WARNINGS AND PRECAUTIONS FOR SAFETY

Please observe the following safety precautions in order to use safely and correctly the refrigerator and to prevent accident and danger during repair.

1. Be care of an 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, please wait for more than five minutes after power cord was disconnected from the wall outlet.

3. Please check if the power plug is pressed down by the refrigerator against the wall. If the power plug was damaged, it may cause fire or electric shock.

4. If the wall outlet is over loaded, it may cause fire. Please use its own individual electrical outlet for the refrigerator.

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

6. Use standard electrical components when replacing them.

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

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

9. Please check the evidence of moisture intrusion in the electrical components. Replace the parts or mask it with insulation tapes if moisture intrusion was confirmed.

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

11. Do not let the customers repair, disassemble, and reconstruct the refrigerator for themselves. It may cause accident, electric shock, or fire.

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

13. Do not put flower vase, cup, cosmetics, chemicals, etc., or container with full of water on the top of the refrigerator.

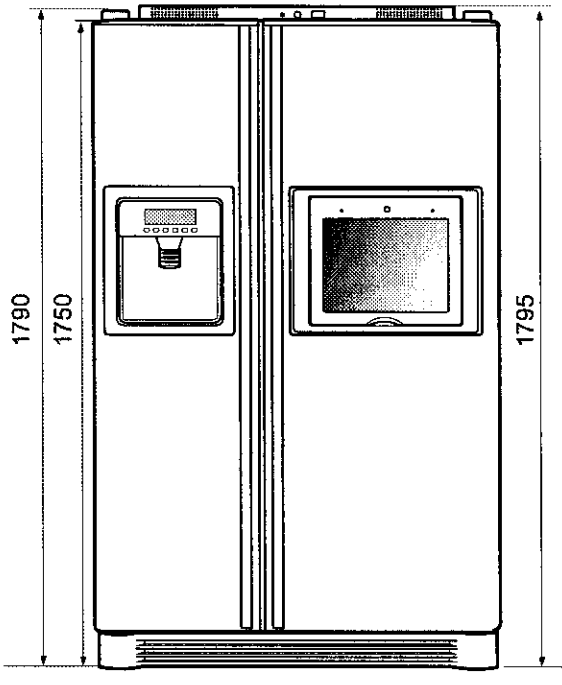
14. Do not put glass bottles with full of water into the freezer. The contents shall freeze and break the glass bottles.

15. When you scrap the refrigerator, please disconnect the door gasket first and scrap it where children are not accessible.

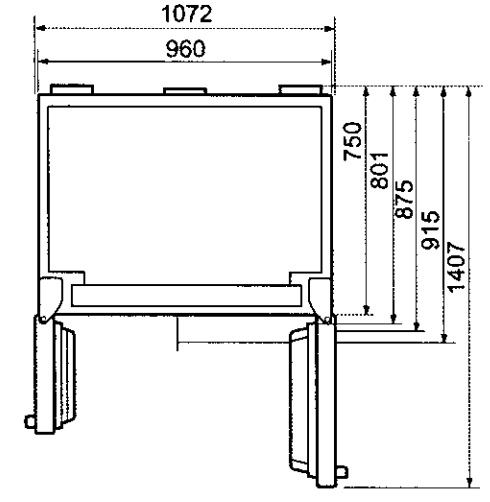
SPECIFICATIONS

ITEMS	SPECIFICATIONS
DIMENSIONS (mm)	960(W)x915(D)x1795(H)
NET WEIGHT (kg)	169
COOLING SYSTEM	Fan Cooling
TEMPERATURE CONTROL	Micom Control
DEFROSTING SYSTEM	Full Automatic
	Heater Defrost
INSULATION	Cyclo-Pentane
COMPRESSOR	P.T.C. Starting Type
EVAPORATOR	Fin Tube Type
CONDENSER	Wire Condenser
REFRIGERANT	R134a (210g)
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)

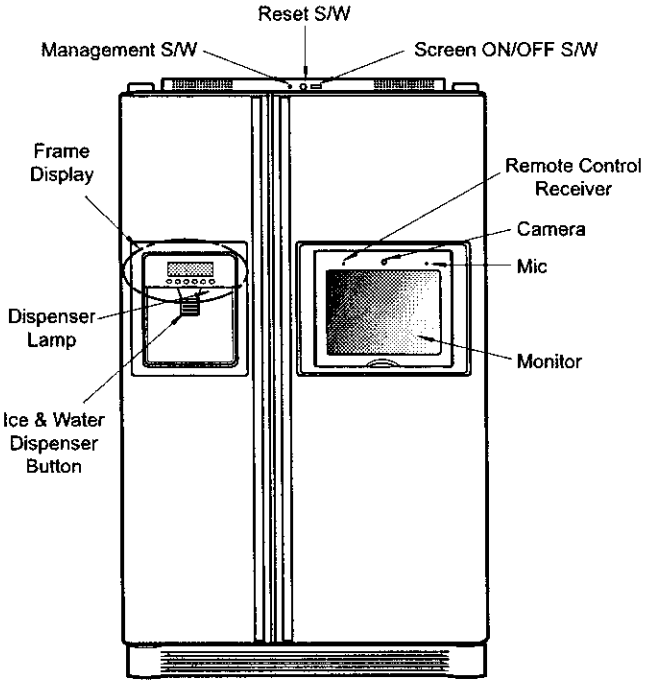


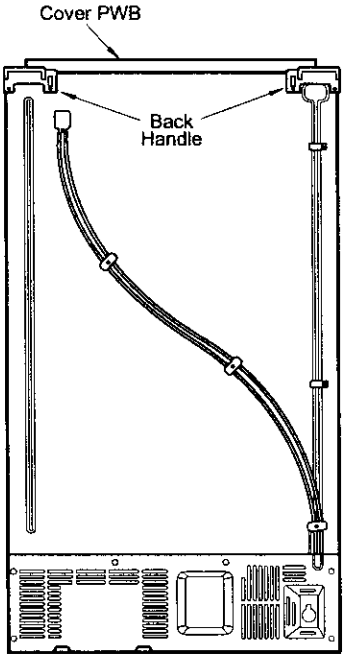
<Front View>

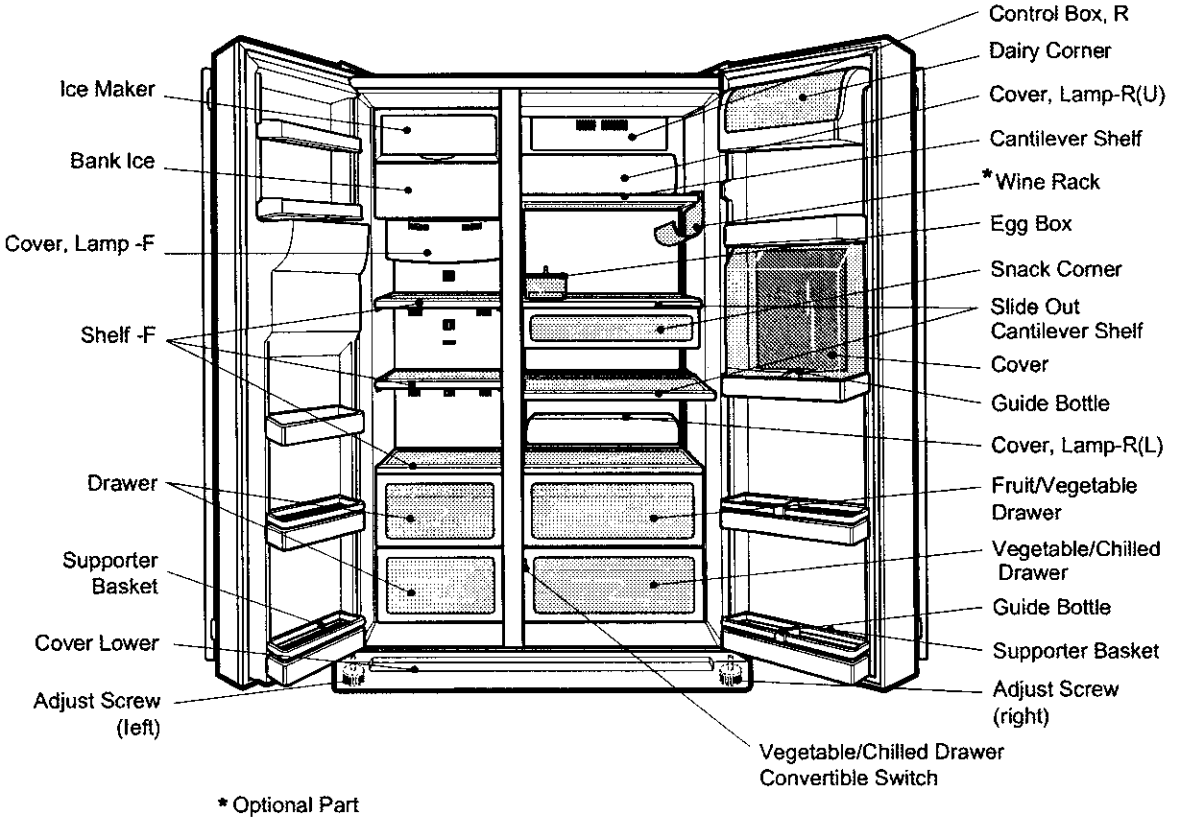


<Plane View>

PARTS IDENTIFICATION







* Optional Part

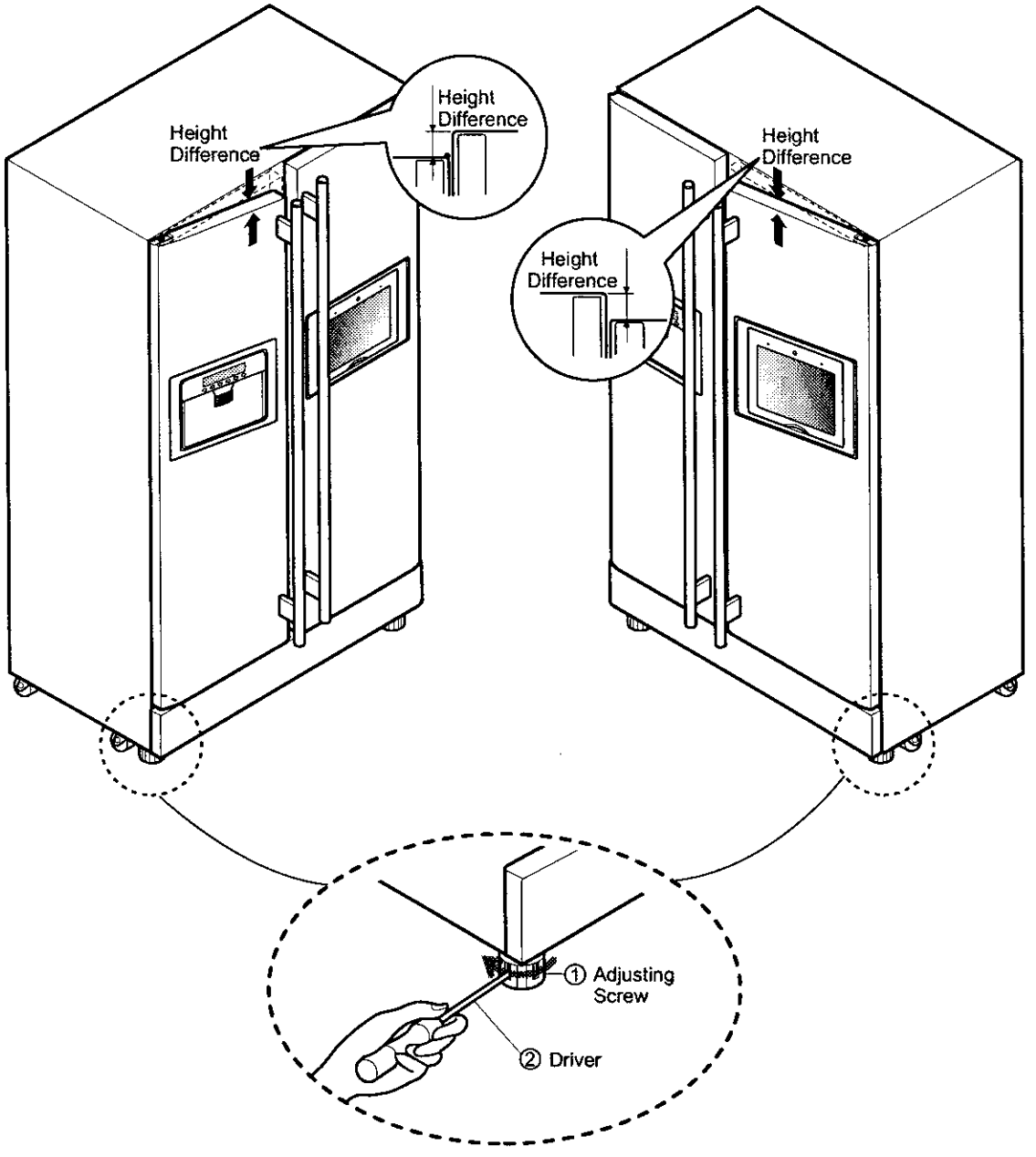
HOW TO INSTALL REFRIGERATOR

1. How to Adjust Door Height of Refrigerator

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

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

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



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

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

HOW TO INSTALL REFRIGERATOR

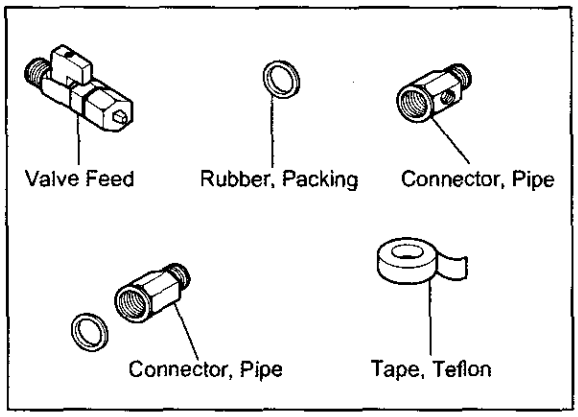
2. How to Install Water Pipe

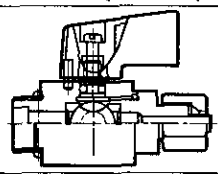
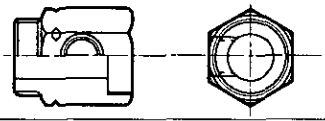
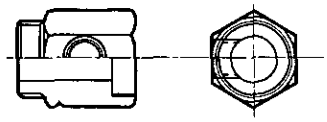
■ Before Installation

1. The icemaker requires the water pressure of 1.5 - 8.5kgf/cm². (It is acceptable if city water fills a cup of 180cc with water for 10 seconds)
2. Install booster pump where the city water pressure is below 1.5kgf/cm² for normal operation of water and ice dispenser.
3. The total length of water pipe shall be less than 12m. Do not bend the pipe at right angle. If the length is more than 12m, there will be troubles on water supply due to water pressure drop.
4. Please install water pipe where there is no heat around.
5. Be sure that the filter does not sterilize.
6. The life span of water filter depends on the use conditions. But the filter is generally replaced in every six months. Install filter where replacement can be easily performed.

2-1. When connecting directly to the water tap.

■ Please confirm the following installation parts.



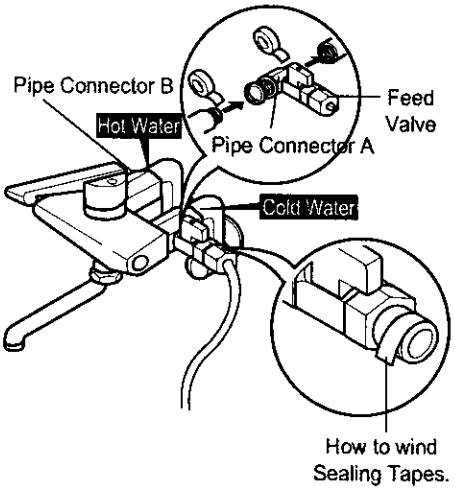
Class.	Shape and Spec.	Nomenclature	P/No	Remarks
Conve-rtible Water Valve		Valve Feed	5221JA3001A	Common Use
Water Conn-ector		Connector, (MECH) Pipe Conversion Connector(3/4") Balance Conector(3/4") Packing(ø24x3t)	4932JA3003A 6631JA3004A 6631JA3004B 3920JA3001B	No Holes
	Connector, (MECH)Pipe 	Connector, (MECH) Pipe Conversion Connector(W25) Balance Conectoor(W25) Packing(ø23x3t)	4932JA3003B 6631JA3004C 6631JA3004D 3920JA3001A	No Holes
		Connector, (MECH) Pipe Conversion Connector(W28) Balance Conector(W28) Packing(ø26x3t)	4932JA3003C 6631JA3004E 6631JA3004F 3920JA3001C	No Holes
		Connector, (MECH) Pipe Conversion Connector(1/2") Balance Conector(1/2") Packing(ø19x3t)	4932JA3003D 6631JA3004G 6631JA3004H 3920JA3001D	No Holes

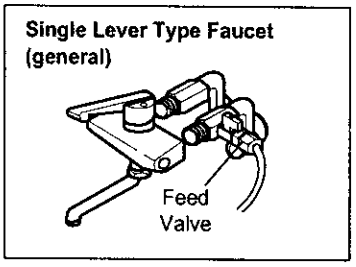
HOW TO INSTALL REFRIGERATOR

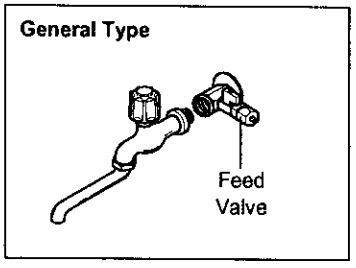
2-2. Connection of Pipe Connector A and B.

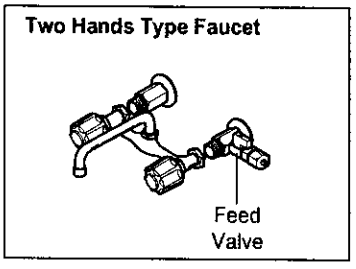
1) Turn off main valve of water pipe.
2) Disconnect water tap from piping by loosening nuts.
3) Connect pipe connector A and B to piping after sealing the pipe connector with sealing tapes.
4) Connect feed valve to pipe connector A.
5) If there is only one tap water pipe, connect pipe connector A only and install feed pipe.

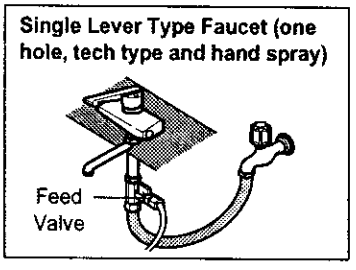
Caution : • Feed pipe should be connected to cold water line. If it is connected to hot water line, trouble may occur.
• Please check rubber packing when connecting feed pipe.





