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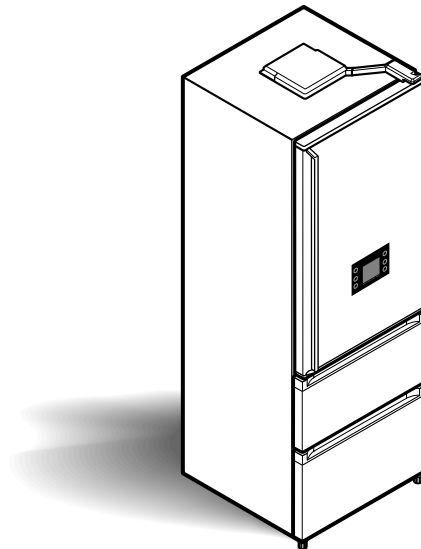
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KIMCHI REFRIGERATOR

SERVICE MANUAL

CAUTION

PLEASE READ CAREFULLY THE SAFETY PRECAUTIONS OF THIS MANUAL
BEFORE CHECKING OR OPERATING THE REFRIGERATOR.



MODEL : GR-J303UG*

SAFETY INSTRUCTIONS

1. Firstly check that there is electrical leakage in the main body of the product.
2. Perform work always after removing the power plugs in handling with the part where electricity conducts through.
3. Wear a rubber gloves(insulation gloves) for preventing electrical shock accident in case of testing with power on.
4. Always check rated current, voltage and capacity in using the instruments.
5. Exercise care so that water does not enter into electrical parts around the machine room.
6. Take care so that things should not fall down by removing them cleanly on the product when leaning the product forward or backward. Especially, take care of thin things (glass panels, books).
7. Ensure to consult the repair and maintenance center shop when the cold storage cycle is damaged (to prevent that gas inside of the cycle gets a room dirty).

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1. PRODUCT SPECIFICATIONS

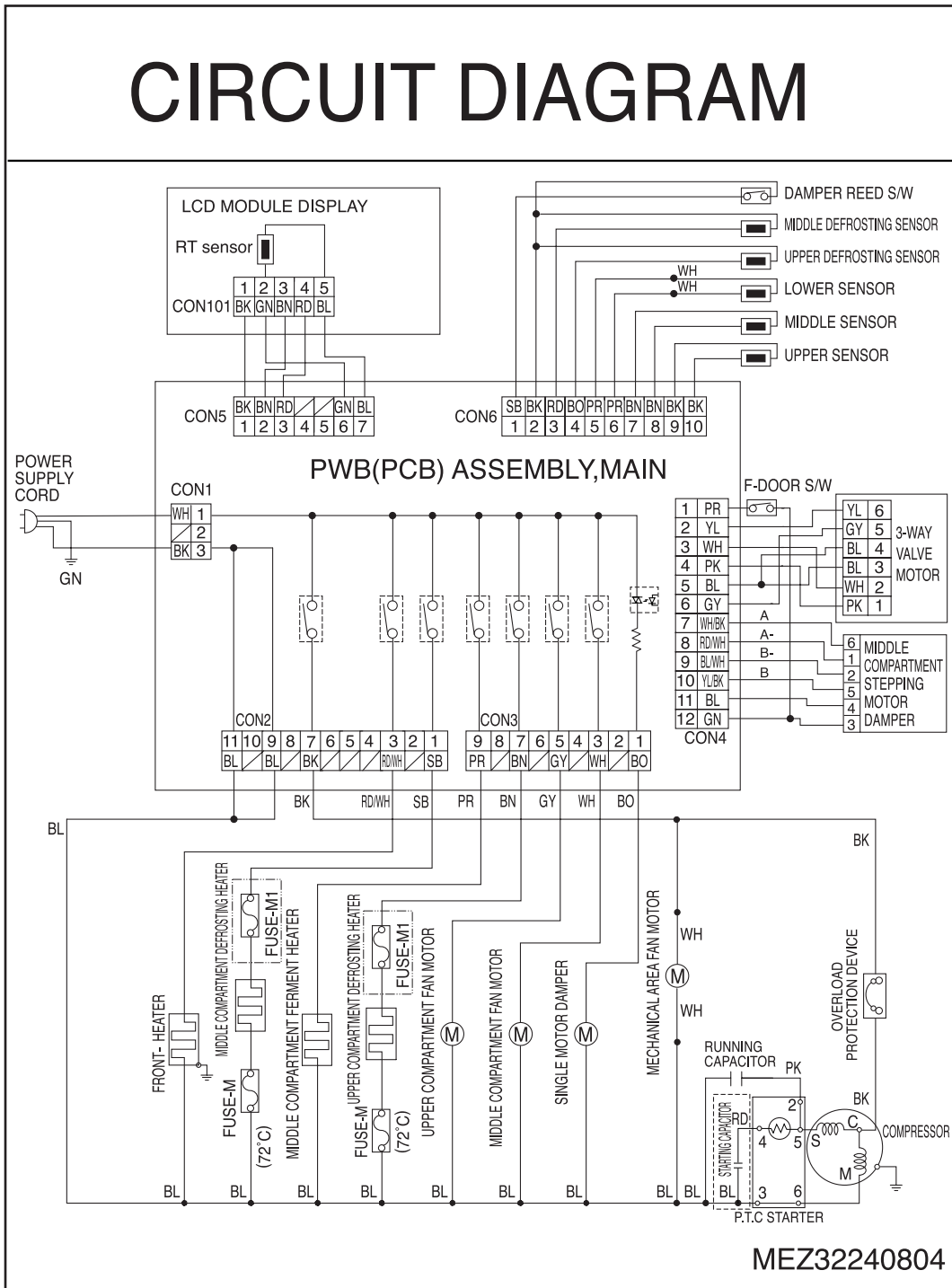
1-1. GR-J303UG*

MODEL		GR-J303UG
ITEMS		SPEC
Rating		115V/60Hz
Capacity	Net Capacity	300 L
	Top Compartment	156 L
	Middle/Bottom Compartment	144 L
Dimensions (mm)		667(W) X 670.4(D) 1775(H)mm
Net Weight		113 Kg
Motor Power Consumption		138W
Cooling Method		Indirect Cooling System
Defrosting System	Method	Force
	Start	Automation
	End	Automation
	Evaporation	Force
Insulation		Light Polyurethane Foam
Evaporation Dish		1 EA (Behind)
Basket		2 EA
Storage Container		14 EA
Drawer		1 EA
Shelf		3 EA
Flap Door		1 EA
Low temperature Catalyst Deodorization		2 EA
Cooling Cycle	Compressor	LC62LBCH
	Evaporator of Top Compartment	Fin Tube Type
	Evaporator of Middle Compartment	Fin Tube Type
	Condenser 2 EA	Wire Condenser, Back Plate Condenser
	Refrigerant	R134a (160 g)
	Refrigerant Oil	α10G 310cc
Defrosting Device		Heater, Sheath

ITEMS		SPEC	
Electrical System Rating	P.T.C		P6R8MD
	Overload Protector		4TM314TFB
	Fan Motor(Top)		Ø110 Fan
	Fan Motor(Middle)		Ø110 Fan
	Condenser Cooling Fan Motor		Ø110 Fan
	Defrosting Heater	Top	115 V 140 W
		Middle	115 V 180 W(Half wave 90 W)
	Front-C Heater		120 V(UL) 7 W
	Fuse-M(Top)		Cuttet at 70 °C
	Fuse-M(Middle)		Cuttet at 70 °C
	Protection Fuse		250 V 9 A
	Capacitor, R		14 μ / 250Vac

2. CIRCUIT DIAGRAM

CIRCUIT DIAGRAM



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

3. MICOM FUNCTION AND EXPLANATIONS OF CIRCUITS

3-1. EXPLANATION OF FUNCTION

3-1-1. DISPLAY PART



NOTCH	Cabbage/Radish/ Mul Kimchi			Vegetble/ Fruit			Light Freezing			Frozen Food				Chilled Food		
	Min	Mid	Max	Min	Mid	Max	Min	Mid	Max	Min	Mid	Max	Max	Min	Mid	Max
Temperature setting	1.0°C	-0.5°C	-2.0°C	4.5°C	3.5°C	2.5°C	-4.0°C	-5.0°C	-6.0°C	-15°C	-18°C	-21°C	-25°C	5.0°C	2.0°C	0.0°C

1. MICOM becomes "Lock" status in initial application of power, and the upper room is indicated as "Freezing Food." "Mid", the middle room as "Cabbage" "Mid", and the lower room as "Cabbage" "Mid".
2. MICOM maintains the previous display status in power failure and re-application of power. But in case of a power-shut or power reconnection during rhythm fermenting, the temperature returns to "Mid" for the applicable food type.
3. Buzzer sound neither ring ever pressing the button in "Lock" status, nor performs function.

3-1-2. Food storage/seasoning function

(1) When selecting food type and storage temperature

1. Press the "Lock/Unlock" button for more than 2 seconds to "Unlock" the refrigerator.
2. When you press the "Upper compartment", "Store" button in this condition, the storage temperature level changes from "Mid" → "Max" → "Min" → "Mid", and the food type changes as follows when the storage temperature level changes from "Min" → "Mid". ("Freeze" → "Refrigerate" → "Kimchi")
3. When you press the "Middle compartment", "Storage" button, the storage temperature level changes from "Mid" → "Max" → "Min" → "Mid", and the food type changes as follows when the storage temperature level changes from "Min" → "Mid". ("Cabbage Kimchi" → "Old Kimchi" → "Light freezing" → "Vegetable/fruit")
4. When you press the "Lower compartment", "Storage" button, the storage temperature level changes from "Mid" → "Max" → "Min" → "Mid", and the food type changes as follows when the storage temperature level changes from "Min" → "Mid". ("Cabbage Kimchi" → "Old Kimchi" → "Broth Kimchi" → "Vegetable/fruit")
5. Press the "Lock/Unlock" button to end the food storage and storage temperature selection. At this time, if no button is selected for 1 minute without the "Lock/Unlock" button pressed, the unit will automatically switch to the Lock condition and end the selection.

(2) When selecting food type and rhythm fermenting (seasoning)

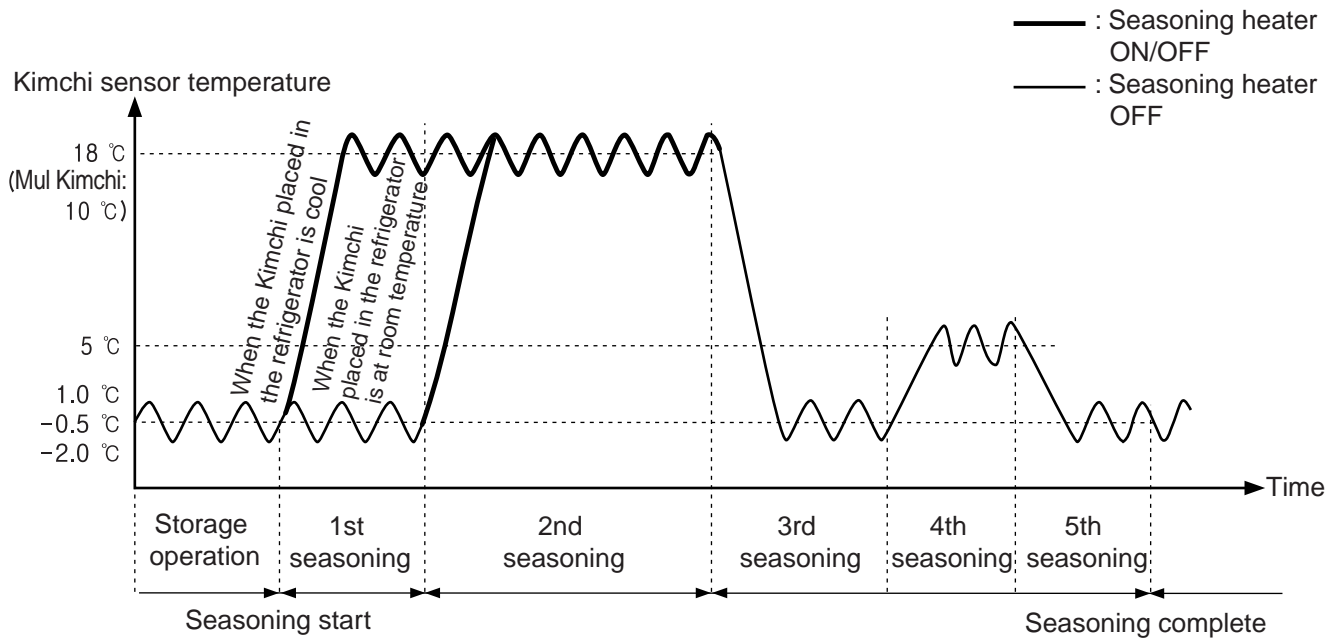
1. Press the "Lock/Unlock" button for more than 2 seconds to "Unlock" the refrigerator.
2. When you press the "Ferment" button at this condition, the rhythm fermenting (seasoning) changes from "Fermented 1" → "Fermented 2" → "More fermented" → "Natural fermentation" → "Less fermented 1" → "Less fermented 2", and the food type changes from Middle compartment: "Cabbage Kimchi" → "Old Kimchi" → "Cabbage Kimchi", Lower compartment: "Cabbage Kimchi" → "Radish Kimchi" → "Broth Kimchi" → "Cabbage Kimchi" when the Rhythm Ferment (Seasoning) changes to "Less fermented 2" or "Fermented 1". (But, the upper compartment only has the underground fermenting function.)
3. When you press the Ferment button when the food type is "Vegetable/fruit", "Light freezing", it is set to "Cabbage Kimchi – Fermented 1".
4. Press the "Lock/Unlock" button to end the food storage and storage temperature selection. At this time, if no button is selected for 1 minute without the "Lock/Unlock" button pressed, the unit will automatically switch to the Lock condition and end the selection.

(3) When selecting Flavor Keeping

1. Press the "Lock/Unlock" button for more than 2 seconds to "Unlock" the refrigerator.
2. The Flavor Keeping function can only be selected when the food type of "Cabbage Kimchi", "Old Kimchi", "Radish Kimchi" or "Broth Kimchi" is selected.
3. When you press the "Flavor Keeping" button at this condition, the Flavor Keeping function will toggle between selected and canceled. (But if both the middle compartment and the lower compartment has food type that can use Flavor Keeping, operate in the order of Middle compartment Flavor Keeping ON → Lower compartment Flavor Keeping ON → Middle/Lower compartment Flavor Keeping ON → Middle/Lower compartment Flavor Keeping OFF → Middle compartment Flavor Keeping ON.)
4. Press the "Lock/Unlock" button to end the Flavor Keeping. At this time, if no button is selected for 1 minute without the "Lock/Unlock" button pressed, the unit will automatically switch to the Lock condition and end the Flavor Keeping.
5. When you select the Flavor Keeping during the fermenting process, the fermenting will immediately end and the Flavor Keeping function will start. AT this time, the storage temperature is automatically set to "Mid".
6. When you select the Flavor Keeping, it controls at lower temperature to keep the current taste of Kimchi longer. (-1 deg for "Min", -0.5deg for "Mid" and 0 deg for "Max".)
7. During the Flavor Keeping operation, the unit runs a cold shock operation every 12 hours.
8. When you select the rhythm fermenting while executing the Flavor Keeping, the Flavor Keeping function will be canceled.

3-1-3. Rhythm fermenting control pattern diagram

1. The fermenting control pattern varies, depending on the temperature of the Kimchi when it is placed into the storage, the type of Kimchi being made and the degree of the seasoning selected.
2. In the 1st seasoning cycle, if the Kimchi is at room temperature, the cold control operates.
3. During the seasoning cycle, if the Kimchi is cold, the seasoning heater is turned on and if the Kimchi is warm, the seasoning heater is turned off.
4. If a failure occurs, such as a sensor error during seasoning, the storage will default to Cabbage Kimchi storage status.
5. The 2nd seasoning is not included in the underground fermenting, in the 3rd seasoning, Perform the Low temperature mature keeping the Temperature is 3°C



3-1-4. TEMPERATURE CONTROL AT UPPER, MIDDLE AND LOWER COMPARTMENT

(1) Temperature control at upper compartment

1. Turn COMP, upper compartment fan motor depending on temperature of the upper compartment sensor and cool them by opening the 3-way valve to the upper compartment.
2. However, cooling of the upper compartment starts after cooling of the Middle/lower compartment is completed while the middle/lower compartment is cooling (Max 25 min).

(2) Temperature control at middle/lower compartment

1. Turn COMP, middle compartment fan motor depending on temperature of the middle/lower compartment sensor and cool them by opening the 3-way valve to the middle/lower compartment ,and opening the middle/lower damper.
2. However, cooling of the middle/lower compartment starts after cooling of the upper compartment is completed while the upper compartment is cooling (Max 35 min).

