-7

ITEMS	SPECIFICATIONS
FIRST DEFROST	5 - 6 Hours
DEFROST CYCLE	13 - 15 Hours
DEFROSTING DEVICE	Heater, Sheath-AL
	Heater, Sheath-ML
	Heater, Drain
ANTI SWEAT HEATER	Dispenser Duct Door Heater
	Dispenser Heater
	Frame LCD Heater
ANTI-FREEZING HEATER	Chilled Room Duct Heater
	Damper Heater
	Tube Inject Heater
FREEZER LAMP	60W (1 EA)
REFRIGERATOR LOWER LAMP	60W (1 EA)
REFRIGERATOR UPPER LAMP	30W (2 EA)
DISPENSER LAMP	15W (1 EA)

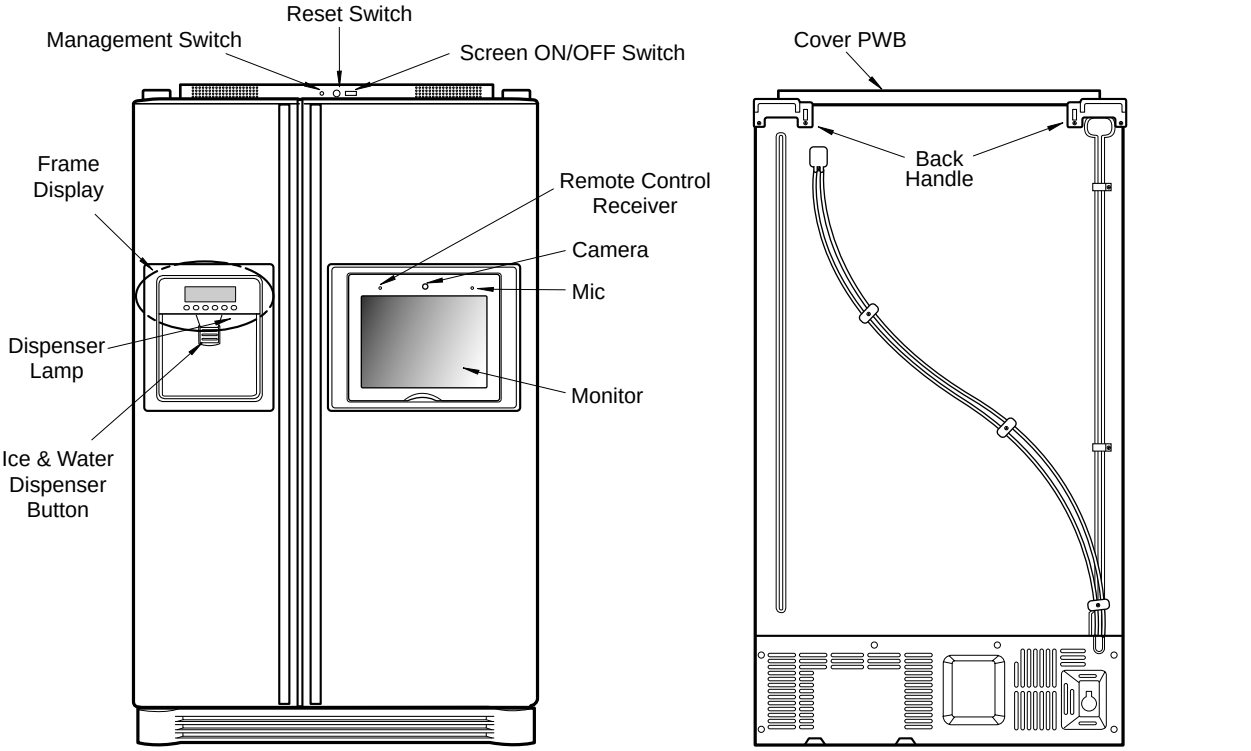


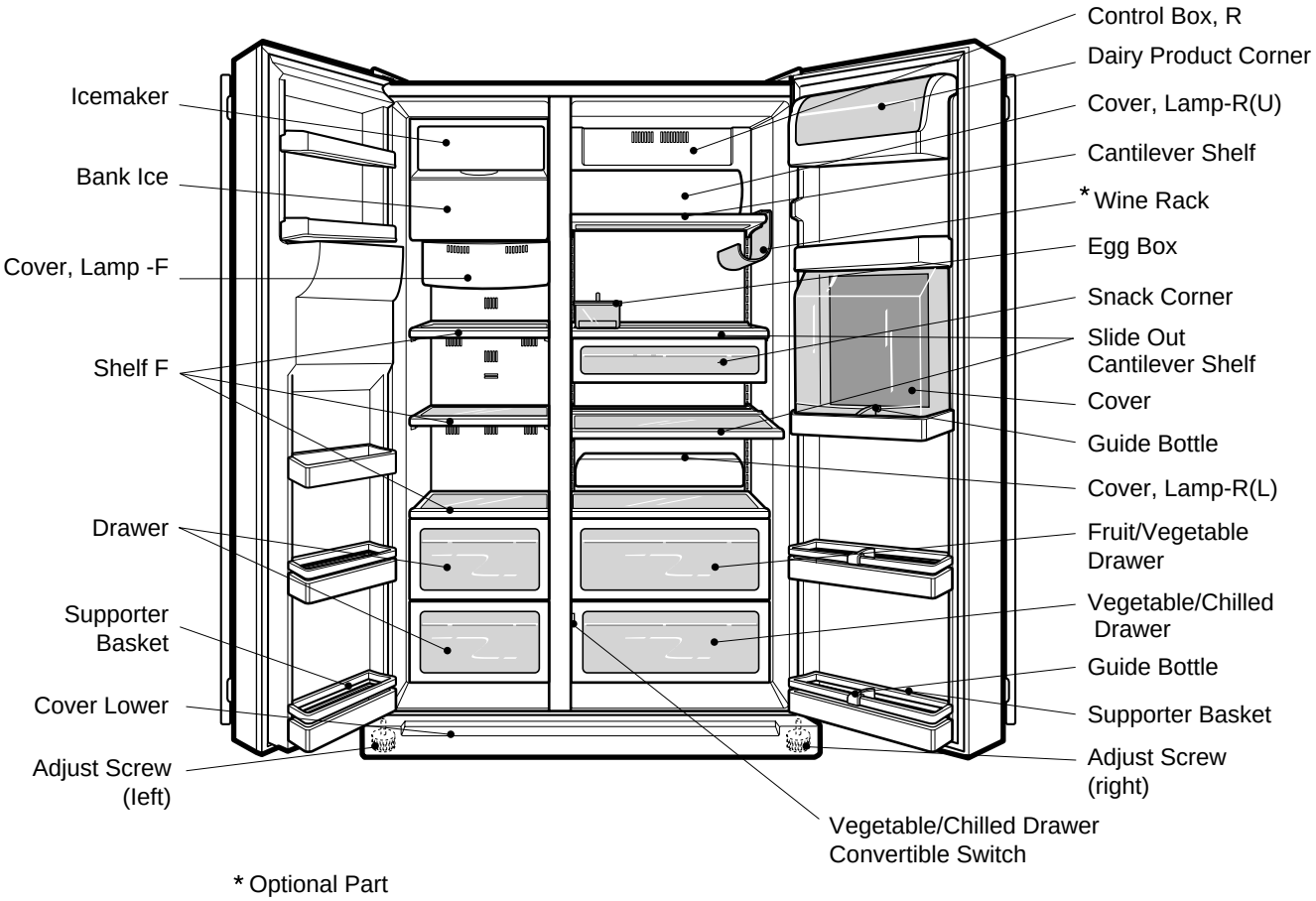
<Front View>



<Top View>

PARTS IDENTIFICATION





* Optional Part

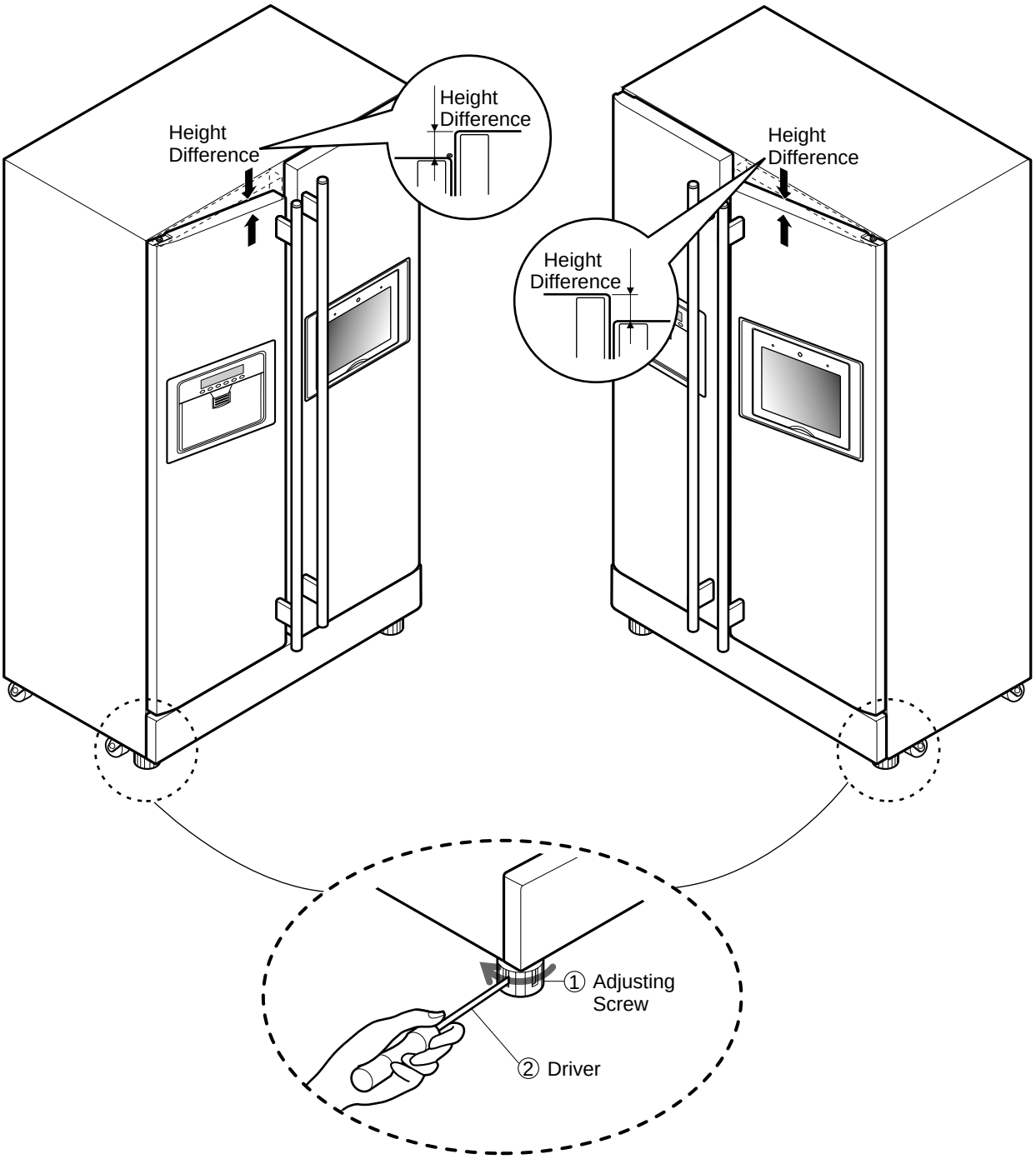
HOW TO INSTALL REFRIGERATOR

1. How to Adjust Door Height of Refrigerator

■ Make the refrigerator level first. (If the refrigerator is not installed on a level floor, the height of freezer and refrigerator door may not be the same.)

1. If the height of freezer door is lower than the refrigerator door:

2. If the height of freezer door is higher than the refrigerator door:



Insert a driver ❷ into the groove ❶ of adjusting screw and rotate driver in arrow direction (clockwise) until the refrigerator becomes horizontal.

Insert a driver ❷ into the groove ❶ of adjusting screw and rotate driver in arrow direction (clockwise) until the refrigerator becomes horizontal.

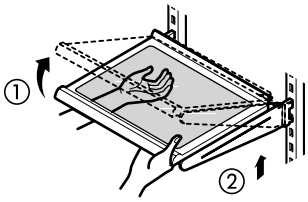
HOW TO INSTALL REFRIGERATOR

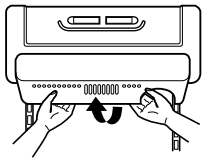
2. How to Install Water Pipe

■ Install Water Filter (Applicable to some models only)

■ Before Installing water filter

1. Before installing the filter, take out the top shelf of the refrigerator after tilting it to the direction (①) and lifting it to the direction (②) and move it to the lower part.
2. Remove the lamp cover by pressing the protrusion under the cover and pulling the cover to the front.





■ Installing water filter

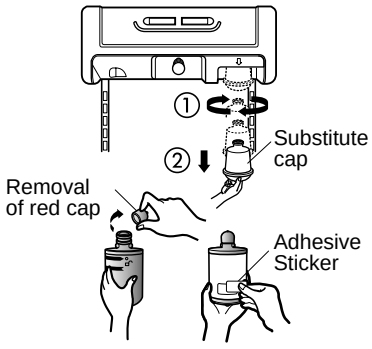
1. **Initial installation of water filter**
   Remove the filter substitute cap by turning it counterclockwise (①) by 90 degrees and pulling it down.

Note : Keep it for later use when you do not use the filter.

Remove the red cap from the filter and attach the sticker. Insert the upper part of the filter (①) after aligning with the guideline marked on the control box, and fasten it by turning it clockwise by 90 degrees.

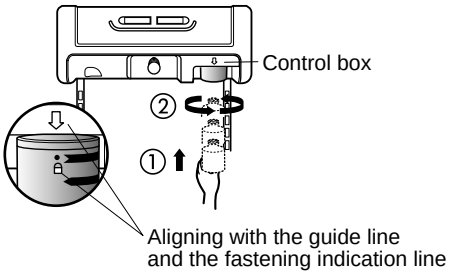
Note : Verify that the guideline and the fastening indication line are aligned.

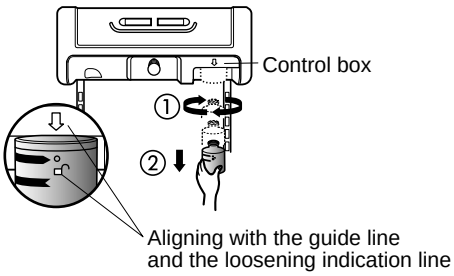
2. **Replacement of water filter**



While holding the lower part of the filter, turn it counterclockwise (①) by 90 degrees and pull it down.

Note : Verify that the guideline and the loosening indication line are aligned.



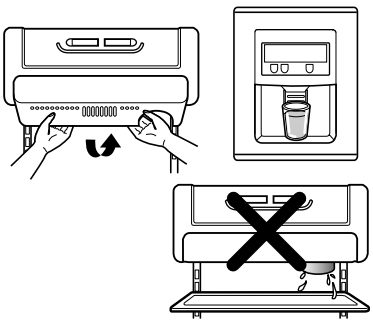


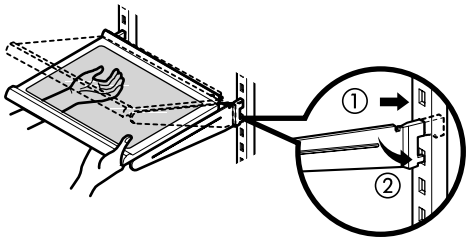
■ After installing water filter

Reassemble the lamp cover and the top shelf of the refrigerator. To place the top shelf of the refrigerator, raise the front part of the shelf a bit so that the hook of the shelf fits into the groove.

In order to clean the water filter system, drain water for about 3 min.

Note : Then open the door of the refrigerator and check for water dripping on the shelf under the filter.



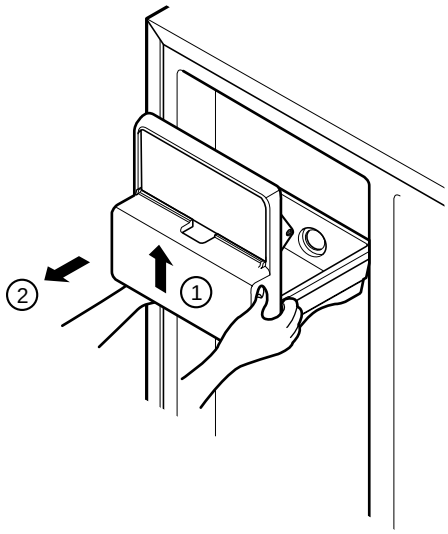


HOW TO INSTALL REFRIGERATOR

3. How to Control the Amount of Water Supplied to Icemaker.

3-1. Verify the amount of water supplied to the Icemaker.

1. Pull out the ice bin in the upper part of the freezer compartment.

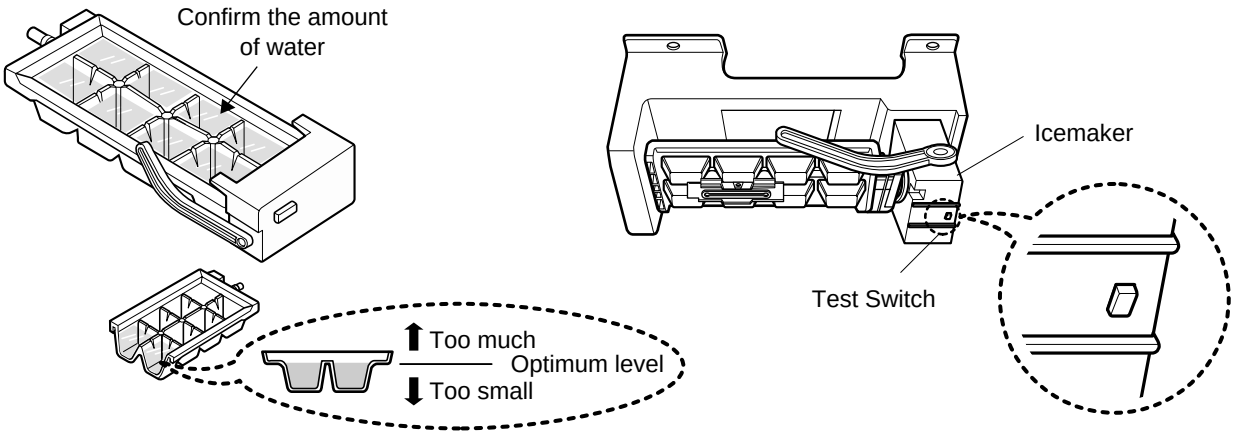


Caution : • Do not put hands or tools into the chute to confirm the operation of geared motor. (Doing so may damage refrigerator or cause injury to hands.)

• Check the operation of motor by its operation noise.

2. Apply electricity after connecting water pipe.

1) Press test switch under the Icemaker for two seconds as shown below.
2) The bell rings(ding~dong), ice tray rotates, and water comes out from the Icemaker water tube.
3) The water shall be supplied two or three times into the tray. The amount of water supplied for each time is small. Put a water container under the ice tray and press test switch.
4) When ice tray rotates, the water in it will spill. Collect the spilled water and throw it into the sink.
5) When ice tray has finished rotation, water comes out from the water tube. Confirm the amounts of water in the ice tray. (Refer to fig. The optimum amount of water is 110cc[6.7in^3])



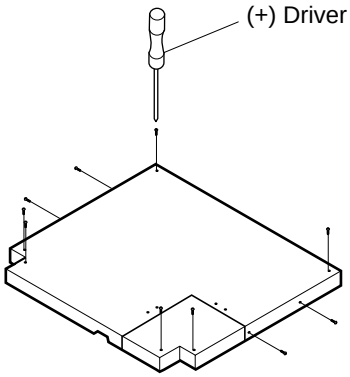
* It is acceptable if the adjusted level of water is a bit smaller than optimum level.

HOW TO INSTALL REFRIGERATOR

3-2. Control the amount of water supplied to the Icemaker.

Caution : • Unplug the power cord from the wall outlet and wait for more than three minutes before disconnecting PWB cover as 310V is applied in the control panel.

1. Disconnect PWB cover from the upper part of the refrigerator.



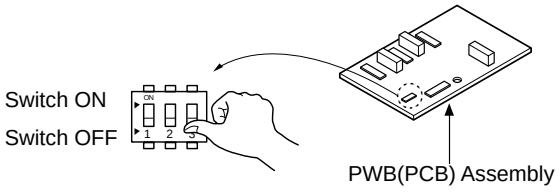
2. Adjust the amount of water supplied by using the DIP switch.

■ **Water Supplying Time Control Option**

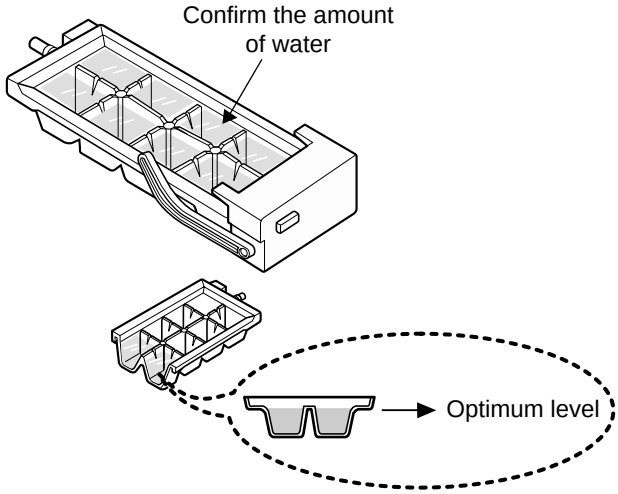
SWITCH NO			Water Suppling
Switch1	Switch2	Switch3	**Time**
OFF	OFF	OFF	6 Sec.
ON	OFF	OFF	4 Sec.
OFF	ON	OFF	4.5 Sec.
ON	ON	OFF	5 Sec.
OFF	OFF	ON	5.5 Sec.
ON	OFF	ON	7 Sec.
OFF	ON	ON	8 Sec.
ON	ON	ON	9 Sec.

1) The water supplying time is set at five seconds when the refrigerator is delivered.
2) The amount of water supplied depends on the setting time and the local water pressure.
3) If the ice cubes are too small, increase the water supplying time. This happens when too little water is supplied to the tray. (eg: change 5 to 5.5 seconds)
4) If ice cubes stick together, decrease the water supplying time. This happens when too much water is supplied into the ice tray. (eg: change 5 to 4.5 seconds)

Caution : When adjusting the amount of water supplied, adjust in small increments. Otherwise the water may spill over.



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



COOLING CYCLE AND REFRIGERANT

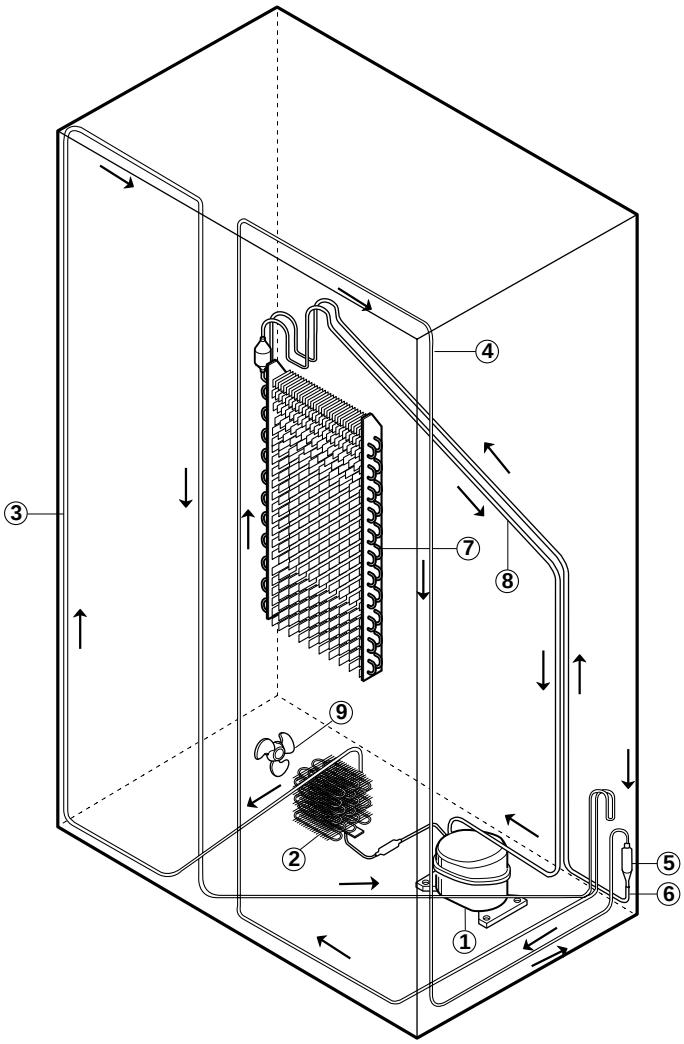
1. Cooling Cycle (Cooling Principles/Refrigerant Gas Circulation)

1-1. Principles of cooling cycle

Cooling is an operation by which the temperature of a unit is maintained below the ambient temperature. For the cooling operation, there must be an insulated space, the refrigerant (R134a) to absorb heat in the space, and a refrigerant circulation system including a compressor, condenser, evaporator, etc. to conduct phase transformation of the refrigerant.

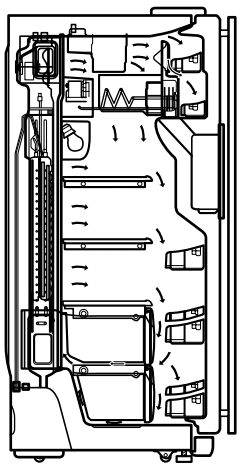
1-2. Refrigerant gas circulation

① Compressor
② Wire Condenser
③ Hot Line (Freezer Compartment)
④ Hot Line (Refrigerator Compartment)
⑤ Drier
⑥ Capillary Tube
⑦ Evaporator
⑧ Suction Pipe
⑨ Cooling Fan

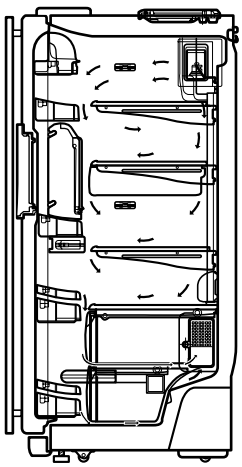


1-3. Cool Air Circulation

Freezer Compartment



Refrigerator Compartment



COOLING CYCLE AND REFRIGERANT

2. Description of each component

NO.	NAME	FUNCTION	REFRIGERANT (IN AND OUTLET)
1	COMPRESSOR	Compresses refrigerant from low(0 kg/cm^2) to high pressure(8-12 kg/cm^2)	LOW PRESSURE GAS(0 kg/cm^2) TEMP(30°C[86°F]) → HIGH PRESSURE GAS(8-12 kg/cm^2) TEMP(80[176°F]-120°C[248°F])
2	CONDENSER	Refrigerant transforms from high pressure gas to high pressure liquid in condenser. This phase transfromation dissipates heat.	HIGH PRESSURE GAS(8-12 kg/cm^2) TEMP(80[176°F]-120°C[248°F]) → HIGH PRESSURE LIQUID(8-12 kg/cm^2) TEMP(40[104°F]-60°C[140°F])
3	DRIER	Drier absorbs moisture in the system. (moisture absorption equipment)	
4	CAPILLARY TUBE	Long and narrow tubes. Refrigerant pressure drops rapidly as refrigerant passes through the tube.	HIGH PRESSURE LIQUID(8-12 kg/cm^2) TEMP(40[104°F]-60°C[140°F]) → LOW PRESSURE LIQUID(10 kg/cm^2) TEMP(-27°C[-17°F])
5	EVAPORATOR	Refrigerant transforms from low pressure liquid to low pressure gas. This phase change absorbs heat from the surrounding air and food. This enables foods to freeze in the freezer and to stay fresh in the refrigerator compartment.	LOW PRESSURE LIQUID(0 kg/cm^2) TEMP(-27°C[-17°F]) → LOW PRESSURE GAS(0 kg/cm^2)
6	SUCTION PIPE	Connects evaporator and compressor.	LOW PRESSURE GAS(0 kg/cm^2) TEMP(-27°C[-17°F]) → LOW PRESSURE GAS(0 kg/cm^2) TEMP(30°C[86°F])

NOTE : • *The pressure of refrigerant changes from high to low at capillary tube outlet. The low pressure refrigerant rushes into the evaporator inlet and makes noise.*

• *When low pressure liquid refrigerant evaporates in the evaporator, evaporation takes place in the entire evaporator from inlet to outlet. When this occurs, noise may sometimes occur. Noise depends on the amount of evaporation so that noise may or may not occur. This is not a problem.*

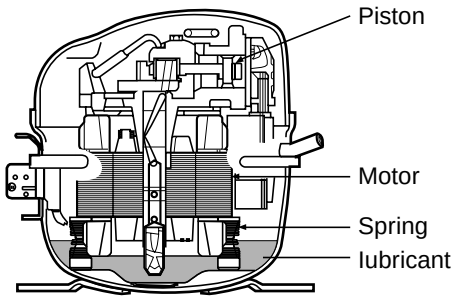
3. Containing refrigerant and foaming agent

Refrigerant	Characteristics	ODP	GWP	Remarks
Cyclo-Pentane (C5H10)	It does not contain chlorine which depletes ozone layer. Its GWP is almost **zero**. Pollution-free foaming agent.	0	8	Foaming Agent
R134a (HFC-134a)	It does not contain chlorine which depletes ozone layer. Its GWP is also very low compared with that of R12 (GWP:15,300).	8	1200	Refrigerant

* **ODP:** Ozone Depletion Index(relative value based on CFC11 as 1.0)
GWP: Globe Warmth Index(relative value based on CO_2 as 1.0)

FUNCTIONS AND OPERATION PRINCIPLES OF MAIN PARTS

1. Compressor(Reciprocating Type)



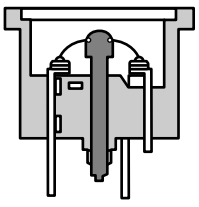
The compressor consists of a piston and motor. The motor pushes piston and piston which compresses refrigerant gas to a high pressure. Lubricants are sealed in the compressor to a accelerate cooling and lubricate compressor. Low pressure refrigerant is distributed through the entire compressor but high pressure refrigerant gathers around outer cooling plate through the outlet pipe.

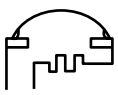
NOTE : • *A replacement compressor for service is full of nitrogen gas and sealed with rubber when it is delivered. This is to protect oxidation and to prevent the intrusion of moisture into the compressor. When bushing seals are removed, nitrogen gas shall rush out, producing noise. This is normal. If the nitrogen gas was leaked out. the compressor may be corroded and should not be used.*

• *Compressor should be protected from impact during transportation or storage to prevent eccentricity of motor axis.*

2. Over Load Protector

Over load protector relay protects motor by breaking circuits when temperature rises and excess current flows in the compressor. It consists of bimetal element and heater. Bimetal element defroms when temperature rises and heater emits heat when over current flows. This relay is mounted on the outer surface of compressor and senses temperature of compressor. This relay is connected to the compressor motor in series. When operating contact point of bimetal comes off from fixed contacting point, over load protector relay breaks circuit. When the temperature of compressor lowers and the heater cools, the operating contact points move back to the fixed contact point and the compressor works again after 3 or 5 minutes.



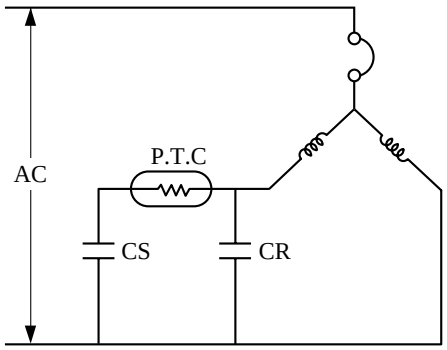


NOTE : • *Over load protector relay detects temperature and current at the same time. It operates when the temperature of compressor is high even there is no current. It shall also operates when over current flows even the temperature of compressor is low. It is also possible that both high temperature and over current shall operate relays at the same time.(Current is more effective than temperature.)*

• *Over load protector relay shall operate again if the surface temperature and current of compressor repeats a breach of the threshold values even though the heater is cools down after 3 or 5 minutes of downtime. Customer may claim that the relays repeated on and off operation as the temperature remained constant. In this case, switch off the power and let the compressor cool down fully. If the relay malfunctions after this, replace it with a new one.*

3. Positive Temperature Coefficient (PTC)

Starter is connected to auxiliary winding in series and accelerates compressor starting. It is located on outer case of compressor with relays. Previously, the starter was a contact point type. but it is now generally a PTC element type. PTC stands for positive temperature coefficient and it has a starting value of resistance(e.g. 22 Ω). It is an element whose resistance becomes infinitive when current flows. The starting principles of a single-phase induction motor and simple alternating current circuit must be fully understood in order to understand the roles of starter. The circuit is shown below.



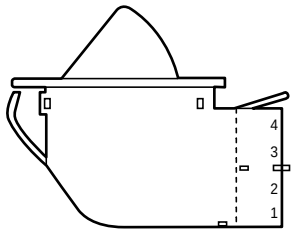
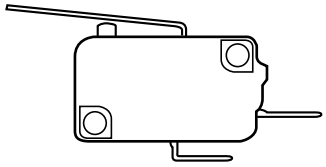
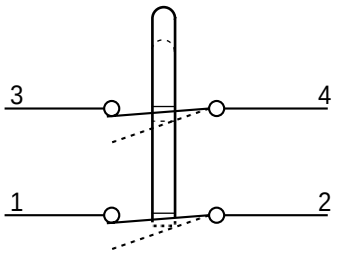
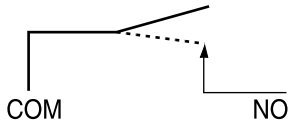
FUNCTIONS AND OPERATION PRINCIPLES OF MAIN PARTS

4. Switch(Door, Dispenser)

1. Function

1) Door switches in freezer and refrigerator compartments turns on and off the lamps when the freezer and refrigerator doors are opened and closed. They also switch the fans in the freezer compartment on and off at the same time.
2) Home bar switch turns on and off the lamp in the refrigerator compartment when home bar is open and close.
3) Dispenser switch turns the dispenser lamp on and off when dispensing ice/water.

2. Operation Principles and Characteristics

Classification	Door Switch	Dispenser Switch
Shapes		
Circuits		
Operation Principles /Charact -eristics	- The switch points make contact depending on wheather one of the doors is opened or closed. These control the lamps in the refrigerator and the freezer compartments.	- The dispenser bushing button is pressed by the switch lever. This turns on the dispenser lamp.

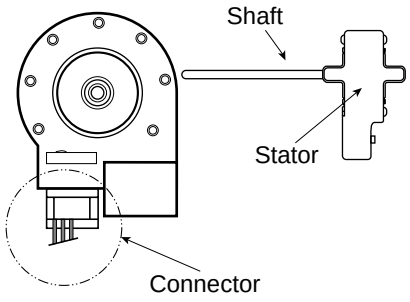
3. Troubleshooting

Troubles (Parts)	Symptoms	Check	Measures
Bad Contact	Lamp is not on when door is open. (door switch)	Operate switch button three or four times and verify that the lamp is on and off. See if lamp is burnt out. If lamp is O.K, then remove switch and measure the resistance between terminals. (Door Switch: 1-2, 3-4.)	Replace switch if the resistance between terminals is not **zero**.
	1. Dispenser lamp is not on when bushing button is pressed. 2. Ice and water are not dispensed.	Operate switch button three and four times and confirm the lamp, ice and water dispenser work. It they do not work, then remove switch and measure the resistance between terminals. (COM-NO)	Replace switch if the resistance between terminals is **zero**.

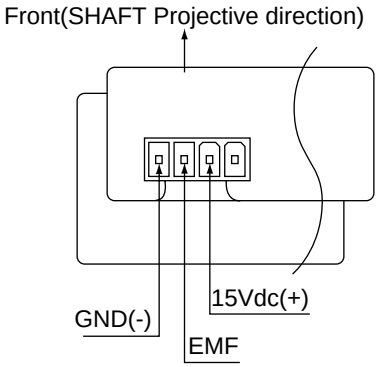
FUNCTIONS AND OPERATION PRINCIPLES OF MAIN PARTS

5. Motor

1. Freezer/Cooling Motor Used mainly for Freezer/Cooling motor

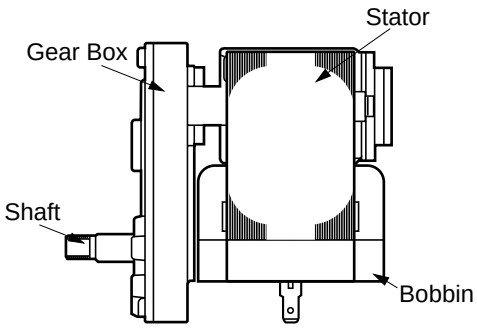


■ **Detail of connector**



2) Gear Box Application Type

Gear box is used for moving and crushing ice which is stored in the ice bin. Gear box is connected at the output axis of shaded motor. Gear box changes high RPM of motor to low RPM but high power by gear box. This power can move and crush ice.



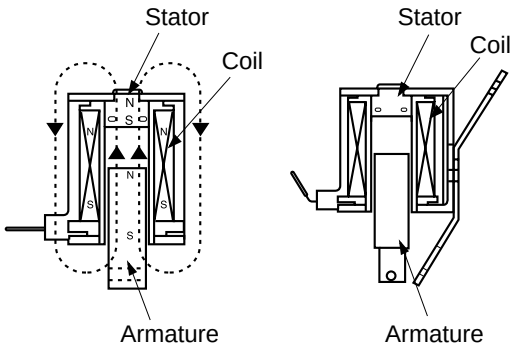
6. Solenoid.

1. Structure of Solenoid

Two types of solenoids are used for refrigerator depending on the applications such as solenoids for ice cube and ice dispenser. The solenoid is composed of an armature, stator and a main body which supports stator and pulls the armature when electricity is applied.

2. Operation Principles

When electricity is applied to the coil, magnetic field forms around the coil. The armature in the magnetic field moves toward the stator and ice dispenses. When electricity is removed, the armature moves back to its original position (rated stroke distance) by the spring force and stops moving.



<Solenoid for ice cube> **<Solenoid for dispenser>**

CAUTIONS : • *Do not operate solenoid for more than two minutes. It may be overheat.*

• *Solenoid is not for continuous use but discontinuous use as it operates when customer dispenses ice.*

FUNCTIONS AND OPERATION PRINCIPLES OF MAIN PARTS

3. Troubleshooting

Symptom	Faults(parts)	Check	Measures
Crushed ice comes out when ice cube is selected.	1. Connector is missed. 2. Solenoid for ice cube is cut.	1. Check connection parts. 2. Check resistance between terminals. The resistance is infinite when it is cut.	1. Join connector. 2. Replace parts.
Ice does not dispense but jams on the door path when ice is selected.	1. Connector is disconnected. 2. Solenoid for dispenser is cut.	1. Check connecting part. 2. Check the resistance between terminals. Resistance is infinite when it is cut.	1. Join connector. 2. Replace parts.

7. Heater

1. Summary

Heaters are used to remove dew and frost on the evaporator and ice and dew on the parts of refrigerator.

* SXS Refrigerator Defrost System
  It is MICOM controlled automatic defrost system.
  Heater turns on when the set time in MICOM has elapsed and off when the defrost sensor senses the defrost is complete.

2. Types of heater and their roles

Classification	Application	Functions	Resistance	Remarks
Heater, Sheath-AL	Evaporator Upper Part	Evaporator Defrost	240W	
Heater, Sheath-ML	Evaporator Lower Part	Evaporator Defrost	260W	
Heater, Plate	Drain Lower Part	It melts and discharges the ice dropped from the evaporator through drain pipe during defrost.	45W	
Heater, Plate	Chilled Room Duct	Prevent icing from the chilled room duct.	5W	
Heater, Plate	Damper	Prevent icing from damper	3W	
Heater, Plate	Dispenser(Freezer door)	Remove dew from dispenser	5W	
Heater, Sheet	Dispenser(Freezer door)	Remove dew from duct door.	1W	
Heater, Cord	Frame LCD	Prevent icing from Home Bar.	2.7W	
Heater, Plate	Tube Inject	Prevent icing Tube Inject	3.5W	

3. Faults Symptom (Products): faulty heater

1) Heater, Sheath-ML/AL

Problem	Symptom	Checks	Measures
1. Heater, Sheath heating wire is cut, corroded, or connecting wire is cut. 2. Evaporator is not close enough to Heater, Sheath-AL. 3. Poor terminal contact.	Poor Defrost	1. The resistance is infinity when it is measured at both connector ends with a tester. 2. Visually check for a faulty defrost with eyes. 3. The resistance fluctuates very much when the resistance is measured at both ends with a tester.	1. Replace parts. (Reconnect if wire is disconnected.) 2. Move evaporator closer to Heater, Sheath-AL. 3. Correctly insert connector.
4. Moisture intrudes into the pipe through the crack as Heater, Sheath-AL Pipe, and/or Silicon Cap are dented.	Short circuit	4. When the resistance between both connector ends is measured with a tester, the resistance is zero or beyond the allowance of marked value. (allowance: marked value±7%)	4. Replace parts.

2) Heater Plate (Drain)

Problem	Symptom	Checks	Measures
1. Heating wire is cut or corroded. 2. Poor terminal contact.	Poor defrost	1. The resistance is infinity when the resistance is measured at both connector ends with a tester. 2. The resistance fluctuates very much when the resistance is measured at both connector ends with a tester.	1. Replace parts. (Reconnect if wire is cut) 2. Correctly reinsert the connector.
3. Moisture intrudes as the heating wire is damaged by a sharp fin of evaporator.	Short circuit	3. When the resistance between both connector ends is measured with a tester, the resistance is zero or beyond the allowance of marked value. (allowance: marked value±7%)	3. Replace parts.

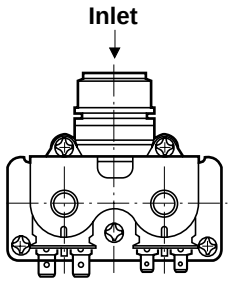
3) Other Heaters

Problem	Corresponding Heater	Symptom	Checks	Measures
1. Heating wire is cut or corroded. 2. Poor terminal contact.	Heater Plate (Chilled drawer duct)	The temperature of chilled drawer is high. (icing on duct)	1. The resistance is infinite when the resistance is measured at both connector ends with a tester. 2. The resistance significantly very much when the resistance is measured at both connector ends with a tester.	1. Replace parts. (Reconnect if the wire is cut) 2. Correctly insert connector.
	Heater Plate (damper)	Incorrect refrigerator compartment temperature. (icing on the duct)		
	Heater Plate (dispenser)	Dew forms around the dispenser	1. Remove connector from freezer hinge and measure the resistance of heater.	
	Sheath Heater (duct door)	Dew forms around duct door.	1. The resistance is infinite when it is measured at both connector ends with a tester.	
	Cord Heater (Frame LCD)	Dew forms around Frame LCD.	1. Remove connector from R hinge and measure the resistance of heater.	

8. Valve

1. Nomenclature of each part

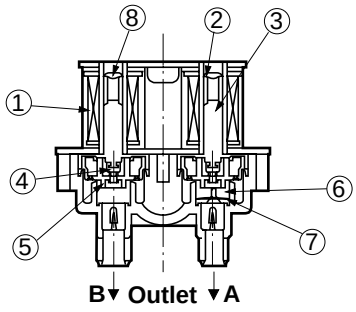
① Solenoid Coil
② Spring
③ Plunger
④ Packing
⑤ Holder
⑥ Flow Control
⑦ Flow Washer



2. Operation Principles

1) While Opening
When power is on and the inlet water pressure reaches at a certain value, the plunger (3) moves up by solenoid coil. The water passes through porous hole and then center holes of the holder and flows to the outlet. Flow control (6) and flow washer (7) are included in order to maintain a constant flow rate and pressure (1.0 ~ 8.0 kgf/cm^2) in A line (water supplied to icemaker).

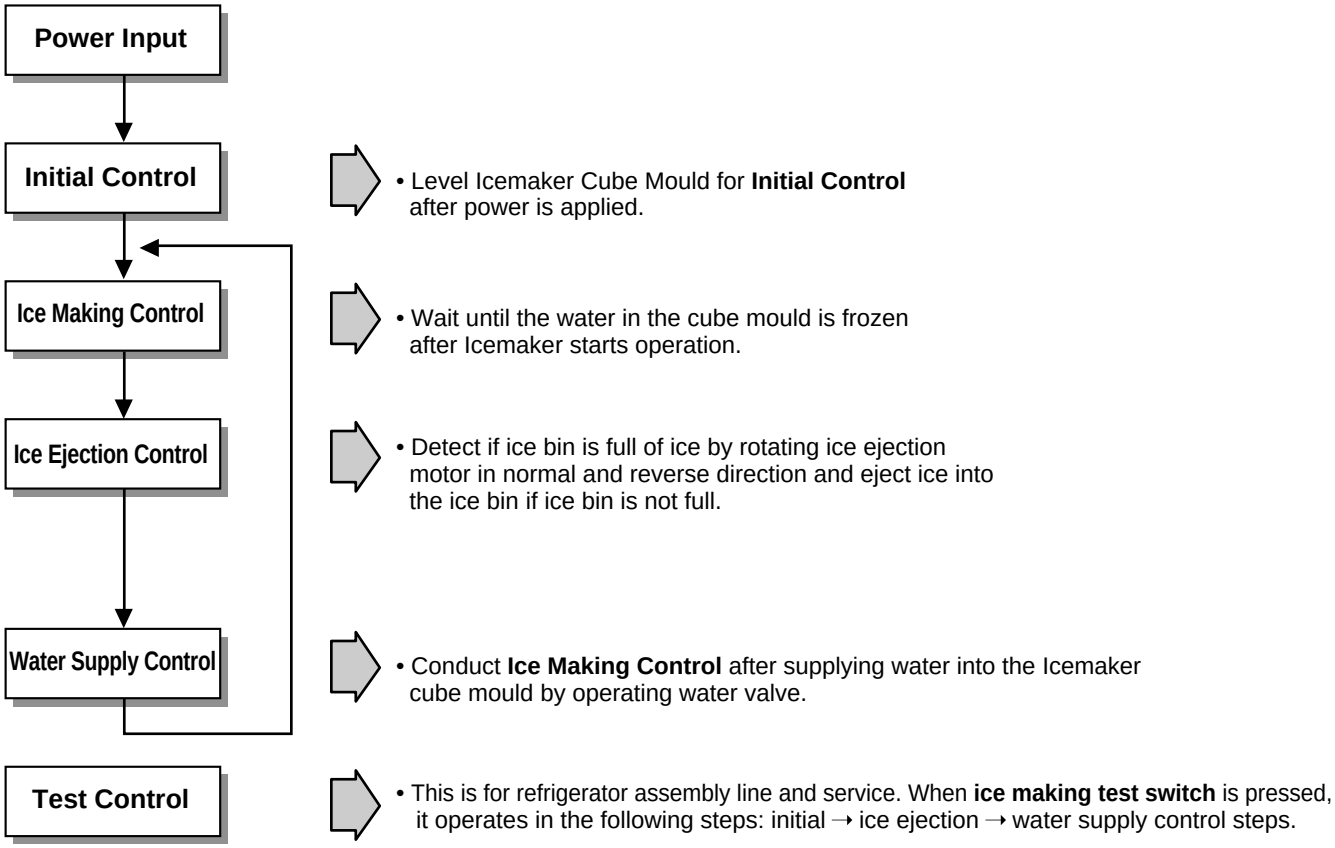
2) While Closing
The water stops flowing to outlet as packing seals (4) the hole of holder (5) by spring when power is off.



ICEMAKER AND DISPENSER OPERATION PRINCIPLE AND REPAIR METHOD

1. Working Principles

1-1. Icemaker Working Principles



1-2. Dispenser Working Principles

1. This function is available in Model GR-D267 where water and ice are available without opening freezer compartment door.
2. **Crushed Ice** is automatically selected when power is initially applied or reapplied after power cut.
3. When dispenser selection switch is continuously pressed, light is on in the following sequence: **Water → Cube Ice → Crushed Ice**.
4. Lamp is on when dispenser bushing button is pressed and vice versa.
5. When dispenser crushed ice bushing button is pressed, dispenser solenoid and geared motor work so that crushed ice can be dispensed if there is ice in the ice bin.
6. When dispenser cube ice bushing button is pressed, dispenser solenoid, cube ice solenoid and geared motor work so that cubed ice can be dispensed if there is ice in the ice bin.
7. When dispenser water bushing button is pressed, water valve opens and water is supplied if water valve is properly installed on the right side of the machine room.
8. Ice and water are not available when freezer door is open.

