4. TROUBLESHOOTING

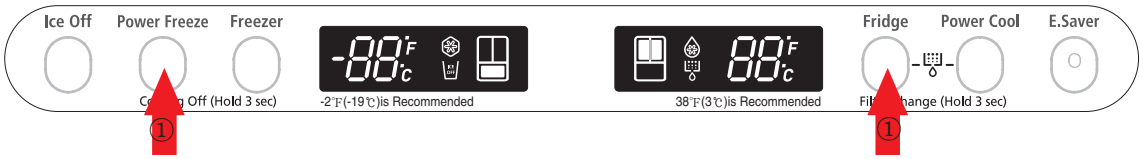
TROUBLESHOOTING

4-1) Function for failure diagnosis

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

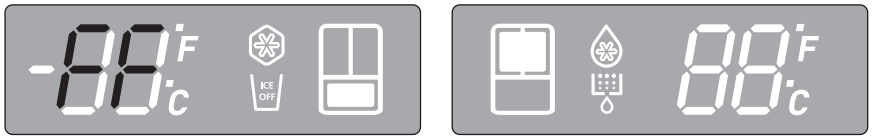
- If Power Freeze & Fridge temperature control Key on the front of panel are pressed simultaneously for 8 seconds , it will be changed to the test mode and all displays on the front of panel will be off.
- If any key on the front of panel is pressed within 15 seconds after the test mode, it will be operated as below sequence :
  manual operation(fresh food compartment) ↔manual defrost of fresh food compartment(rd) ↔ manual defrost of fresh food and freezer compartments (Fd) ↔Cancel(Display all off).
- If any key on the front of panel is not pressed within 15 seconds after the test mode, the test mode will be canceled and it will be returned to previous mode.

1) Manual operation function



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

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



1-2) If manual operation is selected, comp will run at once without 5 minutes delay in any mode. If the refrigerator is on the defrost cycle at the moment, defrost will be finished and manual operation will begin.
(Be careful if manual operation get started at the moment of comp off, over load could be occurred)

1-3) If manual operation works, comp & f-fan operate continuously for 24 hours and fresh food compartment will be controlled by the setting temperature.

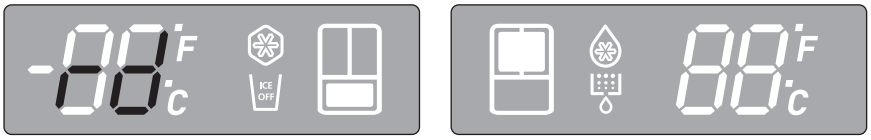
1-4) When the manual operation runs, setting temperature will be selected automatically as below: freezer compartment -14℉(-25℃), fresh food compartment 33.8℉(1℃).

1-5) During manual operation, Power Freeze & Power Cool function will not be worked.
If a function is selected, the power function icon of the selected function will be off automatically after 10 seconds.

1-6) Manual operation can be canceled during manual operation by turning on the appliance after power off(reset) or choosing the step 4) test cancel mode.

1-7) Alarm(0.25 sec ON/ 0.75 sec OFF) will beep continuously until manual operation is completed and there is no function to make the sound stop.

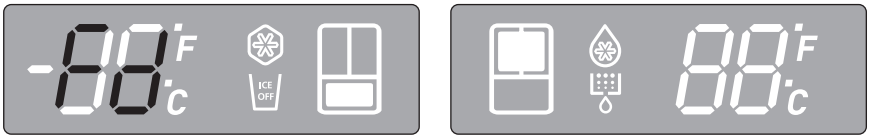
2) Manual defrost(fresh food compartment) function



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

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

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



3-1) If any key is pressed one more time during manual defrost(defrost of fresh food compartment, "rd"), "Fd" shows on the display and then fresh food and freezer compartments defrost will operate.
Manual defrost of Fresh food and freezer compartments are followed by manual defrost freezer compartment.

3-2) At this moment, alarm beeps for 3 seconds (0.5 sec ON/ 0.5 sec OFF) during manual defrost function of fresh food and freezer compartment.

4) Test cancel mode

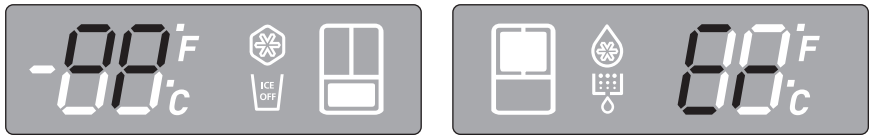
4-1) During defrosting of fresh food and freezer compartments simultaneously, if the display panel change to the test mode and test button is pressed one more time, defrosting of fresh food and freezer compartments will be canceled at the same time and will return to the normal operation.
Or, all test functions will be canceled by turning main power ON again after it OFF.

4-1-2. Display function of Communication error

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

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

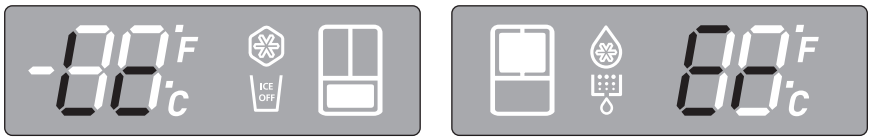
(0.5 sec ALL ON, 0.5 sec ALL OFF alternately)



2) Display function when MAIN ↔LOAD MICOM communication has error

2-1) If there is no answer for 20 seconds after the main micon received the requirement of communication from load MICOM, "Lc - Er" display on the panel PCB will be ON/OFF alternately until the communication error is canceled.

(0.5 sec ALL ON, 0.5 sec ALL OFF alternately)



2-2) Also pantry room display will be ON/OFF alternately until the communication error is canceled.

(0.5 sec ALL ON, 1.5 sec ALL OFF alternately)

4-1-3. Self-diagnostic function

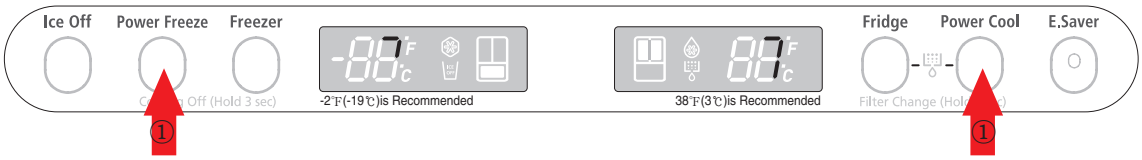
1) Self-diagnostic function in the Initial power ON

1-1) Micom operates self-diagnostic function to check the temperature sensor condition within 1 second when the refrigerator turned On initially.

1-2) If bad sensor is detected by the self-diagnostic function, the applicable display LED will blink for 0.5 sec.
At this moment, there is no beep sound.(Refer to self-diagnostic CHECK LIST)

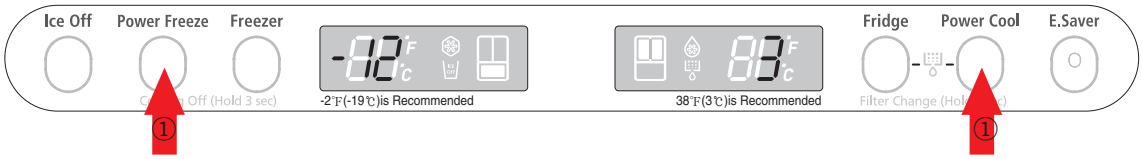
1-3) Self-diagnostic button is recognized only when the error is displayed by the bad sensor. Display does not operate normally but temperature control will be controlled by the emergency operation.

1-4) When the error is detected by self-diagnosis, the error can be canceled automatically if all troubled sensors are corrected or Self-diagnostic function key (Power Freeze + Power Cool) are pressed simultaneously for 8 seconds.
(Return to normal display mode)



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

2) Self-diagnostic function during normal operation



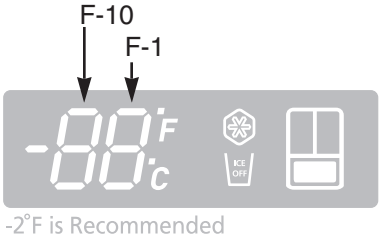
2-1) If Power Freeze + Power Cool Key are pressed simultaneously for 6 seconds during normal operation, the temperature setting display will operate for 2 seconds (ON/OFF 0.5sec each).
If Power Freeze + Power Cool Key are pressed simultaneously for 8 seconds (including above 2 seconds), self-diagnostic function will be selected.

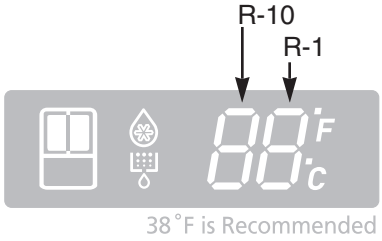
2-2) At this moment, self-diagnostic function will be returned with buzzer sound 'ding-dong'. If there is an error, display of error will be operated for 30 seconds and then return to normal condition whether problem is corrected or not.
(Refer to self-diagnosis CHECK LIST)

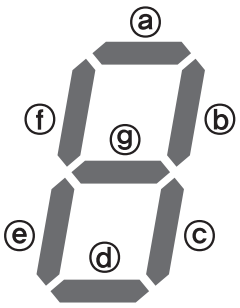
2-3) Input by button is not accepted during self-diagnostic function.

∗ Self-diagnosis CHECK LIST

NO	Trouble item	Display LED	Trouble contents
1	Ice Maker Sensor Error	R-1-ⓐ	ICE MAKER SENSOR part error
2	R-Sensor Error	R-1-ⓑ	FF SENSOR part error
3	R-DEF-Sensor Error	R-1-ⓒ	FF defrost SENSOR part error
4	R-FAN Error	R-1-ⓓ	FF inner fan motor part error
5	Ice Maker Error	R-1-ⓔ	ICE MAKER operation error
6	R-DEF.Error	R-1-ⓖ	FZ defrost part error
7	Ambient-Sensor Error	F-1-ⓐ	External SENSOR part error
8	F-Sensor Error	F-1-ⓑ	FZ SENSOR part error
9	F-DEF-Sensor Error	F-1-ⓒ	FZ defrost SENSOR part error
10	F-FAN Error	F-1-ⓓ	FZ inner fan motor part error
11	C-FAN Error	F-1-ⓔ	Machine room fan motor part error
12	F-DEF. Error	F-1-ⓖ	FZ defrost part error
13	Pantry-Damper-Heater Error	R-10-ⓐ	Damper Heater open/wire error
14	Pantry-Sensor Error	R-10-ⓑ	Pantry Room SENSOR part error
15	Panel↔Main MICOM communication Error	F-10-ⓖ	Panel↔Main MICOM communication error
16	L↔M communication Error	F-10-ⓕ	LOAD↔Main MICOM communication error





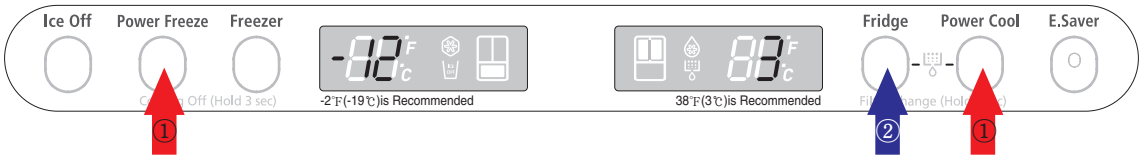


TROUBLESHOOTING

∗ Self-diagnostics check list

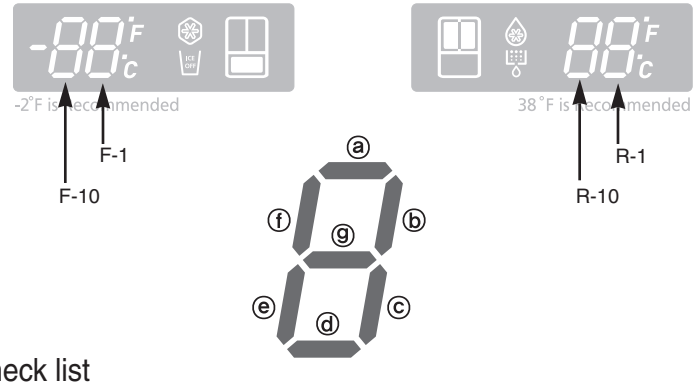
LED	Item	Trouble contents	Diagnostic method
R-1-ⓐ	Ice Maker Sensor Error	Display error : separation of sensor housing part, contact error, disconnection, short circuit Display error of detecting temperature of sensor: more than 149℉ (+65°C) or less than -58℉(-50°C)	When checking the voltage of MAIN PCB CN90 #3↔CN90#4 : shall be between 4.5V~1.0V.
R-1-ⓑ	R-Sensor Error		When checking the voltage of MAIN PCB CN30#6↔CN75#1:shall be between 4.5V~1.0V
R-1-ⓒ	R-DEF-Sensor Error		When checking the voltage of MAIN PCB CN30#7↔CN75#:shall be between 4.5V~1.0V
R-1-ⓓ	R-FAN Error	Display error during operation of applicable fan motor : Feed Back signal line contact error, separation of motor wire, motor error	Voltage of MAIN PCB CN75 Orange ↔Gray shall be between 7V~12V
R-1-ⓔ	Ice Maker Error	Display error : ice making kit is harvested more than 3 times and level error ** Apply to the applicable Ice Maker model.	After replacing ice maker, check the operation by turning the appliance ON again.
R-1-ⓖ	R-DEF. Error	Display error : separation of fresh food compartment defrost heater housing part, contact error, disconnection, short circuit or temperature fuse error. Display error : the defrosting does not finish though fresh food compartment defrost is heating continuously for more than 80 minutes.	After separating MAIN PCB CN70,CN71 from PCB, check the resistance value between CN70 White ↔CN71 Orange shall be 102(441) ohm ± 7%. (Resistant value is varied by the input power) Check 0 Ohm : heater short, ∞Ohm : wire / bimetal Open.
F-1-ⓐ	Ambient-Sensor Error	Display error : sensor housing separation, contact error, disconnection, short circuit Display error by detecting temperature of sensor: more than 149℉(+65°C) or less than -58℉(-50°C)	When checking the voltage of MAIN PCB CN32#1↔#4 : shall be between 4.5V~1.0V.
F-1-ⓑ	F-Sensor Error		When checking the voltage of MAIN PCB CN30#3↔CN75#1:shall be between 4.5V~1.0V
F-1-ⓒ	DEF-Sensor Error		When check the voltage of MAIN PCB CN30#4↔CN75#1:shall be between 4.5V~1.0V
F-1-ⓓ	F-FAN Error	Display error during operation of applicable fan motor : Feed Back signal line contact error, motor wire separation, motor error	Voltage of MAIN PCB CN75 Yellow ↔Gray shall be between 7V~12V.
F-1-ⓔ	C-FAN Error	Display error during operation of applicable fan motor : Feed Back signal line contact error, motor wire separation, motor error	Voltage of MAIN PCB CN75 Sky-blue ↔Gray shall be between 7V~12V.
F-1-ⓖ	F-DEF. Error	Display error : separation of freezer compartment defrost heater housing part , contact error, disconnection, short circuit or temperature fuse error. Display error : the defrosting does not finish though fresh food compartment compartment defrost is heating continuously for more than 70 minutes.	After separating MAIN PCB CN70,CN71 from PCB, check the resistant value between CN70 brown ↔CN71 Orange shall be 102(220) ohm ± 7%. (Resistant value is varied by input power) Check 0 Ohm : heater short, ∞ Ohm : wire / bimetal Open.
R-10-ⓐ	Pantry-Damper-Heater Error	Display error when open error is detected by damper heater : separation of Damper Heater housing part, contact error, disconnection, short circuit	After separating MAIN PCB CN91from PCB, check the resistant value between Black ↔brown wire shall be 145 ohm ± 7%. Check 0 Ohm : heater short, ∞ Ohm : wire / bimetal Open.
R-10-ⓑ	Pantry-Sensor Error	Display error : separation of sensor housing, contact error, disconnection, short circuit. Display error by detecting temperature of sensor: more than 149℉(+65°C) or less than -58℉(-50°C)	When checking the voltage of MAIN PCB CN30#8 ↔#9 : shall be between 4.5V~1.0V.
F-10-ⓖ	Panel↔Main communication Error	Display "oP/LC-Er" in the panel with alarm : MICOM MAIN ↔LOAD communication error MICOM MAIN ↔PANEL communication error LC-Er is displayed when the Option is not equivalent with the right value	Actually, it is desirable to recheck the condition with the oscilloscope after replacing Main and Panel PCB.
F-10-ⓕ	Load↔Main communication Error		

