

CHAPTER 9. SELF-DIAGNOSIS MODE

1. How to input

<SJ-XP680G,XP700G>

1. Open R door.
2. Press "Select" button for 5 seconds or more.
3. When MPU accept the Self-diagnosis mode, a buzzer rings "Beep Beep Beep".
And the check mode goes on for 3minutes.

<SJ-XE680M,XE700M>

1. Open R door.
2. Press "R" button for 5 seconds or more while temperature indicator is turned off.
(Buzzer rings "Beep beep")
3. Close and open the R door three times.
"close → open → close → open → close → open"
(Within 10 seconds after No2 operation.)
4. When MPU accept the Self-diagnosis mode, a long buzzer rings "Beep ---".
And the check mode goes on for 3 minutes.

2. Operation in mode

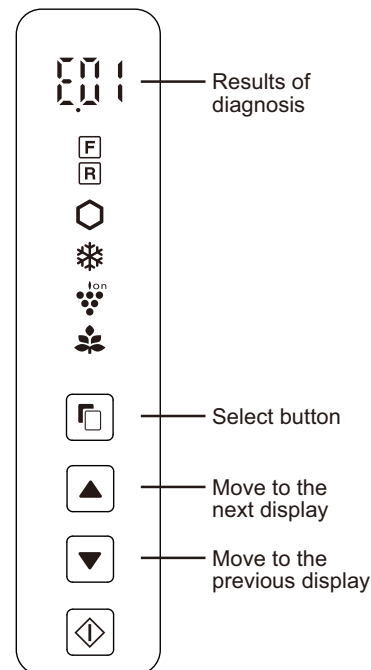
1. The compressor, F fan motor and Plasmacluster are compulsorily turned on.
2. Defect conditions are displayed on the control panel.

In case of plural defects and various conditions, these are displayed one after another by button operation and all contents are notified.

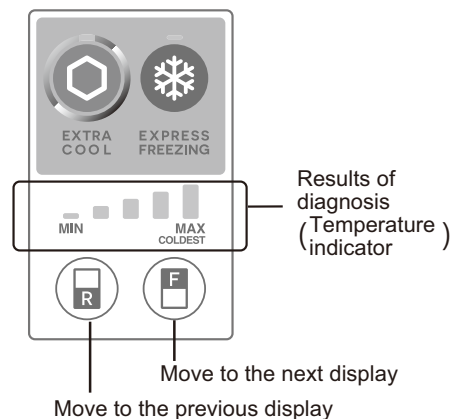
If there is any defect MPU keeps a buzzer ringing during check mode (for 3 minutes).

If there is no defect, the buzzer doesn't ring.

<SJ-XP680G,XP700G>



<SJ-XE680M,XE700M>

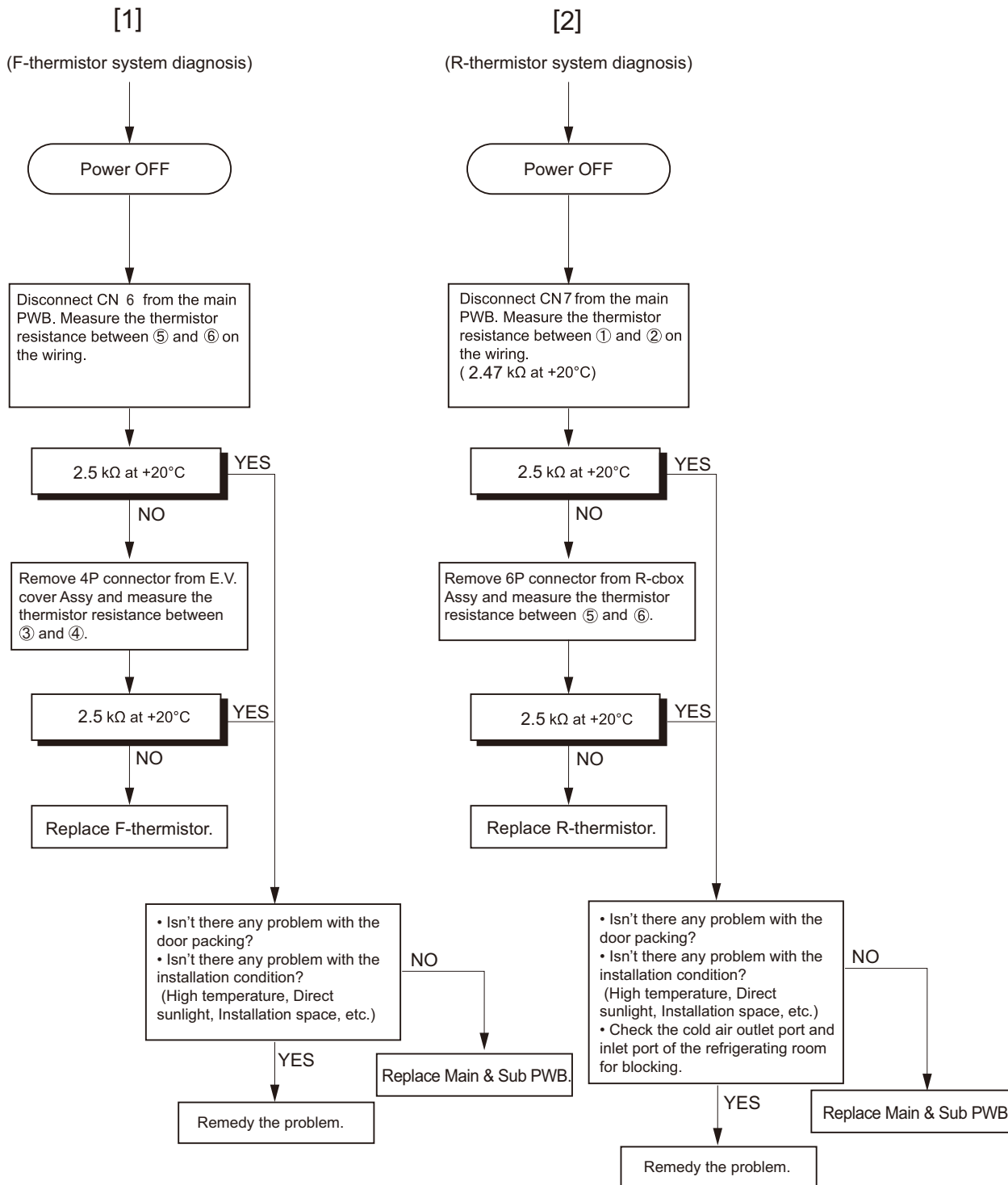


3. Defect display

○ :Lighting ● :Flashing

No.	Status	SJ-XP680G SJ-XP700G	SJ-XE680M SJ-XE700M					Content	Correspondance method
		Control panel LED	Temperature indicator						
			MIN				MAX		
—	No defects	— — —	○	○	○	○	○	—	
1	F-thermistor system defect	E.01					○	Defect of each thermistor / wiring / main PWB	→[1]
2	R-thermistor system defect	E.02				○	→[2]		
3	DEF-thermistor system defect	E.03				○	○		→[3]
4	Outside temperature-thermistor system defect	E.04			○				→[4]
5	Defrost defect	E.07			○		○	Defect of def heater / thermo. Fuse / wiring / main PWB (120-minute defrosting has been occurred continuously 2 times.)"	→[5]
6	Cooling fan motor system defect	E.08			○	○		Defect of fan motor / wiring / main PWB	→[6]
7	Plasmacluster system defect	E.11			○	○	○	Defect of plasmacluster / wiring / main PWB	→[7]
8	Operation PWB communication defect	E.12	—	—	—	—	—	Defect of wiring , Operation or main PWB (Communication with Operation PWB has been abnormal over 5 times within the past 48 hours.)	→[8]
9	Comp starting current defect (include un-connecting)	E.30	●				○	Defect of compressor / wiring / main PWB (Failure occurred twice or more within the past 48 hours.) (These failures are displayed from the 2nd occurrence.)"	→[9]
10	Comp starting defect 1 Comp supply voltage defect	E.31	●			○			
11	Comp starting defect 2	E.34	●			○	○		
12	IPM protection (FO)	E.35	●		○				
13	IPM thermistor high temperature	E.36	●		○		○		
14	Inverter circuit defect	E.37	●		○	○			
15	Inverter communication defect	E.38	●		○	○	○	→[10]	
16	F-thermistor system defect history	H.61		●			○	Defect of thermistor system has been occurred over 1 minute continuously within the past 48 hours	→[1]
17	R-thermistor system defect history	H.62		●		○			→[2]
18	DEF-thermistor system defect history	H.63		●		○	○		→[3]
19	Outside temperature-thermistor system defect history	H.64		●	○				→[4]
20	Cooling fan motor system defect history	H.67		●	○	○		Defect of fan motor has been occurred over 3 times continuously within the past 48 hours	→[6]
21	Plusmacluster system defect history	H.73		●	○	○	○	Defect of plasmacluster system has been occurred over 3 times continuously within the past 48 hours	→[7]

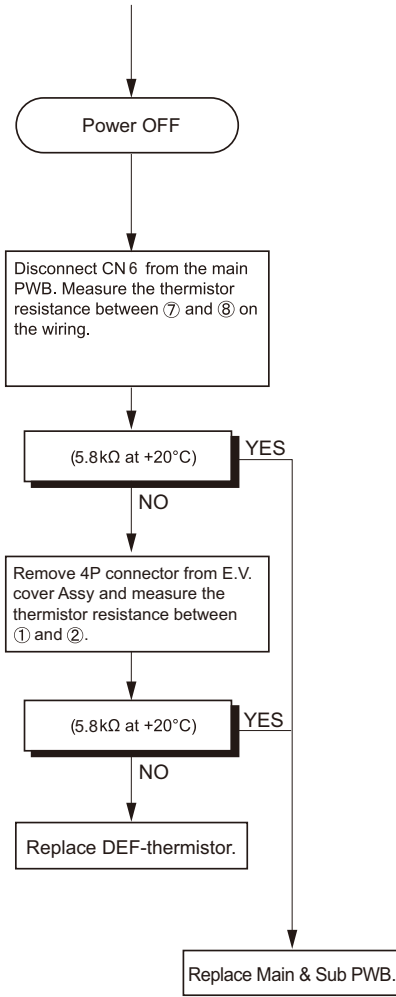
4. Correspondence method



* For the resistance of the thermistor, refer to [8] 5. CONVERSION TABLE BETWEEN TEMPERATURE AND RESISTANCE VALUE

[3]