2. Function of Icemaker

2-1. Initial Control Function

1. When power is initially applied or reapplied after power loss, the Icemaker cube mould level is detected after completion of MICOM initialization. The detecting lever moves up and down.
2. The level of Icemaker cube mould is determined by output signal, high and low signal, of Hall IC. The cube mould is leveled by rotating ice ejection motor in normal or reverse direction. The High/Low Hall signal is be applied to MICOM Pin No. 42.
3. If there is no change in signals one minute after the geared motor starts to operate, it stops Icemaker operation and checks the signal every hour. It reinitializes the Icemaker when the feedback signals becomes normal.
4. It datermines that the initialization is completed when it senses the Icemaker cube mould is horizontal.
5. Ice ejection conducts for 1 cycle whether ice or not ice is in the ice bin when power is initially applied.

2-2. Water Supply Control Function

1. This function supplies water into the Icemaker cube mould by operating the water valve when ice ejection control is completed and Icemaker mould is level.
2. The quantity of water supplied is determined by DIP switches and water pressure.

<Water Supply Quantity Table>

No	DIP SWITCH SETTING			WATER SUPPLY TIME	REMARKS
	SWITCH 1	SWITCH 2	SWITCH 3		
1	OFF	OFF	OFF	6.5 Sec.	* The quantity of water supplied depends on DIP switch setting conditions and water pressure as it is a direct tap water connection type. (the water supplied is generally 80 cc to 120 cc) * DIP switches are on the main PWB.
2	ON	OFF	OFF	5.5 Sec.	
3	OFF	ON	OFF	6 Sec.	
4	ON	ON	OFF	7 Sec.	
5	OFF	OFF	ON	7.5 Sec.	
6	ON	OFF	ON	8 Sec.	
7	OFF	ON	ON	9 Sec.	
8	ON	ON	ON	10 Sec.	

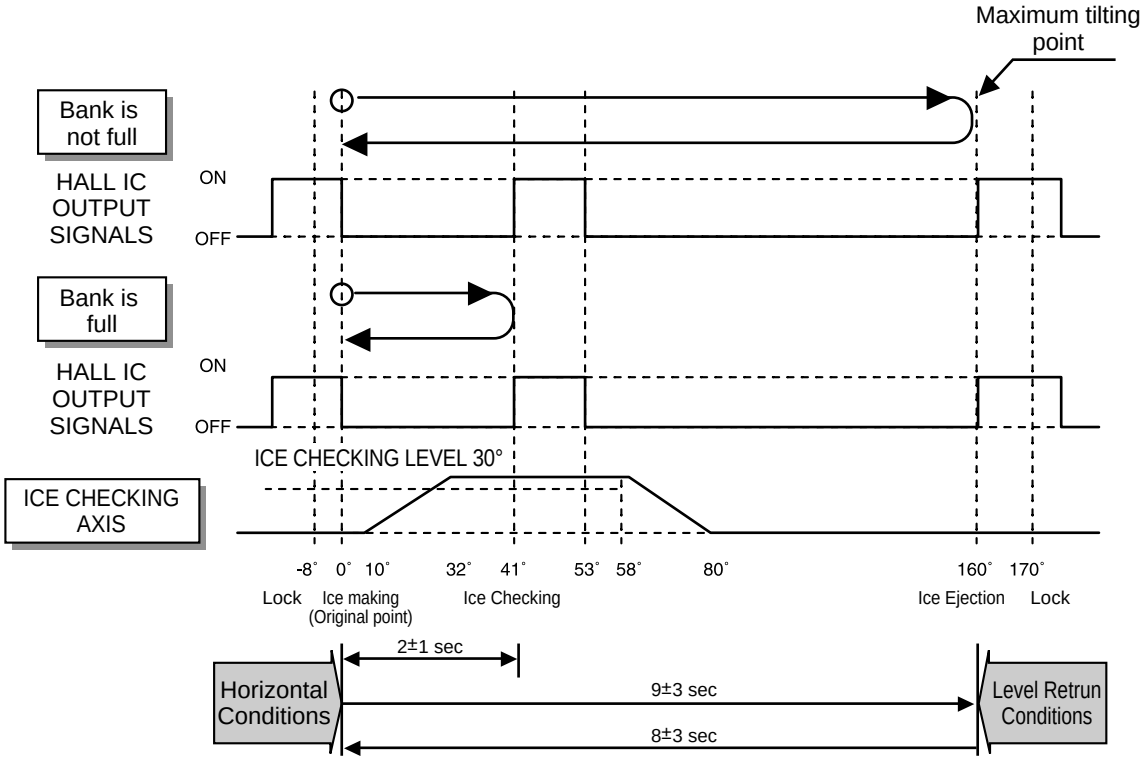
3. The refrigerator actively detects the DIP switch seting so that interrupting power is not necessary to change the supply preset. If the DIP switches are changed while water is being supplied, the changes will take effect until the supply cycle is complets.
4. When water supply signal is applied to water and ice valves at the same time during water supply, water is supplied to water valve. If water supply signal is applied to ice valve during water supply, water is supplied to both water and ice valves.

2-3. Ice Making Control Function

1. Ice making control is carried out from the completion of water supply to the completion of ice making in the cube mould. Ice making sensor detects the temperature of cube mould and completes ice making. (ice making sensor is fixed below Icemaker cube mould)
2. Ice making control starts after completion of water supply control or initial control.
3. Ice making is determined to be completed when ice making sensor temperature reaches at -8°C[18°F] 100 minutes after water is supplied to Icemaker cube mould.
4. It is judged that ice making is completed when Icemaker sensor temperature reaches below -12°C[10°F] after 20 minutes in condition 3.

2-4. Ice Ejection Control Function

1. This function ejects the ice from the Icemaker cube mould after ice making is completed.
2. If Hall IC signal is on within 3.6 seconds after ice ejection motor rotates in normal direction, it does not proceed with ice ejection. but waits. If the ice bin is full, ice ejection motor rotates in normal direction in every hour to check the condition of ice bin. If the ice bin is not full, the water supply control starts after completion of ice ejection control. If the ice bin is full, ice ejection motor rotates in reverse direction and stops ice making.
3. If ice bin is not full, ice ejection starts. The cube mould tilts to the maximum and ice is separated from the mould as ice checking lever raises.
4. Ice ejection motor stops for 1 second if Hall IC signal changes from OFF (low) to ON (high) after 3.6 seconds when ice ejection motor has rotated in normal direction. If there is no change in Hall IC signals within 1 minute after ice ejection motor operates, ice ejection motor stops as ice ejection motor or Hall IC is out of order.
5. If ice ejection motor or Hall IC is abnormal, ice ejection motor rotates in normal direction to perform its reinitialization. It resets the Icemaker if the ice ejection motor or Hall IC is normal.
6. The mould stops for 1 second at maximum tilted conditions.
7. The mould returns to a leveled position as ice ejection motor rotates in reverse direction.
8. When the mould is level, the cycle starts to repeat:
   Water Supply → Ice Making → Ice Ejection → Mould Returns to Horizontal



<Timing Chart During Ice Ejection>

2-5 Test Function

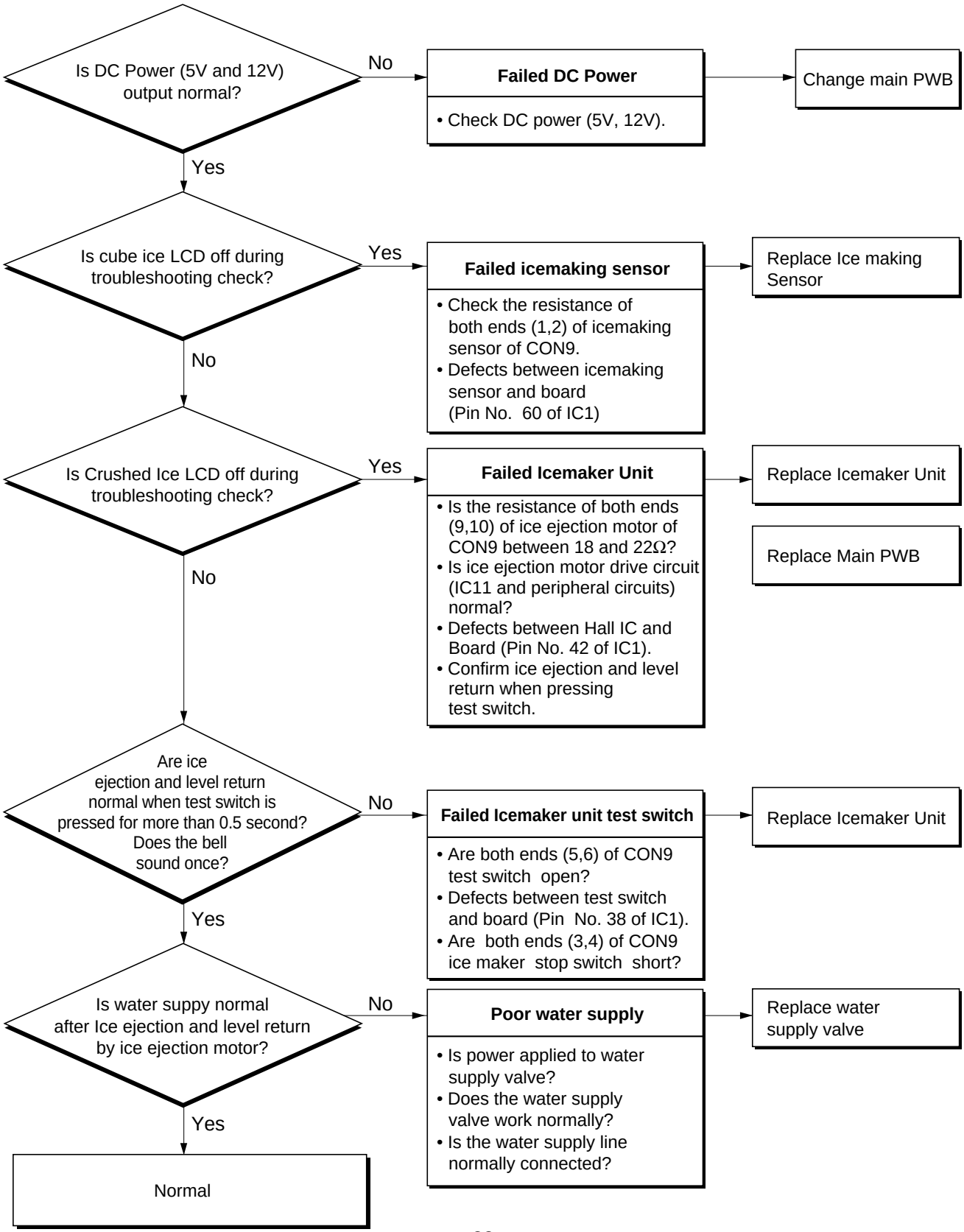
1. This function forces operation during operation servicing and cleaning. The test switch is mounted under the automatic Icemaker. The test function starts when the test switch is pressed for more than 0.5 second.
2. Test button does not work during ice ejection and water supply. It works when the tray is in the horizontal conditions. If the mould is full of ice during test function operation, ice ejection control and water supply control will not work.
3. When the test switch is pressed for more than 0.5 second in the horizontal condition, ice ejection starts irrespect of the mould conditions. Water will splash if test switch is pressed before the water in the mould freezes. Water shall be supplied while the mould returns to the horizontal conditions after ice ejection. Problems involving ice ejection, returning to the horizontal conditions, and water supply can be checked via the test switch. When test function performs normally, a buzzer sounds and the water supply function begins. Check it for repair if buzzer does not sound.
4. When water supply function is completed, the cycle continues as follows: Ice making → Ice ejection → Returning to horizontal conditions → Water supply
5. Remove ice from the Icemaker cube mould and press test switch. When Icemaker cube mould is full of ice as ice ejection and water supply controls do not operate.

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

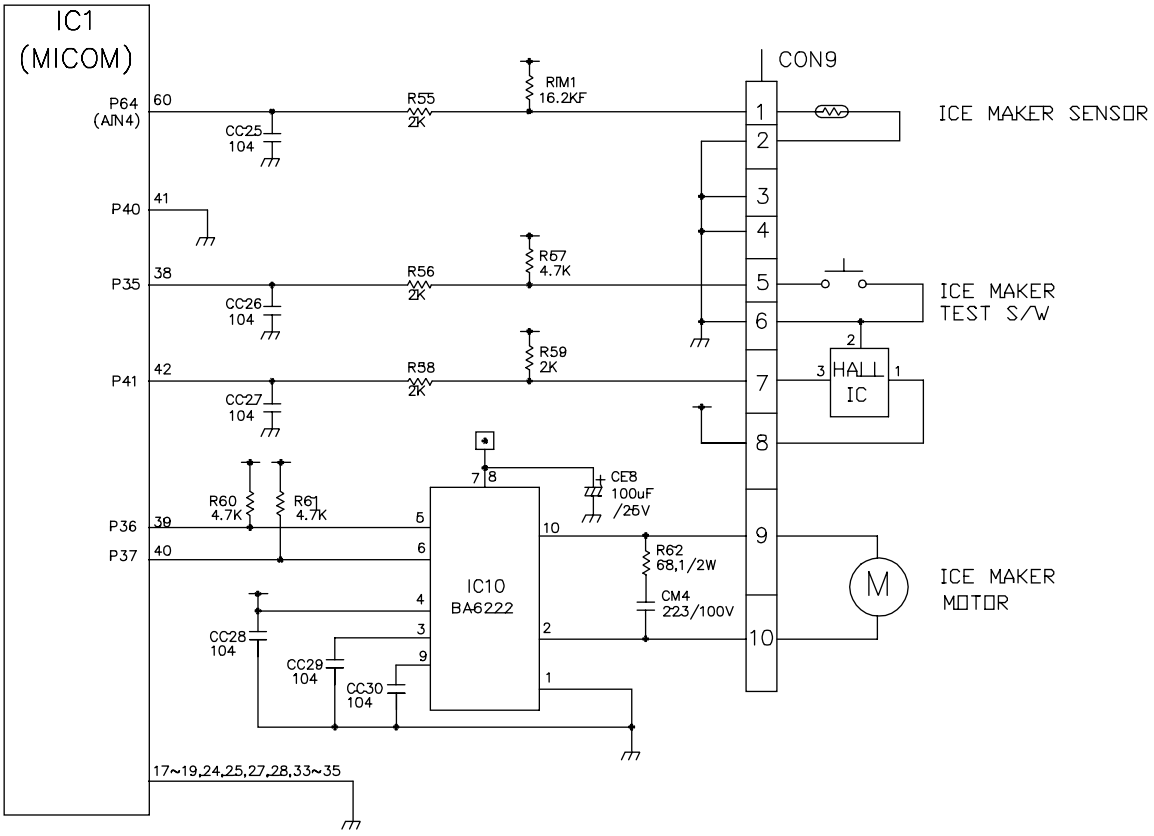
1. When freezer door is open, ice dispenser stops in order to reduce noise and ice drop.
2. When freezer door is open during ice ejection and cube mould returning to horizontal condition, ice ejection and cube mould level return proceed.
3. When freezer door is open, geared motor and cube ice solenoid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

3. Icemaker Troubleshooting

*** Troubleshooting:** it is possible to check the dispenser by pressing freezer and refrigerator temperature control buttons for more than 1 second. (Icemaker is normal if all leds are on): refer to trouble diagnposis function in MICOM section.



4. Icemaker circuit part



The Icemaker circuit above applies to the GR-D267 and consists of the Icemaker unit part installed in the freezing section and the Icemaker drive part of the main PWB.

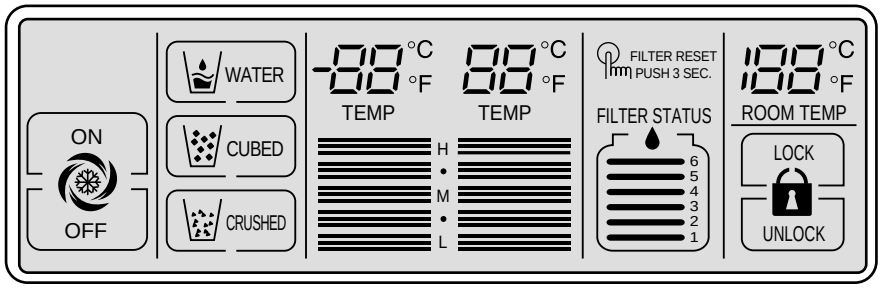
Water supply to the Icemaker container is accomplished by opening the valve via a solenoid relay for a duration set by the DIP switches. When water supply time elapsed, water supply automatically stops. This circuit exists for implementing functions such as ice removal, ice-full detection, horizontal balancing and sense of ice-making temperature sensing for the Icemaker container. Ice-making temperature sensing is same as in the temperature sense circuit part of the main PWB, refer to it.

Test switch input detection of the Icemaker is same as in the door switch input detection circuit of the main PWB.

1. This function is used in operation test, service execution and cleaning, etc. And is performed if pressing the test switch installed at the automatic Icemaker itself for more than 0.5 seconds.
2. The test switch operates when the ice-maker is in the horizontal position. Test function is not available during the water supply operation. Ice removal control and water supply controls are not performed if ice-full is detected during the operation of test function.
3. If pressing the test switch for 0.5 second or more in the horizontal status, ice removal operation is immediately performed regardless of the generation conditions of ice in the ice-making tray. Therefore, exercise caution as water may overflow when operating test function before the water has frozen. The water supply function operates with the horizontal balancing operation after ice removal operation. Therefore, you can check any problem of ice removal operation, horizontal operation and water supply. In this case, if test check returns normal feedback, a bell sound rings and water supply control is performed. No ringing of the bell sound means failure and repair service must be performed.
4. When water supply is completed, operation continues in the normal cycle of **ice making, ice removal, returning to horizontal status,** and **water supply**.

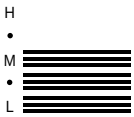
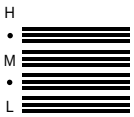
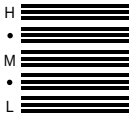
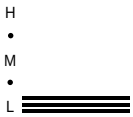
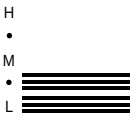
MICOM FUNCTION

1. Monitor Panel



2. Description of Function

2-1. Funnction of Temperature Selection

Division	Power Initially On	1st Press	2st Press	3th Press	4th Press
Setting temperature					
Temperature Control	Medium	Medium Max	Max	Min	Medium Min
Freezer Control	-19 °C [-2 °F]	-22 °C [-7 °F]	-23 °C [-9 °F]	-15 °C [5 °F]	-17 °C [1 °F]
Refrigeration Control	3 °C [37 °F]	2 °C [35 °F]	0°C [32 °F]	6 °C [43 °F]	4 °C [39 °F]

* The temperature can vary ±3 °C depending on the load condition.

❇ Whenever pressing button, setting cycles in the order of (Medium) → (Medium Max) → (Max) → (Min) → (Medium Min).

- The actual inner temperature varies depending on the food status, as the indicated setting temperature is a target temperature, not the actual temperature within refrigerator.
- Refrigeration appears to be weak at first use. Please adjust temperature as shown after using refrigerator for minimum of 2 to 3 days.

MICOM FUNCTION

2-2. LCD Back Light Control

1. In order to easily view display status on the LCD, LCD Back Light turns on for a minute in application of initial power, for a minute with button use, and for a minute after closing the door.
2. If pressing any display button once with the backlight turned off, buzzer rings and button function is not performed but only backlight is turned on (If pressing the first button with the back light turned off, only back light ON function is performed).
3. When pressing the special freezing button and the freezing temperature adjustment button for more than a second, the back light is turns on and all the graphics of LCD are turned on. If releasing the button, the LCD graphic returns to in the previous state and the back light turns off (check LCD graphic and back light ON/OFF status).

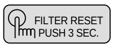
2-3. Outside temperature display function

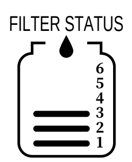
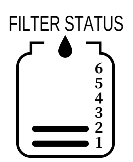
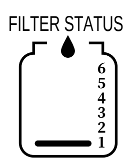
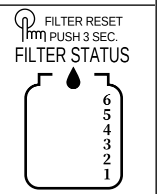
1. The temperature sensor at the left U of refrigerator senses ambient temperature and displays that temperature in the left side of **Outside temperature** text on the LCD display.
2. Ambient temperature is displayed up to -9°C[16°F] ~ 49°C[120°F] and displayed as **Lo** for less than -10°C[14°F] and as **HI** for more than 50°C[122°F]. If the ambient temperature sensor fails, **Er** is displayed.
3. Since display temperature of ambient temperature is temperature sensed by the ambient sensor in the hinge U of the freezing compartment, it may differ from the ambient temperature display of other household electrical appliances.

2-4. Lock function (display button lock)

1. When power is first applied, only the **Release** text is turned on in the lock/release status indicator at the right side of the LCD display.
2. If desiring to lock the display status, press the lock/release button once, **Release** text is turns off at the right side of lock graphic of LCD and **Lock** text is turned on indicating locked status.
3. The only buzzer sound rings and function is not performed even if pressing display button other than lock/release key when in the lock status.
4. If desiring to release the lock status, press the lock/release button once, **Lock** text turns off at the right side of lock graphic of LCD and **Release** text turns on in dicating locked release status.

2-5. Filter status display function

1. Remaining filter replacement period is displayed as in the below figure. Each line in dicates the number of months before the next filter replacement.
2. The graphic/text indicator  appears if in the LCD if 6 months of filter use have passed.
3. Reset the filter status by pressing the filter replace button for more than 3 seconds to after replacing filters when 6 months of filter use have transpired or merely if desiring to reset the filter display status.

Classification	In initial use	1 Month use	2 Months use	3 Months use	4 Months use	5 Months use	6 Months use
Filter Status Display							

2-6. Automatic Icemaker

- The automatic Icemaker can automatically make 8 pieces of ice at a time up to 10 times a day, These quentities may vary according to various conditions in cluding how many times the refrigerator door opens and closes.
- Ice making stops when the ice storage bin is full.
- If you don't want to use automatic Icemaker, switch the Icemaker OFF.
  If you want to use automatic Icemaker later, switch it ON.

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

MICOM FUNCTION

2-7. When Icemaker does not operate smoothly

Ice is frozen together

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

* If ice is not used frequently, it may freeze together.

Power failure

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

The unit is newly installed

- It takes about 12 hours for a newly installed refrigerator to make ice in the freezer compartment.

2-8. Super freezer

Please select this function for prompt freezing.

- **On** or **Off** cycles whenever pressing **SUPER FRZ** button.
- The graphic indicator remains in the On status after flickering 4 times when selecting Special Refrigeration **On**.
- Super freezer function automatically turns off after a fixed time passes.

2-9. Lock

This button prevents use of a different button.

- At initial Power on, the control panel is unlocked.
- Lock or Release cycles whenever pressing the **LOCK CONTROL**.
- Pressing another button while the panel is locked will yield no results.

2-10. Super freezing

1. Super freezing is a function to improve cooling speed of the freezing chamber by consecutively operating compressors and freezing room fan. Pressing the super freezing button toggles the Super Freezer feature on and off when the feature turns on the graphic remains on after blinking once.
2. Super freezing is cycles in order of Selection/ Release (**Turn On** / **Turn Off**) whenever pressing the selection button.
3. Super freezing is released if power failure occurs and the re frigerator then returns to the original status.
4. Temperature setting is not changed even if selecting the super freezing option is selected.
5. A change of the temperature setting of the freezing chamber or the cold storage chamber is permitted with super freezing selected. The change is processed while Super Freeze is active.
6. The cold storage chamber operates in the state currently set with super freezing selected and processed.
7. Note that the super freezing, the super freezing function deactivates after continuously operating compressor and the freezing room fan for a certain amount of time.
8. If frost removal starting time occurs during super freezing, super freezing operation executes only for the remaining time after completion of frost removal when the super freezing operation time passes 90 minutes. If passing 90 minutes, super freezing operation is carried out only for 2 hours after completion of frost removal.
9. If pressing the super freezing button during frost removal, the super freezing LCD indicator turns on but if pressing the super freezing, compressor operates only after the remaining defrost time has passed.
10. If selecting super freezing within 7 minutes (delay for 7 minutes of compressor) after the compressor stops, compressor operates after the remaining time has passed.
11. The freezing room fan motor operates at high RPM during operation of super freezing.

MICOM FUNCTION

2-11. Control of variable speed freezing room fan

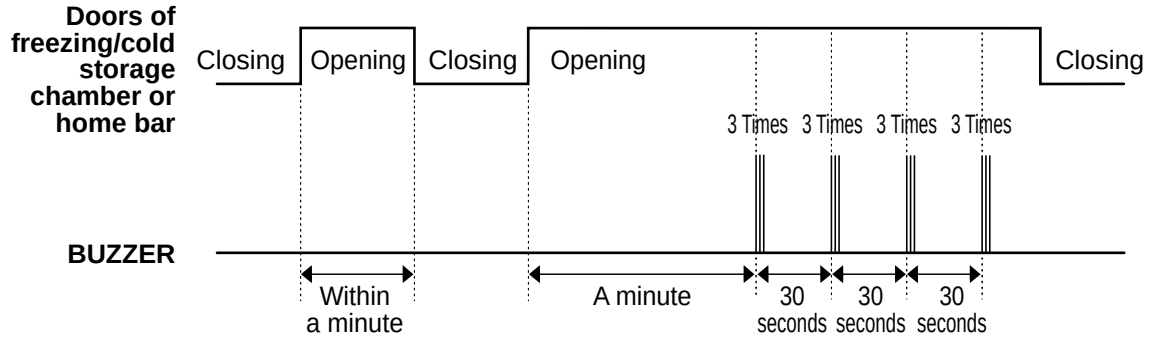
1. To increase cooling speed and load response speed, the MICOM sets freezing room fan motor at the high speed of RPM or the standard RPM.
2. Only at the application of initial power, or special freezing operation, or load response operation does the MICOM direct speed of RPM. The MICOM directs the standard RPM in other general operations.
3. If opening doors of freezing / cold storage chamber or home bar while fan motor in the freezing chamber operates, the freezing chamber fan motor operates normally. (If operating in the high speed of RPM, it switches to the standard RPM). However, if opening doors of freezing chamber or home bar, the freezing room fan motor stops.
4. As for monitoring of BLDC fan motor error in the freezing chamber, MICOM immediately stops the fan motor when sensing that the BLDC fan motor is locked or pooly operating if there would be position signal for more than 65 seconds at the BLDC motor. In such cases, the MICOM in dicutes a failure (refer to failure diagnosis function table) on the LCD display and attempts arestant of the cycle in 30 minutes. If normal operation is detected, failure status is released and refrigerator resets to the initial status (reset).

2-12. Control of cooling chamber fan motor

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

2-13. Door opening alarm

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



2-14. Ringing of button selection buzzer

1. If pressing the front display button, a bell sound rings.

2-15. Ringing of forced operation, forced frost removal buzzer

1. If you press the test button on the Main PCB, a tone sounds.
2. In selecting forced operation, alarm Sound is repeated and completed in the cycle of On for 0.2 second and Off for 1.8 second three times.
3. In selecting forced frost removal, alarm sound is repeated and completed in the cycle of On for 0.2 second , Off for 0.2 second, On for 0.2 second and Off for 1.4 second three times.

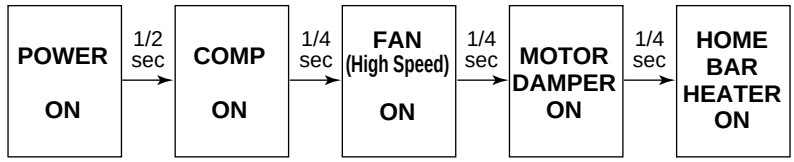
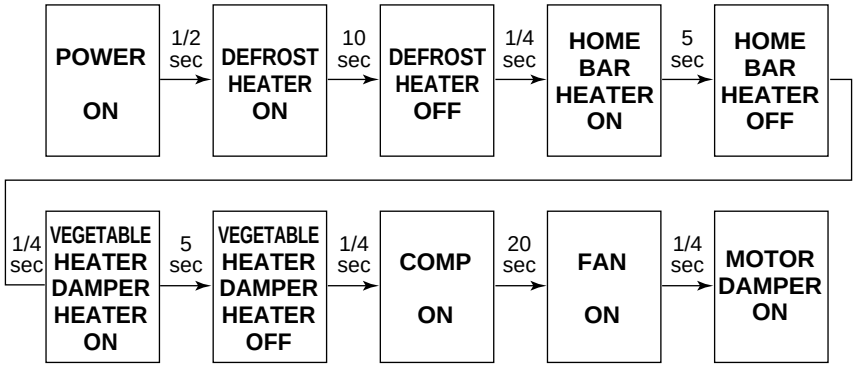
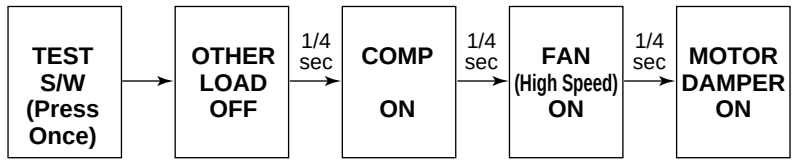
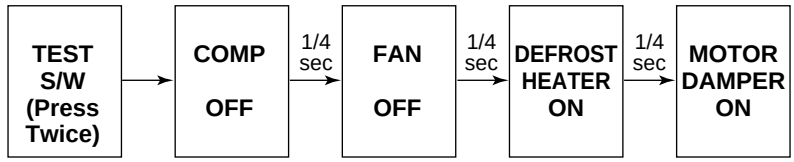
MICOM FUNCTION

2-16. Frost removal function

1. Frost removal is performed every 7 to 7.5 hours of accumulated compressor operation time.
2. After providing initial power (or after power failure), frost removal starts whenever total operation time of compressor becomes 4 to 4.5 hours.
3. Frost removal is completed if temperature of the frost removal sensor becomes more than 5°C[41°F] after starting frost removal. Poor frost removal is not displaced if it does not arrive at 5°C[41°F] even if two hours have passed after starting frost removal.
4. No removal is done if frost removal sensor fails (snapping or short-circuit).

2-17. Electric Equipment Progressive Operation

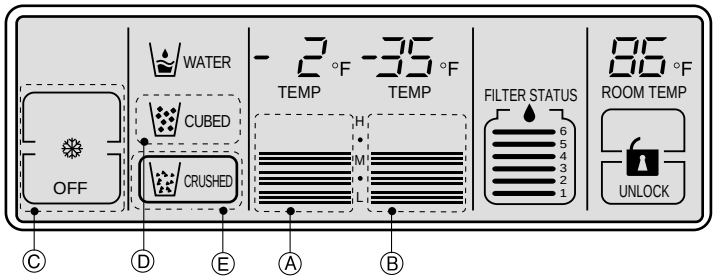
Compressor, defrost heater, freezer fan, cooling fan, electromagnetic single motor damper, etc. start in the following sequence in order to prevent noise and parts damage when power is first applied and when testing is complete.

Function		Load Starting Sequence	Remarks
When electricity is first applied	When the temperature of defrost sensor is above 45°C[113°F] (when purchased or moved to another house)		If there is an error in the process, startup does not work. ■ Load starting sequence when freezer and refrigerator doors are closed.
	When the temperature of defrost sensor is below 45°C[113°F] (during power loss and servicing)		
TEST MODE	Test Mode 1 (Forced Starting)		If switch is once more pressed or the temperature of defrost sensor is above +5°C[41°F] in test mode 2, it returns to test mode and starts initial drive. (compressor will start after seven minutes)
	Test Mode 2 (Forced Defrost)		

MICOM FUNCTION

2-18. Failure Diagnosis Function

1. Failure diagnosis function is a function to facilitate servicing when improper operation of the product occurs.
2. The user will notice a failure when pressing one of the function buttons yields no consequent effect beyond the audible **Ding**.
3. If the improper operation ceases while a failure is displayed, the MICOM resets the display to a normal state.
4. A failure code is indicated on the LCD displays refrigerator and freezer temperature readouts temperature for the freezing room and the display part of setting temperature for the cold storage room of LCD, which are placed at the display part of a refrigerator. All the LCD graphics other than a failure code are turned off.



○ : Normal Operation

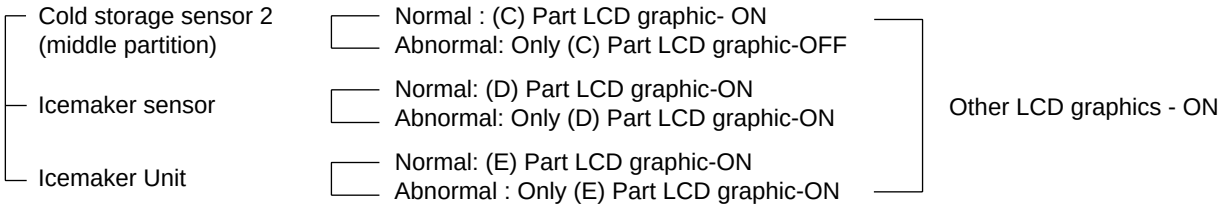
No.	Item	Failure code display part		Symptoms of failure	Product operation status in failure				
		Setting temperature for freezing	Setting temperature for cold storage		Compressor	Freezer Fan	M/C room Fan	Defrost Heater	Stepping motor damper
1	Failure of freezer sensor	Er	FS	Snapping or short-circuit of freezer sensor	ON for 15minutes OFF for 15minutes	Standard RPM	○	○	○
2	Failure of refrigerator sensor 1	Er	rS	Snapping or short-circuit of refrigerator sensor 1	○	Standard RPM	○	○	Open for 10munutes, closing for 15 minutes
3	Failure of refrigerator sensor 2	Setting temperature display (Note 2)		Snapping or short-circuit of refrigerator sensor 2	○	Standard RPM	○	○	○
4	Failure of frost removal sensor	Er	dS	Snapping or short-circuit of frost removal sensor	○	Standard RPM	○	No frost removal	○
5	Poor of frost removal	Er	dH	Snapping of frost removal heater or temperature fuse, pull-out of connector (indicated minimum 4 hours after failure occurs)	○	Standard RPM	○	○	○
6	Failure of BLDC FAN at freezing section	Er	FF	Poor motor, connection of wires to fan. Contact of structures to Fan. Snapping or short-circuit of L/wire (if there is no fan motor signal for more than 60 seconds in operation of fan motor	○	OFF (check every 30 minutes)	○	○	○
7	Failure of BLDC FAN at machine section	Er	CF		○	Standard RPM	OFF (check every 30 minutes)	○	○
8	Failure of Communication	Er	CO	Connection between main PCB and display PCB. Snapping or short-circuit of L/wire. Transmission between main PCB and display PCB. Poor TR and receiving part.	○	Standard RPM	○	○	○
9	Abnormal electronic single motor Damper	Er	dP	Faulty damper motor. Lead wire of damper lead switch in out or short-circuited. Interference of foreign materials in damper baffle or EPS.	○	○	○	○	Check operation every hour
10	Failure of Outside Sensor	Setting temperature display (Note 1)		Snapping or short-circuit of outside temperature perceiving sensor	○	○	○	○	○
11	Failure of ice removal sensor	Setting temperature display (Note 2)		Snapping or short-circuit of ice-making sensor	○	○	○	○	○
12	Failure of Icemaker unit	Setting temperature display (Note 2)		Poor motor or Hall IC within ice-maker unit. Snapping or short-circuit of L/Wire. Poor main PCB drive circuit.	○	○	○	○	○

✻ In display of the failure mode, all LCDs of setting temperature for freezing/ setting temperature and for cold storage are turned off (excluding Note1 and Note2).

MICOM FUNCTION

Note1) In failure of outside sensor, the temperature setting for freezing/ cold storage displays normally and indicated **Er** is indicated on the outside temperature display part (normally displayed except for the outside temperature display part).

Note2) Improper operation of R2 sensor, Icemaker-sensor and Icemaker kit are displayed in LCD check, but not indicated on the failure display part. To check these items, press freezing temperature adjustment button and special freezing button for a second or more.



2-19. Test Function

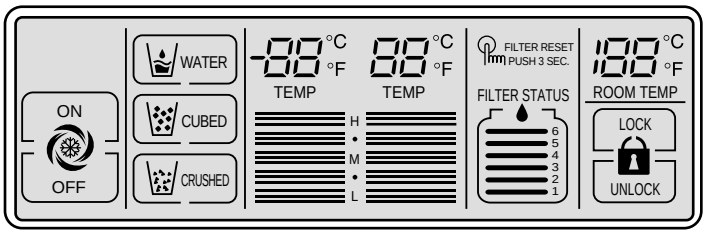
1. The purpose of the test function is to check function of the PWB and product and to search for the failed part when the product is in a failure status.
2. Test button is located on the main PCB of refrigerator (test switch), and the test mode will finish after a maximum of 2 hours irrespective of test mode and then is before restting to the normal operation.
3. Function adjustment buttons do not function during test mode but only warning sound rings.
4. Upon test mode completion, always pull the power cord out and then plug-in it again to reset to normal operation.
5. If misoperations contents such as sensor failure are found during performance of test mode, release the test mode and note the failure code.
6. If pressing the test button is pressed during a failure code display, test mode will not be activated.

Mode	Manipulation	Content	Remarks
Test 1	Press TEST switch once	1. Continuous operation of compressor 2. Continuous operation of freezing chamber fan (high speed RPM) and M/C chamber fan 3. Frost removal heater OFF 4. Full opening status (baffle opened) status of electronic step motor damper 5. All display LCD graphics - ON.	Freezing room fan is turned off in door open.
Test 2	Press TEST switch once at TEST1 condition	1. Compressor OFF 2. Freezing chamber fan and M/C chamber fans are turned off. 3. Frost removal heater ON 4. Full closing status (baffle closed) status of electronic step motor damper 5. All display LCD graphics - OFF ((A) **Medium** status. (B) **Medium** status. Only LCD is turned on)	
Normal condition	Press TEST switch once at TEST2 condition	Return to the initial status.	Compressor is operates after 7 minutes.

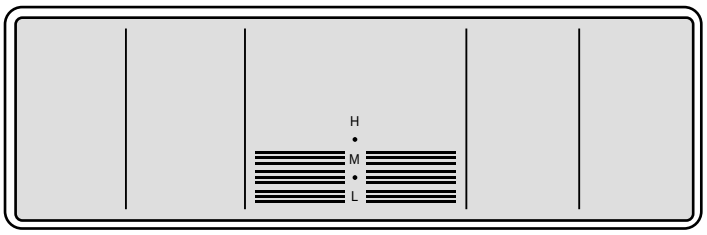
MICOM FUNCTION

* LCD check function: If simultaneously pressing special freezing button and cold temperature adjustment button for a second, a back light is turns on and all display LCD graphics turn on. On releasing the button, the LCD graphic displays the previous status, and the back light is turns off (LCD graphic and back light ON/OFF check).

<TEST MODE 1 LCD STATUS>



<TEST MODE 2 LCD STATUS>



2-20. Function of built-in ice dispenser and water dispenser built-in

1. This function allows dispensing of ice and water to come outside without opening door.
2. If pressing the dispenser switch (bushing button) after selecting ice (cubed or crushed) or water, ice or water equivalent to each come out accordingly. However, the duct doors are opened by an electrical solenoid valve (Duct Door Solenoid) if when pressing the dispenser switch for ICE selection. After pressing the dispenser press switch and releasing it, the duct door closes after it is opened for 5 seconds.
3. Dispensing ice and water stops if freezing chamber door is opened.
4. If there is no Off signal even when 3 minutes have passed while pressing the dispenser press switch after selecting ice (cubed or crushed) or water, geared motor and solenoid (Cube, Water) is automatically turned off. However, the solenoid (duct door) stops 5 seconds after Off (to prevent short-circuiting of a coil due to overheating of solenoid).
5. Dispenser Lamp On/Off function
   Lamp on the dispenser part is turned on when pressing the dispenser press switch after selecting ice (cubed or crushed) or water. The lamp turns off after releasing the dispenser switch.
6. Selection function of crushed ice / water / cubed ice
   1) This is function allows selection of crushed ice water, cubed ice function depending on user's selection. Display and selection is changed by pressing the dispenser selection button.
   2) At initial Power On, crushed ice is automatically selected.
   3) In selecting crushed ice, geared motor operates so that crushed ice can be supplied outside by pressing the dispenser switch when ice is formed in the ice storage container (Ice Bin).
   4) In selecting crushed ice, geared motor is operates so that cube ice can be supplied outside if pressing the dispenser switch when ice is present in the ice storage container (Ice Bin).
7. Water dispenser function
   1) LCD is displays water selection if user chooses water via the selection control.
   2) Water dispenser function is a type directly connected to a water pipe. The water solenoid valve built-in at the right side of the Cooling chamber opens to supply water when the dispenser switch is pressed.

EXPLANATION FOR MICOM CIRCUIT

1. Explanation of PWB circuit

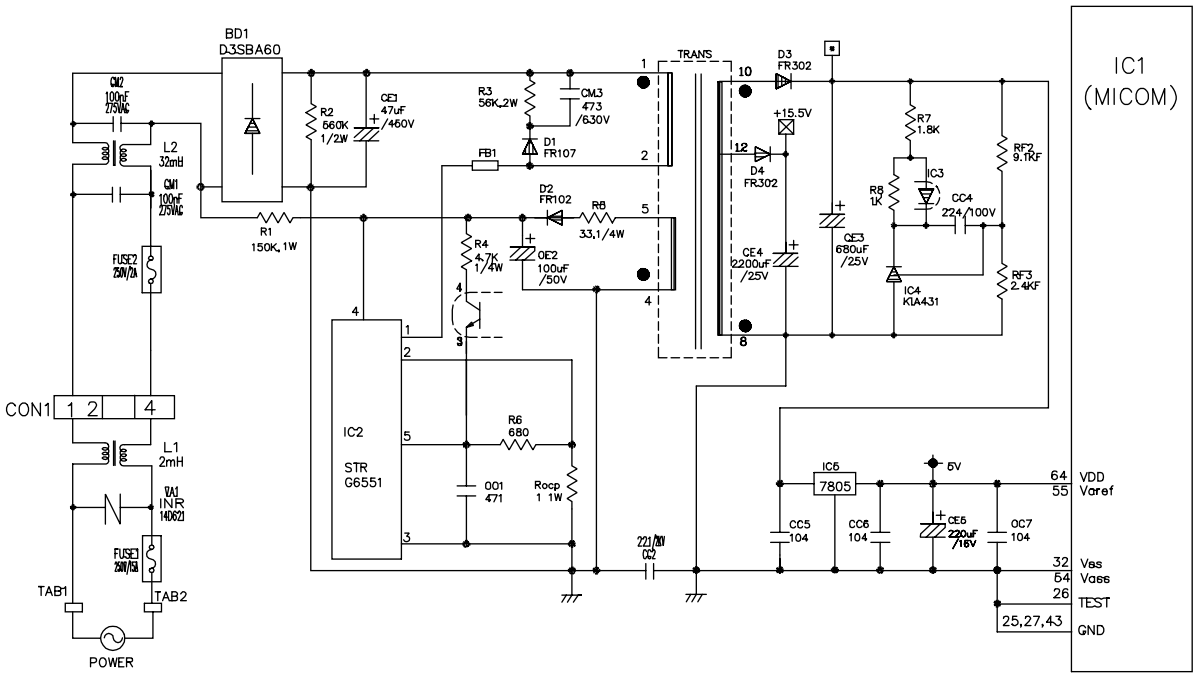
1-1. Power circuit

Power circuit consists of SMPS (SWITCHING MODE POWER SUPPLY) power. The SMPS consist of the rectifying part (BD1, CE1) converting AC voltage to DC voltage, the switching part (IC2) switching the converted DC voltage, transformer transferring energy of the primary side of the switching terminal to the secondary side and the feedback part (IC3, IC4) transferring control information to the primary side.

Caution : Since high voltage (DC310V) is maintained at the power terminal, please take a measurements after more than 3 minutes have passed after removing power cords in the abnormal operating conditions.

Voltages of specific test locations are shown:

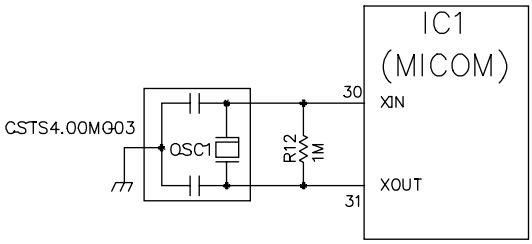
Part	VA1	CE1	CE2	CE3	CE4	CE5
Voltage	230 Vac	310 Vdc	16 Vdc	12 Vdc	15.5 Vdc	5 Vdc



EXPLANATION FOR MICOM CIRCUIT

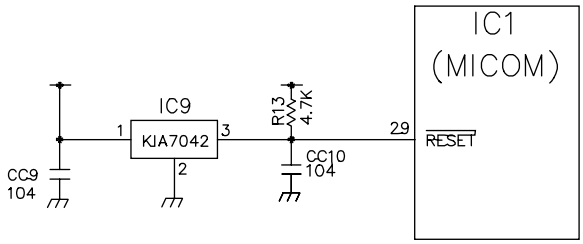
1-2. Oscillation circuit

The oscillation circuit is a circuit with the purpose of generating basic time for clock occurrence for synchronization and time calculation related to information transmission/reception of internal circuitry in IC1 (MICOM). The OSC1 must always use rated parts since If SPEC is changed, time calculated at the IC1 may be changed, and internal operations may cease entirely.



1-3. Reset circuit

The reset circuit is a circuit allowing various parts such as RAM inside of MICOM (IC1) to initialize and the whole of function to start from the initial status, when initial power is input or when power is reapplied again to MICOM following a spontaneous power loss. A **LOW** DC level is applied to the reset terminal of MICOM in the beginning of power supply for a constant time (10ms).
Reset terminal during general operation is 5V (No MICOM operation occurs in failure of RESET IC).



EXPLANATION FOR MICOM CIRCUIT

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

1. Load driving circuit

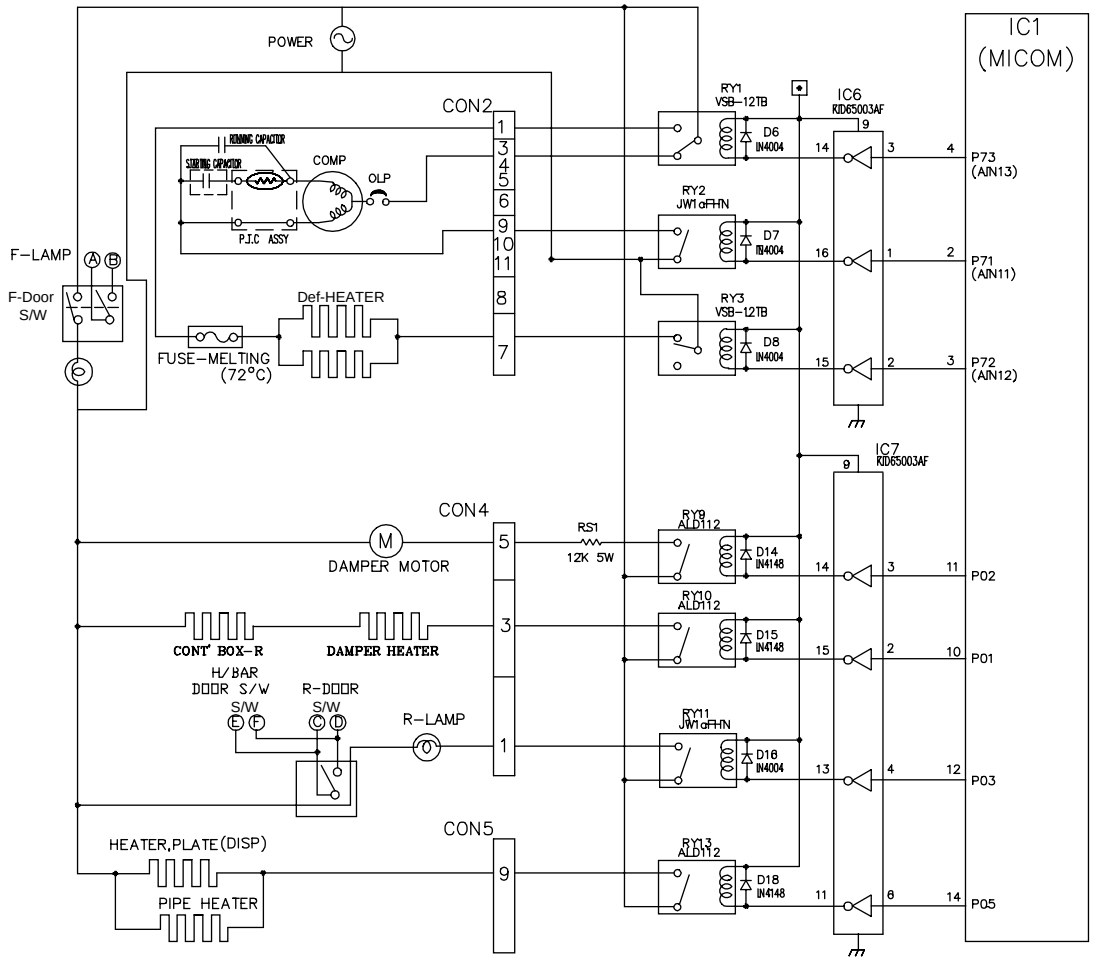
✻ Even if opening the door of freezing chamber or cold storage chamber during operation of fan motor at the freezing chamber, this circuit does not stop and operates at the standard RPM. In addition, if doors of freezing chamber or cold storage chamber, the fan motor normally operates at the RPM previously operated.