4-1-4. Display function of Load condition



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

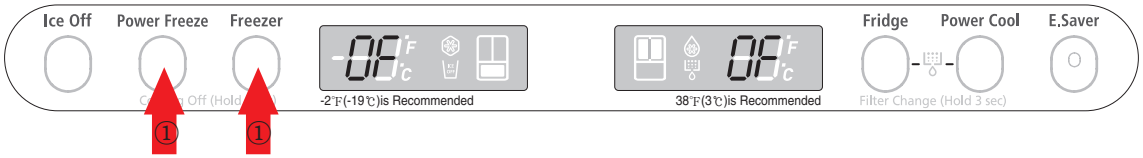
1) If Power Freeze Key + Power Cool Key are pressed simultaneously for 6 seconds during normal operation, the temperature setting display of fresh food and freezer compartments will blink ALL ON/OFF with 0.5 for 2 seconds.
2) At this moment, If Fridge Key after Power Freeze Key + Power Cool Key is pressed, load condition display mode will be returned with alarm.
3) Load condition display mode shows the load that micom signal is outputting.
However, It means that micom signal is outputting, it does not mean whether load is operating or not. That is to say that though load operation is displayed, load could not be operated by actual load error or PCB relay error etc.
4) Load condition display function will maintain for 30 seconds and then normal condition will be returned automatically.
5) Load condition display is as below.



∗ Load mode Check list

Display LED	Display contents	Operation contents
R-1-ⓐ	R-FAN High	When fresh food compartment fan high operates, applicable LED ON
R-1-ⓑ	R-FAN Low	When fresh food compartment fan low operates, applicable LED ON
R-1-ⓒ	R-DEF Heater	When fresh food compartment defrost heater operates, LED ON
R-1-ⓓ	Start Mode	Initial power ON refrigerator, LED ON
R-1-ⓔ	Overload condition	When ambient temperature is more than 93℉(34℃), LED ON
R-1-ⓕ	Low temperature condition	When ambient temperature is less than 72℉(22℃), LED ON
F-1-ⓔ,ⓕ ALL LED Off	Normal Condition	When ambient temperature is between 73℉(23℃) ~ 91 ℉(33℃), LED ON
R1-ⓖ	Exhibition Mode	Display mode, LED ON
F-1-ⓐ	COMP.	When compressor operates, applicable LED ON
F-1-ⓑ	F-FAN High	When freezer compartment fan high operates, applicable LED ON
F-1-ⓒ	F-FAN Low	When freezer compartment fan low operates, applicable LED ON
F-1-ⓓ	F-DEF Heater	When freezer compartment defrost heater operates, LED ON
R-10-ⓔ	C-FAN High	When compressor fan high operates, applicable LED ON
R-10-ⓕ	C-FAN Low	When compressor fan low operates, applicable LED ON
F-10-ⓖ	French Heater	When french heater operates, applicable LED ON
F-10-ⓐ	Pantry Room Damper Open	When damper open, applicable LED ON

4-1-5. Exhibition mode setting function



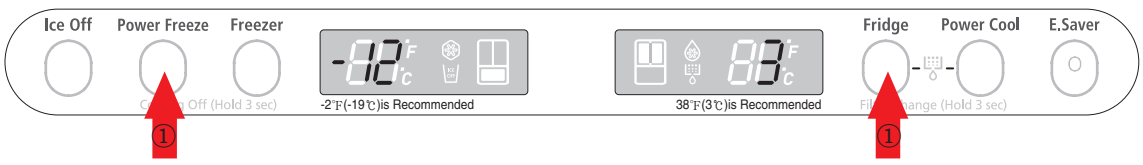
① If Power Freeze Key + Freezer Key are pressed for 3 seconds, show room mode will be started.

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

4-1-6. Option setting function

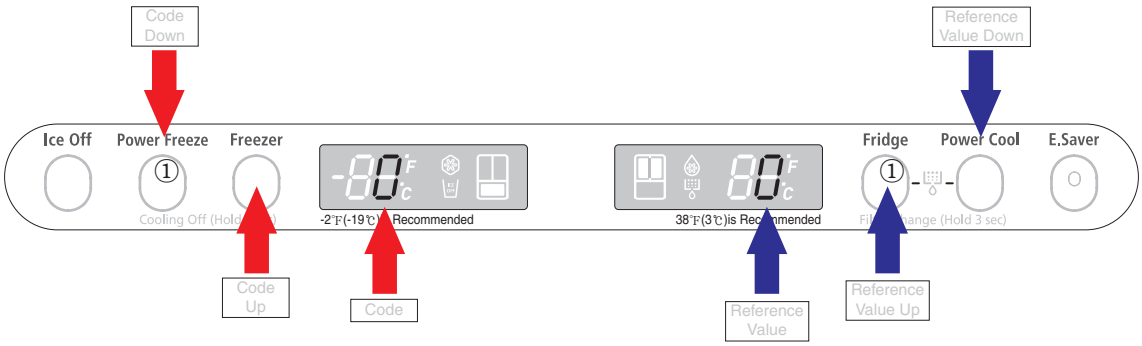
● If Freezer Key + Fridge Key are pressed simultaneously for 12 seconds during normal operation, fresh food and freezer compartments temperature display will be changed to option setting mode.

KEY operation method for changing to option mode



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

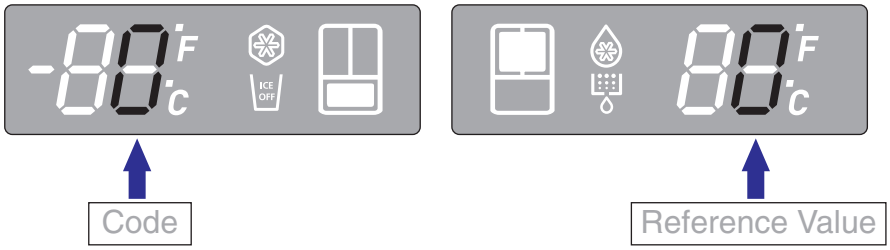
KEY control method after converting to option mode



∗ Key control in option mode

Power Freeze Key	Code Down key
Freezer Key	Code Up key
Power Cool key	Reference Value down key
Fridge key	Reference Value Up key

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

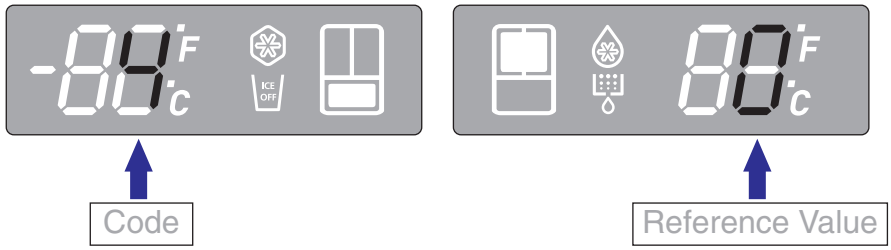


1) For example, if you want to change freezer compartment standard temperature to 28.4°F(-2°C) by operating option, do as below.
This function is for changing the standard temperature.
In -2°F(-19°C) of current temperature of freezer compartment, if you make the temperature lower to 28.4°F(-2°C) by the option, the standard temperature would be controlled -6°F(-21°C)
Therefore, if you change the setting of temperature option to -2°F(-19°C) on the panel, the appliance will be operated with -6°F(-21°C).
It means that standard temperature is controlled 28.4°F(-2°C) less than setting temperature in the display.

NOTE

Basically, option function has cleared data at shipping process.
Therefore, almost all setting value are "0".
Check the product information manual or specifications because setting value could be changed particularly for the purpose of improving product at mass producing process.

2) After changing to the option mode, fresh food compartment "0" , freezer compartment "0" will be displayed. (Basically fresh food compartment "0", freezer "0" would be set at shipping process, but setting value could be changed for the purpose of improving product at mass producing process.)
   - If fresh food compartment "0" shows only, temperature reference value of freezer compartment will be set and current freezer compartment temperature code will be displayed on the freezer temperature display.
3) If freezer compartment "4" is set as below freezer compartment code after fresh food compartment "0 is set, standard temperature of freezer compartment will be lower than 28.4℉(-2.0°C).
   (Refer to the picture "changing the freezer compartment temperature")



   : If you wait for 20 seconds after completing the setting, MICOM will save the setting value to the EEPROM and normal display will be returned and the option setting mode will be canceled.
4) Option changing method as above is the same as all RF266/265** model.
5) By the same method as above, it is possible to control the fresh food compartment temperature, water supply, ice-maker harvest temperature/time, defrost return time, hysteresis by temperature, notch gap by temperature etc.
6) Option function is set in the EEPROM at shipping process in the factory.
   You would better not to change the option of your own.
   Completing the setting is that option function return to normal display after 20 seconds.
   Do not turn off the appliance before returning to the normal display mode.

NOTE

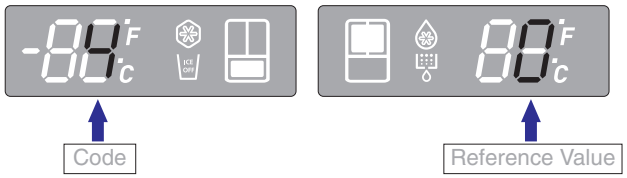
Option setting function exists in the other items.
We will skip the explanation of the other functions by the option because it is associated with refrigerator control function and is not needed at SERVICE.
(Please do not set the other options except above SERVICE Manual.)

4-1-7. Option TABLE

1) Temperature changing table of freezer compartment

Set item	Freezer Temp Shift
MODEL	RF265/266/RF26NB
Reference Value	Fridge Room 7-SEG
	0

Setting value FZ compartment Code	Temp. compensation
0	32°F(0.0°C)
1	31.1°F(-0.5°C)
2	30.2°F(-1.0°C)
3	29.3°F(-1.5°C)
4	28.4°F(-2.0°C)
5	27.5°F(-2.5°C)
6	26.6°F(-3.0°C)
7	25.7°F(-3.5°C)
8	32.9°F(+0.5°C)
9	33.8°F(+1.0°C)
10	34.7°F(+1.5°C)
11	35.6°F(+2.0°C)
12	36.5°F(+2.5°C)
13	37.4°F(+3.0°C)
14	38.3°F(+3.5°C)
15	39.2°F(+4.0°C)



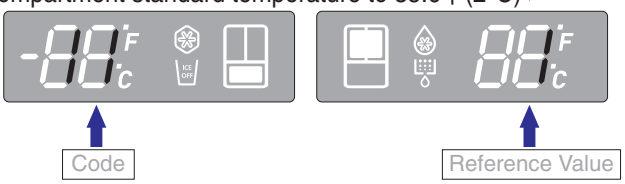
ex) If you want to change the freezer standard temperature to 28.4°F(-2°C)

2) Temperature changing table of fresh food compartment

Set item	Freezer Temp Shift
MODEL	RF265/266/RF26NB
Reference Value	Fridge Room 7-SEG
	1

Setting value FZ compartment Code	Temp. compensation
0	32°F(0.0°C)
1	31.1°F(-0.5°C)
2	30.2°F(-1.0°C)
3	29.3°F(-1.5°C)
4	28.4°F(-2.0°C)
5	27.5°F(-2.5°C)
6	26.6°F(-3.0°C)
7	25.7°F(-3.5°C)
8	32.9°F(+0.5°C)
9	33.8°F(+1.0°C)
10	34.7°F(+1.5°C)
11	35.6°F(+2.0°C)
12	36.5°F(+2.5°C)
13	37.4°F(+3.0°C)
14	38.3°F(+3.5°C)
15	39.2°F(+4.0°C)

ex) If you want to change the Fresh Food compartment standard temperature to 35.6°F(2°C)



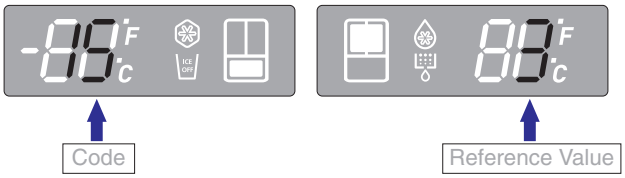
■ Below options are applied to the applicable model with ice maker.
Do not set below options to the model without Ice Maker.

3) To change the ice maker harvest waiting time

This option controls the harvest waiting time for ice dispensing from Ice maker

Set item	ICE MAKER waiting time of ice making
Reference Value	Fridge Room 7-SEG
	3

Setting value FZ compartment Code	Temp. compensation (mins)
0	58
1	57
2	56
3	55
4	54
5	53
6	52
7	51
8	50
9	49
10	48
11	47
12	46
13	45
14	59
15	60



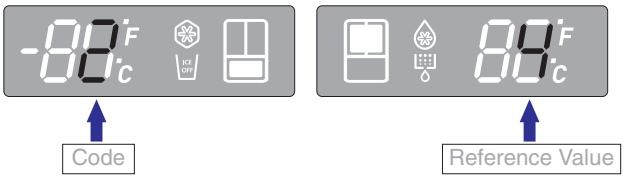
ex) If you want to change the waiting time to 60 minutes

4) To change the ice making sensor temperature of ice maker

This option Controls the standard temperature of judgment that is checking whether ice of ice maker is frozen completely or not.