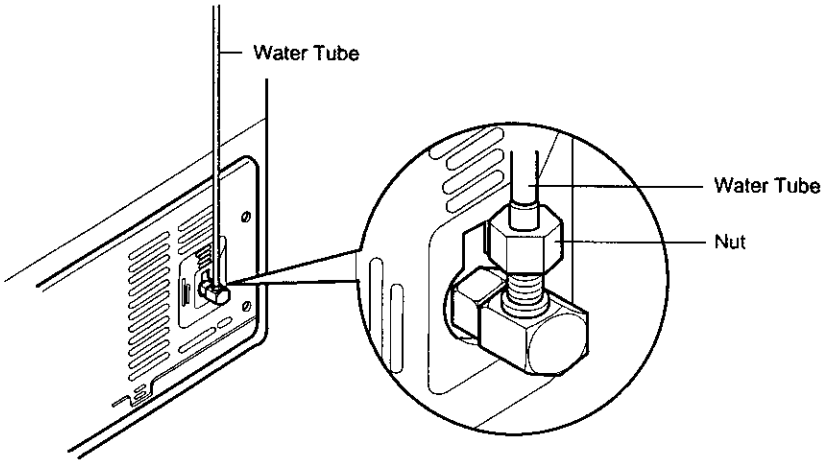






2-3. Water Supply

1) After the installation of feed water, plug the refrigerator to the earthered wall outlet, press the water dispenser button for 2 - 3 minutes, and confirm that the water comes out.
2) Check leakage at connecting part, then arrange water tube and locate the refrigerator at its regular place if there is no leaking.

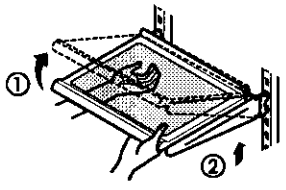


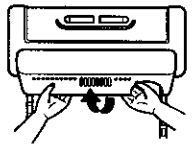
HOW TO INSTALL REFRIGERATOR

■ **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 (a) and lifting it to the direction (b) 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.





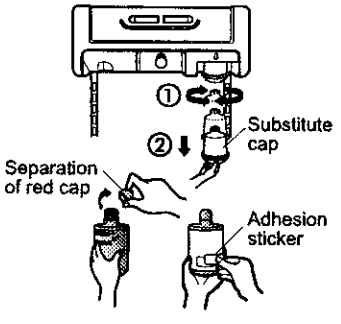
■ **Installing water filter**

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

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

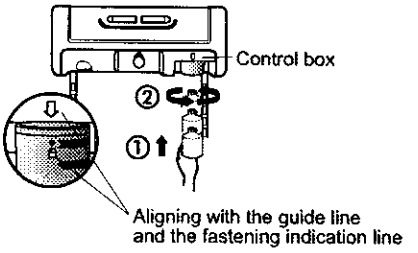
Remove the red cap from the filter and attach the sticker. Insert the upper part of the filter (a) after aligning with the guideline marked on the control box, and fasten it by turning it clockwise by 90 degrees.

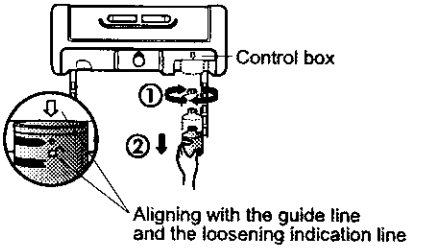
Note : Check that the guideline and the fastening indication line are aligned.



2. **Replacement of water filter**
   While holding the lower part of the filter, turn it counterclockwise (a) by 90 degrees and pull it down.

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



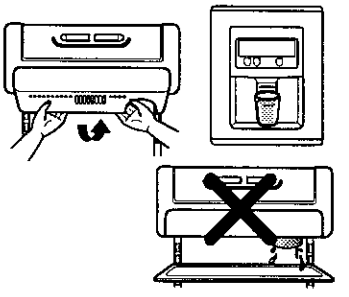


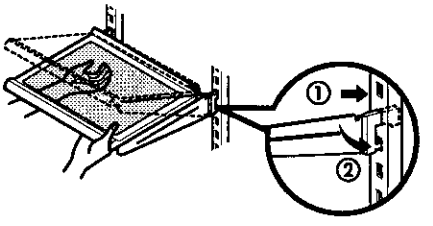
■ **After installing water filter**

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 is fit 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 droppings on the shelf under the filter.



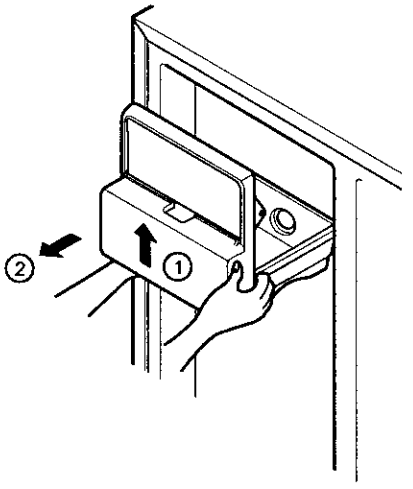


HOW TO INSTALL REFRIGERATOR

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

3-1. Confirm the amount of water supplied to the icemaker.

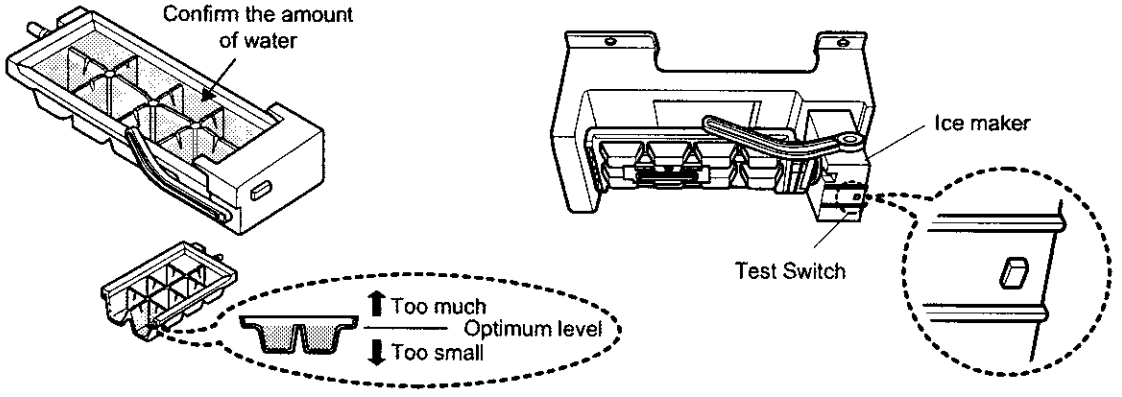
1. Pull out the ice bank in the upper part of the freezer compartment.



Caution : • Do not put hands or tools into the chute to confirm the operation of geared motor. it may damage refrigerator or hurt hands.)
• Check the operation of motor with 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) and 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 spilt water and throw away 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)



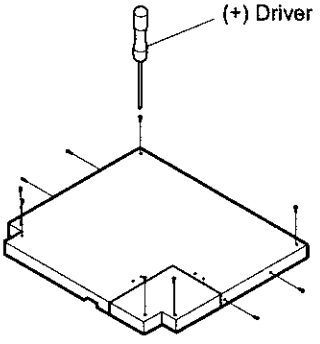
* It is acceptable if the adjusted level of water is a bit smaller than optimum level.

HOW TO INSTALL REFRIGERATOR

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

Caution : • Please 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.



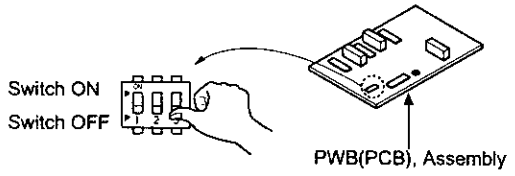
2. Adjust the amount of water supplied by using DIP switch.

■ Water Supplying Time Control Option

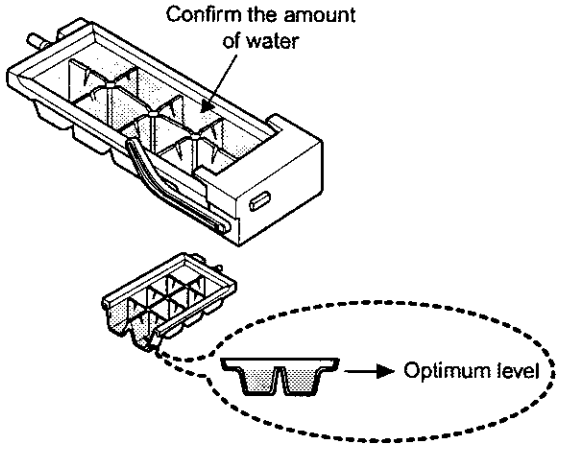
SWITCH NO			Water Suppling
S/W1	S/W2	S/W3	Time
OFF	OFF	OFF	6 Sec.
ON	OFF	OFF	4 Sec.
OFF	ON	OFF	4.5 Sec.
ON	ON	OFF	5 Sec.
OFF	OFF	ON	5.5 Sec.
ON	OFF	ON	7 Sec.
OFF	ON	ON	8 Sec.
ON	ON	ON	9 Sec.

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 water pressure (city water pressure).
3) If ice cube is too small, increase the water supplying time. This happens when too small water is supplied into the ice tray. (eg: change 5 to 5.5 seconds)
4) If ice cube sticks 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 step by step. Otherwise the water may spill over.

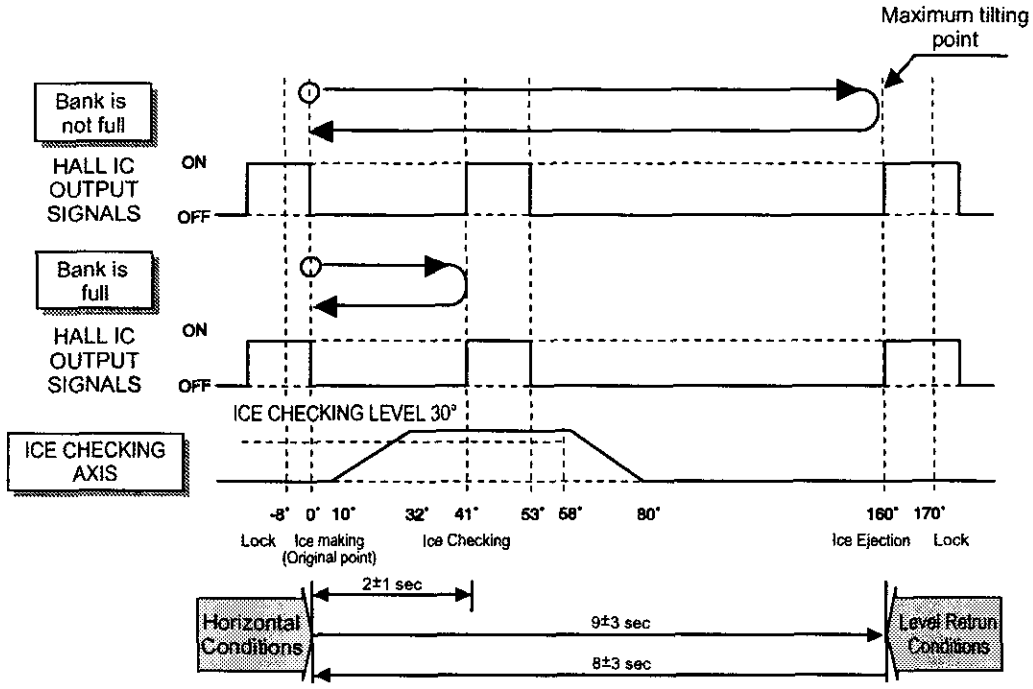


3. When adjustment of control switch for the amount of water supplied is complete, check the level of water in the ice tray.



2-4. Ice Ejection Control Function

1. This is to eject ice from ice maker 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 ice ejection but waits. If the ice bank is full, ice ejection motor rotates in normal direction in every hour to check the condition of ice bank. If the ice bank is not full, the water supply control starts after completion of ice ejection control. If the ice bank is full, ice ejection motor rotates in reverse direction and sops under ice making or waiting conditions.
3. If ice bank is not full, ice ejection starts. The cube mould tilts to the maximum and ice is separated from the mould and ice checking lever raises.
4. Ice ejection motor stops for 1 second if Hall IC signal changes from OFF (low) to ON (high) after 3.6 seconds when ice ejection motor rotates in normal direction. If there is no change in Hall IC signals within 1 minute after ice ejection motor operates, ice ejection motor stops as ice ejection motor or hall IC is out of order.
5. If ice ejection motor or Hall IC is abnormal, ice ejection motor rotates in normal direction to exercise initial operation. It resets the ice maker if ice ejection motor or Hall IC is normal.
6. The mould stops for 1 second at maximum tilted conditions.
7. The mould returns to horizontal conditions as ice ejection motor rotates in reverse direction.
8. When the mould becomes horizontal, the cycle starts to repeat:
   Water Supply → Ice Making → Ice Ejection → Mould Returns to Horizontal



<Timing Chart During Ice Ejection>

ICE MAKER AND DISPENSER OPERATION PRINCIPLE AND REPAIR METHOD

2-5 Test Function

1. It is to force the operation during operation test, service, and cleaning. The test switch is mounted under the automatic ice maker. 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 it is in the horizontal conditions. If mould is full of ice during test function operation, ice ejection control and water supply control do not work.
3. When test switch is pressed for more than 0.5 second in the horizontal conditions, ice ejection starts irrespect of the mould conditions. Water shall be splashed 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. Therefore the problems of ice ejection, returning to the horizontal conditions, and water supply can be checked by test switch. When test function performs normally, buzzer sounds and water supply shall carry out. Check it for repair if buzzer does not sound.
4. When water supply is completed, the cycle operates normally as follows: Ice making → Ice ejection → Returning to horizontal conditions → Water supply
5. Remove ice from the ice maker cube mould and press test switch when ice maker cube mould is full of ice as ice ejection and water supply control do not work when cube mould is full of ice.

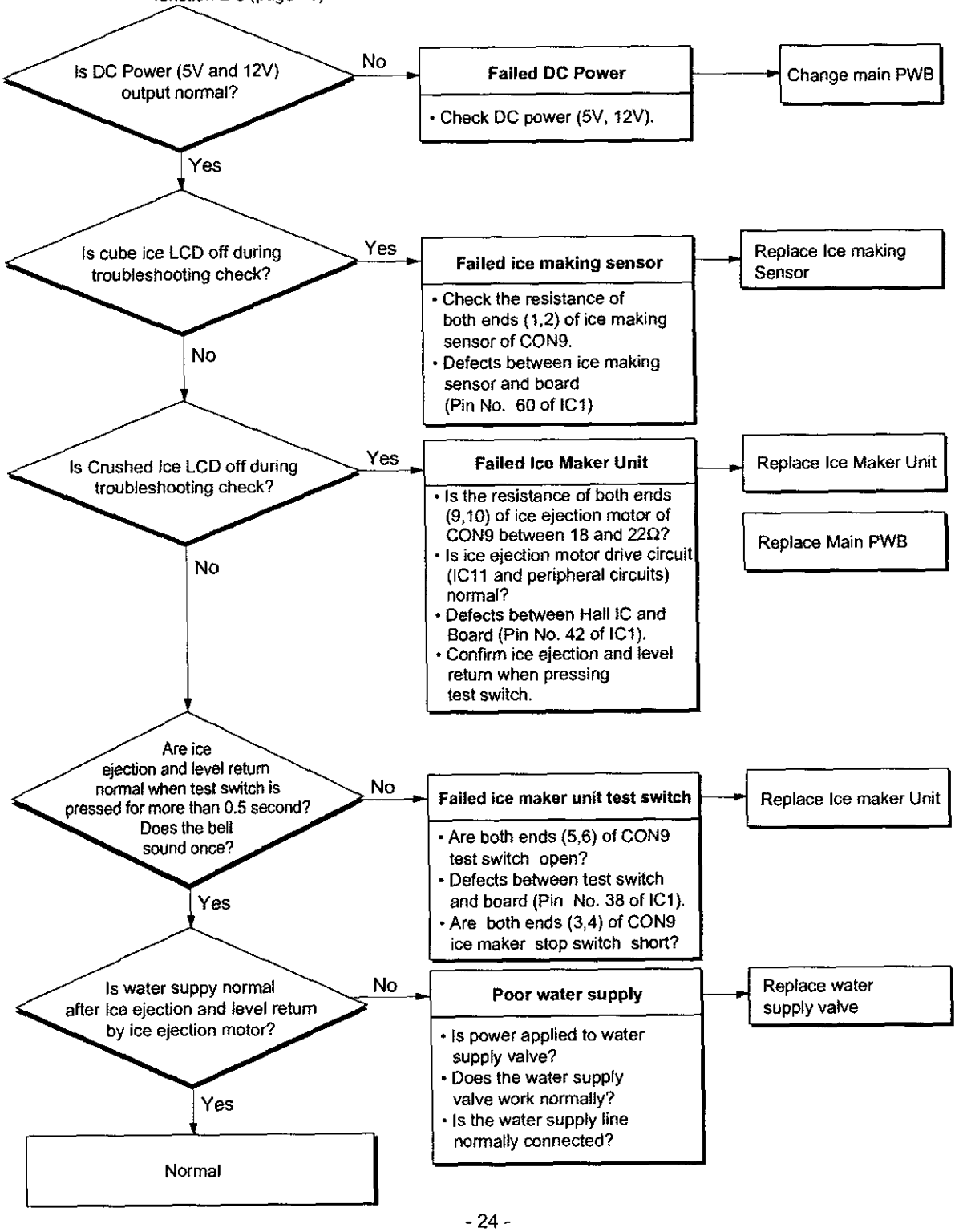
2-6. Other functions relating to freezer compartment door opening

1. When freezer door is open, ice dispenser stops in order to reduce noise and ice drop.
2. When freezer door is open during ice ejection and cube 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 protect water drop when freezer door is open.
5. Test function operates normally irrespect of refrigearator compartment door opening.

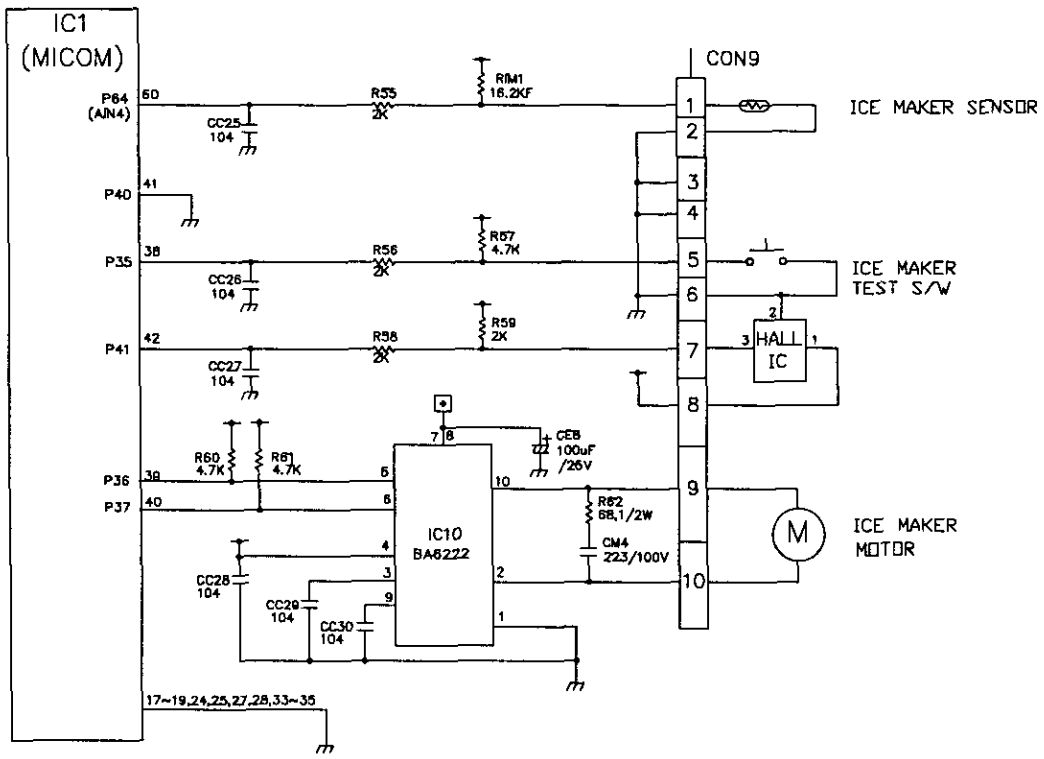
ICE MAKER AND DISPENSER OPERATION PRINCIPLE AND REPAIR METHOD

3. Ice Maker Troubleshooting

* **Troubleshooting:** it is possible to confirm by pressing freezer and refrigerator temperature control buttons for more than 1 second. (ice maker is normal if all leds are on): refer to trouble diagnposis function in MICOM function 2-8 (page 18)



4. Ice maker circuit part



The above ice maker circuit is applied to the GR-D267 and consists of the ice maker unit part installed at the freezing room and the ice maker driving part of the main PWB.