✻ (A), (B), (C) and (D) of door switch for the freezing chamber or freezer room are connected to the door open sensing circuit in parallel toward both ends of switch to signal which door is open at MICOM.

✻ Since a door switch of the home bar is connected to door switch (C), (D) of the cold storage chamber. The circuit senses door opening if either door is opened.

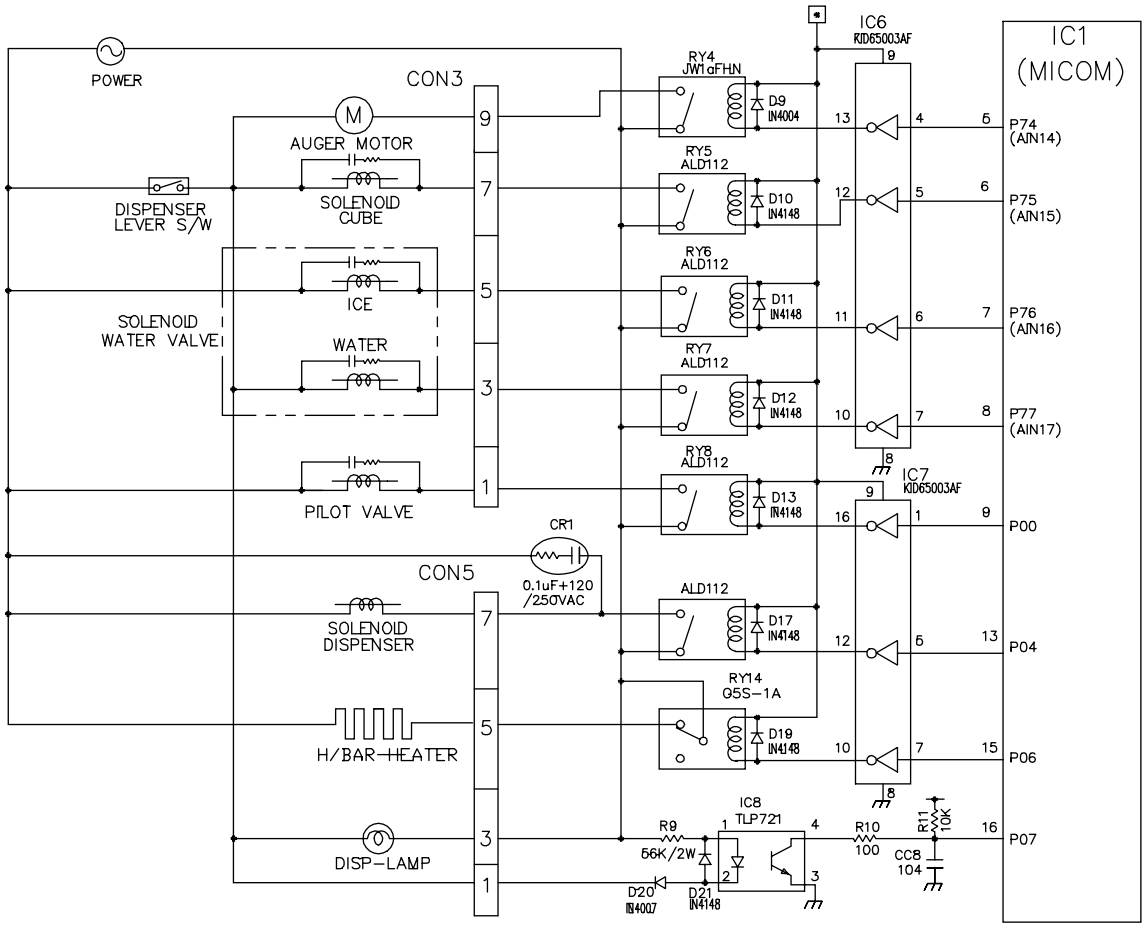
✻ The fan motor will immediately stop if opening doors of the freezing chamber or cold storage chamber during TEST mode and it immediately restarts upon closing them.

Type of Load		Compressor	Frost Removal Heater	AC Converting Relay	Refrigerator LAMP	AC Motor Damper	Damper Heater Control Box Heater	Pipe Heater
Measuring part (IC6)		No.16	No.15	No.14	No.13	No.14 (IC7)	No.15 (IC7)	No.11 (IC7)
Status	ON	Within 1 V						
	OFF	12 V						



EXPLANATION FOR MICOM CIRCUIT

2. Dispenser operation circuit



1) Check load driving status

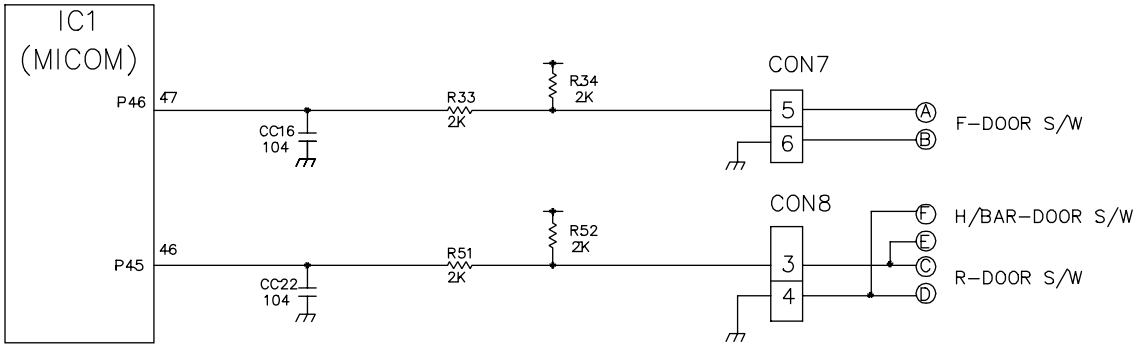
Type of Load		GEARED MOTOR	SOLENOID CUBE	WATER VALVE		SOLENOID DISPENSER	HOME BAR HEATER	SOLENOID PILOT
				ICE	WATER			
Measuring part		IC6-13	IC6-12	IC6-11	IC6-10	IC7-12	IC7-10	IC7-16
Status	ON	Within 1 V						
	OFF	12 V						

2) Lever S/W sensing circuit

Measuring part / Lever SWITCH	IC1(Micom) (No. 16)
On(Press)	5 V / 0 V (60 Hz)
OFF	5V

EXPLANATION FOR MICOM CIRCUIT

3. Door opening sensing circuit

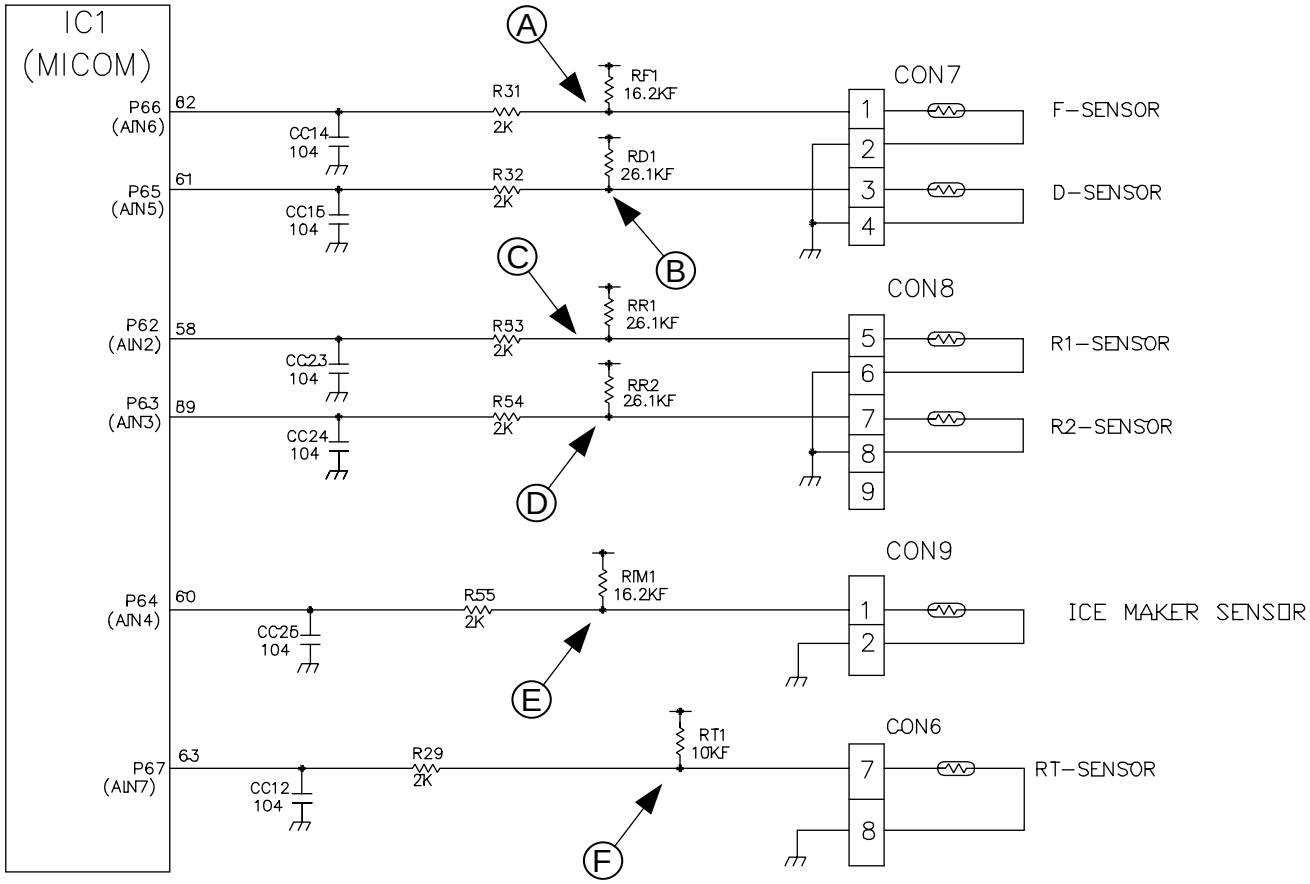


Measuring part / Door of Freezing/Cold Storage Room	IC1 (MICOM) No. 47, 46 Pin
Closing	5 V (Ⓐ - Ⓑ, Ⓒ - Ⓓ . SWITCH at both ends are at Off status)
Opening	5 V (Ⓐ - Ⓑ, Ⓒ - Ⓓ . SWITCH at both ends are at On status)

Since door switch sensing switch (A), (B) is a separate switch even if the door switch of the freezing room normally operates, they may fail to sense door opening in the failure of switch at both ends of (A) and (B) or in failure of the L/wire. Lamp in the cold storage chamber does not turn on if the MICOM of the cold storage chamber fails to sense the door open switch (C), (D) or the home bar switch.

EXPLANATION FOR MICOM CIRCUIT

1-5. Temperature sensing circuit



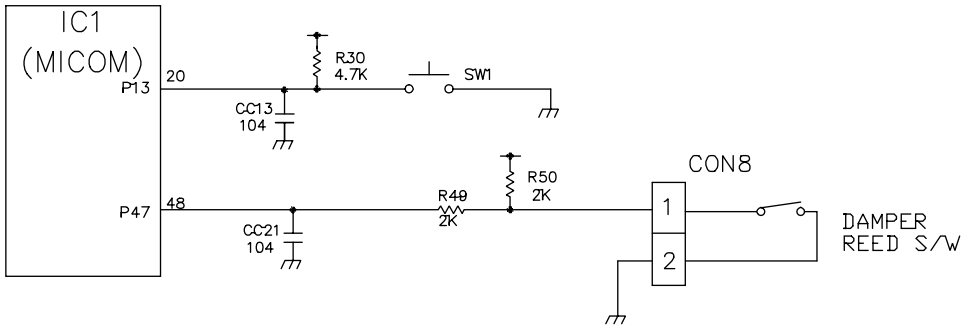
The above circuits are circuits attached to freezing chamber sensor and cold storage room sensors for adjusting temperature settings in the freezing chamber, and cold storage chamber, ice-maker sensor for sensing water temperature in ice-making, or and to an evaporator for sensing temperature of frost removal operations. Short or open status checking of every temperature sensor is as follows:

SENSOR	CHECK POINT	NORMAL(-30 °C ~ 50 °C) (-22 °F ~ 122 °F)	SHORTED	OPEN
Freezing sensor	POINT Ⓐ Voltage	0.5 V~4.5 V	0 V	5 V
Frost removal sensor	POINT Ⓑ Voltage			
Cold storage sensor 1	POINT Ⓒ Voltage			
Cold storage sensor 2	POINT Ⓓ Voltage			
Icemaking sensor	POINT Ⓔ Voltage			
Room temperature sensor	POINT Ⓕ Voltage			

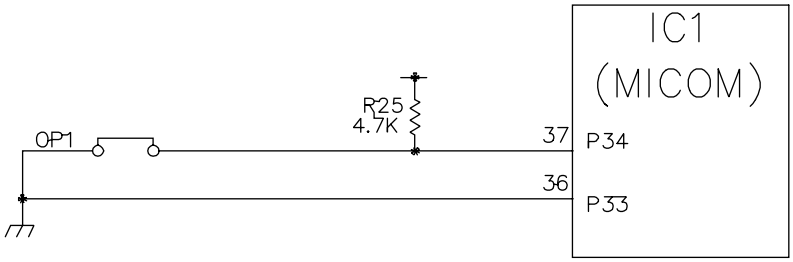
EXPLANATION FOR MICOM CIRCUIT

1-6. Switch entry circuit

The following circuits are entry circuits for sensing signal form test Switch, and the electronic single motor damper reed Switch for examining the refrigerator.



1-7. Option designation circuit (model separation function)



The above circuits are used for designating separation by model as option and notifying the MICOM. Designation of option by model and the application standards are as follows:

▶ These circuits are accurately pre-adjusted in shipment from factory and so you must not alter the option.

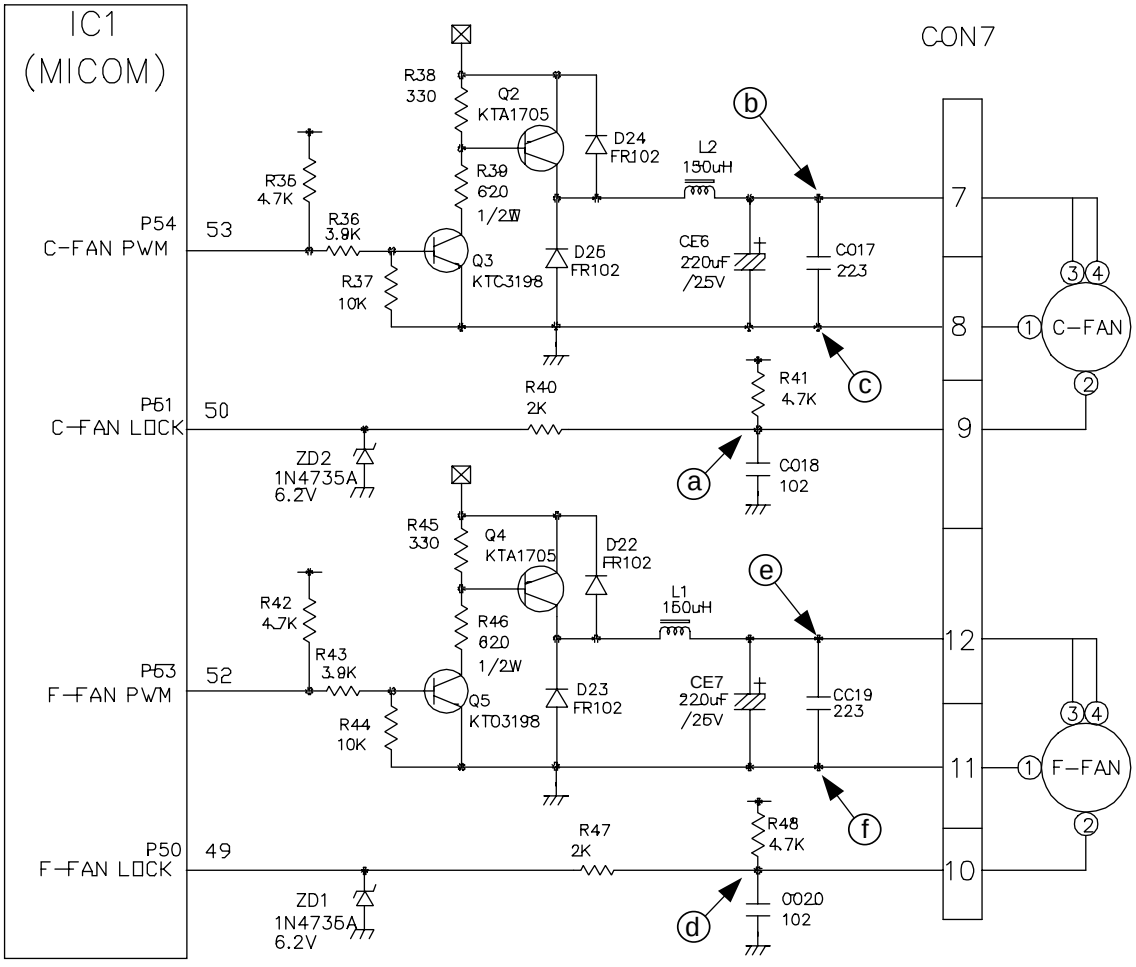
Separation	Connection Status	Application Standard
OP1	Connected	Export model
	CUT	Domestic model

EXPLANATION FOR MICOM CIRCUIT

1-8. Fan motor driving circuit (freezing chamber, M/C chamber)

1. This circuit performs function to make standby power '0' by cutting off power supplied to ICs inside of the fan motor when the fan motor is OFF.
2. This circuit performs a temporary change of speed for the fan motor and applies DC voltage ranging between 7.5V an 16V to the motor.
3. This circuit futher functions to stop the fan motor further by cutting off power applied to the fan motor as it senses the fan motor's RPM.

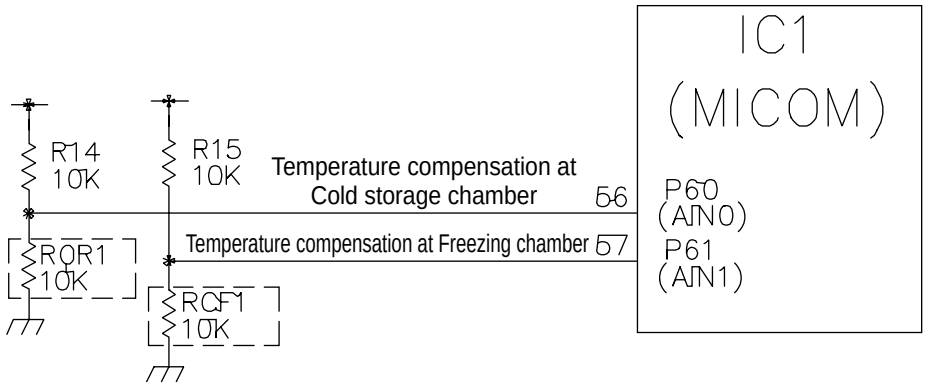
	ⓐ, ⓓ part	ⓑ part	ⓔ part	ⓒ, ⓕ part
Motor OFF	5V	2V or less	2V or less	0 V
Motor ON	2 ~ 3V	12 ~ 14V	8 ~ 16V	0 V



EXPLANATION FOR MICOM CIRCUIT

1-9. Temperature compensation and temperature compensation circuit

1. Temperature compensation at freezing chamber, cold storage chamber



Freezing chamber		Cold storage chamber		Remarks
Resistance value (RCF1)	Temperature compensation	Resistance value (RCR1)	Temperature compensation	
180 kΩ	+5 °C [+9°F]	180 kΩ	+2.5 °C [+4.5°F]	Warmer compensation ↑
56 kΩ	+4 °C [+7.2°F]	56 kΩ	+2.0 °C [+3.6°F]	
33 kΩ	+3 °C [+5.4°F]	33 kΩ	+1.5 °C [+2.7°F]	
18 kΩ	+2 °C [+3.6°F]	18 kΩ	+1.0 °C [+1.8°F]	
12 kΩ	+1 °C [+1.8°F]	12 kΩ	+0.5 °C [+0.9°F]	
10 kΩ	0 °C [0°F]	10 kΩ	0 °C [0°F]	Reference temperature
8.2 kΩ	-1 °C [-1.8°F]	8.2 kΩ	-0.5 °C [-0.9°F]	↓ Cooler compensation
5.6 kΩ	-2 °C [-3.6°F]	5.6 kΩ	-1.0 °C [-1.8°F]	
3.3 kΩ	-3 °C [-5.4°F]	3.3 kΩ	-1.5 °C [-2.7°F]	
2 kΩ	-4 °C [-7.2°F]	2 kΩ	-2.0 °C [3.6°F]	
470 Ω	-5 °C [-9°F]	470 Ω	-2.5 °C [-4.5°F]	

▶ Temperature compensation table by adjustment value (difference value against current temperature)
Ex) If changing compensation resistance at a cold storage room (RCR1) from 10 kΩ (current resistance) to 18 kΩ (modified resistance), temperature at the cold storage will increase by +1°C [+1.8°F].

EXPLANATION FOR MICOM CIRCUIT

▶ Temperature compensation table at the cold storage room is as follows:

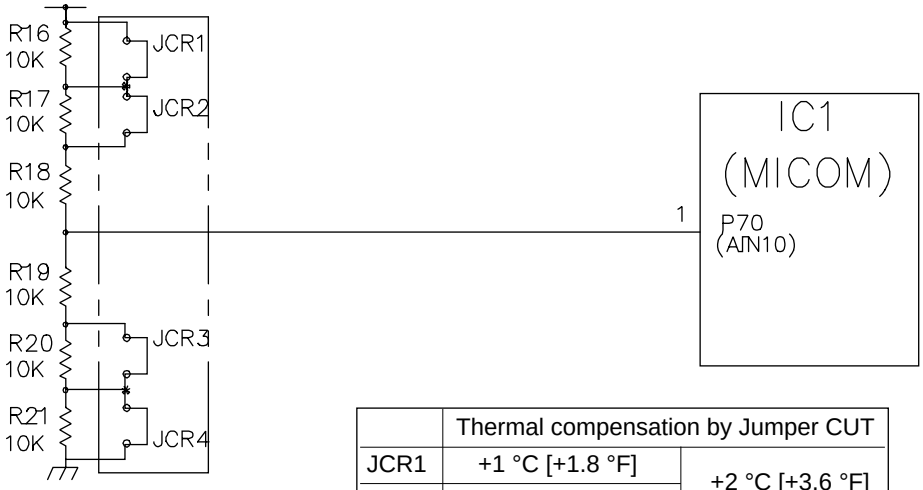
	Modification resistance / Current resistance	470 Ω	2 kΩ	3.3 kΩ	5.6 kΩ	8.2 kΩ	10 kΩ	12 kΩ	18 kΩ	33 kΩ	56 kΩ	180 kΩ
Cold storage chamber (RCR1)	470Ω	No change	0.5 °C [0.9 °F] Up	1 °C [1.8 °F] Up	1.5 °C [2.7 °F] Up	2 °C [3.6 °F] Up	2.5 °C [4.5 °F] Up	3 °C [5.4 °F] Up	3.5 °C [6.3 °F] Up	4 °C [7.2 °F] Up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

▶ Temperature compensation at the freezing chamber is also performed in the same manner as cold storage chamber. Temperature compensation value is twice that of the cold storage chamber.

▶ This circuit determines the necessary level of temperature compensation for the MICOM to control temperature of each chamber.

EXPLANATION FOR MICOM CIRCUIT

2. Compensation circuit for weak-cold, over-cold in freezing chamber



	Thermal compensation by Jumper CUT	
JCR1	+1 °C [+1.8 °F]	+2 °C [+3.6 °F]
JCR2	+1 °C [+1.8 °F]	
JCR3	-1 °C [-1.8 °F]	-2 °C [-3.6 °F]
JCR4	-1 °C [-1.8 °F]	

Compensation for weak-cold		Compensation for over-cold		Temperature compensation value in cold storage chamber	Remarks
JCR3	JCR4	JCR1	JCR2		
⌒	⌒	⌒	⌒	0 °C [32 °F] (In shipment from factory)	
CUT	⌒	⌒	⌒	-1 °C [-1.8 °F]	
⌒	CUT	⌒	⌒	-1 °C [-1.8 °F]	
⌒	⌒	CUT	⌒	+1 °C [+1.8 °F]	
⌒	⌒	⌒	CUT	+1 °C [+1.8 °F]	
CUT	CUT	⌒	⌒	-2 °C [-3.6 °F]	
⌒	⌒	CUT	CUT	+2 °C [+3.6 °F]	
CUT	⌒	CUT	⌒	0 °C [0 °F]	
CUT	⌒	⌒	CUT	0 °C [0 °F]	
⌒	CUT	CUT	⌒	0 °C [0 °F]	
⌒	CUT	⌒	CUT	0 °C [0 °F]	
CUT	CUT	CUT	⌒	-1 °C [-1.8 °F]	
⌒	CUT	CUT	CUT	+1 °C [+1.8 °F]	
CUT	CUT	CUT	CUT	0 °C [0 °F]	

▶ The above option circuit allows compensation for temperature in the cold storage chamber by simply by cutting service jumpers.

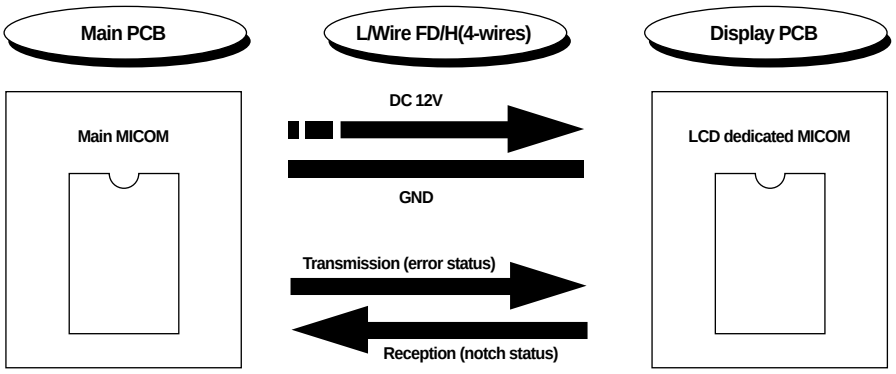
EXPLANATION FOR MICOM CIRCUIT

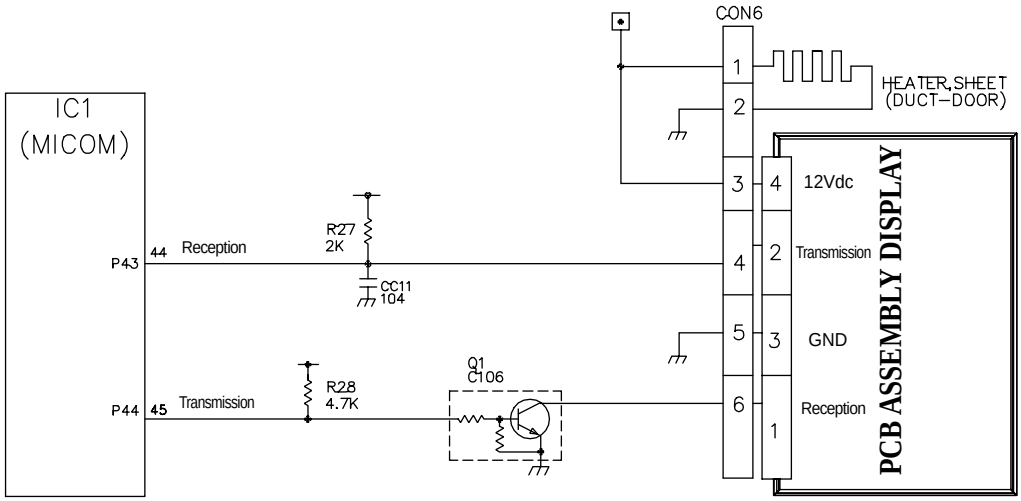
1-10. Communication circuit and connection L/Wire between main PCB and display PCB

The following circuit is a communication circuit used for exchanging the necessary information between main MICOM of main PCB and LCD dedicated MICOM for LCD control of display PCB.

Transmission/receipt L/Wire is necessary display PCB for driving the display PCB is required.

Poor communication occurs if a continuous information exchange fail to continue for more than 30 seconds between main MICOM of main PCB and LCD dedicated MICOM for LCD control of display PCB.





EXPLANATION FOR MICOM CIRCUIT

2. Sensor resistance characteristics table

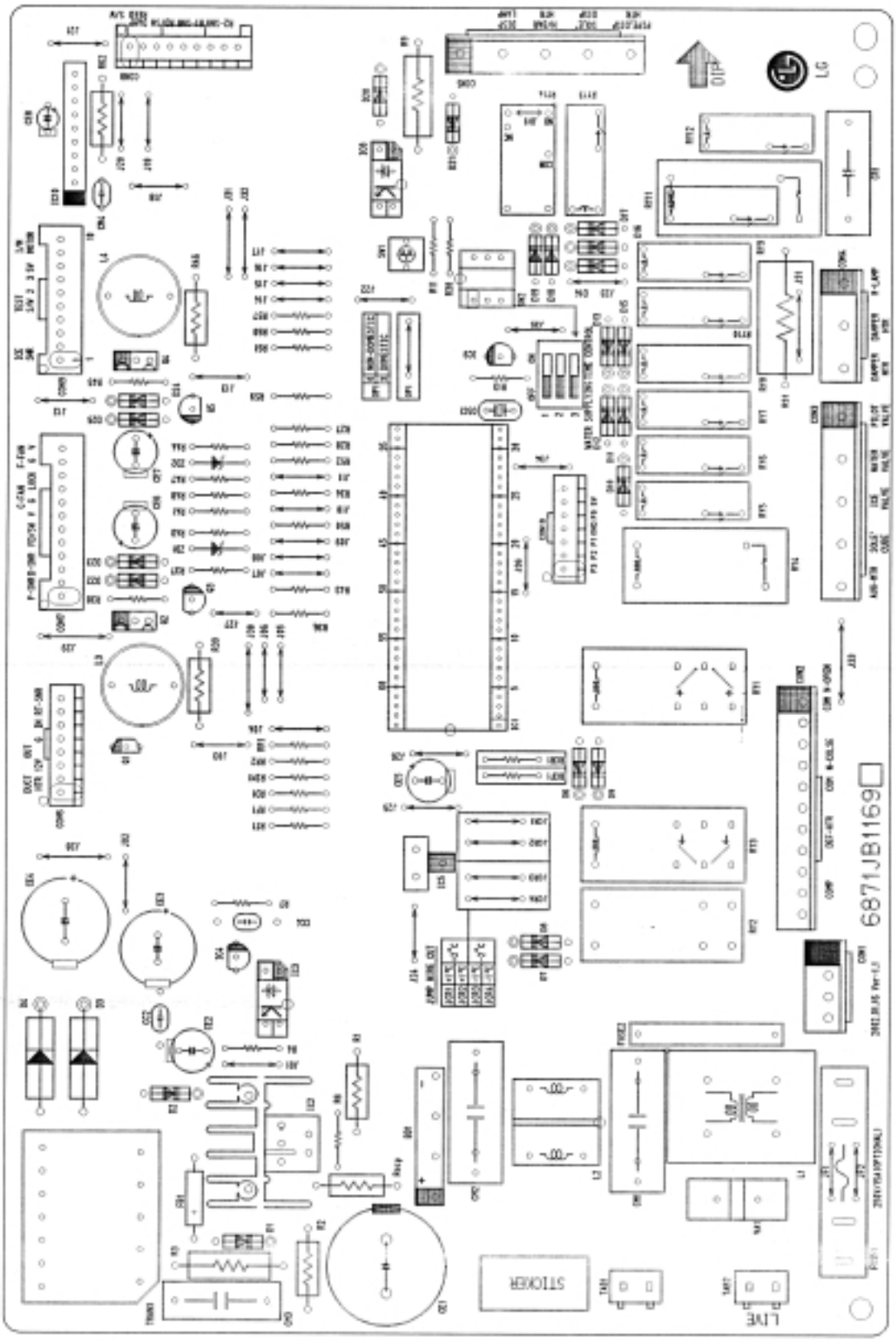
Measuring Temperature (°C / °F)	Freezing Sensor	Cold storage sensor 1, 2. Frost removal sensor, Outside sensor
-20 °C [-4 °F]	22.3 kΩ	77 kΩ
-15 °C [-5.0 °F]	16.9 kΩ	60 kΩ
-15 °C [-5.0 °F]	13.0 kΩ	47.3 kΩ
-5 °C [23.0 °F]	10.1 kΩ	38.4 kΩ
0 °C [32 °F]	7.8 kΩ	30 kΩ
+5 °C [41 °F]	6.2 kΩ	24.1 kΩ
+10 °C [50 °F]	4.9 kΩ	19.5 kΩ
+15 °C [59 °F]	3.9 kΩ	15.9 kΩ
+20 °C [68 °F]	3.1 kΩ	13 kΩ
+25 °C [77 °F]	2.5 kΩ	11 kΩ
+30 °C [86 °F]	2.0 kΩ	8.9 kΩ
+40 °C [104 °F]	1.4 kΩ	6.2 kΩ
+50 °C [122 °F]	0.8 kΩ	4.3 kΩ

- ▶ Resistance value tolerance of sensor is ±5%.
- ▶ In measuring resistance value allowance of sensor, perform measurement after leaving the sensor for more than 3 minutes at the measuring temperature (delay is required due to sense speed relation relationship).
- ▶ Since an analog tester has a large measuring temperature, measuring with a digital tester is strongly recommended.
- ▶ Resistance of the cold storage sensor 1 and 2 shall be measured with a digital tester after separating CON8 of the PWB ASSEMBLY and the MAIN part.
- ▶ Resistance of the freezing sensor shall be measured with a digital tester after separating CON7 of the PWB ASSEMBLY and the MAIN part.

EXPLANATION FOR MICOM CIRCUIT

3. PWB parts diagram and list

3-1. PWB Assembly, main part diagram



EXPLANATION FOR MICOM CIRCUIT

3-2. Parts list

QTY.	QTY.	NO.	DWG. NO.	DESCRIPTION	SPEC'	MAKER	REMARK
1A	1A	1	6870JB8011	PWB,MAIN	FR-1(DS-1107A)	DOO SAN	t=1.6
1A	1A	2	6170JB2013	TRANS,SMPS(COIL)	1,2:1.74mH	SAMIL	TRANS
		3		WAFER		JAE EUN	
1	1	4	6630JB8001Q		JE202-1T-11		CON2
1	1	5	6630JB8001B		JE202-1T-03(SP-2,4)		CON4
1	1	6	6630JB8001G		JE202-1T-04		CON1
		7					
1	1	8	6630JB8001Z		JE202-1T-05(SP-2,4,6,8)RED		CON5
1	1	9	6630JB8001D		JE202-1T-05(SP-2,4,6,8)		CON3
1	1	10	6630JB8007G		917786-1(8P)	AMP	CON6
1	1	11	6630JB8010H		917787-1(9P)		CON8
1	1	12	6630JB8007J		917788-1(10P)		CON9
1	1	13	6630JB8007L		917790-1(12P)		CON7
		14	6630JB8007K		917789-1(11P)		
1	1	15	0IZZJB2010A	MICOM CHIP	TMP87C841N	TOSHIBA	IC1(=0IZZJB2010B)
1	1	16	0IKE780500Z	REGULATOR	KIA78005AP	K.E.C	IC5
1	1	17	0IKE704200A	RESET IC	KIA7042AP	K.E.C	IC9
2	2	18	0IKE650030C	DRIVE IC	KID65003AF	K.E.C	IC6,7
		19					
1	1	20	0IRH622200A	DRIVE IC	BA6222	ROHM	IC10
1	1	21	0ISK655100A	DRIVE IC	STR-G6551	SANKEN	IC2
1	1	22	0IKE431000A	V/REGULATOR	KIA431	K.E.C	IC4
1	1	23	0IT0721000A	PHOTO TR	TLP721F	TOSHIBA	IC3
1	1						IC8
2	2	24	6920JB2007A	RELAY	VSB-12TB	TAKAMISAWA	RY1,3
2	2	25	6920JB2005A		JW1aFHN	NAIS	RY2,4
1	1	26	6920JB2004A		DH12DI-0-Q	JAEIL	RY11(R-LAMP)(NAE-SU)
			6920JB2005A		JW1aFHN	NAIS	RY11(EXPORT)(100~127V)
			6920JB2003B		ALD112	NAIS	RY11(EXPORT)(220~240V)
	1	27	6920JB2009A		G5S-1A	OMRON	RY14(H/BAR-HTR)
		28					
7	7	29	6920JB2003B		ALD112	NAIS	RY5~10,12,13
1	1	30	6920JB2003B		ALD112	NAIS	RY8(PILOT VALVE)
		31					
		32					
1	1	33	6212JB8001B	RESONATOR	CSTS4.00MG03	MURATA	OSC1
			J570-00012B		CST4.00MGW-TF01		(=6212AQ9002B)
1	1	34	6102JB8001B	VARISTOR	INR14D621	IL JIN	VA1
		35	J572-00001D		INR14D271	IL JIN	
5	5	36	0DR102009AA	FAST RECOVER D	FR102	DELTA	D2,D22~25
1	1	37	0DR107009AA		FR107		D1
2	2	38	0DR302000BA		FR302		D3,4
1	1	39	0DD400709AC	RECTIFIER DIODE	1N4007		D20
		40	0DD414809BB	SWITCHING DIODE	1N4148	(1)DELTA (2)PYUNG CHANG	D1(EXPORT)(220~240V)
			0DD400409AC	RECTIFIER DIODE	1N4004		D1(EXPORT)(100~127V)
1	1		0DD400409AC	RECTIFIER DIODE	1N4004		D1(R-LAMP)(NAE-SU)
4	4	41	0DD400409AC	RECTIFIER DIODE	1N4004		D6,7,8,9
1	1	42	0DB360000AA	BRIDGE DIODE	D3SBA60	SHINDENGEN	BD1
8	8	43	0DD414809BB	SWITCHING DIODE	1N4148	(1)ROHM (2)PYUNG CHANG	D10,11,12,14,15,17,18,21
1	1						D13(PILOT VALVE)
	1						D19(H/BAR HTR)
2	2	44	0DZMR00019A	ZENER DIODE	1N4735(6.2V)	DELTA	ZD1,2

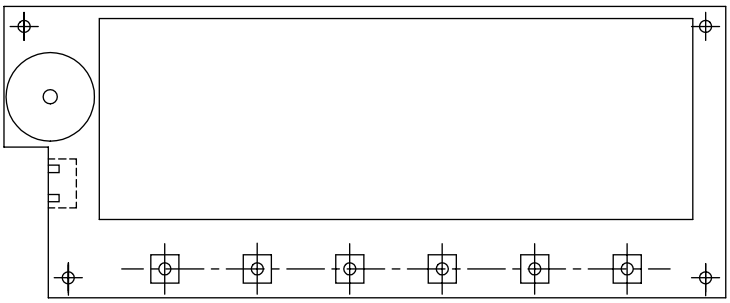
QTY.	QTY.	NO.	DWG. NO.	DESCRIPTION	SPEC'	MAKER	REMARK
1	1	45	0CE2271F638	ELE' CAPA'(YK 85℃)	220uF/16V	RUBYCON	CE5
1	1	46	0CE1061K638		100uF/25V		CE8
1	1	47	0CE687AH690	ELE' CAPA'(RX 105℃)	680uF/25V	SAM HWA	CE3
1	1	48	0CE2287H690		2200uF/25V		CE4
1	1	49	0CE107AH610	ELE' CAPA'(BG 105℃)	100uF/50V		CE2
2	2	50	0CE227AH638		220uF/25V	RUBYCON	CE6,7
1	1	51	0CE476BV640	ELE' CAPA'(HE 105℃)	47uF/450V	SAM HWA	CE1
1	1	52	0CQ4732Y430	MYL' CAPACITOR	473/630V	SEIL	CM3
1	1	53	0CQ2241N630		224/100V	SEIL	CC4
1	1	54	0CK22102510	CER' CAPACITOR	221 /2KV	SAM HWA	CC2
1	1	55	0CK471DK96A	CER' CAPACITOR (SMD 2012 TYPE)	471/50V		CC1
22	22	56	0CK104DK9BA		104/50V		CC5~16,21~30
2	2	57	0CK102DK9BA		102/50V		CC18,20
2	2	58	0CK223DK9BA		223/50V		CC17,19
1	1	59	0CF33408670	FILM CAPACITOR	330nF/275VAC	PILKOR	CM1
		60					
1	1	61	0CF22408670		220nF/275VAC		CM2
		62					
2	2	63	0RS5602K600	R,OXIDE FILM	56K /2W	(1)SMART (2)CHOHYANG	R3,9
1	1	64	0RS1503J609		150K /1W		R1
1	1	65	0RS0101J609		1/1W		ROCP
1	1	66	0RD0682H609	R,CARBON FILM	68J 1/2W		R62
2	2	67	0RD6200H609		620J 1/2W		R39,46
1	1	68	0RD5603H609		560K 1/2W		R2
2	2	69	0RD3300G609		330 1/4W		R38,45
1	1	70	0RD6800G609		680 1/4W		R6
		71					
1	1	72	0RD1801G609		1.8K 1/4W		R7
		73					
7	7	74	0RD2001G609		2K 1/4W		R27,34,40 R47,50,52,59
2	2	75	0RD3901G609		3.9K 1/4W		R36,43
9	9	76	0RD4701G609		4.7K 1/4W		R4,13,28,30 R41,48,57,60,61
3	3	77	0RD1002G609		10K 1/4W		R11,37,44
1	1	78	0RD1202G609		12K 1/4W		RCF1
	1	79	0RD8201G609		8.2K 1/4W		RCR1
1			0RD1002G609		10K 1/4W		
1	1	80	0RN1002G409	R,METAL FILM	10KF 1/4W		RT1
2	2	81	0RN1622G409		16.2KF 1/4W		RF1,RIM1
3	3	82	0RN2612G409		26.1KF 1/4W		RD1,RR1,2
1	1	83	0RM1201N661		12K 5W		RS1(DAMPER) (JS1)
			0RS2701K600		2.7K 2W		
					JUMP WIRE		
1	1	84	0RD0332E672	CHIP RESISTOR (SMD 2012 TYPE)	33 1/8W	ROHM	R5
1	1	85	0RD1001E672		1K 1/8W		R8
1	1	86	0RD1000E672		100 1/8W		R10
11	11	87	0RD2001E672		2K 1/8W		R29,31~33,49 R51,53~56,58
6	6	88	0RD4701E672		4.7K 1/8W		R22~25,35,42
8	8	89	0RD1002E672		10K 1/8W		R14~21
1	1	91	0RD1004E672		1M 1/8W		R12
1	1	92	0RN2401E472		2.4KF 1/8W		RF3
1	1	93	0RN9101E472		9.1KF 1/8W		RF2

EXPLANATION FOR MICOM CIRCUIT

QTY.	QTY.	NO.	DWG. NO.	DESCRIPTION	SPEC'	MAKER	REMARK
2	2	94	0TRKE90004A	TRANSISTOR	KTA1705	K.E.C	Q2,4
2	2	95	0TR319809CA		KTC3198		Q3,5
1	1	96	0TR106009AF		KRC106M		Q1
1	1	97	6210JB8001A	CORE(CIRE),BEADS	BFS3510A0	SAM HWA	FB1
1	1	98	6600JB8001A	TEST S/W	SKHV10910	TACT	SW1
1	1	99	6600JB8003A	WATER SUPPLY SW	3P,DIP	OTAX	SW2
1	1	100	43607015	JUMP WIRE	0.6X7.5mm		J27
26	26				0.6X10mm		J01~26
6	6				0.6X12.5mm		J28~33
			43607015	JUMP WIRE	0.6X10mm		JF1,JF2(FUSE1)
1	1		43607015	JUMP WIRE	0.6X10mm		JCR1
1	1						JCR2
1	1						JCR3
1	1						JCR4
			43607015	JUMP WIRE	0.6X10mm		OP1
			43607015	JUMP WIRE	0.6X10mm		JH1(H/B-HTR)
1	1	101	6200JB8001B	RC FILTER	0.1uF+120/250VAC	PILKO	CR1
1	1	102	4920JB3007A	HEAT SINK(STR)		TAE SUNG	
		103					
1	1	104	6200JB3004B	COMMON COIL	CV970020 (2mH/7A)	TNC	L1
		105					
1	1	106	6200JB8005A		CV910320 (32mH/1A)	TNC	L2
		107					
2	2	108	0LR1500K4J0	CHOKE COIL	150uH	TNC	L3,4
1	1	109	3J02447C	FUSE	15A/250V	SAM JU	FUSE1
2	2	110	6901JB8001A	FUSE HOLDER	FC61F		
1	1	111	0FZZJB3001A	FUSE	2A/250V		FUSE2
		112					
2	2	113	0Q01030F	250 TAB	GP881191-2	K.E.T	TAB1,2
1	1	114	1SBF0302418	SCREW	ASS'Y TO H/SINK	TAE SUNG	
3.0g	3.0g	115	49111001	SOLDER	ALMIT KR-19RMA	HISUNG DAE JIN	SOLD
25g	25g	116	49111004	SOLDER LEAD BAR	H63A		
1.5g	1.5g	117	59333105	FLUX AUTO	JS71	KOKI	