(3) Operation conditions of COMP

1. COMP turns on by the upper compartment sensor and lower compartment sensor.
2. COMP turns off by the upper compartment sensor, middle compartment sensor and lower compartment sensor.

(4) Operation conditions of 3-way valve

1. Open the upper, middle and lower compartment valve by the upper, middle or lower compartment sensor .
2. Perform operation for minimum 25 minutes (for 35 minutes at middle, lower compartment) upon request of “open” (unsatisfactory temperature) at the other side while COMP operates with the valve opened in one side, and then cutoff the valve to other side. In this case, immediately cutoff the valve if temperature is met even if 25 minutes (35 minutes for middle, lower compartment) have not passed.
3. In input of initial power, cool from the upper compartment where the upper compartment is Data Frz. (Deep Frz), Frz. when all upper/middle/lower compartment is not satisfactory, and firstly cool from the middle, lower compartment for the other case.

3-1-5. LCD BACK LIGHT CONTROL (LIMITED TO LCD MODEL)

1. To make the LCD display easy to see, the LCD back light is turned on for 1 minute for the initial power connection or for 20 seconds for the final button operation.
2. When you press any display button when the back light is turned off, the button command will not be executed nor the buzzer sound generated. Only the back light will be turned on. But only the “Lock/Unlock” button will operate normally. (When you press the button when the LCD back light is turned off, only the command to turn on the back light will be executed.)
3. When you press the “Storage” button of the upper compartment and the “Storage” button of the lower compartment simultaneously for more than 1 second, the back light will be turned on and all the graphics on the LCD will be turned on. When you release the buttons, the LCD graphics will return to the prior condition and the back light turned off. (LCD graphic and back light ON/OFF check)

3-1-6. LOCK FUNCTION (DISPLAY BUTTON LOCK/UNLOCK)

1. The “Lock” display is turned on in the Lock status in application of refrigerator power.
2. Turn the “Unlock” display by pressing the Lock/Unlock button for 2 seconds or more to allow operation of the display button.
3. Buzzer sound neither rings ever by pressing any button other than the Lock/Unlock button, nor performs function with the “Lock” display turned on.
4. The “Lock” display automatically turns on and becomes lock status unless operating the display button for more than a minute with the “Unlock” display turned on.

3-1-7. FRONT-C HEATER CONTROL

1. A heater for prevention of dewing is installed on the FRONT-C part between the middle compartment and the lower compartment, and turns on at the time of COMP ON and for 20 minutes after COMP OFF.
2. It turns off in the test mode (turn on after power off for normal operation).

3-1-8. BUZZER RINGING

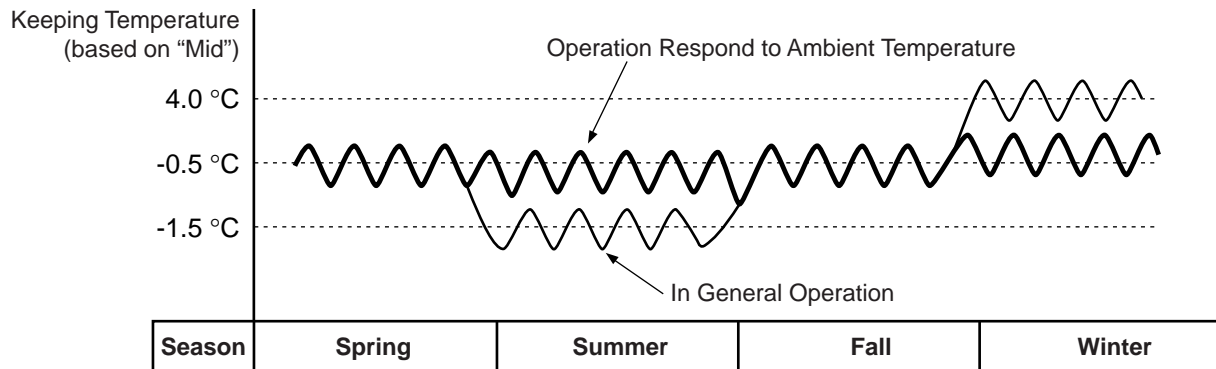
1. "Ding~Dong~" sound rings when pressing the front display button.
2. No buzzer rings if pressing the button not according to the operation order.

3-1-9. POWER FAILURE COMPENSATION FUNCTION

1. Previous operation is performed even applying power again after power failure. However, error status or test mode status is excluded.

3-1-10. OPERATION RESPOND TO AMBIENT TEMPERATURE

1. This is function of maintaining keeping temperature constantly irrespective of season by compensating for the in-refrigerator temperature through ambient temperature of the refrigerator to prevent that the in-refrigerator temperature changes according to ambient temperature (weak cold in winter, excess cold in summer).



3-1-11. DEFROSTING (REMOVAL OF FROST)

1. Defrosting is simultaneously performed by using the defrosting heater at the upper compartment and the middle compartment whenever sum of compressor operation time reaches to 6 hours.
2. Defrosting is started if sum of compressor operation time reaches to 4 hours in input of initial power (or in returning from power failure).
3. Complete defrosting function where defrosting sensor temperature of each room reaches to 7°C (16°C for GR-J213) for the upper compartment, 16°C for the middle compartment respectively, after starting defrost work.
However, poor defrost is indicated if not reaching to 7°C (16°C for GR-J213) for the upper compartment, 16°C for the middle compartment respectively 2 hours after starting defrost (See 3-1-11 Failure Diagnosis Function).
4. Poor defrost is indicated if the defrosting sensor is poor, and defrosting of the relevant room is not done.

3-1-12. SEQUENTIAL OPERATION OF ELECTRICAL PARTS

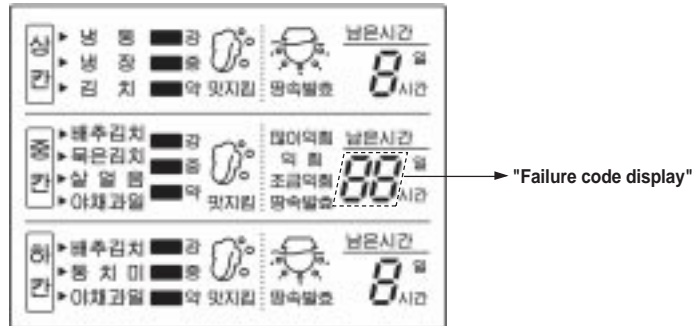
Electrical parts such as COMP, defrosting heater at the upper & middle compartment, fan motor at the upper & middle compartment, single motor damper and FRONT-C heater sequentially operate as follows for preventing noise and damage of parts occurred by that various parts operate at the same time in input of initial power on and after test closing (including temporary power failure, either):

Function	Operation Sequence	Remarks
<p>When defrosting sensor temperature at the upper compartment is more than 45°C (In purchasing, movement)</p>	<pre> graph TD PO[POWER ON] -- 0.5 sec --> SMD[SINGLE MOTOR DAMPER ON] SMD -- 0.3 sec --> CO[COMP ON] CO -- 0.3 sec --> FCH[FRONT-C HEATER ON] FCH -- 10 sec --> FFAN[F-FAN ON] FFAN -- 4-5 sec --> SMDOFF[SINGLE MOTOR DAMPER OFF] PO -- 0.5 sec --> 3VON[3-WAY VALVE ON] 3VON -- 5-6 sec --> 3VOFF[3-WAY VALVE OFF] PO -- 0.5 sec --> SMDAMPON[STEPPING MOTOR DAMPER ON] SMDAMPON -- 3-6 sec --> SMDAMPOFF[STEPPING MOTOR DAMPER OFF] SMDOFF --- 3VOFF SMDAMPOFF --- 3VOFF </pre>	
<p>In initial power on</p> <p>When defrosting sensor temperature at the upper compartment is less than 45°C (In power failure, service)</p>	<pre> graph TD PO[POWER ON] -- 0.5 sec --> DHC[DEFROSTING HEATER AT UPPER COMPARTMENT ON] DHC -- 0.3 sec --> DMC[DEFROSTING HEATER AT MIDDLE COMPARTMENT ON] DMC -- 4 sec --> DUC[DEFROSTING HEATER AT UPPER COMPARTMENT OFF] DUC -- 0.3 sec --> DMC[DEFROSTING HEATER AT MIDDLE COMPARTMENT OFF] DMC -- 0.3 sec --> FCH[FRONT-C HEATER ON] PO -- 0.5 sec --> FCHOFF[FRONT-C HEATER OFF] FCHOFF -- 4 sec --> SMDAMPON[SINGLE MOTOR DAMPER ON] SMDAMPON -- 4 sec --> CO[COMP ON] CO -- 0.3 sec --> FCH PO -- 0.5 sec --> UCFAN[UPPER COMPARTMENT FAN ON] UCFAN -- 10 sec --> SMDAMPOFF[SINGLE MOTOR DAMPER OFF] PO -- 0.5 sec --> 3VON[3-WAY VALVE ON] 3VON -- 5-6 sec --> 3VOFF[3-WAY VALVE OFF] PO -- 0.5 sec --> SMDAMPON[STEPPING MOTOR DAMPER ON] SMDAMPON -- 3-6 sec --> SMDAMPOFF[STEPPING MOTOR DAMPER OFF] SMDAMPOFF --- 3VOFF </pre>	<p>No initial operation is done if error occurs during operation.</p>

3-1-13. FAILURE DIAGNOSIS FUNCTION

(1) Failure Mode

1. Failure diagnosis function is intended in order that service is easily done when failure to affect performance of the product during use occurs.
2. Function is neither done, nor buzzer sound rings even when pressing the button in occurrence of failure.
3. The product returns to normal operation if failure is released during display of failure code in occurrence of failure (RESET).
4. All displays other than failure code display will turn off during occurrence of failure.



NO	Item	Failure Display	Failures	Remarks
1	Failure of upper compartment sensor	FS	Upper compartment sensor is disconnected or shorted	* Check wiring of respective relevant sensor.
2	Failure of middle compartment sensor	US	Middle compartment sensor is disconnected or shorted	
3	Failure of lower compartment sensor	LS	Lower compartment sensor is disconnected or shorted	
4	Failure of upper compartment defrosting sensor	d1	Upper compartment defrosting sensor is disconnected or shorted	
5	Failure of middle compartment defrosting sensor	d2	Middle compartment defrosting sensor is disconnected or shorted	
6	sensor Failure of ambient temperature sensor	Note 1)	Ambient temperature sensor is disconnected or shorted	
7	Failure of single motor damper	dP	When ON/OFF of the reed-S/W is not detected even when driving the single motor damper for 2 minutes	Damper motor damaged, frozen, coil damaged, driving IC(photo coupler) failure
8	Poor defrosting at upper compartment	H1	When defrosting sensor at the upper compartment does not reach to more than 7°C even when two hours have passed after starting defrost	Short of temperature fuse, short of heater, clogging of drain, poor heater driving relay
9	Poor defrosting at middle compartment	H2	When defrost sensor at the middle compartment does not reach to more than 16°C even when two hours have passed after starting defrost	Short of temperature fuse, short of heater, clogging of drain, poor heater driving relay
10	Poor communication	CO	When no communication is consecutively done for 30 seconds	Taking out of connector, Poor TR on communication part

Note 1) All displays except failure code display 7 segments, will turn on if both upper store button and lower store button pressed together.

(2) Load Operation in Failure

NO	ITEM	Classification								
		COMP	UPPER COMPARTMENT FAN	MIDDLE COMPARTMENT FAN	DEFROSTING HEATER OF UPPER COMPARTMENT	DEFROSTING HEATER OF MIDDLE COMPARTMENT	STEPPING MOTOR DAMPER	SINGLE MOTOR DAMPER	3-WAY VALVE	FRONT-C HEATER
1	Normal	○	○	○	○	○	○	○		
2	Failure of Upper compartment (K1) sensor	15 min ON/ 15 min OFF	○	○	○	○	○	○		
3	Failure of Middle compartment (K1) sensor	○	○	○	○	○	15 min OPEN/ 15 min CLOSE	○		
4	Failure of Upper compartment (K1) sensor	○	○	○	○	○	○	10 min OPEN/ 15 min CLOSE		
5	Failure of Upper compartment defrosting sensor	○	○	○	Don't defrost (immediately return)	○	○	○		
6	Failure of Middle compartment defrosting sensor	○	○	○	○	Don't defrost (immediately return)	○	○	○	
7	Failure of ambient Temperature sensor	○	○	○	○	○	(No compensation of ambient temperature)	(No compensation of ambient temperature)		
8	Poor defrosting at upper compartment	○	○	○	○	○	○	○		
9	Poor defrosting at middle compartment	○	○	○	○	○	○	○		
10	Failure of single motor damper	○	○	○	○	○	○	○	Perform normal initialization by checking operation in the cycle of 1 hour	
11	Poor communication	○	○	○	○	○	○	○		

○
(Linked with COMP. However, FRONT-C heater turns off for 15 minutes and turn on again if the heater turn on time continues for more than 40 minutes)

3-1-14. TEST FUNCTION

1. Test function is intended to check function of PCB and the product and find a failure part with failure status.
2. The test S/W exists on the main PCB, and ends the test mode after 2 hours irrespective of the test mode, and then returns to normal status.
3. Function button is neither detected, nor button recognition sound comes out during the test mode.
4. Ensure to take the power cords out in completion of the test mode so that normal status will be arrived.
5. Release the test mode and display the failure mode if failure such as sensor failure during the test mode.
6. No test mode is performed even when pressing the test button during display of failure code.

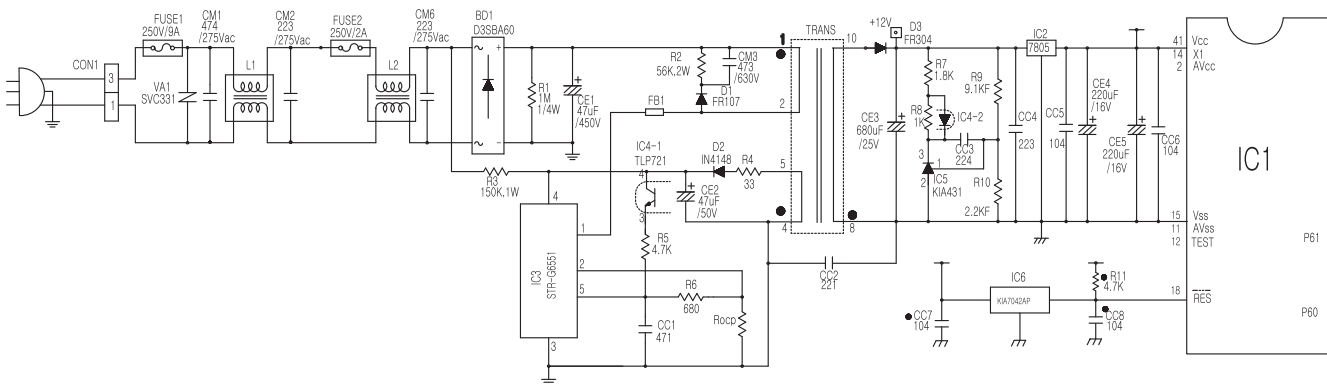
Mode	Operation	COMP	Def heater Upper/middle	Fan Upper/middle	Damper (middle/lower) Stepping/ single motor	Display	remarks
TEST1	Press the test s/w once	ON	OFF/OFF	ON/OFF	OFF/OFF	"11"	Return to normal state when min. 2hrs have passed. *upper/middle fan motor, middle/lower damper and 3 way valve operates in interval of 16/24 min.
TEST2	Press the test s/w once during test mode1	OFF	ON/ON	OFF/OFF	OFF/OFF	"22"	Upper def. sensor at more than 7°C & middle def. sensor at more than 16°C comes to initial state.
TEST3	Press the test s/w once during test mode2	ON	OFF/OFF	ON/OFF	OFF/OFF	"33"	Check Upper compartment cooling system.
TEST4	Press the test s/w once during test mode3	ON	OFF/OFF	OFF/ON	ON/ON	"44"	Check Lower compartment cooling system.
Normal mode	Press the test s/w once during test mode4	Return to initial state, COMP operates after a delay of 7 min.					

- Display check function
All displays turn on if pressing both upper "Store" button and lower "Store" button at the same time for 1 second or more, and return the previous status if releasing the button.
- FRONT-C Heater touching inspection mode
The FRONT-C heater consecutively turns on for 5 minutes and is then released if pressing both upper "Store" button and lower "Ferment" button for 5 seconds or more. It is released if pressing them again for 5 seconds or more.
 - Release check: Remaining time display part of the lower compartment turns on with pressing for 5 seconds or more.
 - Input check: Display for the flavor keeping part turns on with pressing for 5 seconds or more.