Set item	ICE MAKER control the temperature of ice making
Reference Value	Fridge Room 7-SEG
	4

Setting value FZ compartment Code	Temp. compensation (mins)
0	1.4℉(-17°C)
1	3.2℉(-16°C)
2	5.0℉(-15°C)
3	6.8℉(-14°C)
4	8.6℉(-13°C)
5	10.4℉(-12°C)
6	-0.4℉(-18°C)
7	2.2℉(-19°C)



ex) If you want to change the ice making sensor temperature to 5.0 ℉(-15°C)

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

DATA1.Temperature table
Resistance value and MICOM port voltage of sensor according to the temperature
SENSOR CHIP : based on PX41C

˚C	˚F	Voltage	Resistance	˚C	˚F	Voltage	Resistance	˚C	˚F	Voltage	Resistance
-50	-58	4.694	153319	-5	23	3.107	16419	40	104	1.153	2997
-49	-56.2	4.677	144794	-4	24.8	3.057	15731	41	105.8	1.124	2899
-48	-54.4	4.659	136798	-3	26.6	3.006	15076	42	107.6	1.095	2805
-47	-52.6	4.641	129294	-2	28.4	2.955	14452	43	109.4	1.068	2714
-46	-50.8	4.622	122248	-1	30.2	2.904	13857	44	111.2	1.040	2627
-45	-49	4.602	115631	0	32	2.853	13290	45	113	1.014	2543
-44	-47.2	4.581	109413	1	33.8	2.802	12749	46	114.8	0.988	2462
-43	-45.4	4.560	103569	2	35.6	2.751	12233	47	116.6	0.963	2384
-42	-43.6	4.537	98073	3	37.4	2.700	11741	48	118.4	0.938	2309
-41	-41.8	4.514	92903	4	39.2	2.649	11271	49	120.2	0.914	2237
-40	-40	4.490	88037	5	41	2.599	10823	50	122	0.891	2167
-39	-38.2	4.465	83456	6	42.8	2.548	10395	51	123.8	0.868	2100
-38	-36.4	4.439	79142	7	44.6	2.498	9986	52	125.6	0.846	2036
-37	-34.6	4.412	75077	8	46.4	2.449	9596	53	127.4	0.824	1973
-36	-32.8	4.385	71246	9	48.2	2.399	9223	54	129.2	0.803	1913
-35	-31	4.356	67634	10	50	2.350	8867	55	131	0.783	1855
-34	-29.2	4.326	64227	11	51.8	2.301	8526	56	132.8	0.762	1799
-33	-27.4	4.296	61012	12	53.6	2.253	8200	57	134.6	0.743	1745
-32	-25.6	4.264	57977	13	55.4	2.205	7888	58	136.4	0.724	1693
-31	-23.8	4.232	55112	14	57.2	2.158	7590	59	138.2	0.706	1642
-30	-22	4.199	52406	15	59	2.111	7305	60	140	0.688	1594
-29	-20.2	4.165	49848	16	60.8	2.064	7032	61	141.8	0.670	1547
-28	-18.4	4.129	47431	17	62.6	2.019	6771	62	143.6	0.653	1502
-27	-16.6	4.093	45146	18	64.4	1.974	6521	63	145.4	0.636	1458
-26	-14.8	4.056	42984	19	66.2	1.929	6281	64	147.2	0.620	1416
-25	-13	4.018	40938	20	68	1.885	6052	65	149	0.604	1375
-24	-11.2	3.980	39002	21	69.8	1.842	5832	66	150.8	0.589	1335
-23	-9.4	3.940	37169	22	71.6	1.799	5621	67	152.6	0.574	1297
-22	-7.6	3.899	35433	23	73.4	1.757	5419	68	154.4	0.560	1260
-21	-5.8	3.858	33788	24	75.2	1.716	5225	69	156.2	0.546	1225
-20	-4	3.816	32230	25	77	1.675	5039	70	158	0.532	1190
-19	-2.2	3.773	30752	26	78.8	1.636	4861	71	159.8	0.519	1157
-18	-0.4	3.729	29350	27	80.6	1.596	4690	72	161.6	0.506	1125
-17	1.4	3.685	28021	28	82.4	1.558	4526	73	163.4	0.493	1093
-16	3.2	3.640	26760	29	84.2	1.520	4369	74	165.2	0.481	1063
-15	5	3.594	25562	30	86	1.483	4218	75	167	0.469	1034
-14	6.8	3.548	24425	31	87.8	1.447	4072	76	168.8	0.457	1006
-13	8.6	3.501	23345	32	89.6	1.412	3933	77	170.6	0.446	978
-12	10.4	3.453	22320	33	91.4	1.377	3799	78	172.4	0.435	952
-11	12.2	3.405	21345	34	93.2	1.343	3670	79	174.2	0.424	926
-10	14	3.356	20418	35	95	1.309	3547	80	176	0.414	902
-9	15.8	3.307	19537	36	96.8	1.277	3428	81	177.8	0.404	877
-8	17.6	3.258	18698	37	98.6	1.253	3344	82	179.6	0.394	854
-7	19.4	3.208	17901	38	100.4	1.213	3204	83	181.4	0.384	832
-6	21.2	3.158	17142	39	102.2	1.183	3098	84	183.2	0.375	810

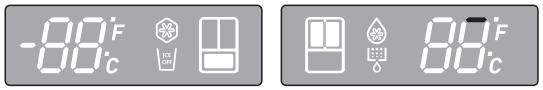
TROUBLESHOOTING

4-2-1. If the trouble is detected by self-diagnosis

- The error of sensor will be displayed on the front of display.
  when the error of sensor is detected at initial power ON, the appliance will not operated and display of abnormal sensor part will blink.
- The appliance will not stop operating when the error of sensor is detected during operation of the appliance.
  But normal freezing might be not operated if the appliance is operated by the emergency operation mode. You would better to check the appliance according to the self-diagnosis of the manual.

1) If ICE Maker Sensor has trouble

ERROR Code



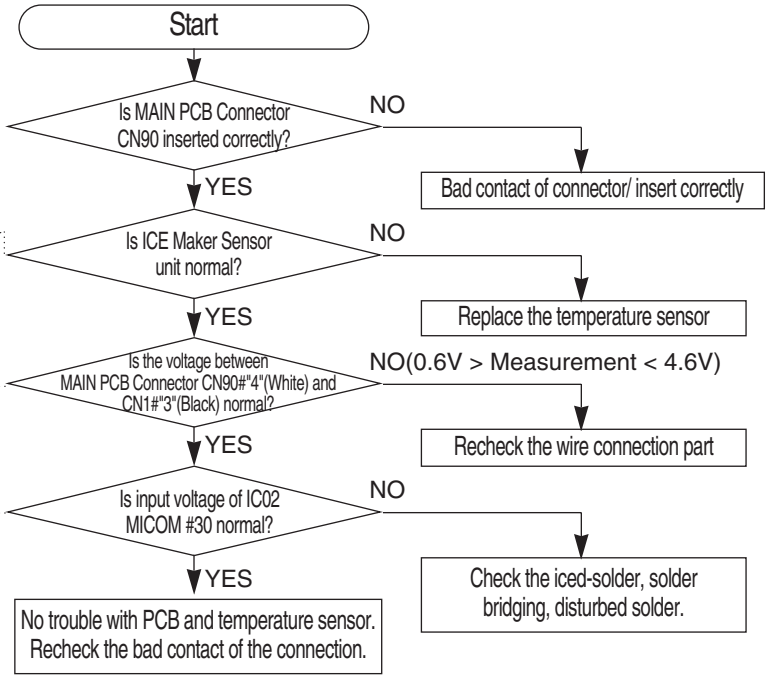
DATA1.
Temperature table

** Measuring point of resistance value according to Sensor **
ICE MAKER : CN90#3 ↔#1 measuring resistance value
** 0 Ω : Short trouble / ∞ Ω : Open trouble

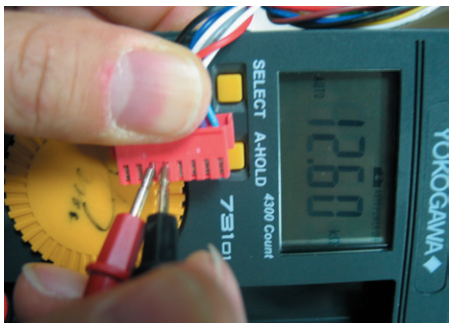
Refer to circuit diagram in the manual

Sensor MICOM/Connector number	
ICE Maker	Connector CN90#"4"(White) and CN1#"3"(Black) PCB common Ground
Voltage measured between 4.6V ~ 0.6V.	

Measuring voltage of IC02 MICOM #30, CN90#4(White) and CN1#3(Black) from PCB typical Ground part are similar.

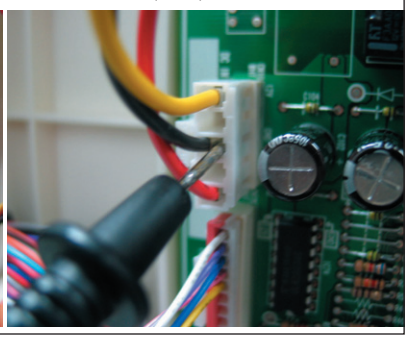


☞ Checking method of ICE Maker Sensor resistance CN90# "3(White) ↔#4"(White)
- Compare the temperature table after the measure.



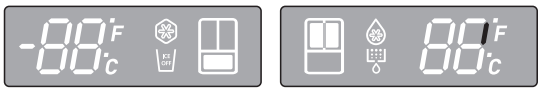
☞ Checking method of ICE Maker Sensor resistance
- Measure the voltage of Sensor Check Point #6(IC02 MICOM #30) on PCB or CN90#4(White) ↔CN1#3(Black)
- Compare the temperature table after the measure.
  Measuring voltage of CN90#4(White) ↔ CN1#3(Black) are below.

typical PCB Ground
CN1#3(Black)



2) If R Sensor has trouble

ERROR Code



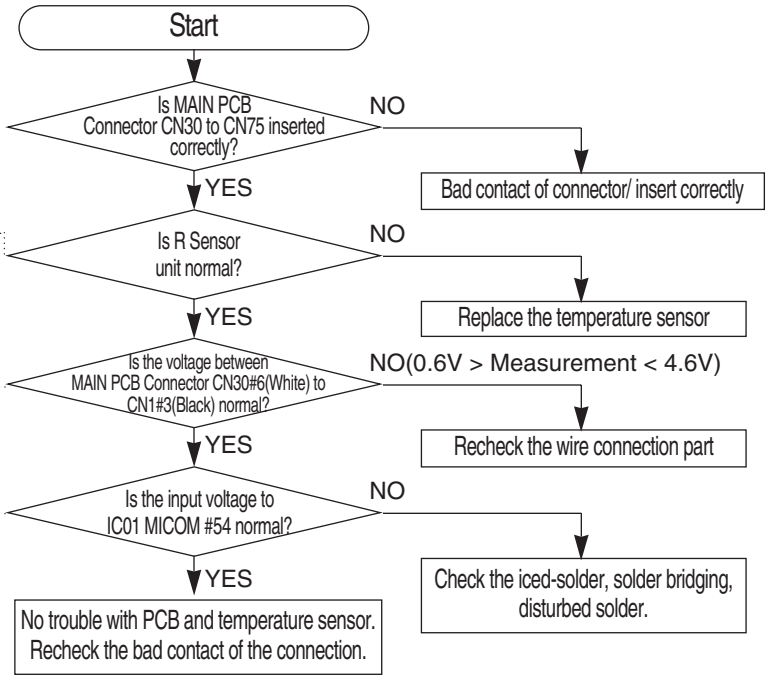
DATA1.
Temperature table

** Measuring point of resistance value according to Sensor **
R : CN30#6 ↔ CN75#1 measuring resistance value
** 0 Ω : Short trouble / ∞ Ω : Open trouble

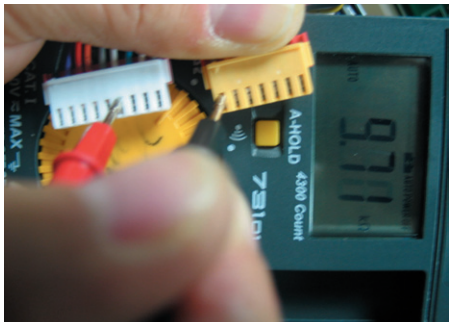
Refer to circuit diagram in the manual

Sensor MICOM/Connector number	
R	Connector CN30#6(White) to CN1#3(Black) PCB typical Ground
Voltage measured between 4.6V ~ 0.6V.	

Measuring voltage IC01 MICOM #54, CN30#6(White) and CN1#3(Black) from PCB typical Ground part are similar.

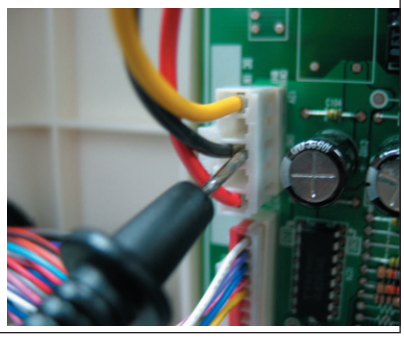


☞ Checking method of R Sensor resistance
CN30#6(White) ↔CN75#1(Gray) Compare the temperature table after the measure.