EXPLANATION FOR MICOM CIRCUIT

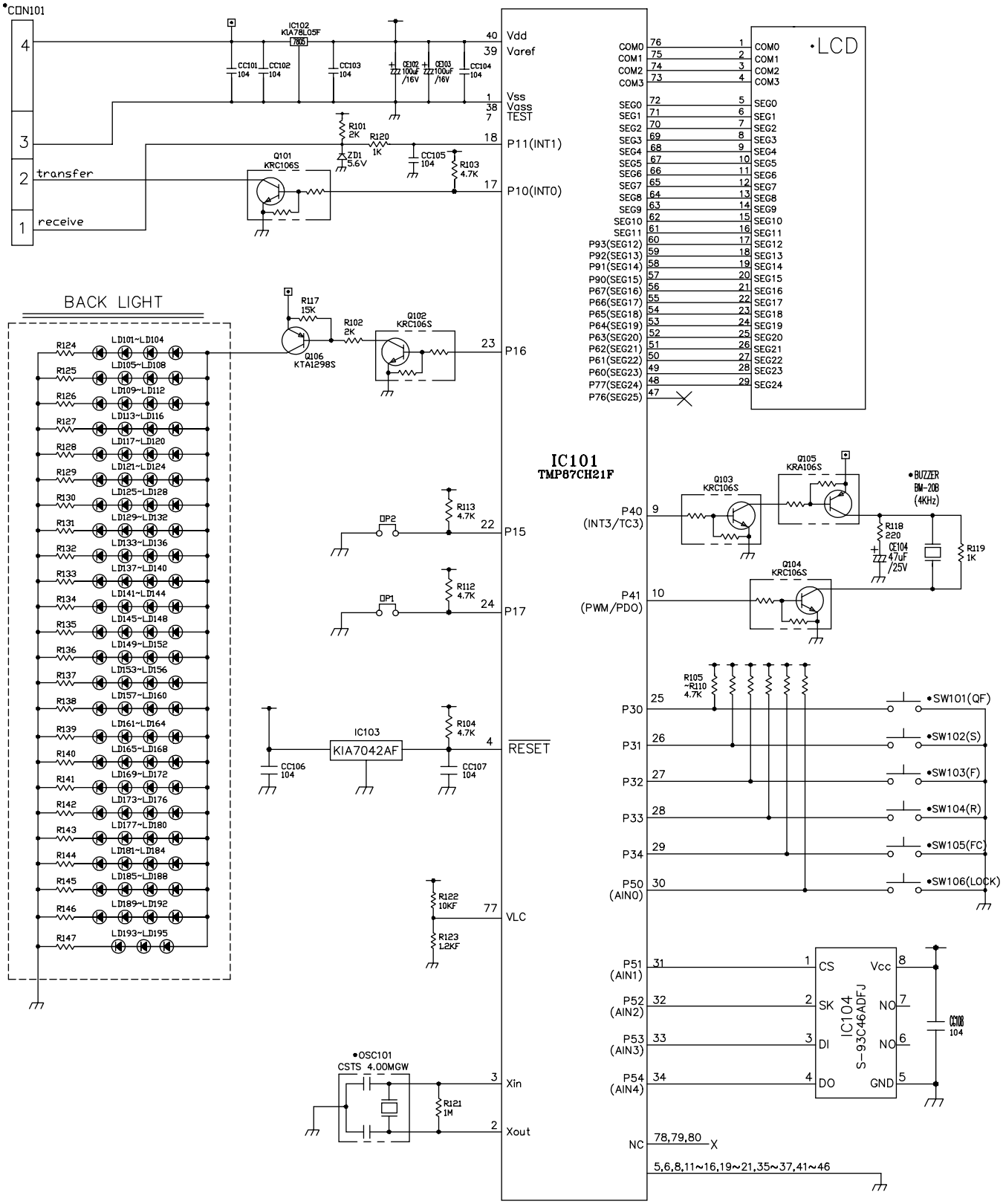
3-3. DISPLAY ASSEMBLY part diagram



A	WORK					
DLX AMERICA	APPLICATION					
Qty	No	P/NO	DESCRIPTION	SPEC	MAKER	REMARK
1A	1	6304TWT009	LCD(LIQUID CRYSTAL DISPLAY)	TN MONO(A-TPB497)	WINTEK	-
1	2	-	PWB	FR-4	-	-
1	3	-	REFLECTOR	PC ABS	-	-
-	4	-	양면 TAPE	NITTO500(W2MM)	-	-
1	5	-	확산SHEET	MTN-WX5(141*44.25MM)	TSUJIDEN	투과율35%
1	6	-	WAFER	SMAW250-04	YEON-HO	CON101
-	7	-	-	-	-	-
-	8	-	-	-	-	-
1L	9	0IZZJB2013	IC,DRAWING	TMP87CH21F QFP80	TOSHIBA	IC101(L=M)
-	10	-	-	-	-	-
1	11	0ISTLKE002A	IC,STANDARD LOGIC	KIA78L05F	KEC	IC102
1	12	0ISTLKE003A	IC,STANDARD LOGIC	KIA7042AF	KEC	IC103
1	13	0IRH934600D	IC,ROHM	BR93LC46RF-W EEPROM	ROHM	IC104
1	14	0ISTLKE004A	IC,STANDARD LOGIC	KRA106S	KEC	Q105
4	15	0ISTLKE005A	IC,STANDARD LOGIC	KRC106S	KEC	Q101~104
1	16	0ISTLKE006A	IC,STANDARD LOGIC	KTA1298	KEC	Q106
-	17	-	-	-	-	-
-	18	-	-	-	-	-
1	19	J570-00012B	RESONATOR	CST4.00MGW-TF01	MURATA	OSC101
-	20	-	-	-	-	-
-	21	-	-	-	-	-
-	22	-	-	-	-	-
-	23	0CE337CH630	CAPACITOR,FIXED ELECTROLYTIC	330UF SHL,SD 25V 20%	SAMWHA	CE101
2	24	0CE107VF6DC	CAPACITOR,FIXED ELECTROLYTIC	100UF MV 16V 20% SMD	RUBYCON	CE102,103
-	25	-	-	-	-	-
1	26	0CE476VH6DC	CAPACITOR,FIXED ELECTROLYTIC	47UF MV 25V 20% SMD	RUBYCON	CE104
-	27	-	-	-	-	-
8	28	0CK104DK94A	CAPACITOR,FIXED CERAMIC	100NF 2012 50V 80%,-20%	MURATA	CC101~108
-	29	-	-	-	-	-
-	30	-	-	-	-	-
-	31	0RD1000G676	RESISTOR,FIXED CARBON FILM	100 OHM 1/4 W 5% 3216	ROHM	-
1	32	0RD2200E672	RESISTOR,FIXED CARBON FILM	220 OHM 1/8 W 5% 2012	ROHM	R118
23	33	0RD4700G676	RESISTOR,FIXED CARBON FILM	470 OHM 1/4 W 5% 3216	ROHM	R124~146
1	34	0RD6800G676	RESISTOR,FIXED CARBON FILM	680 OHM 1/4 W 5% 3216	ROHM	R147
-	35	-	-	-	-	-
-	36	-	-	-	-	-
2	37	0RD1001E672	RESISTOR,FIXED CARBON FILM	1K OHM 1/8 W 5% 2012	ROHM	R119,120
2	38	0RD2001E672	RESISTOR,FIXED CARBON FILM	2K OHM 1/8 W 5% 2012	ROHM	R101,102
10	39	0RD4701E672	RESISTOR,FIXED CARBON FILM	4.7K OHM 1/8 W 5% 2012	ROHM	R103~112
1	40	0RD1502E672	RESISTOR,FIXED CARBON FILM	15K OHM 1/8 W 5% 2012	ROHM	R117
1	41	0RD1004E672	RESISTOR,FIXED CARBON FILM	1M OHM 1/8 W 5% 2012	ROHM	R121
-	42	0RD4702E672	RESISTOR,FIXED CARBON FILM	47K OHM 1/8 W 5% 2012	ROHM	-
1	43	0RD1201E472	RESISTOR,FIXED CARBON FILM	1.2K OHM 1/8 W 1% 2012	ROHM	R123
1	44	0RD1002E472	RESISTOR,FIXED CARBON FILM	10K OHM 1/8 W 1% 2012 R/TP	ROHM	R122
1	45	0DZRM00188A	DIODE,ZENERS	RLZ LLDS(LL-34) 500MW 5.6V	ROHM	ZD101
-	46	-	JUMPER	0 OHM	-	OP1(LINEAR)
1	47	-	JUMPER	0 OHM	-	OP2(AMERICA)
-	48	0DLLE0038AA	LED	LT8B32-UR-191T AMBER 35MCD	LEDTECH	LD101~195
1	49	6908JB8003A	BUZZER	BM-20B PIEZO 4KHZ 85DB	BUJEON	BUZZER
6	50	6600RRT002J	SWITCH,TACT	JTP1138A 12V DC 50MA SMD	JEIL	SW101~106
95	51	0DLLE0048AA	LED	LT8B22J-190T R/TP GN/YL10MCD	LEDTECH	LD101~195
-	52	-	-	-	-	-

EXPLANATION FOR MICOM CIRCUIT

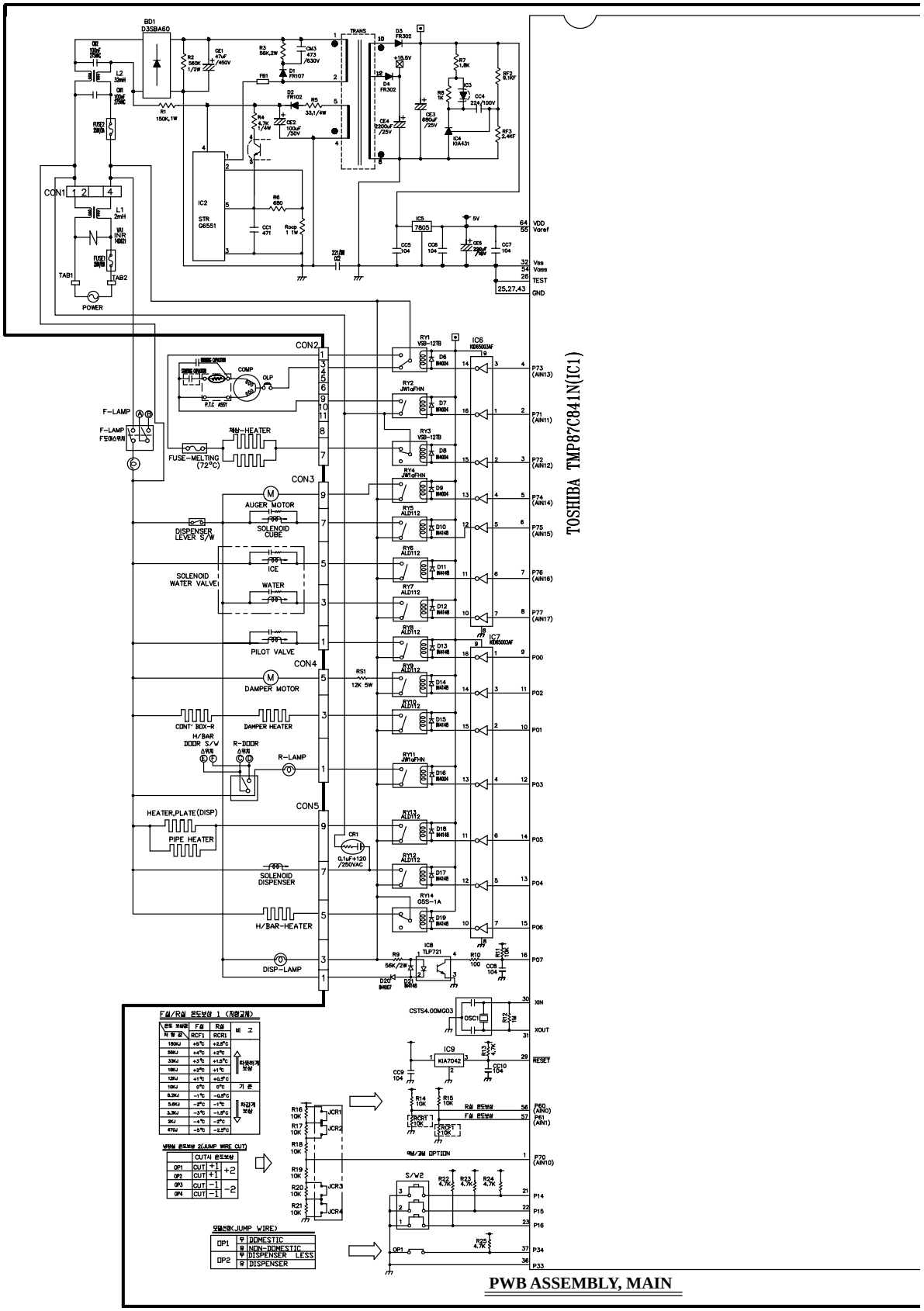
3-4. DISPLAY circuit diagram



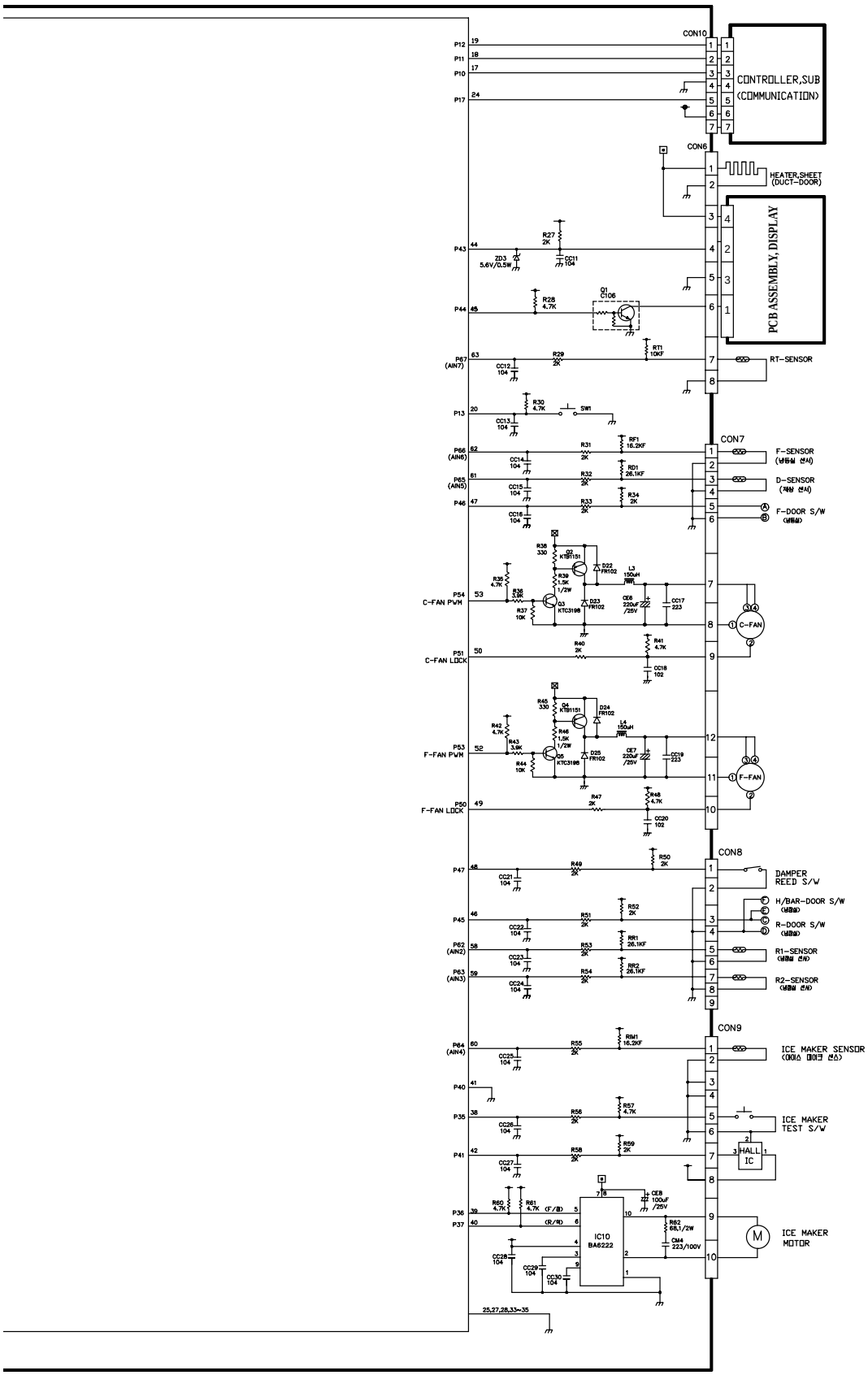
Parts without (•) mark means SMD parts.

EXPLANATION FOR MICOM CIRCUIT

4. PWB circuit diagram - PWB circuit diagram may vary a little bit depending on actual condition.



EXPLANATION FOR MICOM CIRCUIT



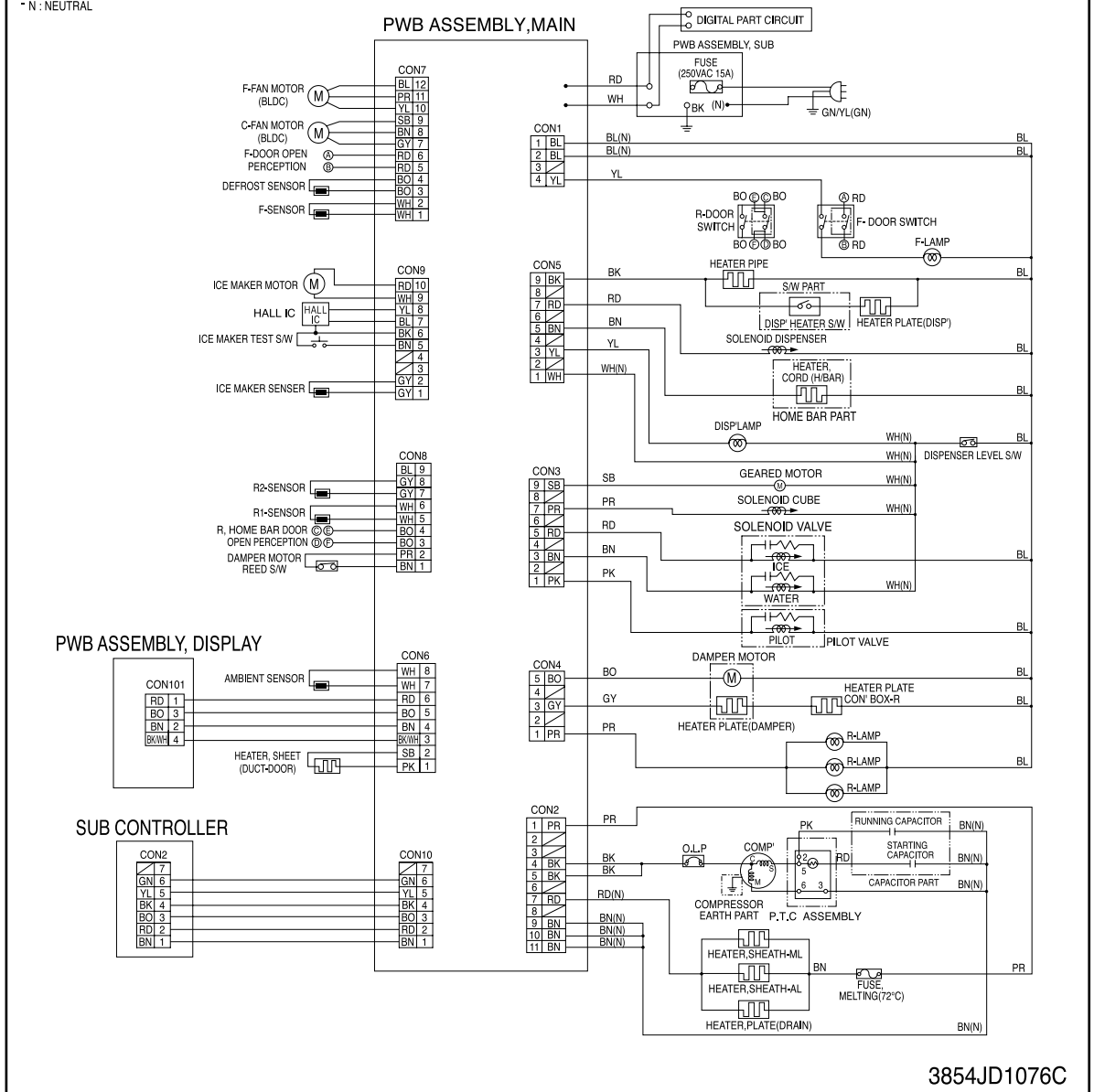
CIRCUIT

THE CIRCUIT DRAWINGS

CIRCUIT DIAGRAM

MODEL : GR-D267**U

- HOME BAR PART(H/BAR HEATER,DOOR S/W),CAPACITOR PART, PLUG TYPE, COMPRESSOR EARTH PART, PILOT VALVE, S/W PART, P.T.C ASSEMBLY ON CIRCUIT DIAGRAMS ARE SUBJECT TO CHANGE IN DIFFERENT LOCALITES AND ACCORDANCE WITH MODEL TYPE.
- N : NEUTRAL



3854JD1076C

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

PROBLEM DIAGNOSIS

1. Trouble Shooting

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK

1. Faulty start	1) No power on outlet.
	2) No power on cord.
	- Bad connection between adapter and outlet. (faulty adapter)
	  - The Inner diameter of adapter.
	  - The distance between holes.
	  - The distance between terminals.
	  - The thickness of terminal.
	- Bad connection between plug and adapter (faulty plug).
	  - The distance between pins.
	  - Pin outer diameter.
	3) Shorted start circuit.
	- No power on power cord.
	  - Disconnected copper wire.
	  - Power cord is disconnected.
	  - Faulty soldering.
	  - Internal electrical short.
	  - Faulty terminal contact.
	  - Loose contact.
	  - Large distance between male terminal.
	  - Thin female terminal.
	  - Terminal disconnected.
	  - Bad sleeve assembly.
	  - Disconnected. - Weak connection.
	  - Short inserted cord length.
	  - Worn out tool blade.
	- No electric power on thermostat.
	  - Thermostat is off.- Gas leaks completely.
	  - Sensor breakage.
	  - Sealed part leak.
	  - Bellows leak.
	  - Faulty terminal connection.
	- OLP is off.
	  - Capacity of OLP is small.
	  - Characteristics of OLP are out of spec.
	  - Bad connection.
	  - Power is disconnected.
	  - Inner Ni-Cr wire blows out.
	  - Bad internal connection.
	  - Faulty terminal caulking (Cu wire is cut).
	  - Bad soldering.
	- No electric power on compressor. - Faulty compressor.
	- Faulty PTC.
	  - Power does not conduct. - Damage.
	  - Bad characteristics. - Initial resistance is high.
	  - Bad connection with compressor.
	  - Too loose.
	  - Assembly is not possible.
	  - Bad terminal connection.
	4) During defrost.
	- Start automatic defrost.
	- Cycle was set at defrost when the refrigerator was produced.
		* Measuring instrument : Multi tester
		■ Check the voltage. If the voltage is within ±85% of the rated voltage, it is OK.
		■ Check the terminal movement.
		■ Check both terminals of power cord. Power conducts : OK. No power conducts : NG
		■ Check both thermostat terminals. Power conducts : OK. If not : NG.
		■ Check both terminals of OLP. If power conducts : OK. If not : NG.
		■ Check the resistance of both terminals. At normal temperature 6 : OK. If disconnected : ∞.

PROBLEM DIAGNOSIS

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK
2. No cooling.	2) Refrigeration system is clogged.	■ Check the clogged evaporator by heating (as soon as the cracking sound begins, the evaporator starts freezing)

- Moisture clogged.
  - Residual moisture in the evaporator.
    - Air Blowing.
      - Not performed.
      - Too short.
      - Impossible moisture confirmation.
      - Low air pressure.
    - Leave it in the air.
      - During rest time.
      - After work.
    - Caps are missed.
  - Residual moisture.
    - Not dried in the compressor.
    - Elapsed more than 6 months after drying
    - Caps are missing.
    - No pressure when it is open.
  - Insufficient drier capacity.
    - Dry drier - Drier temperature.
    - Leave it in the air.
      - Check on package condition.
      - Good storage after finishing.
  - Residual moisture in pipes.
    - Caps are missed.
      - During transportation.
      - During work.
    - Air blowing.
      - Not performed.
      - Performed.
        - Too short time.
        - Low air pressure.
        - Less dry air.
  - Moisture penetration into the refrigeration oil. - Leave it in the air. - Moisture penetration.
- No electric power on therm-ostat.
- Weld joint clogged.
  - Short pipe insert.
  - Pipe gaps.
    - Too large.
    - Damaged pipes.
  - Too much solder.
- Drier cloggeing.
  - The capillary tube inserted too far.
  - Capillary tube melts. - Over heat.
  - Clogged with foreign materials.
    - Desiccant powder.
    - Weld oxides.
    - Drier angle.
  - Reduced cross section by cutting. - Squeezed.
- Foreign material clogging.
  - Compressor cap is disconnected.
  - Foreign materials are in the pipe.

■ The evaporator does not cool from the beginnig (no evidece of moisture attached).
The evaporator is the same as before even heat is applied.

PROBLEM DIAGNOSIS

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK

3. Refrigeration is weak.	1) Refrigerant Partly leaked.
	- Weld joint leak.
	- Parts leak.
	
	2) Poor defrosting capacity.
	- Drain path (pipe) clogged.
	  - Inject P/U into drain hose.
	  - Inject through the hole.
	  - Seal with drain.
	  - Foreign materials penetration.
	  - P/U lump input.
	  - Screw input.
	  - Other foreign materials input.
	  - Drain cap is not disconnected.
	- Defrost heater does not generate heat.
	  - Parts disconnected.
	  - Defrost thermo-stat
	  - Thermostat is cut.
	  - Bad caulking connection.
	  - Base material (Ammonia).
	  - Terminal is corroded.
	  - Water penetration
	  - Bad terminal contact.
	  - Plate heater
	  - Wire is cut.
	  - Heating wire.
	  - Contact point between heating and electric wire.
	  - Dent by fin evaporator.
	  - Poor terminal contacts.
	  - Cord heater
	  - Wire is cut.
	  - Lead wire.
	  - Heating wire.
	  - Contact point between heating and electric wire.
	  - Heating wire is corroded
	  - Water penetration.
	  - Bad terminal connection.
	  - Melting fuse
	  - The fuse blows out.
	  - Paraffin melted
	  - Welding flame.
	  - Bad terminal contact.
		■ Check visually.
		
		■ Check terminal
		Conduction: OK.
		No conduction: NG.
		If wire is not cut, refer to resistance.
		P=Power
		V=Voltage
		R=Resistance
		$P=\frac{V^2}{R}$
		$R=\frac{V^2}{P}$

PROBLEM DIAGNOSIS

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK

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

PROBLEM DIAGNOSIS

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK

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

PROBLEM DIAGNOSIS

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

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

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

PROBLEM DIAGNOSIS

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK

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

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

PROBLEM DIAGNOSIS

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

PROBLEM DIAGNOSIS

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

PROBLEM DIAGNOSIS

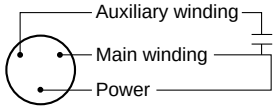
CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK
10. Structure, appearance and others.	1) Door foam. Sag. — Hinge loose — Bolt is loosened during Transportation. Hinge loose — Not tightly fastened. Hinge loose — Screw worn out . Weak gasket adhesion. — Adhesion surface. Fixed tape. — Poorly applied. Noise during operation. — Hinge interference. — Bigger door foam. Hinge interference. — Hinge-Pin tilted-Poor flatness. Hinge interference. — No washer. Hinge interference. — No grease or not enough quantity. Malfunction. — Not closed Interference between door liner and inner liner. Malfunction. — Refrigerator compartment is opened when freezer compartment is closed (faulty stopper). — Stopper worn out. Refrigerator compartment is opened when freezer compartment is closed (faulty stopper). — Bad freezer compartment door assembly. Refrigerator compartment is opened when freezer compartment is closed (faulty stopper). — No stopper. 2) Odor. Temperature of refrigerator compartment. — High. — Faulty damper control. High. — Button is set at **weak**. High. — Door is open (interference by food). Deodorizer. — No deodorizer. Deodorizer. — Poor capacity. Food Storage. — Seal condition. Food Storage. — Store special odorous food. Food Storage. — Long term storage. Others. — Odors from chemical procucts.	

2. Faults

2-1. Power

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

2-2. Compressor

Problems	Causes	Checks	Measures	Remarks
Compressor does not operate.	- Faulty PTC.	- Check the resistance. Value:∞ is defective.	- If resistance is infinite, replace it with new one. - If it is not infinite, it is normal. - Check other parts.	
	- Compressor is frozen.	- If compressor assembly parts are normal(capacitor, PTC, OLP), apply power directly to the compressor to force operation.  OLP It starts as soon as it is contacted.	- During forced operation: - Operates: Check other parts. - No operation: Replace the frozen compressor with new one, weld, evacuate, and recharge refrigerant. • Refer to weld repair procedures.	

2-3. Temperature

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

2-4. Cooling

Problems	Causes	Checks	Measures	Remarks
High temperature in the freezer compartment.	Refrigerant leak.	Check sequence 1. Check the welded parts of the drier inlet and outlet and drier auxiliary in the compressor compartment (high pressure side). 2. Check the end of compressor sealing pipe (low pressure side). 3. Check silver soldered parts. (Cu + Fe / Fe + Fe). 4. Check bending area of wire condenser pipe in compressor compartment (cracks can happen during bending). 5. Check other parts (compressor compartment and evaporators in freezer compartment).	Weld the leaking part, recharge the refrigerant.	Drier must be replaced.
	Shortage of refrigerant.	Check frost formation on the surface of evaporator in the freezer compartment. - If the frost forms evenly on the surface, it is OK. - If it does not, evaporator is not good.	- Locate the leaking area, repair, evacuate, and recharge the refrigerant. - If not leaking, remove the remaining refrigerant, and recharge new refrigerant.	Drier must be replaced.

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

2-5. Defrosting failure

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

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

2-6. Icing

Problems	Causes	Checks	Measures	Remarks
Icing in the refrigerator compartment. - Damper icing. - Pipe icing. - Discharging pipe icing.	1) Bad circulation of cool air. - Clogged intake port in the refrigerator compartment. - Seal is not good. - Too much food is stored and blocks the discharge port. - Bad defrosting.	- Verify the food is stored properly (see it discharge and intake port are blocked). - Check icing on the surface of baffle and cool air path (pipe) after dissembling the container box. - Check icing at intake ports of freezer and refrigerator compartment.	- Be acquainted with proper use. - Seal on connecting parts. - Check the damper and replace it if it has defects. - Check defrost. (After forced defrosting, check ice in the evaporator and pipes.)	- Check the defrost related parts if problem is caused by faulty defrosting.
	2) Faulty door or refrigerator compartment. - Faulty gasket. - Faulty assembly.	- Check gasket attachment. - Check door assembly conditions.	- Correct the gasket attachment conditions or replace as necessary. - Door assembly and replacement.	- Replacement should be done when gasket cannot be repaired.
	3) Overcooling in the refrigerator compartment. - Faulty damper in the refrigerator compartment. - Faulty MICOM (faulty sensor)	- See if refrigerator compartment is overcooling (when button pressed on **weak**). - Check for faulty parts.	- Replace faulty parts.	
	4) Bad defrosting - Heater wire is cut. - Defective defrost sensor. - Defrosing cycle.	- Check frost on the evaporator after dissembling shroud and fan grille. - Check for ice on intake port of freezer and refrigerator compartments.	- Check parts related to defrosting. - Check defrosting. (Check ice on the evaporator and pipe.)	- Moisture does not on the evaporator but is sucked into the refrigerator, being condenses and ices, with coolain circulation, and suppressing sublimation.
	5) Customers are not familiar with this machine. - Door is left open. - High temperature, high moisture, and high load.	- Check food interfering with door closing. - Check ice on the ceilings.	- Acquaint customers with how to use.	

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

2-7. Sound

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

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

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

2-8. Odor

Problems	Causes	Checks	Measures	Remarks
Food Odor.	Food (garlic, kimchi, etc)	- Check to see if food is not wrapped. - See if the shelves or inner wall are stained with food juice. - Check the food in the adhesive wraps. - Check food for spoilage.	- Dry deodorizer in the bright well ventilated place. - Store the food in the closed container instead of vinyl wraps. - Clean the refrigerator and set the cooling to **strong**.	
Plastic Odor.	Odors of mixed food and plastic odors.	- See if wet food is wrapped with plastic bowl or bag. - Certain odors are common in new refrigerator.	- Clean the refrigerator. - Persuade customers not to use plastic bag or wraps with wet food or odorous foods.	
Odor from the deodorizer.	Odor from the old deodorizer.	- Check the deodorizer odors.	- Dry the deodorizer with dryer and then in a birght and well ventilated place. - Remove and replace the deodorants.	

2-9. Micom

Problems	Symptom	Causes		Checks	Measures	Remarks
Bad PCB electric power.	All display LCDS are off.	Bad connection between Main PCB and display circuit.	Bad connector connection from main PCB to display PCB.	Visual check on connector connection.	Reattach connector.	
		Defective PCB transformer	PCB transformer winding is cut.	Check resistance of PCB trans input and output terminals with a tester. (If resistance is infinity, trans winding is cut).	Replace PCB transformer or PCB.	Applicable to model without dispenser.
			PCB transformer temperature fuse is burnt out.			
		DefectivePCB electric circuit parts.	Defective regulator IC (7812, 7805).	Check voltage at input/output terminals.	Replace regulator.	Refer to electric circuit in circuit explanation.
			PCB electric terminal fuse is burnt out.	Check fuse in PCB electric terminal with a tester.	Replace PCB fuse.	
			STR Parts are damaged.	Check if STR No. 2 and 3 pins are cut when power is off.	Replace parts.	Applicable to model with dispenser.
	Abnormal display LCD operation	Bad connection between Main PCB and display circuit.	Lead Wire connecting main PCB and display PCB is cut or connector terminal connection is bad.	Check Lead Wire terminals connecting Main PCB and display PCB with a tester.	Reconnect Lead Wire and directly connect defective contact terminal to Lead Wire.	
		Defective LCD module.	Defective LCD.	Check if all LCDs are on when Main PCB Test switch is pressed (or when both freezer key and power freezer key are pressed at the same time for more than one second.)	Replace display PCB.	Refer to display circuit in circuit explanation.

Problems	Symptom	Causes		Checks	Measures	Remarks
Bad cooling.	Freezer temperature is high.	Compressor does not start.	Compressor Lead Wire is cut.	Check compressor Lead Wire with a tester.	Reconnect Lead Wire.	
			Defective compressor drive relay.	Measure voltage at PCB CON5 (3&9) after pressing main PCB test switch once. It is OK if voltage is normal.	Replace relay RY1 and RY14 or PCB.	Refer to load driving circuit in circuit explanation.
		Defective freezer sensor.	Defective Freezer sensor parts.	Check resistance of freezer sensor with a tester.	Replace freezer sensor.	Refer to resistance characteristics table of sensor in circuit
			Freezer sensor is substituted for other sensor.	Confirm the color of sensor in circuits (main PCB sensor housing).	Repair main PCB sensor housing	explanation.
		Defective freezer fan motor.	Fan motor lead wire is cut.	Check fan motor lead wire with a tester.	Reconnect lead wire.	
			• Defective door switch (freezer, refrigerator, home bar). • Defective fan motor. • Defective fan motor drive relay.	Measure the voltage between PCB power blue line and fan motor after pressing test switch of Main PCB. If the voltage is normal, it is OK.	• Replace door switch (freezer, refrigerator and home bar). • Replace fan motor. • Replace relay RY5 & RY6 or PCB.	Refer to load drive circuits in circuit explanation.
		Faulty defrost.		Refer to faulty defrost items in problem diagnosis functions.		Refer to problem diagnosis function.

Problems	Symptom	Causes		Checks	Measures	Remarks
Bad cooling	Wrong Refrigerator temperature.	Defective AC Damper.	Check AC damper motor and reed switch and lead wire are cut.	Using a tester, see if AC damper motor and reed switch lead wire are cut with a tester.	Reconnect lead wire.	
			Check AC damper part.	Refer to AC damper in parts repair guide.	Replace AC damper or refrigerator control box ASSEMBLY.	
			Check AC damper Motor drive relay in PCB.	Refer to AC damper in parts repair guide.	Replace relay or PCB.	Refer to single motor damper drive circuits in circuit explanation.
			Foreign materials in AC damper baffles	Check AC damper baffle visually.	Remove foreign materials.	
			Ice formation on AC damper baffles	Check if AC damper Heater wire is cut with a tester.	Replace AC damper or refrigerator control Box ASSEMBLY.	
		Defective refrigerator sensor	Defective refrigerator sensor parts.	Check the resistance of refrigerator sensor with a tester.	Replace refrigerator sensor.	Refer to sensor resistance characteristic table in circuit explanation.
			Refrigerator sensor is substituted for other sensor.	Visually inspect the sensor color in the circuit. (main PCB sensor housing.)	Repair main PCB sensor housing.	
			Defective refrigerator sensor assembly condition.	Visually if refrigerator sensor is not fixed at cover sensor but inner case visually.	Reposition the refrigerator sensor.	

Problems	Symptom	Causes	Checks	Measures	Remarks
Bad defrost.	Defrost is not working.	Defrost lead wire is cut.	Using a tester, check if defrost lead wire is cut with a tester.	Reconnect Lead Wire.	
		Defective defrost drive relay.	Check the voltage of CON5 (1 and 7) with a tester after pressing main PCB test switch twice. If the voltage is normal then relay is OK.	Replace relay (RY 7 and RY 14) or PCB.	Refer to load driving conditions check in circuit explanation.
		Defective defrost sensor parts.	Check the resistance of defrost sensor with a tester.	Replace defrost sensor.	Refer to sensor resistance characteristic table of circuit explanation.
Defective buzzer	Buzzer continuously rings or door opening alarm does not work.	Defective connecting lead wire from main PCB to door switch.	Check lead wire related to door switch with a tester.	Repair lead wire.	
		Defective door switch parts.	Refer to door switch in parts repair guide.	Replace door switch.	
Defective display button	Buzzer does not ring and key does not function when pressed.	Key input wire is cut or bad connector terminal contact in main PCB and display PCB connecting lead wire.	Check input wire with a tester.	Reconnect lead wire and replace or directly connect bad contact terminal to lead wire.	Refer to display circuit in circuit explanation.
		Key is continuously depressed due to structural interference.	Disassemble frame display and confirm visually.	Adjust or replace interfering structures.	

Problems	Symptom	Causes	Checks	Measures	Remarks
Defective display button.	Buzzer rings but key does function when button is pressed.	Trouble mode indication.	Check problem diagnosis function.	Remedy faults	Refer to mode indication in function explanations.
Bad water/ice dispenser.	Buzzer continuously rings or door open alarm does not work.	Defective connecting lead wire from main PCB to door switch.	Check lead wire associated with door switch.	Repair lead wire.	Check model with dispenser.
		Defective freezer compartment door switch parts.	Refer to door switch in parts repair guide.	Replace Freezer compartment door switch.	
	Ice and water do not dispensed.	Defective connecting lead wire from Main PCB to lever switch.	Check Lead Wire associated with lever switch with a tester.	Repair lead wire.	
		Defective lever switch parts	Refer to door switch in parts repair guide.	Replace lever switch.	
		Defective photo coupler IC parts.	Check voltage change at photo coupler output terminals when lever switch pressed. It is OK if voltage change is from 0V - 5V.	Replace photo coupler IC or PCB.	
		Defective relay associated with ice dispense (geared motor, cube and dispenser solenoid).	Check relay (RY9, RY11, RY12) with a tester.	Replace defective relay.	
		Defective parts associated with ice dispenser (geared motor, cube and dispenser solenoid).	Check resistance of parts with a tester.	Replace defective parts.	
		Defective relay associated with water dispenser.	Check relay (RY10) with a tester	Replace defective relay.	
		Defective parts associated with water dispenser.	Check resistance of parts with a tester.	Replace defective parts.	

PROBLEM DIAGNOSIS

3. Cooling Cycle Heavy Repair

3-1. The Heavy Repair Standards for Refrigerator with R134a Refrigerant

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

NOTE) Please contact Songso company on +82-53-554-2067 if you have inquiry on heavy repair special facility.

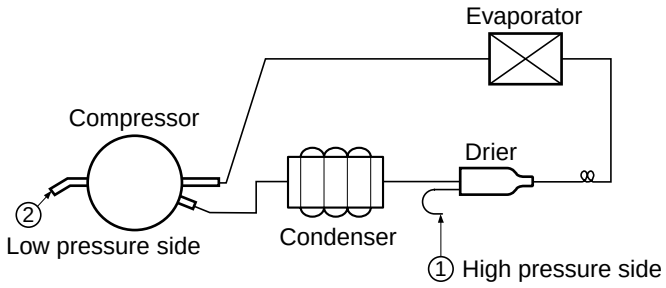
PROBLEM DIAGNOSIS

3-2. Summary Of Heavy Repair

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

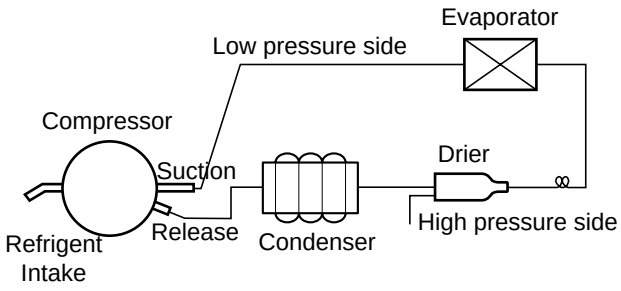
PROBLEM DIAGNOSIS

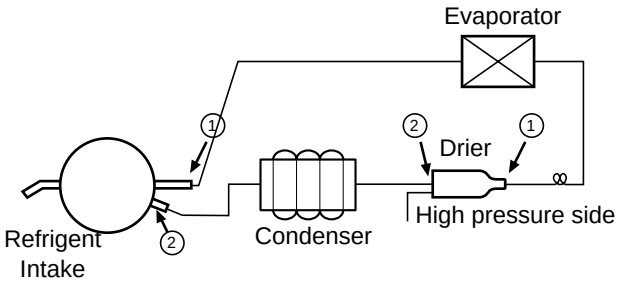
3-3. Precautions During Heavy Repair

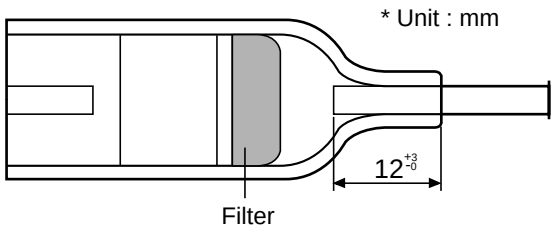
Items	Precautions
1. Use of tools.	1) Use special parts and tools for R134a.
2. Removal of retained refrigerant.	1) Remove retained refrigerant more than 5 minutes after turning off a refrigerator. (If not, oil will leak inside.) 2) Remove retained refrigerant by cutting first high pressure side (drier part) with a nipper and then cut low pressure side. (If the order is not observed, oil leak will occur.) 
3. Replacement of drier.	1) Be sure to replace drier with R134a only when repairing pipes and injecting refrigerant.
4. Nitrogen blowing welding.	1) Weld under nitrogen atmosphere in order to prevent oxidation inside a pipe. (Nitrogen pressure : 0.1~0.2 kg/cm^2.)
5. Others.	1) Nitrogen or refrigerant R134a only should be used when cleaning and sealing inside of cycle pipes inside and sealing. 2) Check leakage with an electronic leakage tester. 3) Be sure to use a pipe cutter when cutting pipes. 4) Be careful not to let the water let intrude into the inside of the refrigerant cycle path.

PROBLEM DIAGNOSIS

3-4. Practical Work For Heavy Repair

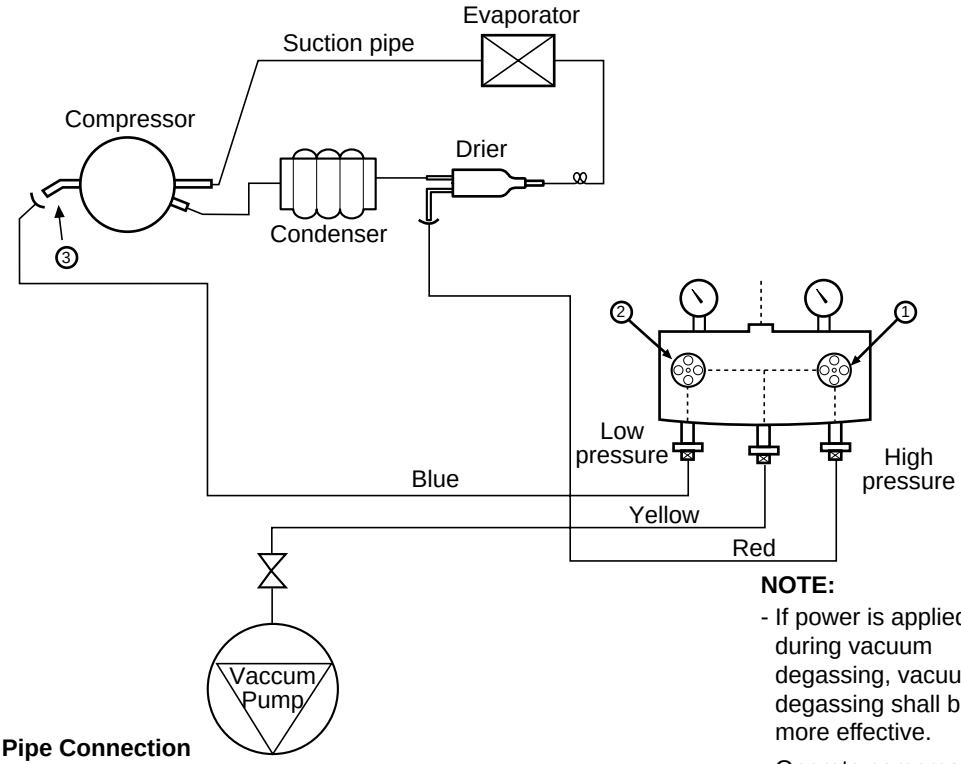
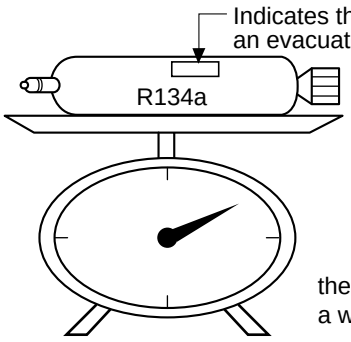
<table>
<tr><th>Items</th><th>Precautions</th></tr>
<tr><td>1. Removal of residual refrigerant.</td><td>


NOTE:
Observe the sequence for removal of refrigerant. (Otherwise, compressor oil may leak.)
1) Remove residual refrigerant more than 5 minutes later after turning off the refrigerator. (Otherwise, compressor oil may leak inside.)
2) Remove retained refrigerant slowly by cutting first high pressure side (drier part) with a nipper followed by cutting the low pressure side.
</td></tr>
<tr><td>2. Nitrogen blowing welding.</td><td>


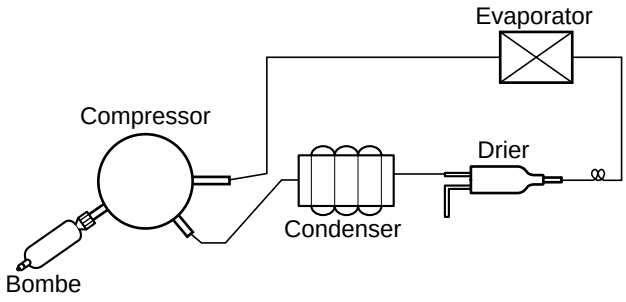
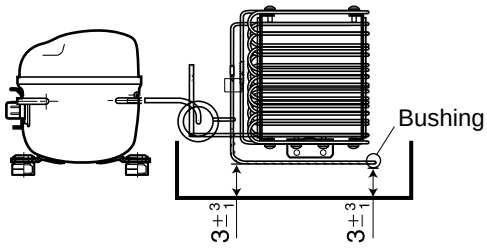
NOTE:
Welding without nitrogen blowing produces oxidized scales inside a pipe, which affect on performance and reliability of a product.
When replacing a drier:
Weld ① and ② parts by blowing nitrogen(0.1~0.2kg/cm²) to high pressure side after assembling a drier.
When replacing a compressor:
Weld ① and ② parts by blowing nitrogen to the low pressure side.
Note) For other parts, nitrogen blowing is not necessary because not all welding is performed for a long enough time to produce oxidation scales.
</td></tr>
<tr><td>3. Replacement of drier.</td><td>


NOTE:
Be sure to check the inserted length of capillary tube when it is inserted. (If too much is inserted, the capillary tube is blocked by a filter.)
Inserting a capillary tube
Measure distance with a ruler and put a mark($12^{+3/-0}$)on the capillary tube. Insert tube to the mark and weld it
</td></tr>
</table>

PROBLEM DIAGNOSIS

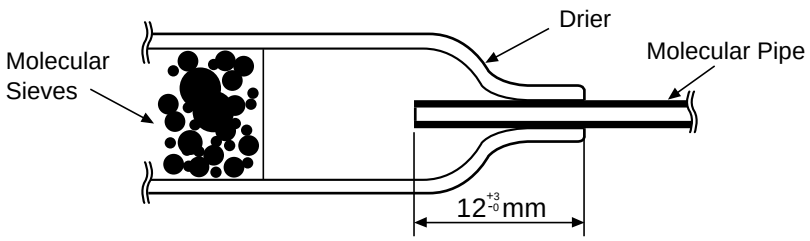
Items	Precautions
4.Vacuum degassing.	 **Pipe Connection** Connect a red hose to the high pressure side and a blue hose to the low pressure side. **Vacuum Sequence** Open valves ① and ② and evacuate for 40 minutes. Close valve ①. **NOTE:** - If power is applied during vacuum degassing, vacuum degassing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

PROBLEM DIAGNOSIS

Items	Precautions
	 4) Refrigerant Charging Charge refrigerant while operating a compressor as shown above. 5) Pinch a charging pipe with a pinch-off plier after completion of charging. 6) Braze the end of a pinched charging pipe with copper brazer and perform a gas leakage test on the welded parts.
6. Gas-leakage test	* Take for leaks on the welded or suspicious area with an electronic leakage tester.
7. Pipe arrangement in each cycle	Verify that each pipe is placed in its original location before closing a cover after completion of work. Particularly check the size of Joint Drain Pipe 

3-5. Standard Regulations For Heavy Repair

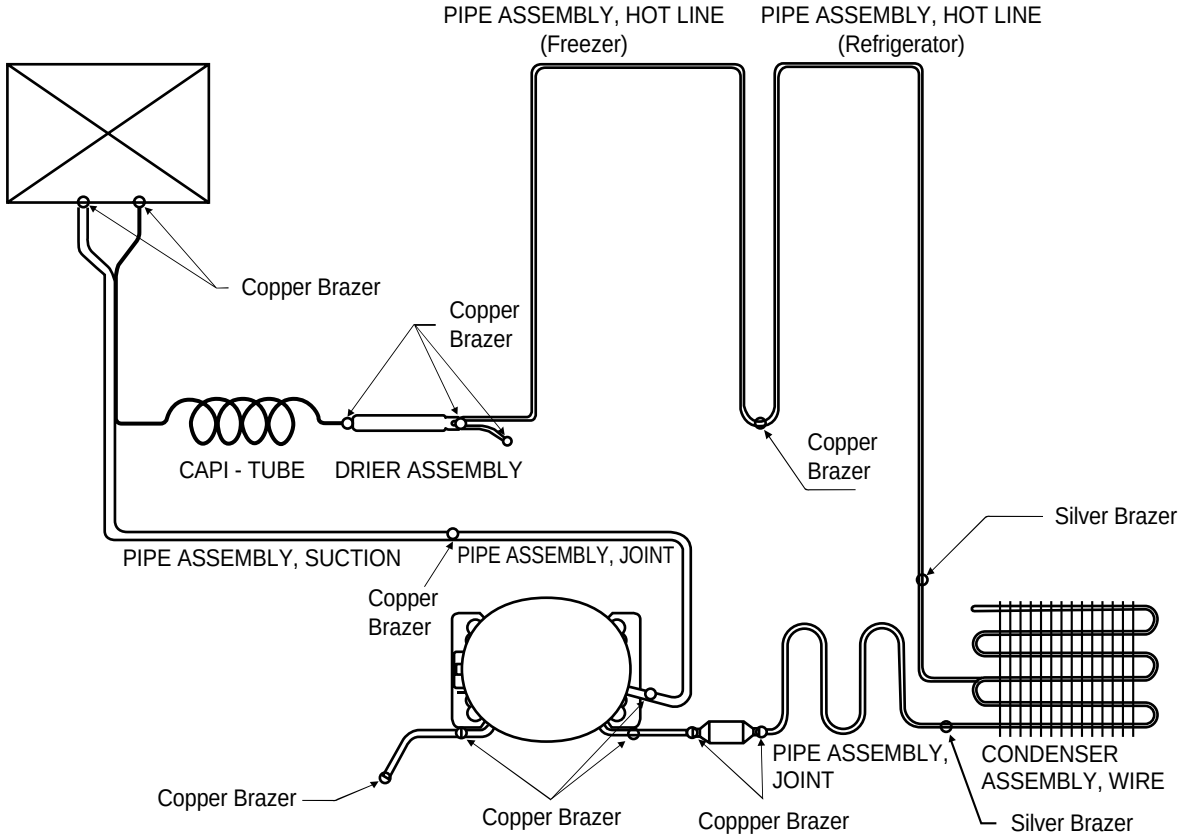
1) Observe the safety precautions for gas handling.
2) Use JIG (or wet towel) in order to prevent electric wires from burning during welding. (In order to prevent insulation damage and consequent accidents.)
3) The inner case shall will melt and the insulation material (polyurethane) shall be damaged if care is not taken during welding of inner case parts.
4) The copper piping wil oxidize from overheating if care is not taken during welding.
5) Do not allow aluminum and copper pipes to touch. (In order to prevent corrosion.)
6) Observe that the inserted length of a capillary tube into a drier should be 12^{+3}_{-0} mm.