Water supply to the ice maker container is done by opening the valve for the established water supply time by operating the container via a solenoid relay for the ice valve of the solenoid valve placed at the M/C room. If the water supply time is elapsed, water supply is automatically stop. This circuit is a circuit for implementing function such as ice removal, ice-full detection, horizontal balancing and sense of ice-making temperature for the ice-maker container. Since ice-making temperature sense is same as in the temperature sense circuit part of the main PWB, refer to it.

Test switch input detection of the ice-maker 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 performed if pressing the test switch installed at the automatic ice-maker itself for more than 0.5 second.
2. The test switch operates in the horizontal status and test function is not input in the water supply operation. Ice removal control and water supply control is not performed if full-ice is arrived 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 irrespective of the generation conditions of ice at the ice-making tray. Therefore, care is required since water may overflow if operating test function in the water state that ice-making is not done. A cycle of water supply is performed in 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 function is normally performed, "Ding~" buzzer sound rings and water supply control is performed. Thus, no ringing of "Ding~" buzzer sound means failure and repair check must be performed.
4. If water supply is completed, operation in the normal cycle of "ice making → ice removal → returning to horizontal status → water supply".

EXPLATION FOR MICOM CIRCUIT

1. Explanation for PWB circuit

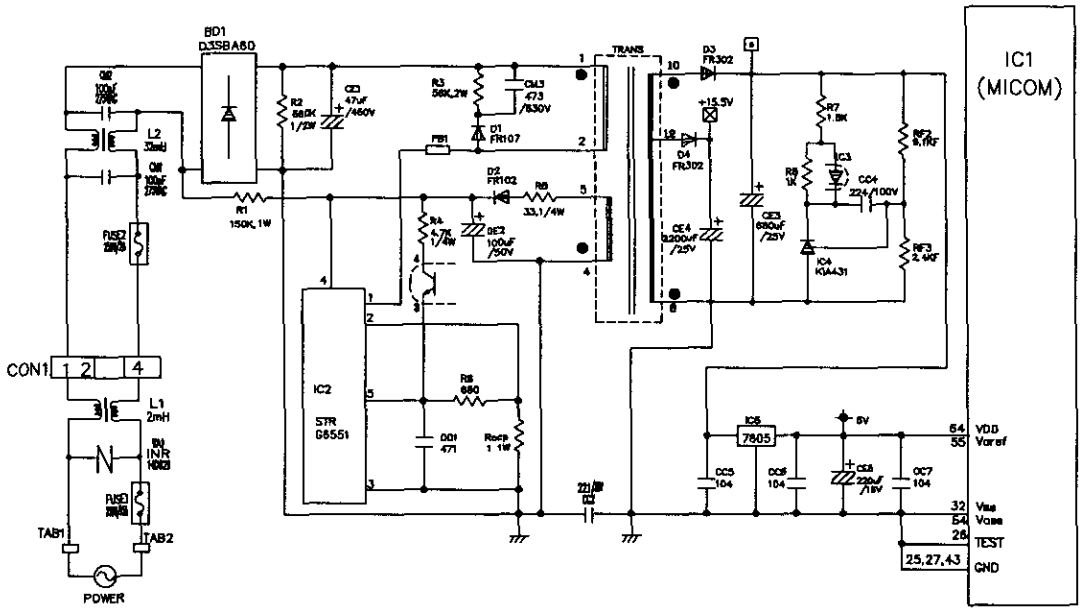
1-1. Power circuit

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 it to the primary side.

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

Voltage of every part is as follows:

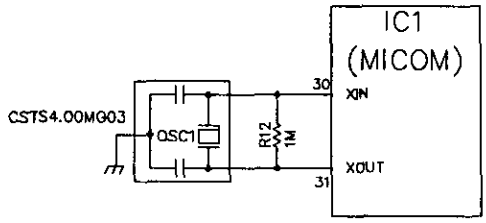
Part	VA1	CE1	CE2	CE3	CE4	CE5
Voltage	230 Vac	310 Vdc	16 Vdc	12 Vdc	15.5 Vdc	5 Vdc



EXPLATION FOR MICOM CIRCUIT

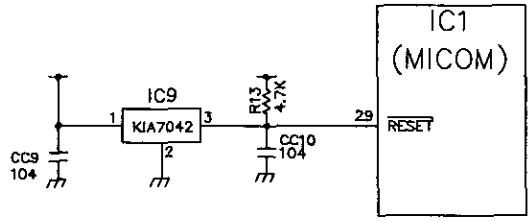
1-2. Oscillation circuit

Oscillation circuit is a circuit with the purpose of generating basic time for clock occurrence for synchronization and time calculation in relation with information transmission/reception of inside elements of IC1 (MICOM). The OSC1 must always use rated parts since if SPEC is changed, time calculated at the IC1 may be changed or no operation is done.



1-3. Reset circuit

The reset circuit is 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 applied again to MICOM by a spontaneous power failure. 'LOW' voltage 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 operates in failure of RESET IC).



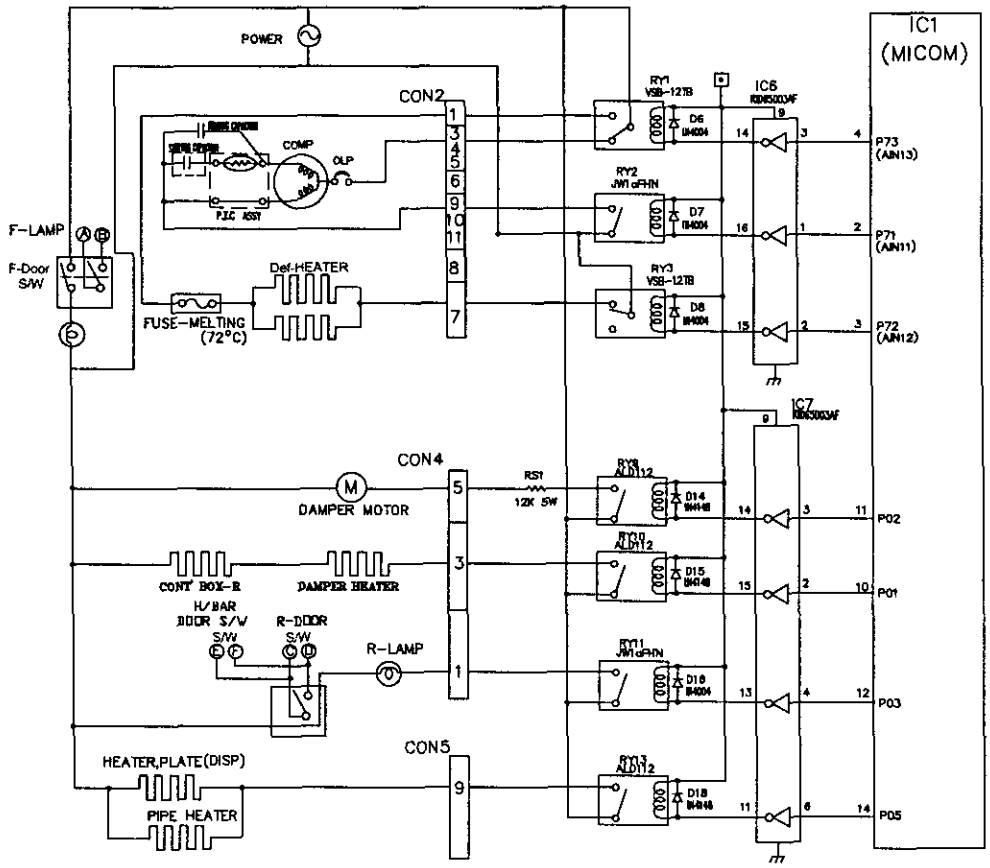
EXPLATION FOR MICOM CIRCUIT

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

1. Load driving circuit

* In even if opening the door of freezing room or cold storage room during operation of fan motor at the freezing room, this circuit does not stop and operates at the standard RPM. In addition, if doors of freezing room or cold storage room, the fan motor normally operates at the RPM previously operated.
* (A), (B), (C) and (D) of door switch for the freezing room or cold storage room are connected to the door open sensing circuit in parallel toward both ends of switch to determine door open at MICOM.
* Since a door switch of the home bar is connected to door switch (C), (D) of the cold storage room, it senses door opening if even one of both is opened.
* The fan motor is immediately stop if opening doors of the freezing room or cold storage room at the TEST mode and it immediately operates if closing them.

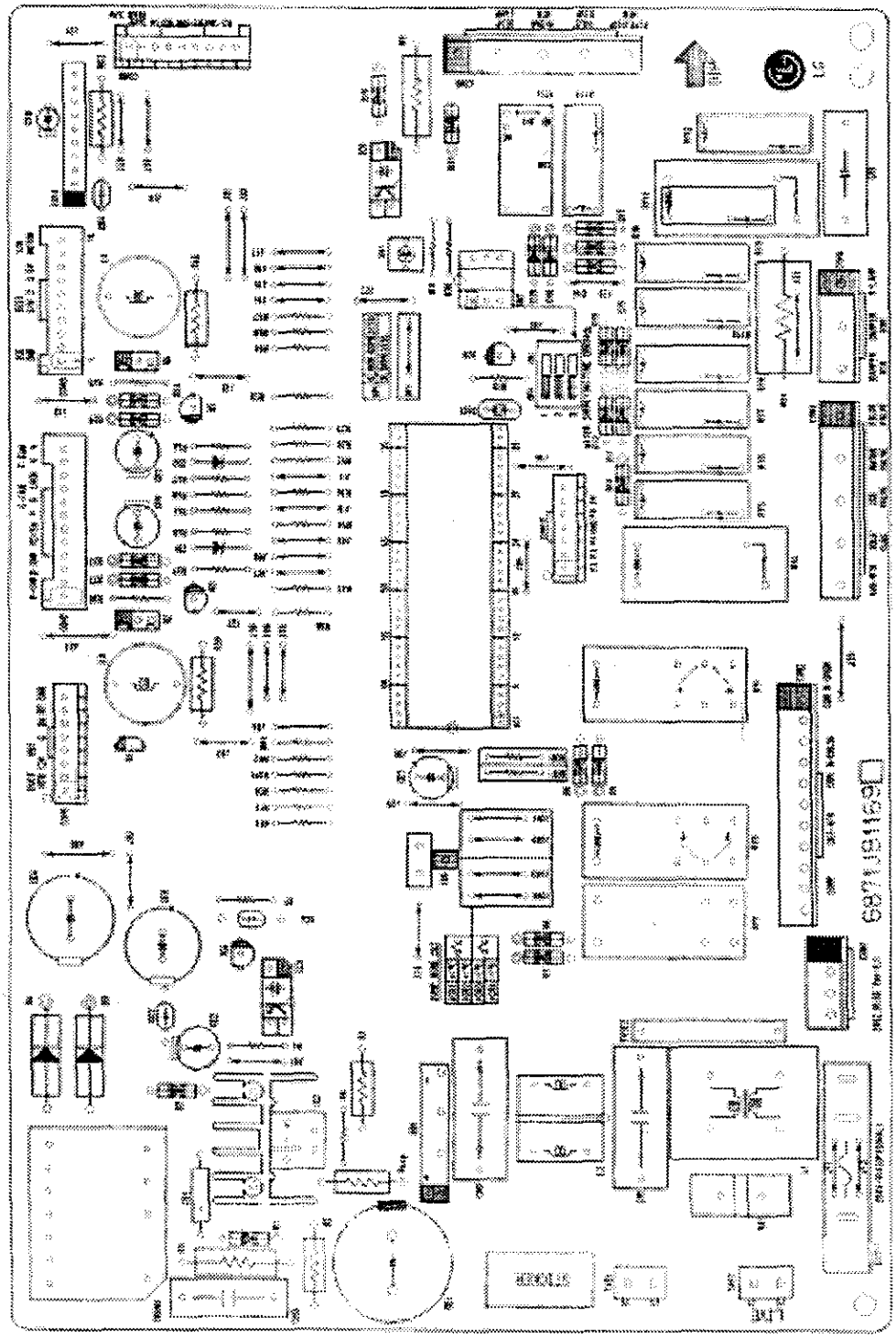
Type of Load		COMP	Frost Removal Heater	AC Converting Relay	R-room LAMP	AC Motor Damper	Damper Heater Control Box Heater	Pipe Heater
Measuring part (IC6)		No.16	No.15	No.14	No.13	No.14 (IC7)	No.15 (IC7)	No.11 (IC7)
Status	ON	Within 1 V						
	OFF	12 V						



EXPLATION FOR MICOM CIRCUIT

3. PWB parts diagram and list

3-1. PWB Ass'y, main part diagram



EXPLATION 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					
1	1	4	6630JB8001Q	WAFER	JE202-1T-11	JAE EUN	CON2
1	1	5	6630JB8001B		JE202-1T-03(P-2.0)		CON4
1	1	6	6630JB8001G		JE202-1T-04		CON1
		7					
1	1	8	6630JB8001Z		[illegible]		CON5
1	1	9	6630JB8001D		[illegible]		CON3
1	1	10	6630JB8007C		917786-1(8P)	AMP	CON6
1	1	11	6630JB8001QH		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	0ZZZJB2010A	MICOM CHIP	TMP87C841N	TOSHIBA	IC1(=0ZZZJB2010B)
1	1	16	0RE7805002	REGULATOR	KIA78005AP	K.E.C	IC5
1	1	17	0RE7042008	RESET IC	KIA7042AP	K.E.C	IC9
2	2	18	0RE6500300	DRIVE IC	KID65003AF	K.E.C	IC6,7
		19					
1	1	20	0RH6222006A	DRIVE IC	BA6222	ROHM	IC10
1	1	21	0RK8551006A	DRIVE IC	STR-G6551	SANKEN	IC2
1	1	22	0RE431000A	V.REGULATOR	KIA431	K.E.C	IC4
1	1	23	0RT0721000A	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-C	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
			J570-000128		CST4.00MGW-TF01		(=6212A08002B)
1	1	34	6102JB8001B	VARISTOR	INR14D821	IL JIN	VA1
		35	J572-000010		INR14D271	IL JIN	
5	5	36	0DR102008AA	FAST RECOVER D	FR102	DELTA	D2,D22~25
1	1	37	0DR107008AA		FR107		D1
2	2	38	0DR302008BA		FR302		D3,4
1	1	39	0DD400708AC	RECTIFIER DIODE	1N4007		D20
		40	0DD414809BB	SWITCHING DIODE	1N4148	(1)DELTA (2)PYUNG CHANG	D19(EXPORT) (220~240V)
			0DD400409AC	RECTIFIER DIODE	1N4004		D16(EXPORT) (100~127V)
1	1		0DD400409AC	RECTIFIER DIODE	1N4004		D15(R-LAMP) (NAE-SU)
4	4	41	0DD400409AC	RECTIFIER DIODE	1N4004		D6,7,8,9
1	1	42	0DB380000AA	BRIDGE DIODE	D3SBA60	SHINDENGEN	BD1
8	8	43	0DD414809BB	SWITCHING DIODE	1N4148	(1)ROHM (2)PYUNG CHANG	D9,11,12,14,15,17,18,21
1	1						D13 (PILOT VALVE)
	1						D18 (H/BAR HTR)
2	2	44	0DZMR00018A	ZENER DIODE	1N4735(6.2V)	DELTA	ZD1,2

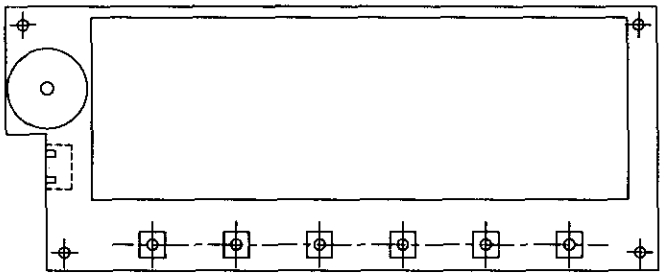
QTY.	QTY.	NO.	DWG. NO.	DESCRIPTION	SPEC'	MAKER	REMARK
1	1	45	0CE2271F638	E/C CAP'(105°C)	220uF/16V	RUBYCON	CE5
1	1	46	0CE1061K838		100uF/25V		CE8
1	1	47	0CE687AH690	E/C CAP'(105°C)	680uF/25V	SAM HWA	CE3
1	1	48	0CE2287H690		2200uF/25V		CE4
1	1	49	0CE107AH610	E/C CAP'(105°C)	100uF/50V		CE2
2	2	50	0CE227AH638		220uF/25V	RUBYCON	CE6,7
1	1	51	0CE478BH640	E/C CAP'(105°C)	47uF/450V	SAM HWA	CE1
1	1	52	0CC04732Y430	MYL' CAPACITOR	473/630V	SEIL	CM3
1	1	53	0CC2241N630		224/100V	SEIL	CC4
1	1	54	0CK221025100	CER' CAPACITOR	221 /2KV	SAM HWA	CC2
1	1	55	0CK471DK96A	CER' CAPACITOR (SMD 2012 TYPE)	471/50V		CC1
22	22	56	0CK104DK96A		104/50V		CC5~16,21~30
2	2	57	0CK102DK96A		102/50V		CC18,20
2	2	58	0CK223DK96A		223/50V		CC17,19
1	1	59	0CF33406670	FILM CAPACITOR	330nF/275VAC	PILKOR	CM1
		60					
1	1	61	0CF22406670		220nF/275VAC		CM2
		62					
2	2	63	0RS5602K600	R,OXIDE FILM	56K /2W	(1)SMART (2)OKOHOME	R3,9
1	1	64	0RS1503J609		150K /1W		R1
1	1	65	0RS0R01J609		1/1W		ROCP
1	1	66	0RD0682H609	R,CARBON FILM	6BJ 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	0RN1002C409	R,METAL FILM	10KF 1/4W		RT1
2	2	81	0RN1622G409		16.2KF 1/4W		RF1,RM1
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		R26,31~33,49 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

EXPLATION FOR MICOM CIRCUIT

QTY.	QTY.	NO.	DWG. NO.	DESCRIPTION	SPEC'	MAKER	REMARK
2	2	94	0TRKE90004A		KTA1705		Q2,4
2	2	95	0TR319800CA	TRANSISTOR	KTC3198	K.E.C	Q3,5
1	1	96	0TR106009AF		KRC106M		Q1
1	1	97	6210JB6001A	CORE(CORE,WEAVE)	BFS3510A0	SAM HWA	FB1
1	1	98	6600JB6001A	TEST S/W	SKHV10910	TACT	SW1
1	1	99	6600JB6003A	WATER SUPPLY S/W	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		DP1
			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	CLR1500K4J0	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	QFZZJB3001A	FUSE	2A/250V		FUSE2
		112					
2	2	113	0Q01030F	250 TAB	GP881191-2	K.E.T	TAB1,2
1	1	114	1SBF030241B	SCREW	ASS'Y TO H/SINK	TAE SUNG	
3.0g	3.0g	115	49111001	SOLDER	ALMIT KR-19RMA	HISUNG OAE JIN	SOLD
25g	25g	116	49111004	SOLDER LEAD BAR	H63A		
1.5g	1.5g	117	59333105	FLUX AUTO	JS71	KOKI	