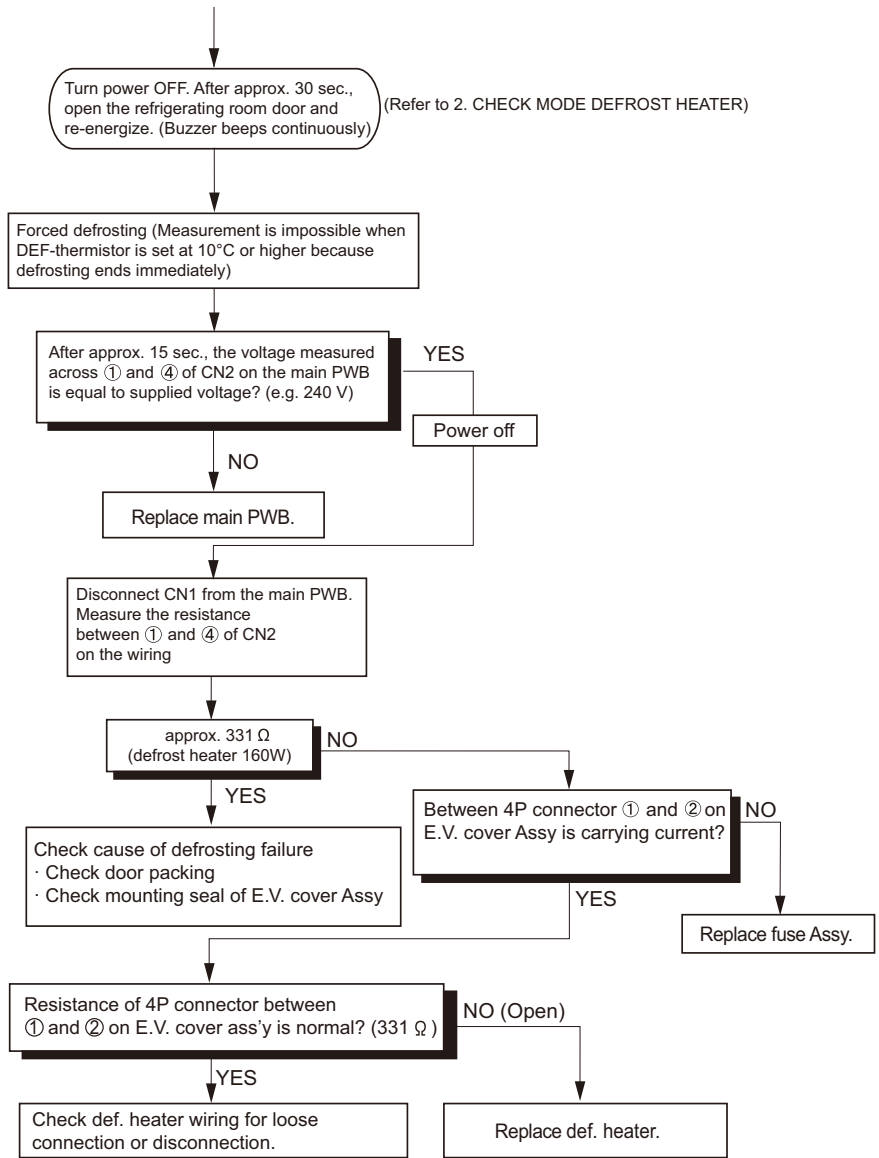
(DEF-thermistor system diagnosis)



* For the resistance of the thermistor, refer to [8] 5. CONVERSION TABLE BETWEEN TEMPERATURE AND RESISTANCE VALUE

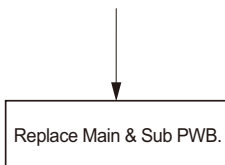
[5]

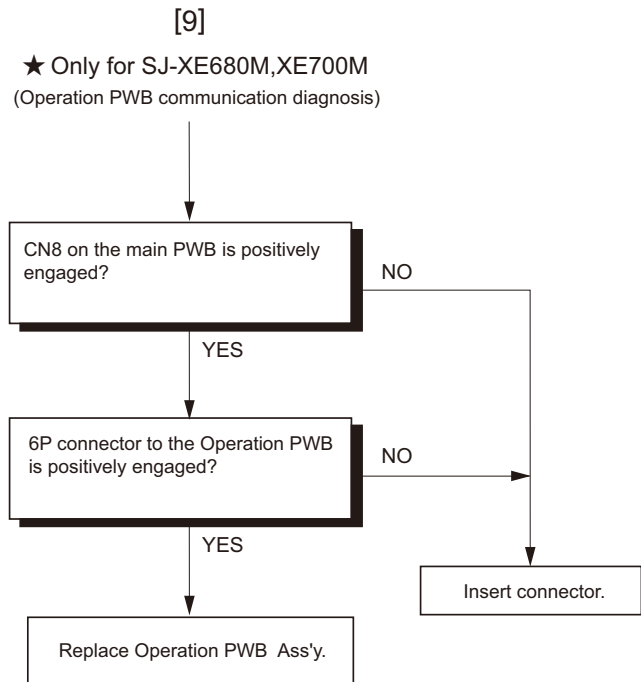
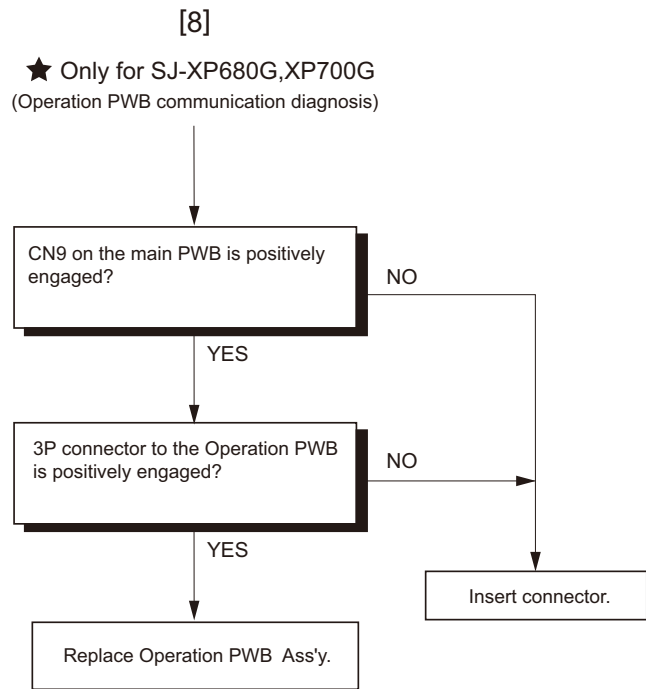
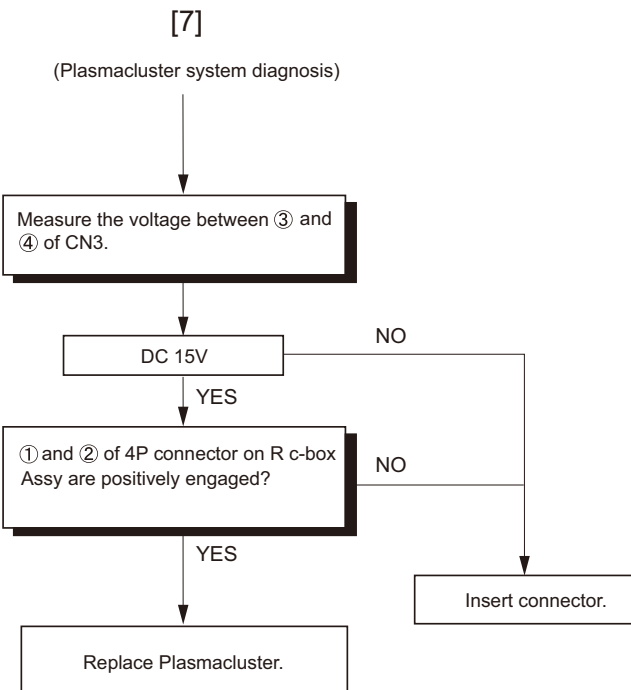
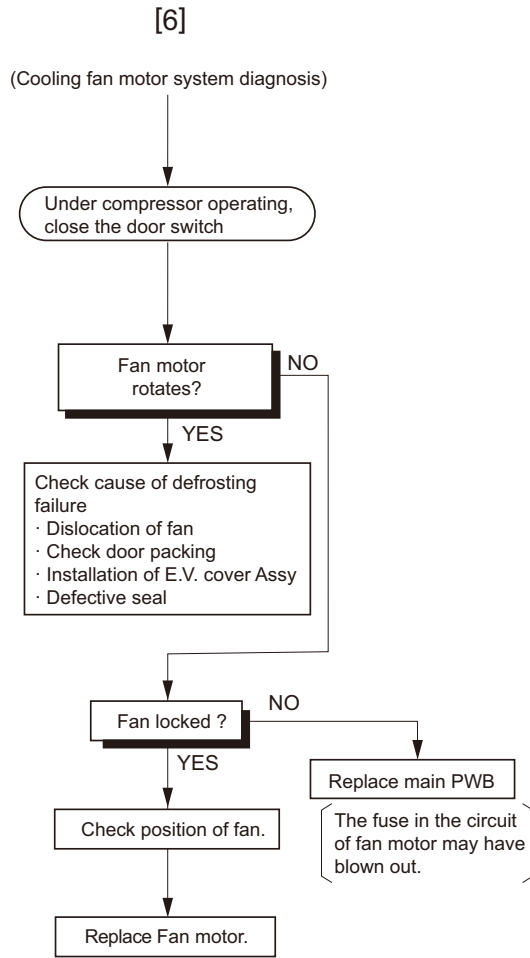
(Defrosting diagnosis)

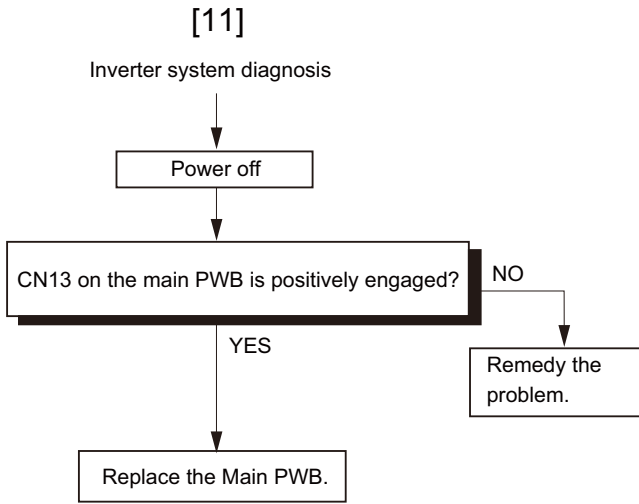
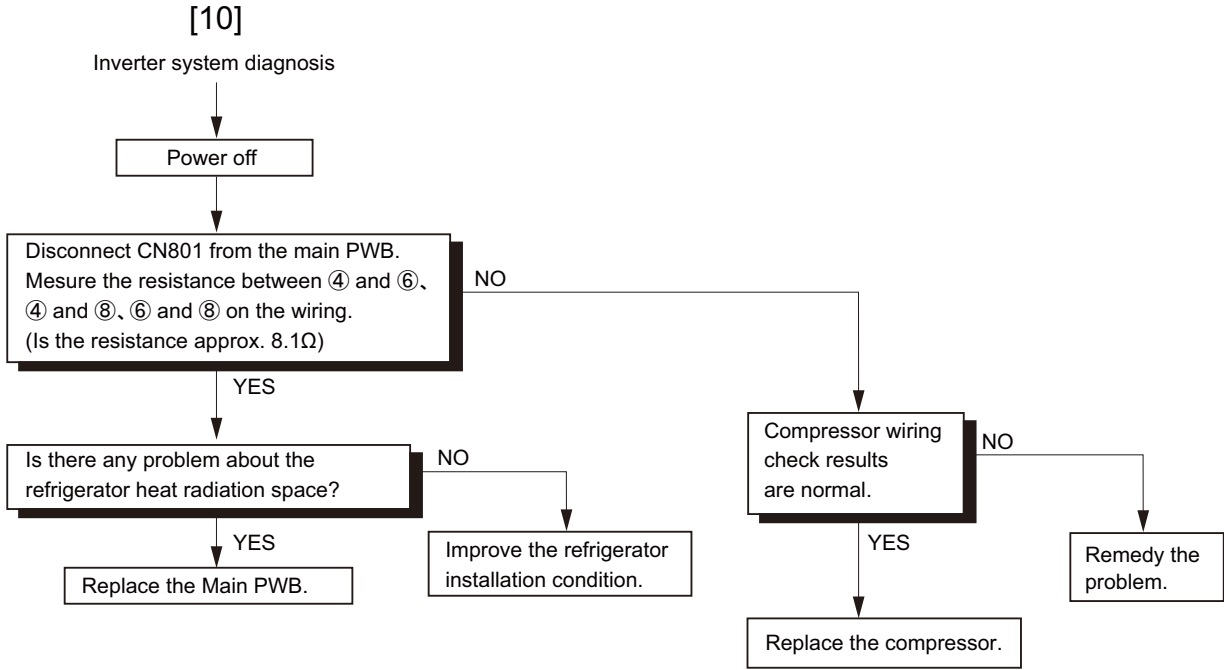


[4]

(Outside temperature - thermistor system diagnosis)





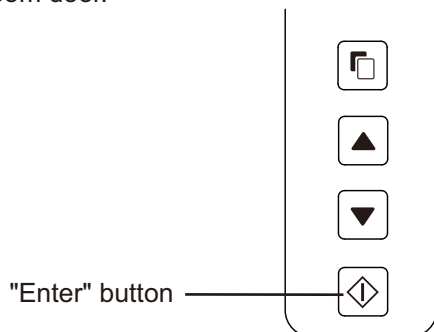


CHAPTER 10. MODE FOR DISPLAY

<SJ-XP680G,XP700G>

1) Entering method of the mode

Within 2 minutes after main power input, press the "Enter" button over 5 seconds at the opening condition of the refrigerating room door.