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

PROBLEM DIAGNOSIS

3-6. Brazing Reference Drawings



PROBLEM DIAGNOSIS

4. HOW TO DEAL WITH CLAIMS

4-1. Sound

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

PROBLEM DIAGNOSIS

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

PROBLEM DIAGNOSIS

4-2. Measures for Temperature Related Symptoms

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

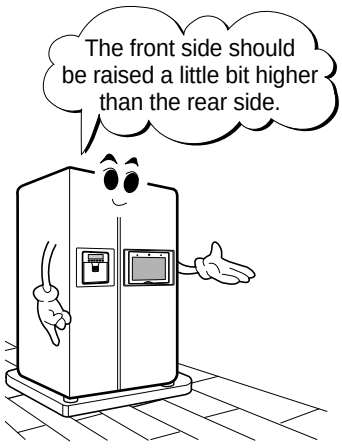
PROBLEM DIAGNOSIS

4-3. Odor and Frost

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

PROBLEM DIAGNOSIS

4-4. Others

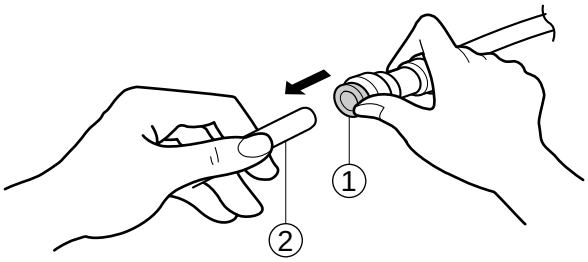
Problems	Checks and Measures
The refrigerator case is hot.	■ Explain the principles of radiator. • The radiator pipes are installed in the refrigerator case and partition plate between the refrigerator and the freezer compartment in order to prevent condensation formation. Particularly in summer or after installation of refrigerator, it may feel hot but this is normal. If there is not enough space to dissipate heat, the case may be hotter due to lack of heat radiation. Please install the refrigerator in a well-ventilated place and leave a clearance between refrigerator and wall:
Small holes in a door liner	■ Explain that the hole is for releasing gas. • A small hole in the door liner is for releasing gas during insulation materials lining work. With a release hole, forming can be easily accomplished.
Electric bills are too expensive.	■ Check the use conditions. • Excessive door opening and hot food storage cause the compressor to operate continuously and increase the electric consumption and bills.
Condensation on the inside wall of the refrigerator compartment and the cover of properly vegetable drawer.	■ Explain how to store foods • Condensation forms when refrigerator is installed at damp area, door is frequently opened, and wet foods are not stored in the air tight container or wrapped. Be sure to store wet foods in the air tight container or in secure wrapping.
When is the power connected?	■ When should the power be connected ? • You can connect the power right after the installation. But if the refrigerator was laid flat during transportation for a long period of time, then the refrigerant and compressor oils are mixed up, and this will affect badly the performance of the refrigerator. Be sure to connect the power 2~3 hours after refrigerator is installed.
Door does not open properly. 	■ Refrigerator compartment door does not open properly. • When the door is open, warm open air comes into the compartment and is mixed up with cool air. This mixed air shall be compressed and increases the internal pressure when door is closed. This causes the door to more closely adhere to the refrigerator in a moment. As the refrigerator guins use, this symptom will diminish. ■ When the refrigerator compartment door is opened and closed, the freezer compartment door moves up and down. • When the refrigerator compartment door is opened or closed, fresh air comes into the freezer compartment and moves up and down the freezer compartment door. ■ Door opens too easily. • There is a magnet in the gasket bushing so that it is. if door is securely closes without a gap. Also, check to see if the foods in the refrigerator or freezer compartments are holding the door open. ■ The doors do not close properly. • If the rear side of the refrigerator is raised higher than front side, the doors shall not be easily closed. Adjust the level of refrigerator with the levelling screws.

HOW TO DISASSEMBLE AND ASSEMBLE

1. DOOR

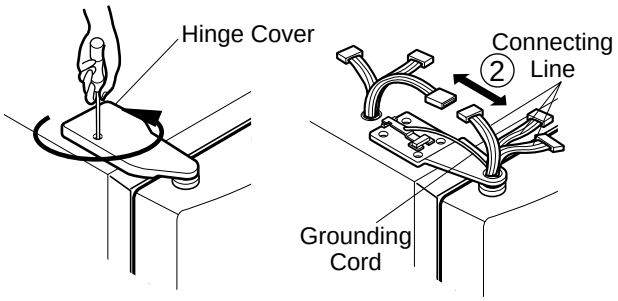
1) Remove lower cover and then disconnect water supply tube in the lower part of freezer door.

• Pull the water supply tube ② forward while pressing ① part to disconnect water supply tube as shown below.

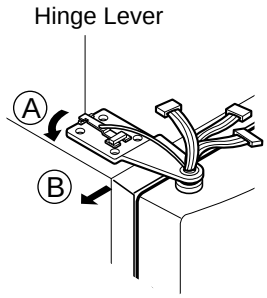


2) Remove a freezer door.

(1) Loosen hinge cover screw of freezer door and remove cover. Disconnect all connecting lines except grounding cord.



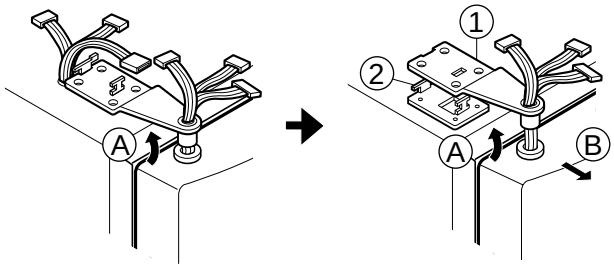
(2) Turn hinge lever in arrow Ⓐ direction until it is loosened and take it out in arrow Ⓑ direction.



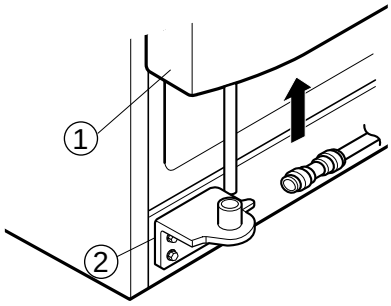
Note : • *When disconnecting refrigerator door, turn hinge lever counterclockwise.*

• *If hinge lever or bracket hinge pin is deformed during assembling freezer and refrigerator doors, attach two screws (Tap Tite Screw, M6: Lower fixing screw) in the hole of upper hinge.*

(3) Disconnect upper hinge ① from a hinge supporter ② by grasping the front part of upper hinge and lifting up (Hinge Assembly, U) in arrow direction Ⓐ and pull forward in arrow Ⓑ direction. Be careful so the door does not fall down.



(4) Lift up the freezer door ① in arrow direction and disconnect the door from the lower hinge ②. Don't pull a door forward.



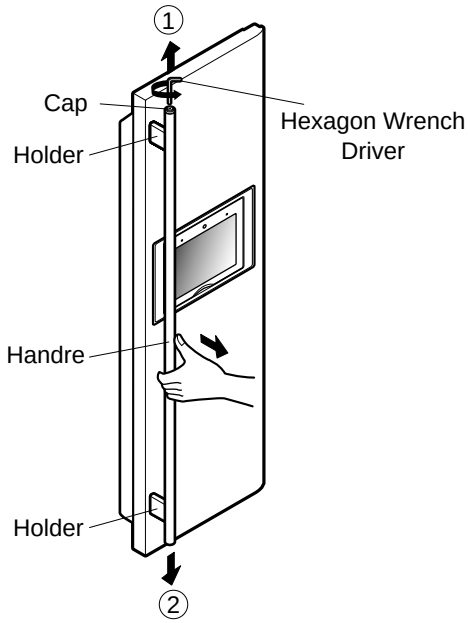
Note : • *Lift up a freezer door until a water supply tube is fully removed.*

(5) Assembly is the reverse order of disassembly

HOW TO DISASSEMBLE AND ASSEMBLE

2. HANDLE

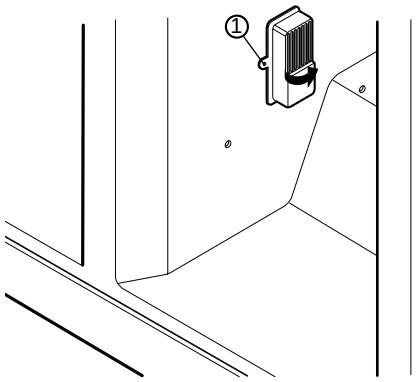
1) ①, ② Disconnect Cap by using Hexagon Wrench Dirver.
2) Disconnect Handle.
3) Disconnect Holder by using Hexagon wrench Driver.



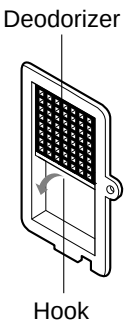
3. DEODORIZER

1) Loosen the screw in ①.
2) Pull out a deodorant cover forward (Fig. 1) while turning a cover in arrow direction.
3) Take out a deodorizer carefully after opening hook in arrow direction(Fig. 2).
4) Assembly is the reverse order of disassembly.

Note : • *Be sure to attach the aluminum plate of defrost heater to the floor of intake before assembling.*



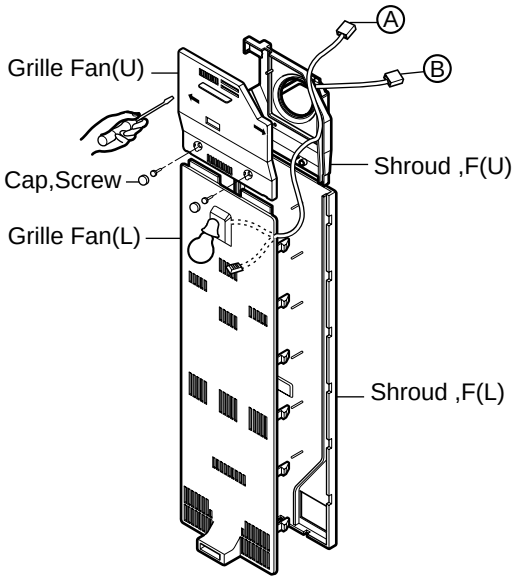
<Fig. 1>



<Fig. 2>

4. SHROUD, GRILLE FAN

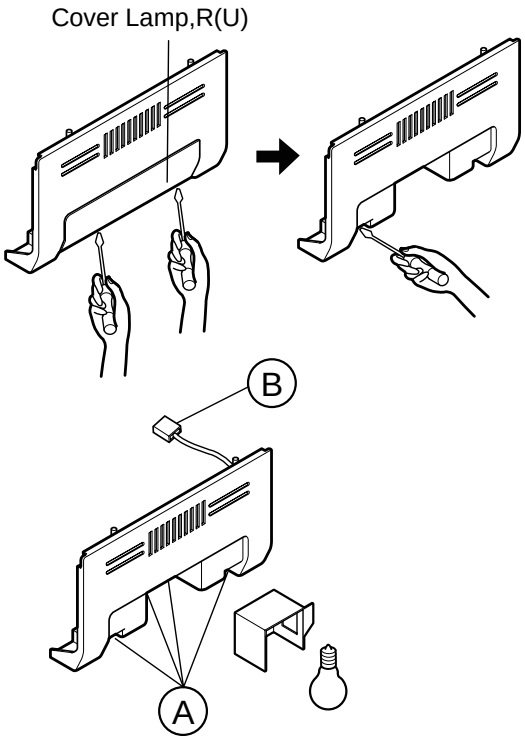
1) Loosen two screws after disconnecting a cap screw of a grille fan(U) with a blade screwdriver.
2) Disassembly of a grille fan(U) : Pull forward after opening hook at → part with a blade screwdriver.
3) Disconnect housing Ⓐ of a grille fan (L) from the main body.
4) Disassembly of a grille fan (L) : Hold upper part of a grille fan(L) and pull forward carefully.
5) Loosen two screws.
6) Disassembly of shroud. F(U) : Disconnect housing of Ⓑ after removing two rail guides with a balde screwdriver.
7) Disassembly of shroud. F(U) : Hold upper part and pull forward.
8) Check foam PU sticking conditions around the shroud, F(U) and F(L) during assembling. If damaged, torn or poorly attached, assemble with a new one after sealing well.



HOW TO DISASSEMBLE AND ASSEMBLE

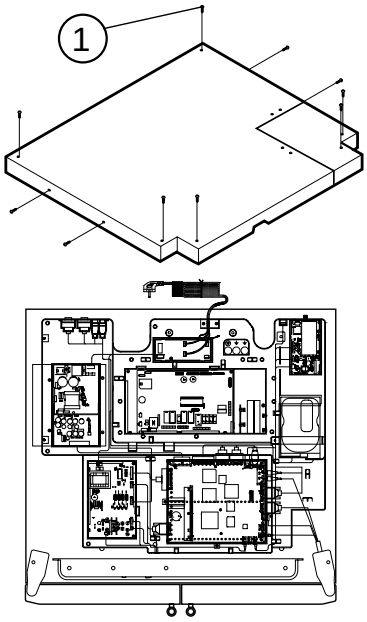
5. CONTROL BOX, R

1) Disconnection of Cover Lamp, R(U) : Loosen one screw in the center with a phillips screwdriver after pushing two rail guides on the lower part of a control box, R with a blade screwdriver, and pull the cover lamp, R(U) forward.
2) Loosen four screws in Ⓐ after taking out the lamp. Hold a lower part of control box and take out a control box by pulling forward and disconnect housing Ⓑ from the main body.



6. CASE PWB

1) Loosen ten screws in ① and remove cover PWB by pulling up in arrow direction.
2) When disassembling the whole case PWB, disassemble all housings first and push the case PWB in arrow direction to disassemble from the main body.
3) When disassembling Main PWB Assembly. and Sub. PWB Assembly from a case PWB, open each hook and disconnect.

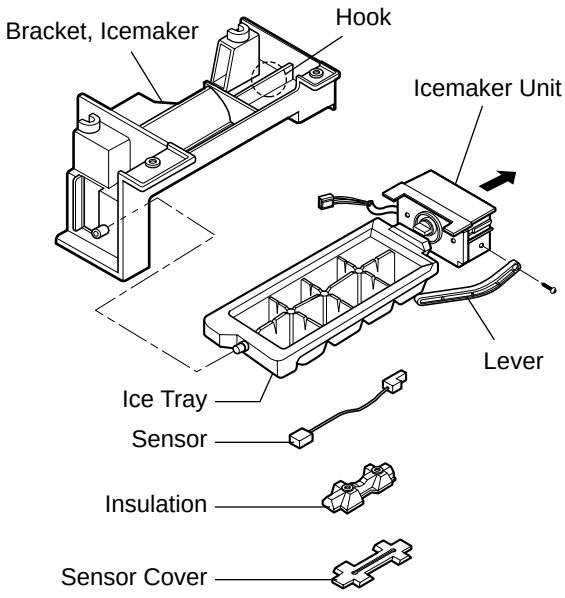


HOW TO DISASSEMBLE AND ASSEMBLE

7. ICEMAKER ASSEMBLY

7-1. Dispenser Model

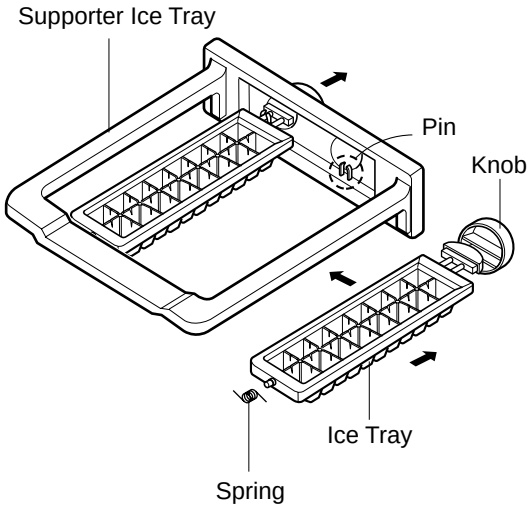
1) How to disassemble:
   (1) Remove ice bank from the freezer compartment.
   (2) Loosen two screws on the upper part of Icemaker bracket.
   (3) Disconnect Icemaker bracket so that it can slide forward.
   (4) Disconnect Icemaker housing and sensor housing.
   (5) Disconnect Icemaker horizontally by pressing bracket hook part. (Don't disassemble further. The set value may be changed.)
2) How to assemble : The assembly is the reverse order of the above disassembly.



Note : *When the ice tray is not horizontal after assembly, assembly was performed in correctly. Check and assemble again.*

7-2. Basic Model

1) How to disassemble:
   (1) Remove ice tray assembly from the freezer compartment.
   (2) Pull out knob from the ice tray in arrow direction. (At this time, pull out a knob in arrow direction while shaking right and left as the knob is connected to pins in Ⓐ.)
   (3) Spring can be removed by pulling ice tray in arrow direction and pulling out a spring inserted in ice tray axis from the hole of supporter ice tray.
2) How to assemble : Assembly is the reverse order of disassembly.

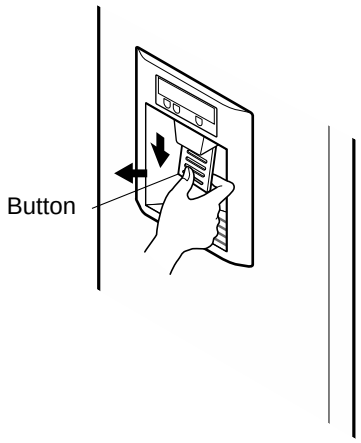


Note : *It is important to put one end of spring into the hole of the supporter ice tray and the other end on the lower part of an ice tray when inserting spring into the shaft.*

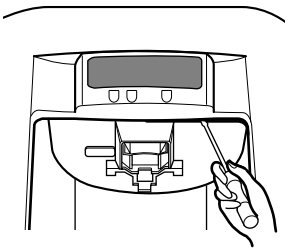
HOW TO DISASSEMBLE AND ASSEMBLE

8. DISPENSER

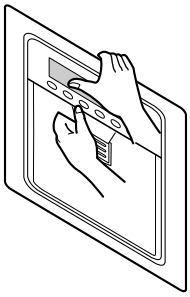
1) Disconnect button assembly by pulling down until it stops and then pull it forward.



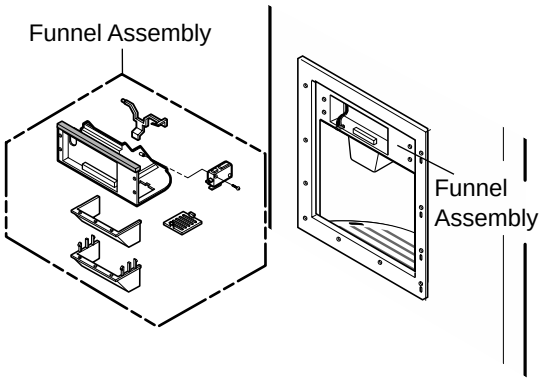
2) Remove display frame Assembly by making a gap between a display frame Assembly. and funnel Assembly. with a blade screwdriver and pulling it forward. The cover dispenser is fixed with a hook.



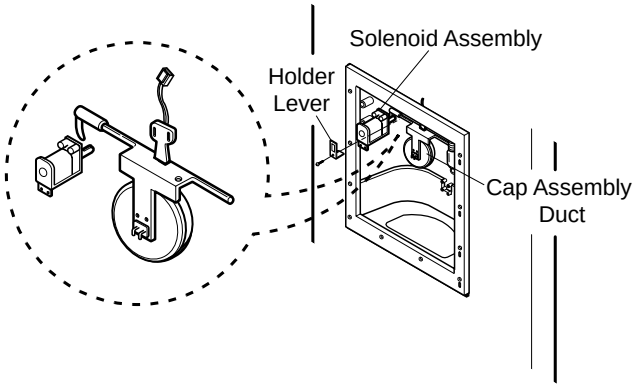
3) Display Assembly can be disconnected by pressing the upper part of a cover dispenser and pushing a display Assembly. after disconnecting display frame Assembly. housing.



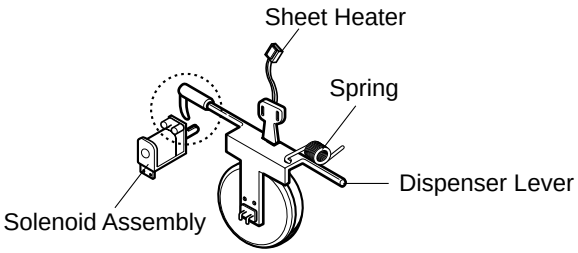
4) Loosen four screws with a phillips screwdriver and pull the funnel Assembly to disconnect.



5) Duct cap Assembly is disconnected if hold lever connecting screw is loosened with a phillips screwdriver.



6) For assembling a duct cap Assembly, insert one end of a spring into the right hole of dispenser lever, and insert the other end into the right hole in upper part of dispenser. And then assemble a holder lever after fixing the holder at the solenoid Assembly working part.

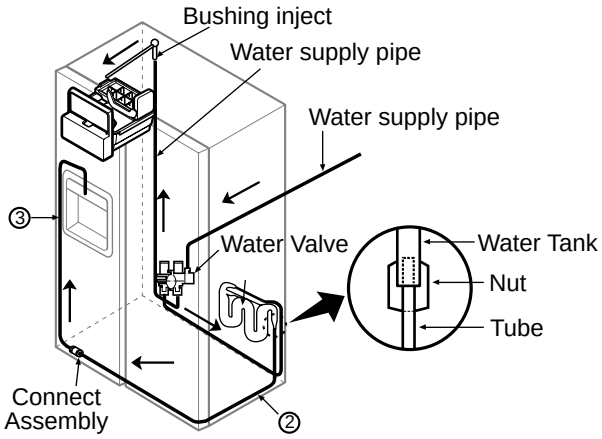


HOW TO DISASSEMBLE AND ASSEMBLE

9. WATER TANK AND WATER LINE

▶ The water tank at back and lower part of a refrigerator is attached by one screw and has a capacity containing of 7 glasses (180cc per glass) of cold water. It will take time to make more cold water in the tank.

* The first portion of dispensed water is not cold even though the refrigerator is working. In this case, dispense ice first in the cup and then water to make a water cold.



9-1. How to disassemble the water supply pipe ①

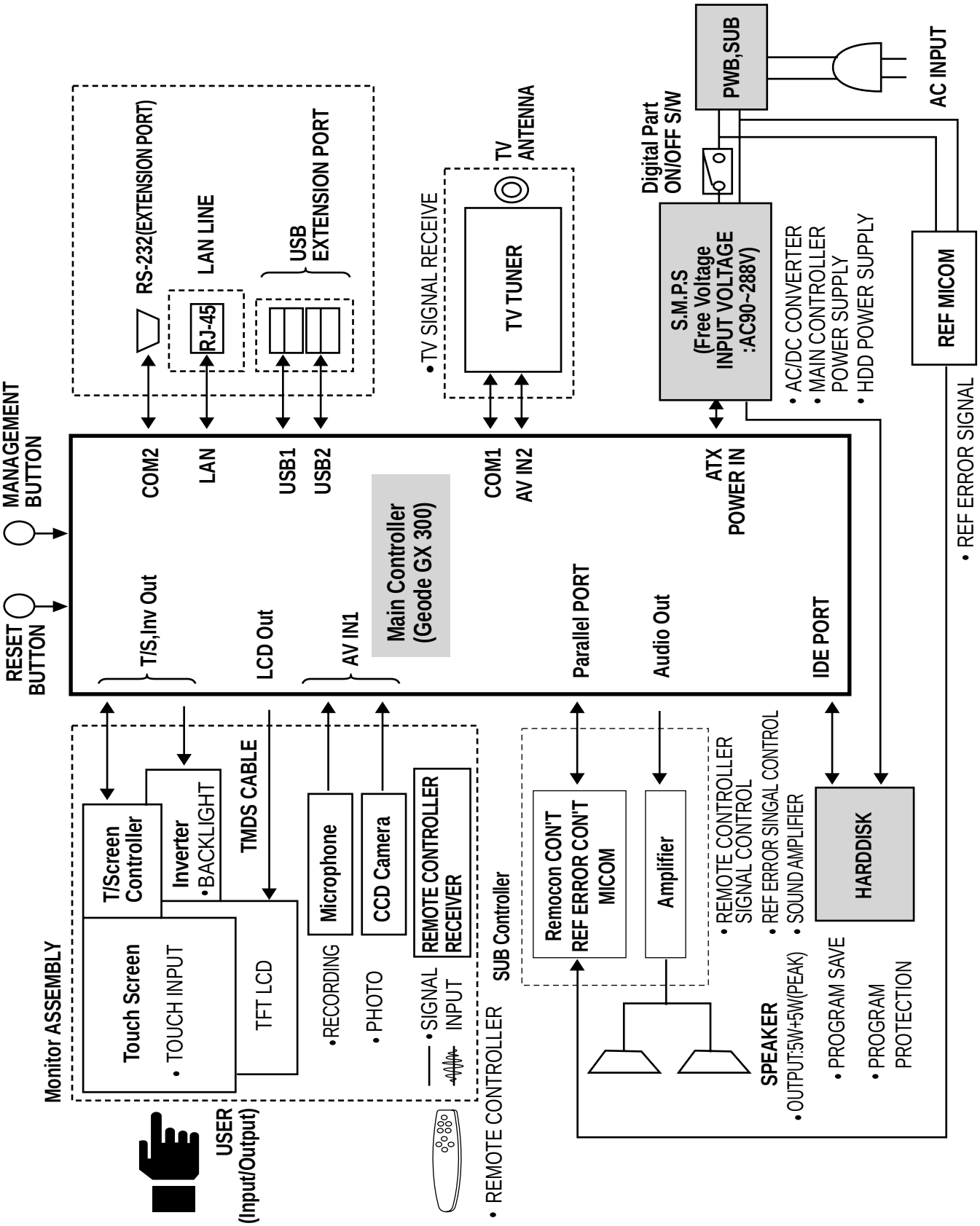
1) Disconnect five fixtures mounted on the rear wall of the refrigerator after disconnecting the water supply pipe ① from a water valve.
2) Remove the tie-wrap and two screws connected to the bushing inject.
3) Replace the water supply pipe ① after disconnecting the water supply pipe ① from a rubber inject. And assemble the parts by performing disassembly in reverse order.

9-2. How to disassemble the water tank and the water supply pipe

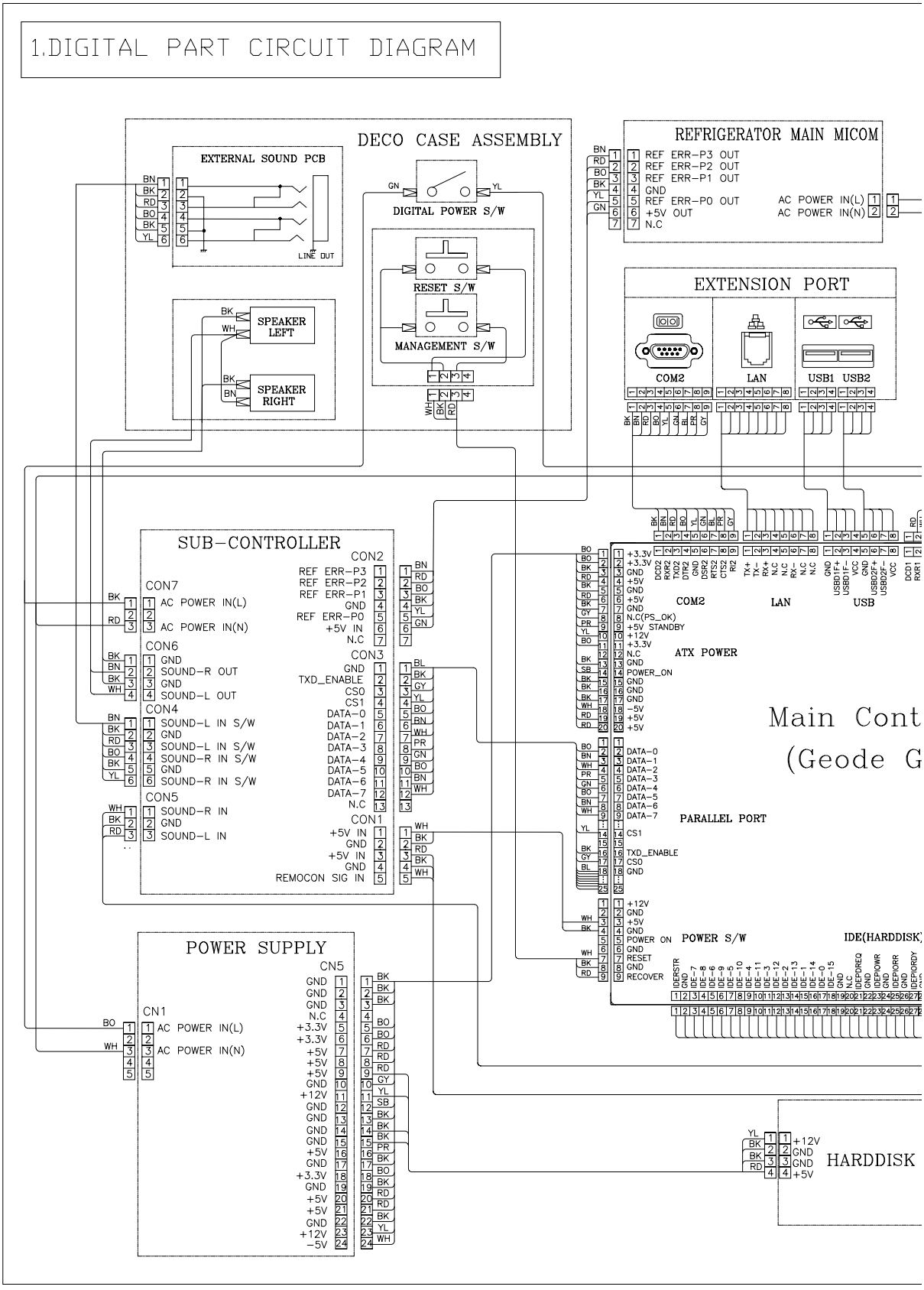
1) Disconnect the water supply pipe ② from a water valve on the back and lower part of the freezer.
2) Disconnect the connector Assembly. in water supply pipe at lower part of the freezer door.
3) Pull out the water supply pipe ② from the thermal insulation materials after removing one screw and six tie-wraps in the lower part of a refrigerator compartment.
4) Replace a water tank or a water supply pipe ② and assemble the parts by performing disassembly in reverse order.

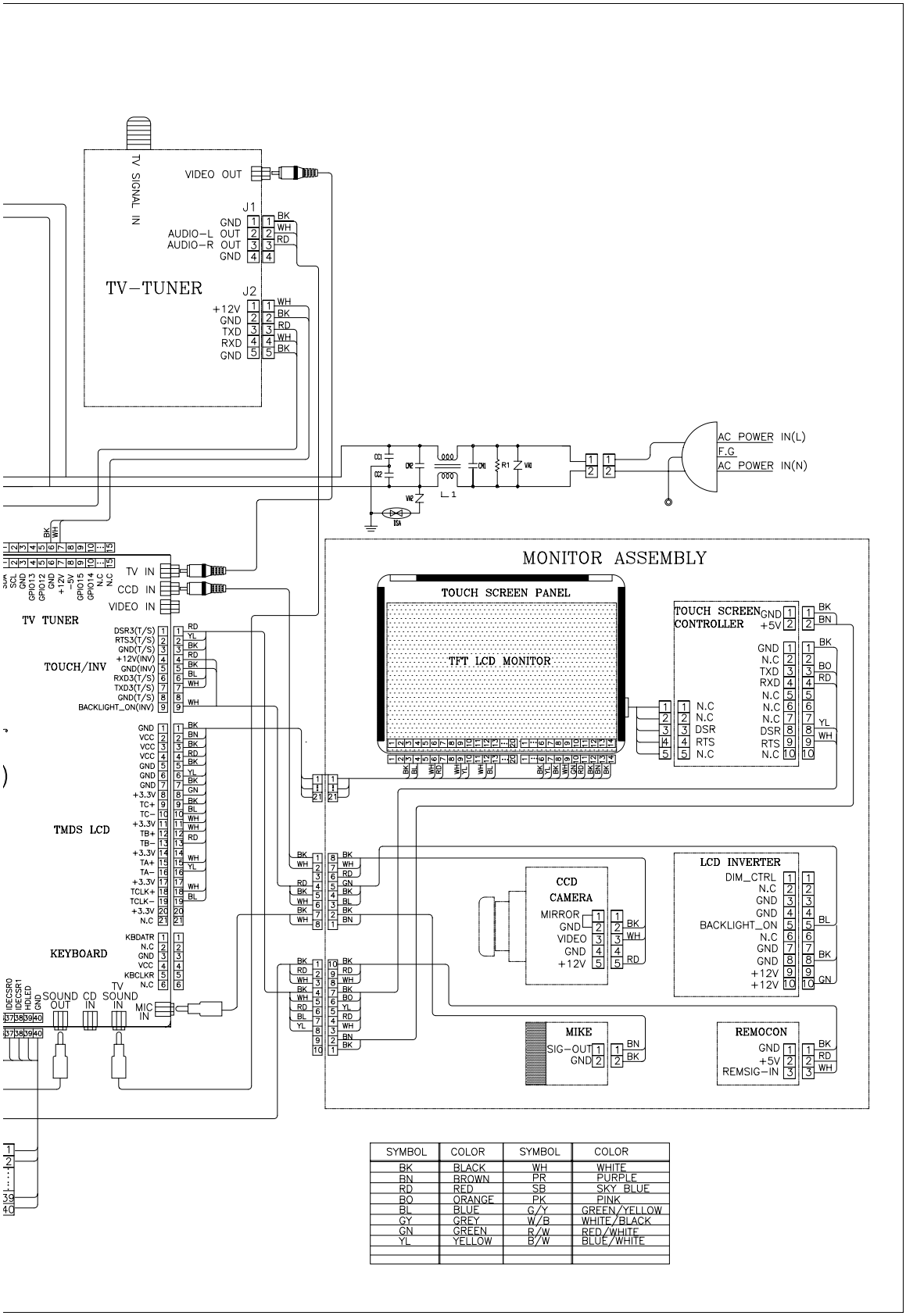
Note : • *The water supply pipe ③ cannot be disassembled.*
• *Tightly fasten six tie-wraps to prevent leakage.*

DIGITAL SECTION LAYOUT



DIGITAL SECTION LAYOUT





SYMBOL	COLOR	SYMBOL	COLOR
BK	BLACK	WH	WHITE
BN	BROWN	PR	PURPLE
RD	RED	SB	SKY BLUE
BO	ORANGE	PK	PINK
BL	BLUE	G/Y	GREEN/YELLOW
GY	GREY	W/B	WHITE/BLACK
GN	GREEN	R/W	RED/WHITE
YL	YELLOW	B/W	BLUE/WHITE

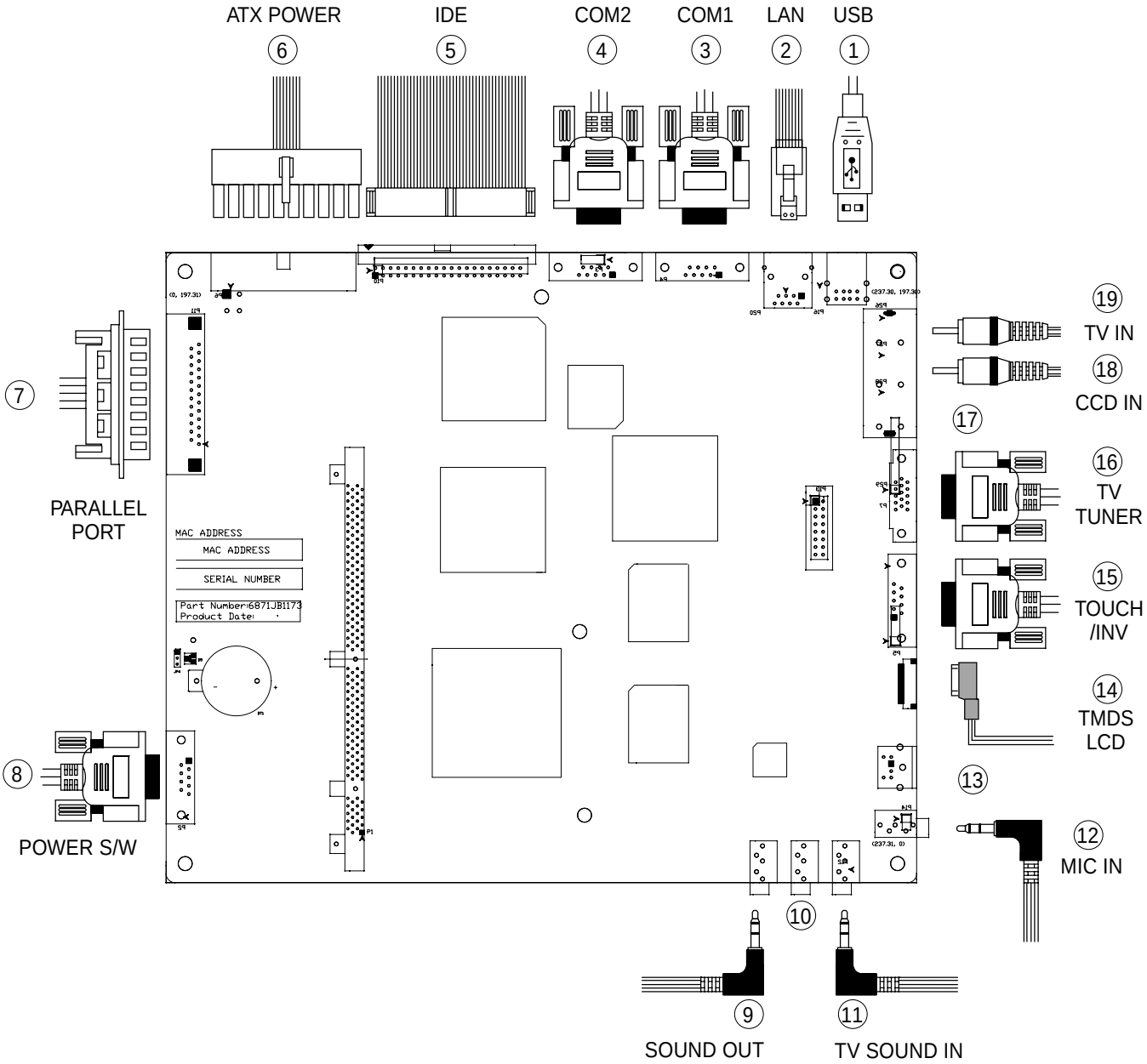
DIGITAL PARTS MANUAL

1. MAIN CONTROLLER

1-1. Function

This is one of the key components of the internet refrigerator, and it is a controller where TV, audio, video, input-output, internet functions reside.

1-2. Connector Connection Diagram and Names



1-3. Function and Connecting Parts

No	Name	Function	Connecting Part
①	USB	Connect to supporting device (External CDROM)	Extended connecting cable
②	LAN	Connect to Internet network cable	LAN connecting cable
③	COM1	Contol TV-tuner	TV-tuner
④	COM2	External Device Communication Port 2	Extended connecting cable
⑤	IDE	Hard disk data communication	Hard disk
⑥	ATX POWER	Main controller power service line	Power supply
⑦	PARALLEL PORT	Sub-controller communication	Sub-controller
⑧	POWER S/W	Sub-controller power supply, Reset/management S/W input	Reset PCB, sub-controller
⑨	SOUND OUT	Audio output	Sub-controller
⑩	CD IN	External audio input (reserve terminal)	Reserve terminal
⑪	TV SOUND IN	TV sound input	TV-tuner
⑫	MIC IN	MIC sound input	MIC connector
⑬	KEYBOARD	Connect to keyboard for SVC	Keyboard (SVC)
⑭	TMDS LCD	Monitor visual output	TMDS connector
⑮	TOUCH/INV	T/Screen communication, LCD inverter power supply	T/Screen connector
⑯	TV TUNER	TV-Tuner data communication	TV-Tuner
⑰	VIDEO IN	External video input (reserve terminal)	Reserve terminal
⑱	CCD IN	Camera visual input	Camera connector
⑲	TV IN	TV visual input	TV-Tuner

1-4. Specifications of parts

1. Main CPU SPEC

(1) Maker Type: Geode GX1 300-B85
(2) Maker: National Semiconductor
(3) L1 Cache Size: 16KB
(4) CPU Power Consumption: 1.6V / 200MHz - 0.8W
2.0V / 300Mhz - 1.5W
(5) Memory Extend: Total 512MB Expansion possible
(up to 512 MB)
(6) O/S: Windows 98SE

2. Video, Audio Output, PCI-to-ISA Bridge

(1) Maker Type: CS5530A-UCE
(2) Maker: National Semiconductor
(3) Build-in Xpress Graphic / Audio
(4) Resolution: 1280 X 1024 (85MHz)
(5) Audio: AC97 Codec Interface
(6) 2 USB Interface

3. External A/V Input/Output handling (A/V Input/Output - MUX)

(1) Maker Type: Fusion 878A
(2) Maker: Conexant
(3) NTSC, PAL, SECAM Video Support
(4) Resolution: 768 X 576 (Full PAL Resolution)
(5) 3 Composite Input support
(6) 3:1 MUX (TV, FM, MIC)

4. Graphic Accelerator

(1) Maker Type: ATIM6-M(216M6TGDFA22E)
(2) Maker: ATI Technologies
(3) Embedded Memory: 8MB
(4) Color: 32 bit colors
(5) Highly-optimized 128 bit engine.
(6) LVDS and PaneLink Support with TMDS Transmitter.