EXPLATION FOR MICOM CIRCUIT

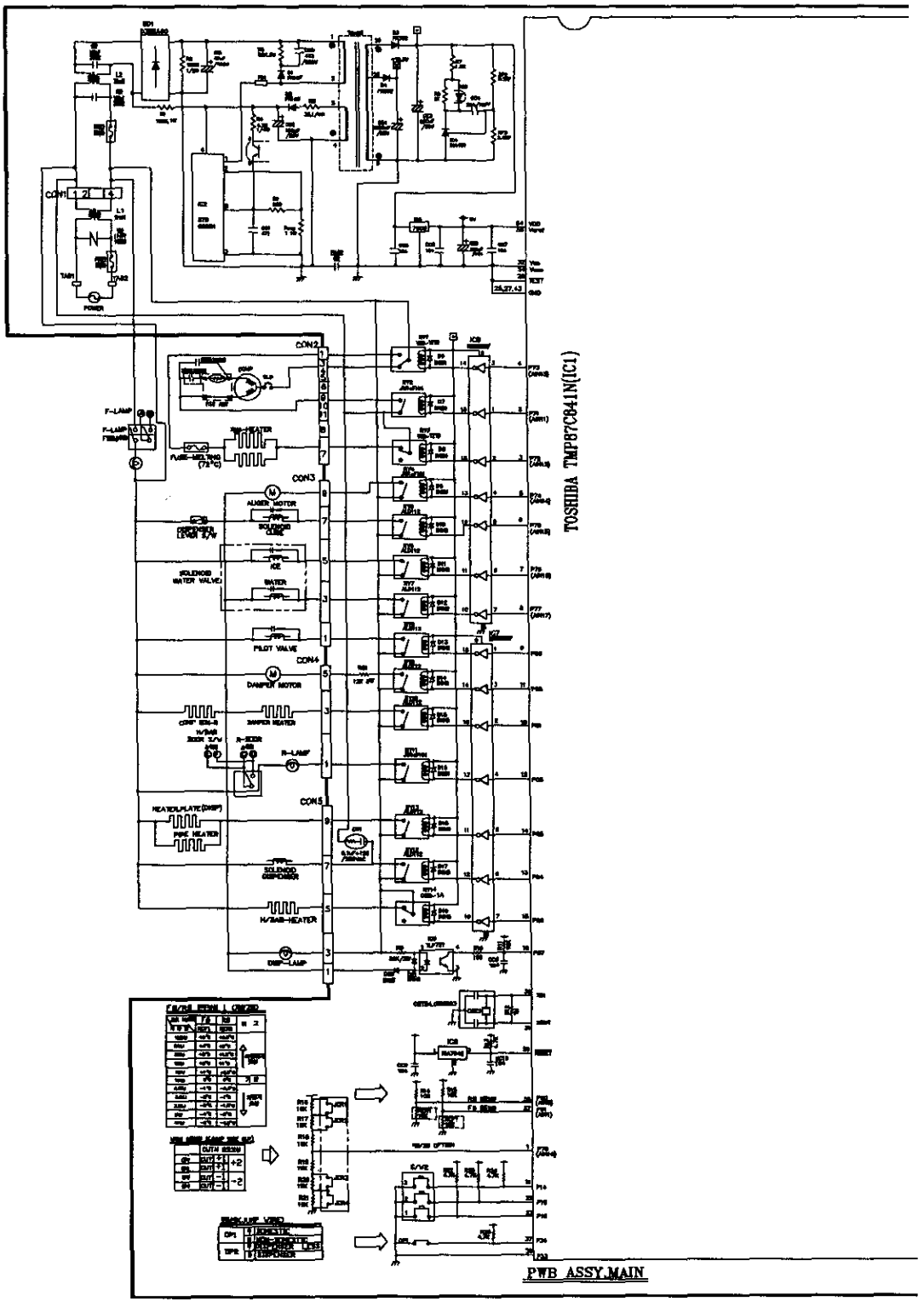
3-3. DISPLAY ASSY part diagram



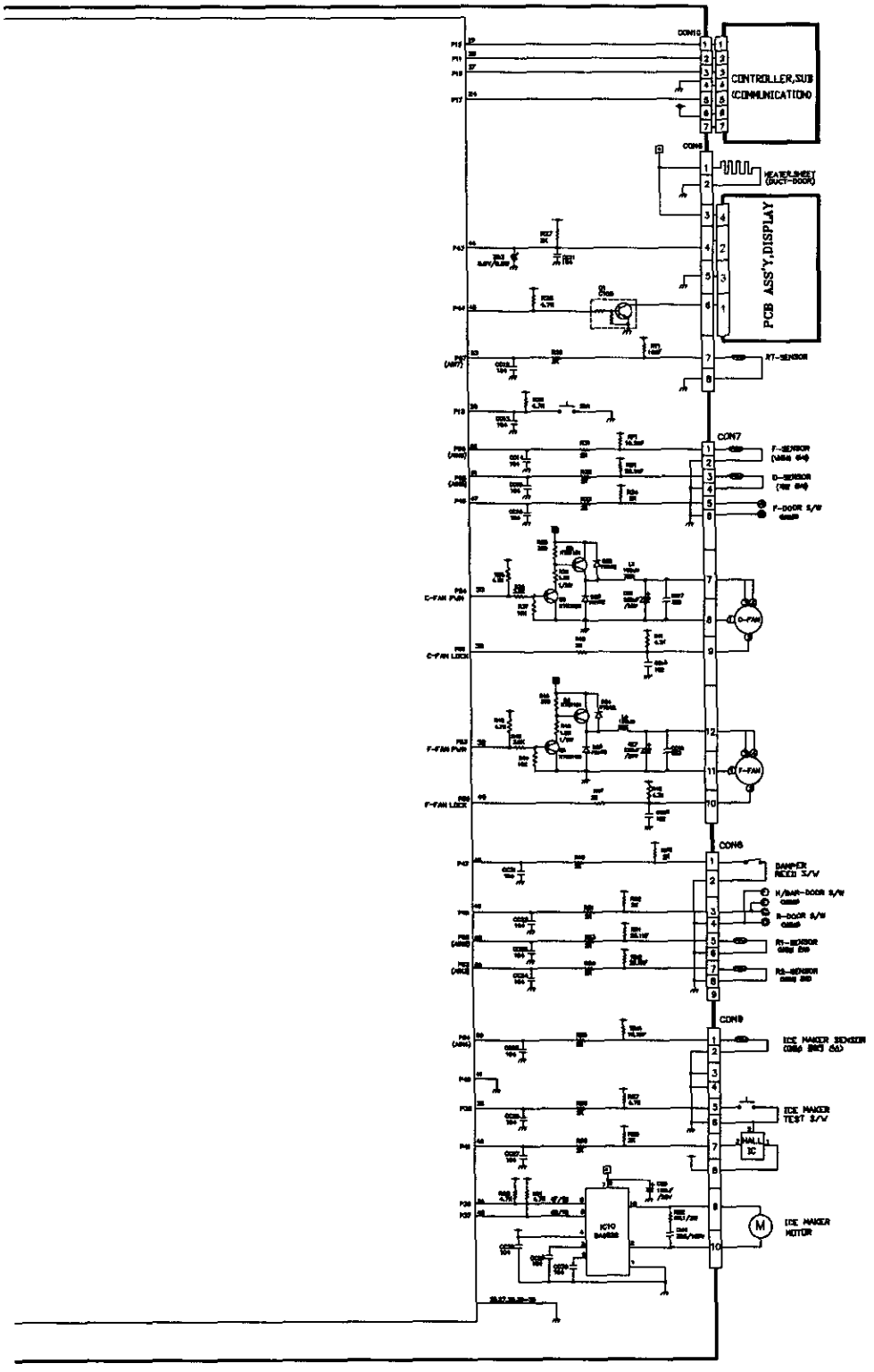
Qty	No	P/NO	DESCRIPTION	SPEC	MAKER	REMARK
1	1	6304TWT004A	LCD	TN MONO 27PIN	WINTEK	TPB-381
1	2	-	PWB	FR-4	-	-
1	3	-	REFLECTOR	PC ABS	-	-
2	4	-	TAPE	NITTO500(W2MM)	-	-
1	5	-	SHEET	MTN-WX5(141*44.25mm)	TSUJIDEN	
1	6	-	WAFER	SMAW250-04	YEON-HO	CON101
-	7	-	-	-	-	-
-	8	-	-	-	-	-
1E	9	0IZZJB2013	IC,DRAWING	TMP87CH21F 80,QFP	TOSHIBA	IC101(E=F)
-	10	-	-	-	-	-
1	11	0ISTLKE002A	IC,STANDARD LOGIC	KIA78L05F	KEC	IC102
1	12	0ISTLKE003A	IC,STANDARD LOGIC	KIA7042AF	KEC	IC103
1	13	0ISTLSE001A	IC,STANDARD LOGIC	S-93C46ADFJ EEPROM	SEIKO	IC104
1	14	0ISTLKE004A	IC,STANDARD LOGIC	KRA106S	KEC	Q105
4	15	0ISTLKE005A	IC,STANDARD LOGIC	KRC106S	KEC	Q101~Q104
1	16	0ISTLKE006A	IC,STANDARD LOGIC	KTA1298	KEC	Q106
-	17	-	-	-	-	-
-	18	-	-	-	-	-
1	19	J570-00012B	RESONATOR	CST4.00MGW	MURATA	OSC101
-	20	-	-	-	-	-
-	21	-	-	-	-	-
-	22	-	-	-	-	-
-	23	0CE337CH630	CAPACITOR,FIXED ELECTROLYTIC	330UF SHL,SD 25V	SAMWHA	CE101
2	24	0CE107VF6DC	CAPACITOR,FIXED ELECTROLYTIC	100UF MV 16V SMD	RUBYCON	CE102,103
-	25	-	-	-	-	-
1	26	0CE476VH6DC	CAPACITOR,FIXED ELECTROLYTIC	47UF MV 25V SMD	RUBYCON	CE104
-	27	-	-	-	-	-
8	28	0CKI04DK94A	CAPACITOR,FIXED CERAMIC	100NF 2012 50V	MURATA	CC101~CC108
-	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	R117
23	33	0RD3900G676	RESISTOR,FIXED CARBON FILM	390 OHM 1/4 W 5% 3216	ROHM	R123~R145
1	34	0RD6200G676	RESISTOR,FIXED CARBON FILM	620 OHM 1/4 W 5% 3216	ROHM	R146
-	35	-	-	-	-	-
-	36	-	-	-	-	-
2	37	0RD1001E672	RESISTOR,FIXED CARBON FILM	1K OHM 1/8 W 5% 2012	ROHM	R118,119
2	38	0RD2001E672	RESISTOR,FIXED CARBON FILM	2K OHM 1/8 W 5% 2012	ROHM	R101,102
13	39	0RD4701E672	RESISTOR,FIXED CARBON FILM	4.7K OHM 1/8 W 5% 2012	ROHM	R103~115
1	40	0RD1502E672	RESISTOR,FIXED CARBON FILM	15K OHM 1/8 W 5% 2012	ROHM	R116
1	41	0RD1004E672	RESISTOR,FIXED CARBON FILM	1M OHM 1/8 W 5% 2012	ROHM	R120
-	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	R122
1	44	0RD1002E472	RESISTOR,FIXED CARBON FILM	10K OHM 1/8 W 1% 2012	ROHM	R121
1	45	0DZRM00188A	DIODE,ZENERS	RLZ ROHM 5.6V 20MA	ROHM	ZD101
1	46	-	WIRE,JUMP	-	-	OP1
95	47	0DLLE0028AA	LED	LT8B32-UR-190T AMBER 1608(590nm)	LEDTECH	LD101~LD195
1	48	6908JB8003A	BUZZER	BM-20B BUJEON PIEZO 4KHZ 85DB	BUJEON	BUZZER
6	49	6600RRT002J	SWITCH,TACT	JTP1138A JEIL 12V DC 50MA SMD	JEIL	SW101~SW106
-	50	-	-	-	-	-
-	51	-	-	-	-	-
-	52	-	-	-	-	-

EXPLATION FOR MICOM CIRCUIT

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

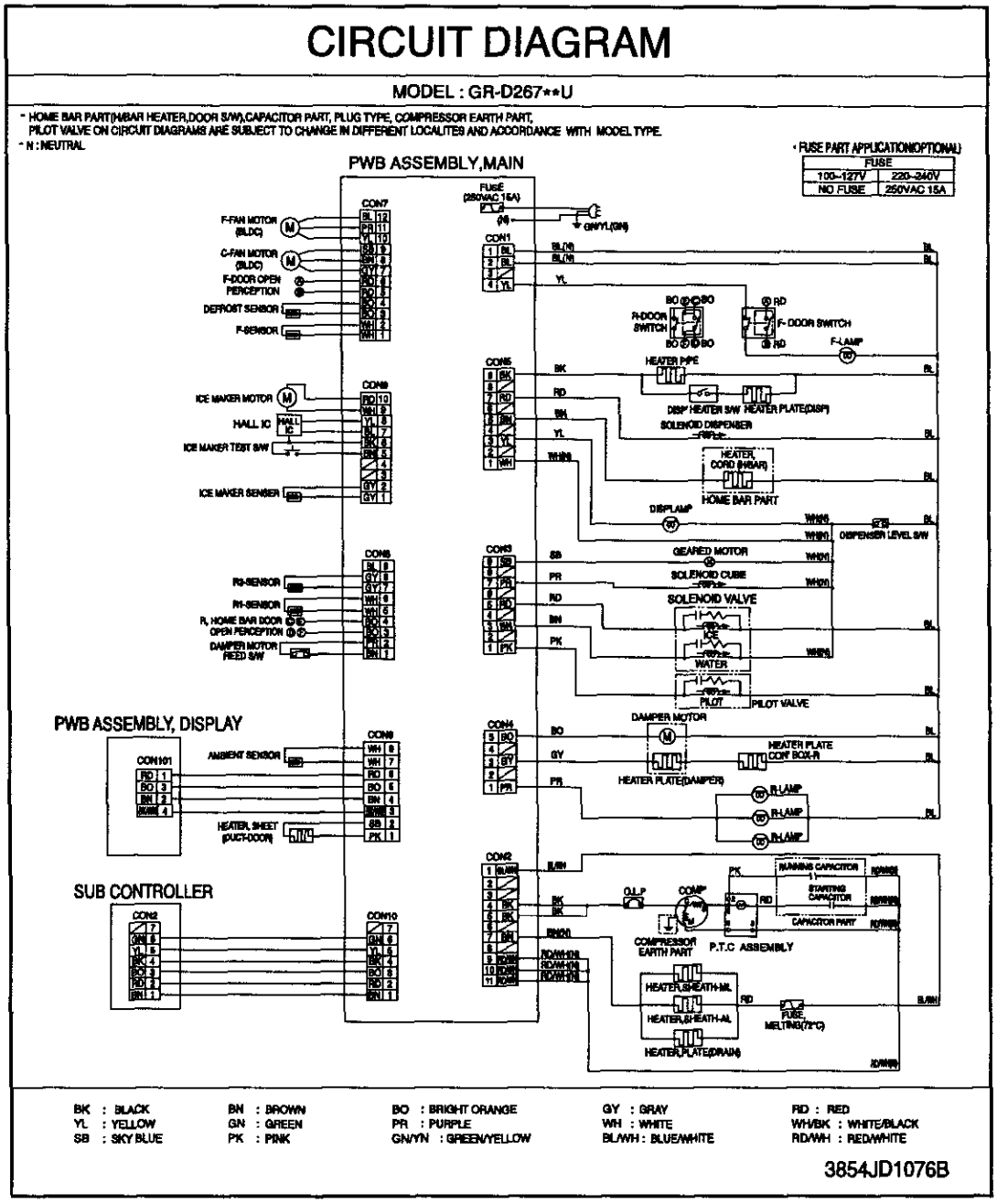


EXPLATION FOR MICOM CIRCUIT



CIRCUIT

THE CIRCUIT DRAWINGS



TROUBLE 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.
	- O.L.P is off. - Capacity of O.L.P is small. / Characteristics of O.L.P is bad. / 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 big. / 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 O.L.P. If power conducts : OK. If not : NG.
		■ Check the resistance of both terminals. At normal temperature 6 : OK. If disconnected : ∞.

TROUBLE DIAGNOSIS

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK

2. No cooling.	2) Refrigeration system is clogged.
	- Moisture clogged.
	  - Residual moisture in the evaporator.
	  - Air Blowing.
	  - Not performed.
	  - Too short.
	  - Impossible moisture confirmation.
	  - Low air pressure.
	  - Leave it in the air.
	  - During rest time.
	  - After work.
	  - Caps are missed.
	  - Residual moisture.
	  - Not dried in the compressor.
	  - Elapsed more than 6 months after drying
	  - Caps are missed.
	  - No pressure when it is open.
	- No electric power on therm-ostat.
	  - 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 - Leave it in the air. - Moisture penetration. into the refrigeration oil.
	- Weld joint clogged.
	  - Short pipe insert.
	  - Pipe gaps.
	  - Too large.
	  - Damaged pipes.
	  - Too much solder.
	- Drier cloggeing.
	  - The capillary tube inserted depth. - Too much.
	  - Capillary tube melts. - Over heat.
	  - Clogged with foreign materials.
	  - Desiccant powder.
	  - Weld oxides.
	  - Drier angle.
	  - Reduced cross section by cutting. - Squeezed.
	- Foreign material clogging.
	  - Compressor cap is disconnected.
	  - Foreign materials are in the pipe.
		■ Check the clogged evaporator by heating (as soon as the cracking sound begins, the evaporator start freezing)
		■ The evaporator does not cool from the beginnig (no evidece of misture attached). The evaporator is the same as before even heat is applied.

TROUBLE 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.
	  - Cap drain is not disconnected.
	- Defrost heater does not generate heat.
	  - Parts disconnected.
	  - Defrost thermostat
	  - 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
		
		$P=\frac{V^2}{R}$
		
		$R=\frac{V^2}{P}$

TROUBLE 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.

TROUBLE 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.

TROUBLE DIAGNOSIS

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK
4. Warm refrigerator compartment temperature.	1) Colgged 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 opens.
	3) Poor insulation.
	4) Bad radiation.
	- High ambient temperature.
	- Space is secluded.
	5) Refrigerant leak.
	6) Inadequate of refrigerant.
	7) Weak compressor discharging power.
	- Different rating.
	- Small capacity.
	8) Fan does not work.
	9) Button is positioned at "strong."
		■ Inspect parts measurements and check visually.

6. Dew and ice formation.	1) Ice in freeezer compartment.
	- External air inflow. — Rubber 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 not closes.
	  - Insufficient closing.
	  - Door sag.
	  - Food hinders door closing.
	- Gasket gap.
	3) Condensation on liner foam.
	- Cool air leak and transmitted.
	  - Not fully filled.
	  - Toop table part.
	  - Out plate R/L part.
	  - Flange gap. — Not sealed.
	  - Gasket gap.	

TROUBLE DIAGNOSIS

CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK
6. Dew 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. — Liquid shortage. Liquid leak. - 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. - Dew in the refrigerator compartment. - Defrosted water overflows. — Clogged discharging hose. - Discharging hose — Evaporation tray located at wrong place. location. - 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. Rubber 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. - O.L.P. sound. — Chattering sound. - Capacitor noise. — Insulation paper vibration. - Pipe sound. — Pipe contacts each other. - Narrow interval. / No vibration damper. — Damping rubber-Q. / Damping rubber-S. / Capillary tube unattached.	