3-2. EXPLANATION OF CIRCUITS

3-2-1. POWER CIRCUIT

Power circuits consist of SMPS (Switching Mode Power Supply) power, and the SMPS consists of the rectification part (BD1, CE1) to convert AC voltage to DC voltage, the switching part (IC3) to switch the converted DC voltage, a transformer to transfer energy of the primary side on the switching terminal, secondary side power to supply power to the MICOM and IC and the feed back part (IC4, IC5) to feedback the secondary side voltage to the primary side of transformer in order to maintain it uniformly.



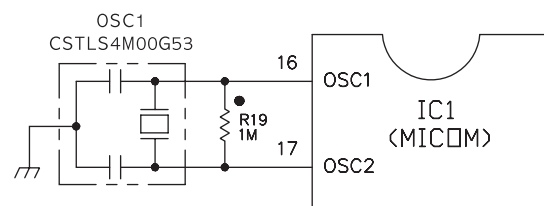
Caution.: Take a measure after more than 3 minutes have passed after removing the power cords in abnormal operation of circuits since high voltage (DC310V) is maintained at the power terminal. Otherwise, it may cause electric shock.

Part	Both ends of VA1	Both ends of CE1	Both ends of CE2	Both ends of CE3	Both ends of CE4
Voltage	220 Vac	310 Vdc	16 Vdc	12.5 Vdc	5 Vdc

Voltage of each part is as follows:

3-2-2. OSCILLATION CIRCUIT

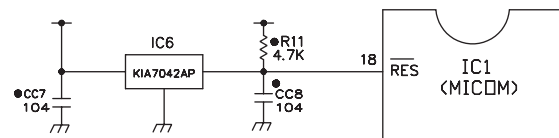
Oscillation circuits are intended to generate clock for synchronization for information transmission/receipt of logic elements inside of the IC1 (MICOM) and generate basic time for time calculation. Rated parts must be used since the OSC1 does not operate or time calculated at the IC1 changes where SPEC changes.



3-2-3. RESET CIRCUIT

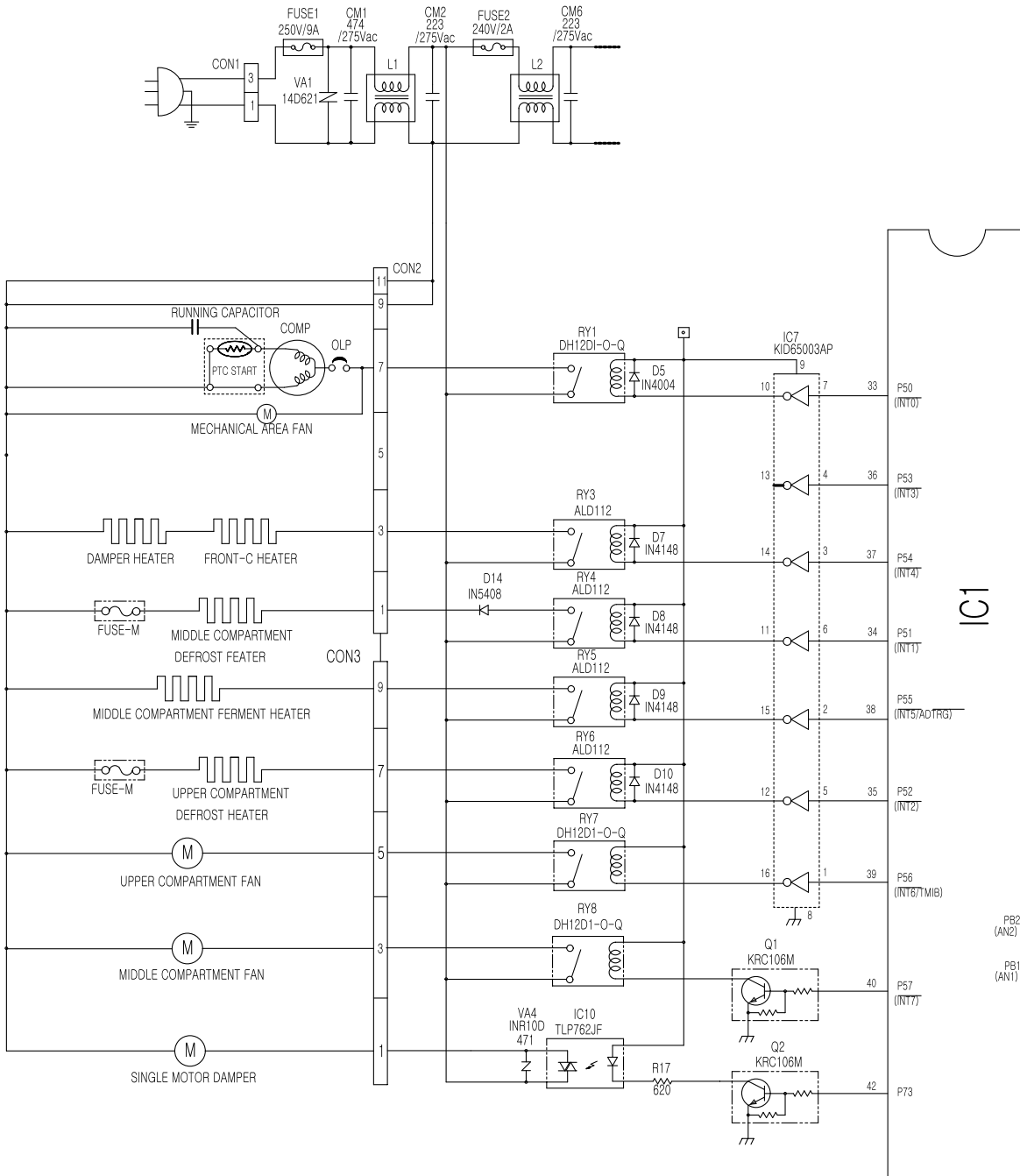
The reset circuits are intended so that the whole of function is started at the initial status by initializing various parts such as ram inside of the MICOM (IC1) when power is applied to MICOM again in input of initial power or by temporary power failure. "LOW" voltage is applied to the reset terminal of MICOM for the fixed time (10ms) at the start of power input.

During general operation, the reset terminal is at 5V (No MICOM operates in case of poor reset IC).



3-2-4. LOAD/BUZZER DRIVE CRICUIT

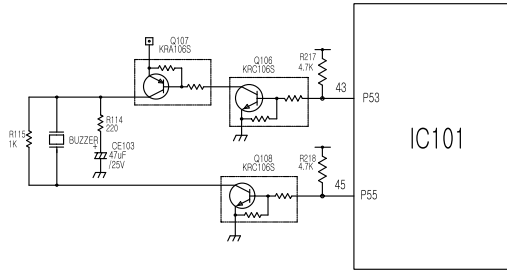
(1) Load Drive Circuit



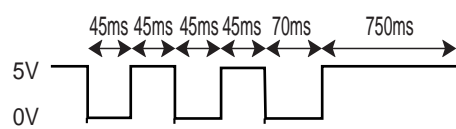
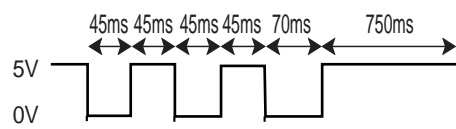
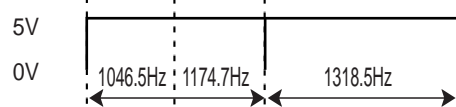
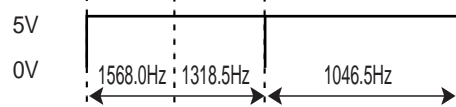


Type of Load	COMP, Mechanical Area FAN	UPPER FAN MOTOR	UPPER DEFROST HEATER	MIDDLE FAN MOTOR	MIDDLE DEFROST HEATER	MIDDLE FERMENT HEATER	LOWER FERMENT HEATER	SINGLE MOTOR DAMPER	FRONT-C HEATER
Measuring Point(IC7)	No.10	No.16	No.12	Q1 Collector	No.11	No.15	No.13	Q2 Colletor	No.14
Status	ON	Within 1V							
	OFF	11 ~ 13 V							

(2) Buzzer driving circuit (located on display PCB)

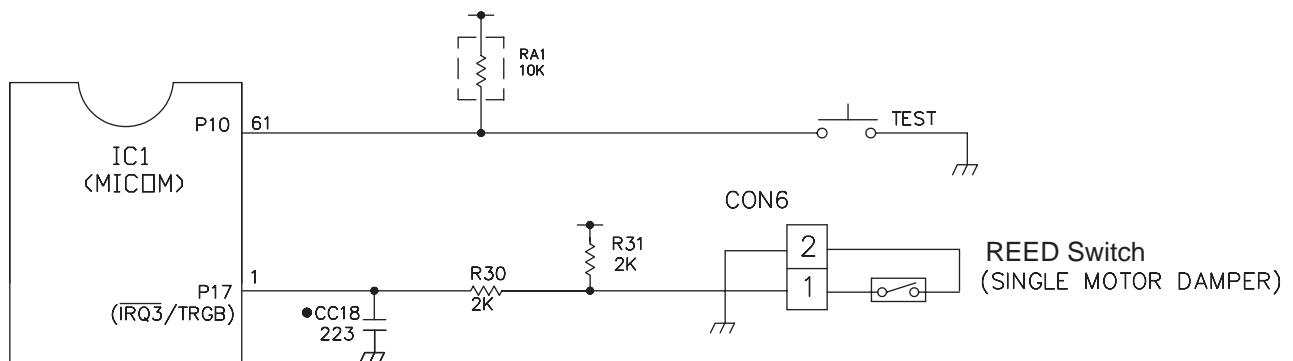
* Only the buzzer sound for the Lock/Unlock operation is shown in this SVC technical manual.



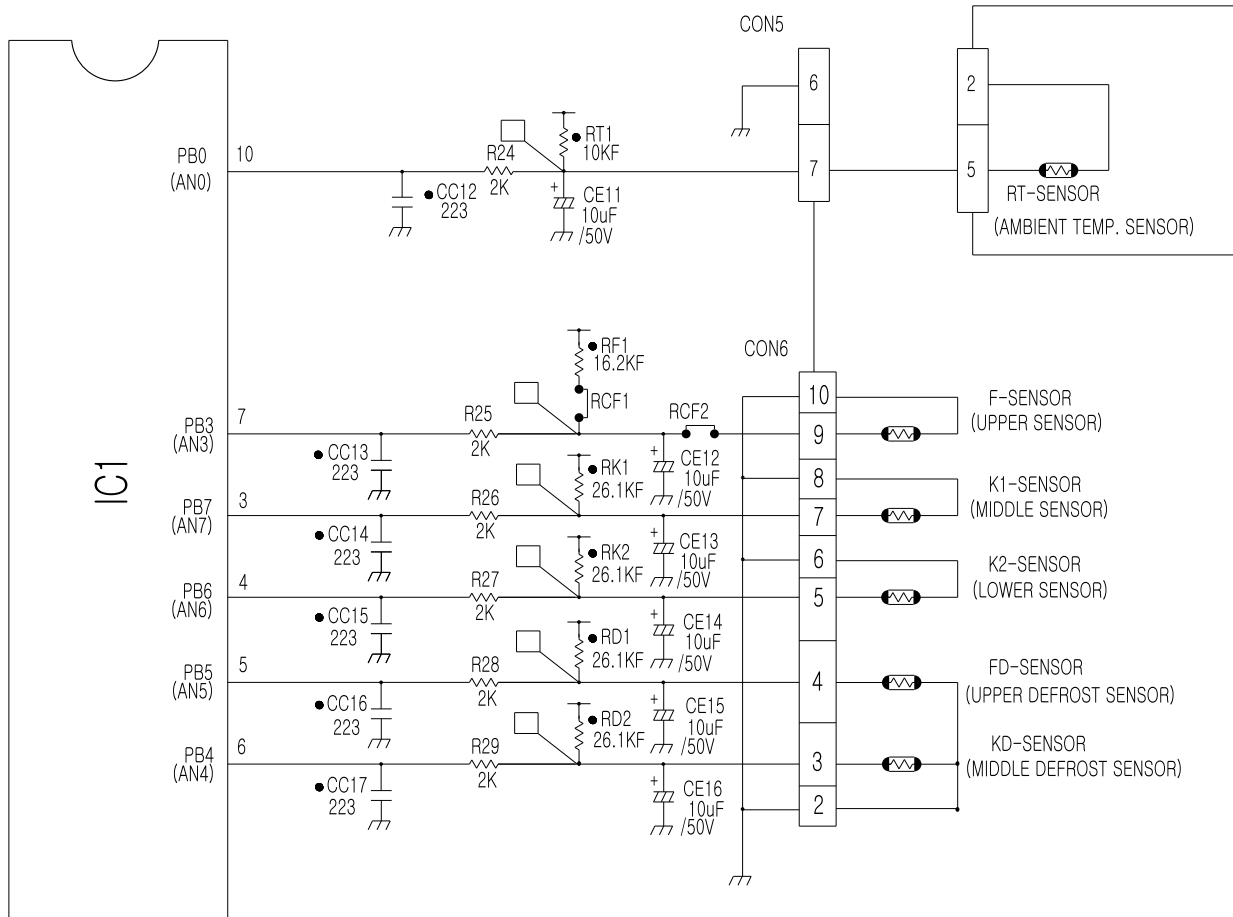
Status	Ex) Lock: "Ding-D-Dong" sound 	Ex) Lock: "Ding-D-Dong" sound 	Off
Measuring point			
IC101 (Pin 3/61)			5V
IC101 (Pin 2/62)			0V

3-2-5. SWITCH INPUT CIRCUIT

Following circuits are input circuits for detecting signal of the test switch for checking refrigerator or the reed switch of the single motor damper.



3-2-6. TEMPERATURE SENSING CIRCUIT

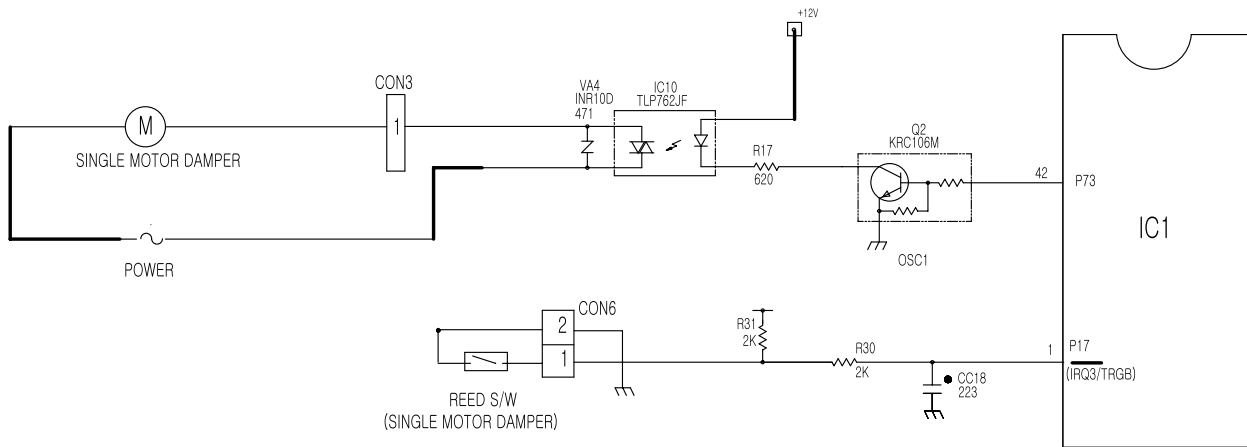


Above circuits consist of the upper sensor, middle sensor, lower sensor for adjusting setup temperature at the upper, middle and lower compartment, the ambient temperature sensor to detect ambient air temperature, the upper defrost sensor and the middle defrost sensor attached to the evaporator at the upper, middle compartment to detect the defrost return temperature. Status in short or open are as follows:

Sensor	Check points	Normal (-30 °C ~ 50 °C)	In Short	In Open
Ambient temp. Sensor	POINT ε Voltage	0.5V ~ 4.5V	0V	5V
Upper Sensor	POINT ε Voltage			
Middle Sensor	POINT ε Voltage			
Lower Sensor	POINT ε Voltage			
Upper Defrost Sensor	POINT ε Voltage			
Middle Defrost Sensor	POINT ε Voltage			