5. Sound Input/Output handling (Sound Input/Output)

(1) Maker Type: AD1819B
(2) Maker: Analog Devices
(3) S/N Ration: 90dB
(4) 16-Bit Full Duplex Codec
(5) Analog Input: LINE, CD, VIDEO, AUX, 2 MONO MIC
(6) 7kHz ~ 48kHz Sampling Rate (with 1Hz Resolution)

6. External Input/Output handling (SUPER Input/Output)

(1) Maker Type: PC97317
(2) Maker: National Semiconductor
(3) Plug and play Compatibility (PnP)
(4) 24 GPIO bit ports
(5) FDC, KBC, two UARTs, IR support, IEEE1284 parallel port
(6) RTC (Real Time Clock) Control

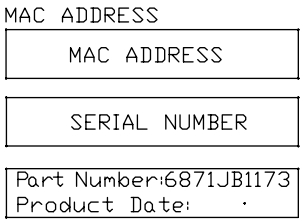
7. LAN-Ethernet

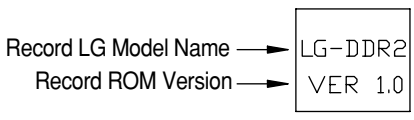
(1) Maker Type: RTL8139C
(2) Maker: Realtek
(3) 10Mb/s and 100Mb/s operation
(4) Wake-On-LAN function, Remote wake-up Support
(5) Half, Full duplex capability
(6) Integrated Fast Ethernet MAC Physical chip, transceiver in one chip

8. Labeling

(1) Attach MAC ADDRESS, SERIAL NUMBER, PART NUMBER labels to **Section A**
- Labeling location: Attach to **Section A**

(2) Attach ROM BIOS Version label to **Section B**
- Labeling location: Attach to **Section B**



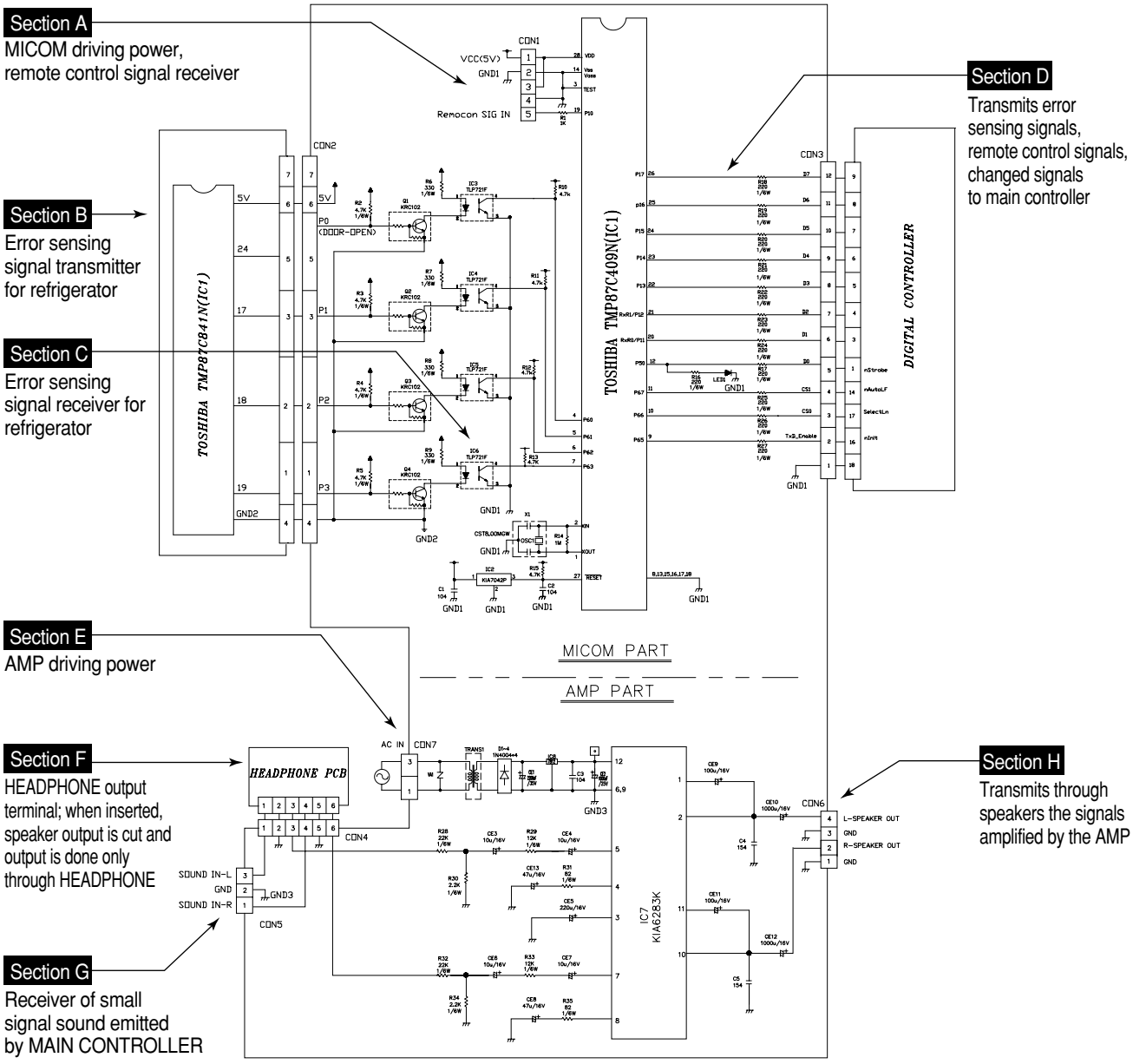


2. SUB-CONTROLLER

2-1. Function

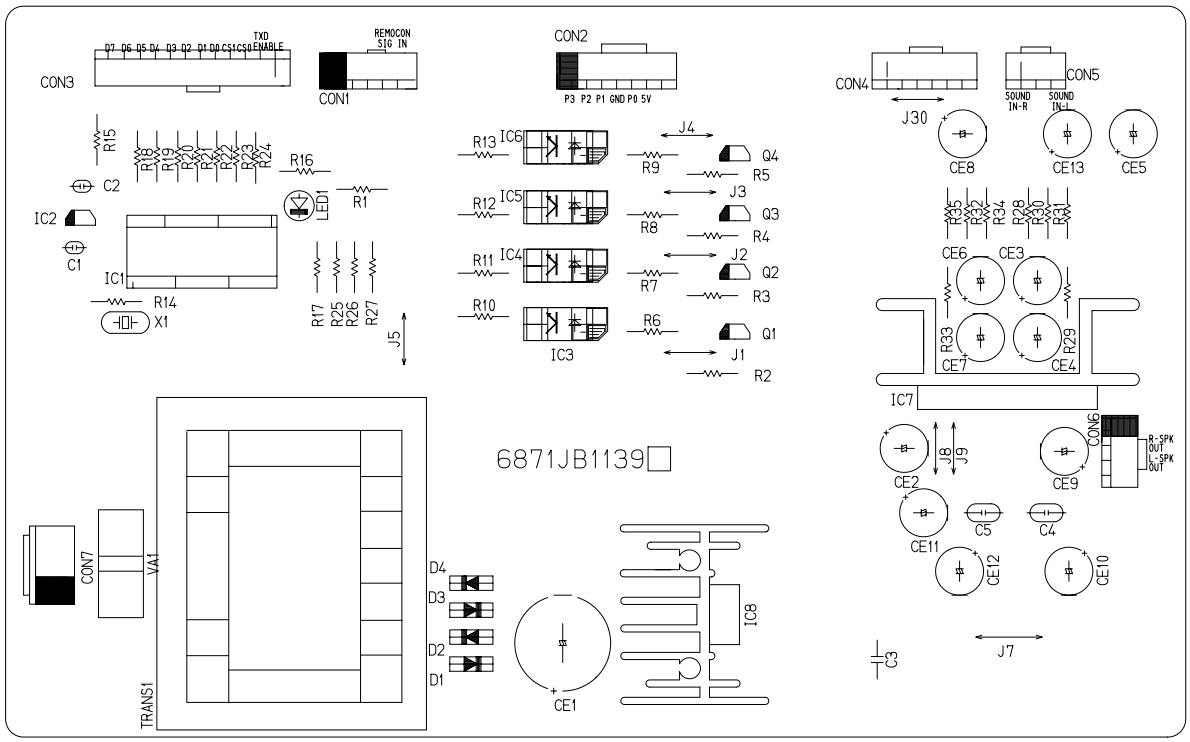
: Sub Controller is composed of MICOM PART and AMP PART and

- MICOM PART: senses refrigerator error and passes signals from remote control transmits to main controller
- AMP PART: carries out the function of amplifying the small signal being input through the Sound Output of the MAIN CONTROLLER



2-2. Outline Diagram and INPUT/OUTPUT Structure

2-2-1. Outline Diagram



2-2-2. INPUT/OUTPUT Structure

SYMBOL	NO	INPUT/OUTPUT	Input/Output SPEC
CON1	1	I	DC 5V
	2		GND
	3		DC 5V
	4		GND
	5		REMOCON
CON2	1	I	REF ERR-P3
	2		REF ERR-P2
	3		REF ERR-P1
	4		GND
	5		REF ERR-P0
	6		DC 5V
	7		N.C
CON4	1	O	GND
	2		TXD-ENABLE
	3		CS0
	4		CS1
	5		DATA 0
	6		DATA 1
	7		DATA 2
	8		DATA 3
	9		DATA 4
	10		DATA 5
	11		DATA 6
	12		DATA 7
	13		N.C

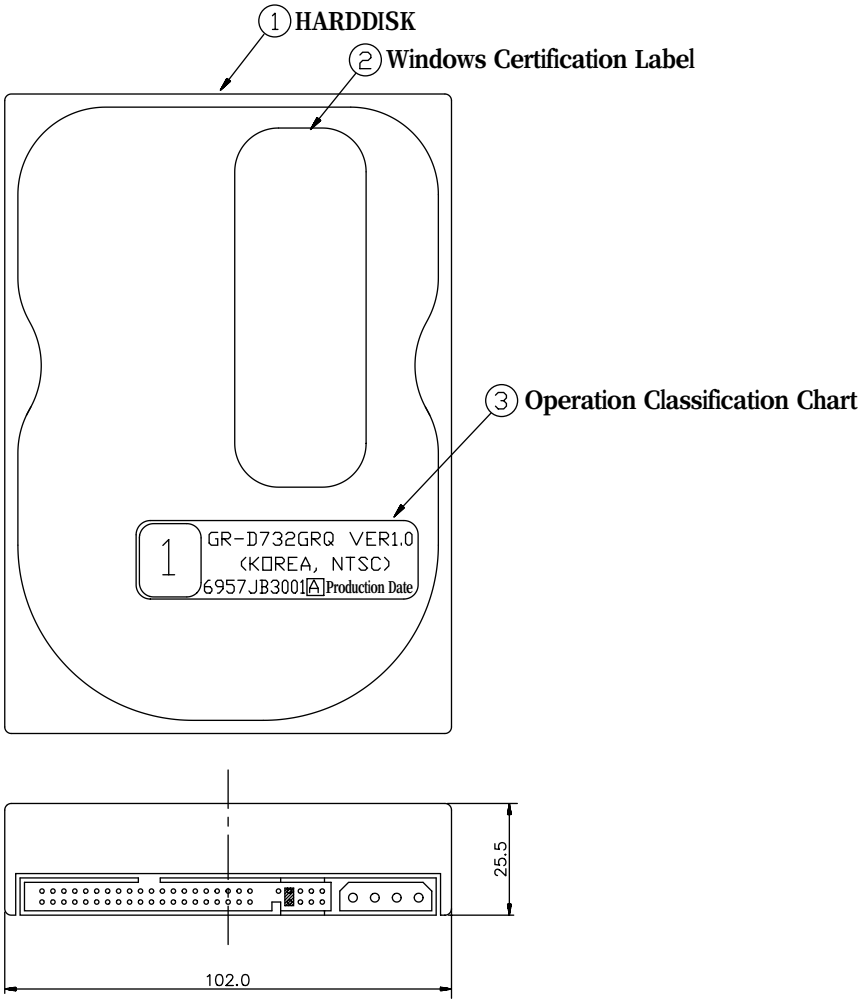
SYMBOL	NO	INPUT/OUTPUT	Input/Output SPEC
CON4	1	I	SOUND-L
	2		GND
	3		SOUND-L2
	4		SOUND-R1
	5		GND
	6		SOUND-R2
CON5	1	I	SOUND-R IN
	2		GND
	3		SOUND-L IN
CON6	1	O	GND
	2		SOUND-R OUT
	3		GND
	4		SOUND-L OUT
CON7	1	I	AC 220V(L)
	2		N.C
	3		AC 220V(N)

3. HARDDISK

3-1. Function

This is the program storage device for the Digital Section of the Internet Refrigerator

3-2. Outline Diagram

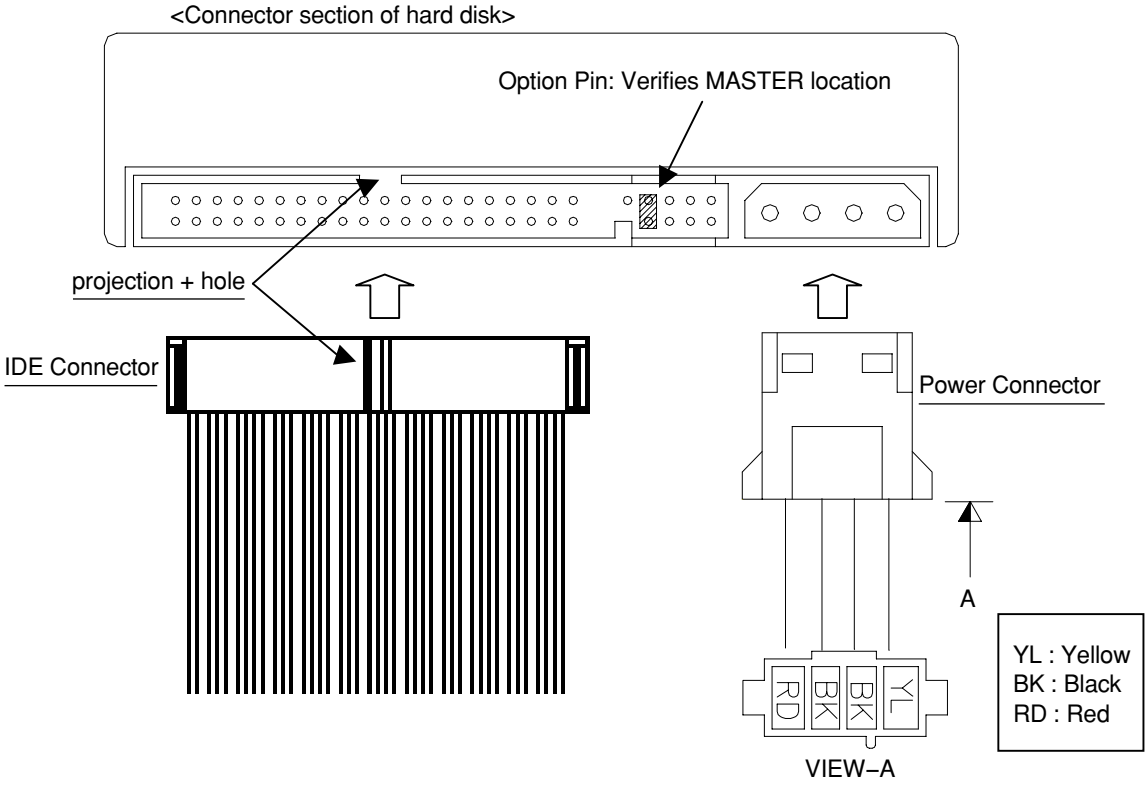


<Operation Classification Chart>

Operation Classification	HDD VERSION	MODEL NAME	SPEC			SWITCH VERSION	REMARK
			LANGUAGE	TV	NETWORK		
A	1	R-D732GRS	KOREA	NTSC	STANDALONE	VER 1.0	
B	2	GR-D267FTU	ENGLISH	PAL-I	STANDALONE	VER 1.0	
C	3	GR-D267FTU	SPAIN	NTSC	STANDALONE	VER 1.0	
D	4	GR-D267DTU	ENGLISH	NTSC	STANDALONE	VER 1.0	
E	5	GR-D267DTU	SPAIN	PAL-B/G	STANDALONE	VER 1.0	ATI M6 CHIPSET
F	6	GR-D267DTU	ENGLISH	PAL-B/G	STANDALONE	VER 1.0	ATI M6 CHIPSET
G	7	GR-D267DTU	ENGLISH	NTSC	STANDALONE	VER 1.0	ATI M6 CHIPSET

3-3. Connecting Method to Connector upon replacement

When servicing, the hard drive, it is replaced with the program preinstalled and according to the Operation Classification Chart.



3-4. SPEC of parts

1. HARDDISK SPEC (3.5˝)

- MAKER: FUJITSU, MAXTOR, LG-IBM, SAMSUNG, WESTERN-DIGITAL
- Storage Capacity: Over 20GB
- Rotation Speed: Over 5,400rpm
- Ultra DMA 100 support (average seek time: 9.5ms under)

2. Operating Environment

- Operating temperature: 5°C[41°F] ~ 55 °C[131°F]
- Operating humidity: 8% ~ 80%

3. Storage Environment

- Storage temperature: -40°C[-40°F] ~ 60°C [140°F]
- Storage humidity: 5% ~ 85%

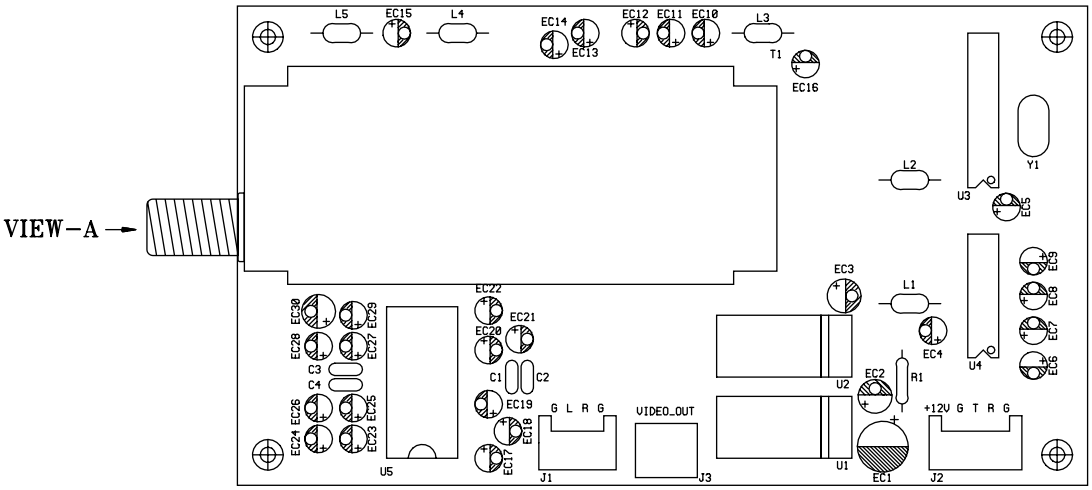
4. TV-TUNER

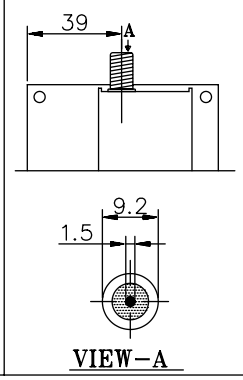
4-1. Function

After receiving and handling the video and audio signals through cable, it transmits the signals to the video input section of the main controller.

4-2. Outline Diagram and INPUT/OUTPUT Structure

4-2-1. Outline Diagram



작업구분	A				
TV방식	NTSC				
형상					

4-2-2. INPUT/OUTPUT Structure

CONNECTOR	PIN NO.	I / O	SYMBOL	DESCRIPTION
J1	1	GND	GND	GND
	2	Output	AUDIO-L	AUDIO LEFT OUTPUT
	3	Output	AUDIO-R	AUDIO RIGHT OUTPUT
	4	GND	GND	GND
J2	1	Input	12V	POWER
	2	Input	GND	GND
	3	I/O	T	TXD
	4	I/O	R	RXD
	5	Input	GND	GND
VIDEO	1,2	Output	TV OUT	TV VIDEO Signal Output

4-3. Specifications of parts

1. Operating Environment

- Operating temperature: -10°C[14°F] ~ 60°C[140°F]
- Operating humidity: 0 ~ 95% (under 35°C[95°F] condition)

2. Storage Environment

- Storage temperature: -25°C[-13°F] ~ 85°C[185°F]
- Storage humidity: 95% (under 35°C[95°F] condition)

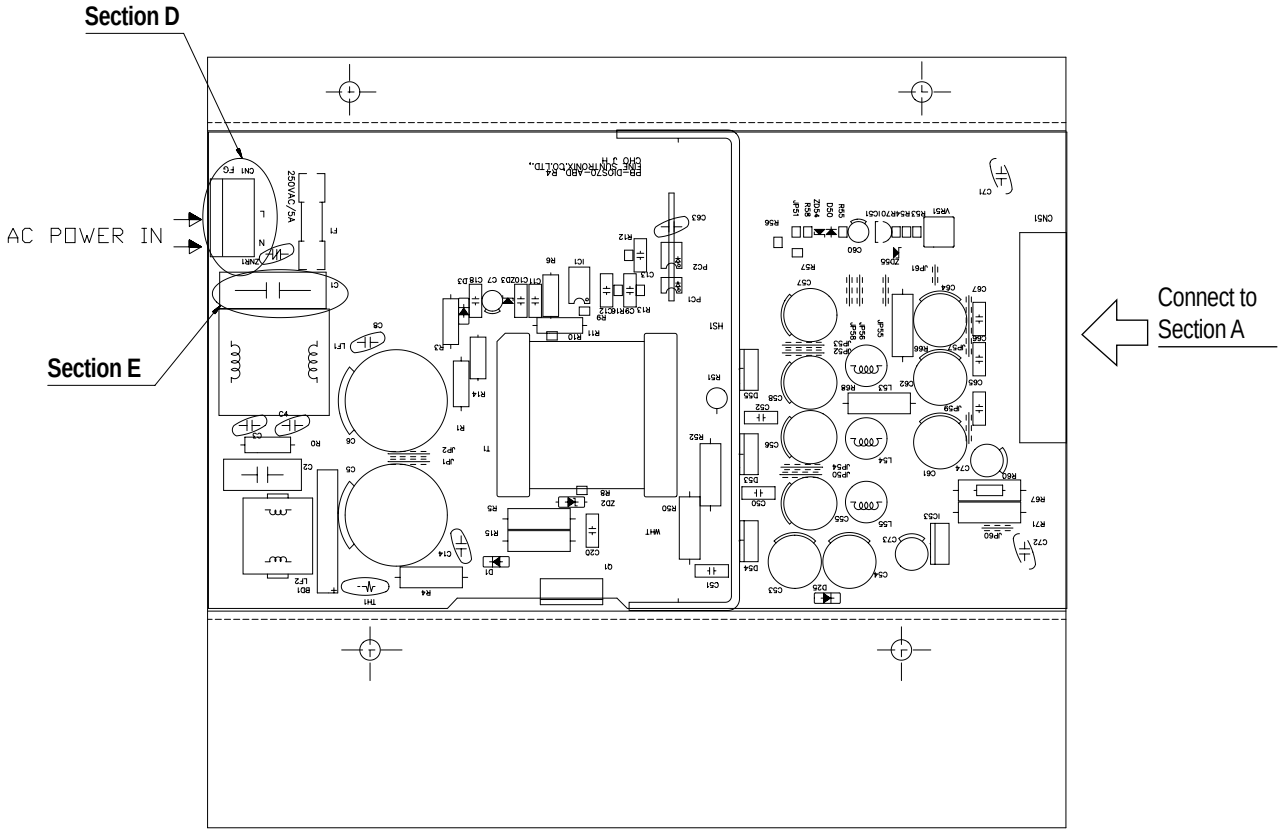
5. POWER SUPPLY

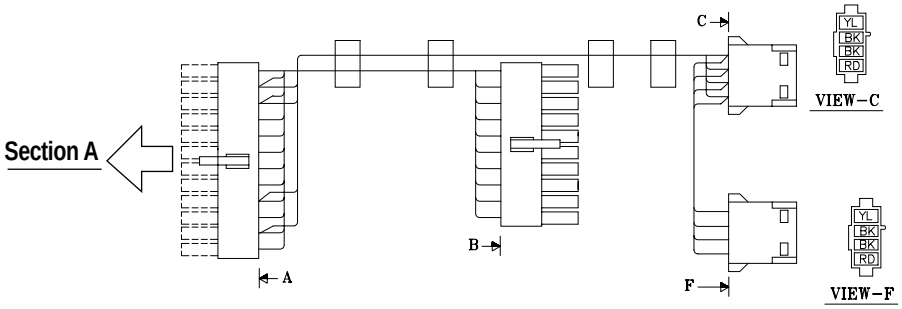
5-1. Function

This is the power supplying section for driving the main controller and hard disk.

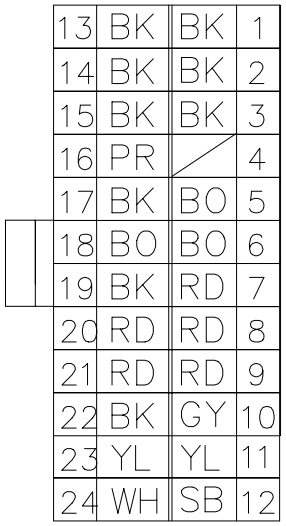
5-2. Outline Diagram and INPUT/OUTPUT Structure

5-2-1. Outline Diagram

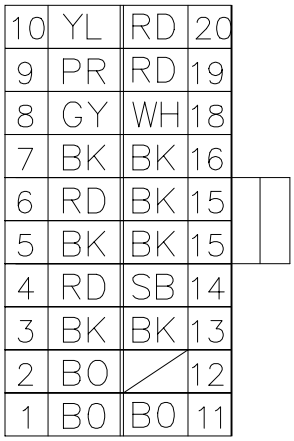




5-2-2. INPUT/OUTPUT Structure



VIEW-A



VIEW-B

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

(1) Section D Input voltage SPEC

PIN NO	I/O	INPUT VOLTAGE RANGE	REMARK
1	INPUT	90~264	NEUTRAL
2			N.C
3	INPUT	90~264	LIVE
4			N.C
5	F.G	-	GND

✻ MAKER TYPE : DIOS70B-ABD

- Input voltage range : 1.5Kv/1min, 1.8Kv/sec
- Insulated resistance : over 10 Mohm

(2) VIEW-B Output Voltage SPEC

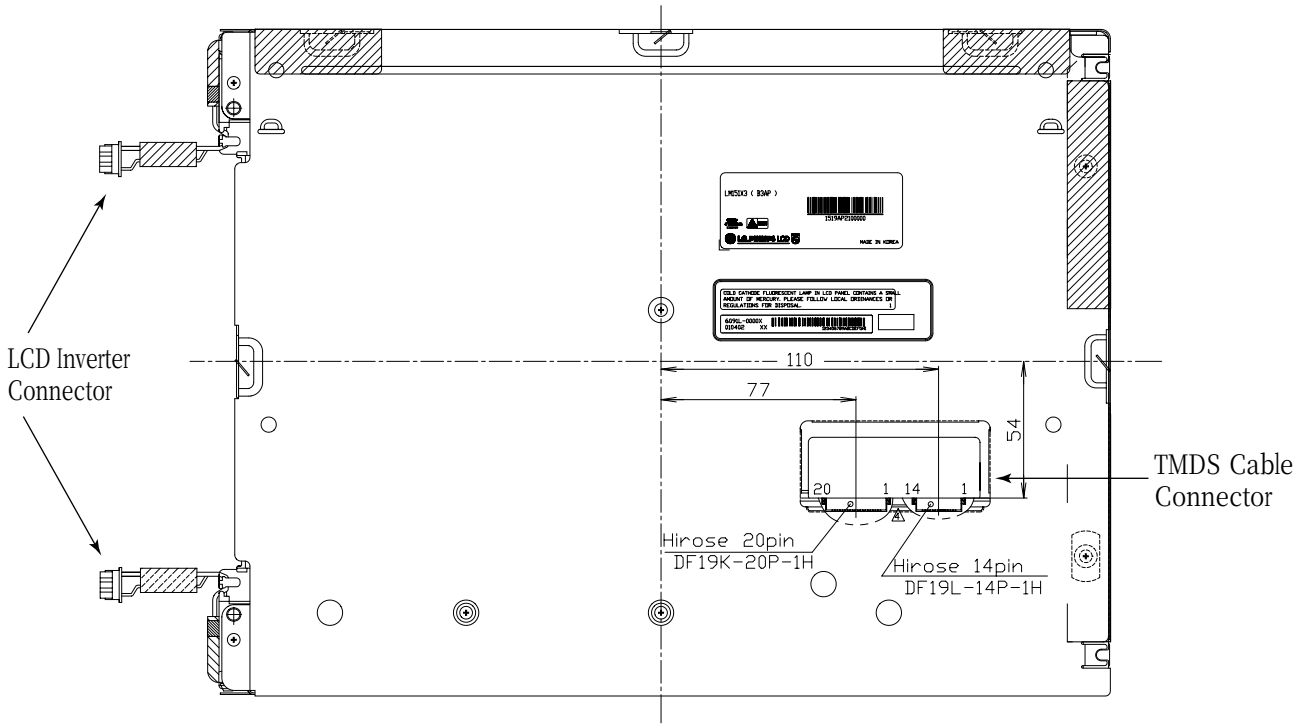
PIN NO	I/O	VOLTAGE	OUTPUT VOLTAGE RANGE	COLOR	REMARK
1	Output	3.3	3.0 ~ 3.6	ORANGE	
2	Output	3.3	3.0 ~ 3.6	ORANGE	
3	-	GND	-	BLACK	
4	Output	5	4.85 ~ 5.15	RED	
5	-	GND	-	BLACK	
6	Output	5	4.85 ~ 5.15	RED	
7	-	GND	-	BLACK	
8	-	GND	-	GRAY	POWER-GOOD
9	Output	5	4.85 ~ 5.15	PURPLE	STANDBY
10	Output	12	10.8 ~ 13.2	YELLOW	
11	Output	3.3	3.0 ~ 3.6	ORANGE	
12					
13	-	GND	-	BLACK	
14	-	GND	-	SKY-BLUE	POWER S/W ON
15	-	GND	-	BLACK	
16	-	GND	-	BLACK	
17	-	GND	-	BLACK	
18	-	-5V	-4.75 ~ -5.25	WHITE	
19	Output	5	4.85 ~ 5.15	RED	
20	Output	5	4.85 ~ 5.15	RED	

6. LCD MONITOR

6-1. Function

After receiving the LCD video output from the main controller, this device outputs it to the LCD monitor

6-2. Outline Diagram



6-3. Specifications of parts

1. MAKER: LG PHILIPS
2. MAKER TYPE: LM151X3(B3AP)
3. 15.1″ XGA TFT LCD SPEC
   - Pixel Pitch: 0.300mm X 0.300mm
   - Color Depth: 8-bit, 16,777,216 colors
   - Luminance, White: 250cd/m^2
   - Power Consumption: 2.1W Logic / 9.7W CCFL
   - Display Operating Mode: TMDS
4. Operating Environment
   - Operating temperature: 0°C[32°F] ~ 50°C[122°F]
   - Operating humidity: 5% ~ 90% (under 40°C condition)
   - Storage Environment
   - Storage temperature: -20°C[-4°F] ~ 60°C[140°F]

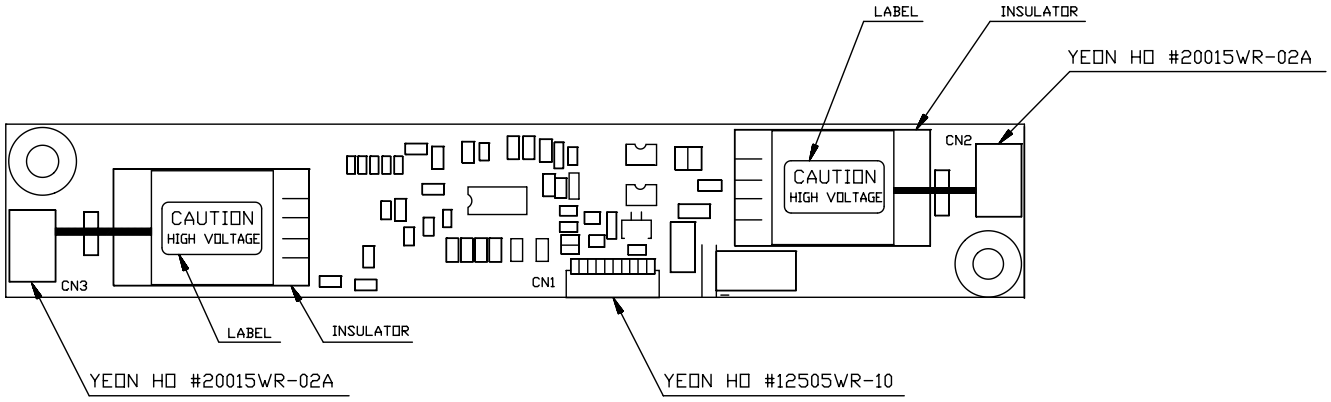
7. LCD INVERTER

7-1. Function

This device supplies the driving power for backlight inside the LCD.

7-2. Outline Diagram and INPUT/OUTPUT Structure

7-2-1. Outline Diagram



〈Inverter PCB〉

7-2-2. INPUT/OUTPUT Structure

CONNECTOR	PIN NO.	INPUT/OUTPUT	SYMBOL	DESCRIPTION
CN1	1	INPUT	CTRL	Dim. Adjust
	2	NC		
	3	GND	GND	GND
	4	GND	GND	GND
	5	INPUT	ON/OFF	Power System Return (5V:ON, 0V:OFF)
	6	NC		
	7	GND	GND	GND
	8	GND	GND	GND
	9	INPUT	Vin	DC 12V±1V
	10	INPUT	Vin	DC 12V±1V
CN2	1	OUTPUT	Lamp H1	High Voltage connection to high side of lamp.
CN3	2	OUTPUT	Lamp L1	Low Voltage connection to low side of lamp.

7-3. Specifications of parts

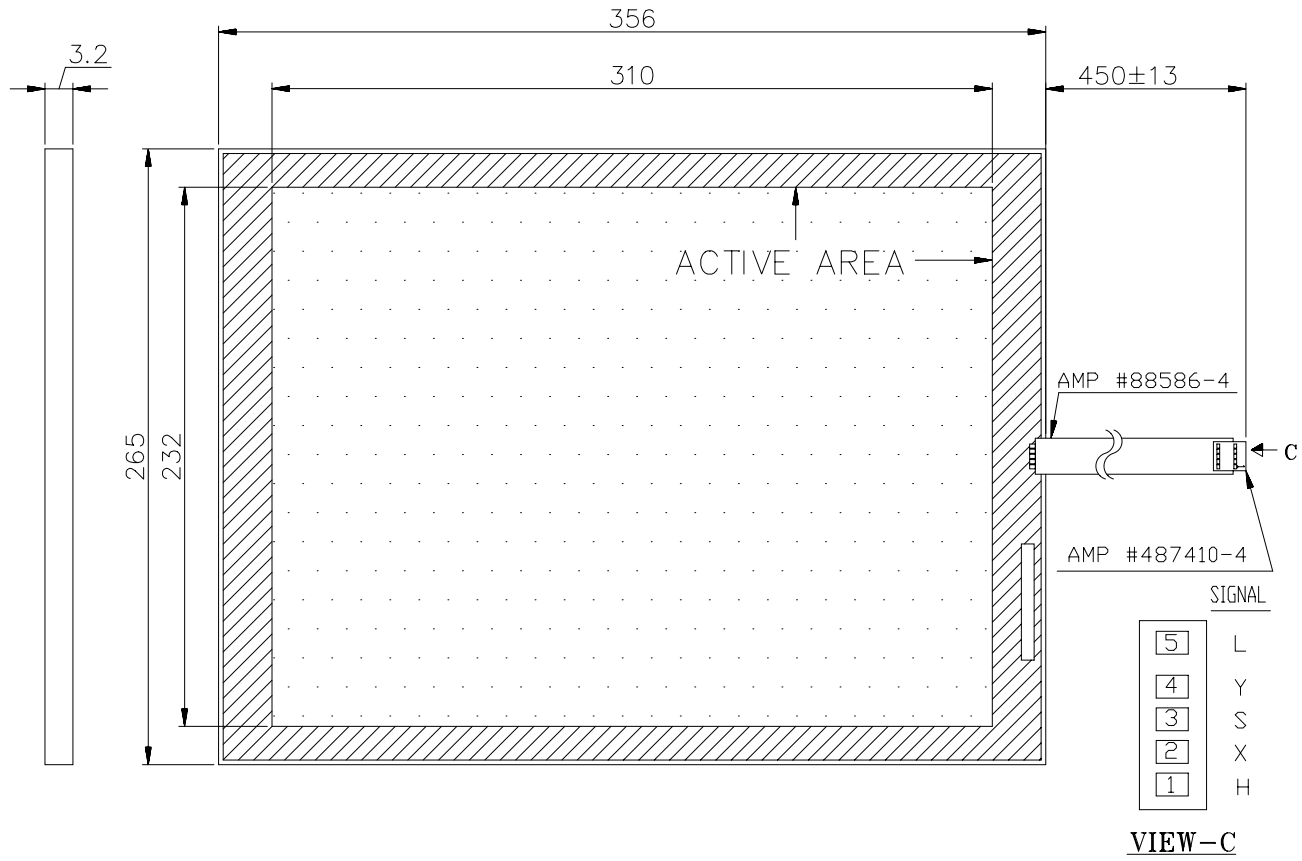
1. Maker: LG Electronics
2. Inverter Type: NMC1507-02
3. Maker Type: 6632Z-1507B
4. Inverter SPEC
   - Input Supply Voltage: DC 11~13V
   - Input Current: 1.1A
   - Input Power: 13.2W
   - Output Voltage: 616Vrms
   - Output Current: 9.0mArms
   - Output Power: 12W (2 lamps total)
   - Input Signal Voltage: -0.3V ~ 6.0V
5. Operating Environment
   - Operating temperature: 0°C[32°F] ~ 60°C[140°F]
   - Operating humidity: 10% ~ 85%
6. Storage Environment
   - Storage temperature: -30°C[-22°F] ~ 80°C[176°F]

8. TOUCH SCREEN

8-1. Function

Transmits the coordinates from the contact on the touch screen to the touch screen controller.

8-2. Outline Diagram



8-3. Specifications of parts

1. Touch Panel SPEC (15.1˝)

- Analog Resistive (5-line resistance film type)
- Operating Voltage: DC 5V
- Resolution: 4,096 X 4,096 line
- Activation Force: 57 ~ 113g
- Surface Hardness: 3H

2. Operating Environment

- Operating Temperature: -10°C[14°F] ~ 50°C[122°F]
- Operating humidity: 0% ~ 90% (under 35°C condition)

3. Storage Environment

- Storage Temperature: -40°C[40°F] ~ 71°C[160°F]
- Storage Humidity: 240 hours in 90% (under 35°C[95°F] condition)

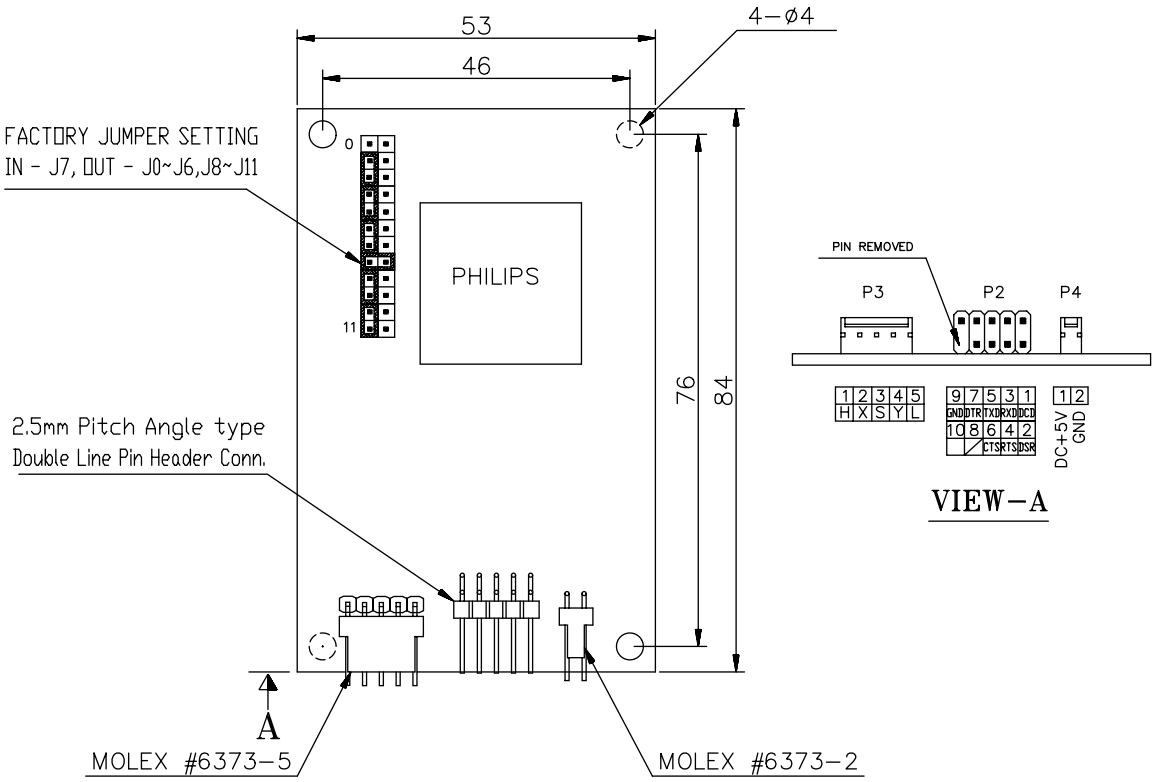
9. TOUCH CONTROLLER

9-1. Function

After receiving and processing the touch coordinates from the touch screen, it transmits this information to the main controller

9-2. Outline Diagram and INPUT/OUTPUT Structure

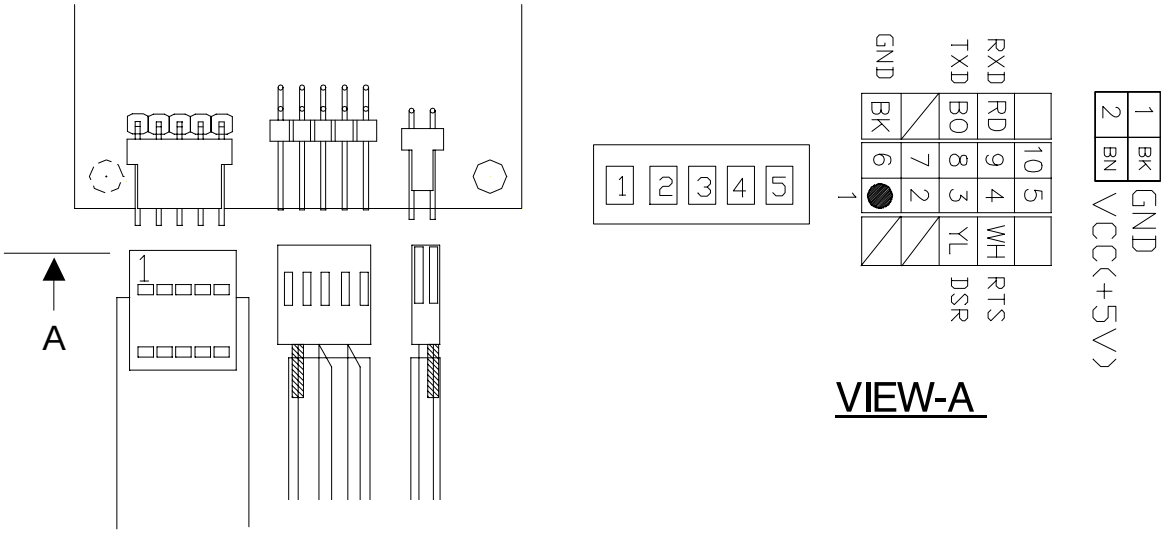
9-2-1. Outline Diagram



9-2-2. INPUT/OUTPUT Structure

CONNECTOR	PIN NO.	INPUT/OUTPUT	SYMBOL	DESCRIPTION
P2	1	INPUT	DCD	Data Carrier Detect
	2	INPUT	DSR	Data Sct Ready
	3	INPUT	RxD	Receive Data
	4	INPUT	RTS	Ready To Send
	5	INPUT	TxD	Transmit Data
	6	INPUT	CTS	Clear To Send
	7	INPUT	DTR	Data Terminal Ready
	8	N/C	N/C	N/C
	9	GND	GND	Ground
	10			PIN REMOVED
P4	1	INPUT	+5V	DC +5V
	2	GND	GND	Ground

9-3. Connecting Method of Connector upon Replacement



9-4. Specification of parts

1. Operating Voltage: DC +5V ± 10%
2. Operating Current: 160mA (Peak 240mA)

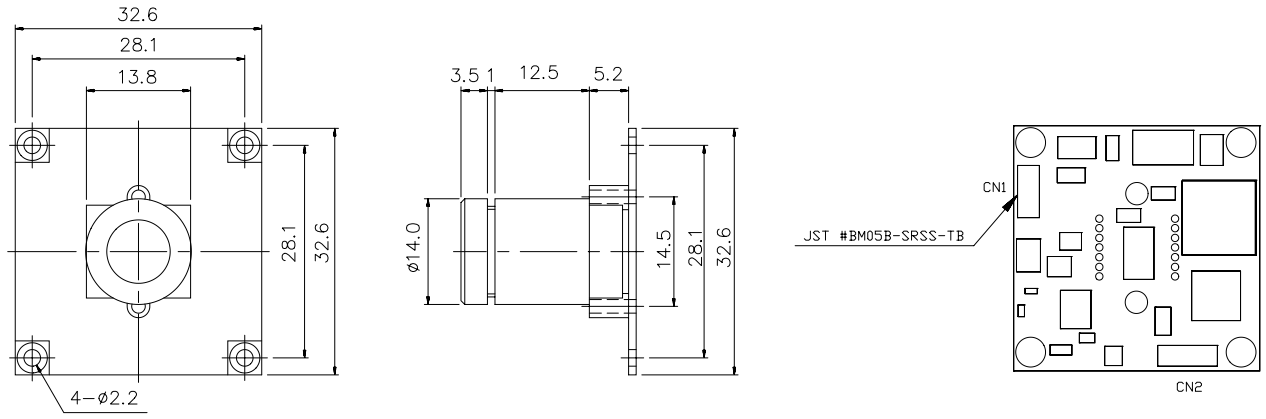
10. CCD (CHARGE COUPLED DEVICE) CAMERA

10-1. Function

This changes the external video signal received through the lens into an electronic signal and transmits to main controller

10-2. Outline Diagram and INPUT/OUTPUT Structure

10-2-1. Outline Diagram



10-2-2. INPUT/OUTPUT Structure

CONNECTOR	PIN NO.	INPUT/OUTPUT	SYMBOL	DESCRIPTION
CN1	1	INPUT	+12V	DC +12V
	2	GND	GND	GND
	3	OUTPUT	VIDEO	CAMERA VIDEO OUT
	4	GND	GND	CAMERA VIDEO GND
	5	OUTPUT	MIRROR	CAMERA MIRROR

10-3 Specifications of parts

1. CCD Camera Module Specification

- Operating Voltage: DC 12 ± 1V
- Current Consumption: Max. 100mA ± 10%
- Image Sensor: 1/4 inch 270,000
- Effective Pixel: 512(H) X 492(V)
- Signal System: NTSC
- Horizontal Frequency: 15.734kHz
- Vertical Frequency: 59.94kHz
- S/N Ratio: 48dB min.
- Video Output: Analog Composite

2. Operating Environment

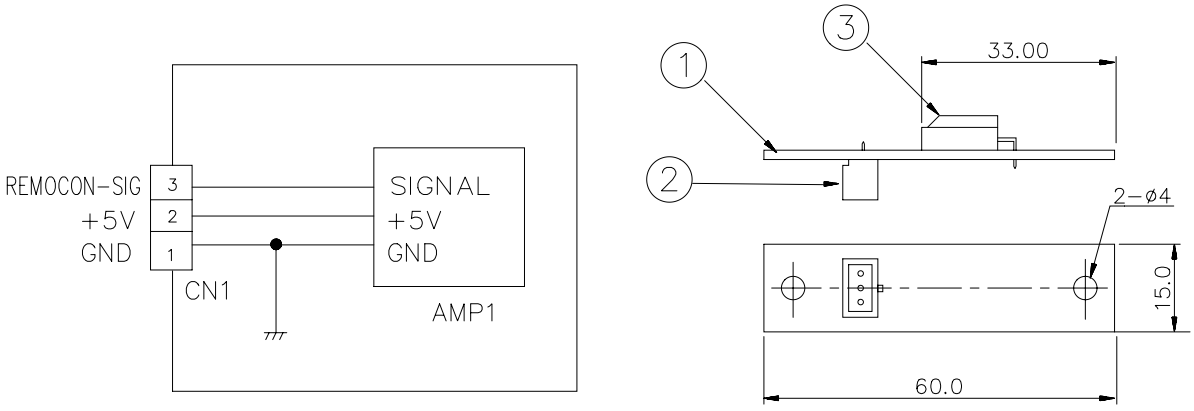
- Operating temperature:

11. REMOTE CONTROL RECEIVER

11-1. Function

This device receives weak signal from the remote control, transfers then to a spherical wave and transmits to the remote control processing section in the sub-controller.

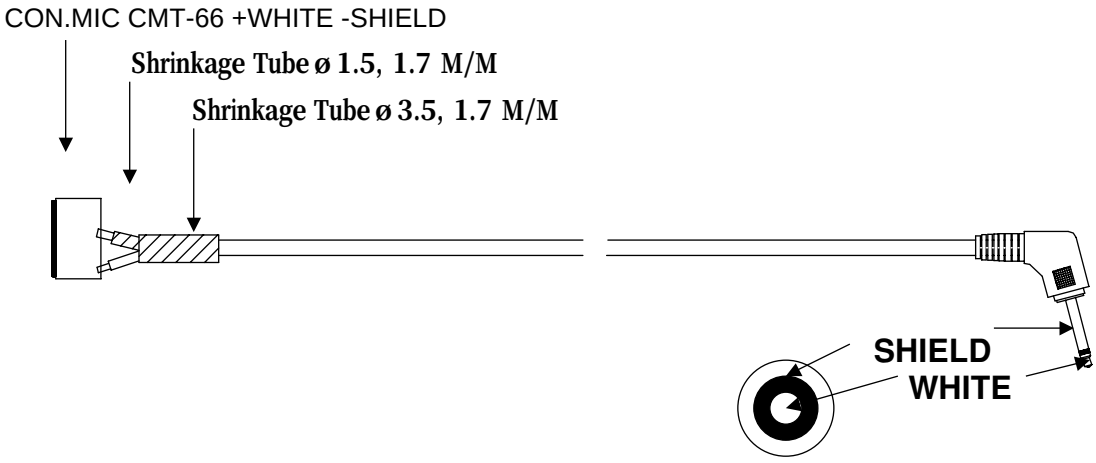
11-2. Outline Diagram and INPUT/OUTPUT Structure



12. MICROPHONE

12-1. Function

Receives external sound signal, converts it to electronic signal and transmits the signal to the MIC input section of the main controller



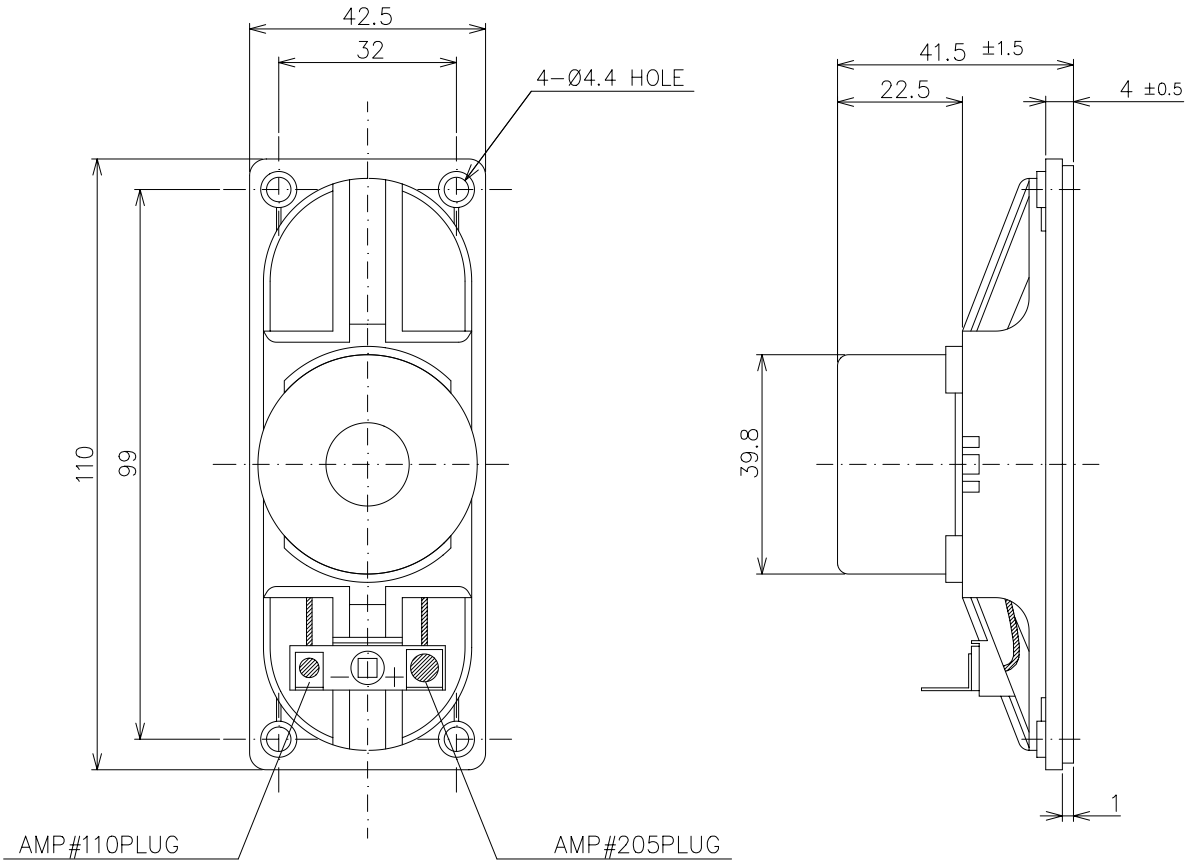
12-2. Outline Diagram and INPUT/OUTPUT Structure

13. SPEAKER

13-1. Function

This device transfers and outputs the electronic signal amplified by the AMP in the sub controller into audible sounds.