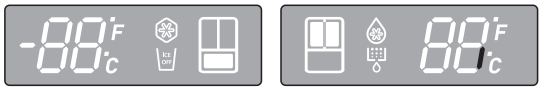
☞Checking method of R Sensor resistance
- Measure the voltage of Sensor Check Point #3(IC01 MICOM #54) on PCB or CN30#6(White) ↔CN1#3(Black)
- Compare the temperature table after the measure.
Measuring voltage of CN30#6(White)°ICN1#3(Black) are below.

typical PCB Ground
CN#3(Black)



3) If R DEF Sensor has trouble

ERROR Code



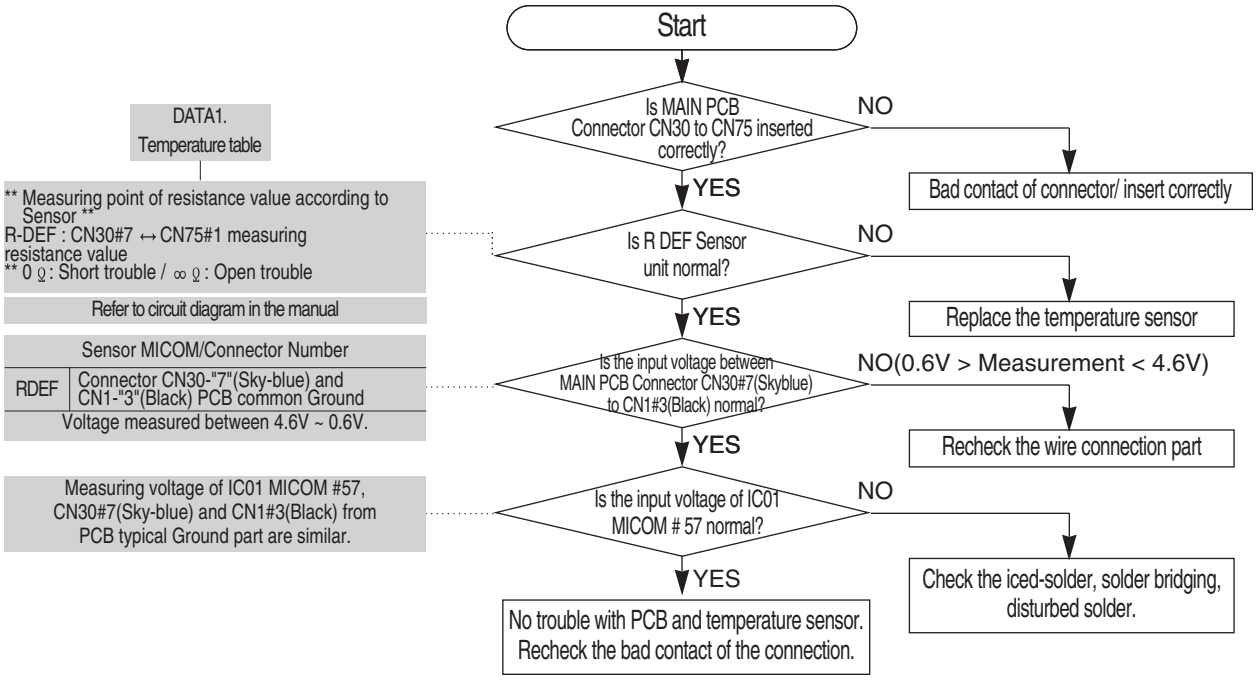
DATA1.
Temperature table

** Measuring point of resistance value according to Sensor **
R-DEF : CN30#7 ↔ CN75#1 measuring resistance value
** 0 Ω : Short trouble / ∞ Ω : Open trouble

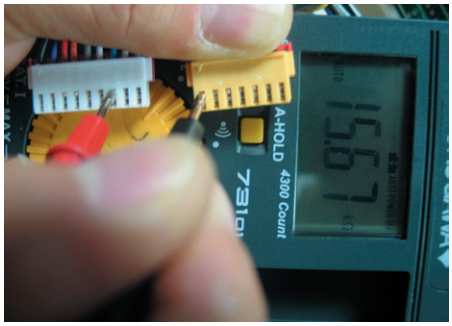
Refer to circuit diagram in the manual

Sensor MICOM/Connector Number	
RDEF	Connector CN30-"7"(Sky-blue) and CN1-"3"(Black) PCB common Ground
Voltage measured between 4.6V ~ 0.6V.	

Measuring voltage of IC01 MICOM #57, CN30#7(Sky-blue) and CN1#3(Black) from PCB typical Ground part are similar.



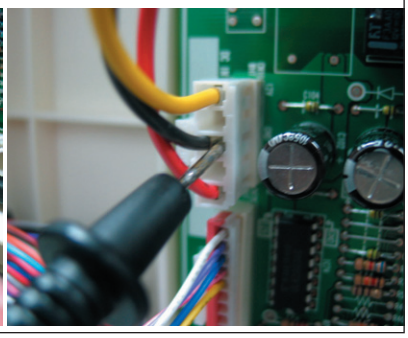
☞ Checking method of R Sensor resistance
CN30#7(Sky-blue) ↔ CN75#1(Gray)
- Compare the temperature table after the measure.



☞ Checking method of R DEF Sensor resistance
- Measure the voltage of Sensor Check Point #4(IC01 MICOM #57) on PCB or CN30#7Sky-blue)←CN1#3(Black)
- Compare the temperature table after the measure.

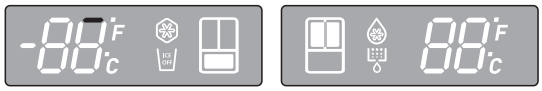
Measuring voltage of CN30#7(Sky-blue) ↔CN1#3(Black) are below.

typical PCB Ground
CN1#3(Black)



4) If Ambient Sensor has trouble

ERROR Code



DATA1.
Temperature table

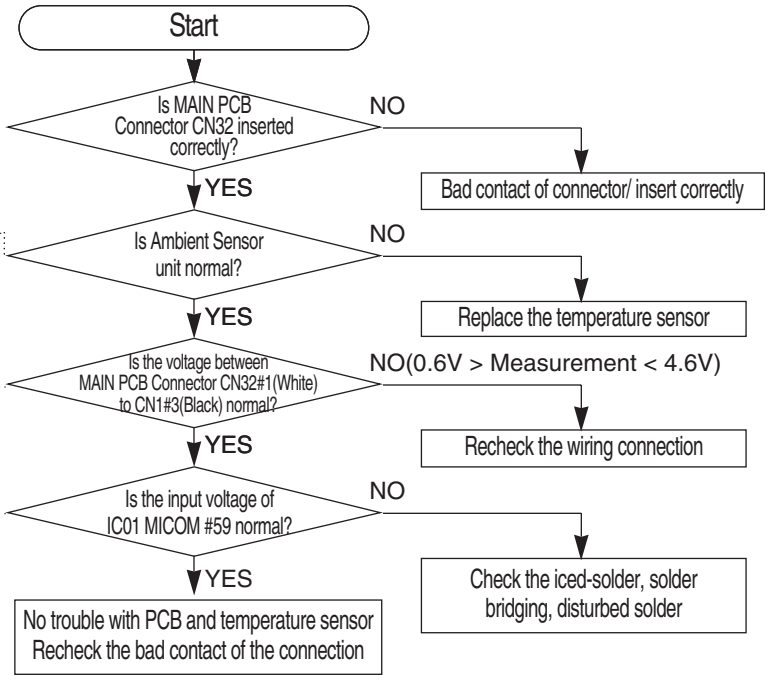
** Measuring point of resistance value according to Sensor **
Ambient : CN32#1 ↔ #4 measuring resistance value
** Placed in the right top table of upper hinge.
** 0 Ω : Short trouble / ∞ Ω : Open trouble

Refer to circuit diagram in the manual

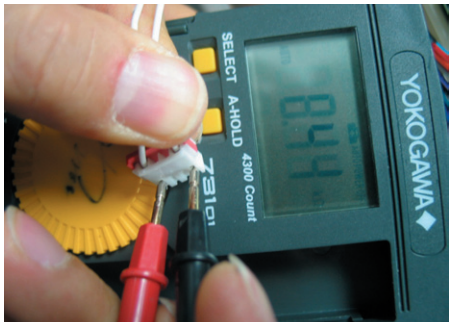
Sensor MICOM/Connector number	
Ambient	Connector CN32#1(White) to CN1#3(Black) PCB typical Ground

Voltage measured between 4.6V ~ 0.6V.

Measuring voltage of IC01 MICOM #59, CN32#1(White) and CN1#3(Black) from PCB typical Ground part are similar.

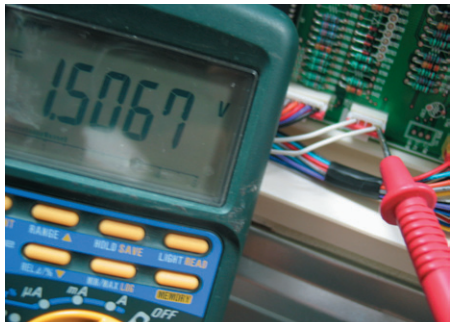


☞ Checking method of Ambient Sensor resistance
CN32#1(White) ↔ #4(White)
- Compare the temperature table after the measure

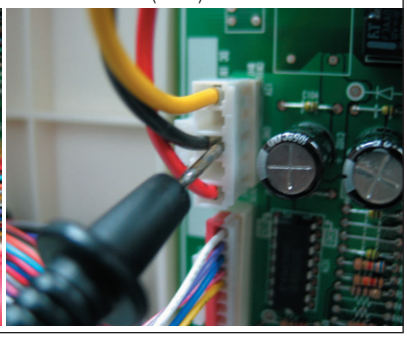


☞ Checking method of Ambient Sensor voltage
- Measure the voltage of Sensor Check Point #7(IC01 MICOM #59) on PCB or CN32#1(White) ↔CN1#3(Black)
- Compare the temperature table after the measure

Measuring voltage of CN32#1(White) ↔CN1#3(Black) are below

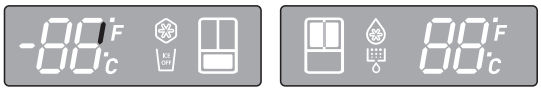


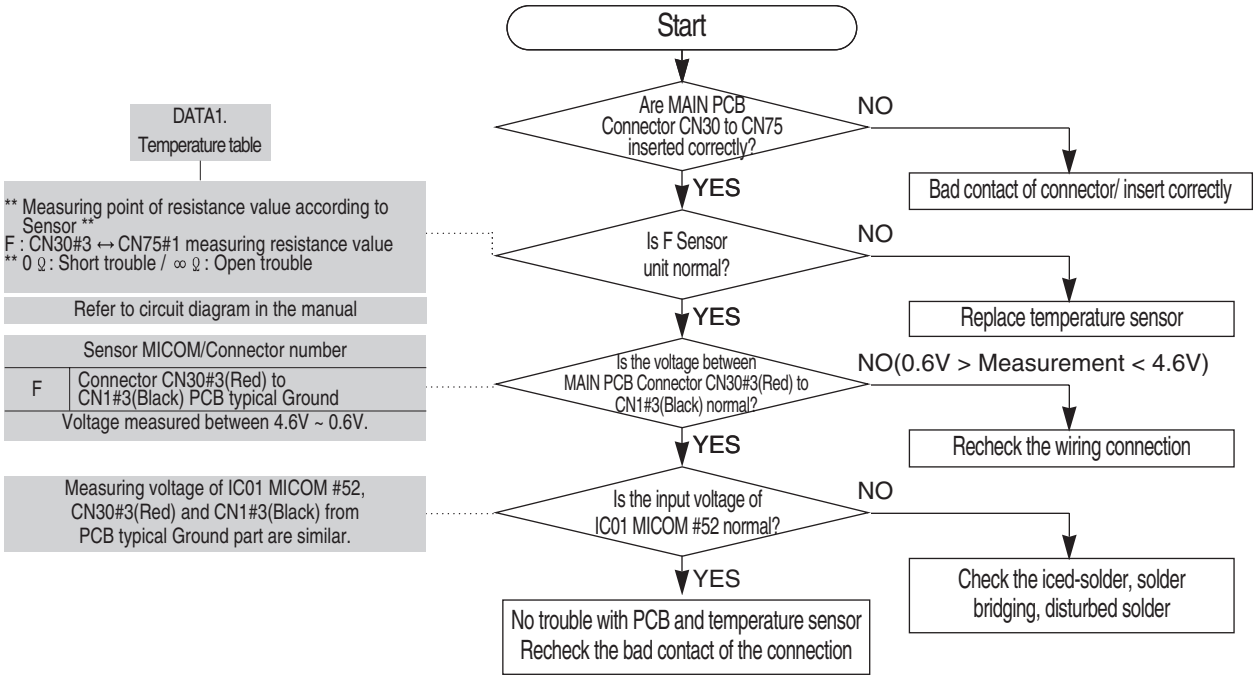
typical PCB Ground
CN1#3(Black)



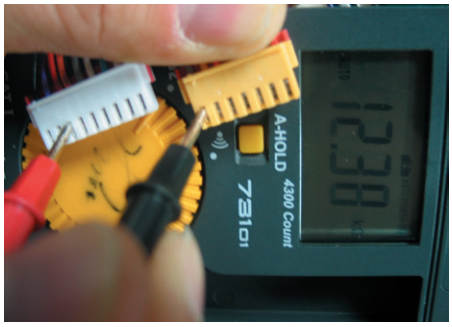
5) If F Sensor has trouble

ERROR Code





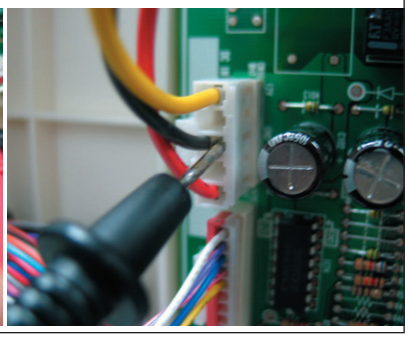
☞ Checking method of F Sensor resistance
CN30#3(Red) ↔CN75#1(Gray)
- Compare the temperature table after the measure



☞Checking method of F Sensor voltage
- Measure the voltage of Sensor Check Point #1(IC01COM #52) on PCB or CN30#3(Red) ↔CN1#3(Black)
- Compare the temperature table after the measure

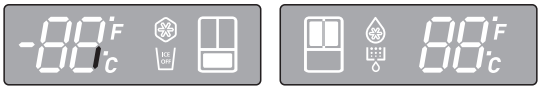
Measuring voltage of CN30#3(Red) ↔CN1#3(Black) are below.