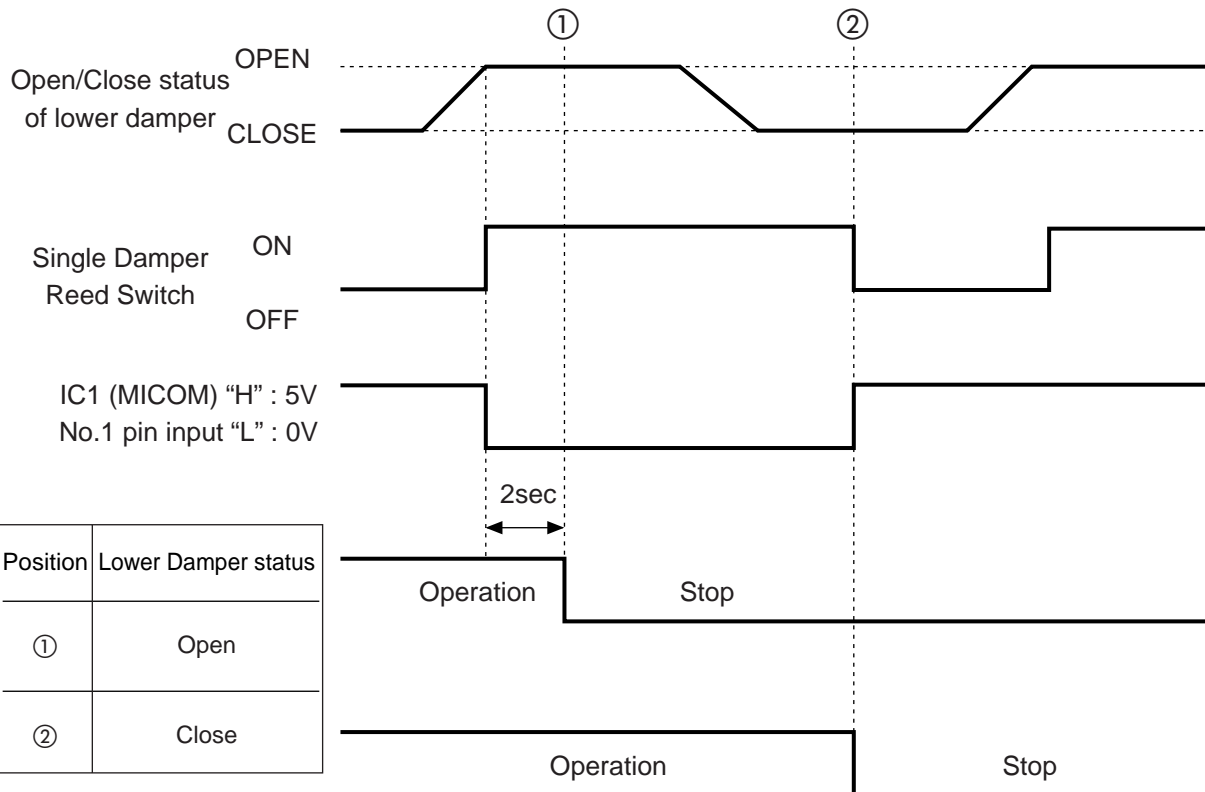
3-2-7. TEMPERATURE SENSING CIRCUIT

1. Temperature adjustment at the lower compartment consists of the circuit part for driving the damper, as electronic single motor damper, to open or close the baffle and the reed switch part to detect open/close status of the damper.
2. Drives the motor, and if there is no status change of the reed switch within 2 minutes, determines it as failure and displays as failure (See 3-1-11. Failure Diagnosis Function).
3. Rotates once for 15 seconds irrespective of temperature to detect damper status in input of initial power (initial drive inspection).



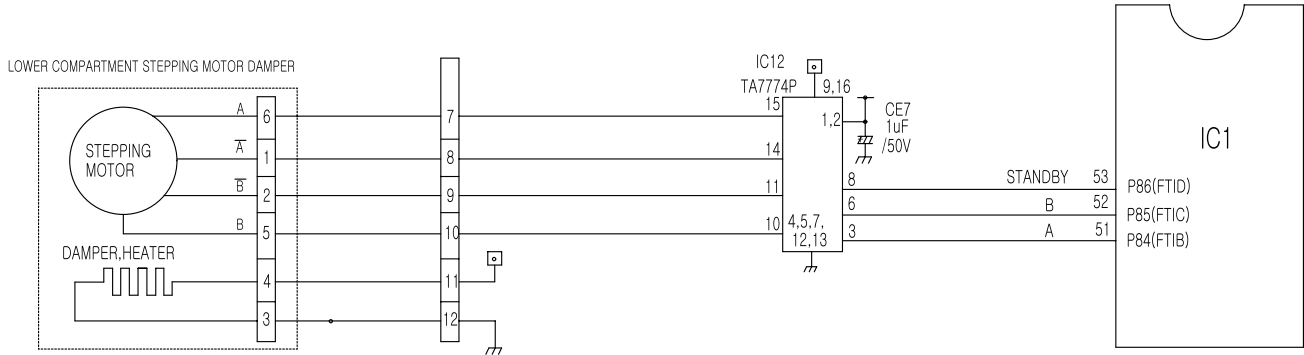
4. Open/Close of the damper, status of the reed switch and No.1 pin input of the IC1 (MICOM) are as follows:

<SINGLE MOTOR DAMPER>



► The above time is time until the single motor stops after status change of the reed switch.

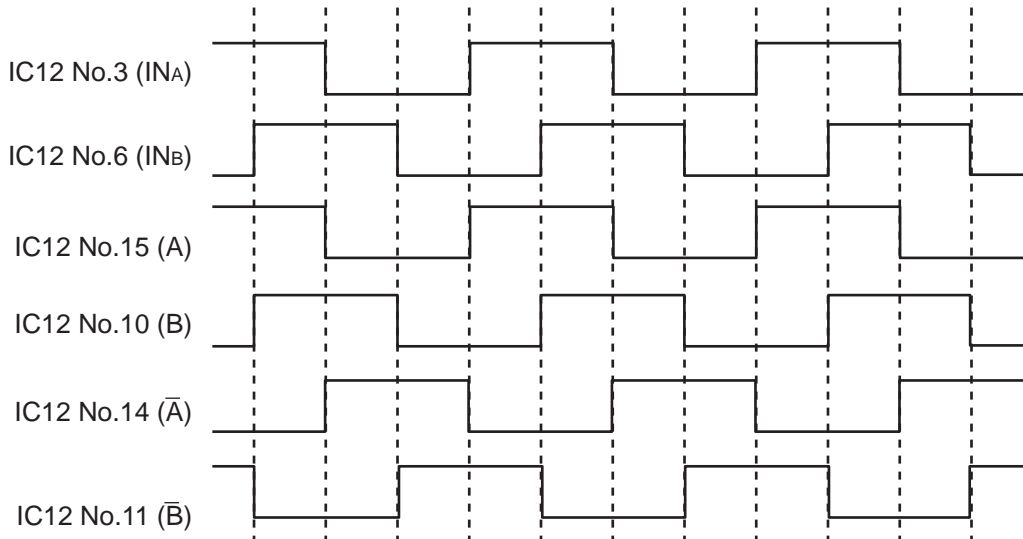
3-2-8. STEPPING MOTOR DAMPER DRIVE CIRCUIT (FOR TEMPERATURE CONTROL AT MIDDLE COMPARTMENT)



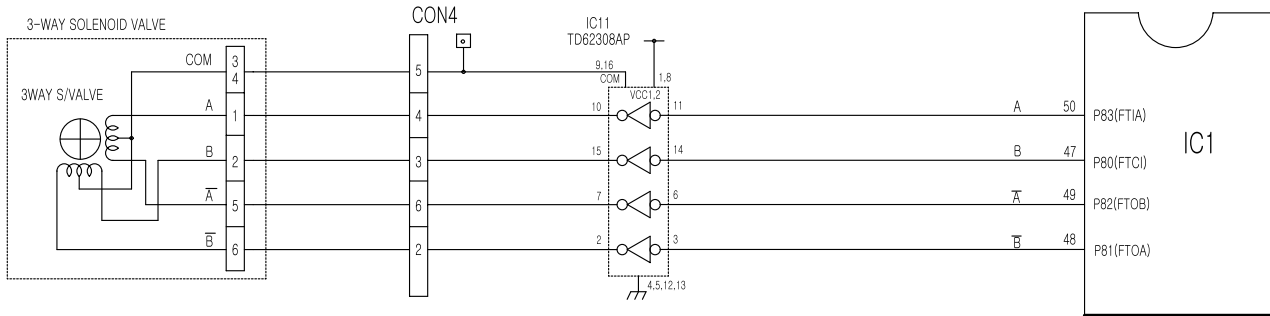
As for motor drive, the motor rotates since rotation magnetic force is formed at coils wound around each phase of the motor and the stator if outputting “High” “Low” signal as much as the fixed step numbers through the MICOM pin 51 and pin 52 after applying “High” signal to the IC 12 (TA7774P) from the MICOM pin 53.

Explanation) For driving method of the motor, send signal in the cycle of 3.33ms by using the terminal of the MICOM PIN53, 52 and 51 as shown in waveform of each part below. This signal is output to the output terminal No.10, 11, 14, 15 via the input terminal No.3, 6, 8 of the IC12 (TA7774P) as IC for motor drive. The motor rotates by which motor coils wound around each phase of the stator forms rotation magnetic field. The stepping motor damper rotates by which motor coils wound around each phase of the stator forms rotation magnetic field if inputting as figure to the input part (No.3 INA, No.6 INB) of the IC12 (TA7774P) for motor drive.

CCW (reverse rotation) ← ————— → CW (positive rotation)



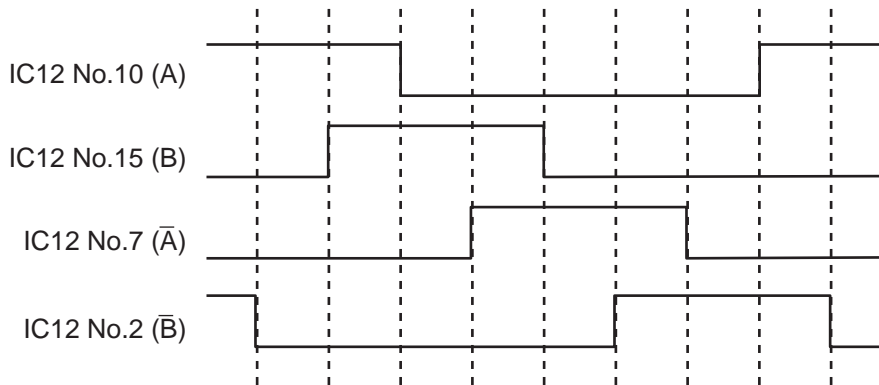
3-2-9. 3-WAY VALVE STEPPING MOTOR DRIVE CIRCUIT (FOR SWITCHING UPPER/MIDDLE/LOWER COMPARTMENT CYCLE)



As for motor drive, the motor rotates since rotation magnetic force is formed at coils wound around each phase of the motor and the stator via the IC11 (TD62308AP) as IC for motor drive if outputting “High” “Low” signal as much as the fixed step numbers from the MICOM pin 50, 47 and 48.

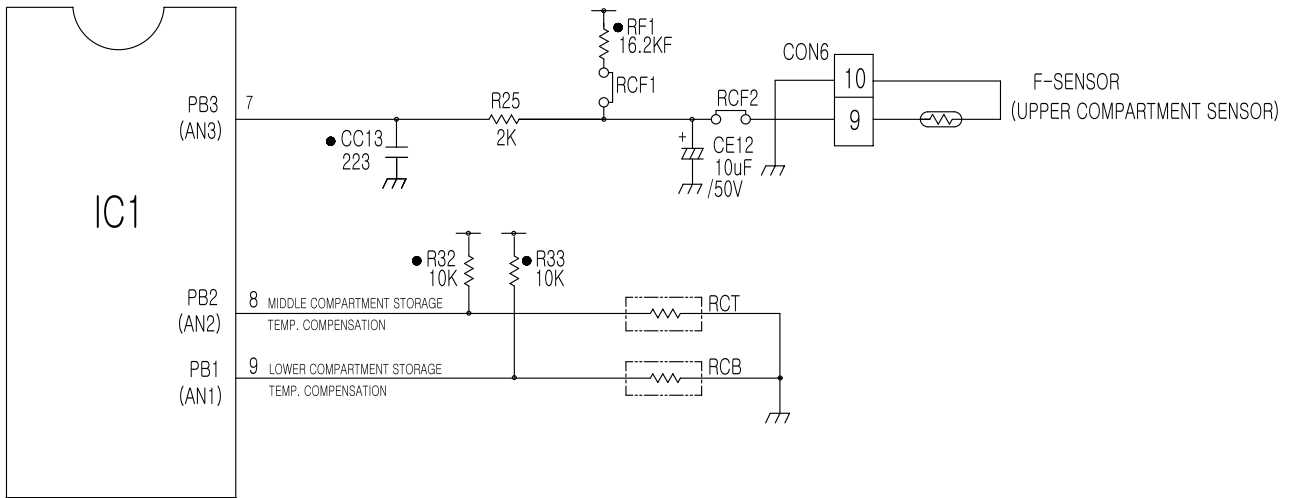
Explanation) For driving method of the motor, send signal in the cycle of 30ms by using the terminal of the MICOM PIN 50, 47, 49 and 48 as shown in waveform of each part below. This signal is output to the output terminal No.10, 15, 7, 2 via the input terminal No.11, 14, 6, 3 of the IC11 (TD62308AP) as IC for motor drive. The motor rotates by which motor coils wound around each phase of the stator forms rotation magnetic field.

CW (positive rotation) ← ————— → CCW (reverse rotation)



3-2-10. KEEPING TEMPERATURE COMPENSATION AND TOO COLD/ TOO WARM CUT COMPENSATION CIRCUIT

(1) Keeping Temperature Compensation Circuit



► This circuit is used for entering the required level of temperature compensation into MICOM to adjust keeping temperature at the upper, middle and lower compartment.

Upper Compartment		Temperature Compensation	Middle/Lower Compartment		Remarks
Resistance Value	Temperature Compensation		Resistance Value	Temperature Compensation	
RCF1	RCF2		RCT(Middle)	RCB(Lower)	
	6.2 KΩ	+2.5 °C	180 KΩ		warmer ↑
	5.1 KΩ	+2.0 °C	56 KΩ		
	3 KΩ	+1.5 °C	33 KΩ		
	2.4 KΩ	+1.0 °C	18 KΩ		
	1.2 KΩ	+0.5 °C	12 KΩ		
		0 °C	10 KΩ		Standard temperature
620 Ω		-0.5 °C	8.2 KΩ		↓ Cooler
1.2 KΩ		-1.0 °C	5.6 KΩ		
1.8 KΩ		-1.5 °C	3.3 KΩ		
2.4 KΩ		-2.0 °C	2 KΩ		
3 KΩ		-2.5 °C	470 Ω		

► Temperature compensation table by adjustment of resistance value (difference value against current temperature).

Ex) Temperature at the middle compartment increases by +1°C if changing compensation resistance at the middle compartment (RCT) from 10K (current resistance) to 18K (corrected resistance).