2) Release of the mode

Press the "Enter" button over 5 seconds at the opening condition of the refrigerating room door. (Even without the above operation, release can be made by main power OFF.)

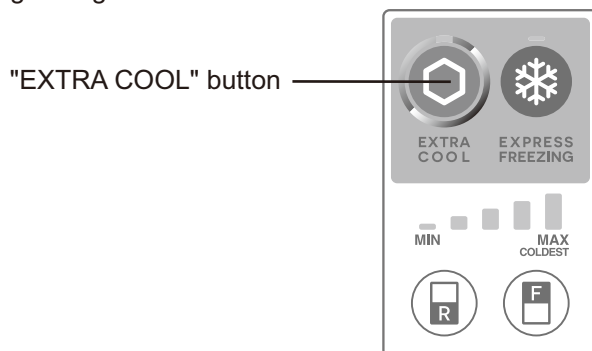
3) Movement in the mode

1. Compressor, heater, fan motor and Plasmacluster are stopped.
2. Damper is always made [OPEN] condition.
3. Indoor lamp is light when door is open.
4. LED lamp on control panel will be displayed in turn automatically.
5. Door alarm is not operated.

<SJ-XE680M,XE700M>

1) Entering method of the mode

Within 2 minutes after main power input, press the "EXTRA COOL" button over 5 seconds at the opening condition of the refrigerating room door.



2) Release of the mode

Press the "EXTRA COOL" button over 5 seconds at the opening condition of the refrigerating room door. (Even without the above operation, release can be made by main power OFF.)

3) Movement in the mode

1. Compressor, heater, fan motor and Plasmacluster are stopped.
2. Damper is always made [OPEN] condition.
3. Indoor lamp is light when door is open.
4. LED lamp on control panel will be displayed in turn automatically.
5. Door alarm is not operated.

CHAPTER 8. FAILURE DIAGNOSIS

[1] OUTLINE OF CONTROL

1) ON/OFF Control of Compressor

ON/OFF of the compressor will be controlled depend on the temperature detected by the R-thermistor and F-thermistor. (Normal cooling control)

In case the surrounding temperature is high at the power supply input, the compressor will be ON at once and the normal cooling control will start after several hours.

- During 6 minutes after the compressor stops, it will not start regardless of the detected temperature by R-thermistor and F-thermistor.

2) Defrosting

Microcomputer calculates the appropriate timing of defrosting and defrosting is made automatically. Therefore no manual operation by user is required. The cycle of defrosting varies depend on the usage condition of the refrigerator. (Maximum time 50 hours, minimum time 40 minutes)

3) Thermistor

Thermistors are installed in 4 places; in the refrigerator and freezer compartment, and on the Main PWB and close to Evaporator. (R-thermistor, Fthermistor, Outside temp-thermistor, Def-thermistor)

R-thermistor and F-thermistor reads the temperature in the refrigerator and freezer compartment respectively and controls ON/OFF of the compressor and OPEN/CLOSE of the electrical damper.

Def-thermistor detects the temperature around the evaporator and shows the progress of defrosting.

Outside temp-thermistor reads the surrounding temperature of refrigerator. It changes the operation mode by the outside temperature.

[2] CHECK MODE OF DEFROST HEATER (Forced Defrosting)

The operation of the defrost heater can be checked by starting it.

In case the failure of defrosting is suspected, this is an effective inspection method.

1. Starting Method

At the power OFF condition.

- 1) Keep the door of the refrigerator compartment open.
- 2) Supply power source.

2. Normal Operation

- 1) Approximately 2 seconds after power supply, the relay on the PWB will be turned ON and the defrost heater will be electrified for 5 seconds.
- 2) After 5 seconds, if the temperature of Def-thermistor reaches high enough (over 10 ° C) and judged as defrosting completion, it returns to the normal control.

On the other hand, if the temperature of Def-thermistor is still low (under 10 ° C), the defrost heater will be electrified until the temperature of Def-thermistor reaches the specified temperature or higher.

- * In the case that there is any abnormality in Door Switch, this mode will not be entered nor the defrost heater is electrified.

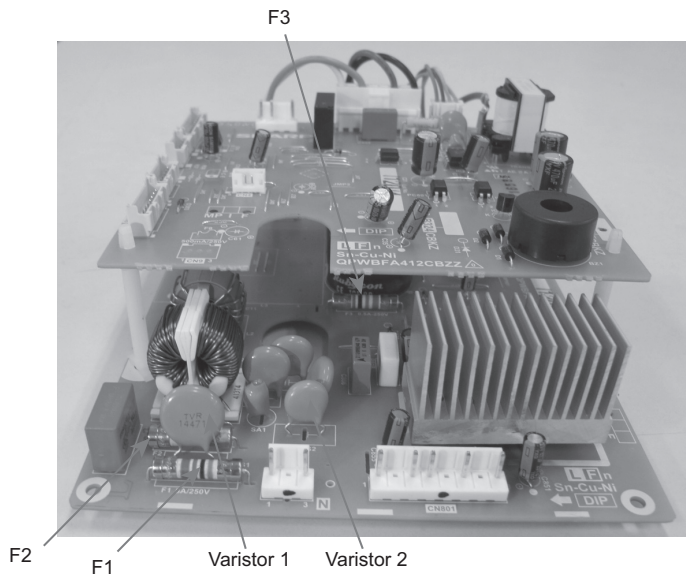
[3] RE-SETTING OF MICROCOMPUTER AT POWER FAILURE

- At the power failure for over 0.1 second, the control of the microcomputer will be reset. When the power is re-supplied, the temperature of F-thermistor will be detected again and ON/OFF of the compressor will be decided.
- At the momentary power failure (less than 0.1 second), of the compressor might work due to the high load to the compressor for re-starting.
- When resetting is made during the operation of the defrost heater, the normal cooling will be resumed.

[4] DIAGNOSIS METHOD OF FAILURE

Check by the following procedure;

1. Disconnect power supply and check the following point.
 - Is there any failure portion in inserting connectors?
2. Detach the PWB and check the appearance.
 - Is there any burning or abnormal damage?
3. Check the conditions of the fuse and the varistor. (Fuse and varistor are located at the position in the figure.)
 - Under the condition of power supply plug connected;
When the fuse F1 or F2 or F3 is melt down, PWB does not operate at all. (No cooling and no indoor LED lamp)
 - Melting in the fuse cannot be checked visually (as the safer one than transparent glass tube is used).
Be sure to detach the connector "CN1" before measuring the resistance between the both ends of the fuse by the tester.
 - Next, measure the resistance value between the both leads of the varistor.



* This picture indicates the location of the fuse and the varistor.
There is a part different from actual PWB.

Varistor →	Normal (several hundreds Ω ~several KΩ)	Damage
Fuse ↓		
Melting	Flow of excessive current is considerable for some reasons. Check for any portion to cause short circuits especially on the primary circuit.	There is a possibility of excessive voltage applied from out-side with the factor such as thunder etc. When repeated with a factor other than thunder, there might be the apparatus near by generating noises.
Conduction	Fuse and varistor are normal. Possibility to be caused by excessive current or voltage near the power supply is low. Proceed to the next check item.	—

4. Check whether the temperature (resistance value) shown by R-thermistor is correct or not.
 - Detach the connector "CN7" on the PWB and measure the resistance value between 1 and 2 pins.
5. Check whether the temperature (resistance value) shown by Def-thermistor is correct or not.
 - Detach the connector "CN6" on the PWB and measure the resistance value between 7 and 8 pins.
6. Check whether the temperature (resistance value) shown by F-thermistor is correct or not.
 - Detach the connector "CN6" on the PWB and measure the resistance value between 5 and 6 pins.

* For the resistance of the thermistor, refer to 7. CONVERSION TABLE BETWEEN TEMPERATURE AND RESISTANCE VALUE

[5] CONVERSION TABLE BETWEEN TEMPERATURE AND RESISTANCE VALUE

1) R-thermistor, F-thermistor

Temperature (°C)	Resistance Value (KΩ)	Temperature (°C)	Resistance Value (KΩ)	Temperature (°C)	Resistance Value (KΩ)
-25	26.1	-9	10.3	7	4.5
-24	24.5	-8	9.8	8	4.3
-23	23.1	-7	9.2	9	4.1
-22	21.7	-6	8.8	10	3.9
-21	20.5	-5	8.3	11	3.7
-20	19.3	-4	7.9	12	3.6
-19	18.2	-3	7.5	13	3.4
-18	17.1	-2	7.1	14	3.2
-17	16.2	-1	6.7	15	3.1
-16	15.3	0	6.4	20	2.5
-15	14.4	1	6.1	25	2.0
-14	13.6	2	5.8	30	1.6
-13	12.9	3	5.5	35	1.3
-12	12.2	4	5.2	40	1.1
-11	11.5	5	5.0		
-10	10.9	6	4.7		

2) Def-thermistor

Temperature (°C)	Resistance Value (KΩ)	Temperature (°C)	Resistance Value (KΩ)	Temperature (°C)	Resistance Value (KΩ)
-25	61.2	-9	24.1	7	10.6
-24	57.5	-8	22.9	8	10.1
-23	54.1	-7	21.7	9	9.6
-22	50.9	-6	20.5	10	9.2
-21	47.9	-5	19.5	11	8.7
-20	45.2	-4	18.5	12	8.3
-19	42.6	-3	17.5	13	8.0
-18	40.1	-2	16.6	14	7.6
-17	37.9	-1	15.8	15	7.3
-16	35.7	0	15	20	5.8
-15	33.7	1	14.3	25	4.7
-14	31.9	2	13.6	30	3.8
-13	30.1	3	12.9	35	3.1
-12	28.5	4	12.3	40	2.5
-11	26.9	5	11.7		
-10	25.5	6	11.1		

[6] METHOD OF STOPPING THE DOOR ALARM TEMPORARILY (Only for SJ-XE680M,XE700M)