13-2. Outline Diagram and INPUT/OUTPUT Structure.



13-3. Specifications of parts

- Power Rating: RMS 3W / Peak 5W
- Size: 110 X 42.5mm
- Total weight: 151g
- Impedence: 4ohm ± 0.6ohm
- Resonance Frequency: 180Hz ± 36Hz
- SPL: 84dB/W ± 2dB
- Response: F0 ~ 20kHz
- Distortion: 5% Max.

14. HDD SHERIFF

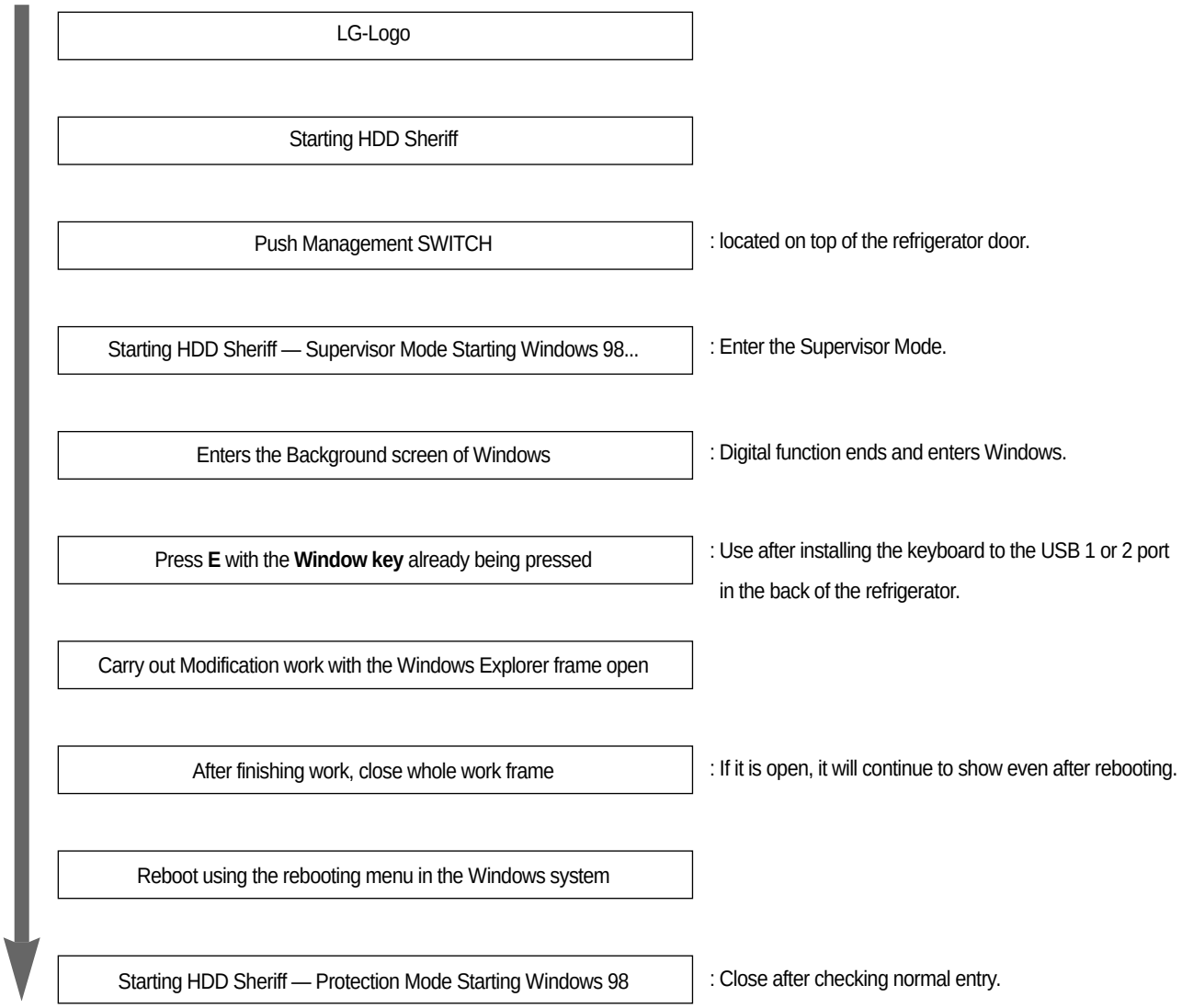
14-1. Function

The HDD SHERIFF is a program protecting the data stored in the hard disk. It can be booted in two modes.

- Supervisor Mode:
  Mode which enables the modification of the contents in the C drive.
  * When updating or modifying files, the new contents are reflected only if entered through the supervisor mode

- Protection Mode:
  Mode which protects the C drive so that it returns to the original state when rebooted even after modifications have been made.

14-2. Program Modification Method after entering in the Supervisor Mode

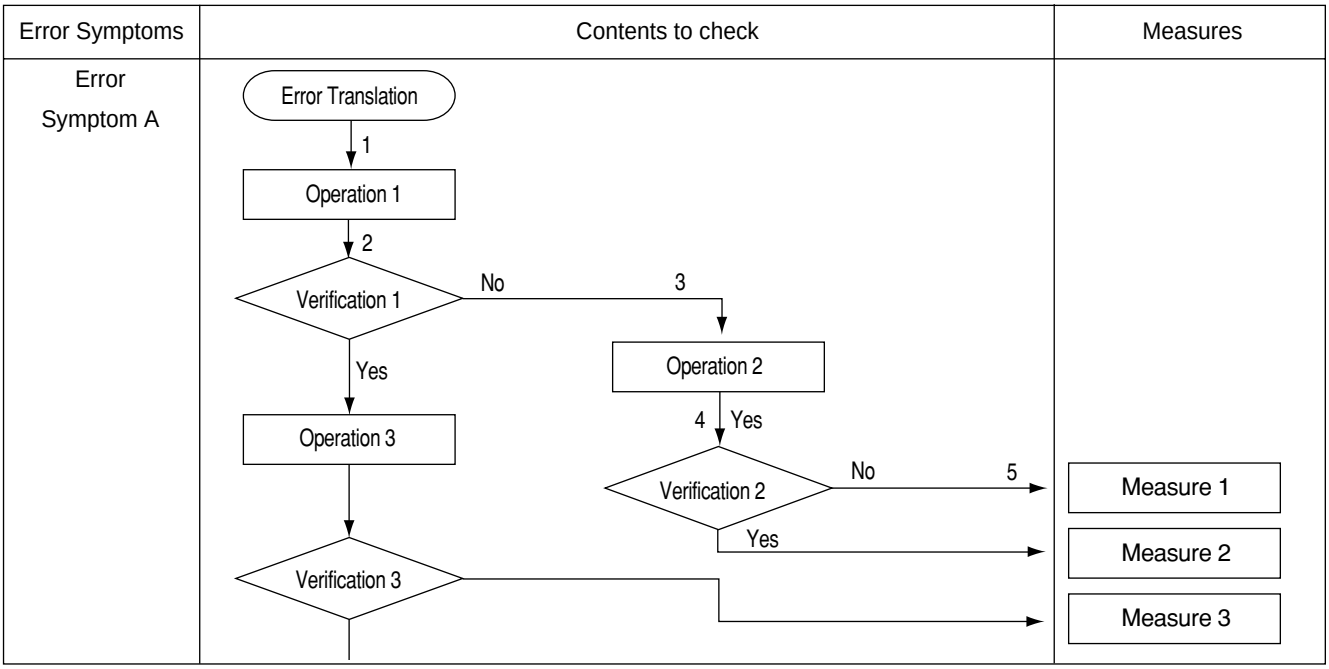


TROUBLESHOOTING FOR THE DIGITAL FUNCTION SECTION

1. TROUBLESHOOTING FOR THE DIGITAL FUNCTIONS SECTION

This section's purpose is for finding causes and taking measures by checking related functions when there is something wrong with the digital function section. The way to use this is to determine the real error through matching the symptoms with the Error Diagnosis Flow Chart and taking measures according to the chart.

◆ How to read the Translation Flow Chart

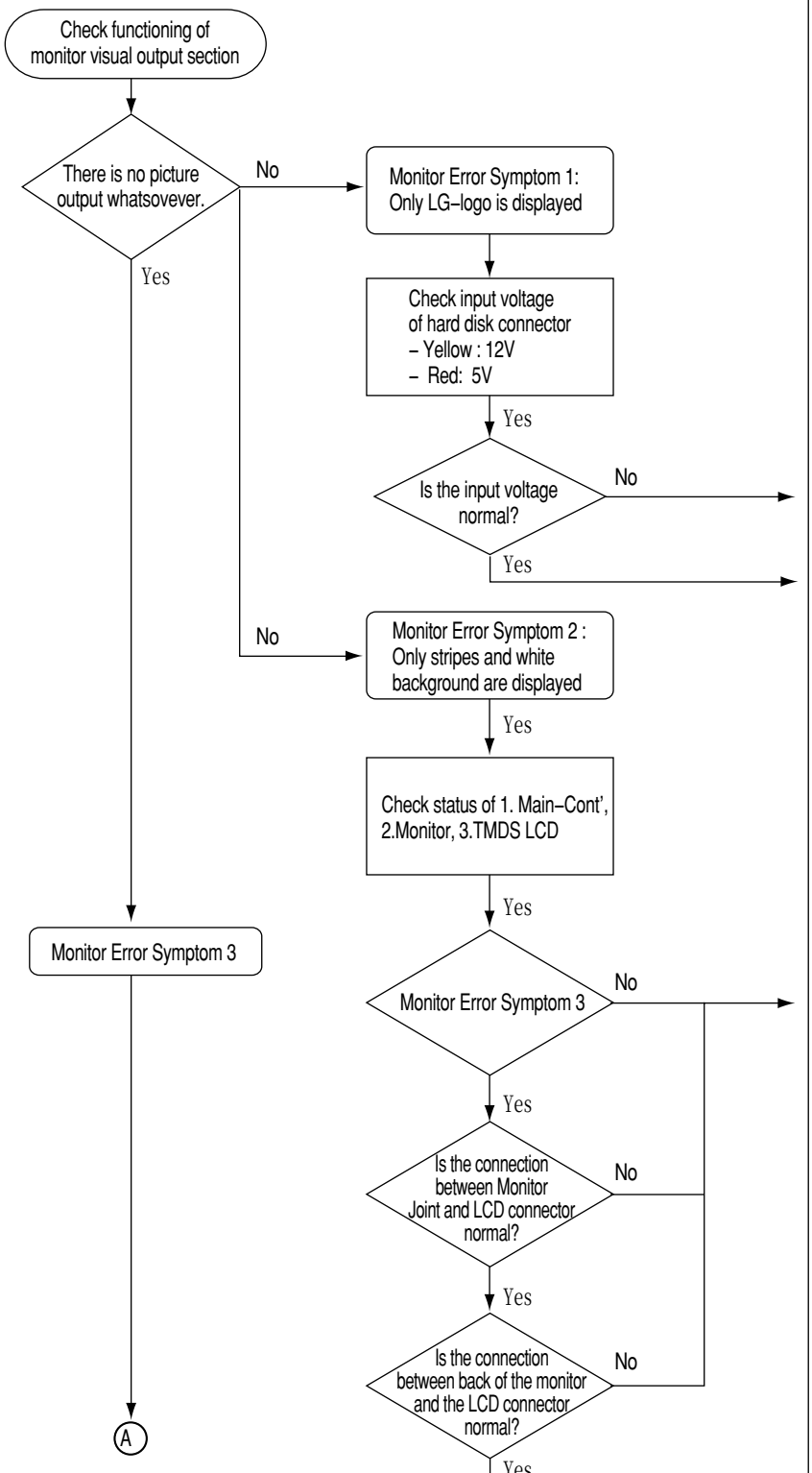


1) Select a symptom closest to the present current error. (Error Symptom A)
2) According to the selected error symptom, translate and take measures according to Steps 1,2, 3, 4, 5.
3) The progress should be done from top to bottom, from left to right.
4) Move in the direction of **Yes** or **No** at the verification stage and proceed accordingly.
5) Repeat this method until you reach a measure that solves the cause and go through the related operations and verifications.

◆ Error Symptom Chart

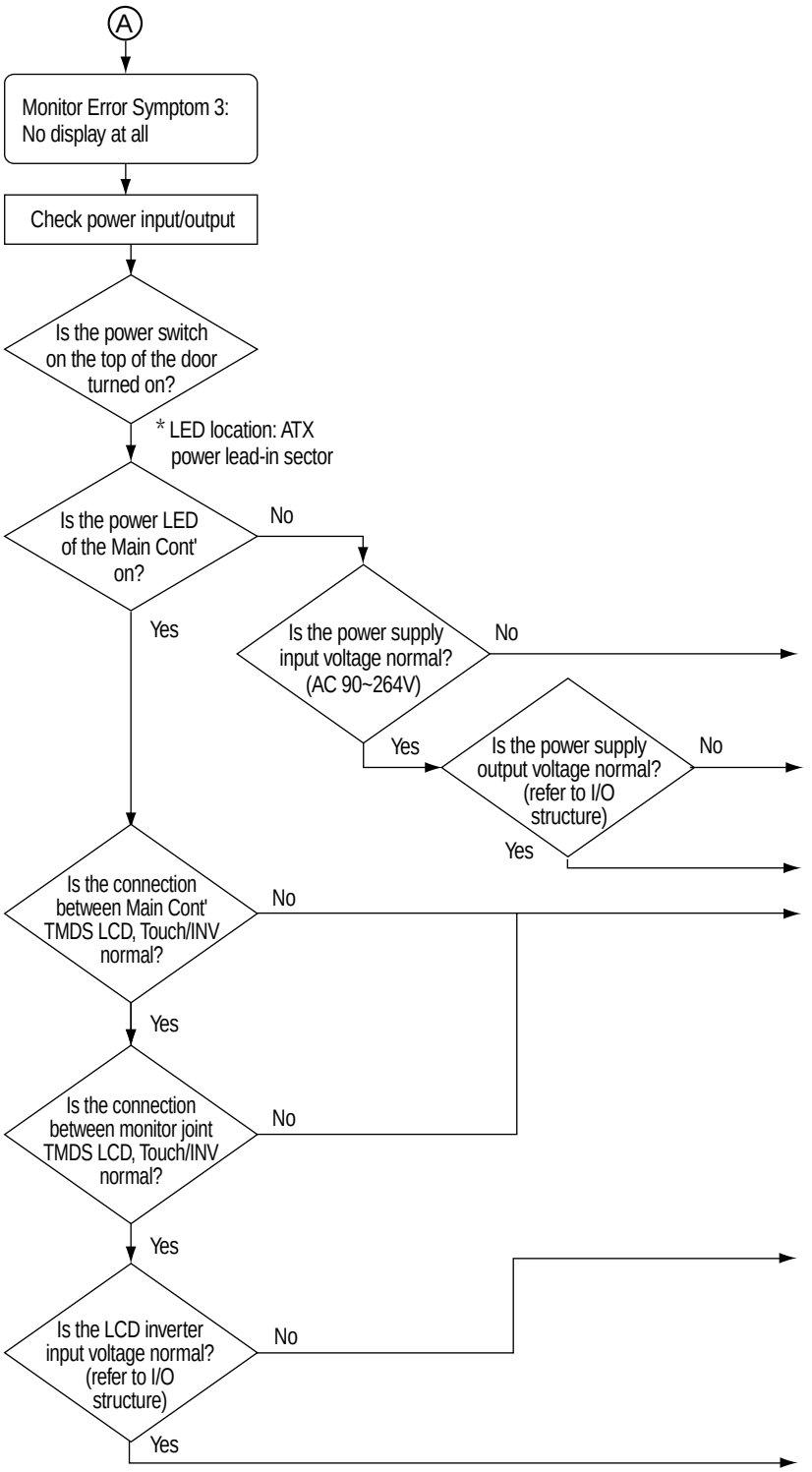
1) Monitor does not operate normally.
 - Monitor Error Symptom 1: Only LG-logo is displayed
 - Monitor Error Symptom 2: Only stripes and white background are displayed
 - Monitor Error Symptom 3: No display at all
2) The touch screen does not work.
3) Sound cannot be recorded.
4) Camera visual is not displayed.
5) Remote Control does not work.
6) There is no audio output of sound.
7) There is no TV output.
8) There is no output of TV sound.
9) The sensor for refrigerator errors does not work.

TROUBLESHOOTING FOR THE DIGITAL FUNCTION SECTION

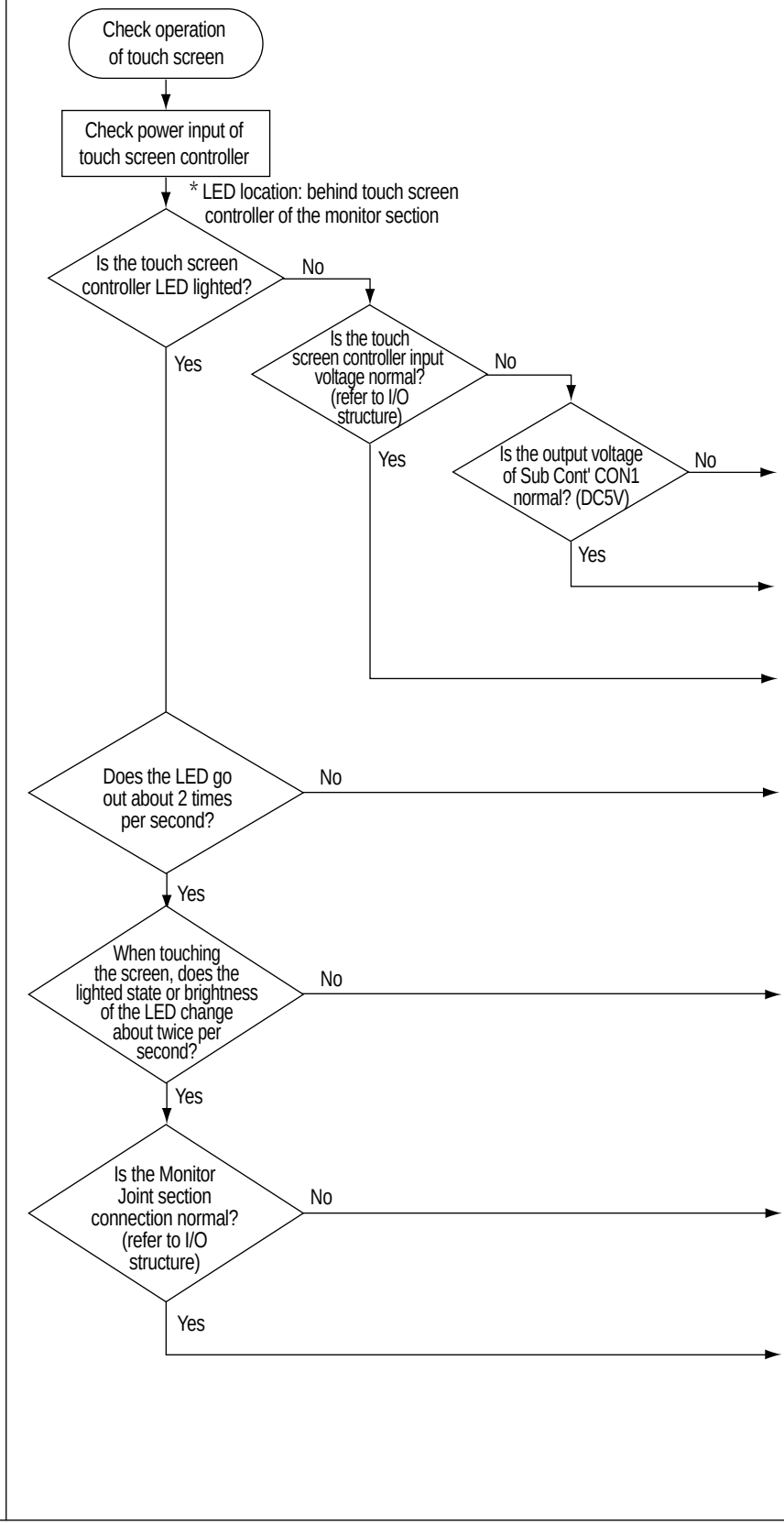
Error Symptoms	Contents to check	Measures
Monitor does not operate normally.		

TROUBLESHOOTING FOR THE DIGITAL FUNCTION SECTION

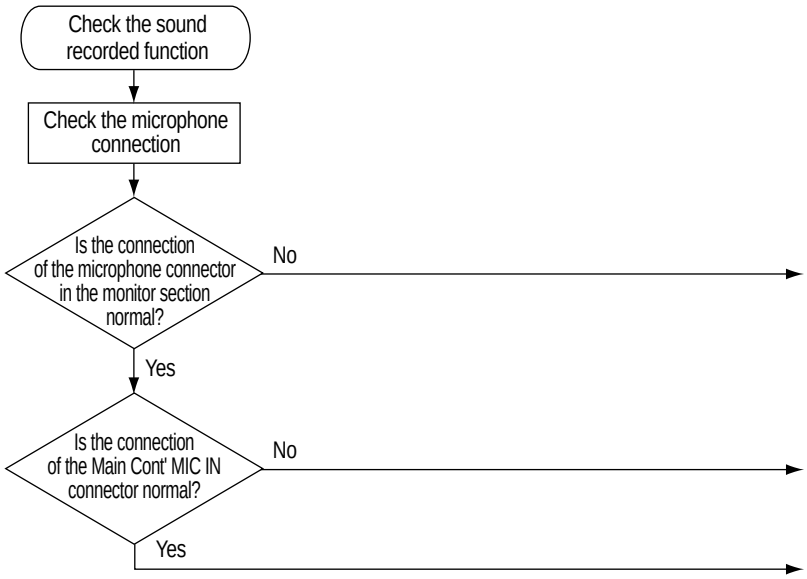
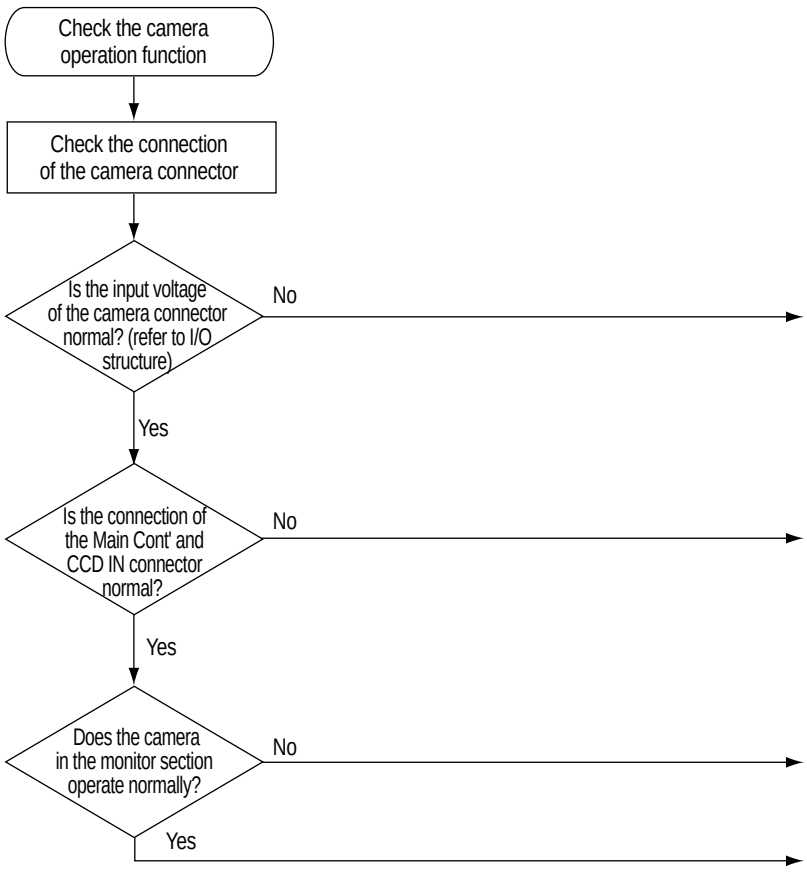
Error Symptoms	Contents to check	Measures



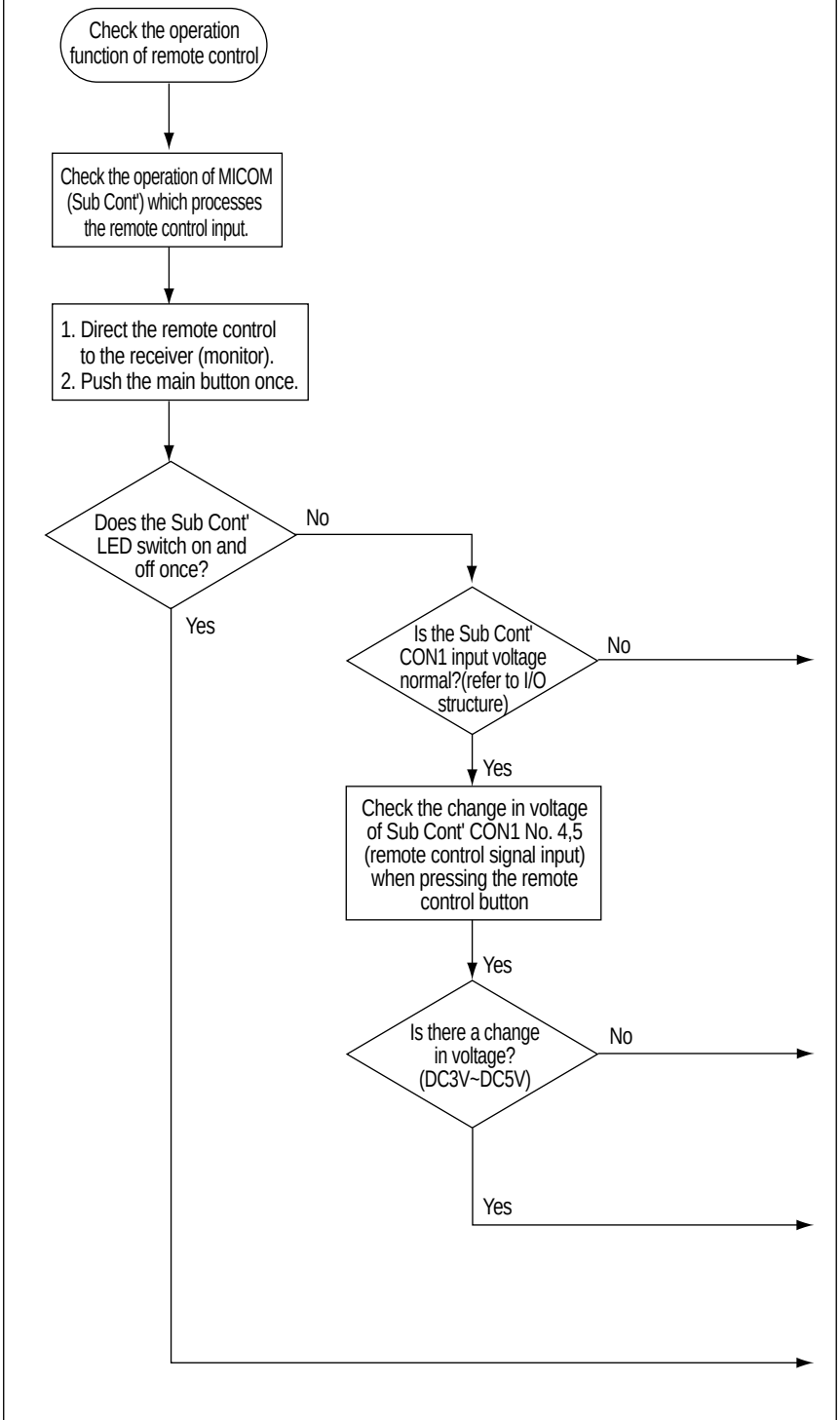
TROUBLESHOOTING FOR THE DIGITAL FUNCTION SECTION

Error Symptoms	Contents to check	Measures
The touch screen does not work.		

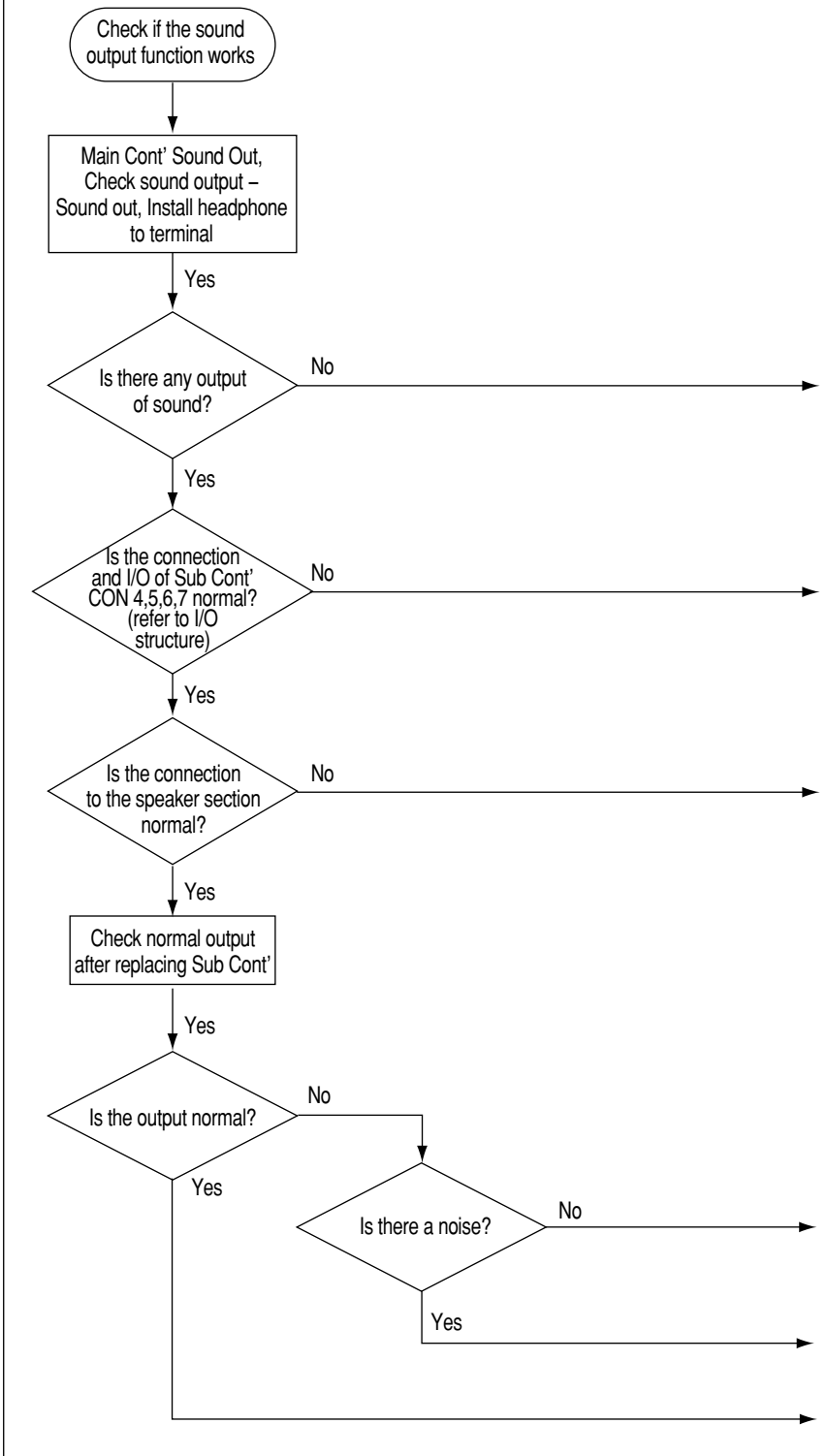
TROUBLESHOOTING FOR THE DIGITAL FUNCTION SECTION

Error Symptoms	Contents to check	Measures
Sound cannot be recorded.		Check monitor joint connector and reconnect Check Main Con't MIC IN connector and reconnect Replace MIC
Camera video is not displayed.		Check connection of Main Cont' and Touch/INV and reconnect Check the Main Cont' and CCD IN connector and reconnect If it does not operate normally even after replacing the camera, replacethe Main Cont' END

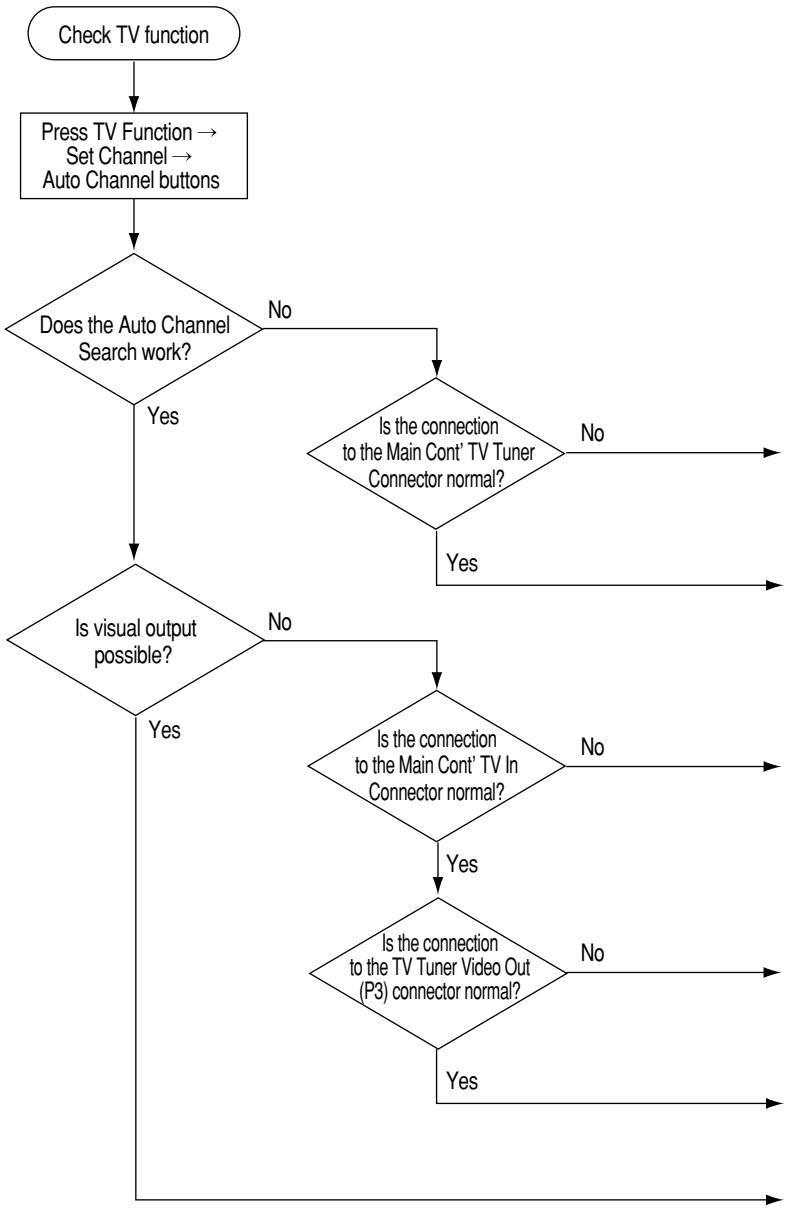
TROUBLESHOOTING FOR THE DIGITAL FUNCTION SECTION

Error Symptoms	Contents to check	Measures
Remote Control does not work.		

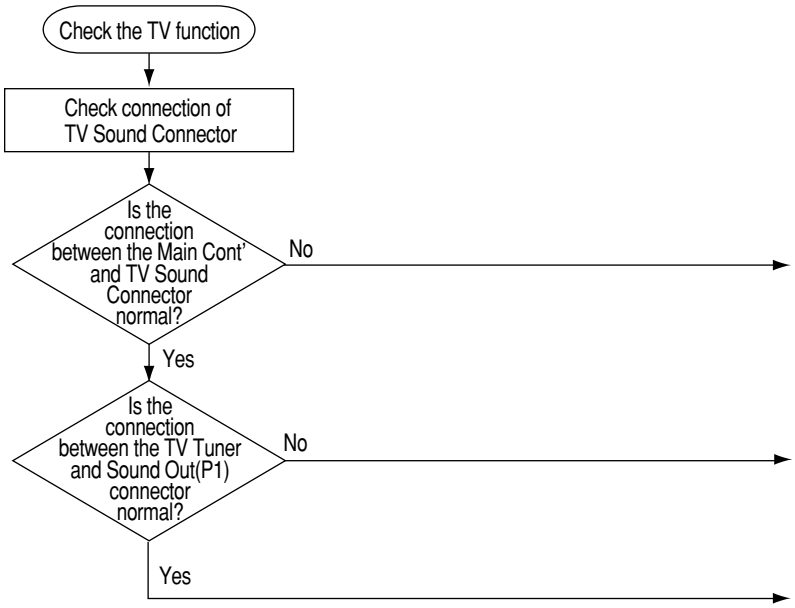
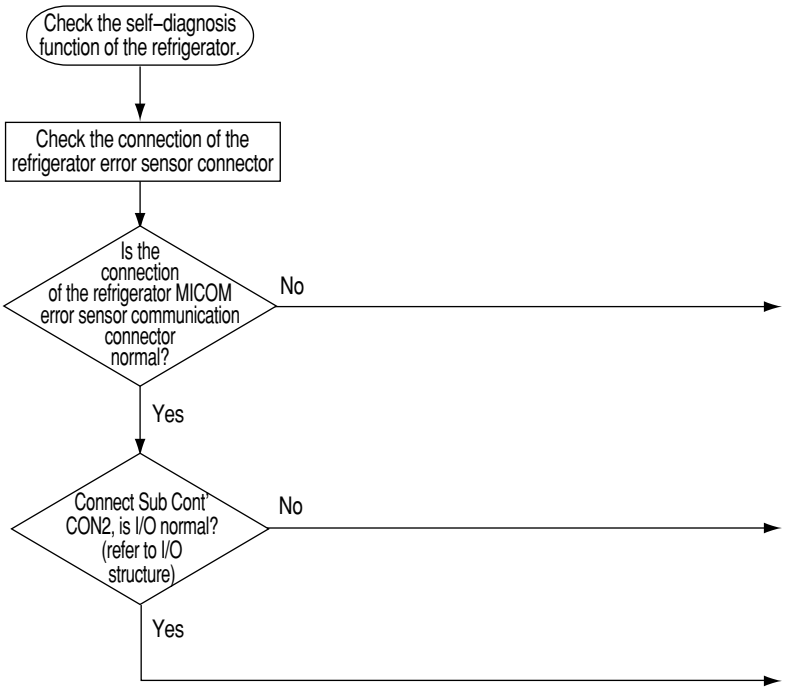
TROUBLESHOOTING FOR THE DIGITAL FUNCTION SECTION

Error Symptoms	Contents to check	Measures
There is no output of sound.		

TROUBLESHOOTING FOR THE DIGITAL FUNCTION SECTION

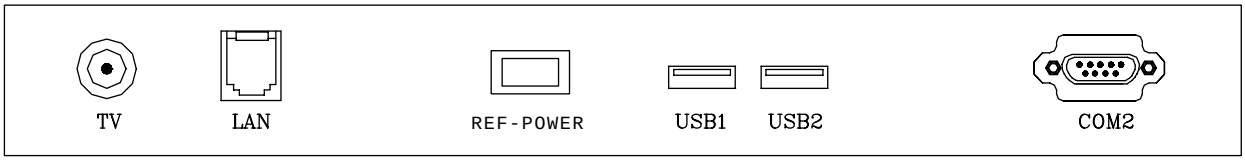
Error Symptoms	Contents to check	Measures
There is no TV output		

TROUBLESHOOTING FOR THE DIGITAL FUNCTION SECTION

Error Symptoms	Contents to check	Measures
There is no output of TV sound.		Reconnect the Main Cont' and TV Sound In Connector Reconnect TV Tuner and Sound Out (P1) connector. (refer to I/O structure) If same symptom occurs after replacing TV Tuner, replace Main Cont'
The sensor for refrigerator errors does not work.		Reconnect refrigerator MICOM error sensor communication connector Reconnect Sub Cont' CON2 If same symptom occurs after replacing Sub Cont', replace Main Cont' and refrigerator MICOM

EXTERNAL EXTENSION PORT

1. EXTERNAL EXTENSION PORT



1-1. TV

- Connect to cable TV.

1-2. LAN

- Connect Internet network cable

1-3. USB1,2

- Connect a keyboard when updating or revising programs in the digital section of the internet refrigerator
- To use an Internet network cable, install the additional software provided by ISP (Internet Service Provider)

✻ Software Installation Method

(1) Connect a USB Type CD-ROM to USB port 1.
(2) Reboot the digital section by pushing the reset switch.
(3) Enter the hard disk safety device in the supervisor mode.
(4) The CD-ROM drive is set as drive E in the Windows Explorer. Carry out the software addition work.

1-4. COM1

- Use when connecting the home network device.

1-5. COM2

- Use when connecting external modem.

1-6. REF-POWER

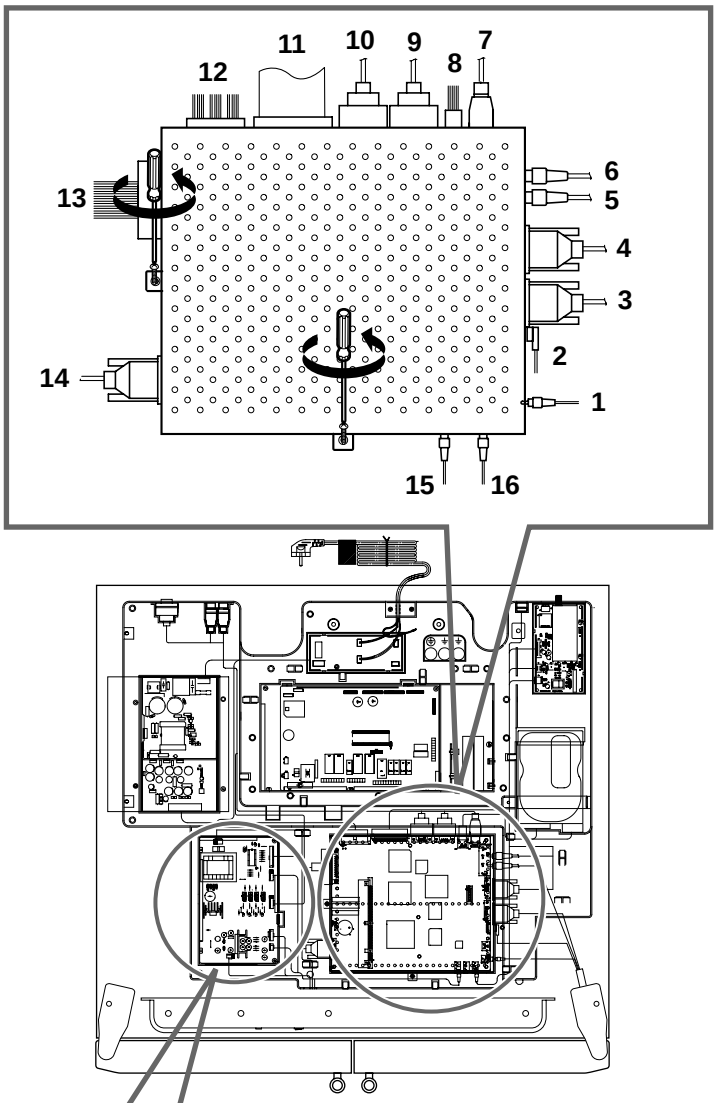
- Use when refrigerator power is off.

HOW TO DISASSEMBLE AND ASSEMBLE(DIGITAL SECTION)

1. TOP COVER PART

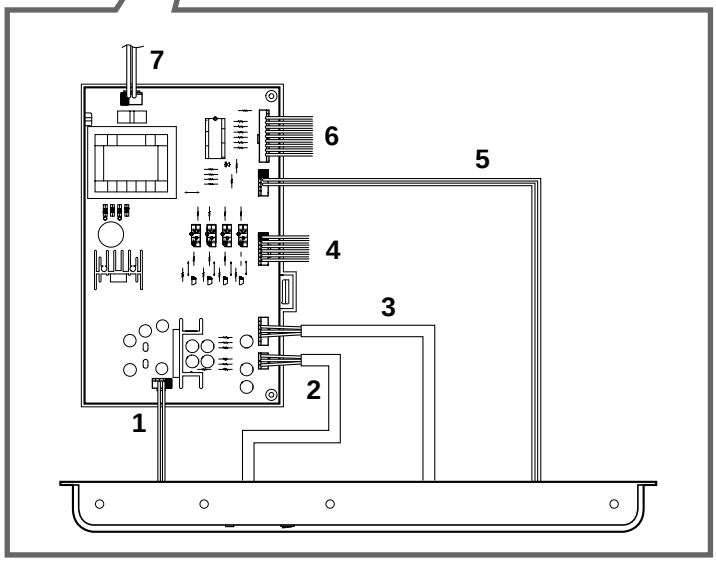
1-1. Main Controller Part

- Unscrew two point.
- Disassemble after disconnecting Main Controller connections 1~16.



1-2. Sub-Controller, Deco Case Part

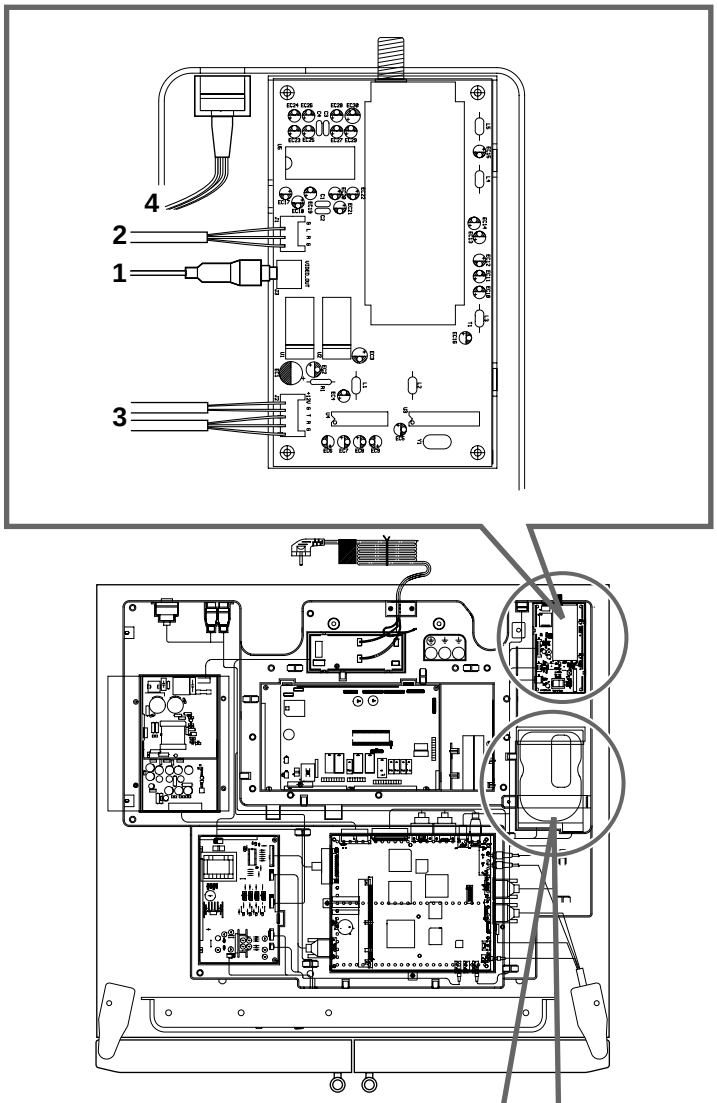
- Disassemble after disconnecting 1~7.