TROUBLE 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 rubber seat.
	  - Bad torque for assembling motor bracket.
	- Sounds from fan contact.
	  - Fan guide contact.
	  - Shroud burr contact.
	  - Damping evaporator contact.
	  - Residual frost contact.
	  - Poor treatment Cord heater.
	  - Narrow evaporator interval.
	- Unbalance fan sounds.
	  - Unbalance.
	  - Surface machining conditions.
	  - Fan distortion.
	  - Misshappen.
	  - Burr.
	  - Ice on the fan. — Air intake (opposite to motor rubber 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.	

TROUBLE 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. — Its own defect. / Refrigerator and freezer switch is reversed. / Travlel distance. / Bad connection. / Bad terminal contact. / P/U liquid leak..	
9. Faulty internal voltage(short).	1) Lead wire is damaged. Wire damage when assembling P.T.C. 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.

TROUBLE DIAGNOSIS

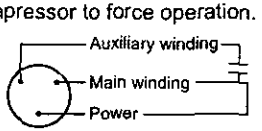
CLAIMS.	CAUSES AND CHECK POINTS.	HOW TO CHECK
10. Structure, appearance and others.	1) Door foam. Sag. — Weak torque of hinge connection. — Bolt is loosened during transportaion. Not tightly fastened. Screw worn out. Weak gasket adhesion. — Adhesion surface. Fixed tape. — Not well fixed. Noise during operation. — Hinge interference. — Bigger door foam. Hinge-Pin tilted-Poor flatness. No washer. No grease and not enough quantity. Malfunction. — Not closed Interference between door liner and inner liner. Refrigerator compartment is opened when freezer compartment is closed (faulty stopper). — Stopper worn out. Bad freezer compartment door assembly. No stopper. 2) Odor. Temperature of refrigerator compartment. — High. — Faulty damper control. Button is set at "weak". Door is open (interference by food). Deodorizer. — No deodorizer. Poor capacity. Food Storage. — Seal condition. Store special odorous food. 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.	-Replace the components. -Reconnect the connecting parts. - Reconnect the connecting parts.	
Fuse blows out.	- Short circuit by wrong connection. - Low voltage products are connected to high voltage. - Short circuit by insects. - Electricity leakage. - High voltage. - Short circuit of components (tracking due to moisture and dust penetration).	- Check the fuse with tester or visually. - Check the input volt are with tester (between power cord and products). - Check the resistance of power cord with testerf (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 confirming its specification. ■ If fuse blowns out frequently, reconfirm the cause and prevent.

2-2. Compressor

Problems	Causes	Checks	Measures	Remarks
Compressor does not operate.	- Faulty PTC.	- Check the resistance. Vlaue:∞ 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. - Not operate: Replace the frozen compressor with new one, weld, evacuate, and recharge refrigerant. • Refer to weld repair procedures.	

2-3. Temperature

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

2-4. Cooling

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

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

2-5. Defrosting failure

Problems	Causes	Checks	Measures	Remarks
No defrosting.	Heater does not generate heat as the heating wire is cut or the circuit is shorted. 1) Heating wire is damaged when inserting into the evaporator. 2) Lead wire of heater is cut. 3) Heating wire at lead wire contacts is cut.	1. Check the resistance of heater. 0Ω: Short. ∞Ω: Cut. Tens to thousands Ω: OK. 2. Check the resistance between housing terminal and heater surface. 0Ω: Short. ∞Ω: Cut. Tens to thousands Ω: Short.	Heating wire is short and wire is cut. • Parts replacement: Refer to parts explanations.	Seal the lead wire with insulation tape and heat 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 more than 3hours 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 Sucking duct and Heater plate(Ice in the gap).	1. Confirm in the Sucking duct.	1) Turn off the power, confirm impurities and ice in the gap, and supply hot water until the ice in the gap melts down. 2) Push the Heater plate to drain bottom with hand and assemble the disconnected parts.	
	Wrong heater rating (or wrong assembly).	1. Check heater label. 2. Confirm the capacity after substituting the resistance value into the formula. $P=\frac{V^2}{R}$ (V: Rated voltage of user country) (R: Resistance of tester[Ω]) Compare P and lavel capacity. Tolerance: ±7%	Faults:replace. - How to replace: Refer to main parts.	

Problems	Causes	Checks	Measures	Remarks
No defrosting	Melting fuse blows out. 1) Lead wire is cut. 2) Bad soldering.	- Check melting fuse with tester. - If 0Ω: OK. If ∞Ω: wire is cut.	Faulty parts: parts replacement. - Check wire color when maeasuring resistance with a tester.	
	Ice in the Sucking duct. 1) Icing by foreign materials in the duct. 2) Icing by cool air inflow through the gap of heater plate. 3) Icing by the gap of heater plate.	1. Check the inner duct with mirror. 2. Check by inserting soft copper wire into the duct (soft and thin copper not to impair heating wire).	1) Turn power off. 2) Raise the front side(door side), support the front side legs, and let the ice melt naturally. (If power is on, melt the frost by forced defrosting.) 3) Reassemble the heater plate.	
	Bad cool air inflow and discharge, and bad defrosting due to faulty contact and insertion (bad connector insertion into housing of heater, melting, fuse and motor fan).	1. Turn on power, open or close the door, check that motor fan operates (If it operates, motor fan is OK). 2. Disconnect parts in the refrigerator compartment, check the connection around the housing visually, defrost, and confirm heat generation on the heater. Do not put hands on the sheath heater. 3. Check the parts which have faults described in 1, 2 (mechanical model: disconnect thermostat from the assembly).	1) Check the faulty connector of housing and reassemble wrongly assembled parts. 2) If the parts are 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. - Sealing is not good. - Too much food is stored and clogs the discharge port. - Bad defrosting.	- Check the food is stored properly (check discharge and intake port are clogged). - Check icing on the surface of baffle and cool air path (pipe) after dissembling the container box. - Check icing at intake ports of freezer and refrigerator compartment.	- Be acquainted with how to use. - Sealing on connecting parts. - Check the damper and replace it if it has defects. - Check defrost. (After forced defrosting, check ice in the evaporator and pipes.)	- Check the defrost related parts if problem is caused by faulty defrosting.
	2) Faulty door or refrigerator compartment. - Faulty gasket. - Faulty assembly.	- Check gasket attached conditions. - Check door assembly conditions.	- Correct the gasket attachment conditions and replace it. - Door assembly and replacement.	- Replacement should be done when it cannot be repaired.
	3) Overcooling in the refrigerator compartment. - Faulty damper in the refrigerator compartment. - Faulty MICOM (faulty sensor)	- Check refrigerator compartment is overcooled (when button pressed on "weak"). - Check parts are faulty.	- Replace faulty parts.	
	4) Bad defrosting - Heater wire is cut. - Defective defrost sensor. - Defrosing cycle.	- Check frost on the evaporator after dissembling shroud and fan grille. - Check ice on intake port of freezer and refrigerator compartment.	- Check parts related to defrosting. - Check defrosting. (Check ice on the evaporator and pipe.)	- Moisture cannot frost on the evaporator but can be sucked into the refrigerator, being condensed and iced, interferes with cool air circulation, and suppresses sublimation.
	5) Customers are not familiar with this machine. - Door opens. - High temperature, high moisture, and high load.	- Check food interferes with door closing. - Check ice on the ceilings.	- Be acquainted with how to use.	

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

2-7. Sound

Problems	Causes	Checks	Measures	Remarks
"Whizz" sound	1. Loud sound of compressor operation.	1.1 Check the level of the refrigerator. 1.2 Check the rubber seat conditions (sagging and aging).	1) Maintain horizontal level. 2) Replace rubber and seat if they are sagged and aged. 3) Insert rubber where hand contact reduces noise in the pipe. 4) Avoid pipe interference. 5) Replace defective fan and fan motor. 6) Adjust fan to be in the center of bell mouth of the fan guide. 7) Leve a clearance between interfering parts and seal gaps in the structures. 8) Reassemble the parts which make sound. 9) Leave a clearance if evaporator pipes and suction pipe touch freezer shroud.	
	2. Pipes resonat sound which is connected to the compressor.	2.1 Check the level of pipes connected to the compressor and their interference. 2.2 Check rubber inserting conditions in pipes. 2.3 Touch pipes with hands or screw -driver (check the change of sound).		
	3. Fan operation sound in the freezer compartment.	3.1 Check fan insertion depth and blade damage. 3.2 Check the interference with structures. 3.3 Check fan motor. 3.4 Check fan motor rubber 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. ("Cluck")	1. Vibration of shelves and foods in the refrigerator. 2. Pipes interference and capillary tube touching in the compressor. compartment. 3. Compressor stopper vibration. 4. Moving wheel vibration. 5. Other structure and parts vibration.	1-1. Remove and replace the shelves in the refrigerator 1-2. Check light food and container on the shelves. 2-1. Touch pipes in the compressore compartment with hands. 2-2 Check capillary tube touches cover back. 3-1 Check compressor stopper vibration. 4-1 Check vibration of front and rear moving wheels. 5-1 Touch other structures and parts.	1) Reassemble the vibrating parts and insert foam or cushion where vibration is severe. 2) Leave a clearance where parts interfere with each other. 3) Reduce vibration with rubber and restrainer if it is severe. (especially, compressor and pipe). 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 make sounds. 2) If evaporator pipe contacts with other structures, leave a clearance between them (freezer shroud or inner case).	

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

2-8. Odor

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

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.	Reconnect connector.	
		Defective PCB trans.	PCB Trans 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 Trans or PCB.	Applicable to model without dispenser.
			PCB Trans 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 LED module.	Defective LED.	Check if all LEDs 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 driving 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 driving 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 driving circuits in circuit explanation.
		Faulty defrost.		Refer to faulty defrost items in trouble diagnosis functions.		Refer to trouble 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.	Check 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 Assy.	
			Check AC damper Motor driving relay in PCB.	Refer to AC damper in parts repair guide.	Replace relay or PCB.	Refer to single motor damper driving 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 Assy.	
		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.	Check the sensor color in the circuit. (main PCB sensor housing.)	Repair main PCB sensor housing.	
			Defective refrigerator sensor assembly condition.	Check if refrigerator sensor is not fixed at cover sensor but inner case visually.	Fix again the refrigerator sensor.	

Problems	Symptom	Causes	Checks	Measures	Remarks
Bad defrost.	Defrost is not working.	Defrost lead wire is cut.	Check if defrost lead wire is cut with a tester.	Reconnect Lead Wire.	
		Defective defrost driving 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 it 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 sense even button is 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 not sense even button is pressed.	Trouble mode indication.	Check trouble diagnosis function.	Repair troubles	Refer to mode indication in function explanations.
Bad water/ice dispenser.	Buzzer continuously rings or door opening 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 are 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 with lever switch pressed. It is OK if voltage change is between 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 dispense (geared motor, cube and dispenser solenoid).	Check resistance of parts with a tester.	Replace defective parts.	
		Defective relay associated with water dispense.	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.	

TROUBLE DIAGNOSIS

4. HOW TO DEAL WITH CLAIMS

4-1. Sound

Problems	Checks and Measures
"Whizz" 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. "Whizz" 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 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 becomes gradually quiet. When the engine stops, it stops with vibration.
Vibration sound	■ **Check the sound whether it comes from the pipes vibration and friction.** • Insert rubber or leave a space between pipes to avoid 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 loosened. ■ **Sound depends on the installation location.** • Sound becomes louder if the refrigerator is installed on a wooden floor or near a wooden wall. Move it to the another location. • If the refrigerator is not leveled properly, a small vibration can make a loud sound. Please adjust the level of the refrigerator.

TROUBLE DIAGNOSIS

Problems	Checks and Measures
Sounds of water flowing	■ **Explain the flow of refrigerant.** • When the refrigerator stops, the water flowing sound happens. This sound happens when the liquid or vapor refrigerant flows from the evaporator to compressor.
"Click" sounds	■ **Explain the characteriistics of moving parts.** • This noise comes from the MICOM controller's switch on the top of the refrigerator when it is turned on and off.
Noise of ice maker operation (applicable to model with ice maker). - Noise produced by ice dropping and hitting ice bank. - Noise from motor sounds "Whizz".	■ **Explain the procedure and principles of ice maker operation.** • Automatic ice maker repeats the cycle of water supplying → icemaking → ice ejection. When water is supplied, the water supply valve in the machine room makes sounds like "Whizz" 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 "Whizz" produced by a motor to rotate an ice tray and ice dropping and hitting ice bank 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 ice making in a dispenser. • When ice cube button is pressed, ice stored in the ice bank 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 bank sounds are heard.

TROUBLE DIAGNOSIS

4-2. Measures for Symptoms on Temperature

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

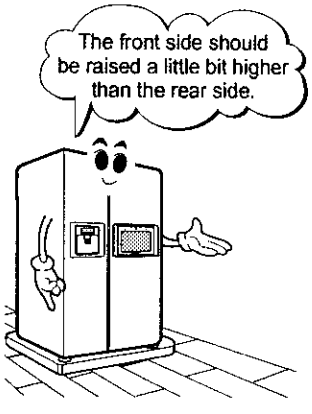
TROUBLE DIAGNOSIS

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 peculiar odor. Therefore it is impossible to prevent or avoid food odor completely when food is stored in the completely sealed refrigerator compartment. Deodorizer can absorb some portions of the odor but not completely. The intensity of odor depends on refrigerator conditions and environments. ■ **Check the temperature control button and set at "strong".** • Clean inside of the refrigerator with detergent and remove moisture. Dry inside the refrigerator by opening the door for about 3 or 4 hours and then set the temperature control button at "strong".
Frost in the freezer compartment	■ **Explain the basic principles of frost formation.** • The main causes for frosting: - Door was left open. - Air penetration through the gasket - Too frequent door opening. (parties. etc.) - Hot foods are stored before they are cooled down. The temperature of freezer is -19°C. 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 shall freeze and form frost. If warm water was put into the ice mold, the situation will become worse.

TROUBLE 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 it is normal. If there is no enough space to dissipate heat, it can be hotter due to lack of heat radiation. Please install a refrigerator in a well-ventilated place and leave 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 releasing hole, forming can be easily done .
Electric bills are too much.	■ Check the use conditions. • Too frequent door opening and hot food storing cause the compressor to operate continuously and hence 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 the wrap.
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 and the refrigerant and compressor oils are mixed up, then this will affect badly the performance of a 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 increase the internal pressure when door is closed. This causes the door sticked closely to the refrigerator in a moment. (If the refrigerator is used for a long time, it will then open smoothly.) ■ When the refrigerator compartment door is open and close, the freezer compartment door moves up and down. • When the refrigerator compartment door is open and close, 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 rubber so that it is ok. if door is securely closed without a gap. It can be open easily if the foods in the refrigerator or freezer compartments hold the door open. ■ A door does not close properly. • If the rear side of the refrigerator is raised higher than front side, door shall not be easily closed. Adjust the level of refrigerator with levelling screws.

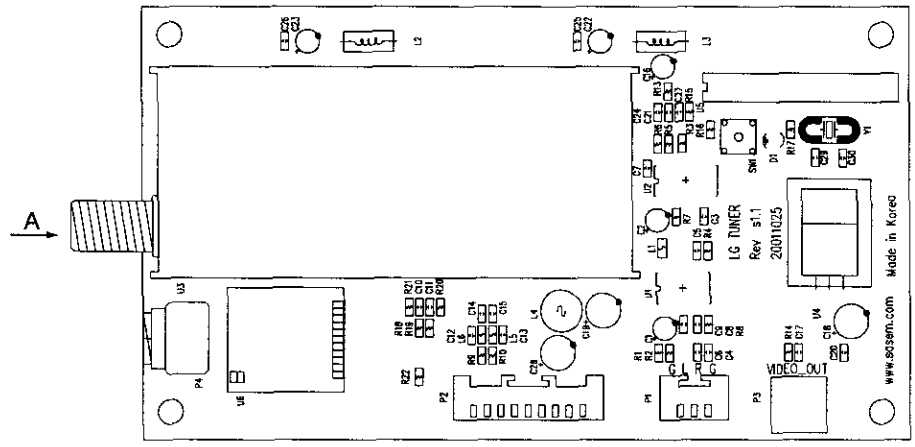
4. TV-TUNER

4-1. Function

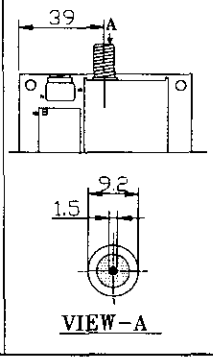
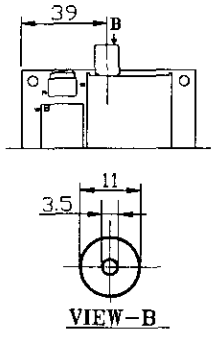
After receiving and handling the video and audio signals through cables, it transmits the signals to the video input section of the main controller.