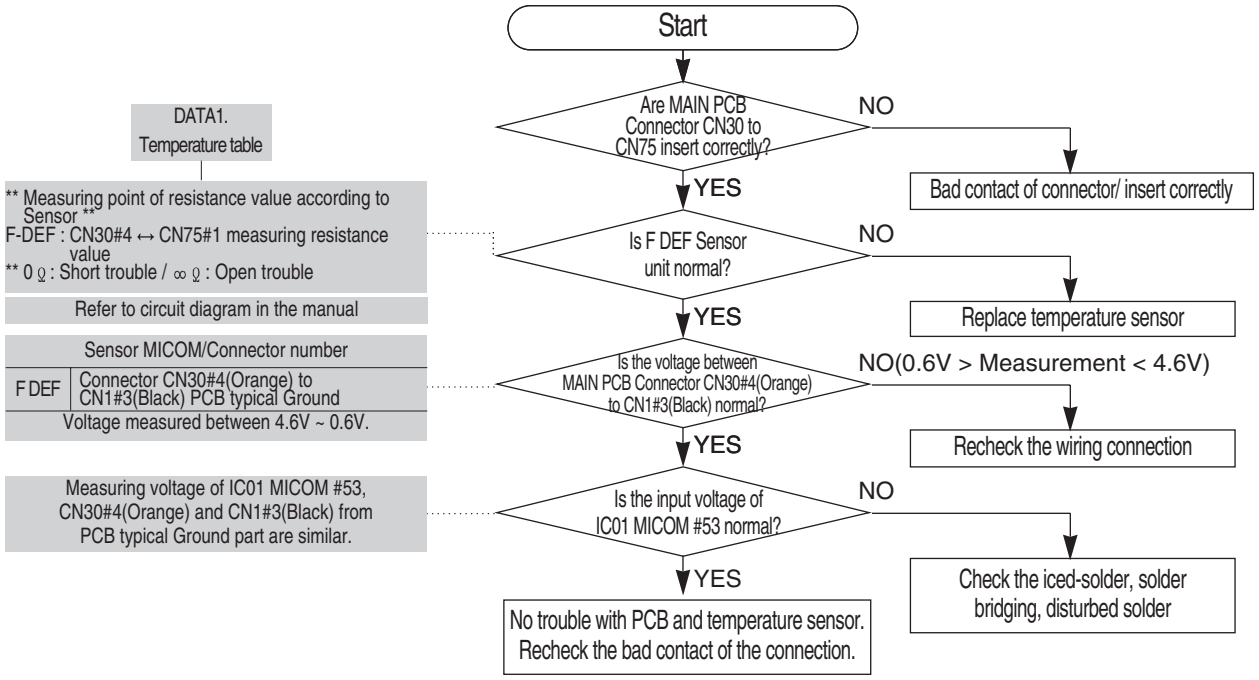
typical PCB Ground
CN1#3(Black)



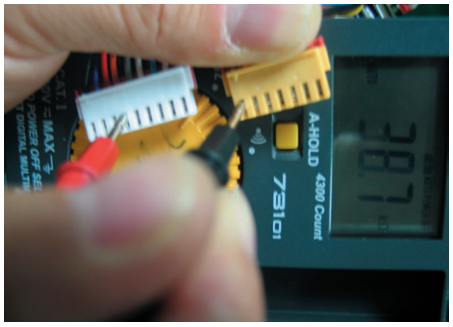
6) If F DEF Sensor has trouble

ERROR Code





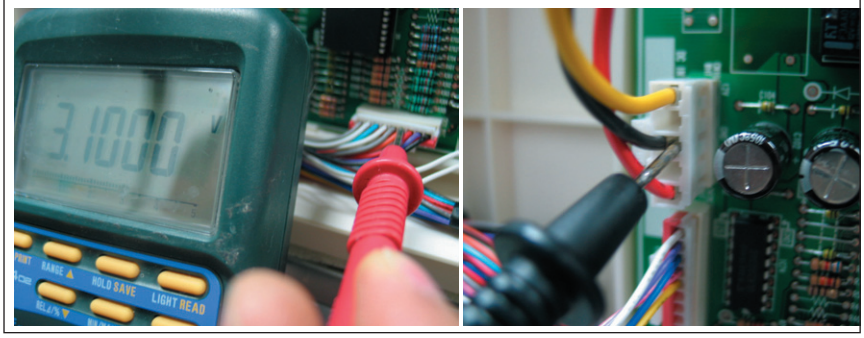
☞ Checking method of F DEF Sensor resistance
CN30#4(Orange) ↔CN75#1(Gray)
- Compare the temperature table after the measure.



☞Checking method of F DEF Sensor voltage
- Measure the voltage of Sensor Check Point #1(IC01 MICOM #52) on PCB or CN30#4(Orange) ↔CN1#3(Black)
- Compare the temperature table after the measure

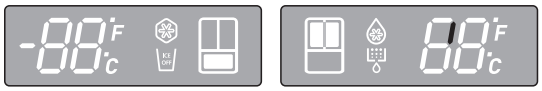
Measuring voltage of CN30#4(Orange) ↔CN1#3(Black) are below

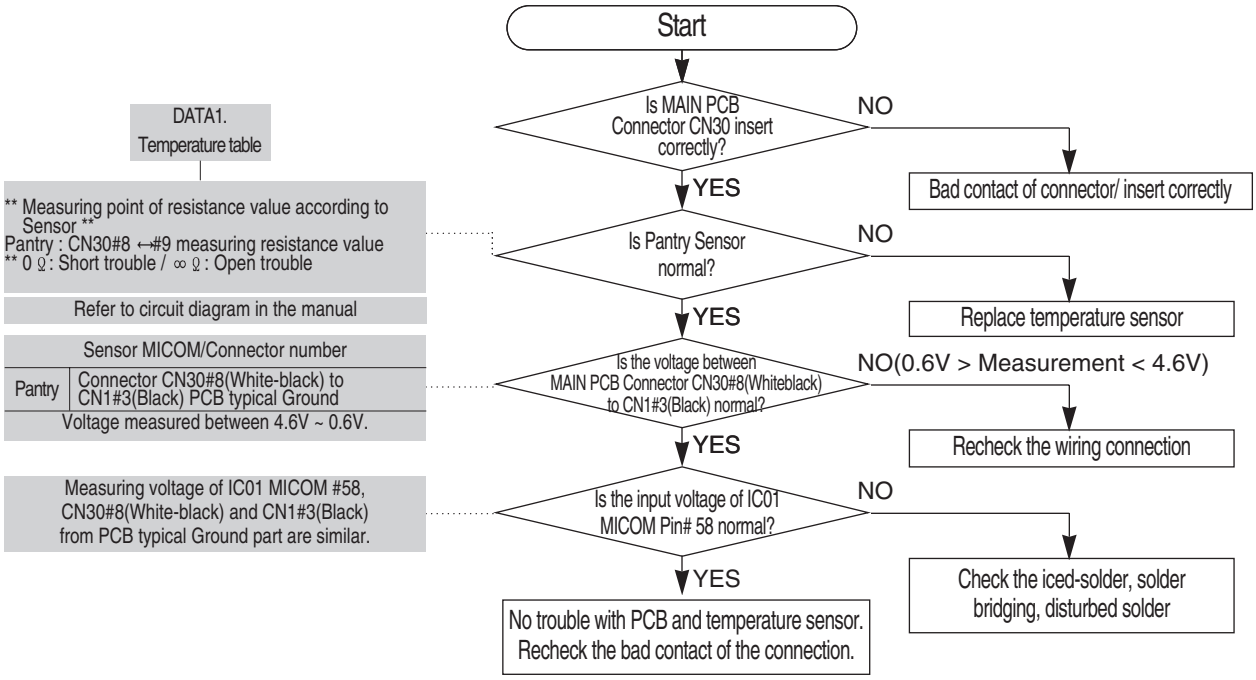
typical PCB Ground
CN1#3(Black)



7) If Pantry Sensor has trouble

ERROR Code

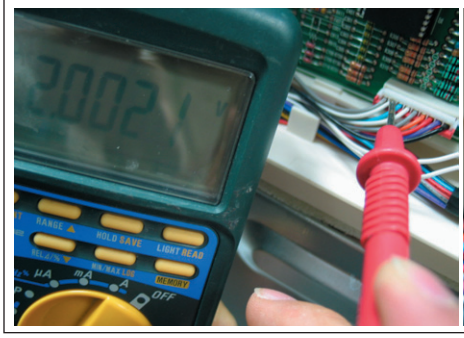


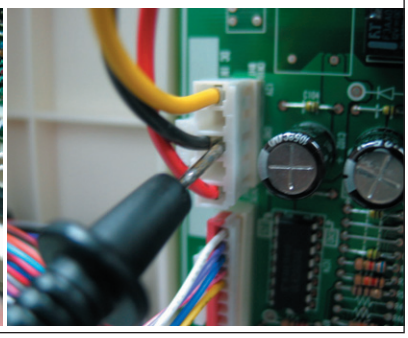


☞ Checking method of Pantry Sensor resistance
CN30#8(White-black) ↔ #9(Gray)
- Compare the temperature table after the measure

☞Checking method of Pantry Sensor voltage
- Measuring voltage of Sensor Check Point #5(IC01 MICOM #58) on PCB or CN30#8(White-black) ↔CN1#3(Black)
- Compare the temperature table after the measure
Measuring voltage of CN30#8(white-black)↔CN1#3(Black) are below

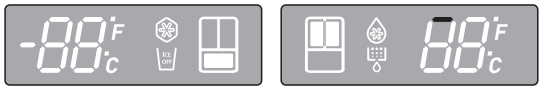
typical PCB Ground
CN1#3(Black)

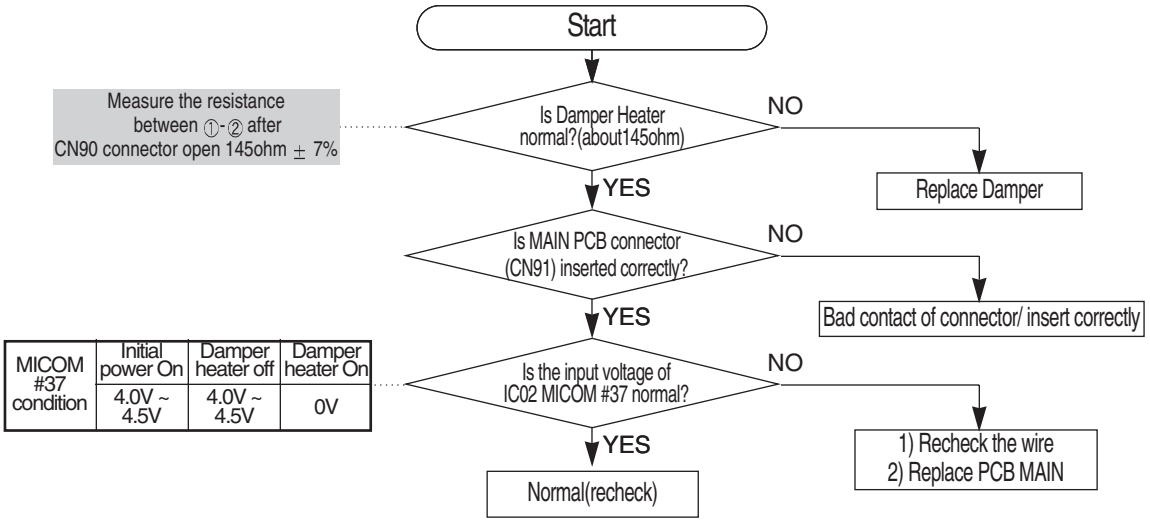




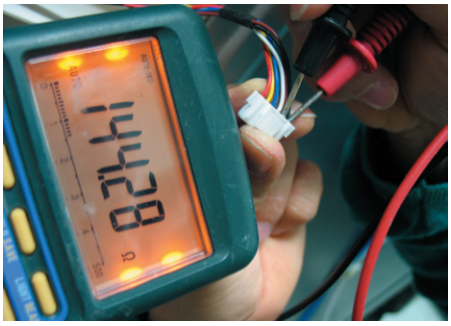
8) If Pantry Room Damper Heater has trouble

ERROR Code



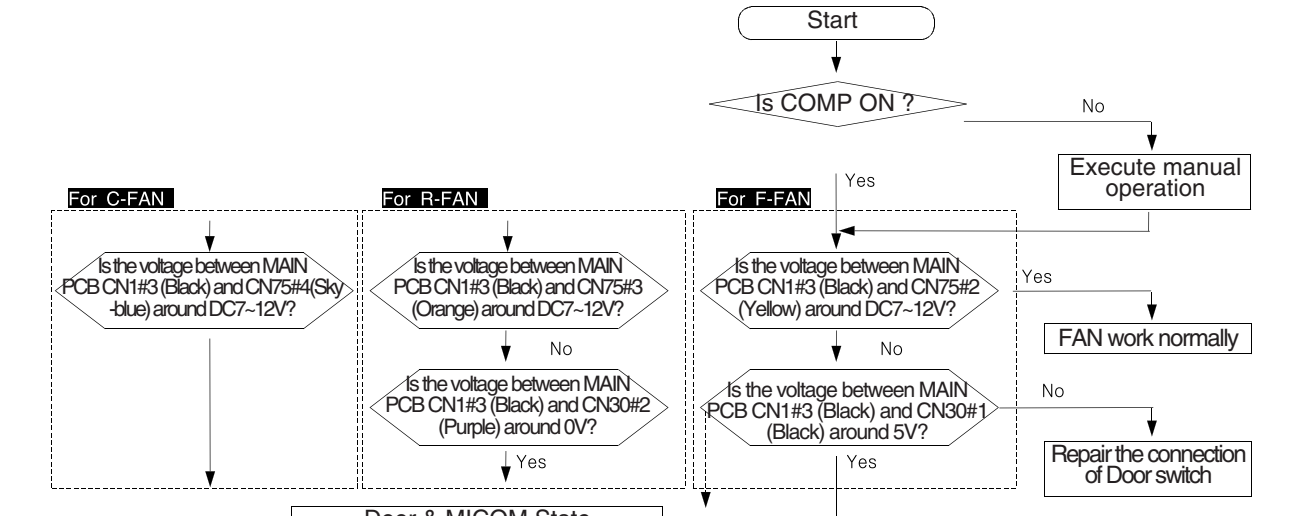


☞ Checking method of Pantry Room Damper resistance CN91#1(Black) ↔ #2(Brown)
** ∞ Ω : Open(wire disconnection, heater disconnection) trouble 0 Ω : Short trouble



4-2-2. If FAN does not operate

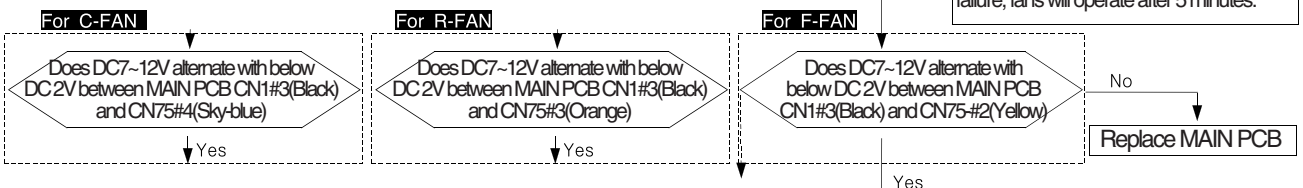
- The refrigerator of this model has BLDC FAN motor. BLDC motor is driven by DC 7~12V.
- On the normal condition of COMP ON, it operates together with F-FAN motor.
  If door is opened and closed once at a high ambient temperature, it will be operated after 1 minute delay.
  Therefore, you are advised not to taken it for an error.
-. If there is a trouble, you should select the self-diagnostic function to check the trouble before power off.



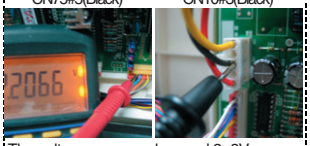
Door & MICOM State		
Door	F MICOM (#50)	R MICOM(#3) Right and Left
Close	5V(High)	0V(Low)
Open	0V(Low)	5V(High)

Power ON with 5 minutes delay after power OFF. For preventing the over load of compressor)

In initial power to appliance, the compressor and fans of fresh food/ freezer, compressor fan operate. If freezer temperature is sensed of 41 °F by momentary power failure, fans will operate after 5 minutes.



F FAN pulse voltage CN75#5(Black) / typical PCB Ground CN10#3(Black)



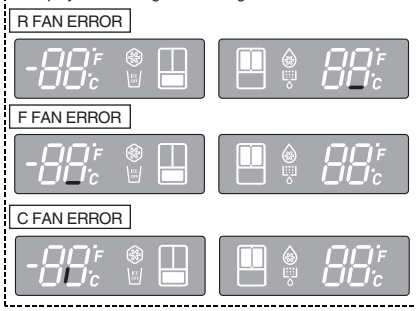
The voltage measured around 2~3V with multi-meter though the voltage is very weak because of pulse signal

Reference

CN75-5(F),6(R),7(C)will generate the pulse signal when motor rotates.
These signals will be inputted into MICOM.
Unless signals are not inputted during motor operating, will be ON 10 seconds after fan Off. But if signals are not still entered, the above operation will restart four times more.
If signals are not entered continuously, the motor will be restarted after 10 seconds.
This function is effective when the normal operation of motor would be restrained by foreign matters such as ice.