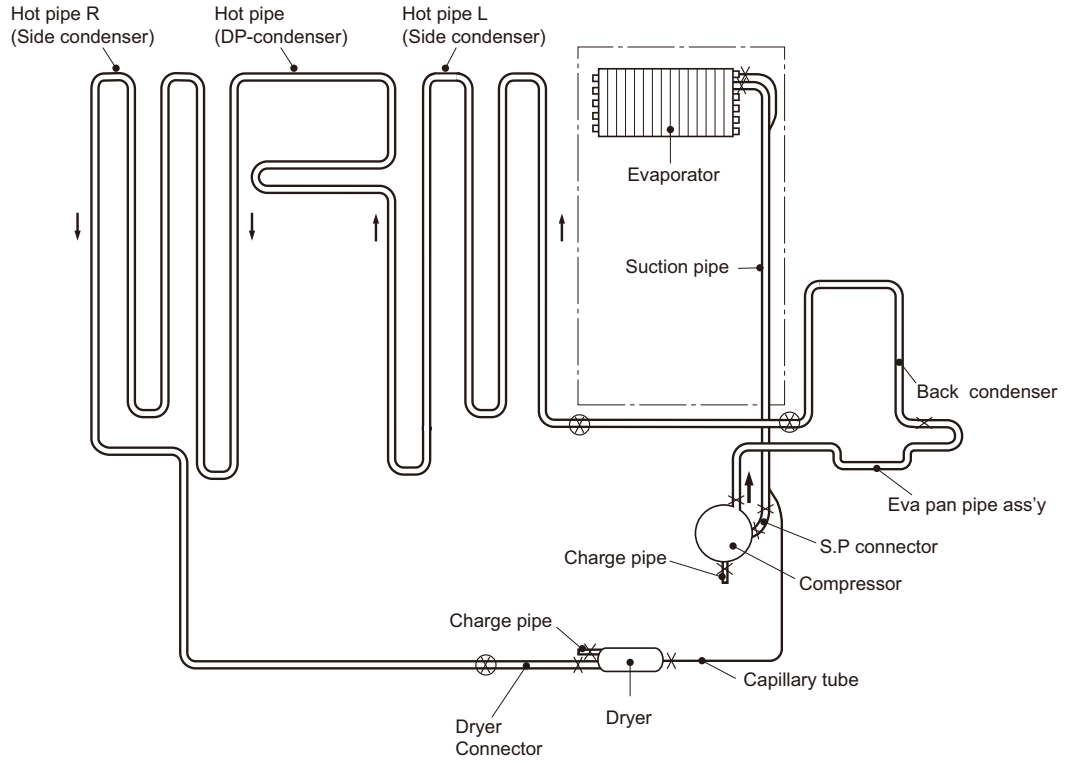
Press “R” button and “F” button continuously for 3 seconds simultaneously and or more.



CHAPTER 12. COOLING UNIT

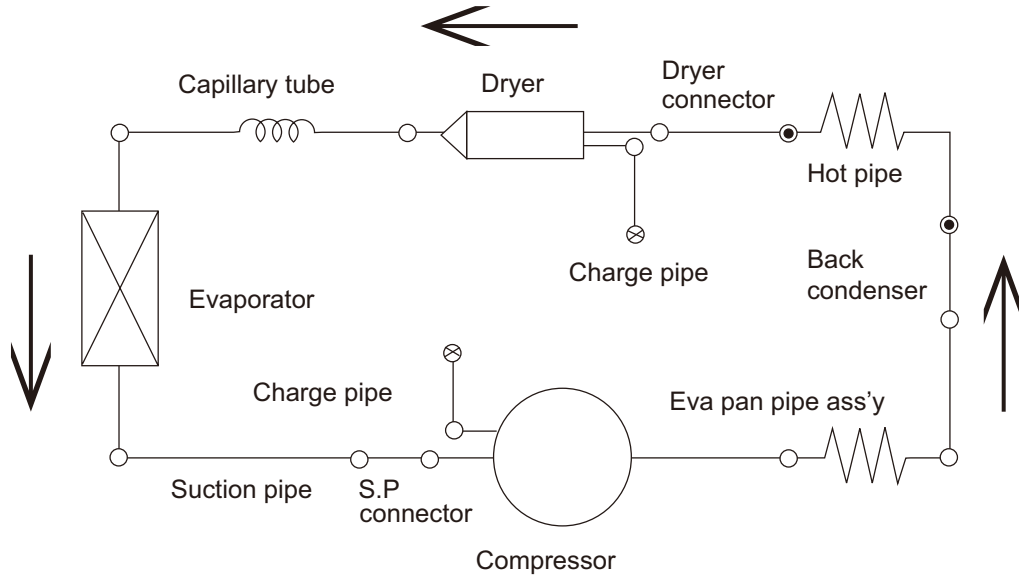
1. COOLING UNIT

- ➔ Mark: Refrigerant flow
- ✕ Mark: Brazing portion (copper to copper)
- ⊗ Mark: Brazing portion (steel to copper)



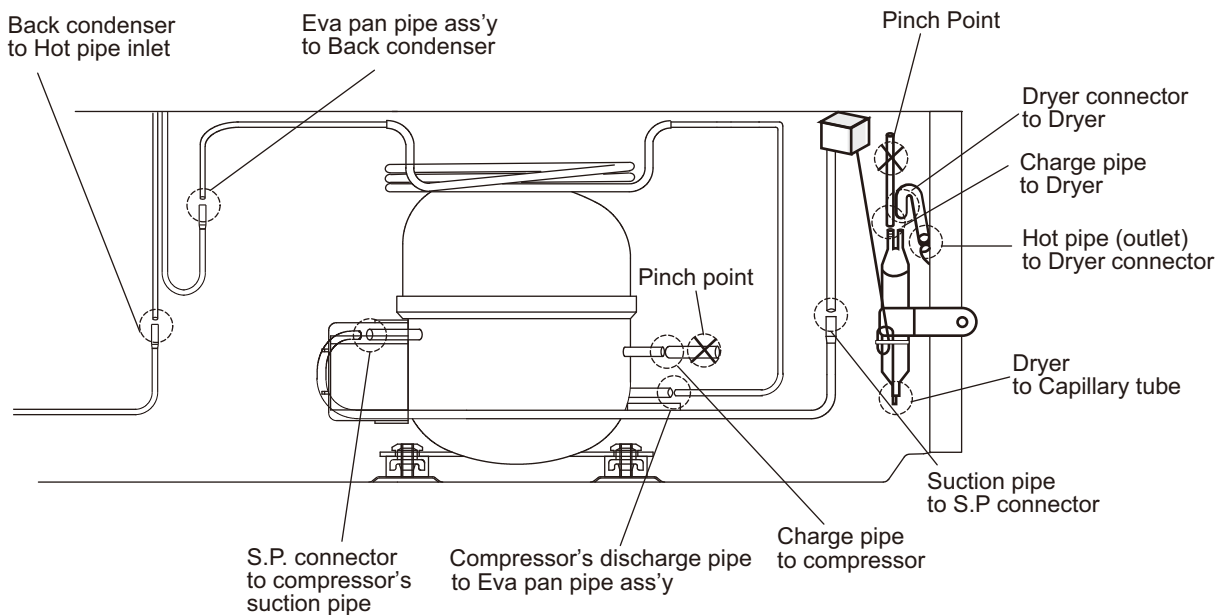
2. LOCATION

1) LOCATION 1



- ⊗ Mark shows pinch points
- Mark shows welding points (copper to copper)
- Mark shows welding points (steel to copper)

2) LOCATION 2



CHAPTER 11. DISASSEMBLING/ASSEMBLING PROCEDURES

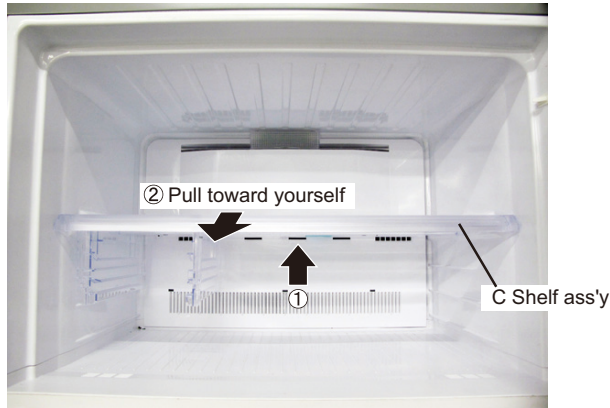
CAUTION: DISCONNECT THE UNIT FROM THE POWER SUPPLY BEFORE ANY REPAIRING.

[1] FREEZER COMPARTMENT

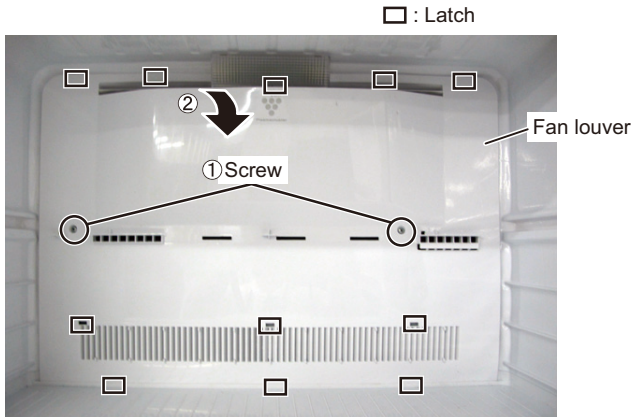
Parents parts name	Included main parts
E.v cover ass'y	Fuse ass'y, F led lamp pwb ass'y, F/def-thermistor, F fan motor

1-1. Disassembling procedures

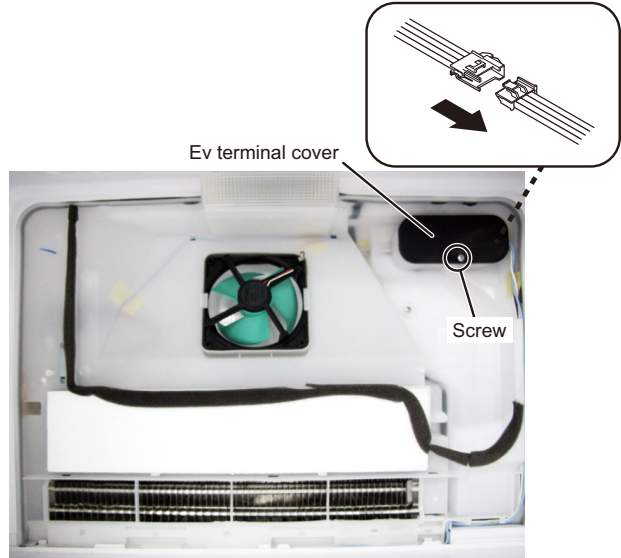
- 1) Remove the accessories(shelf, case, etc.).
- 2) Remove the F shelf.



- 3) Remove the Fan louver.

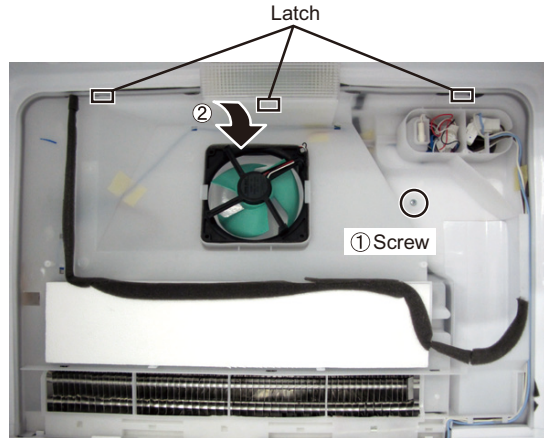


- 4) Remove the Ev terminal cover, and disconnect the connectors.



- 5) Remove the E.v cover ass'y.

When installing the E.v cover, take care not to tuck lead wires.