4-2. Outline Diagram and I/O Structure

4-2-1. Outline Diagram



<"Section A" outline diagram based on TV system>

Operation Classification	A	B			
TV system	NTSC	PAL-I			
Form					

4-2-2. I/O Structure

CONNECTOR	PIN NO.	I/O	SYMBOL	DESCRIPTION
P1	1	GND	GND	GND
	2	Output	AUDIO-L	AUDIO LEFT OUTPUT
	3	Output	AUDIO-R	AUDIO RIGHT OUTPUT
	4	GND	GND	GND
P2	1	Input	SDA	12C-BUS Serial Data
	2	Input	SCL	12C Serial Clock
	3	Input	GND	GND
	4	Input	GPIO13	General Purpose I/O 13
	5	Input	GPIO12	General Purpose I/O 12
	6	Input	GND	GND
	7	Input	+12V	DC+12V
	8	Input	-5V	DC-5V
	9	Input	GPIO15	General Purpose I/O 15
	10	Input	GPIO14	General Purpose I/O 14
P3	1,2	Output	TV OUT	TV VIDEO Signal Output

4-3. SPEC of parts

1. Operating Environment

- Operating temperature: -10°C ~ 60°C
- Operating humidity: 0 ~ 95% (under 35°C condition)

2. Storage Environment

- Storage temperature: -25°C ~ 85°C
- Storage humidity: 95% (under 35°C condition)

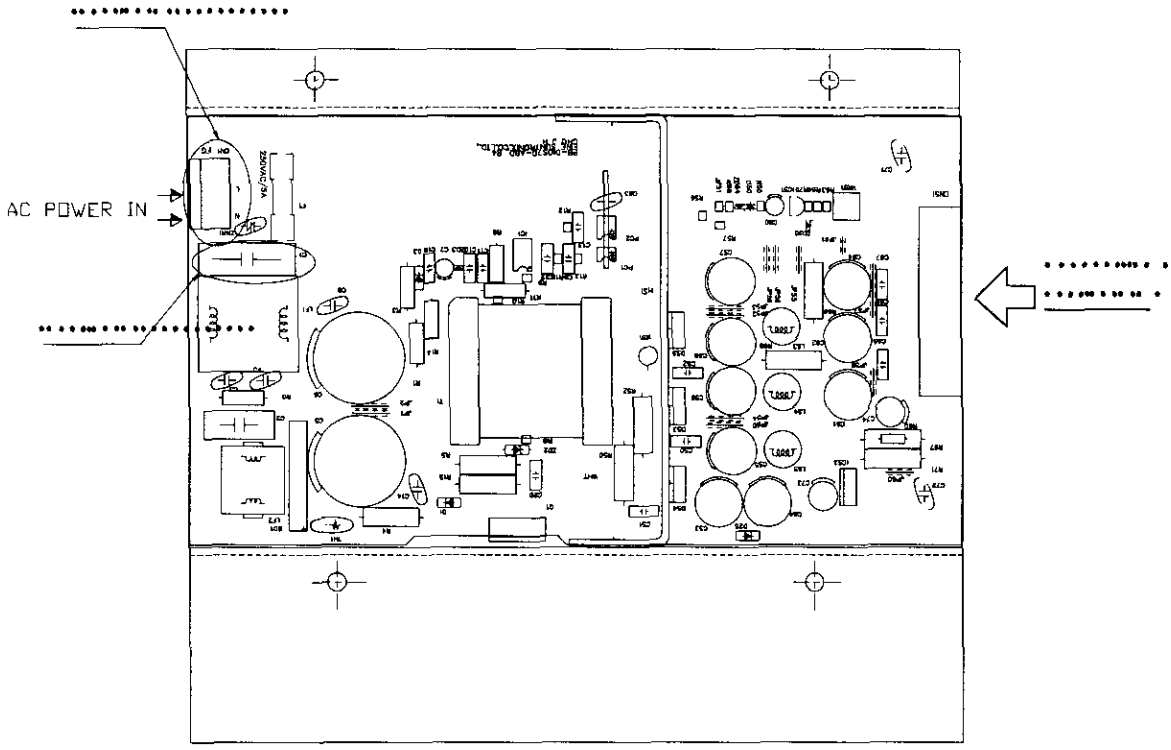
5. POWER SUPPLY

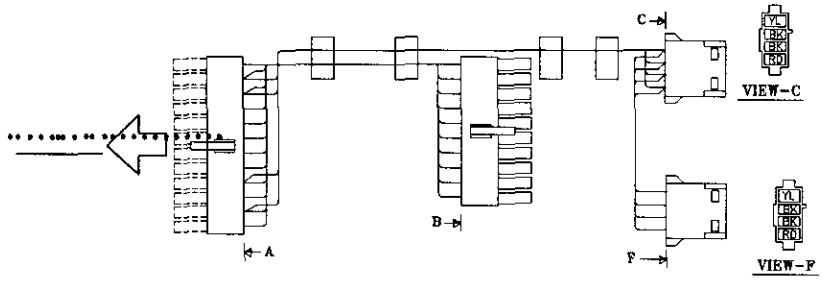
5-1. Function

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

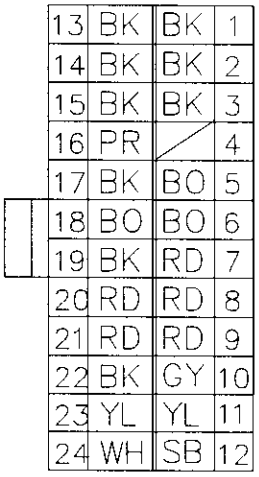
5-2. Outline Diagram and I/O Structure

5-2-1. Outline Diagram



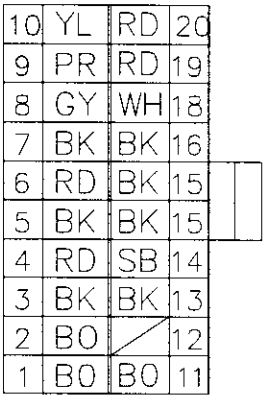


5-2-2. I/O Structure



13	BK	BK	1
14	BK	BK	2
15	BK	BK	3
16	PR		4
17	BK	BO	5
18	BO	BO	6
19	BK	RD	7
20	RD	RD	8
21	RD	RD	9
22	BK	GY	10
23	YL	YL	11
24	WH	SB	12

VIEW-A



10	YL	RD	20
9	PR	RD	19
8	GY	WH	18
7	BK	BK	16
6	RD	BK	15
5	BK	BK	15
4	RD	SB	14
3	BK	BK	13
2	BO		12
1	BO	BO	11

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

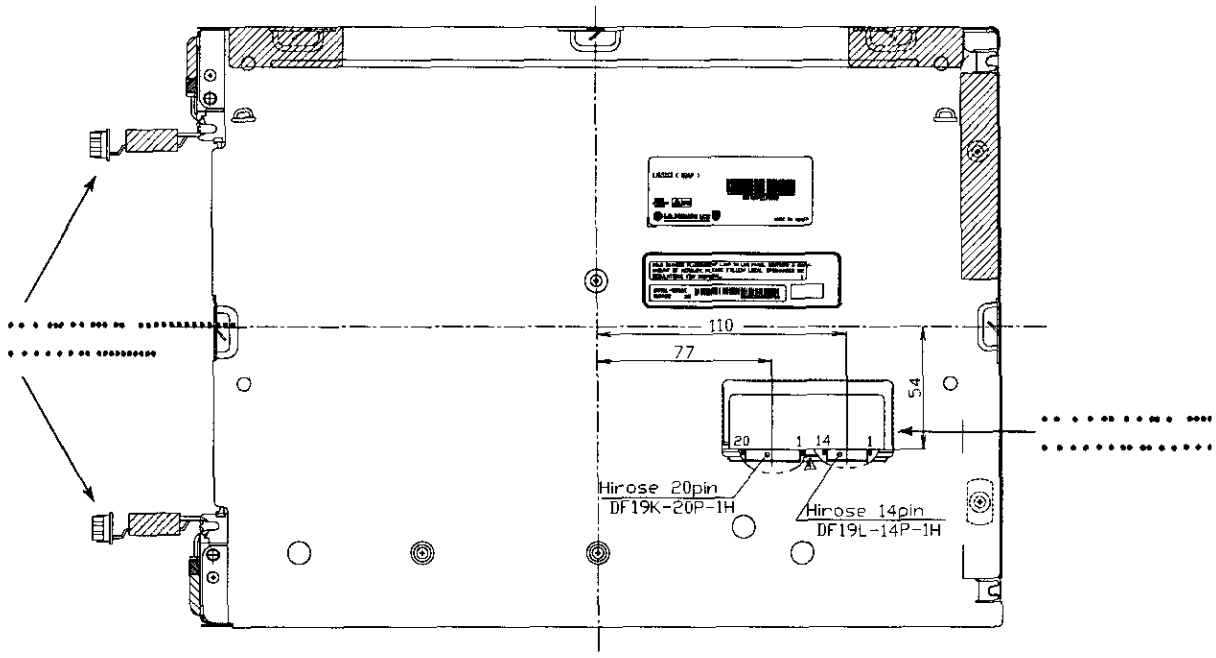
PIN NO	I/O	VOLTAGE	OUTPUT VOLTAGE RANGE	COLOR	REMARK
1	Output	3.3	3.0 ~ 3.6	ORANGE	
2	Output	3.3	3.0 ~ 3.6	ORANGE	
3	-	GND	-	BLACK	
4	Output	5	4.85 ~ 5.15	RED	
5	-	GND	-	BLACK	
6	Output	5	4.85 ~ 5.15	RED	
7	-	GND	-	BLACK	
8	-	GND	-	GRAY	POWER-GOOD
9	Output	5	4.85 ~ 5.15	PURPLE	STANDBY
10	Output	12	10.8 ~ 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, outputs it on the LCD monitor

6-2. Outline Diagram



6-3. SPEC 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/m²
   - Power Consumption: 2.1W Logic / 9.7W CCFL
   - Display Operating Mode: TMDS
4. Operating Environment
   - Operating temperature: 0°C ~ 50°C
   - Operating humidity: 5% ~ 90% (under 40°C condition)
   - Storage Environment
   - Storage temperature: -20°C ~ 60°C

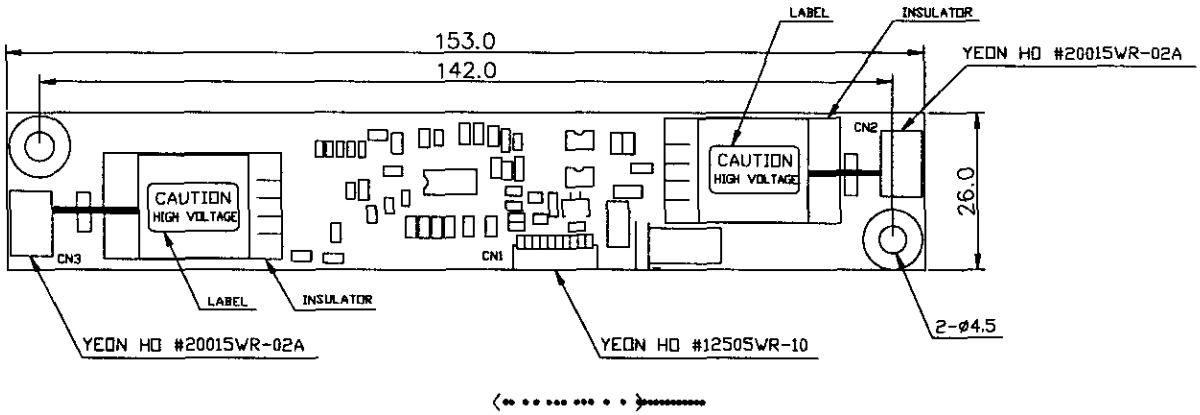
7. LCD INVERTER

7-1. Function

Supplies the driving power for backlight inside the LCD.

7-2. Outline Diagram and I/O Structure

7-2-1. Outline Diagram



7-2-2. I/O Structure

CONNECTOR	PIN NO.	I/O	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. SPEC of parts

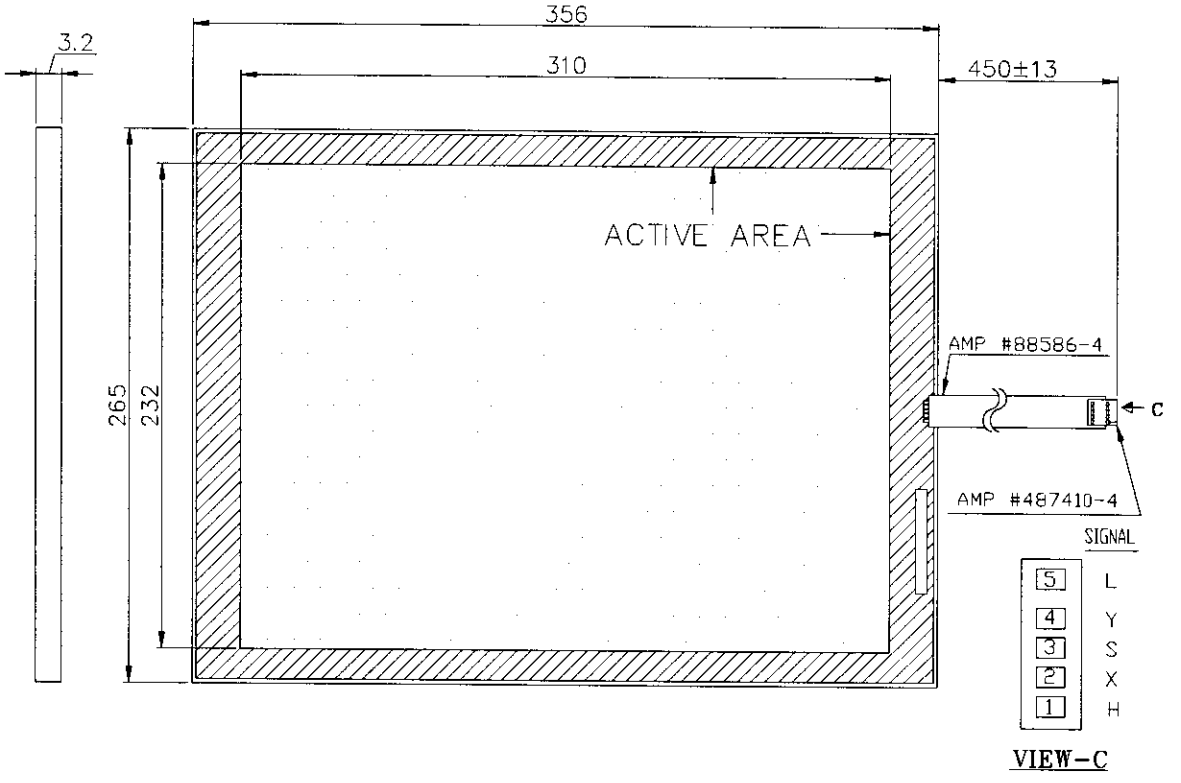
1. Maker: LG Electronics
2. Inverter Type: NMC1507-02
3. Maker Type: 6632Z-1507B
4. Inverter SPEC
   - Input Supply Voltage: DC 11~13V
   - Input Current: 1.1A
   - Input Power: 13.2W
   - Output Voltage: 616Vrms
   - Output Current: 9.0mArms
   - Output Power: 12W (2 lamps total)
   - Input Signal Voltage: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

8. TOUCH SCREEN

8-1. Function

Transmits the dimensions from the contact to the touch screen to the touch screen controller.

8-2. Outline Diagram



8-3. SPEC 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 ~ 50°C
- Operating humidity: 0% ~ 90% (under 35°C condition)

3. Storage Environment

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

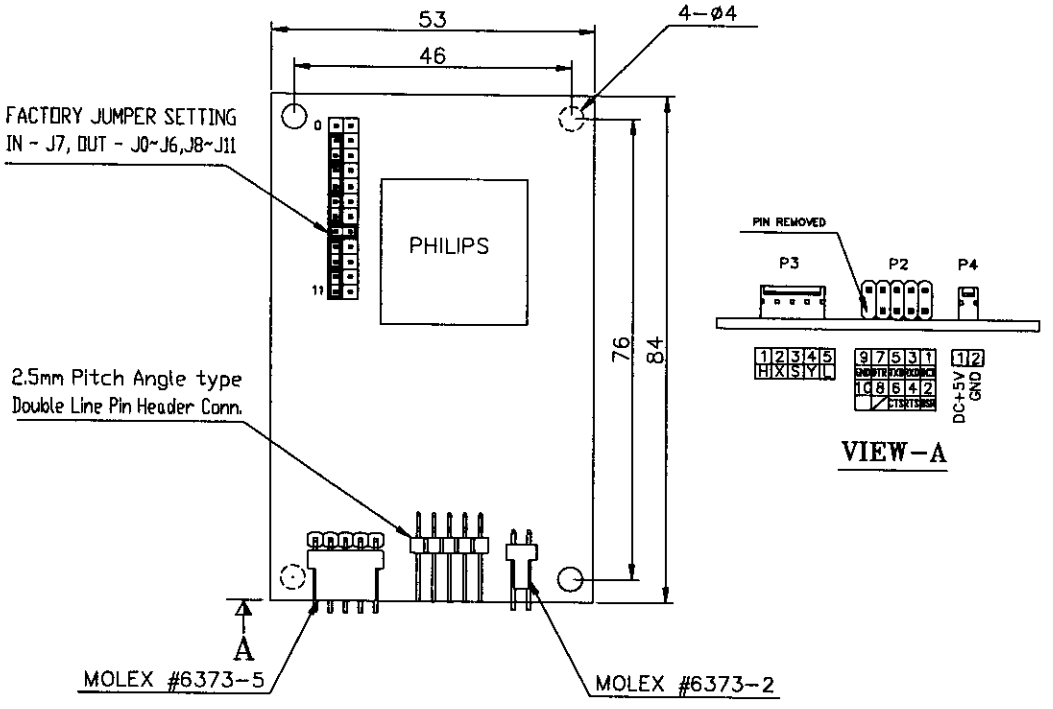
9. TOUCH CONTROLLER

9-1. Function

After receiving and handling the touch dimensions from the touch screen, transmits to the main controller

9-2. Outline Diagram and I/O Structure

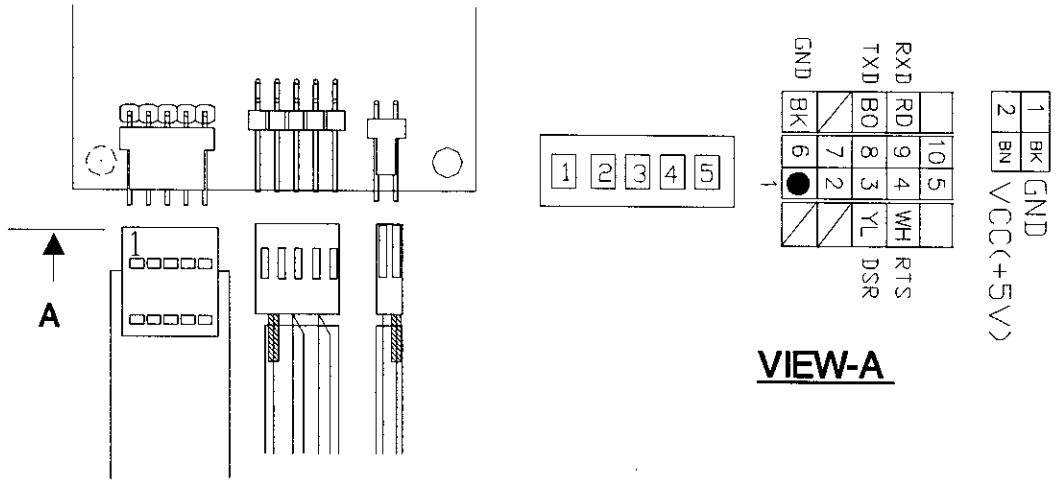
9-2-1. Outline Diagram



9-2-2. I/O Structure

CONNECTOR	PIN NO.	I/O	SYMBOL	DESCRIPTION
P2	1	INPUT	DCD	Data Carrier Detect
	2	INPUT	DSR	Data Set 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. SPEC of parts

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

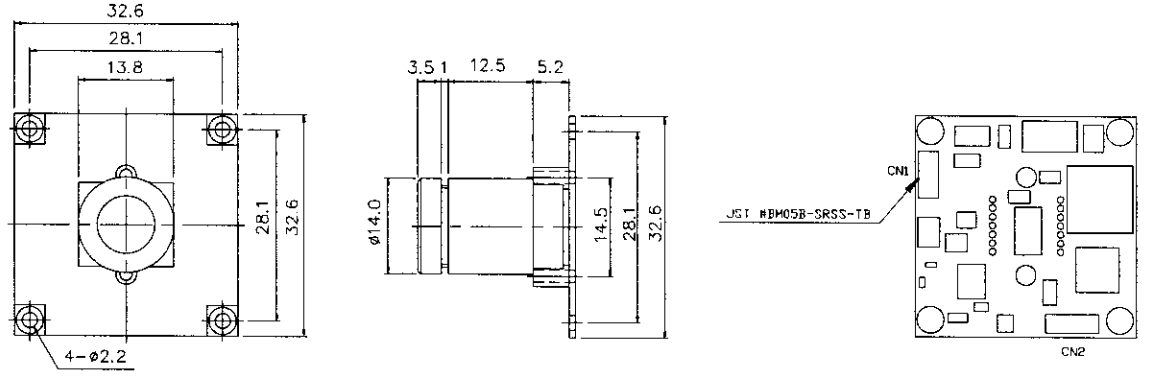
10. CCD (CHARGE COUPLED DEVICE) CAMERA

10-1. Function

Changes the external video signal received through the lens into an electric signal and transmits to main controller

10-2. Outline Diagram and I/O Structure

10-2-1. Outline Diagram



10-2-2. I/O Structure

CONNECTOR	PIN NO.	I/O	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. SPEC of parts

1. CCD Camera Module SPEC

- 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

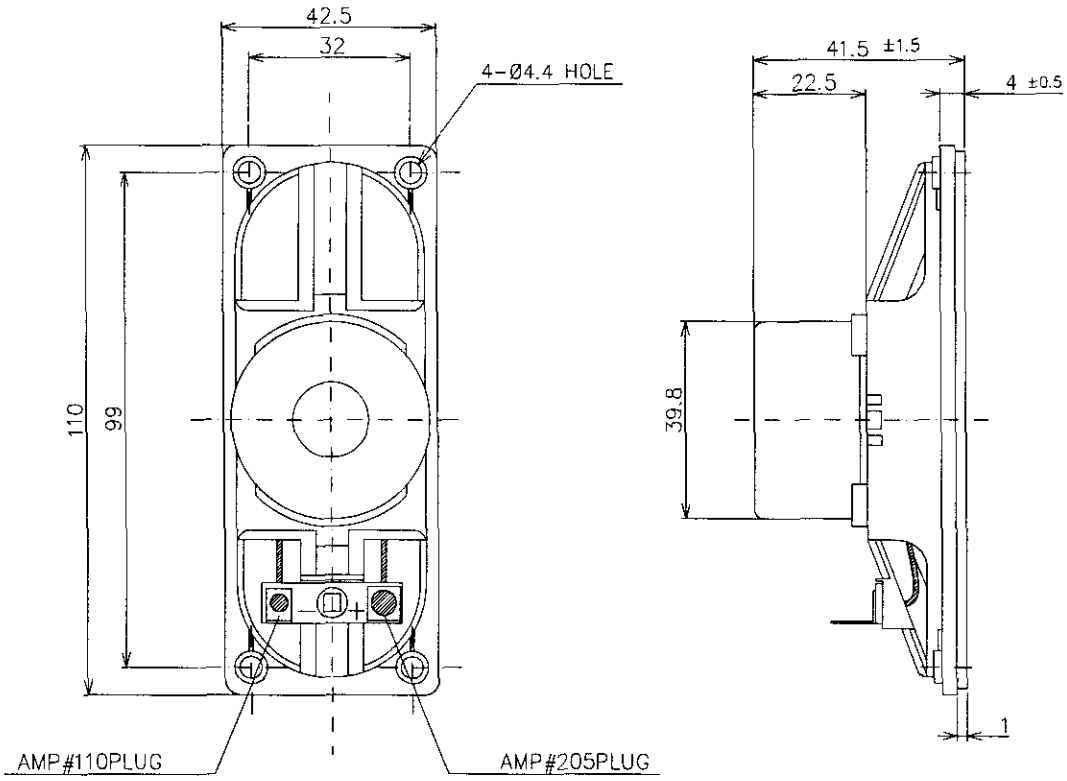
- Operating temperature:

13. SPEAKER

13-1. Function

Transfers and outputs the electric signal amplified by the AMP in the sub controller into hearable sounds.