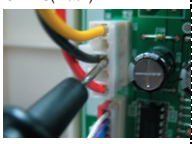
◆ Expected causes
① Check that if FAN-MOTOR has failure itself.
② Check that if wiring connection has bad contact.
③ Check the input of the fan motor rotation pulse when motor fan operates.

☞ Display for checking the self-diagnostic function

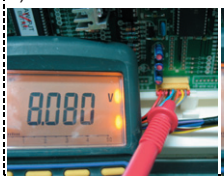


☞ Checking method of R,F,C FAN Motor voltage
The voltage between PCB typical Ground CN1-"3"(Black) and
R FAN ; CN75#2(Yellow) shall be less than DC 7~12V.
F FAN ; CN75#3(Orange) shall be less than DC 7~12V.
C FAN ; CN75#4(Sky-blue) shall be less than DC 7~12V.
- Recheck if resistance values are different after measuring.

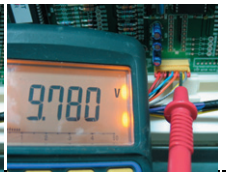
typical PCB Ground CN1#3(Black)



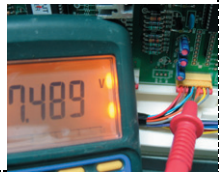
1) R-FAN



2) F-FAN



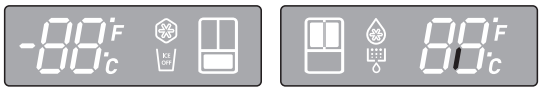
3) C-FAN

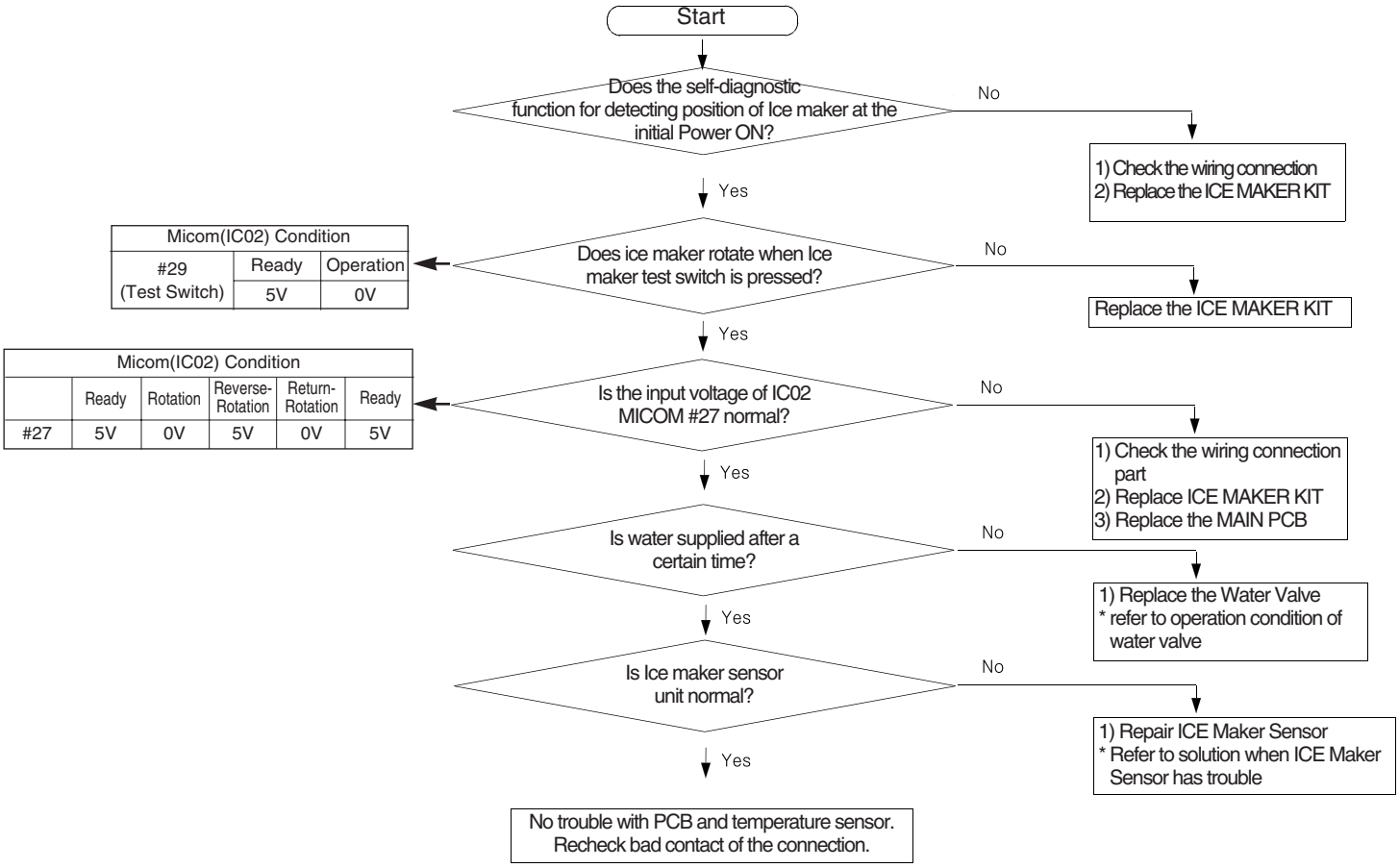


4-2-3. If ICE MAKER does not operate

1. Water is automatically supplied to the Ice maker by temperature & time and ice maker dispenses cubed or crushed ice.
2. Power is applied to one of its wires. So, refer to its exploded diagram when disassembling.
3. The operation of the Ice maker shall be checked after pressing the Ice maker test switch. (Freezer compartment Ice Maker) It is not possible to check when the power is disengaged.

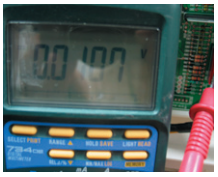
Function ERROR Code





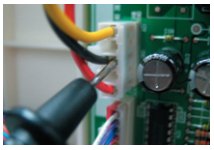
☞ Checking method of ICE Maker voltage
The voltage between PCB typical Ground CN1#3(Black) and
1) Test switch operation(press selected) ; CN90#5(Gray) shall be DC 0V.
Waiting for test switch operation ; CN90#5(Gray) shall be less than DC 5V.

1)Test Switch operating



1)Test Switch waiting

typical PCB Ground CN1-"3"(Black)



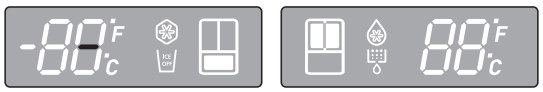
☞ Checking method of ICE Maker voltage
The voltage between PCB typical Ground CN1#3(Black) and
2) IC02 MICOM #27 voltage ; wait(5V) → rotate clockwise(0V)
→ rotate counterclockwise(5V) → horizontal condition(0V) → wait(5V)
* The voltage of MICOM #27 and Connector CN90#7(Purple) are same.

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

- If defrost has trouble, select the self-diagnostic function to detect the error of defrost heater before Power Off. (Check the function with refer to the self-diagnostic function)

R DEF ERROR

F DEF ERROR



Measuring point of resistance value according to heater
F-DEF : CN70#9(Brown) ↔CN71#9(Orange) measuring resistance value(55(220) ohm ± 7%)
R-DEF(Ice Pipe parallel) : CN70#7(White)↔N71#9(Orange) measuring resistance value(105(407) ohm ± 7%)
** 0 Ω: Short trouble / ∞ Ω: Open(bimetal, heater) trouble

**Measuring point of resistance value according to sensor **
F-DEF : CN30#4 ↔CN75#1 measuring resistance value
R-DEF : CN30#7 ↔CN75#1 measuring resistance value
** 0 Ω: Short trouble / ∞ Ω: Open trouble

Resistance value of sensor according to temperature		
86 °F(30°C)	4.22 kΩ	If you need the temperature with detail, refer to DATA1. temperature table
68 °F(20°C)	6.05 kΩ	
50 °F(10°C)	8.87 kΩ	
32°F(0°C)	13.29 kΩ	
14 °F(-10°C)	20.42 kΩ	
-4 °F(-20°C)	32.23 kΩ	
-22 °F(-30°C)	52.41 kΩ	

**Measuring point of resistance value according to sensor **
F-DEF : CN30#4 ↔CN75#1 measuring resistance value
R-DEF : CN30#7 ↔CN75#1 measuring resistance value
** 0V: Short trouble / 5V: Open trouble

Start

Are the all deforst heater normal?
- No → Check the bimetal, heater disconnection, wiring connection etc.
- Yes ↓

Is defrost sensor by self-diagnostic normal?
- No → Refer to self-diagnostic function in the manual → Replace the applicable sensor
- Yes ↓

Is the temperature of defrost sensor lower than 53.6 °F(12°C)?
- No → manual operation for a certain time
- Yes ↓

Manual defrosting of fresh food and freezer compartments operate simultaneously.

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

Is power applied to each defrost heaters?
- No → Is connection terminal of MAIN PCB part normal?
- Yes ↓

Does the system return to cooling operation after heating for specified time?
- No → Recheck the applicable sensor.
- Yes → Normal

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

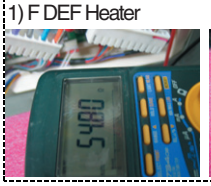
Is connection terminal of MAIN PCB part normal?
- No → Repair connection terminal
- Yes ↓

Check bimetal, heater itself, disconnection etc.

Replace failure Relay or replace PCB ASS'Y

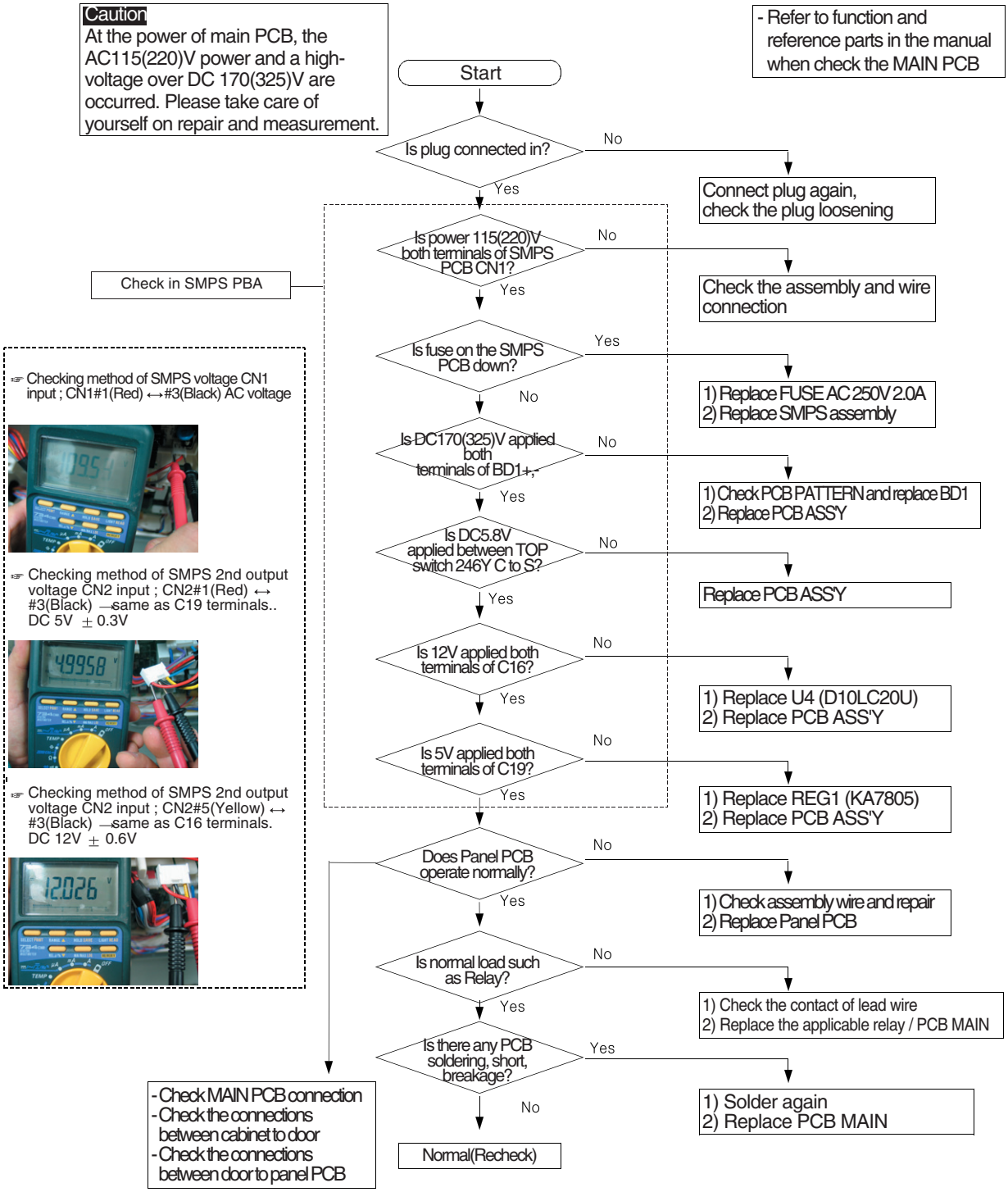
☞Checking method of F,R DEF Heater resistance value
F FEF ; CN70#9(Brown) ↔ CN71#9(Orange)
R FEF ; CN70#7(White) ↔ CN71#9(Orange)
- Recheck if resistance values are different after the test