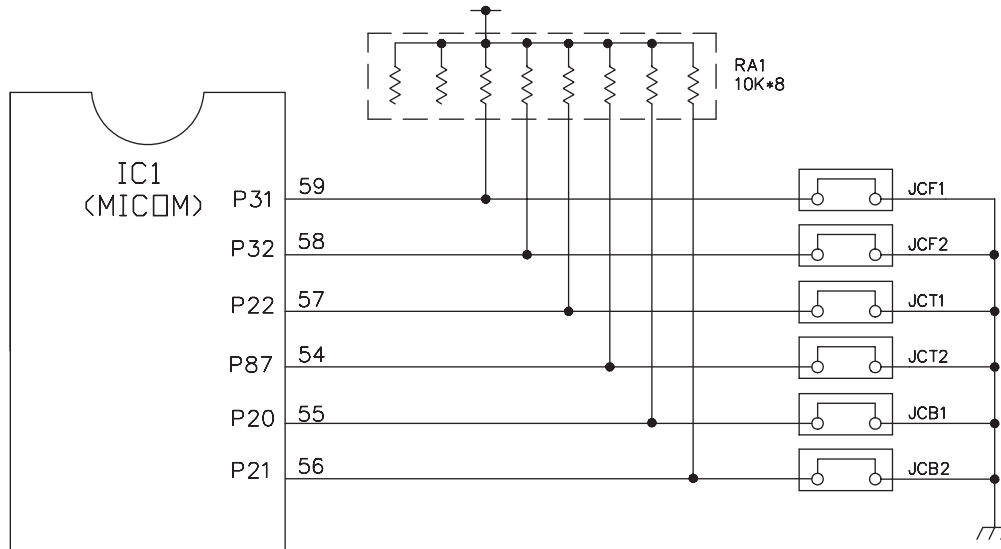
► Temperature compensation table at the upper compartment is as follows:

Division	Modification	RCF1:3 K Ω	RCF1:2.4 K Ω	RCF1:1.8 K Ω	RCF1:1.2 K Ω	RCF1:620 Ω	RCF1: $\frac{5}{8}$	RCF1: $\frac{5}{8}$	RCF1: $\frac{5}{8}$	RCF1: $\frac{5}{8}$	RCF1: $\frac{5}{8}$	RCF1: $\frac{5}{8}$
	Current	RCF2: $\frac{5}{8}$	RCF2: $\frac{5}{8}$	RCF2: $\frac{5}{8}$	RCF2: $\frac{5}{8}$	RCF2: $\frac{5}{8}$	RCF2: $\frac{5}{8}$	RCF2:1.2 K Ω	RCF2:2.4 K Ω	RCF2:3 K Ω	RCF2:5.1 K Ω	RCF2:6.2 K Ω
Upper Compartment (RCF1, RCF2)	RCF1:3 K Ω RCF2: $\frac{5}{8}$	No change	0.5 °C up	1 °C up	1.5 °C up	2 °C up	2.5 °C up	3 °C up	3.5 °C up	4 °C up	4.5 °C up	5 °C up
	RCF1:2.4 K Ω RCF2: $\frac{5}{8}$	0.5 °C down	No change	0.5 °C up	1 °C up	1.5 °C up	2 °C up	2.5 °C up	3 °C up	3.5 °C up	4 °C up	4.5 °C up
	RCF1:1.8 K Ω RCF2: $\frac{5}{8}$	1 °C down	0.5 °C down	No change	0.5 °C up	1 °C up	1.5 °C up	2 °C up	2.5 °C up	3 °C up	3.5 °C up	4 °C up
	RCF1:1.2 K Ω RCF2: $\frac{5}{8}$	1.5 °C down	1 °C down	0.5 °C down	No change	0.5 °C up	1 °C up	1.5 °C up	2 °C up	2.5 °C up	3 °C up	3.5 °C up
	RCF1:620 Ω RCF2: $\frac{5}{8}$	2 °C down	1.5 °C down	1 °C down	0.5 °C down	No change	0.5 °C up	1 °C up	1.5 °C up	2 °C up	2.5 °C up	3 °C up
	RCF1: $\frac{5}{8}$ RCF2: $\frac{5}{8}$	2.5 °C down	2 °C down	1.5 °C down	1 °C down	0.5 °C down	No change	0.5 °C up	1 °C up	1.5 °C up	2 °C up	2.5 °C up
	RCF1: $\frac{5}{8}$ RCF2:1.2 K Ω	3 °C down	2.5 °C down	2 °C down	1.5 °C down	1 °C down	0.5 °C down	No change	0.5 °C up	1 °C up	1.5 °C up	2 °C up
	RCF1: $\frac{5}{8}$ RCF2:2.4 K Ω	3.5 °C down	3 °C down	2.5 °C down	2 °C down	1.5 °C down	1 °C down	0.5 °C down	No change	0.5 °C up	1 °C up	1.5 °C up
	RCF1: $\frac{5}{8}$ RCF2:3 K Ω	4 °C down	3.5 °C down	3 °C down	2.5 °C down	2 °C down	1.5 °C down	1 °C down	0.5 °C down	No change	0.5 °C up	1 °C up
	RCF1: $\frac{5}{8}$ RCF2:5.1 K Ω	4.5 °C down	4 °C down	3.5 °C down	3 °C down	2.5 °C down	2 °C down	1.5 °C down	1 °C down	0.5 °C down	No change	0.5 °C up
RCF1: $\frac{5}{8}$ RCF2:6.2 K Ω	5 °C down	4.5 °C down	4 °C down	3.5 °C down	3 °C down	2.5 °C down	2 °C down	1.5 °C down	1 °C down	0.5 °C down	No change	

► Temperature compensation table at the middle/ lower compartment is as follows:

Division	Modification	470 Ω	2 K Ω	3.3 K Ω	5.6 K Ω	8.2 K Ω	10 K Ω	12 K Ω	18 K Ω	33 K Ω	56 K Ω	180 K Ω
	Current											
Middle Compartment (RCT)	470 Ω	No change	0.5 °C up	1 °C up	1.5 °C up	2 °C up	2.5 °C up	3 °C up	3.5 °C up	4 °C up	4.5 °C up	5 °C up
	2 K Ω	0.5 °C down	No change	0.5 °C up	1 °C up	1.5 °C up	2 °C up	2.5 °C up	3 °C up	3.5 °C up	4 °C up	4.5 °C up
	3.3 K Ω	1 °C down	0.5 °C down	No change	0.5 °C up	1 °C up	1.5 °C up	2 °C up	2.5 °C up	3 °C up	3.5 °C up	4 °C up
	5.6 K Ω	1.5 °C down	1 °C down	0.5 °C down	No change	0.5 °C up	1 °C up	1.5 °C up	2 °C up	2.5 °C up	3 °C up	3.5 °C up
	8.2 K Ω	2 °C down	1.5 °C down	1 °C down	0.5 °C down	No change	0.5 °C up	1 °C up	1.5 °C up	2 °C up	2.5 °C up	3 °C up
-----	10 K Ω	2.5 °C down	2 °C down	1.5 °C down	1 °C down	0.5 °C down	No change	0.5 °C up	1 °C up	1.5 °C up	2 °C up	2.5 °C up
Lower Compartment (RCB)	12 K Ω	3 °C down	2.5 °C down	2 °C down	1.5 °C down	1 °C down	0.5 °C down	No change	0.5 °C up	1 °C up	1.5 °C up	2 °C up
	18 K Ω	3.5 °C down	3 °C down	2.5 °C down	2 °C down	1.5 °C down	1 °C down	0.5 °C down	No change	0.5 °C up	1 °C up	1.5 °C up
	33 K Ω	4 °C down	3.5 °C down	3 °C down	2.5 °C down	2 °C down	1.5 °C down	1 °C down	0.5 °C down	No change	0.5 °C up	1 °C up
	56 K Ω	4.5 °C down	4 °C down	3.5 °C down	3 °C down	2.5 °C down	2 °C down	1.5 °C down	1 °C down	0.5 °C down	No change	0.5 °C up
	180 K Ω	5 °C down	4.5 °C down	4 °C down	3.5 °C down	3 °C down	2.5 °C down	2 °C down	1.5 °C down	1 °C down	0.5 °C down	No change

(2) Too Cold/Too Warm Cut Compensation Circuit.



Upper compartment cut compensation		Upper compartment temperature compensation value		Middle compartment cut compensation		Middle compartment temperature compensation value	Lower compartment cut compensation		Lower compartment temperature compensation value
Too cold compensation	Too warm compensation	Frozen Food	The others	Too cold compensation	Too warm compensation		Too cold compensation	Too warm compensation	
JCF1	JCF2			JCT1	JCT2		JCB1	JCB2	
CUT	<input type="checkbox"/>	+2 °C	+1 °C	CUT	<input type="checkbox"/>	+1 °C	CUT	<input type="checkbox"/>	+1 °C
<input type="checkbox"/>	CUT	-2 °C	-1 °C	<input type="checkbox"/>	CUT	-1 °C	<input type="checkbox"/>	CUT	-1 °C
CUT	CUT	0 °C	0 °C	CUT	CUT	0 °C	CUT	CUT	0 °C
<input type="checkbox"/>	<input type="checkbox"/>	0 °C (When shipping from factory)		<input type="checkbox"/>	<input type="checkbox"/>	0 °C (When shipping from factory)	<input type="checkbox"/>	<input type="checkbox"/>	0 °C (When shipping from factory)

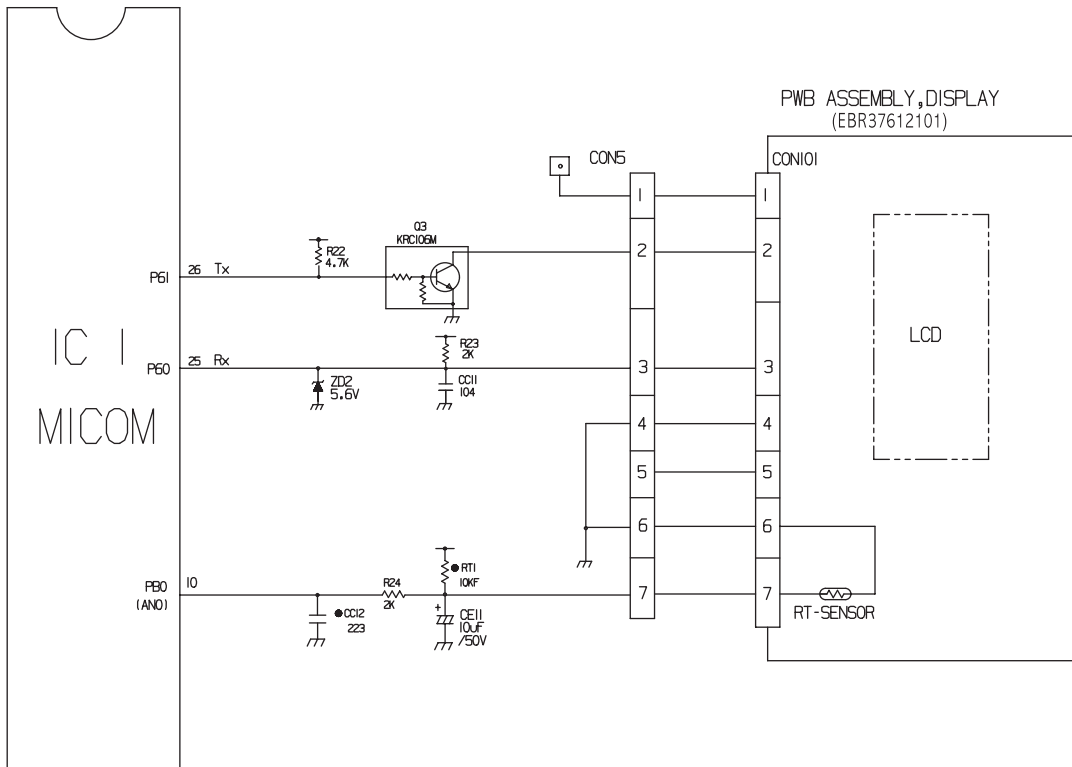
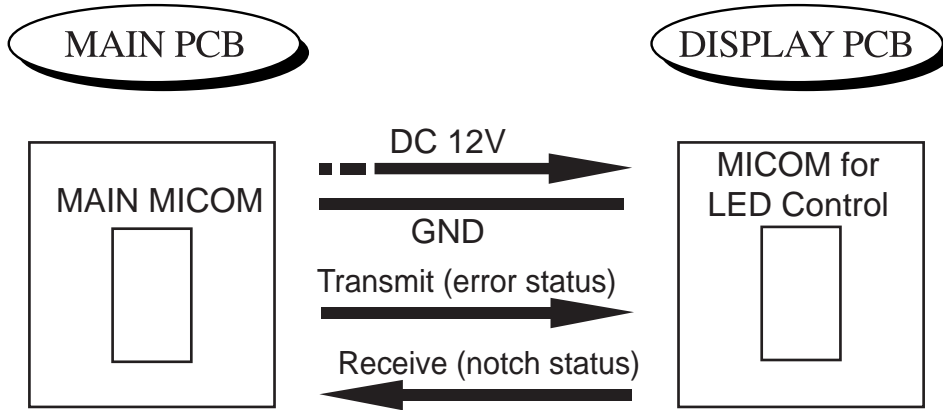
► The cut compensation circuit compensates the keeping temperature of the upper/middle/lower compartment by simply cutting it out of service for a brief period.

3-2-11. COMMUNICATION CIRCUIT BETWEEN MAIN PCB AND DISPLAY PCB

Following circuits as communication circuits are circuits for changing necessary information between the main MICOM of the main PCB and the MICOM for LED control of the display PCB.

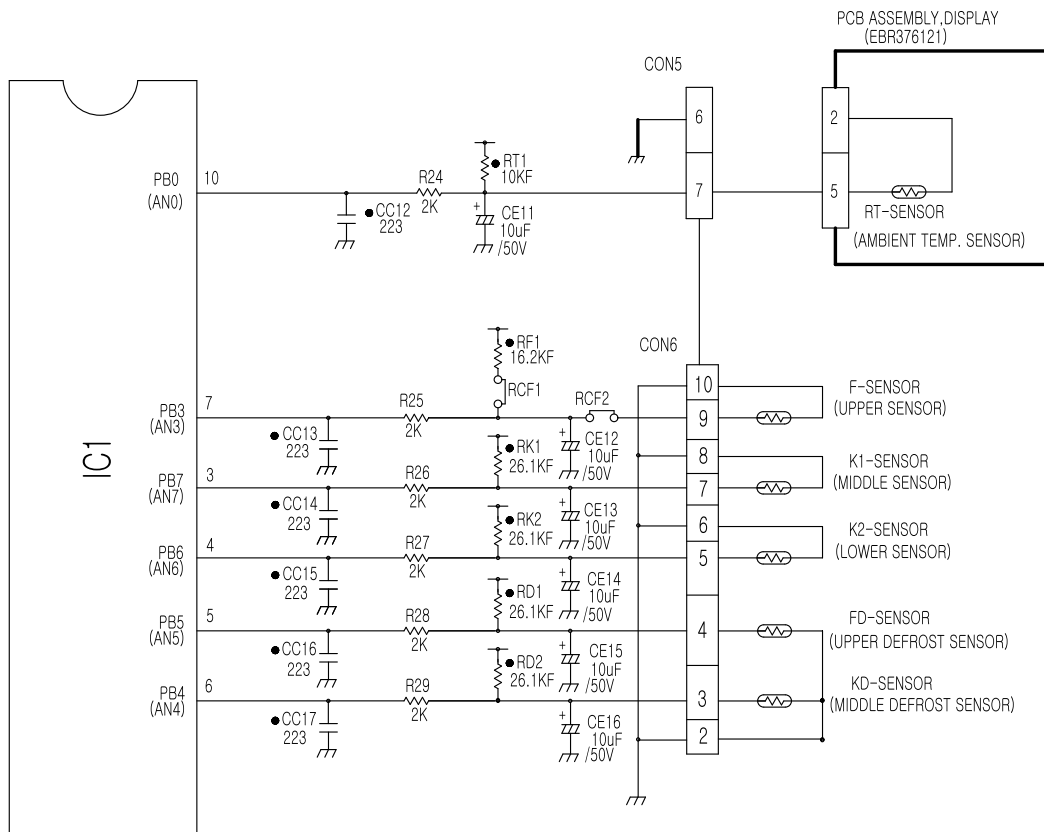
DC12V for driving the display PCB, transmit/receive circuits are required.

Poor communication occurs where continuing information change between the main MICOM of the main PCB and the MICOM for LED control of the display PCB is not done for more than 30 seconds.