13-2. Outline Diagram and I/O Structure.

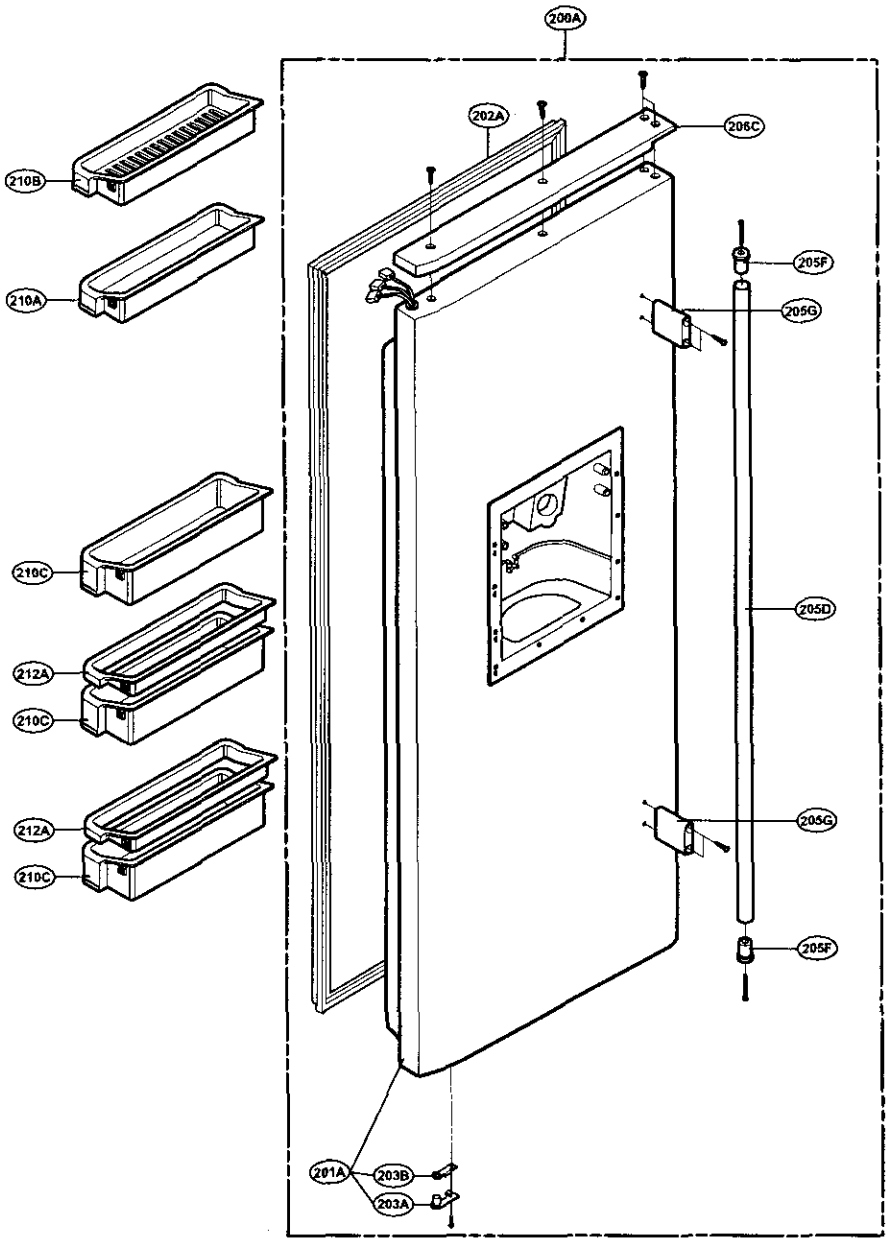


13-3. SPEC of parts

- 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.