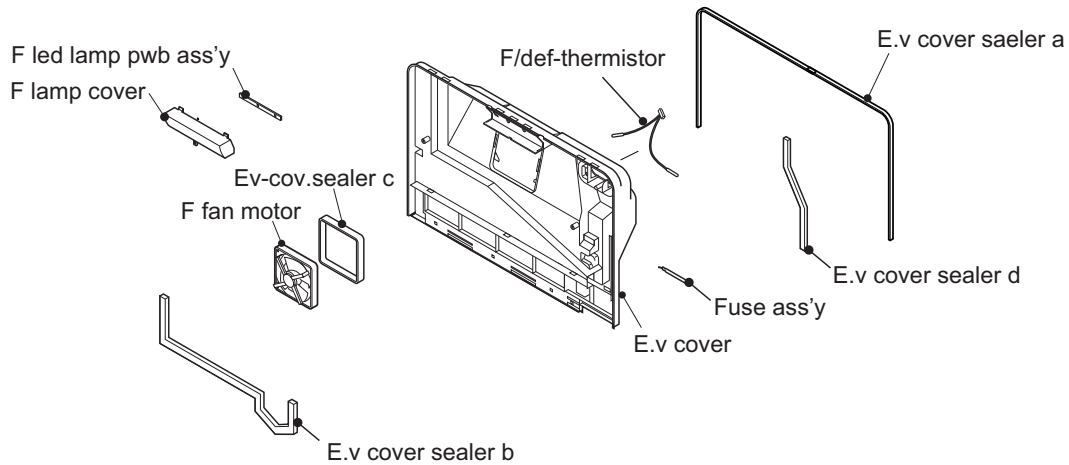


Caution: The screw is easy to fall in R-shower duct.

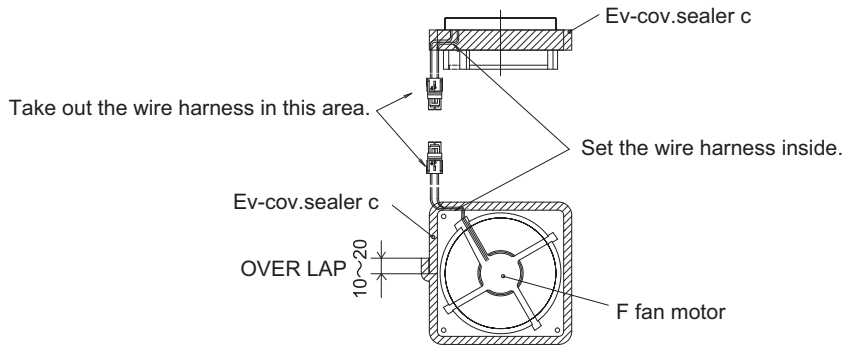
If the screw falls in R-shower duct,

- 1) Open R-c box ass'y.
- 2) Remove the screw.

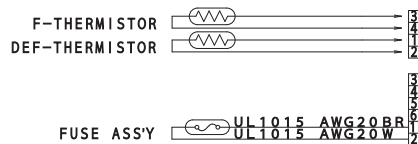
1-2. Assembling procedures of E.v cover ass'y



1) Stick Ev-cov.sealer c to F fan motor.



2) Insert terminal F-thermistor and Def-thermistor in the housing.



3) Insert the terminals of Fuse ass'y to dent area of E.v cover, and fix it with Al tape.

4) Set the F fan motor to E.v cover.

5) Set the Def-thermistor to E.v cover in order of a, b, c, d, e.

Stick Paper tapes at 3 places.

6) Set F-thermistor to E.v cover.

7) Stick E.v cover sealer d to E.v cover.

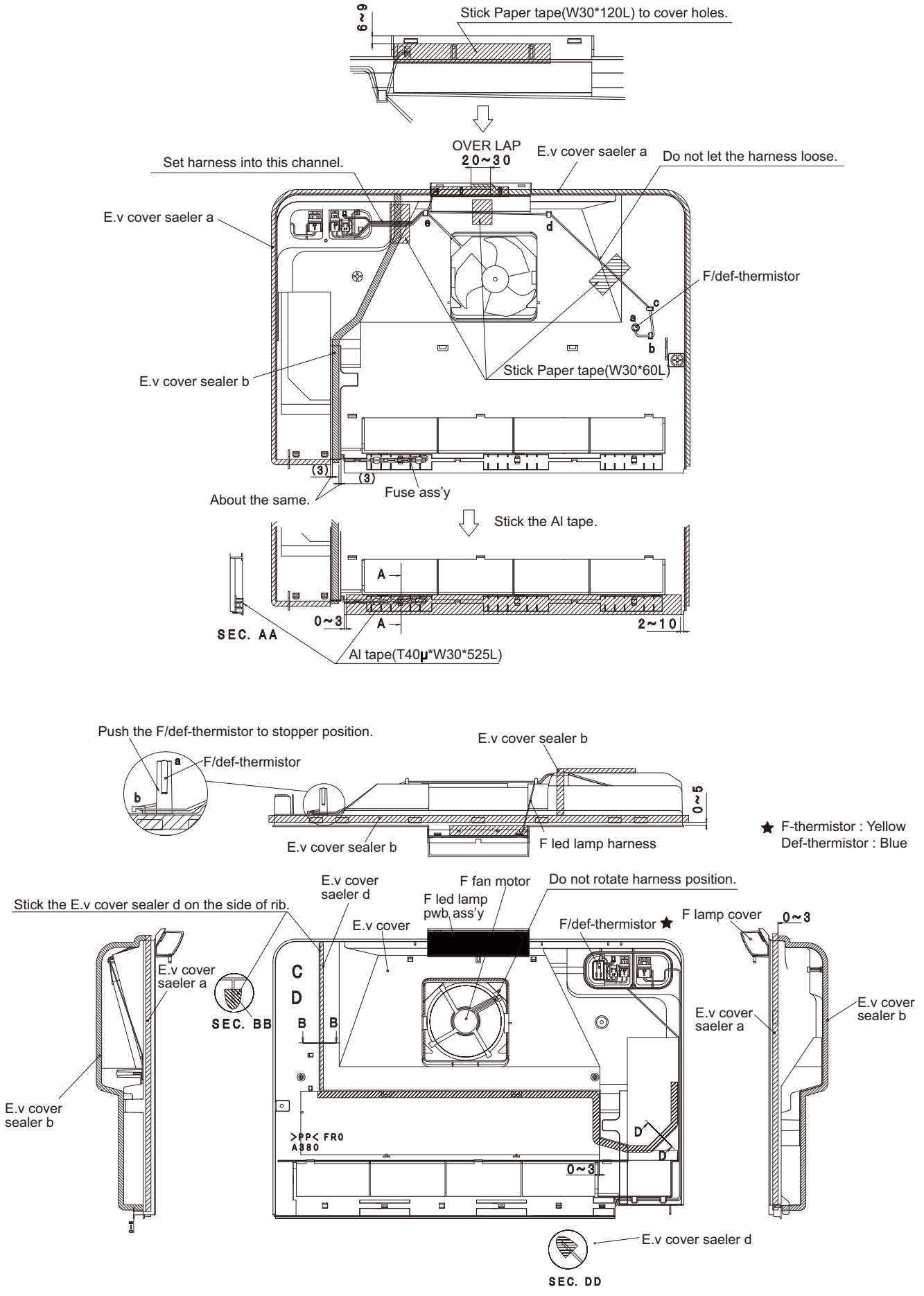
8) Stick F led lamp ass'y to E.v cover.

Insert F led lamp harness to F led lamp pwb ass'y.

Stick Paper tape to E.v cover to cover holes and F led lamp harness.

9) Stick E.v cover sealer a, E.v cover sealer b to E.v cover.

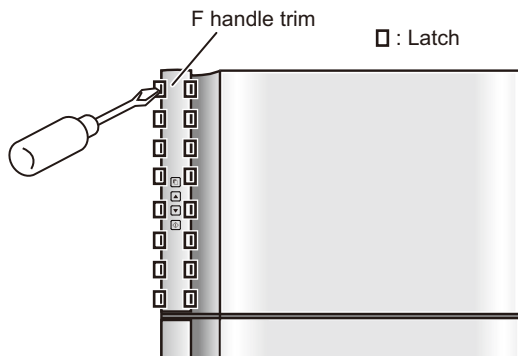
10) Set F lamp cover to E.v cover.



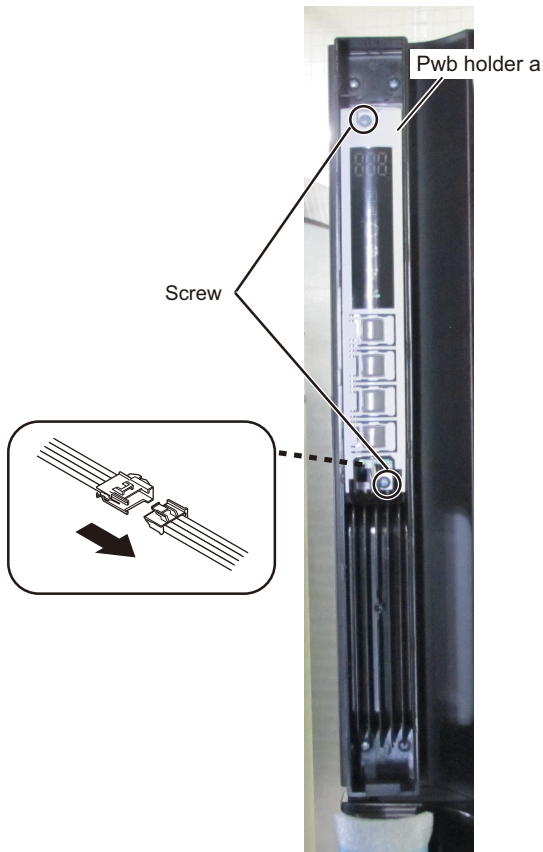
1-3. How to remove the pwb holder a (Only for SJ-XP680G,XP700G)

Included main parts
Operation pwb ass'y

1) Remove the F handle trim



2) Remove the Pwb holder a and disconnect connector.

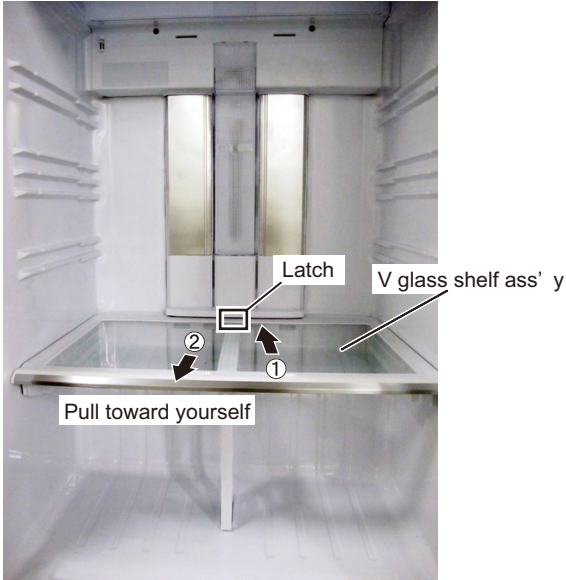


[2] REFRIGERATOR COMPARTMENT

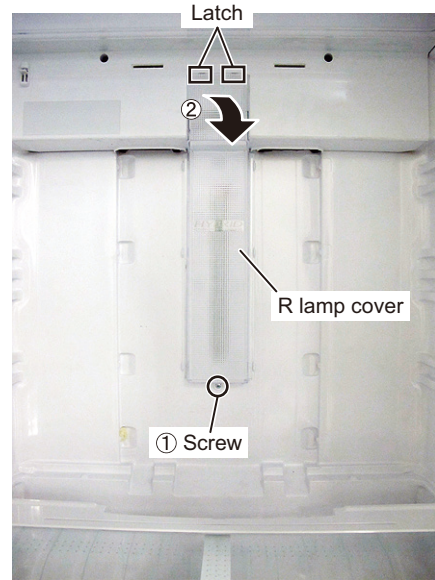
Parents parts name	Included main parts
R control cov. ass'y	Plasmacluster unit, Damper ass'y, R-pl harness, Damper harness, R-thermistor
R lamp ass'y	R led lamp pwb ass'y, R1 led lamp pwb ass'y, R led lamp harness

2-1. Disassembling procedures

- 1) Remove the accessories (shelves, vegetable case, etc.).
- 2) Pull the V glass shelf ass'y slightly toward you.