3-3. SENSOR RESISTANCE CHARACTERISTICS TABLE

Measuring Temperature(°C)	Upper/Middle/Lower sensors, RT sensor, Upper/Middle defrosting sensors
-20 °C	77 KΩ
-15 °C	60 KΩ
-10 °C	47.3 KΩ
-5 °C	38.4 KΩ
0 °C	30 KΩ
+5 °C	24.1 KΩ
+10 °C	19.5 KΩ
+15 °C	15.9 KΩ
+20 °C	13 KΩ
+25 °C	11 KΩ
+30 °C	8.9 KΩ
+40 °C	6.2 KΩ
+50 °C	4.3 KΩ

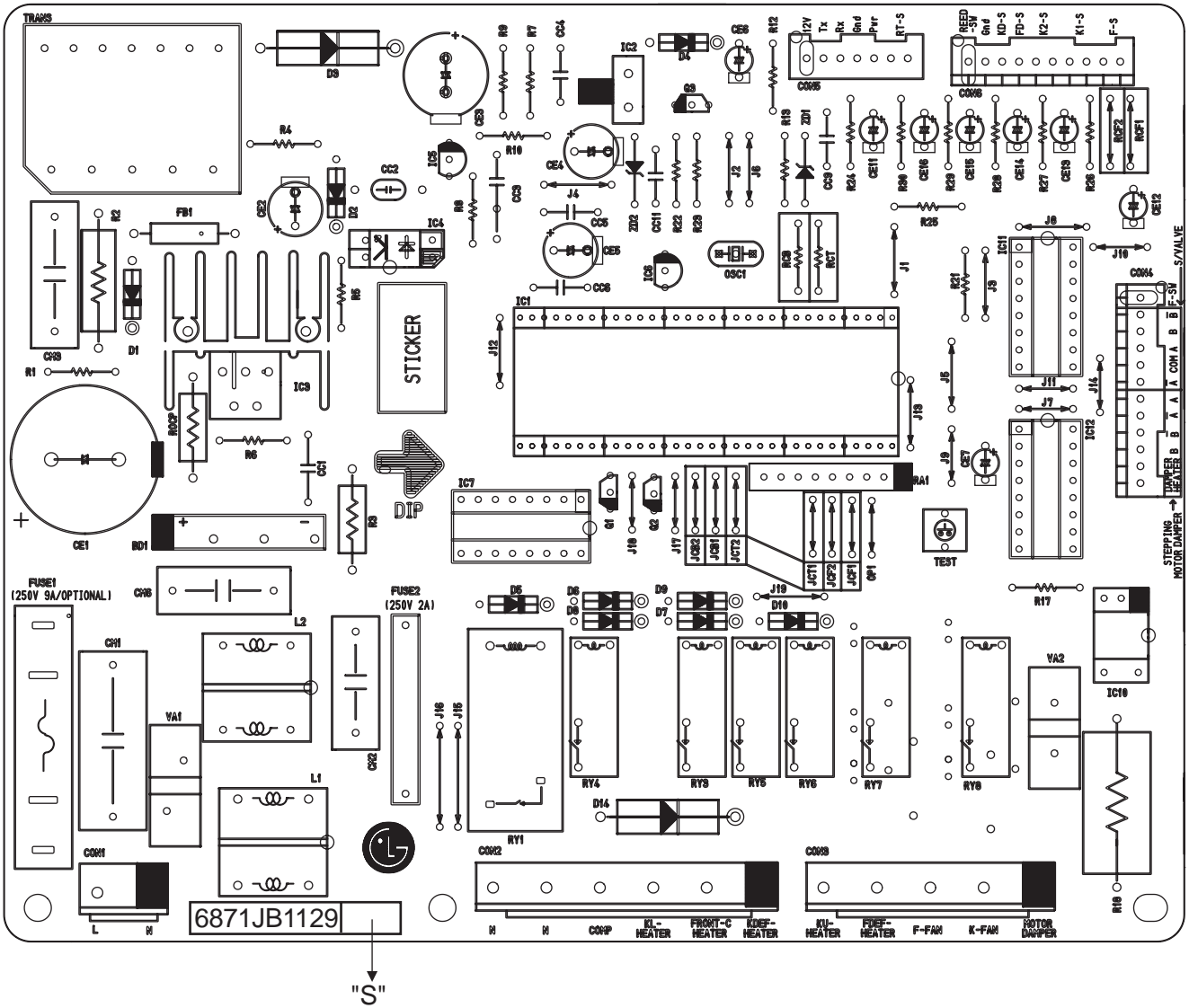


- ▶ Allowance of sensor resistance is 3%.
- ▶ Measure resistance value of sensor after leaving it for more than 3 minutes (delay is required due to sensing speed).
- ▶ Always use a digital tester! Analog testers have too great a margin of error.
- ▶ Measure resistance after separating PWB (PCB) assembly, the CON6 on the main part since the upper compartment sensor and the middle compartment sensor have no connector. Measure resistance at both ends of No.6, 7 of the CON5 for the RT-sensor. However, measure resistance at both ends of the sensor after separating barrier assembly between the middle compartment and the lower compartment for the lower compartment sensor.

3-4. PCB PARTS DIAGRAM AND LIST

3-4-1. PWB(PCB) ASSEMBLY, MAIN

(1) Parts diagram



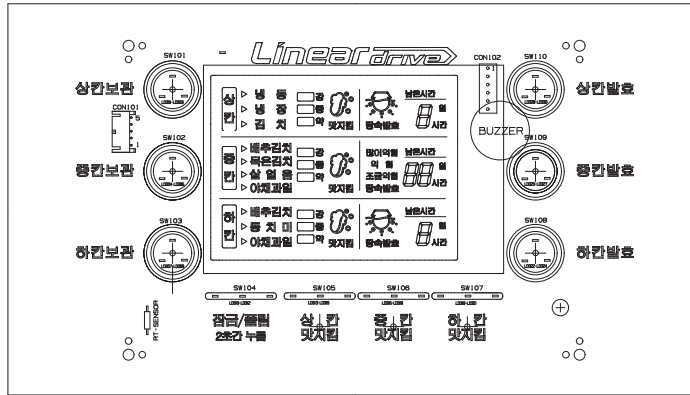
(2) Parts List

S		WORK				
08 DIOS KIMCHI MIJU 110V/50Hz		APPLICATION				
Qty	No	P/NO	DESCRIPTION	SPEC	MAKER	REMARK
1	1	6870JB8020E	PWB(PCB)	GS-PJT MAIN VER3	DOOSAN	FR1,1.6T
1	2	6630AQ9008B	CONNECTOR (CIRC),WAFER	YW396-03V 3P 3.96MM	YEONHO	CON1
1	3	6630VM01111	CONNECTOR (CIRC),WAFER	YW396-11246810V 11P 3.96MM	YEONHO	CON2
1	4	6630VM02609	CONNECTOR (CIRC),WAFER	YW396-09V(2,4,6,8) 9P 3.96MM	YEONHO	CON3
1	5	6630JB8007L	CONNECTOR (CIRC),WAFER	917790-1 AMP 12PIN 2.5	AMP	CON4
1	6	6630JB8007F	CONNECTOR (CIRC),WAFER	917785-1 AMP 7PIN 2.5M	AMP	CON5
1	7	6630JB8007J	CONNECTOR (CIRC),WAFER	917788-1 AMP 10PIN 2.5	AMP	CON6
1	8	0IKE780500W	IC,KEC	KIA7805PI - - - -	KEC	IC2
1	9	0IKE704200A	IC,KEC	KIA7042P 3P BK RESET	KEC	IC6
1	10	0IKE650030B	IC,KEC	KID65003AP "18P,SDIP"	KEC	IC7
1	11	0ITO623080C	IC,DRAWING	62308 16PIN,SDIP BK DR	TOSHIBA	IC11
1	12	0ITO777400A	IC,TOSHIBA	TA7774AP 16,SDIP BK DR	TOSHIBA	IC12
1	13	0IKE431000A	IC,KEC-	IC,KEC KIA431 3PIN TP	KEC	IC5
1	14	0IPMGNE001A	IC,POWER MANAGEMENT	PS2561-1 NEC4P,DIP BK=TLF76	NEC	IC4
1	15	0ITO762000A	IC,TOSHIBA	TLP762JF 6P,DIP(LF2) B	TOSHIBA	IC10
1	16	6212BA3041A	RESONATOR,CERAMIC	CSTLS4M00G53-A0 MURATA	MURATA	OSC1
1	17	6102W5V007A	VARIATOR	SVC331D-14A	SAMHWA	VA1
1	18	6102W5V007A	VARIATOR	SVC331D-14A	SAMHWA	VA2
3	19	6920000001A	RELAY	ALE15B12 MATSUSHITA 250V	MATSUSHITA	RY1,7,8
		6920JB2005B	RELAY	G5JS-1A-NT OMRON 250VAC	OMRON	
		6920JB2005C	RELAY	DH1U II DEC 250VAC 16A	DEC	
		EBB35235101	RELAY	OMIH-SS-112LM OEG AC240V DC12V	OEG	
		EBB40294801	RELAY	DH12D1-0-II AC250V DC12V	DAIICHI	
4	20	6920JB2003D	RELAY	G5NB-1A-E(JAPAN) 250VAC 5A 12VDC	OMRON	RY3,4,5,6
		6920JB2003E	RELAY	G5NB-1A-E(CHINA) 250VAC 5A 12VDC	OMRON	
3	21	0TR106009AF	TRANSISTOR	KRC 106M KEC	KEC	Q1,2,3
1	22	0DB360000AA	DIODE,BRIDGE	D3SBA60 BK SHINDENGEN	SHINDENGEN	BD1
1	23	0DRDE00024A	DIODE,RECTIFIERS	FR304 DELTA TP52 DO201A-	DELTA	D3
1	24	0DR107009AA	DIODE,RECTIFIER	FR107 TP DELTA DO41 10	DELTA ,PYUNGCHANG	D1
1	25	0DR154080AA	DIODE,RECTIFIER	1N5408 BK DELTA DO201A	DELTA	D14
1	26	0DD400409AC	DIODE,RECTIFIER	RECT1N4004 TP	DELTA	D5
6	27	0DD414809AD	DIODE	1N4148 PNONEC TP52 DON	ROHM	D2,6,7,8,9,10
1	28	0DZMR00029A	DIODE,ZENERS	1N5232B MOTORORA TP DO	DELTA	ZD2
1	29	0IPMGSK001A	IC,POWER MANAGEMENT	STR-G6351L SANKEN 5PIN	SANKEN	IC3
1	30	0CE4762V8E0	CAPACITOR,FIXED ELECT	47UF HE 450V 20% BULK	SAM HWA	CE1
1	31	0CE687YH6E0	CAPACITOR,FIXED ELECT	680UF RX 25V 20% BULK	SAM HWA	CE3
2	32	0CE2276F638	CAPACITOR,FIXED ELECT	220UF SMS,SG 16V 20% F	RUBICON,SAMHWA	CE4,5
1	33	0CE226ZK638	CAPACITOR,FIXED ELECT	22UF YXA 50V 20% FM5 TP	RUBICON,SAMHWA	CE2
1	34	0CE1056K638	CAPACITOR,FIXED ELECT	1UF SMS,SG 50V 20% FM5	RUBICON,SAMHWA	CE7
6	35	0CE106AK638	CAPACITOR,AL.ELECTROL	10UF KM TYPE 50V M FM5	RUBICON,SAMHWA	CE11-16
1	36	0CK47418670	CAPACITOR,POLYESTER	0.47UF D 275V M M/PP N	PILKO	CM1
1	37	0CQ22418670	CAPACITOR,FIXED FILM	0.22UF D 275V M M/PP N	PILKO	CM2
1	38	0CF4731Y470	CAPACITOR,POLYESTER	0.047UF D 630V 0.05 BULK M/PP	PILKOR	CM3
1	39	0CQ22418670	CAPACITOR,FIXED FILM	0.22UF D 275V M M/PP N	SAM HWA	CM6
8	40	0CK223DK96A	CAPACITOR,FIXED CERAM	22NF 2012 50V 80%,-20%	MURATA	CC10,CC12-18
1	41	0CG2220U630	CAPACITOR,CERAMIC,RADIAL	SD2G222M12BW1, 2200PF 20% 400V Y5U	SAMHWA	CC2
3	42	0CK1040K949	CAPACITOR,FIXED CERAM	0.1UF D 50V 80%,-20% F	TAE YANG	CC5,6,11
1	43	0CK2230H908	CAPACITOR,CERAMIC (HI	22000PF D 25V 80%,-20%	TAE YANG	CC4
2	44	0CK104DK94A	CAPACITOR,FIXED CERAM	100NF 2012 50V 80%,-20	MURATA	CC7,8
1	45	0CK4710K519	CAPACITOR,CERAMIC (HI	470PF 50V K B TA52	TAE YANG	CC1
1	46	6104JB8001B	RESISTOR,DRAWING	RA 1/4W 9A 10K J	SMART	RA1
1	47	0CK1040K949	CAPACITOR,FIXED CERAM	0.1UF D 50V 80%,-20% F	SAM HWA	CC3
1	48	0RS3303J609	RESISTOR,FIXED METAL	330K OHM 1 W 5% TA52	SMART	R3
1	49	0RS5602K641	RESISTOR,FIXED METAL	56K OHM 2 W 5.00% F20	SMART	R2
1	50	0RS0121J609	RESISTOR,FIXED METAL	1.2 OHM 1 W 5% TA52	SMART	ROCP
1	51	0RN9101G409	RESISTOR,FIXED METAL	9.1K OHM 1/4 W 1.00% T	SMART	R9
1	52	0RN2201G409	RESISTOR,FIXED METAL	2.2K OHM 1/4 W 1.00% T	SMART	R10
1	53	0RD1002G609	RESISTOR,FIXED CARBON	10K OHM 1/4 W 5.00% TA	SMART	RCT
1	54	0RD1000G609	RESISTOR,FIXED CARBON	100 OHM 1/4 W 5% TA52	SMART	R4
1	55	0RD6200G609	RESISTOR,FIXED CARBON	620 OHM 1/4 W 5.00% TA	SMART	R17
1	56	0RD6800G609	RESISTOR,FIXED CARBON	680 OHM 1/4 W 5.00% TA	SMART	R6
9	57	0RD2001G609	RESISTOR,FIXED CARBON	2K OHM 1/4 W 5.00% TA5	SMART	R21,23-30

S	WORK					
08 D/OCS KIMCHI MUJU 110V/50Hz	APPLICATION					
	Qty	No	P/NO	DESCRIPTION	SPEC	MAKER
1	58	ORD4701G609	RESISTOR, FIXED CARBON	4.7K OHM 1/4 W 5.00% T	SMART	R22
1	59	ORD1004G609	RESISTOR, FIXED CARBON	1M OHM 1/4 W 5.00% TA5	SMART	R1
1	60	ORD6801G609	RESISTOR, FIXED CARBON	6.8K OHM 1/4 W 5.00% TA52	SMART	R5
1	61	ORD1501G609	RESISTOR, FIXED CARBON	1.5K OHM 1/4 W 5% TA52	SMART	R7
2	62	ORD2001E672	RESISTOR, FIXED CARBON	2K OHM 1/8 W 5% 2012 R	SMART, ROHM	R20,31
1	63	ORD4701E672	RESISTOR, FIXED CARBON	4.7K OHM 1/8 W 5% 2012	SMART, ROHM	R11
2	64	ORD1002E672	RESISTOR, FIXED CARBON	10K OHM 1/8 W 5% 2012	SMART, ROHM	R32,33
1	67	ORD1004E672	RESISTOR, FIXED CARBON	1M OHM 1/8 W 5% 2012 R	SMART, ROHM	R19
1	68	ORD1002E472	RESISTOR, FIXED CARBON	10K OHM 1/8 W 1% 2012	SMART, ROHM	RT1
4	69	ORD2612E472	RESISTOR, FIXED CARBON	26.1K OHM 1/8 W 1% 201	SMART, ROHM	RK1,2, RD1,2
1	68	ORD2612E472	RESISTOR, FIXED CARBON	26.1K OHM 1/8 W 1% 201	SMART, ROHM	RF1
1	69	ORD1501G609	RESISTOR, FIXED CARBON	1.5K OHM 1/4 W 5% TA52	SMART	R8
1	70	6210JB8001A	CORE (CIRC), BEAD	BFS3510A0 SAMWHA 35X10	SAM HWA	FB1
1	71	6600RRT001W	SWITCH, TACT	THVV502GAA POSTECH 12V	POSTEC	TEST
1	72	6200JB8003A	FILTER(CIRC), NOISE	3A 3MH 250V CV430030 A	TNC	L1
1	73	6200JB8007X	FILTER(CIRC), NOISE	UV11-05320 TNC BK 0.5A 32	TNC	L2
1	74	0FM9001B621	FUSE, NON TIME DELAY 1	9000MA 250 V 6.3X31.8	SAMJU	FUSE1
2	75	6901JB8001A	FUSE ASSY, HOLDER	KORE-PJT N/S	SAMJU	FUSE HOLDER
1	76	0FZZJB3001A	FUSE	250V 2A SLOW-BLOW LIT	SAMJU	FUSE2
1	77	6170JB2010B	TRANSFORMER, SMPS[COIL	A3-PJT 12.5V 1A	SAM IL	TRANS
10	78	43607015	WIRE, JUMP	GC10 WHITE T0.6 L10 FO	10MM	J1-6,8,12,13,20
1	79	43607015	WIRE, JUMP	GC10 WHITE T0.6 L10 FO	10MM	RCF1
1	80	43607015	WIRE, JUMP	GC10 WHITE T0.6 L10 FO	10MM	RCF2
7	81	43607015	WIRE, JUMP	GC10 WHITE T0.6 L10 FO	8MM	J7,9,10,11,14,17,18
6	82	43607015	WIRE, JUMP	GC10 WHITE T0.6 L10 FO	8MM	JCF1,2, JCT1,2, JCB1,2
1	83	43607015	WIRE, JUMP	GC10 WHITE T0.6 L10 FO	8MM	OP1
2	84	43607015	WIRE, JUMP	GC10 WHITE T0.6 L10 FO	15MM	J15,16
1	85	43607015	WIRE, JUMP	GC10 WHITE T0.6 L10 FO	25MM	R18
1	86	4920JB3007A	HEAT SINK	23.3*17*25 DRIVE IC ST	TAE SUNG	STR ASSEMBLY
2	87	1SBF0302418	SCREW TAP TITE(S), BIN	+ D3.0 L8.0 MSWR3/FZY	-	STR ASSEMBLY
3,09	88	49111001	SOLDER, SOLDERING	SOLDER(ROSIN WIRE)RSO	HUISUNG, DAEJIN	-
		SS0000008AA	SOLDER, SOLDERING	SR-34 PB FREE, LFM-48	HUISUNG	-
25g	89	49111004	SOLDER, SOLDERING	H63A	-	-
		SSWZU-L05AA	SOLDER, SOLDERING	LFM-38, SN 3.0AG-0.5CU%	HUISUNG	-
1,50	90	59333105	FLUX	SG:0.825-0.830 KOREA F	KOKI	-
		7245ZB0004A	FLUX	SV-PBF-06 KSK 12.5 WT%	-	-
1	91	SAA33004201	S/W, SYSTEM PROGRAM	HD6473644P 64P, SIDP BK	HITACHI	IC1(PROGRAM-C/S:3586)
1	92	0IZZJB2012A	IC, MICROCONTROLLER	HD6473644P 64P, SIDP BK	HITACHI	IC1(OTP)