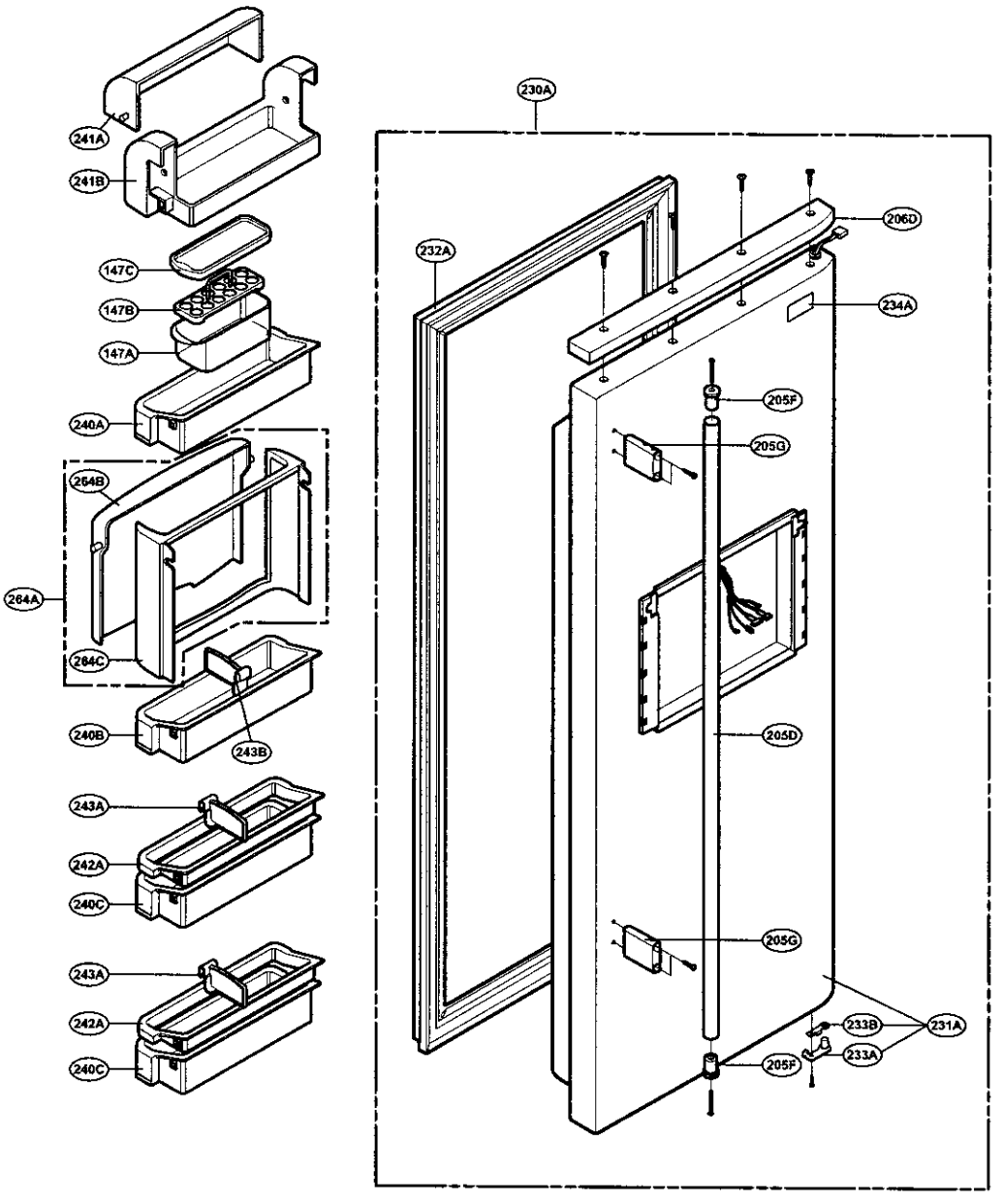
EXPLODED VIEW

FREEZER DOOR PART



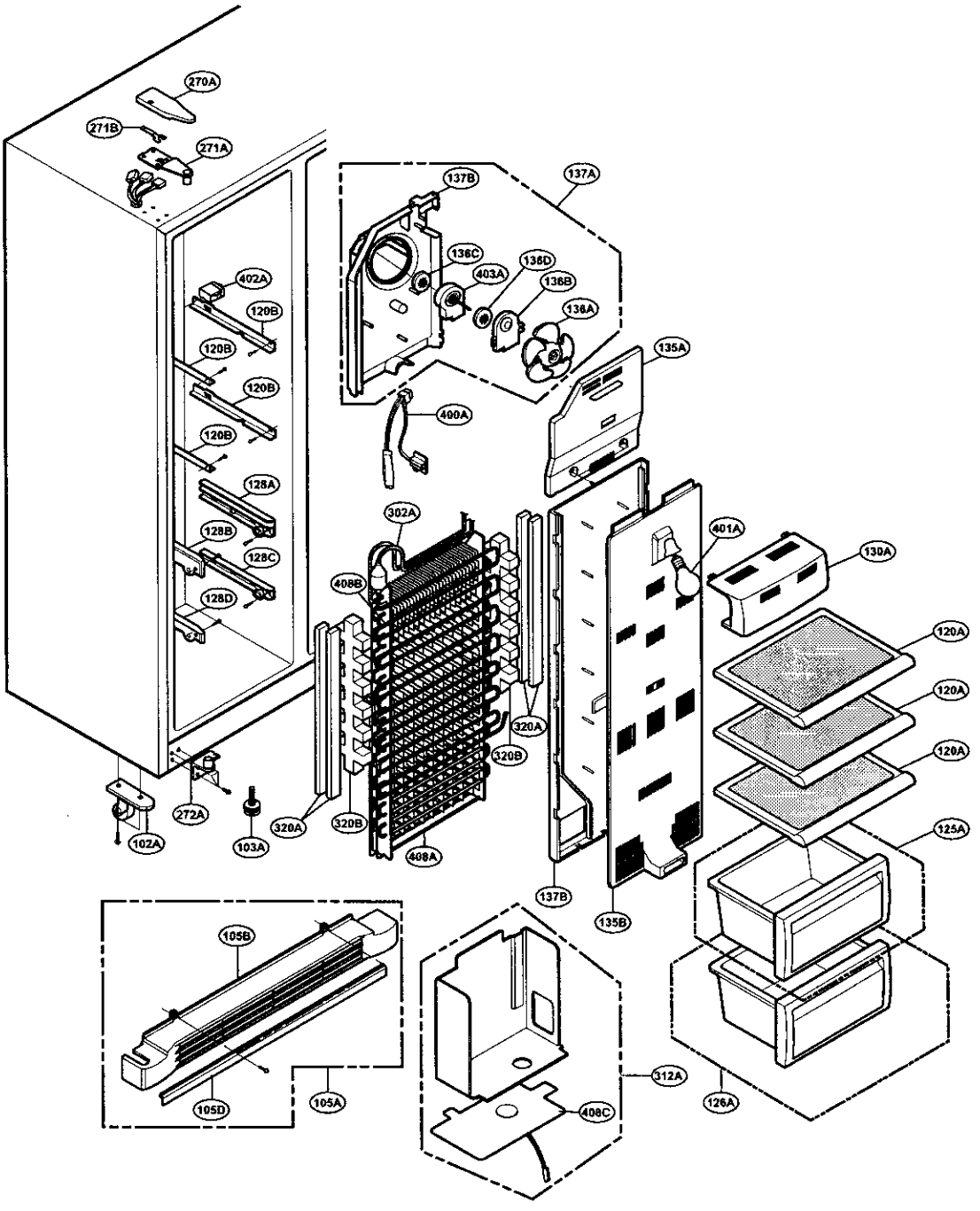
EXPLODED VIEW

REFRIGERATOR DOOR PART



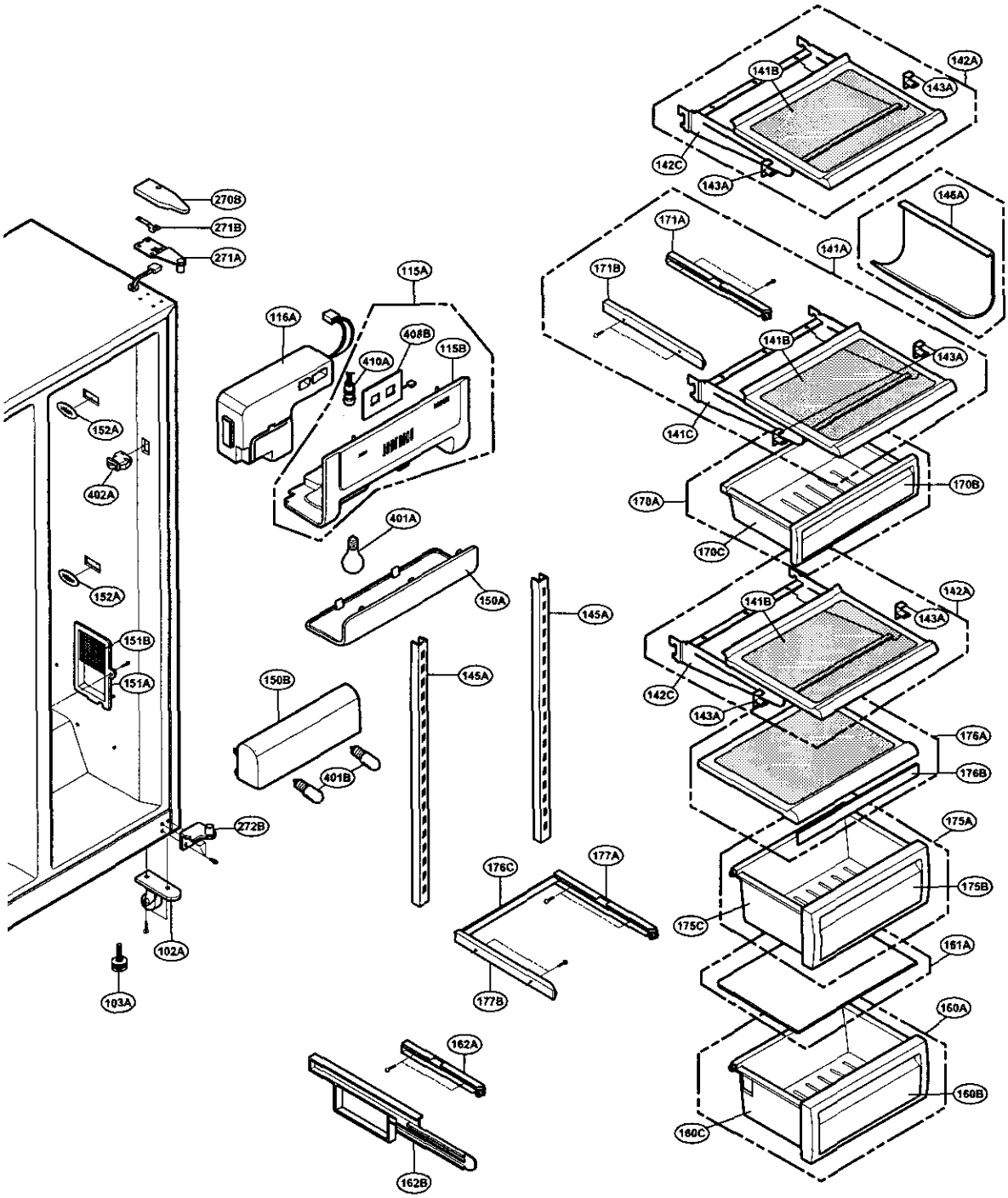
EXPLODED VIEW

FREEZER COMPARTMENT



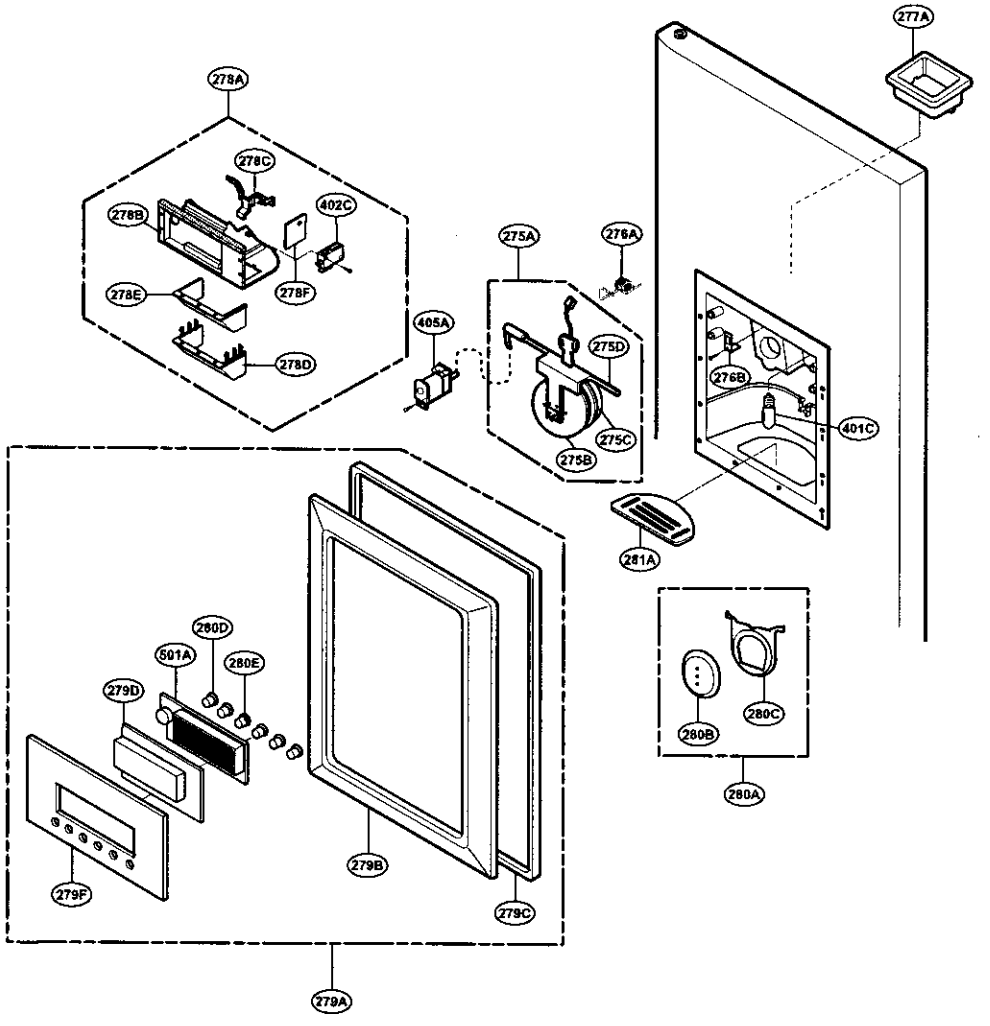
EXPLODED VIEW

REFRIGERATOR COMPARTMENT



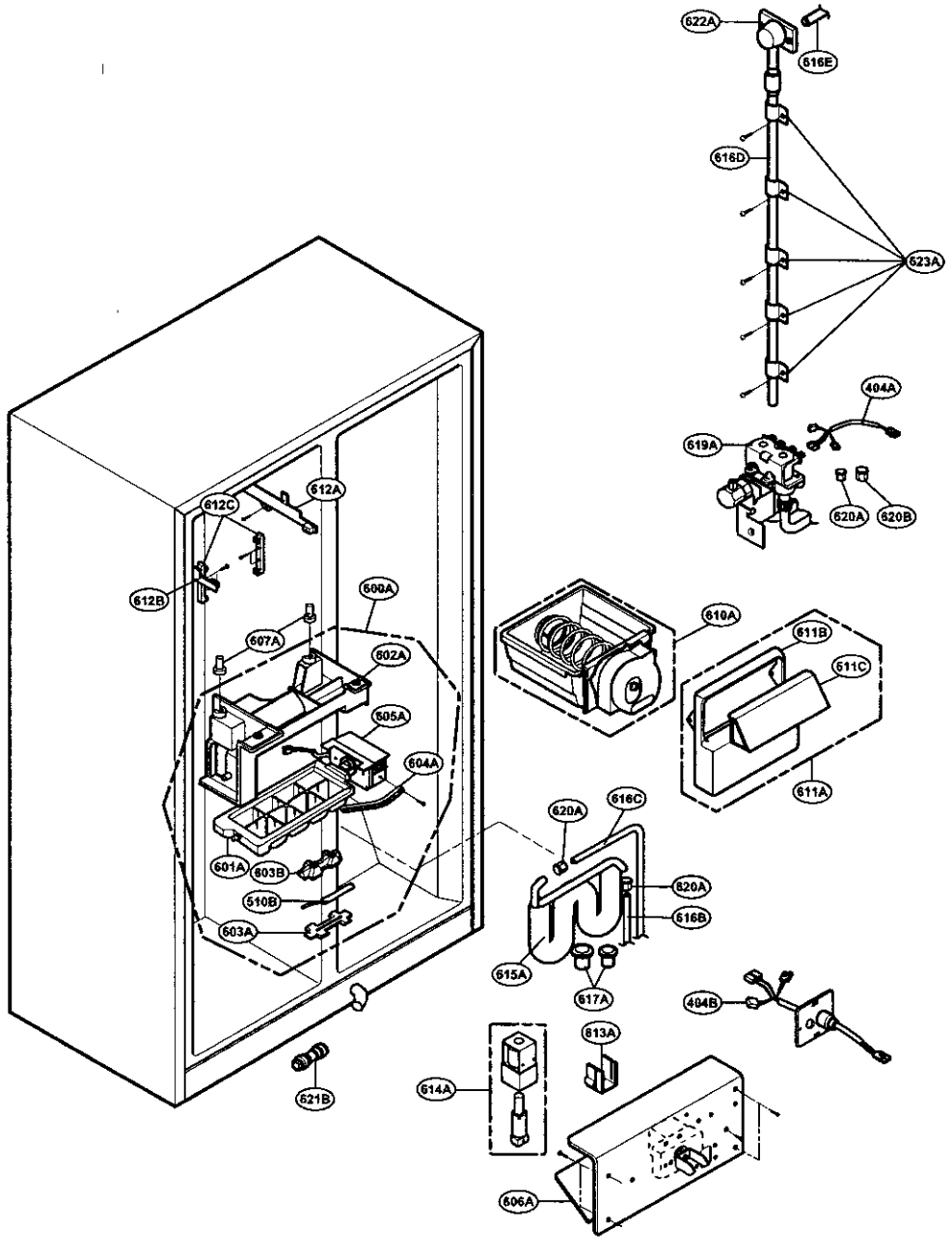
EXPLODED VIEW

DISPENSER PART



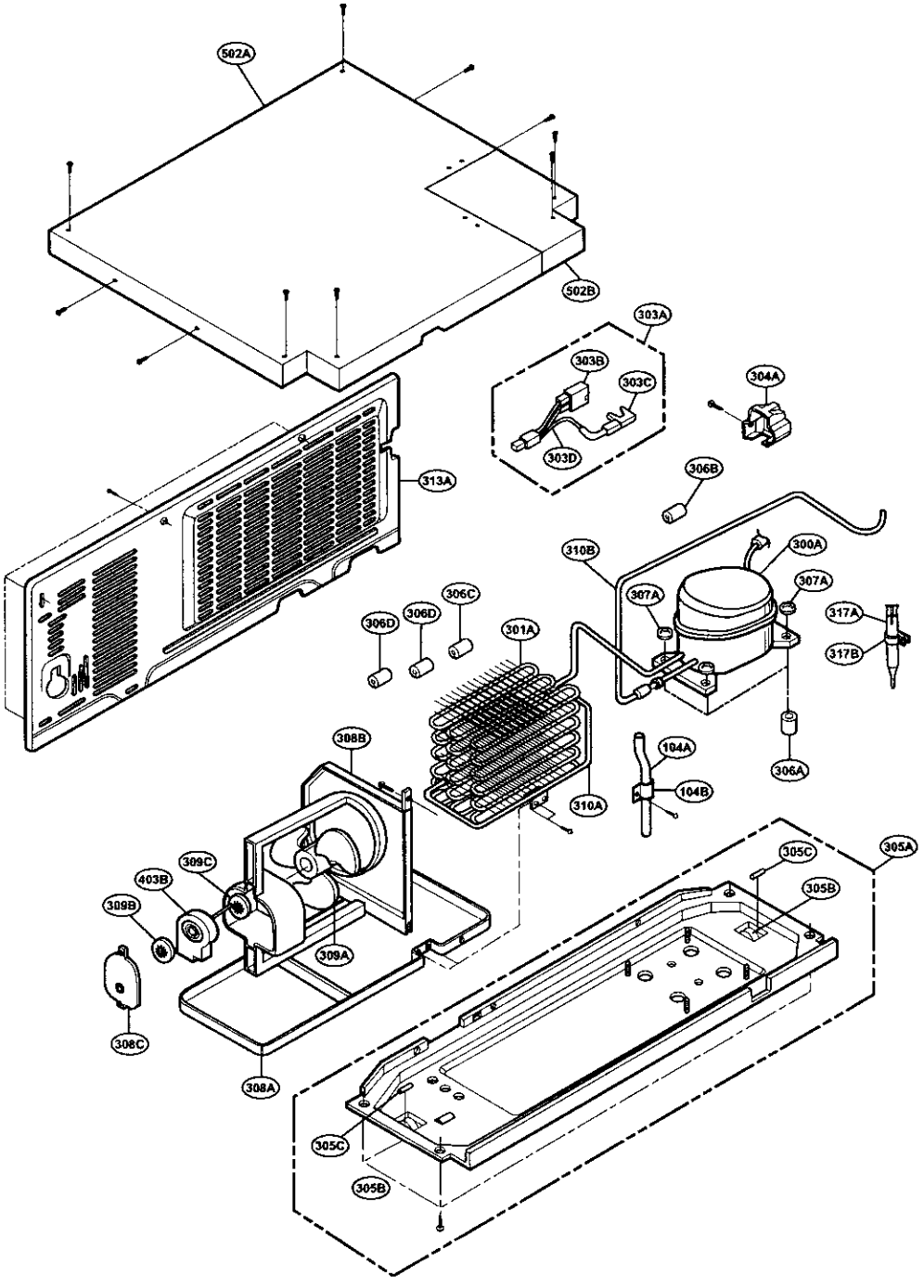
EXPLODED VIEW

ICE & WATER PART



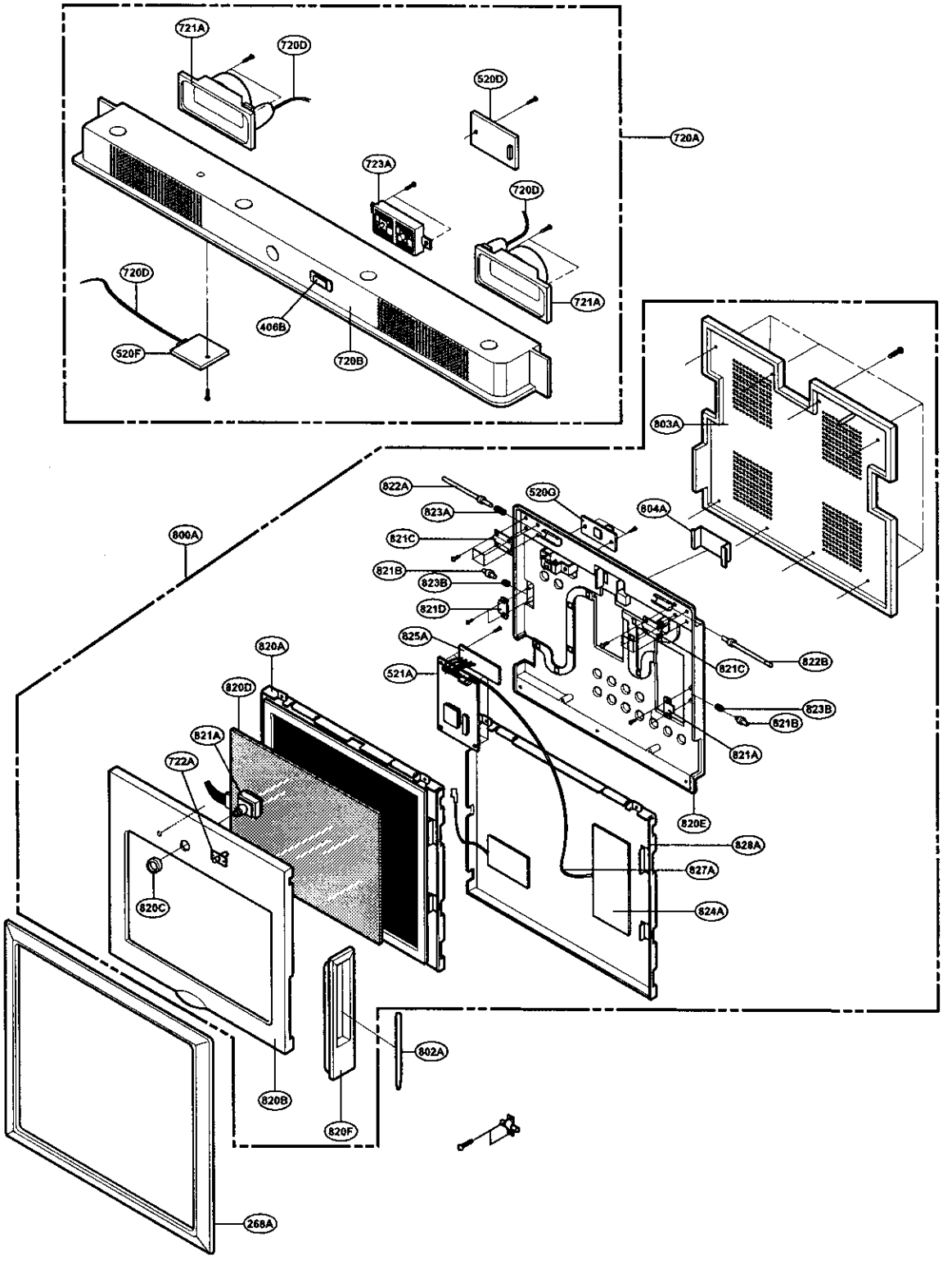
EXPLODED VIEW

MACHINE COMPARTMENT

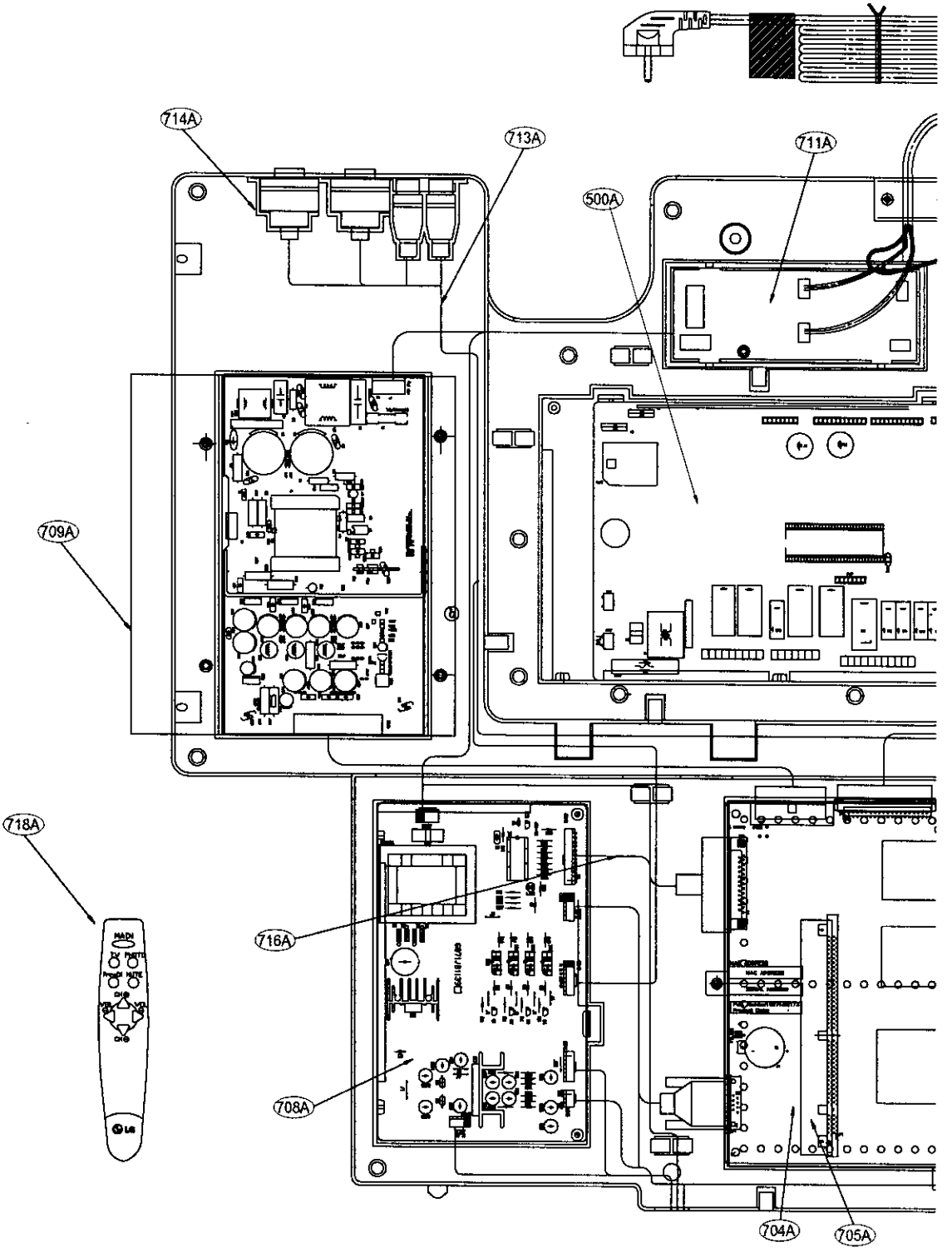


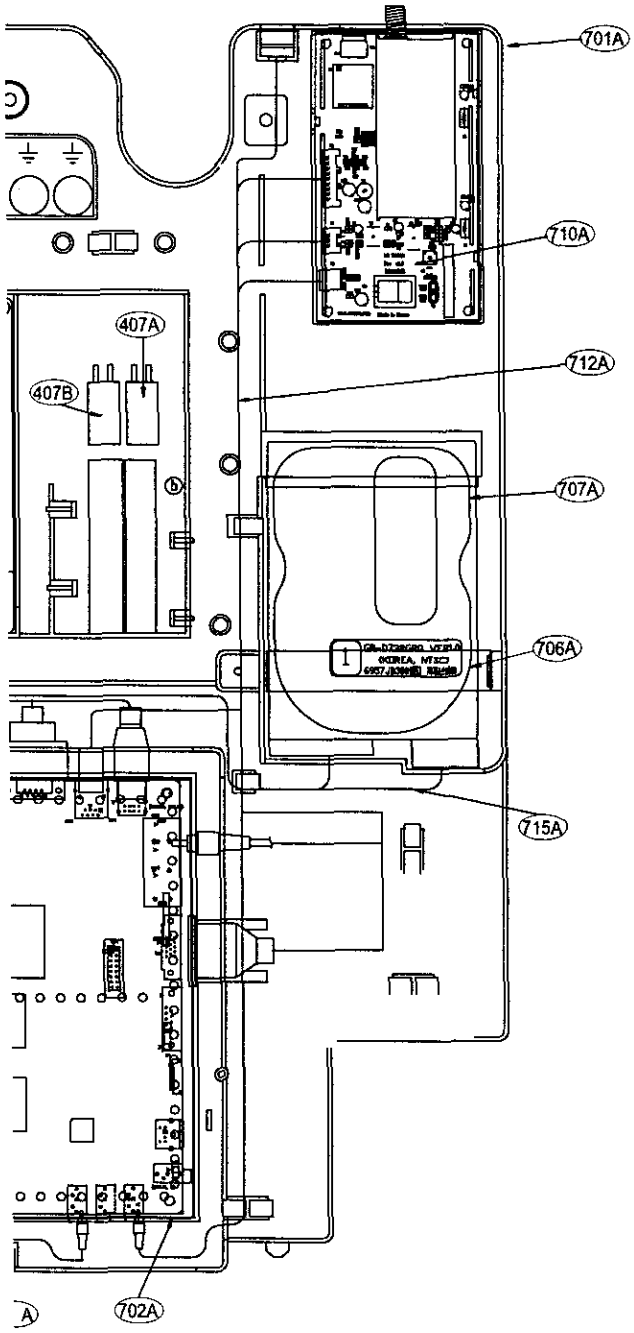
EXPLODED VIEW

SPEAKER & MONITOR PART



DIGITAL PART COMPONENTS

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