HOW TO DISASSEMBLE AND ASSEMBLE(DIGITAL SECTION)

1-3. TV-Tuner Part

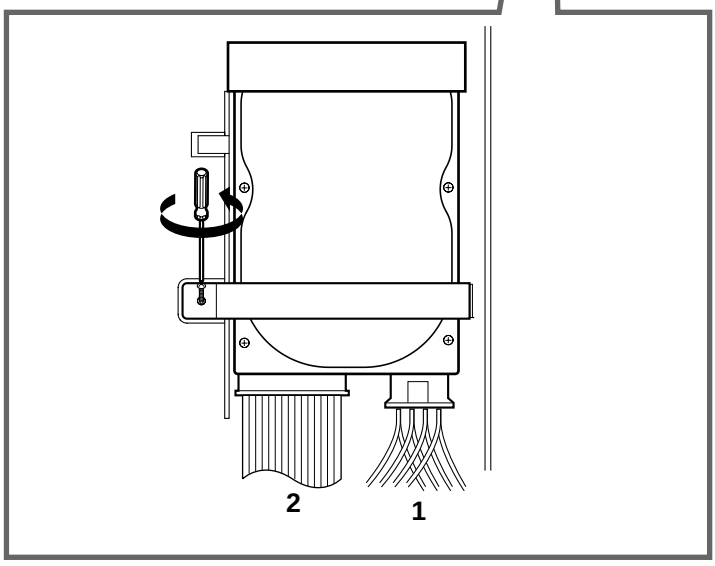
● Disassemble after disconnecting 1~4.



1-4. Hard Disk Part

● Unscrew 1 point.

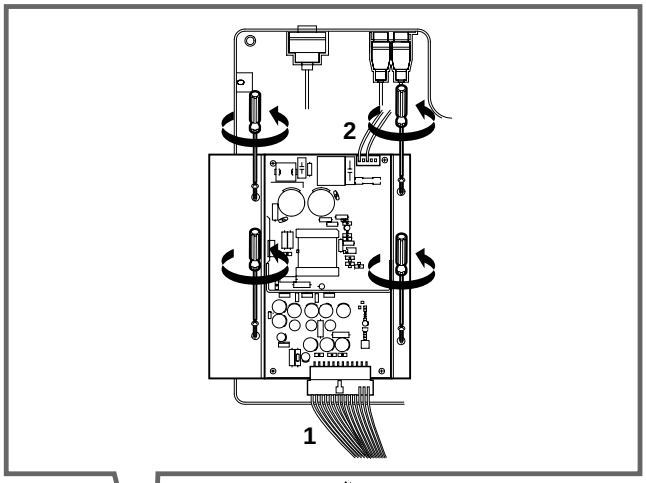
● Disassemble after disconnecting 1~2.



HOW TO DISASSEMBLE AND ASSEMBLE(DIGITAL SECTION)

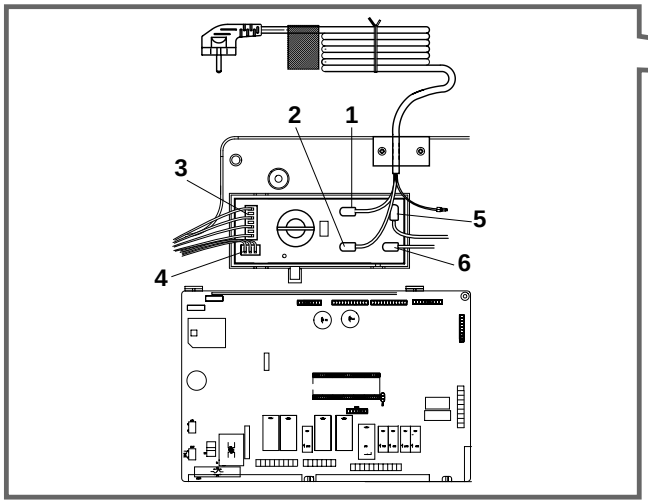
1-5. Power Supply Part

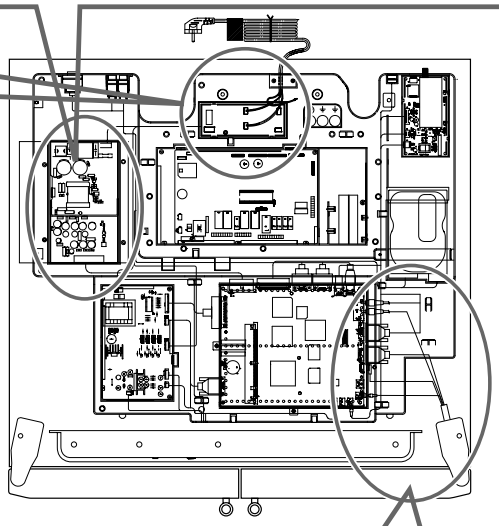
- Unscrew 4 points.
- Disassemble after disconnecting 1~2.



1-6. Sub-PCB Part

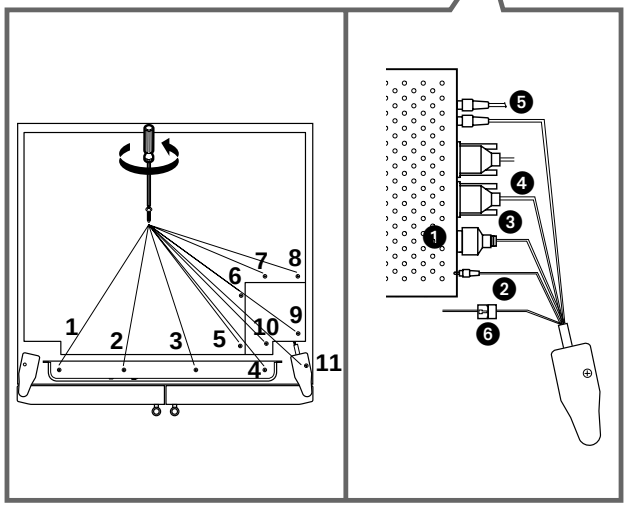
- Disassemble after disconnecting 1~6.





1-7. Ref-Door Part

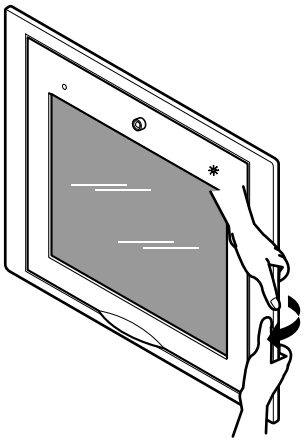
- Disassemble DECO CASE after disconnecting 1~4.
- Disassemble COVER-S disconnecting 5~10.
- Disassemble HINGE COVER after unscrewing 11.
- Disassemble the socket ❶ only when both sides are being pressed in.
- Disassemble ❷, ❸, ❹, ❺, ❻ .
- Disassemble REF-DOOR after disconnecting HINGE.



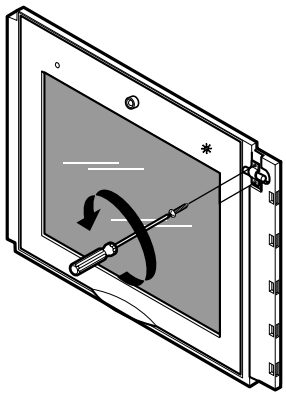
HOW TO DISASSEMBLE AND ASSEMBLE(DIGITAL SECTION)

2. MONITOR PART

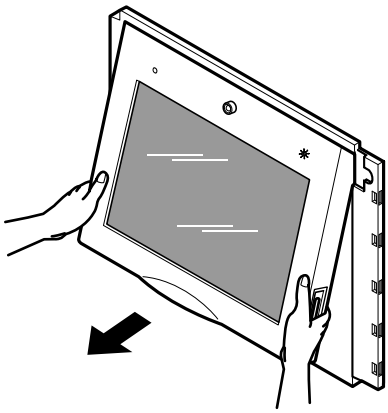
1. Disassemble Monitor Cover, Frame LCD.



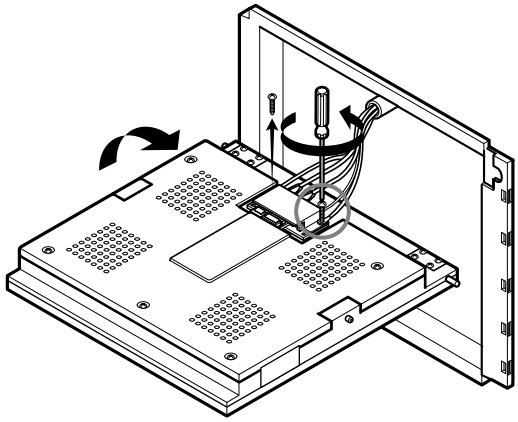
2. Disassemble Bracket after unscrewing.



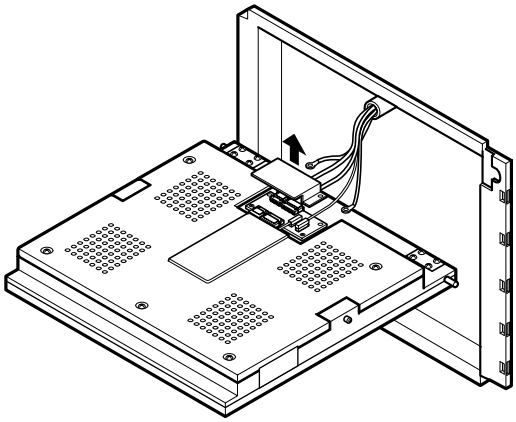
3. Disassemble MONITOR after pulling out at bottom.



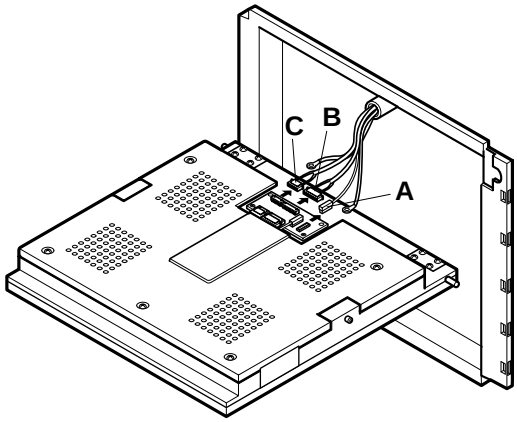
4. Unscrew No1, 2.



5. Disassemble Support Housing.

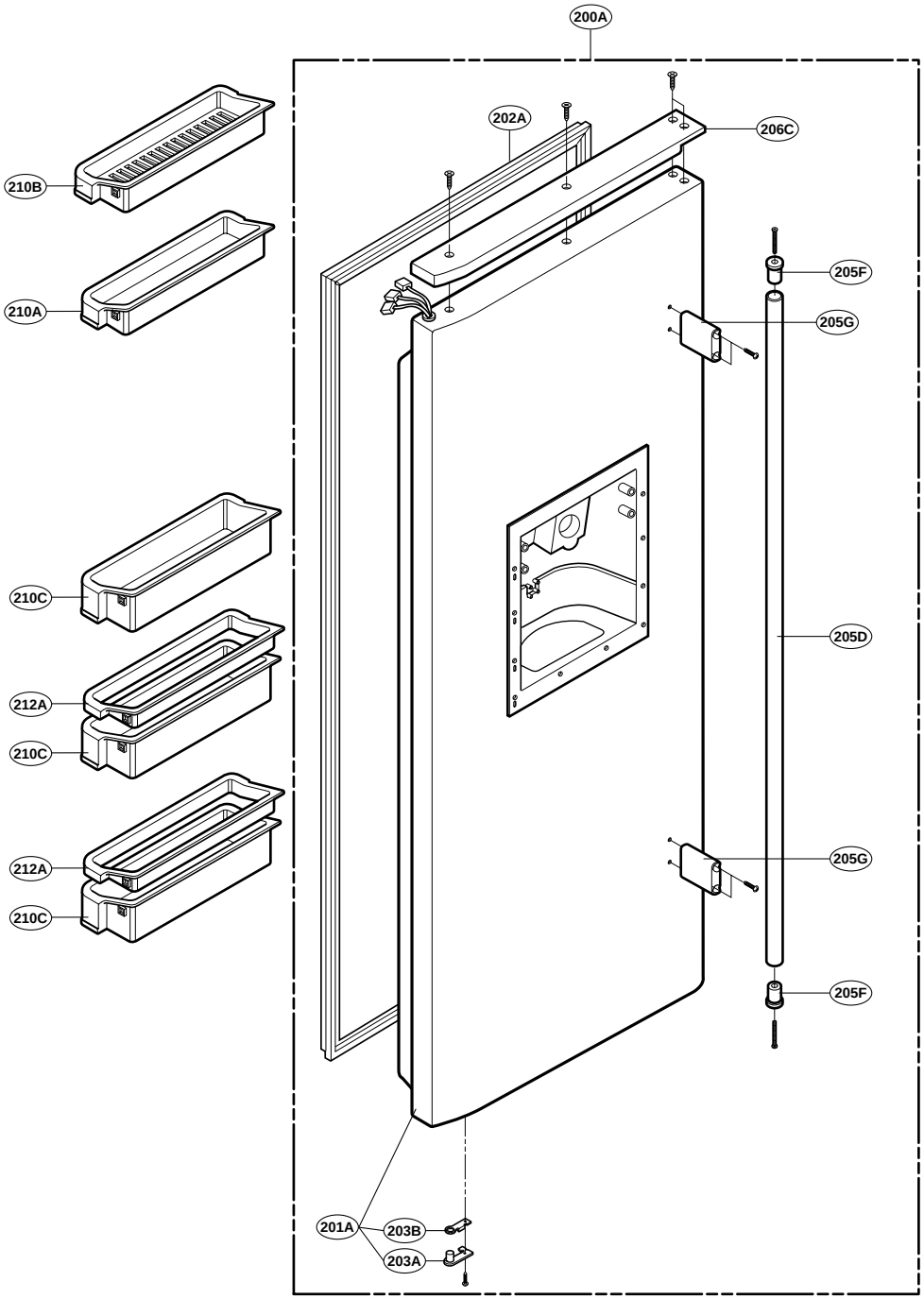


6. Disassemble Monitor after removing Connecters A, B, C.



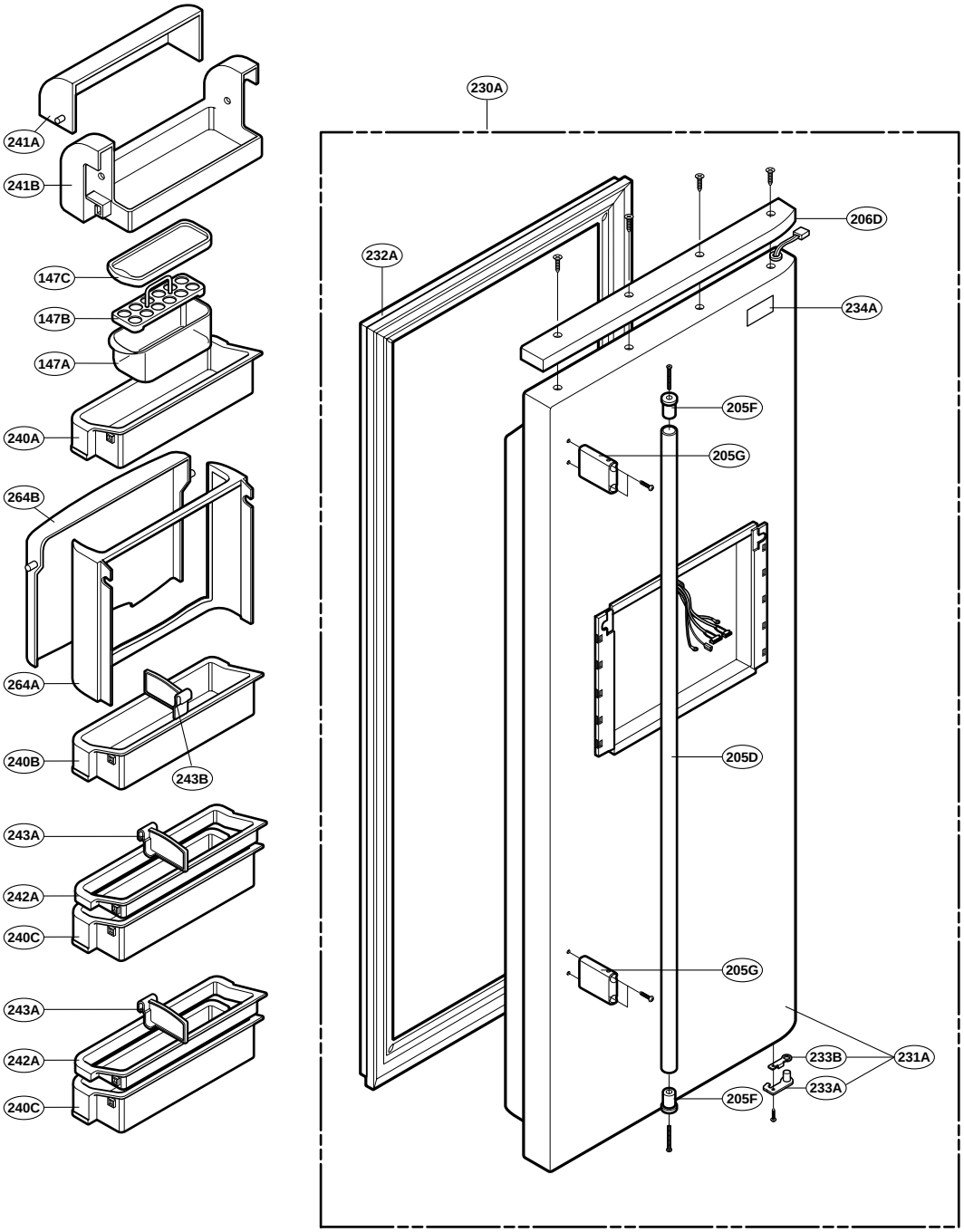
EXPLODED VIEW

FREEZER DOOR PART



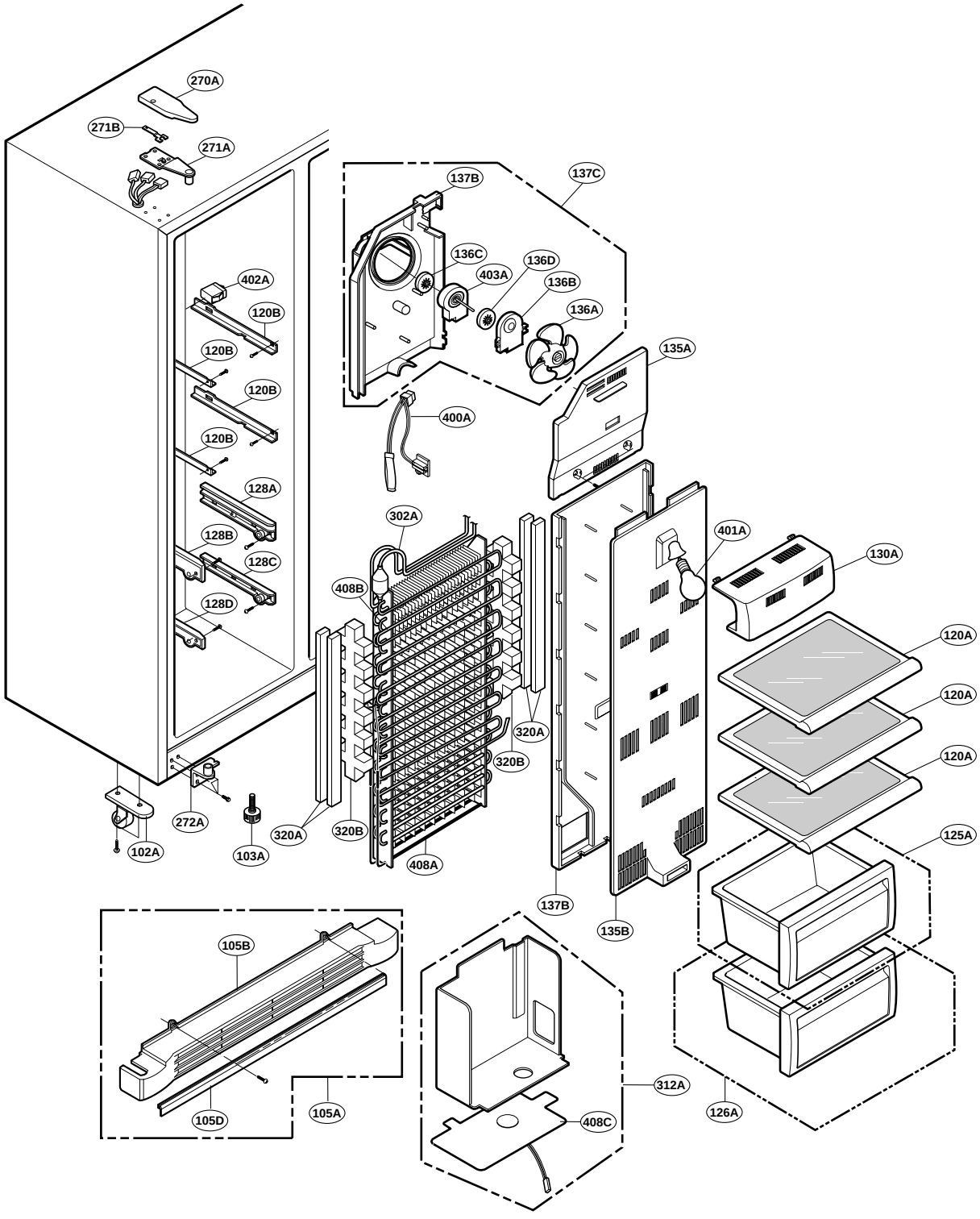
EXPLODED VIEW

REFRIGERATOR DOOR PART



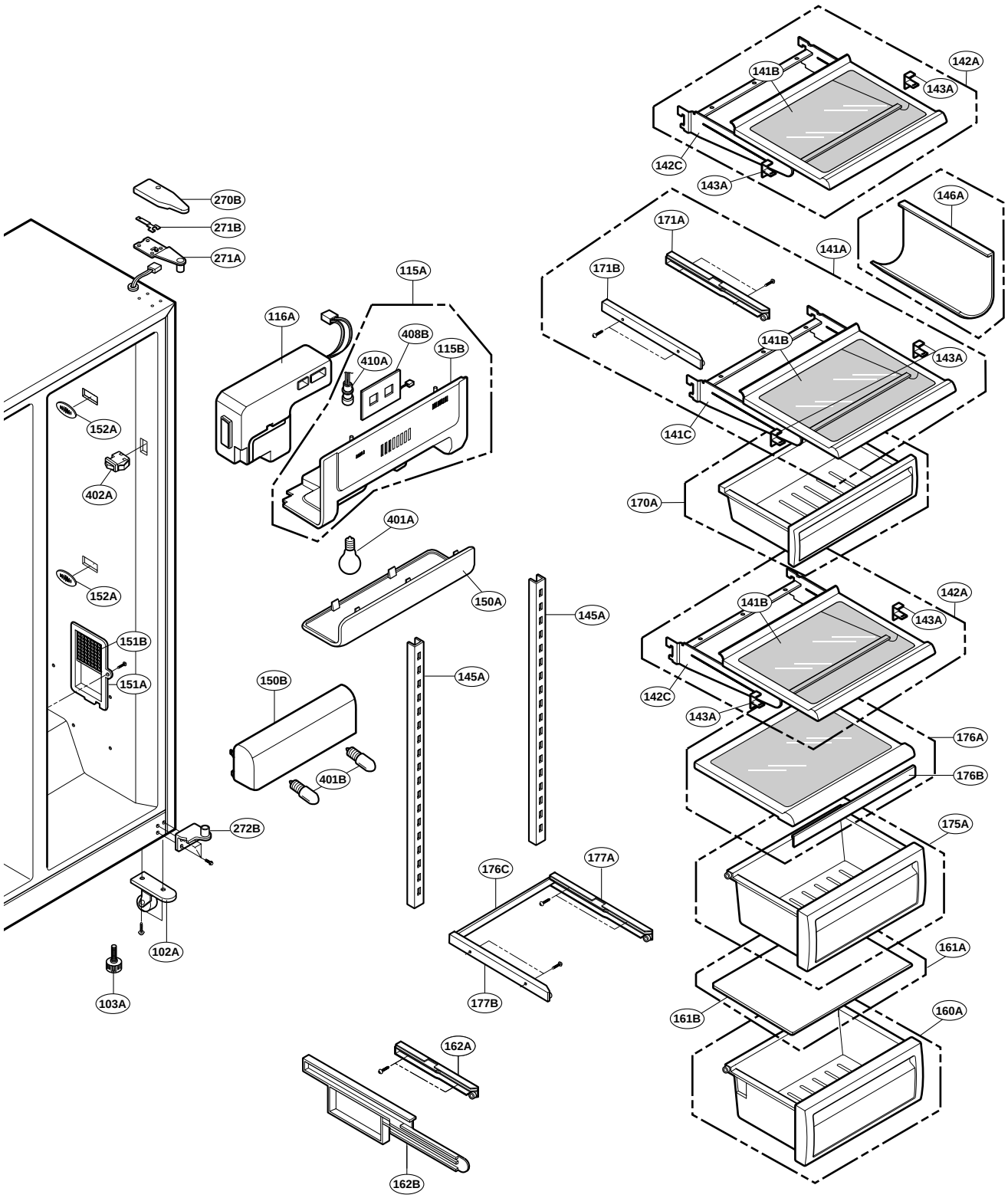
EXPLODED VIEW

FREEZER COMPARTMENT



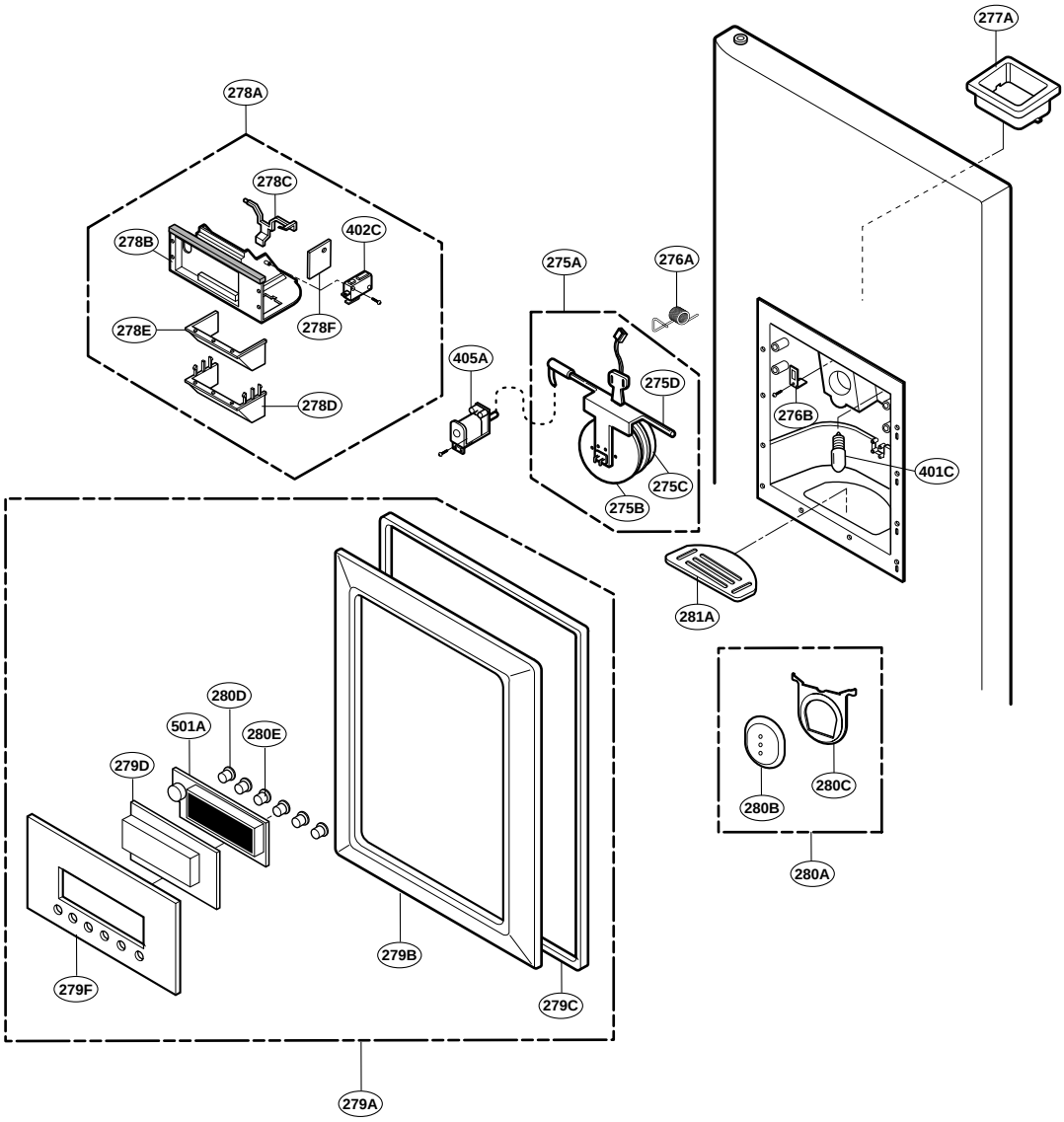
EXPLODED VIEW

REFRIGERATOR COMPARTMENT



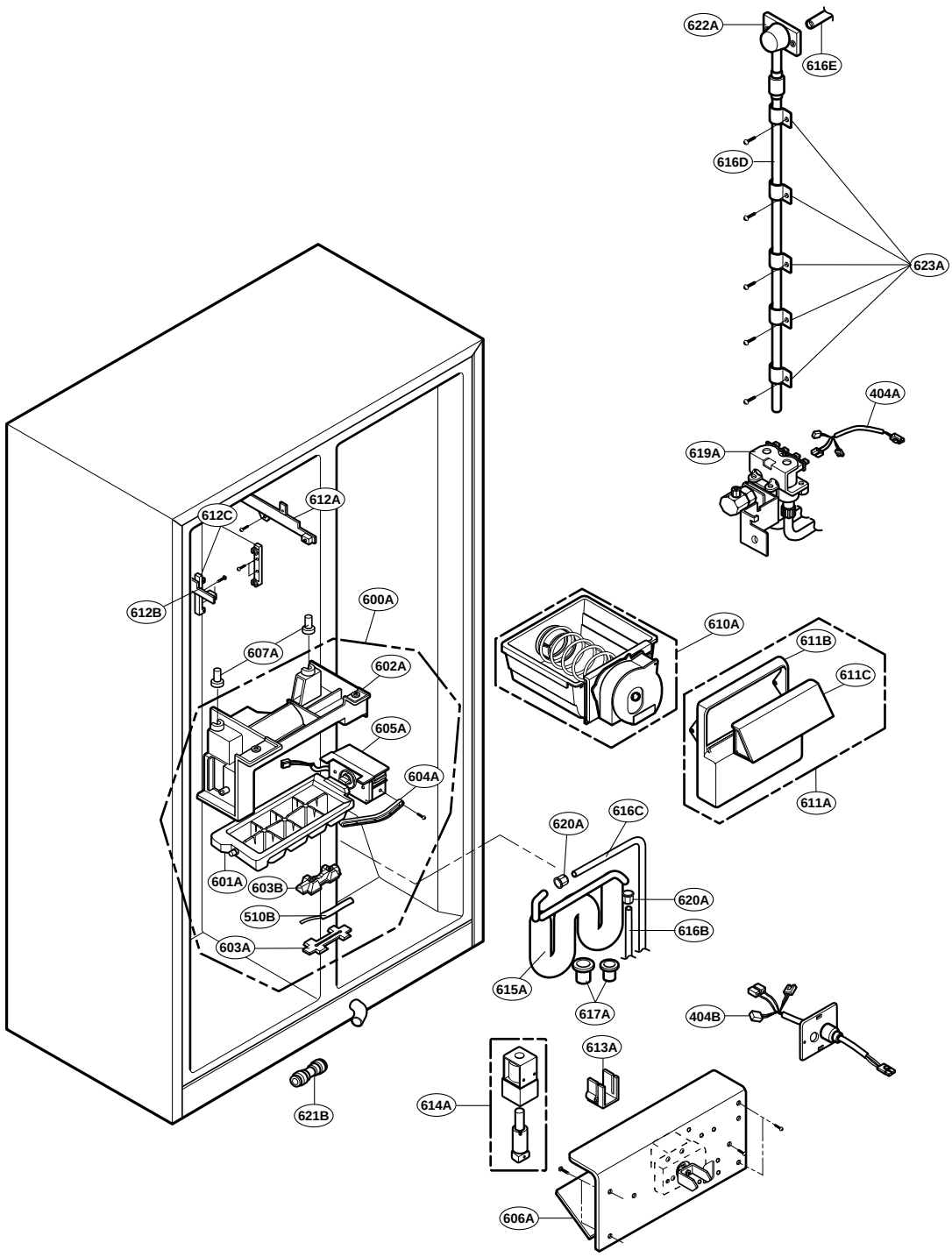
EXPLODED VIEW

DISPENSER PART



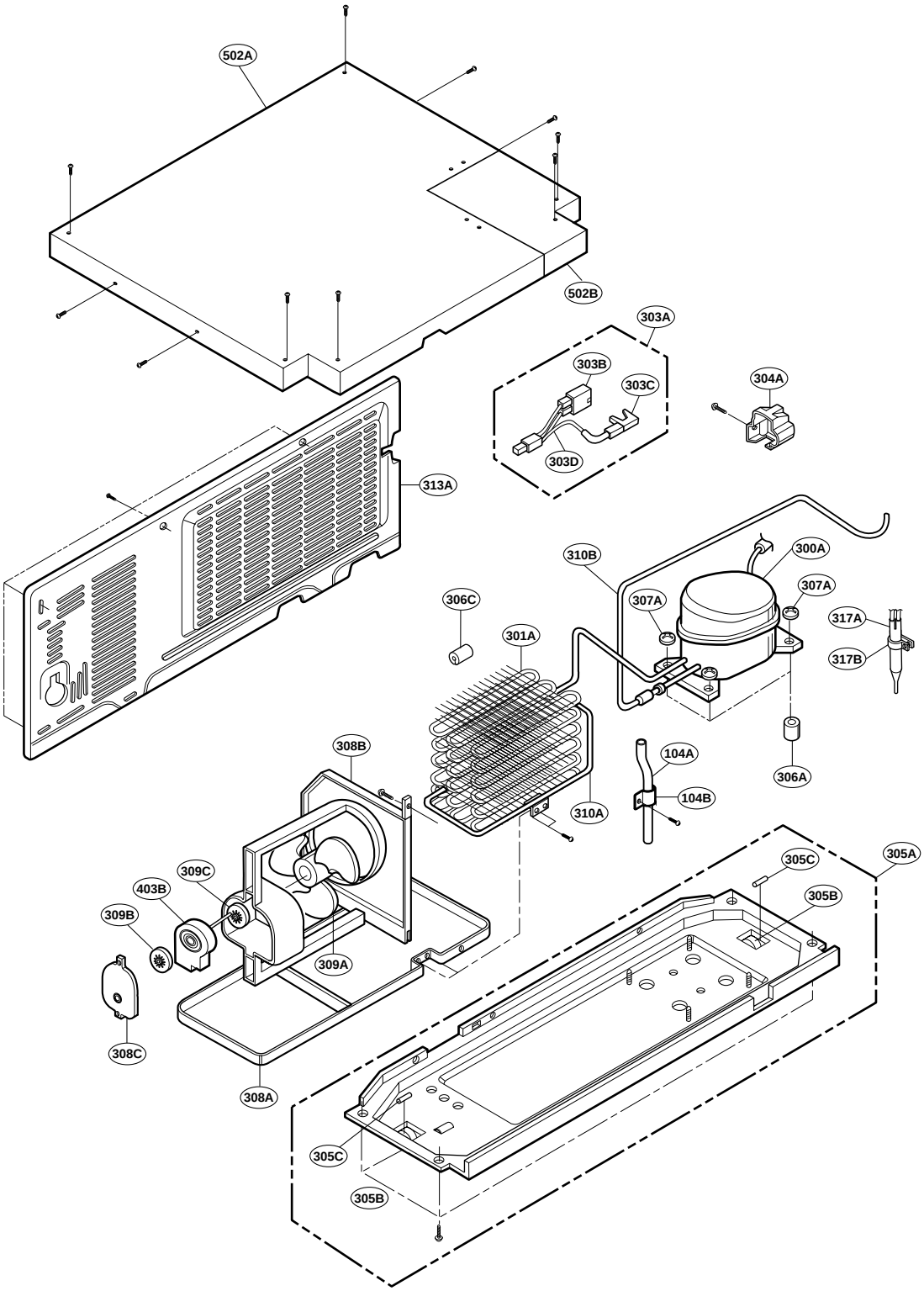
EXPLODED VIEW

ICE & WATER PART



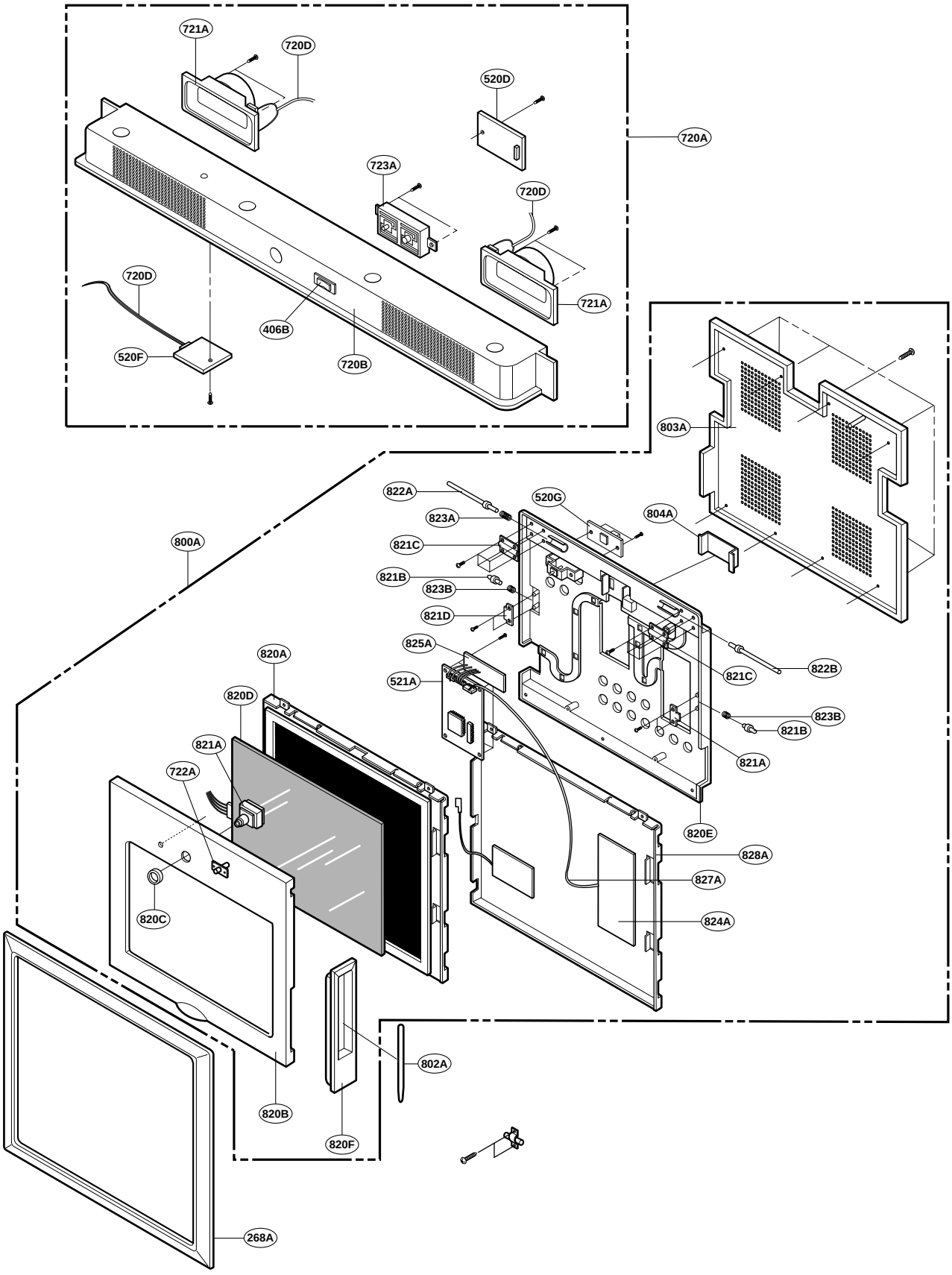
EXPLODED VIEW

MACHINE COMPARTMENT

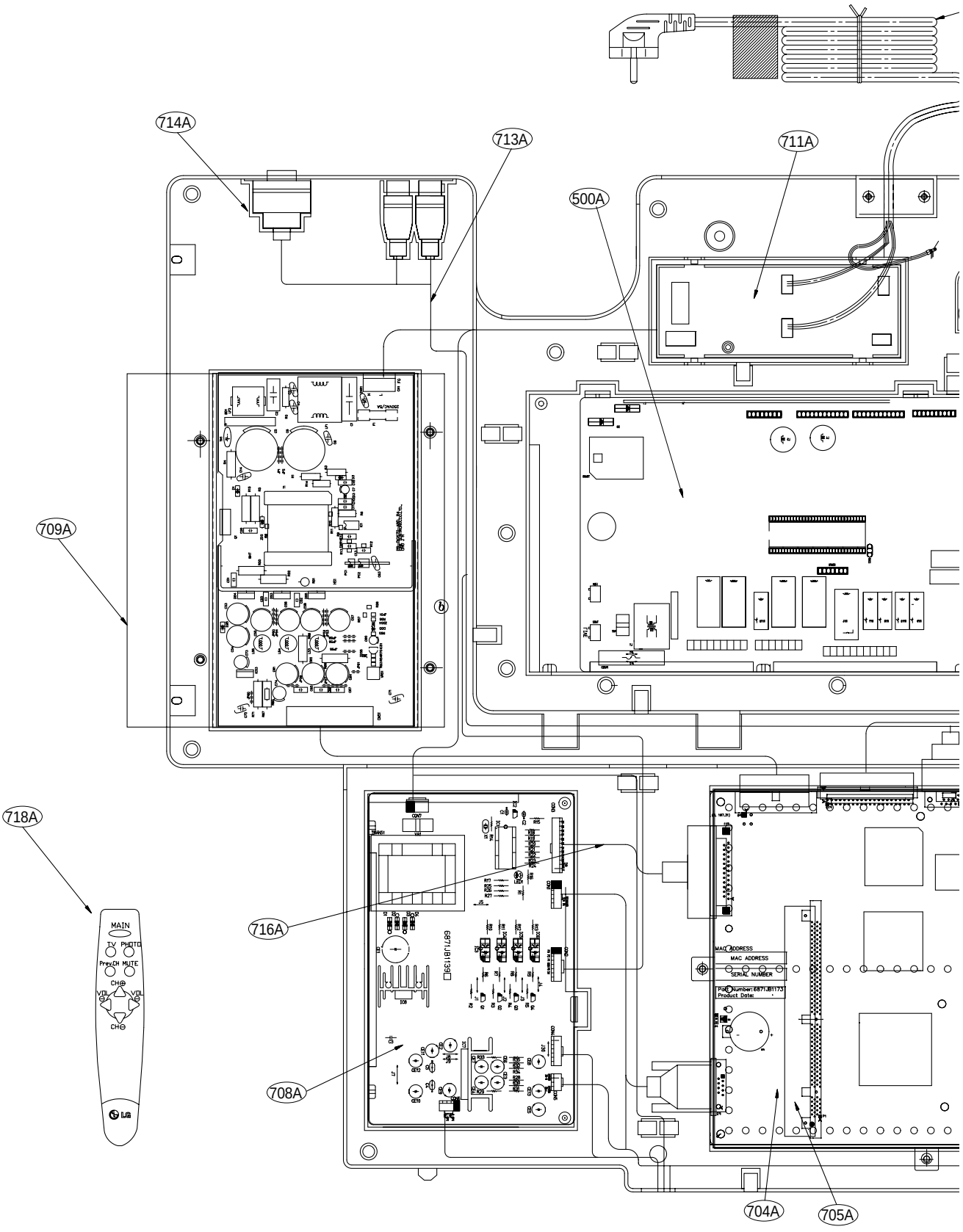


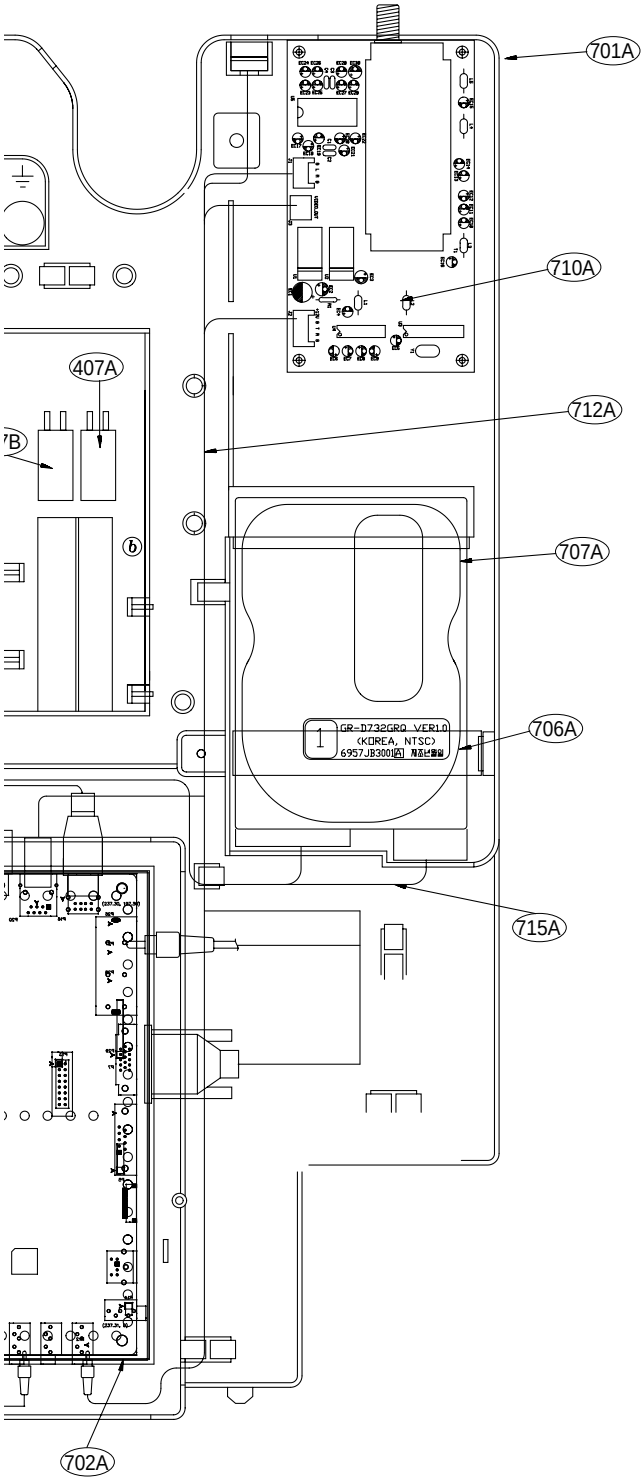
EXPLODED VIEW

SPEAKER & MONITOR PART



DIGITAL PART COMPONENTS

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