3-4-2. PWB(PCB) ASSEMBLY, DISPLAY [STANDARD]

(1) Parts diagram



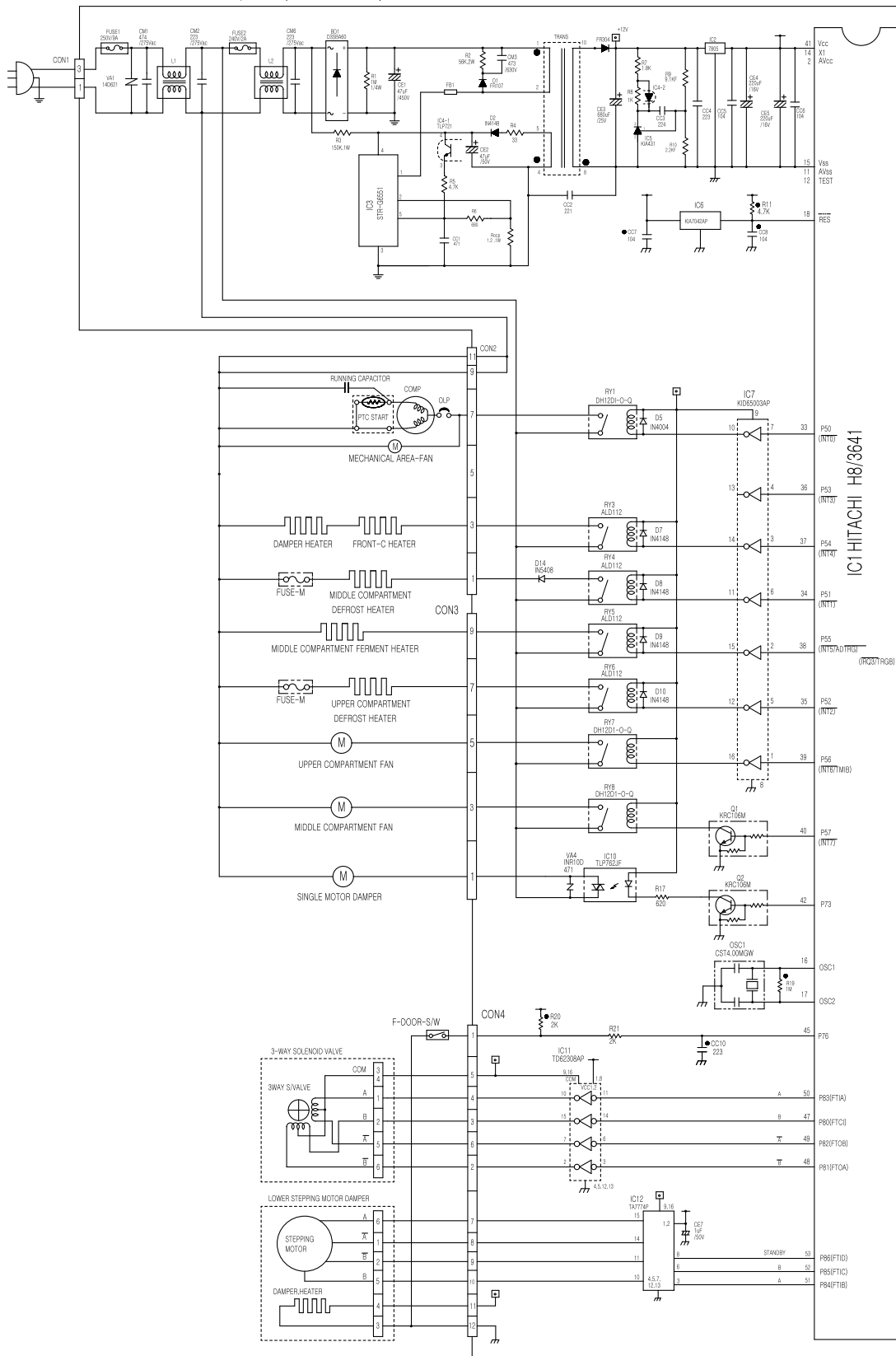
(2) Parts List

Q1	WORK	Q7 INFINITY3 LCD APPLICATION	Qty	No	P/NO	DESCRIPTION	SPEC	MAKER	REMARK
			1	1	EAX37910901	PWB(PCB)	Q7 INFINITY3-PJT DIQS KIMCHI LCD QUANTUM Ver 4.5 5.0	SAMHO	FR4
			1	2	EAJ39765601	LCD,Panel-TN	HK2923A 0.7INCH 100X12 0CD MONO	JINGHWA(KONECS)	LCD Glass
			1	3	-	REFLECTOR	HIPS	ILSAN	Reflector
			1	4	-	DIFFUSION SHEET	MTN-WX5(47.25*164MM)	KIMOTO	TRANSMISSION RATIO 66%
			1	5	-	BEF	THIN BRIGHT ENHANCE FILM (Thickness : 0.062 mm)	3M	
			1	6	-	DIFFUSION STRUCTURE	LC1500	IDEMITSU	TRANSMISSION RATIO 92%
			1	7	8630AQ9159D	CONNECTOR (CIRC),WAFER	SMAW250-05(WH) YEONHO 2.5MM ANGLE TYPE	YEON HO	CON101
			1	8	8630JB8004E	CONNECTOR (CIRC),WAFER	SMW250 6P 2.50MM 1R STRAIGHT DIP BK WHITE	YEON HO	CON102
			1	9	EAJ398871304	IC,DRAWING	TMP86FS28FG 80P FLASH TRAY INFINITY3-PJT	TOSHIBA	IC101
			2	10	ISTL00120A	IC,STANDARD LOGIC	QT1080-1SG QUANTUM 32P, SSOP TRAY TOUCH SENSOR IC	QUANTUM	IC201,202
			1	11	ICE476VF6DC	CAPACITOR, FIXED ELECTR	47UF MV 25V 20% R/TP(SMD) SMD	SAMHWA.RUBYCON	CE101,103
			1	12	ICE107VF6DC	CAPACITOR, FIXED ELECTR	100UF MV 16V 20% R/TP(SMD) SMD	SAMHWA.RUBYCON	CE102
			1	13	ICK105DK94A	CAPACITOR, CERAMIC,CHIP	1UF -20T+80% 50V Y5V -30T+85C 2012 TP	SAMHWA.RUBYCON	CE104
			1	14	ICE106VK6DC	CAPACITOR, FIXED ELECTROLYTIC	10UF MV 50V 20% R/TP(SMD) SMD	SAMHWA.RUBYCON	CE201
			1	15	8212B83245A	RESONATOR,CERAMIC	CSTCR4M00353-R0 MURATA 4.0MHz +/- 0.5% T/R SMD	MURATA	OSC101
			2	16	IPMGKE028A	IC,STANDARD LOGIC	KIA78L05F KEC 3PIN SOT-89 R/TP 5V 150MA REGULATOR	KEC	IC102,105
			1	17	ISTLKE003A	IC,STANDARD LOGIC	KIA7042AF KEC SOT-89 TP RESET IC	KEC	IC103
			1	18	IRH934600D	IC,ROHM	BR93L46RF-W 8PIN SOP BK EEPROM -	ROHM	IC104
			1	19	IGS934660D	IC,SGS-THOMSON	M93C46-WMN6T 8PIN TP AUTO RESTART SMD	ST	
			10	19	MAK30070801	BAR	CASTING STEEL STS 304 SILVER T3.0 L15 8pin	AD SEMICON	SW101-110
			10	20	ADX30067803	BASKET ASSEMBLY	L218-258 none / 5.5*5.5(15)	AD SEMICON	SW101-110(T5)
			6	21	MEG31736301	HOLDER,BUTTON	MOLD PP PP SP/WHITE T2.0 TRINITY3-PJT 15mm	ILSAN	SW101-103,108-110
			1	22	MBG39387502	HOLDER,BUTTON	MOLD PP PP BLACK T2.0 INFINITY3-PJT 15mm	ILSAN	SW104-107
			17	23	ICK104DK94A	CAPACITOR, FIXED CERAMI	100NF 2012 50V 80% -20% X7R R/TP F(Y5V)	MURATA	CC101,113, 127,128,201, 129
			14	24	ICK103DK96A	CAPACITOR, FIXED CERAMIC(HIGH)	0.01UF 2012 50V 80% -20% X7R R/TP	MURATA	CC115-124,126, 302,303,307
			3	25	ICK682DH56A	CAPACITOR, FIXED CERAMIC(HIGH)	C2012X7R1E682KT 6800p 10% 25V X7R -55T+125C 2012 TP	MURATA	CC300,305,309
			2	26	DCH1123K566	CAPACITOR, FIXED CERAMIC(HIGH)	C2012X7R1H123KT 12nF 10% 50V X7R -55T+125C 2012 TP	MURATA	CC301,308
			1	27	EAE36240601	CAPACITOR, FIXED CERAMIC(HIGH)	GRM2192C1H562JA01D 5.6nF 5% 50V X7R -55T+125C 2012 R/TP	MURATA	CC304
			1	28	DCH1153K566	CAPACITOR, FIXED CERAMIC(HIGH)	0805B153K500CT 15nF 10% 50V X7R -55T+125C 2012	MURATA	CC306
			22	29	ORJ1002E672	RESISTOR, METAL GLAZED(CHIP)	10K OHM 1/8 W 5% 2012 R/TP	ROHM	R201-212,334-343
			1	30	ORJ2200E672	RESISTOR, FIXED CARBON	220 OHM 1/8 W 5% 2012 R/TP	ROHM	R114
			2	31	ORJ1001E672	RESISTOR, FIXED CARBON	1K OHM 1/8 W 5% 2012 R/TP	ROHM	R102,115
			3	32	ORJ2001E672	RESISTOR, FIXED CARBON	2K OHM 1/8 W 5% 2012 R/TP	ROHM	R101,106,181
			32	33	ORJ4701E672	RESISTOR, FIXED CARBON	4.7K OHM 1/8 W 5% 2012 R/TP	ROHM	R103,104,116-119,123-132,143-146,150-159,217,218
			2	34	ORJ2702E672	RESISTOR, METAL GLAZED(CHIP)	27K OHM 1/8 W 5% 2012 R/TP	ROHM	R121,161
			3	35	ORJ1502E672	RESISTOR, METAL GLAZED	15K OHM 1/8 W 5% 2012 R/TP	ROHM	R105,120,160
			3	36	ORH2701L622	RESISTOR, FIXED CARBON	2.7K OHM 1/8 W 5% 2012 R/TP	ROHM	R108-110
			1	37	ORJ1004E672	RESISTOR, FIXED CARBON	1M OHM 1/8 W 5% 2012 R/TP	ROHM	R113
			1	38	ORJ1201E472	RESISTOR, METAL GLAZED	1.2K OHM 1/8 W 1% 2012 R/TP	ROHM	R107
			10	39	ORJ4700E672	RESISTOR, FIXED CARBON	470 OHM 1/8W 5% 2012 R/TP	ROHM	R133-142
			3	40	ORJ1000E672	RESISTOR,CHIP	100 OHM 5% 1/8W 2012 R/TP	ROHM	R147,148,149
			4	41	ORJ0622G676	RESISTOR,CHIP	330 OHM 5% 1/4W 3216 R/TP	ROHM	R171-174
			10	42	ORH2201L622	RESISTOR, METAL GLAZED(CHIP)	2.2K OHM 1 / 8 W 2012 5.00% D	ROHM	R324-333
			16	43	ORJ1004E672	RESISTOR, FIXED CARBON	1M OHM 1/8 W 5% 2012 R/TP	ROHM	R304-311, R314-321
			8	44	EAV38867001	LED	SIDE-VIEW WHITE SMD LED (WE LANK)	LGIT	LD101-108
			30	45	EAV35984201	LED	HARVATEK HT-1938P5 0603(1608) REEL TAPING WHITE	HARVATEK	LD301-330
			1	46	ODZRM00188A	DIODE,ZENERS	RLZ ROHM R/TP LDO5(LL-34) 500MMW 5.6V 20MA PF	SEUL-SEMICON	LD301-330
			1	47	DISTLKE004A	IC,STANDARD LOGIC	KRA108S KEC SOT-23 TP TRANSISTOR	KEC	ZD101
			14	48	DISTLKE005A	IC,STANDARD LOGIC	KRC108S KEC SOT-23 TP TRANSISTOR	KEC	Q107
			1	49	DISTLKE006A	IC,STANDARD LOGIC	KTA1298 KEC SOT-23 TP TRANSISTOR	KEC	Q101,103,106,108,110-119
			1	50	8908JB8003A	BUZZER,PIEZO CERAMIC	BM-20B BUJEON PIEZO 4KHZ 85DB	BUJEON	Q102
			1	51	8908JB3002G	BUZZER,PIEZO CERAMIC	CBE2240BP DAE YOUNG PIEZO 4KHZ 90DB(CHINA)	DAE YOUNG	BUZZER
			1	51	8500JB3001A	SENSOR,TEMPERATURE	RT_SENSOR JAMES-TEC COMBI PCB	JAMES TECH	RT-SENSOR
			0.4g	52	SS000008AA	SOLDER,SOLDERING	SR-34 PB FREE, LFM-48	HEESUNG	
			3.5g	53	SS0000019AA	METAL CREAM	LFM-48W TM-TS PB FREE HEESUNG METAL CREAM SN+3.0AG+0.5CU%	HEESUNG	

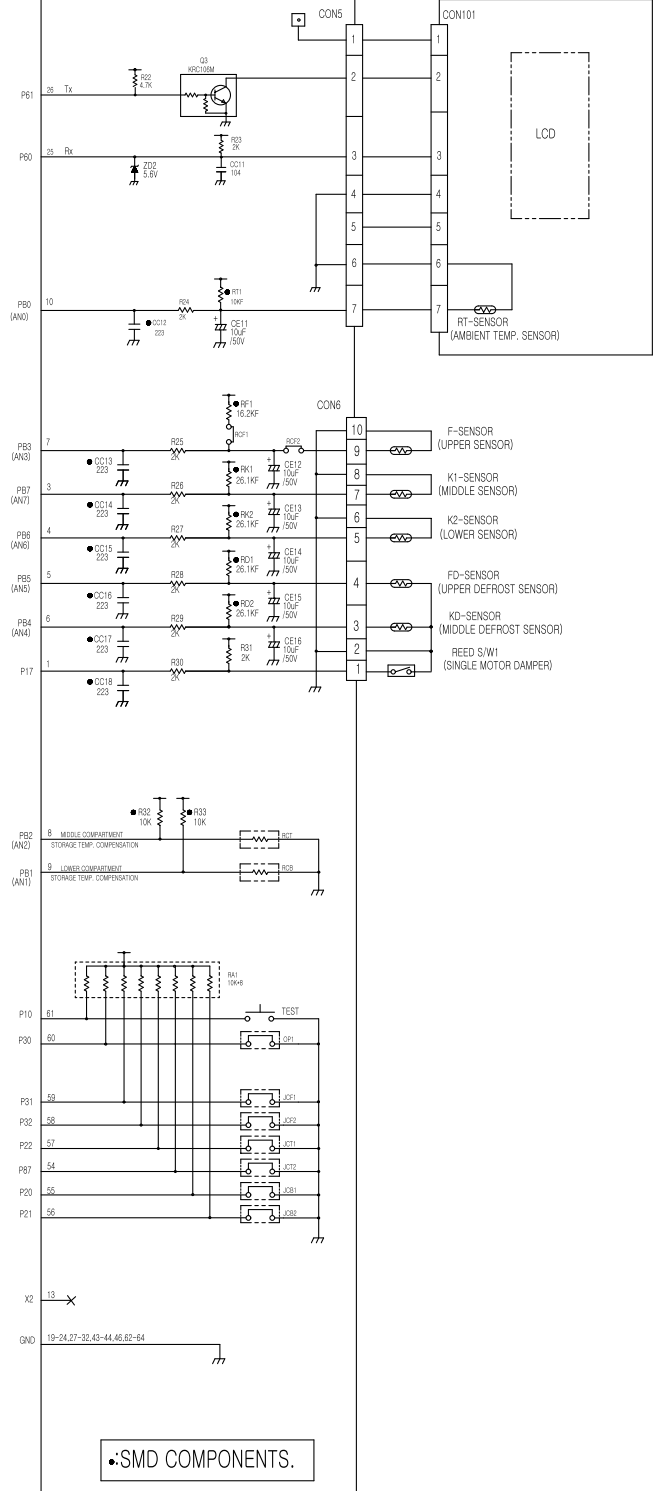
3-5. PCB CIRCUIT DIAGRAM – PCB CIRCUIT DIAGRAM MAY CHANGE DEPENDING ON SITUATION.