- 4) Remove the R lamp cover.
When installing the cover, insert the lower latch first.

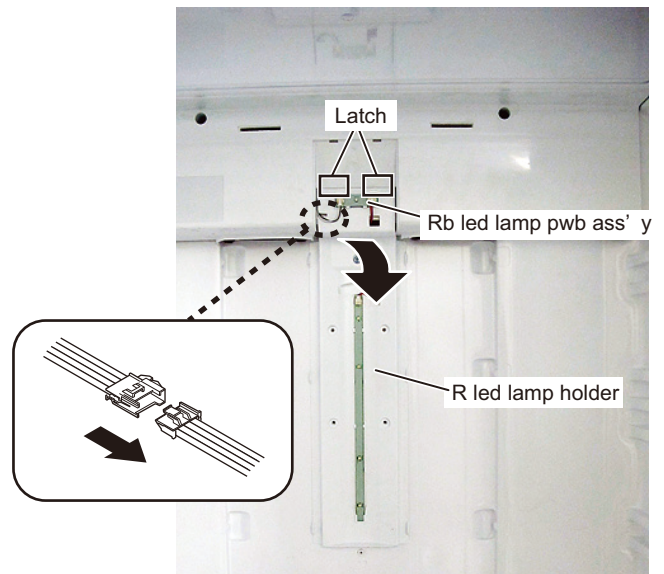


- 3) Remove the R shower duct ass'y.

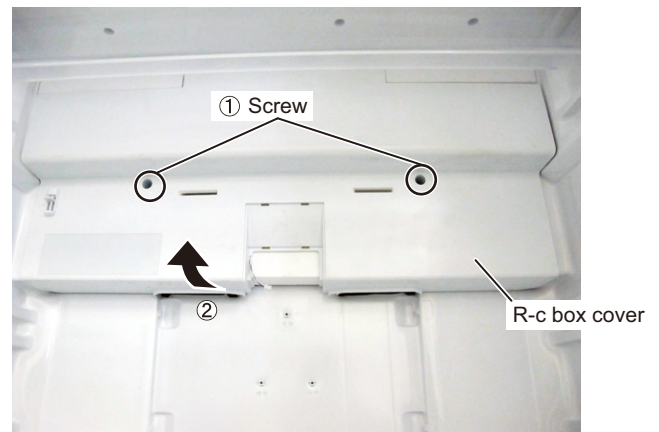
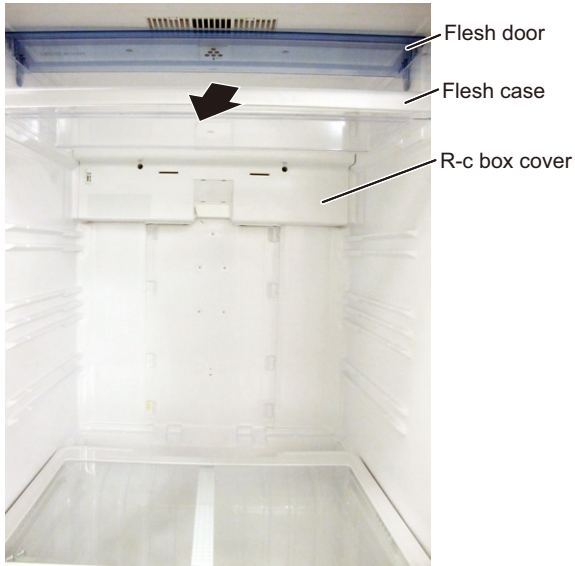
□ : Latch



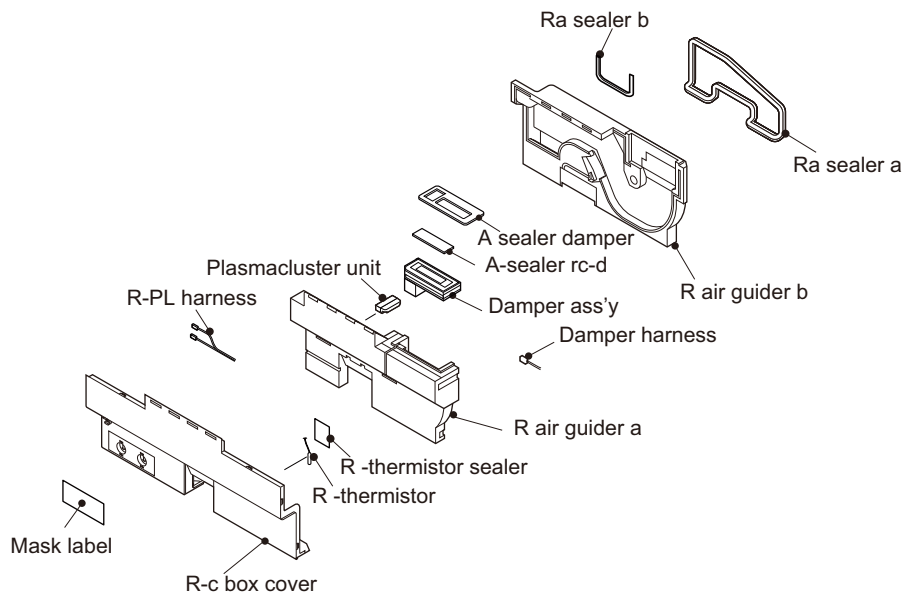
- 5) Disconnect the connector (left side of Rb led lamp pwb ass'y), and remove the R lamp ass'y holder.
When installing the holder, insert the lower latch first.



6) Pull the Fresh case toward yourself, and remove the R-c box cover.

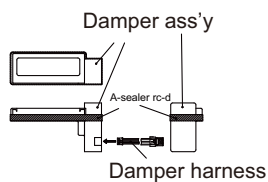


2-2. Assembling procedures of R control cov. ass'y.

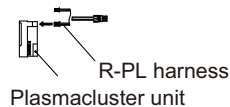


1) Connect Damper harness to Damper ass'y.

2) Stick A sealer rc-d to Damper ass'y.

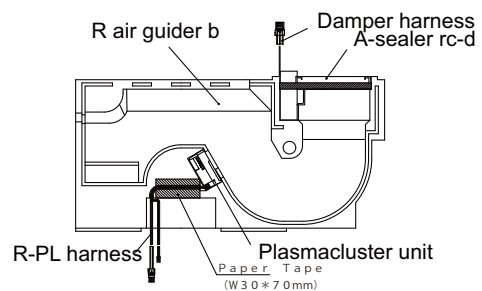


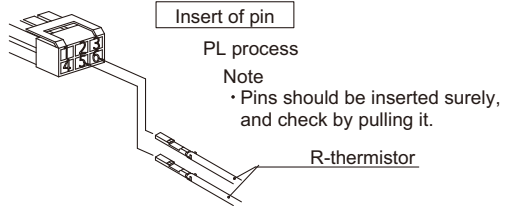
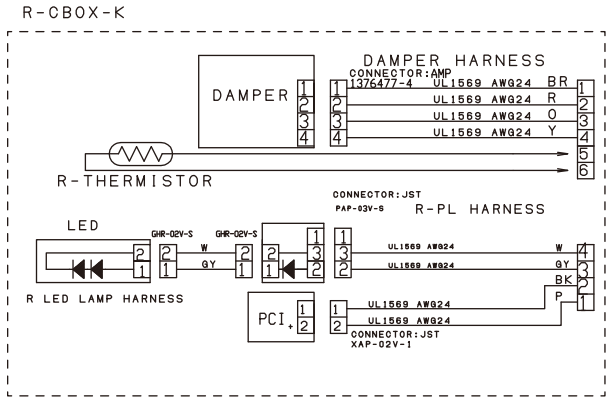
3) Connect R-PL harness to Plasmacluster unit.



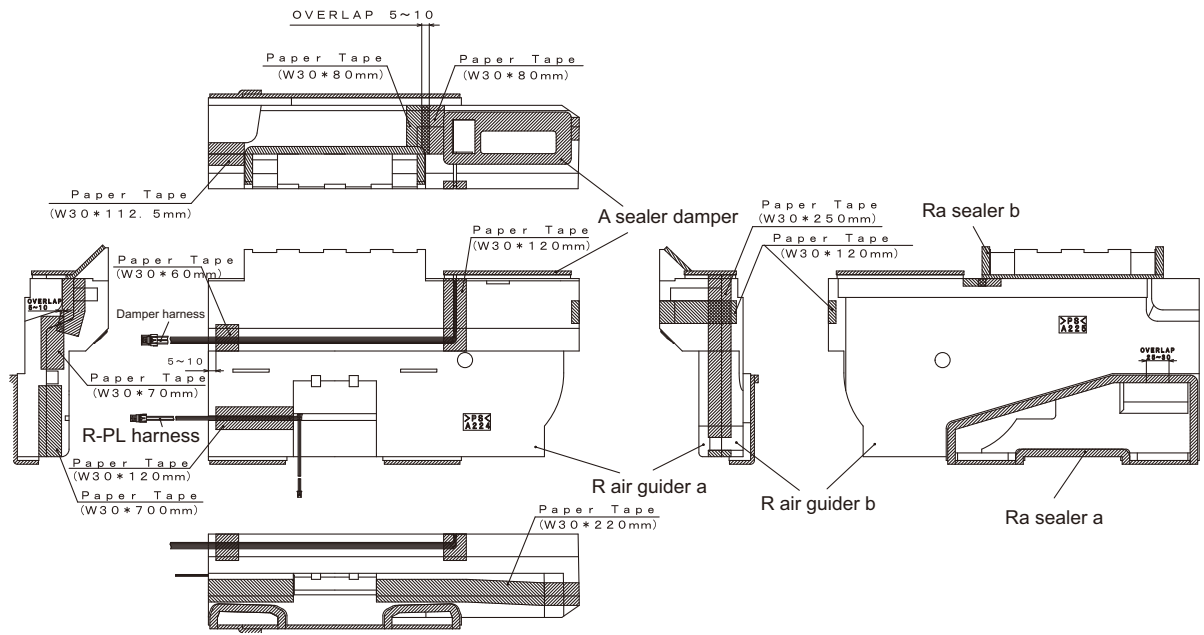
4) Insert 2) and 3) ass'y to specific slot of R air guider b.

5) Insert R air guider a to a air guider b.