1) F DEF Heater

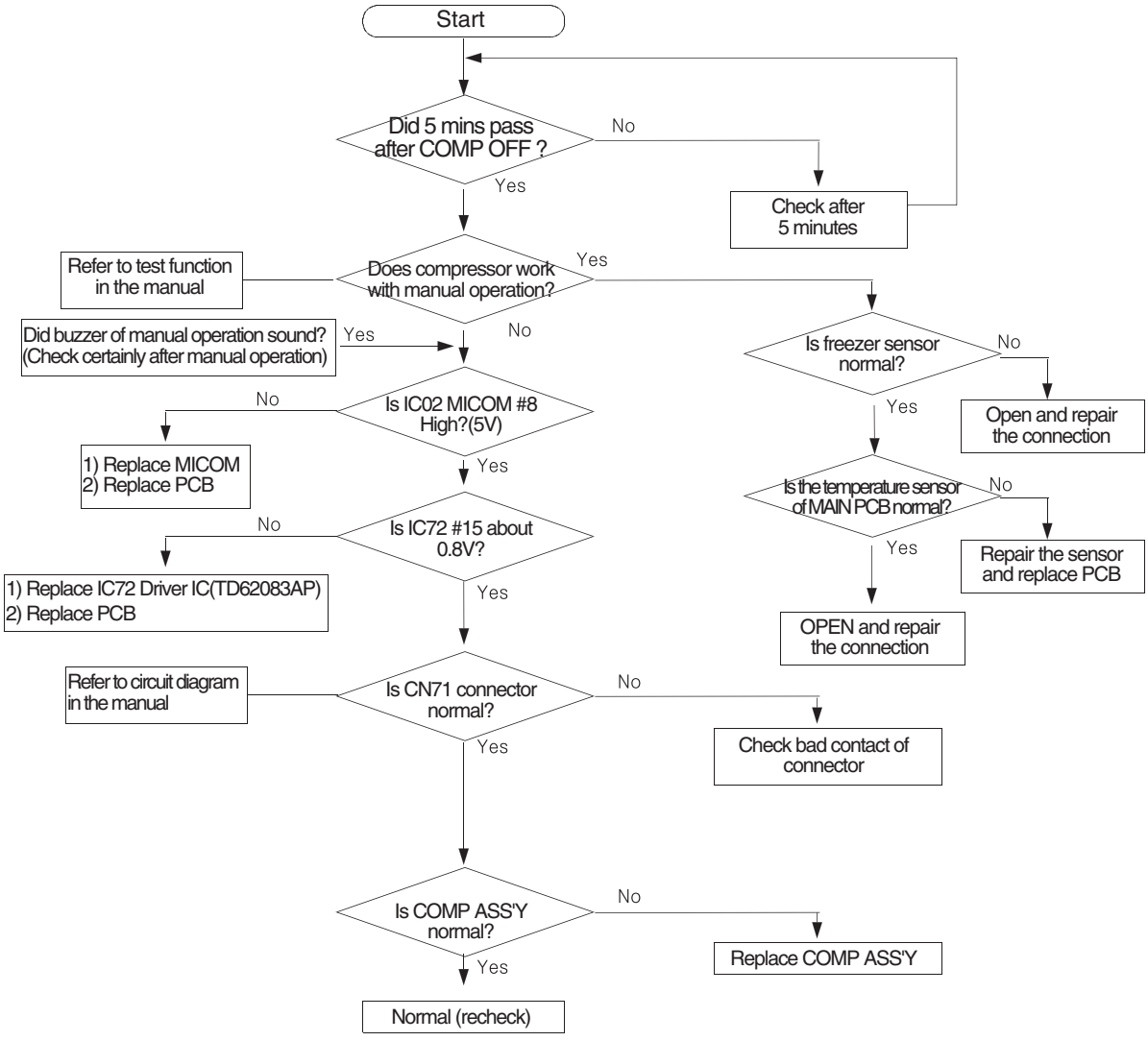


2) R DEF Heater

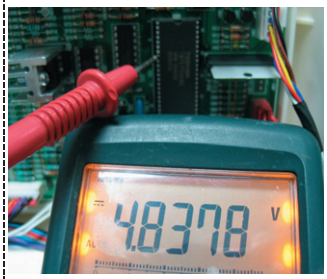
4-2-5. If Power is not supplied



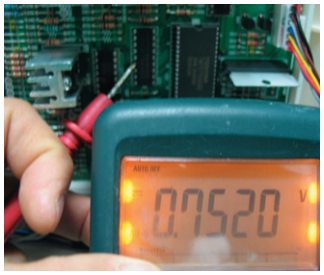
4-2-6. If compressor does not operate



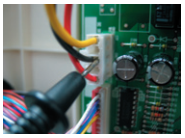
☞ Checking method of voltage PCB typical Ground CN1#3(Black) and
1) IC02 MICOM #8 ; voltage High(5V ±0.5V)
IC02 MICOM #8, COMP operating



☞ Checking method of voltage PCB typical Ground CN1#3(Black) and
1) IC72 #15 : Voltage Low(0V)

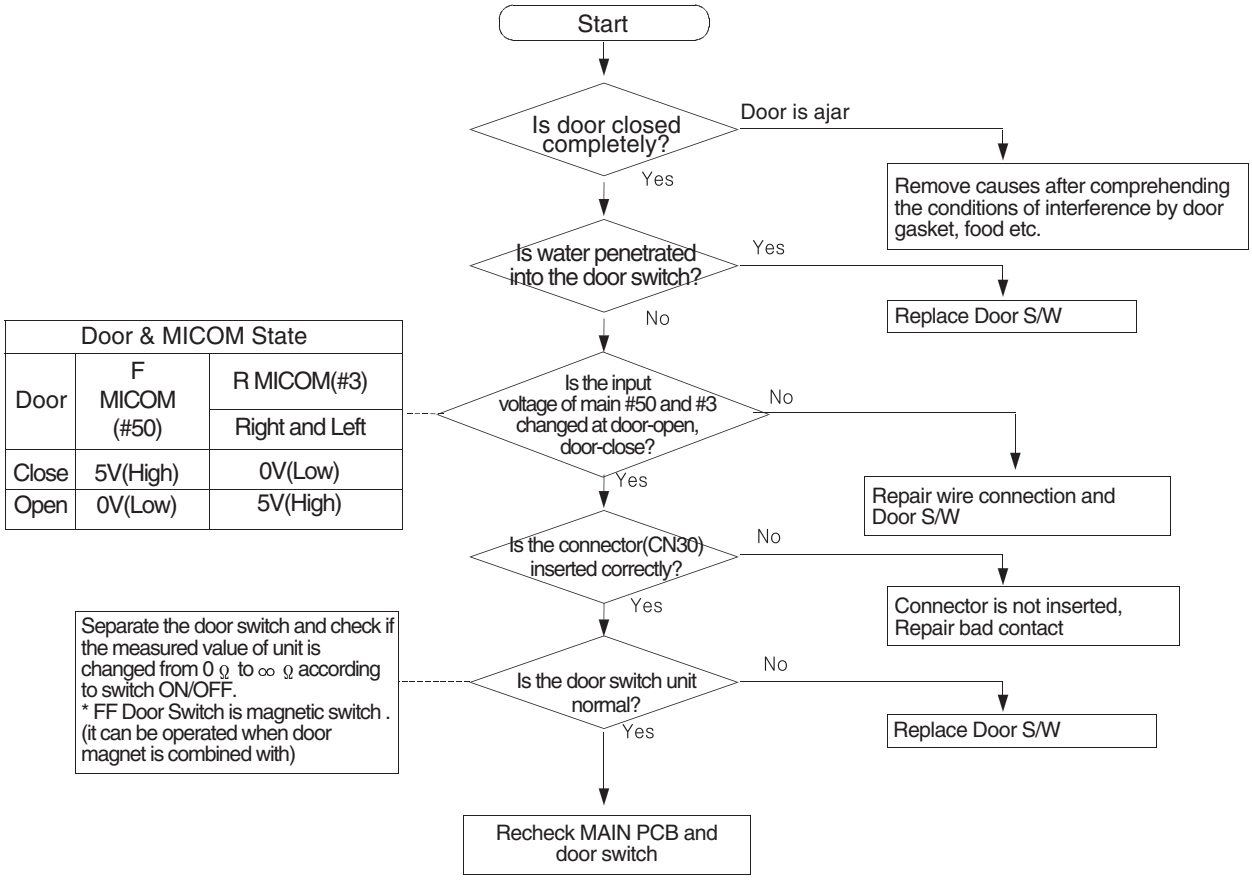


typical PCB Ground CN1#3(Black)



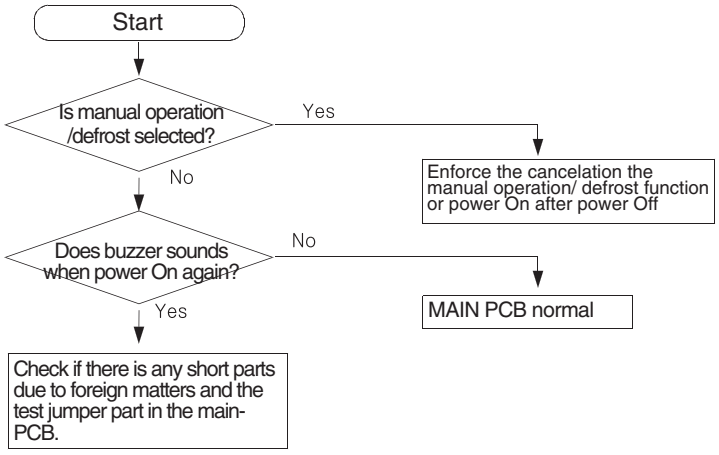
4-2-7. When alarm sound continuous without stop(related with buzzer sound)

① If 'ding-dong' sounds continuously



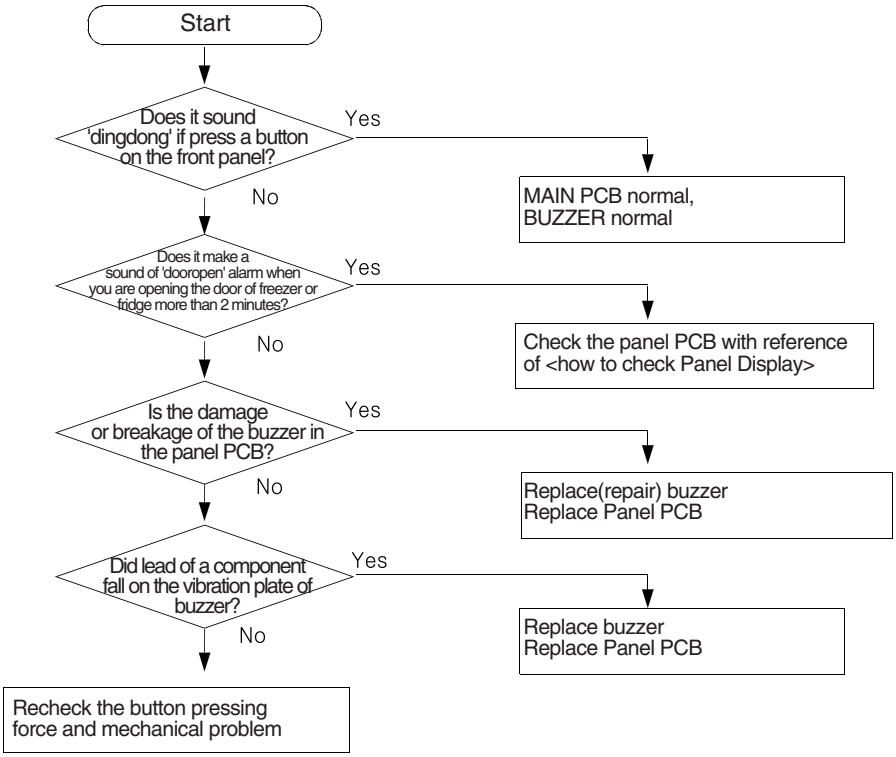
Door & MICOM State		
Door	F MICOM (#50)	R MICOM(#3) Right and Left
Close	5V(High)	0V(Low)
Open	0V(Low)	5V(High)

② If 'beep-beep' sounds continuously



③ If buzzer does not sound

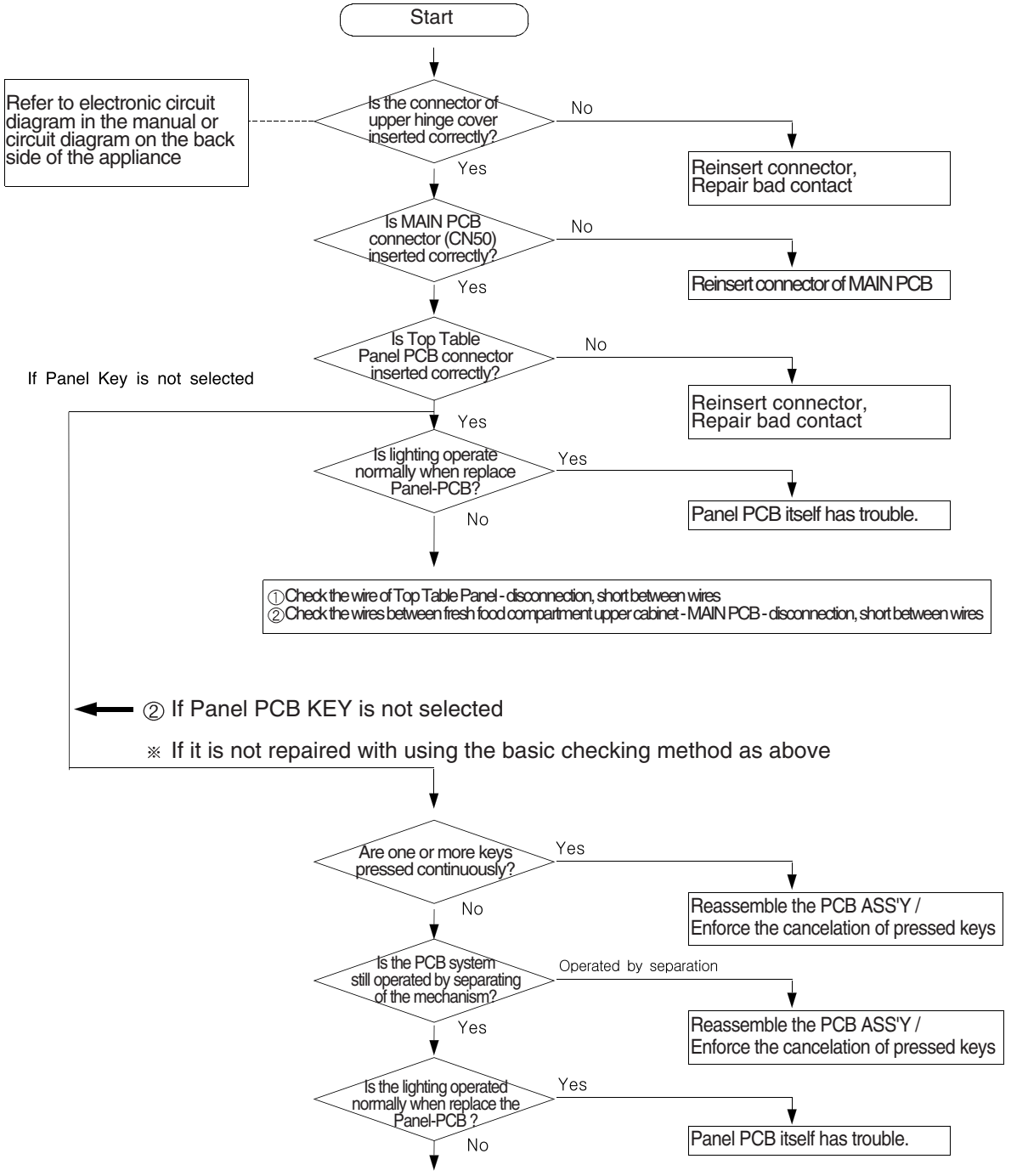
Buzzer is installed on the panel PCB in this model.
If buzzer does not sound when button is pressed, manual operation is started and door is opened, should separate panel PCB and check the breakage of buzzer and bad soldering.
It is very hard to repair the panel PCB because it consists of SMD assemblies.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