3-5-1. PWB (PCB) ASSEMBLY, MAIN CIRCUIT DIAGRAM (LED MODULE TYPE)

PWB ASSEMBLY,MAIN (6871JB1129S)

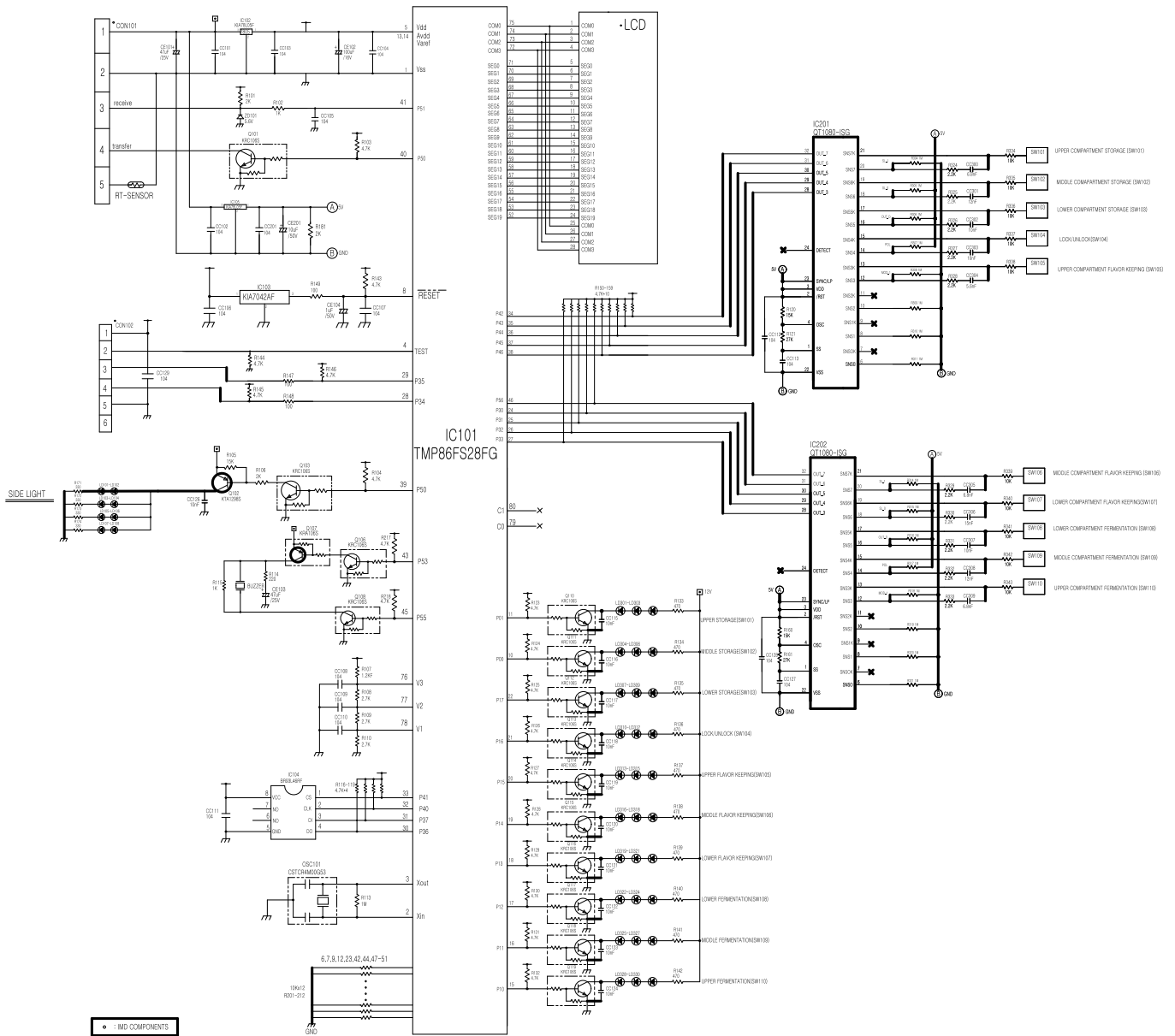


PWB ASSEMBLY, DISPLAY
(EBR37612101)



•SMD COMPONENTS.

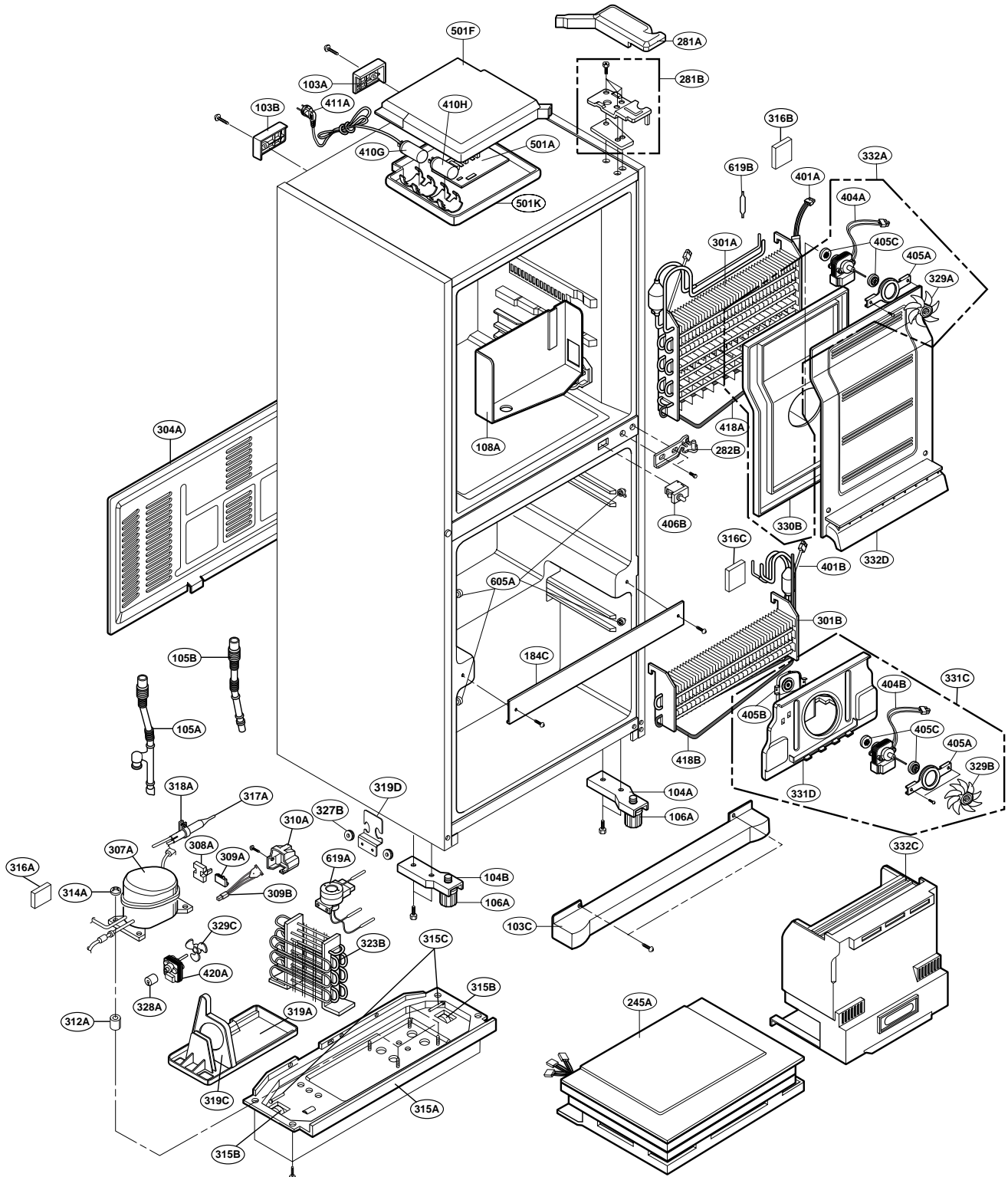
3-5-2. PWB (PCB) ASSEMBLY, DISPLAY CIRCUIT DIAGRAM



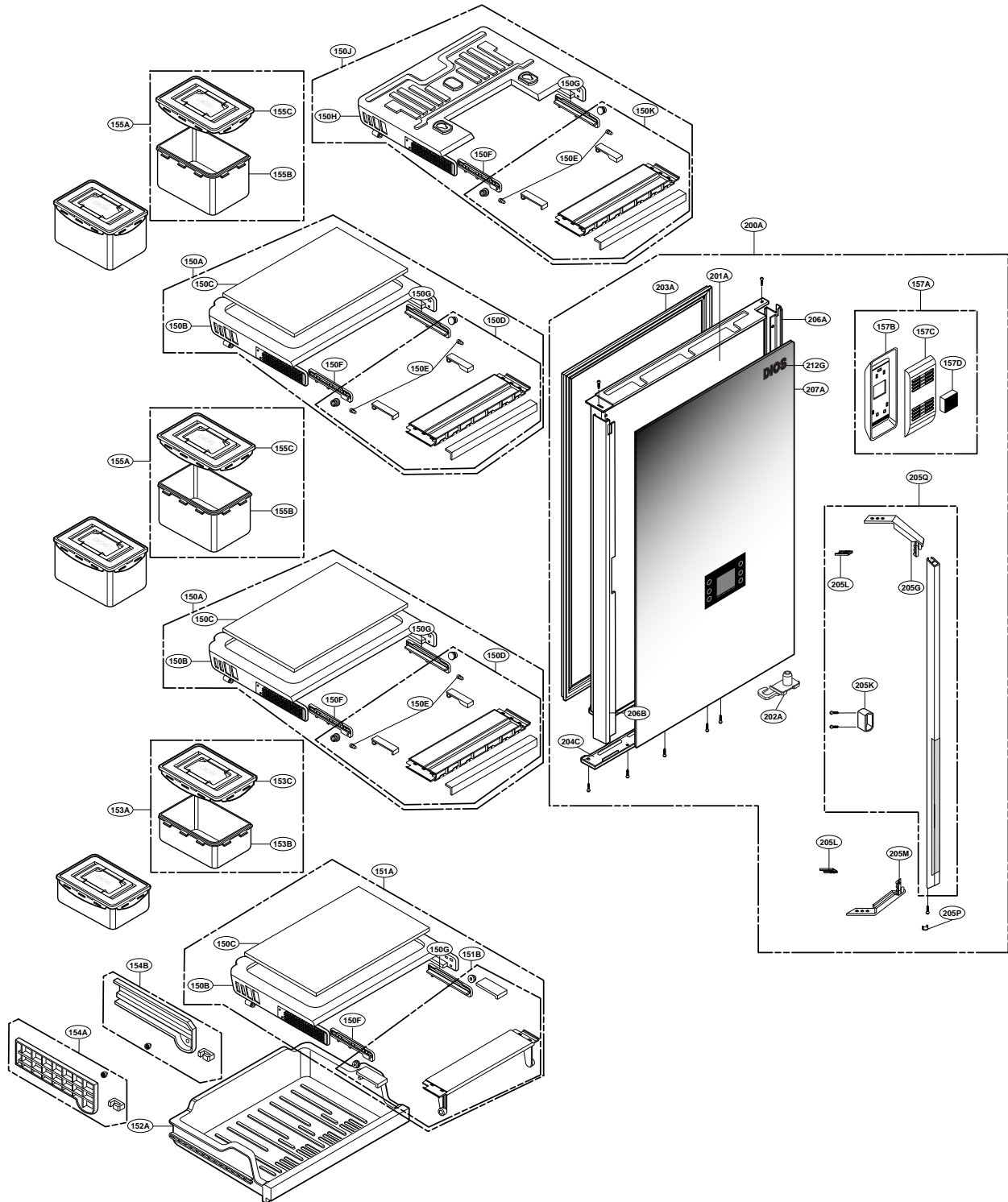
4. EXPLODED VIEW AND SERVICE PARTS LIST

4-1. EXPLODED VIEW

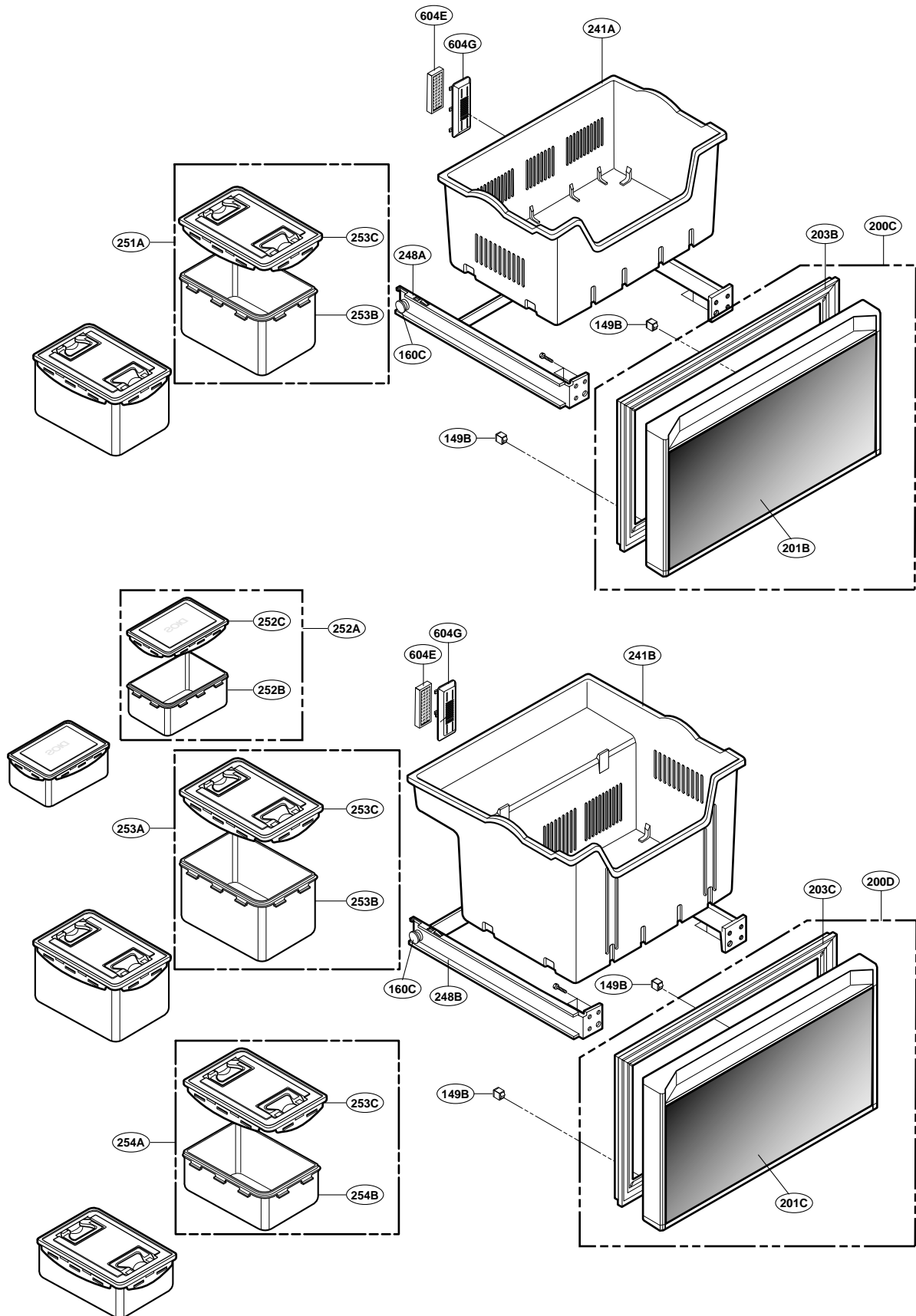
► GR-J303UG



► GR-J303UG



► GR-J303UG





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