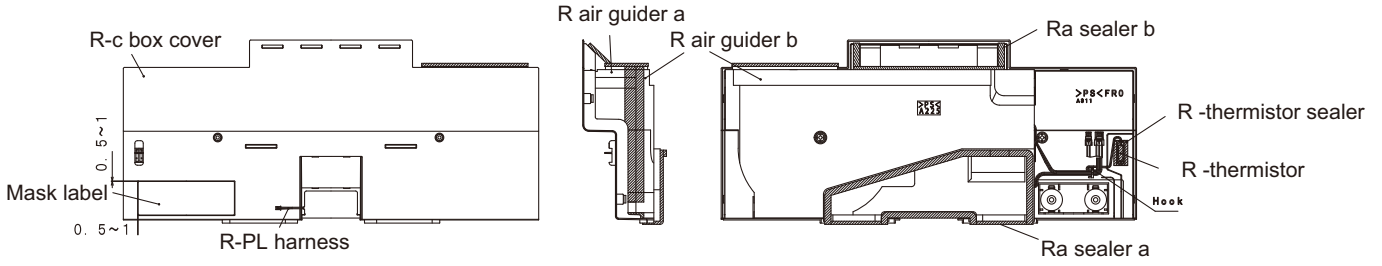




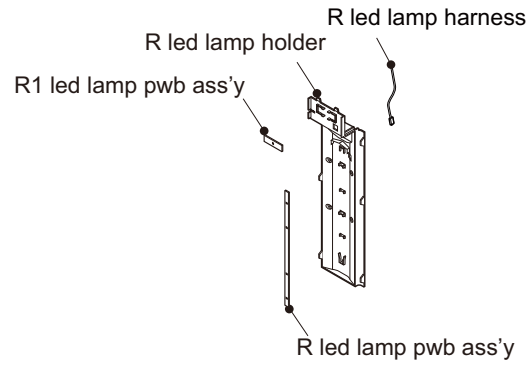
- 6) Fix R air guider a and R air guider b with paper tape.
- 7) Insert Damper harness and R-PL harness to specific slot.
- 8) Stick A-sealer damper to 7) ass'y.
- 9) Stick Ra sealer a to 8) ass'y.
- 10) Stick R a sealer b to 9) ass'y.



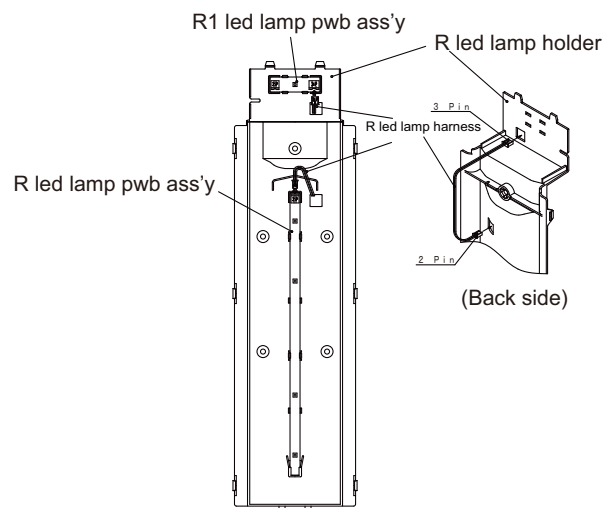
- 11) Fix 10) ass'y to R-C box cover.
- 12) Insert R-thermistor to specific slot of 11) ass'y.
- 13) Fix Damper harness to and R-PL harness to R-C box cover.
- 14) Stick Mask label to R-c box cover.
- 15) Stick R-thermistor sealer to R-c box cover.



2-3. Assembling procedures of R lamp ass'y

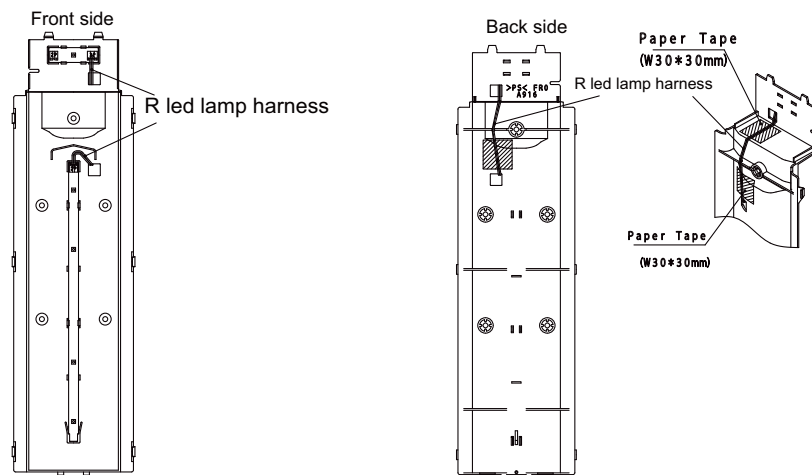


1) Fix R led lamp Pwb ass'y and R1 led lamp pwb ass'y to R led lamp holder.

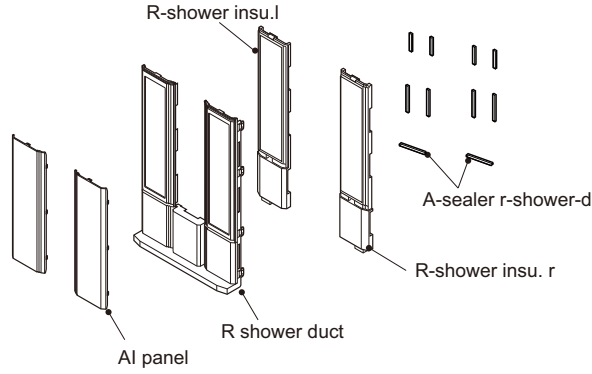


2) Connect R led lamp harness between R led lamp pwb ass'y and R1 led lamp pwb ass'y from the back side through each hole.

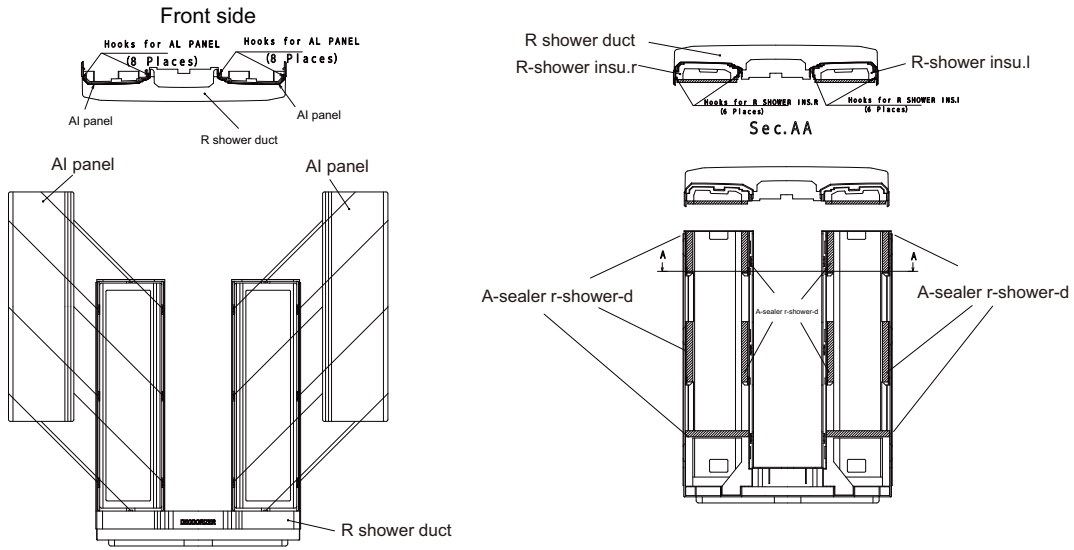
3) Fix R led lamp harness with paper tape.



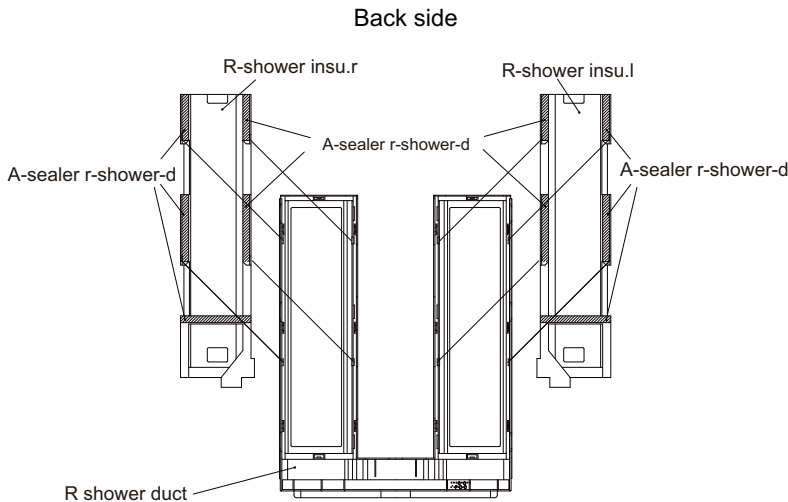
2-4. Assembling procedures of R shower duct ass'y (SJ-XP680G,XE680M)



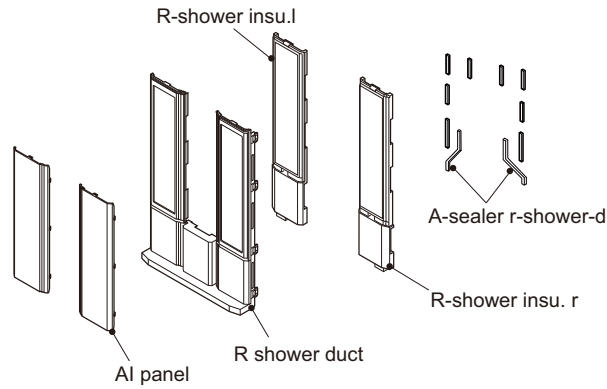
- 1) Fix 2 pieces of Al panel to R shower duct by hooks.
- 2) Stick A sealer R-shower d to R-shower insu.l and R-shower insu.r.



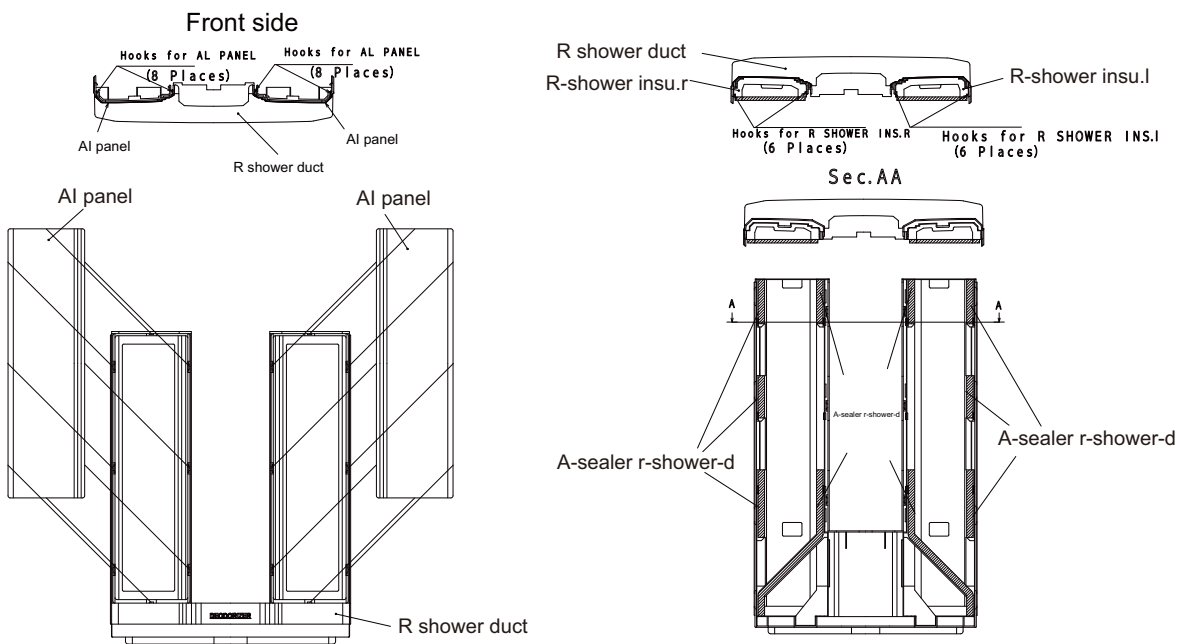
- 3) Fix R-shower insu.l and R-shower insu.r to 2) ass'y by hooks.