4-2-8. If Panel PCB does not work normally

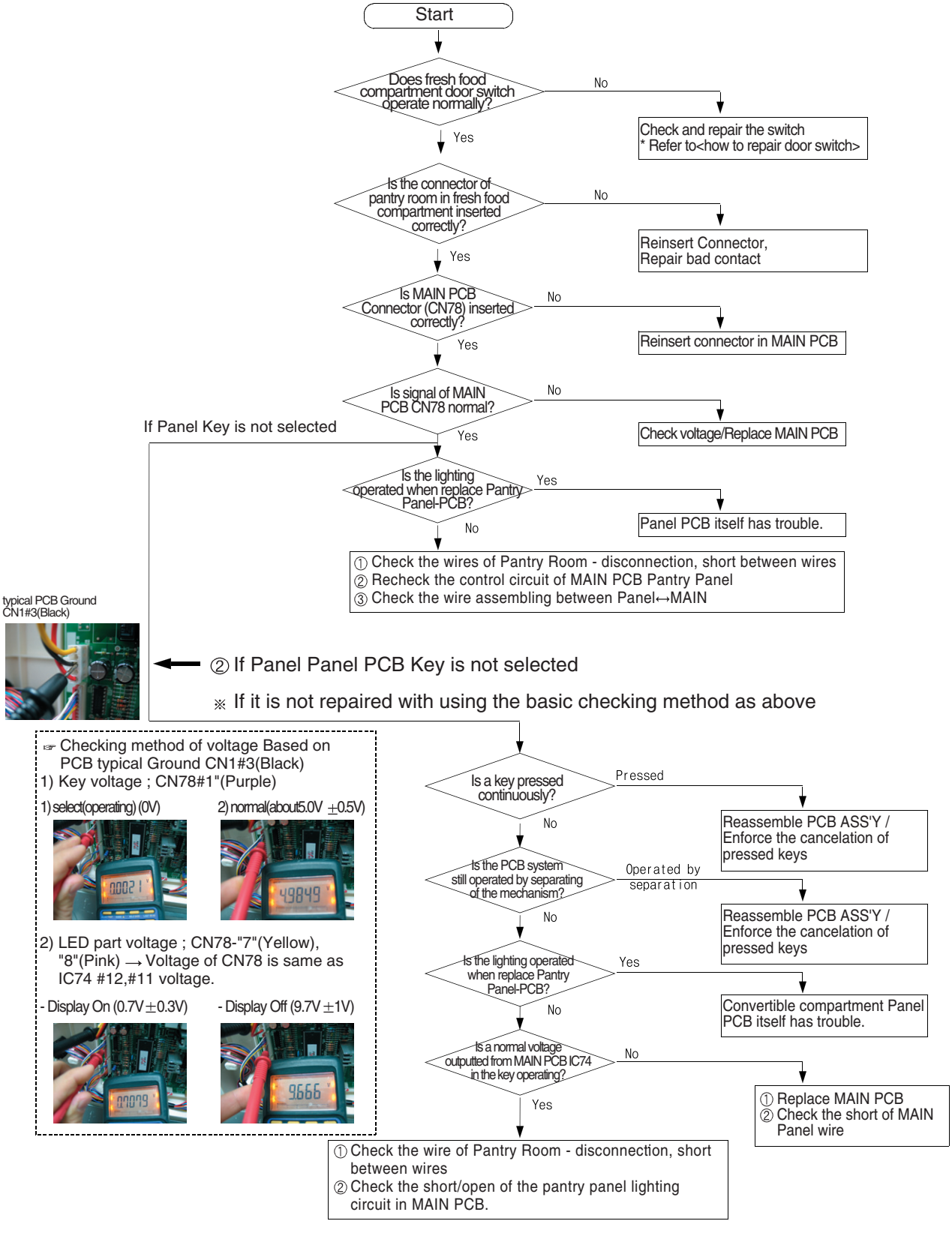
① When lighting of Panel PCB is disabled or only some LED Lamp are disabled

Be careful to repair because display of this model is installed in the MICOM of internal PCB.
It is recommend to replace PCB MAIN after checking except specified solder touch.



4-2-9. If Pantry Panel PCB is not working normally

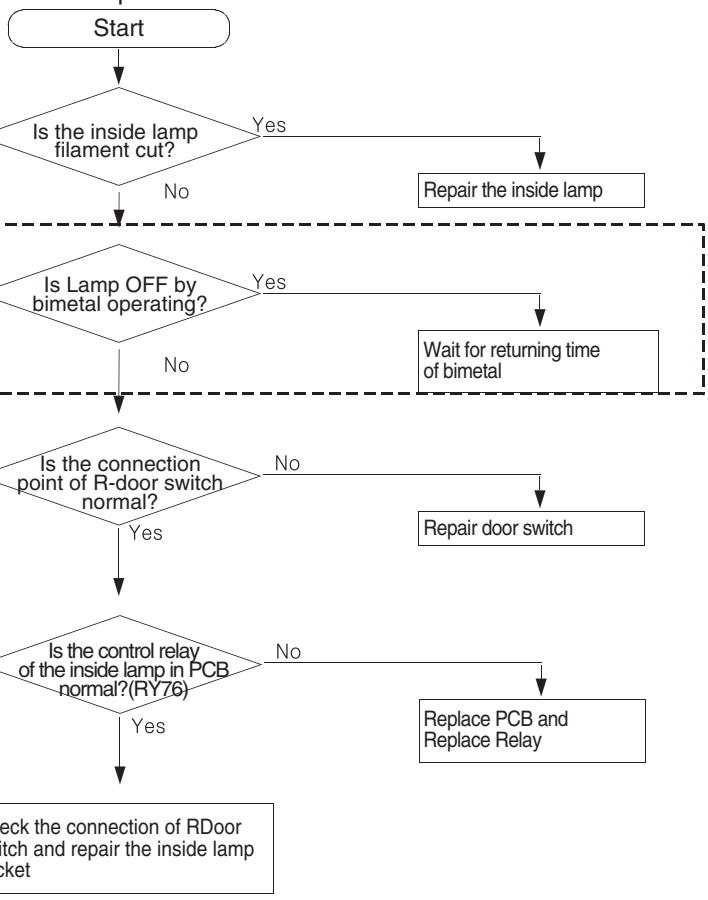
You should check the display after door opening because the display of this model operates only when the fresh food compartment door is opened.



4-2-10. When refrigerator ROOM Lamp does not light up

1. When you replace the lamp of freezer, please power OFF to avoid an electric shock.
2. Please keep in mind you could get burnt by the excessive heating of an incandescent light bulb.
3. Bimetal is installed in the refrigerator LAMP. Check that if LAMP may be OFF by bimetal.

※ The case of fresh food compartment(room) lamp will be explained only.
Because it is possible to repair the other room lamps with the same method.



Fresh food compartment Lamp is applied only.

Door & MICOM State		
Door	F MICOM (#50)	R MICOM(#3)
		Right and Left
Close	5V(High)	0V(Low)
Open	0V(Low)	5V(High)

Reference
* The interior lamp relay operates lighting/lightout according to door open / close.
* If interior lamp does not light, check the noise of relay operation.
* Noise of relay operation sounds every Door Open / Close.
* F-LAMP Relay -- RY75
* R-LAMP Relay -- RY76

Reference
If the door is opened, the contact of door switch will be opened and MICOM will get applied 5V to finally sense Open.
If 5V has been sensed over two minutes afterwards, Door-Open alarm will sound 'Ding-Dong' for 10 seconds in a oneminute cycle. For that reason, if the door switch has failure, the refrigerator can make a "Ding-Dong" sound per a oneminute cycle. Please note the step for its service.

☞ When measure lamp resistance to the Wire
→Resistance can be changed by Lamp input voltage.
(Actual measurement is below, it can be changed by performance)

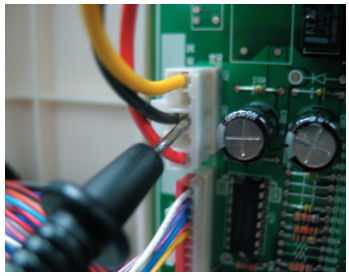
☞ Fresh food compartment lamp CN70#1(Red) ↔ CN71#1 (Blue) ; 10(33)Ohm±3 Ohm Lamp ; 60W + 60W

☞ Freezer compartment lamp CN70#1(Red) ↔ CN71#3 (Purple) ; 15(66)Ohm±5 Ohm Lamp ; 60W

☞ Checking method of Door Switch voltage
- Measuring voltage of Sensor Check Point #5(IC01 MICOM #58) on PCB or CN30#8(White-black) ↔ CN75#1(Gray)
- Compare time table after measuring

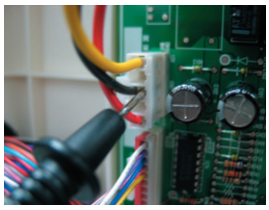
Measuring voltage of CN30#8(white-black)↔CN75#1(Gray) are below

typical PCB Ground CN10#3"(Black)



4-2-11. If ICE Water is not supplied

typical PCB Ground CN1#3(Black)

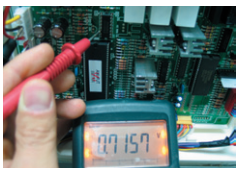


☞ Checking method of voltage Based on PCB typical Ground CN1#3(Black)

1) Check the voltage of IC73#4(same voltage as IC02 #12)
- ICE Water valve operating (about 5V ±0.5V)

Based on PCB typical Ground CN1#3(Black)

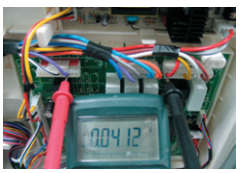
2) IC73 #13 voltage
- ICE Water valve operating (about 0.7V ±0.5V)



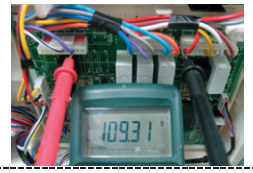
3) Check the voltage of ICE Water Valve operating(AC voltage)

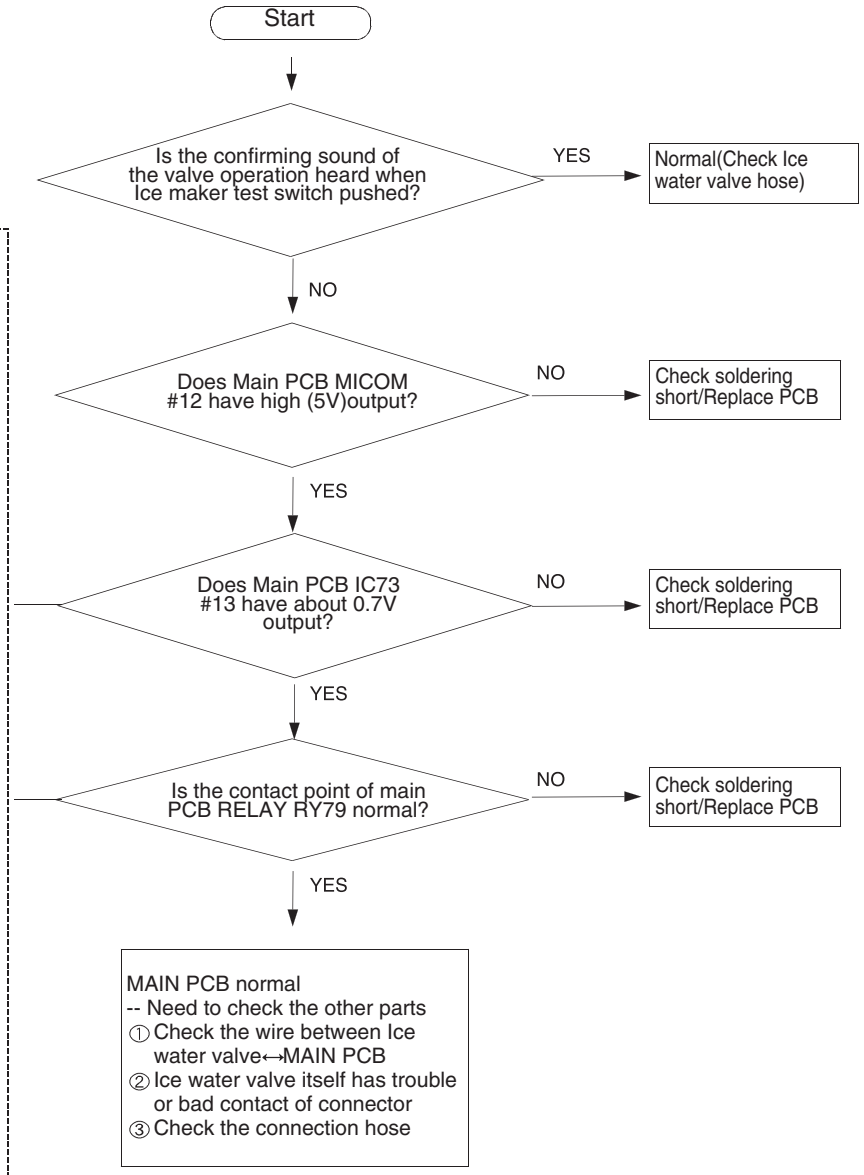
=> For checking the Relay RY79 operating.

CN70#1(Red) ↔ CN73#7(Purple)
- ICE Water valve waiting (about AC 0V)



- ICE Water valve operating (about AC 110V ± 20%)

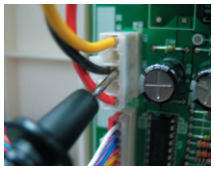




4-2-12. If Water is not supplied

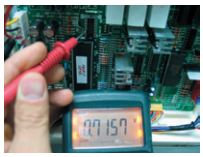
☞ Checking method of Valve resistance (Must power off for checking)
Resistance can be changed by input voltage.
CN70#1 (Red) ↔CN73#5 (White-black)
- resistance value ; 388Ohm ± 7%)
** 0 Ω: Short trouble / ∞ Ω: Open trouble

typical PCB Ground CN1#3(Black)



☞ Checking method of voltage
Based on PCB typical Ground CN1#3(Black)
1) Check voltage of IC73# (same voltage as IC01#64)
- Water valve operating (about 5V ±0.5V)

Based on PCB typical Ground CN1#3(Black)
2) IC73 #14 voltage
- Water valve operating (about 0.7V ±0.5V)



3) Check the voltage of Water Valve operating (AC voltage)
=> For checking the Relay RY7A operating.
CN70#1(Red) ↔CN73#5(White-black)
- ICE Water valve waiting (about AC 0V)

- ICE Water valve operating (about AC 110(230)V ±20%)