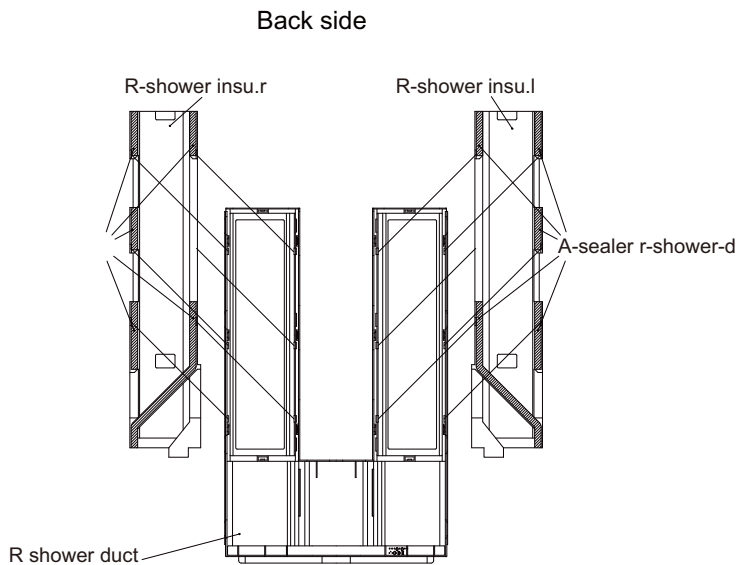
2-5. Assembling procedures of R shower duct ass'y (SJ-XP700G,XE700M)



- 1) Fix 2 pieces of Al panel to R shower duct by hooks.
- 2) Stick A sealer R-shower d to R-shower insu.l and R-shower insu.r.



- 3) Fix R-shower insu.l and R-shower insu.r to 2) ass'y by hooks.



2-6. DEFROST HEATER ASSEMBLY

2-6-1. Taking-out Evaporator

- 1) Take-out Fan louver.
- 2) Take-out E.V cover ass'y.

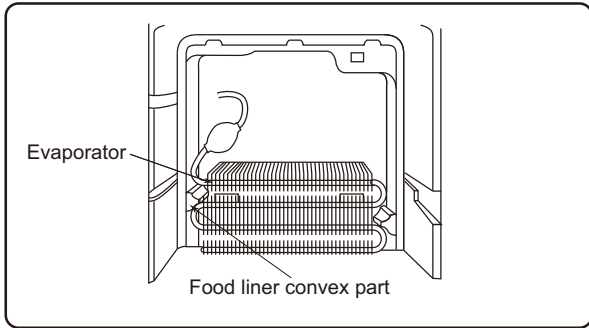


Figure A-15

- 3) As shown in Figure A-16, pull the upper part of Evaporator toward you, pull it diagonally so that the pipe of Evaporator does not contact the convex part of food liner.

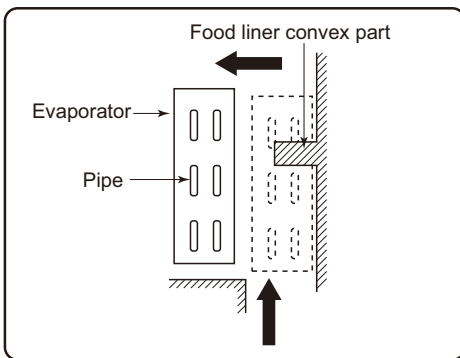


Figure A-16

- 4) Pull the Evaporator for remove as shown in Figure-17.

NOTE: When pulling Evaporator and bending the pipes, pay attention so as not to break and deform the pipes. Still, take care not to hurt yourself by fin of Evaporator.

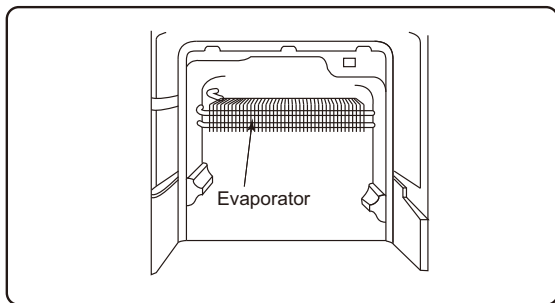


Figure A-17

2-6-2. Replacement of Def. heater ass'y.

- 1) Take off the Drain support al from the food liner.

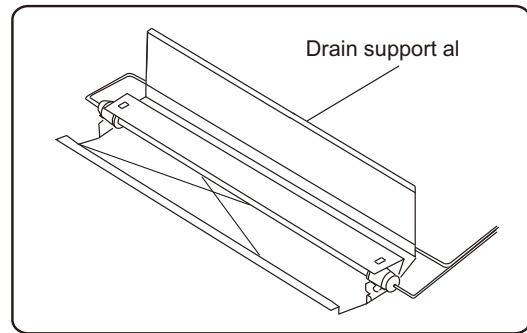


Figure A-18

- 2) Raise the protrusion part of Drain support al. Then remove Heater cover.

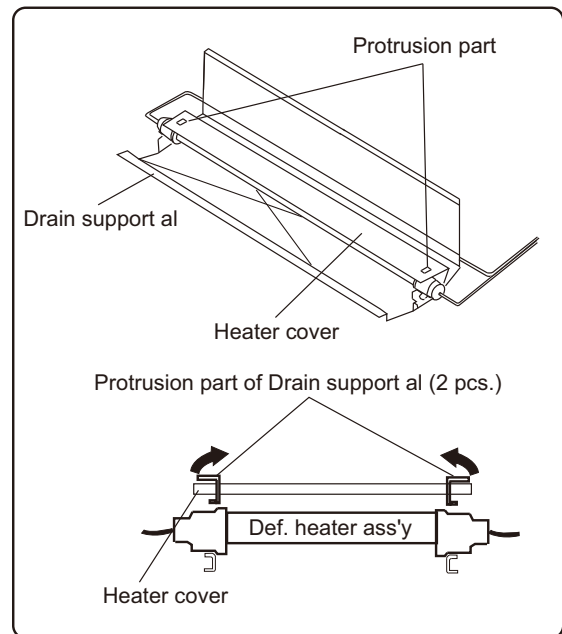


Figure A-19

- 3) Open Def.heater fixed part of Drain support al to the right and left, then remove Def.heater ass'y.

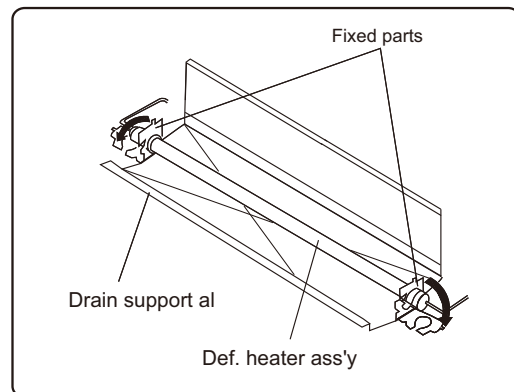


Figure A-20

4) Replace Def. heater ass'y with new one.

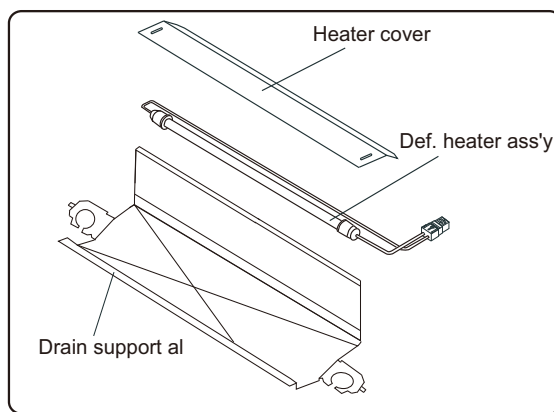


Figure A-21

5) Bend the end of Drain support 90°.

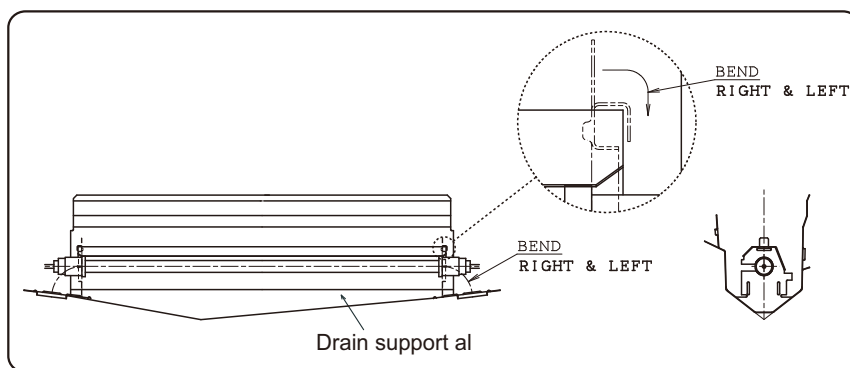


Figure A-22

6) Assemble Defrost heater to Drain support al.

7) Assemble Heater cover to Drain support al. Bend top edge to outside.

8) Stick the Vinyl tape on the Lead wire of Defrost heater ass'y.

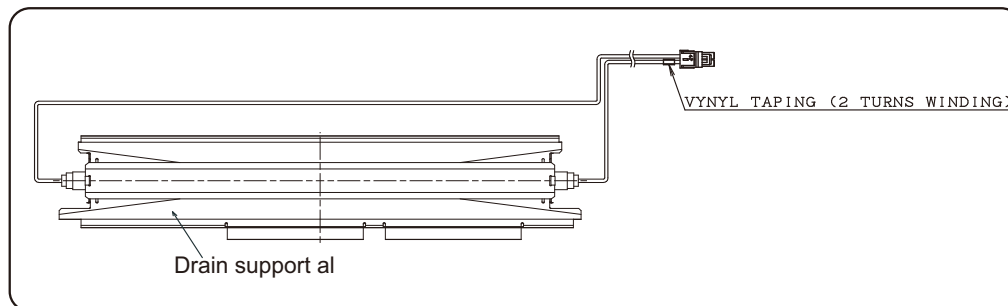


Figure A-23

2-6-3. Installing of Evaporator

1. Install Evaporator as shown in the Figure A-15 in the reverse order of Figure A-16.

2. Correct the defromed fin.

NOTE:

1. When installing Evaporator, take care not to deform significantly and break the pipes.

2. Take care not to damage the lead wires and hurt yourself by the fin of Evaporator.

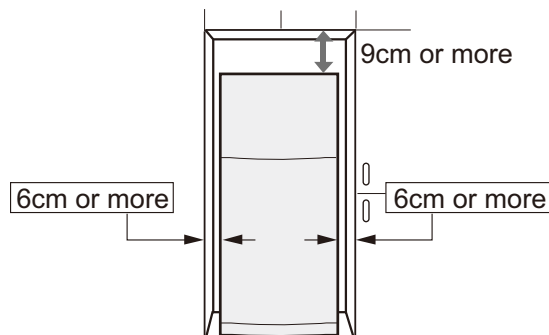
3. You shouldn't touch Defrost heater with your bare hand. (You should wear pure gloves.)

4. You should wipe that with alcohol. When you touch Defrost heater with your bare hand.

CHAPTER 1. INSTALATION

Free standing type

- To ensure adequate ventilation for this refrigerator, a minimum space of 6cm at both sides, with a minimum space of 9cm above the refrigerator, with more than 6cm less tan 7.5 cm at the rear.



- This refrigerator shall be used under the ordinary place condition between +5 °C and +43 °C of ambient temperature, and also not be left under -10 °C for long days.
- To be used this refrigerator within the range of the rated voltage $\pm 6\%$.